

Origami Theory

Abstract

For many decades we have been facing a fundamental dilemma in physics. This is because the physicists realized around hundred years ago that Newtonian equations do not work for subatomic particles. In other words, we have a science of physics that only works for macroscopic objects and when we apply the same rules on a tiny object (anything lighter than 20 microgram) we get wrong results. So, they created a new set of principles and formulae which are called quantum mechanics. Unlike the classical equations that contain one to three simple variables such as distance or mass, each one of these modern equations contains multiple variables that have a very complex meaning as well as undecided mathematical value and uncertain behavior, besides the results of the equations are wide range of statistical probabilities, instead of a transparent outcome.

In the early 20th century, some physicists realized that most likely the Newtonian system is as unfitting as the Quantum mechanics but the majority decided at the end to keep both, each one dealing with its own domain. As of the year 2022, for ordinary, visible subjects we use the usual, classical equations, but for the invisible elite we utilize the sophisticated quantum mechanics, with nonconclusive answers. For example, when you ask a modern physicist about the location of a traveling car at a certain time, he would tell you with certainty, based on the mass of the car, its direction and velocity. However, if you ask him about the location of a traveling electron in a cable on his desk, he would say, "The position of the electron right at this very moment, is virtually in a range of probabilities from here in the wire on my desk up to 384000 kilometers away on the surface of the moon, virtually to the end of the universe, so this means that the electron could be located in many places at the very same moment, and we will never be able to ascertain its exact location." Must be much easier to say, "I don't know".

The Standard Model with its noncreative title, at its furthest ambition tries only to explain the baryonic matter in the universe, leaving 95% of our world as an unsolved enigma. The model completely denies any possible role for gravity, even the slightest effect in quantum world. Standard Model and the current quantum mechanics picture a world for us that is entirely uncertain, delusional and even nonexistent. After centuries of arguing over the nature of light, we are now told that light, and in fact everything in the universe is made of particles that are at the same time waves. This means when particles get together and create a car, we know where they are, but when the particles

are traveling alone, each of these single particles somehow becomes a wide range of trillions of particles at every single moment of time and can be anywhere in the universe. However, as soon as we observe any of these particles, all of them collapse into one single particle again (the Collapse of Wave) and act as a single particle again, therefore we will never be able to locate them even mathematically. To make things even more absurd, our intelligence is challenged with ideas such as superposition that claims a particle is in many places as far as other side of the universe, at any exact moment. We are also to believe and try to imagine the existence of more than four dimensions, which is called Space-Time Fabric of Universe. This Space-Time Fabric is clearly beyond the comprehension of human mind, because it has more than three dimensions and everybody knows that a normal mind cannot combine space with time and create a carpet that has four dimensions. This invisible, beyond-imagination modality, also bends around any mass and this is why things accelerate when they approach a mass. It is absolutely impossible to imagine a four-dimensional thing yet alone, bending it in our head around a ball of mass. Now, the definition of mass is, "the resistance that a body of matter offers to a change in its speed or position upon the application of a force." This awful definition uses the term *matter* which is supposedly trying to define, as well as utilizing other complex features of resistance, speed, force and position that are not yet defined either. In most physics' lectures, we see the drawn picture of a two-dimensional fabric that is curved by a heavy ball sitting on it, but no one has ever been able to even create a picture of an imaginary four-dimensional object made of space and time, because any form of image that we develop, will eventually have three dimensions at its best. One of the most prominent physicists who lectures at MIT, says in his speech on May 2020, "Less than a handful of extraordinarily intelligent physicists have been able to envision and fully comprehend this." But he does not mention who has been able to witness, understand and confirm the correctness of the imaginations of these extraordinarily intelligent physicists.

For the first time in the history of science, models that are not even fathomable, are accepted and approved by those who are not able to envision and fully comprehend them. Very similar to the 16th century church. Arguments that are unimaginable to man's rational mind have become accepted reality, and the more difficult to make sense gets more credit. Today's so-called spiritual speakers also use these quantum physics ghostly entities, such as quantum tunnelling, entanglement, frequency and superposition, in order to impress the audience. We have all heard this statement many times, "the frequency of our universe is changing," or this one, "When you die you enter a different frequency," or another one, "there are beings entering our universe from an interdimensional space, and they have different frequencies." While we can never find anyone who would be able to clearly define and explain what these statements mean, nobody asks any questions and everyone seems deeply impressed and convinced that they have are really learning something.

While the current physical model of our world believes that entire ancient thoughts are a collection of religious myths, at the same time it prophesizes that based on *Uncertainty Principle* of Heisenberg any calculation or experiment human beings are going to do, even a million-year future, will definitely be incorrect and we will certainly not be able to locate a particle's position and momentum with certainty. We are to accept an Uncertainty Principle as a certain and eternal principle.

The new contracted model of unreal reality began by Planck, Heisenberg and Erwin Schrodinger, and agreed on by their colleagues in 1927. Since then it is constantly repeated to us that, "We can never find the exact location and/or the momentum of a particle,...We can only calculate the range of statistical probabilities for an object location in any given time,...Reality is not an abstract concept....We live in a universe that is uncertain and interwoven into multiple other universes made of many dimensions which are incomprehensible for human mind." This clearly means that physicists today instead of admitting the failure of their theory in explaining the reality, try to convince the public that reality is not real.

Such ambiguous statements that are sadly the pillars of our current physics, challenge the common sense of average intelligent person and attempts to shake even the mathematical basis of our beautiful reality. Sixty years ago, Kurt Gödel presented his ingenious arithmetic *Incompleteness Theorem* which simply demonstrates that even a glorious mathematical system will have to be either incomplete or inconsistent. But such understanding of universe, will only leave us in more darkness and confusion.

In this book we will find out together that the universe is simply made of two complementing systems, one consistent and incomplete, the other one complete but inconsistent. The combination of these twines, creates one world that we know as our consistent and complete universe. Such universe has to rotate to exist and will not allow any retrograde time-travel to the *past*. Any other incomplete or inconsistent worlds, had the defect of allowing time-travel to the past, which caused their destruction. *This is why every imperfect universe, has already self-destructed.* This simply means, our current universe, is the only and the perfect, consistent and complete reality. A reality more elegant than any music, more glorious than any mountain, a reality that is ours.

This book's mission is simply to prove that we do really live, and we are not trapped inside a holographic or an absurd delusional ecosphere with so many dimensions that are beyond our comprehension. Such drug-induced, psychotic delusions are only the product of incompetent minds that have financial influence to sit their ideas on the throne of today's scientific society. Interestingly, the most prominent scientist that speaks their ideas to the public and he is repeatedly introduced as the most intelligent man on the planet, Stephen Hawking has not been able to utter a single word for more

than twenty-five years. We are told that IBM company miraculously invented a magic computer more than three decades ago that was able to read Hawking's mind based on the twitches of the only little muscle still functioning in his cheek or his eye, and tell us what he was thinking. Out of hundreds of articulate scientists, only Hawking was always presented on highest world stage, with a Machine speaking on his behalf:

" Everything is random and massive black holes will eventually swallow the entire world, taking it back to its original nothingness."

It has become customary in our era to believe that a large part of physics is beyond our comprehension and even our brightest minds do not really grasp these complex phenomena, but these super complex theories have somehow been proved to our scientific leaders. The truth is that, a good theory should be explainable to a fourteen-year-old. This emphasizes how crucial is for the acceptability of a theory to be understandable and sensible in first place. Statements such as "our world is a complete illusion" or "observing the experiment changes the outcome", or "universe started from an infinitely dense mass (its particles closer than Planck Length to each other) which came from nothing (against the laws of thermodynamics) and suddenly exploded with infinitely fast speed (higher than speed of light)", have two great features: First, they are wrong, and second, they add no useful information to human mind.

Human superiority over animal is his common sense, not his academic credentials. The common sense tells us that any abstract ideas which state that our world is not real, or it is beyond our comprehension or it will never be understood by us or it will eventually be annihilated, is simply not true because it contradicts its own validity.

For centuries, the greatest physicists argued about the nature of light. Most believed that light was wave until Newton proved that it is made of particles. Then the Standard Model stepped in and suggested the most ambiguous statement: "Light is made of particles and it is also a wave." This not only adds no information to our understanding of light, it creates enormous confusion. In order to solve this completely nonsense statement, they use more and more meaningless terms such as "Collapse of the Wave Function when particle is observed," Claiming that a particle is also a wave at the same time which is located in many places simultaneously. To justify the issue of superposition, they present probabilities and statistics and claim that we can only guess with no certainty where the particle is. Compared with the older incorrect theories about light, the current model is fundamentally malignant because it is not only horrendously wrong, it tries to deceive us about the reality of our home. If a hypothesis is based on a notion that is not clearly comprehensible, it is not going to enhance our knowledge of the universe, it will never be provable or disprovable, and by definition, it is not a scientific finding. So many brilliant, young minds struggle at university to somehow understand the Schrödinger's wave equation and when they realize that it means that a cat could be at the same time dead and alive, instead of admitting that it is simply an

incorrect equation, they wrestle with their brain cells to accommodate the bizarre idea of the probabilities of simultaneous locations. Then they put on a proud smile and come to their struggling friends, announcing, "Ahh...finally,.....I got it...wow...it's so complex..."

The current models and theories are packed with newly coined jargons, decorated with numerous strange variables and mobilized with statistical sticks, to make them too sophisticated to be incorrect. Schrodinger's cat is a well-known example of pure misunderstanding of physics in our century, because if Schrodinger was really so bright, he would have been able to bring a clear, understandable definition for time, before trying to play with it. The truthful scientist will admit his lack of knowledge when his theory is not able to describe a phenomenon, but in current model of quantum mechanics, our scientists expand their statistical manifestation of reality to every corner of human's life in order to destroy any trace of hope that is left for man to find the truth even in future. We are told to accept that if you can see a chair and touch it with your hands, it does not mean that chair is real and it is in the room in front of your eyes, but because the probability of the chair to be there is more than its probability to be on the moon, and therefore there is always a small possibility that the chair is actually in front of you and also at the same time, it is on the other side of the moon. "Don't try to understand it, reality is much more complicated than our fathers thought."

Suddenly we are faced with a very aloof, arrogant and aristocratic universe that has fastidiously chosen a handful of sacred scientists and granted them the intelligence to understand it and other people must shut up and follow them. Even God is more friendly than the universe that our scientists have imagined for us. Even Big Foot is less blurry than the reality that quantum mechanics has cooked for us.

The current Standard Model is founded on *statistical* physics, and every day we see more statistical contamination infiltrating other domains of science: medicine, chemistry and cosmology. Anytime they are not sure, they state it with statistics. Truth and statistics are two arch enemies. Truth is existent, and unalterable. Statistics are unreal and variable, impossible to prove or disprove. We know that nothing is ever repeated in our universe, this means statistics are always incorrect, since statistics are based on repeated, identical experiments, while universe does not allow any phenomenon to repeat itself because time and location of a particle constantly change. We knew from ancient times that one cannot wash his hands in the same river twice, so how could we talk about percentage of the probability of the occurrence of an event. In other words, we would never be able to toss a coin in the same circumstances for even twice, so how could we create a percent value for the chance of head or tail to happen. They have only *assumed* that if we repeat the same experiment in exactly identical circumstances so many times, then we will have a number representative of something called the possibility of that outcome. This is when we know very well that assumption is to do with religion, not science. This concept of assumption and making agreements and contracts over unknown features of universe and calling it science has resulted in a cult today that

does not allow anyone who is not willing to sign the agreement to speak out. Another great example is the electrical current in a conductor. The current model says that electricity is a current of electrons flowing in a conductor from the negative pole to the positive pole. However, the scientists have decided to demonstrate the direction of the electrical current in opposite direction, from positive to negative. It is impossible for a rational mind to find the logic for such ritualistic decisions.

In this book we read about a different model that is called Origami Model. Origami Model is based on the simplest way of understanding the universe, because the truth is always clear and understandable for all, not absurd and confusing. This model explains the fundamental structure of the universe, it solves the current conflicts and disparities in the Standard Model and also predicts the behavior of matter with no ambiguous features such as wave-particle dualities that only disorients us further. Origami Model is based on the foundation that all modalities in our universe such as mass, space, location, time and velocity are all created by different behaviors of time; just as the various shapes in the art of origami are produced by different folds of the same paper. The foundation of Origami Model is based on the following two basic concepts:

- Firstly, ***time is the only dimension in the universe***. Time is quantized and it reveals itself as what we perceive as mass, time and space(locality). Speed of time (which will be defined and explained later) has been constantly accelerating since the beginning of the universe;
- Secondly, ***gravity is the only fundamental force***. Gravity is analog, and it is the order which we perceive as the force. Therefore, gravity has direction and it is a dipolar (not scalar) order. It is the gravity that creates direction in the digital units of time. This means gravity may manifests itself as repulsion or attraction, producing various features, behaviors and phenomena involving matter (time). The two directions of gravity produce the two opposite orders in digits of time, which we know as Matter and Anti-matter.

This simply means everything that we see around us is made of time. The gravity is the unseen (nothing) will that decides and puts the units of time in order, creating the world in front of our eyes.

All aspects of this basis are to be observationally demonstrated and mathematically proved throughout this book. Based on these two simple principles, Origami Model provides a simple model of our universe that is consisted of only two entities: Time and Gravity. To create the world, you only need two items:

Time which is 1 and Gravity that is 0.

We will see the fundamental truth that what we perceive as NOTHING, is actually the gravity, the core of our universe. Gravity is timeless so it has no time, mass, size or location. Gravity exists independent of time. Therefore, the absolute vacuum that we call “nothing”, does not exist. Gravity is in fact the property of what we call NOTHING. Origami Model shows mathematically that all other three fundamental forces (electromagnetic force, weak nuclear force and strong nuclear force) are various manifestations of gravity. This model shows that gravity is not a force, but the effect of vacuum on order/speed of time. In other words:

Gravity is the Will that Decides the Order and Speed of Time.

We will see soon what we mean by terms such as “will” and “order” and “speed” of time. The model demonstrates that time is a quantized entity that is digitalized and noncontinuous, consisted of digits (numbers) which we perceive as information, and these digits are ordered by the Gravity. The Gravity also affects the density of these digits which manifests itself as speed of time, that we perceive as speed of light and eventually as speed of events in our world. This simply means that while time is the quantized, interrupted matter, gravity is the analog, continuous command. Gravity is not just pulling a mass. Therefore, we will have comprehensive definitions for mass, time, gravity, location and velocity. These definitions clarify our vision of the universe and at the end, instead of leaving us baffled and perplexed, we will be relieved by comprehending the most elegant presentation of cosmos.

In each chapter, together we will discover a new piece and by the end of the book the entire mystery will be solved. Origami Model clearly explains the causality of what is called Cosmic Inflation and the mechanism of what they call as Expansion of the Universe and it will clarify the nature and quantity of Dark Energy, Dark Matter, Anti-matter as well as the formation of celestial bodies and the nature of black holes and white holes. We will conclude equations to calculate the life span of the universe and to convert time into other modalities such as length and mass which are in fact various manifestations of time, and also to predict the future of a star or a galaxy or the universe as a whole. We will be able to find out how many stars and what number of black holes are there in our universe. We will see that the world is much easier to understand, than what we are told currently because the truth is based on the uniformity of our universe as a whole. This model tells us that above and below, big and small, all follow the same rules. What we consider incredibly small and quantum size, is of an ordinary volume for a virus; and what we see as a gigantic star, is a golf ball for Andromeda. There is no above or below, there is no big or small, such perceptions are due to the relative perception that can deviate us from the elephant in the room.

The Model then extends its domain to subatomic field, providing a conclusive mechanism for complex quantum mechanical phenomena such as quantum entanglement, quantum tunneling and it explains why we experience confusing observations such as superposition and particle-wave duality in Double Slit Experiment. Origami Model produces a stable, transparent and rational universe with all its parts possessing definitive positions and certain functions that leaves no room for any conflicts. While Standard Model believes that our world is made of mysterious, ultrasmall objects that are particles and at the same time they are waves, Origami Model demonstrates that everything (including light) is only made of quantized particles and it explains the mechanism by which we observe the interference effect and wave feature.

Unlike the standard model that believes “Observing Affects the Outcome” and therefore, when you do not look at the moon, it does not necessarily exist and when you see the particle, it changes its behavior from wave to particle, in Origami Model we see the object permanence, which means that our world does exist, regardless of our alertness. When James passes away, his car is still parked in his garage.

The new equations provided by this model explain and predict proton decay and color confinement – subjects that have perplexed the scientific community for long. This model shows that the entire universe is made of only one primary particle, instead of 38 elementary particles in the standard model (the number grows every year). This fundamental corpus that is used as the building unit of our universe is named the Origamon, and it is fundamentally identical to the photon. All other subatomic particles are consisted of fused collections of Origamons, therefore entire population of elementary subatomic particles in Standard Model are subject of decay. Maybe the most prominent feature of Origami Model is its ability to finally discover and calculate all the Physical Constant one by one. As we know, these constants have been mystified us for centuries. Throughout the book we will find out together the true nature and the reason we encounter these so-called Constants in our calculations. Then we find equations and discover patterns that can predict the course of our universe. Origami Model, blasphemously reveals to us the hidden secrets: what time really is, how universe is formed and where it is going to. We are going to dissect the fundamental entities first and then we will generalize it to ultra-small and ultra-big characters, since As Above So Below. Origami is the Archaic Model. The Way that returns us home, after centuries of painful wandering in desert.

It might be easier to divide the book in two parts: The first part gives us a simple version of the physics of our universe that is understandable for everyone, and this is the ultimate goal of the mission. However, the second half would provide mathematical equations and complex calculations as well as existing observational evidence to establish the point, for those who rely more on digits than cogent. Ultimately, convincing

a rational mind is the corner stone of true science, not staging a glorious mathematical theatre starring only numerical characters.

The source of this book is the same as the source of every kind of human knowledge, inspired mind. The creator has no choice other than using some of his creations as the channel to shine the way. The truth is permanently present, the hand is only a dancing pen, rewriting it for us.

Qafshinra
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Chapter 1

Plain English Version

Patchwork

At the beginning of the book, we talked about the conflict between the general relativity and quantum mechanics. We see that the current quantum physics is in profound conflict with our natural perception of reality without proposing any clear, comprehensible solution. Today's science contains two separate schools of theories and equations, one for macroscopic objects and one for microscopic particles. Even the territories of these two giants are not well defined. However, to concern a border separating them we may consider anything smaller than $2.18 \times 10^{-8} kg$ belonging to the quantum mechanics. This virtually means that today's science is convinced that once something gets smaller than this size, it starts disobeying the classic laws of physics.

Classic mechanics provides simple numerical figures as its mathematical results, while quantum mechanics concludes with variable statistical probabilities in zero certainty. Schrodinger and Heisenberg were the two geniuses pioneering the quantum mechanics. Schrodinger says a cat is dead and at the same time it is alive. Heisenberg says the only certain thing in universe is uncertainty. On the other hand, classical physics says that any mass produces a force of gravity that is maximum at its center, where there is no mass! The sad truth is that both of these two sisters are wicked. It takes no genius to understand that larger objects are simply collections of same microscopic particles, besides size of an object is relative to the distance and size of the observer. Therefore, if our equations are correct, they must not provide incorrect results when applied to different physical conditions such as a heating metal or when applied to dissimilar sized objects. This all started with an experiment labeled as the Ultraviolet Catastrophe in late 19th century. During this interesting experiment, physicists realized that applying Newtonian physics would give them meaningless results, concluding that a black body at thermal equilibrium would emit unbound quantity of energy, which is obviously impossible and incorrect. The fact that classical equations applied to variant situations or dimensions of the matter turns useless, proves that we have fundamental errors in both schools of physics. However, after years of argument, no group accepted defeat and at the end, something very strange occurred: they decided to accept both sets of rules and equations, one for big things and the other one for small things!

This is the ocean of science today has become so contaminated that anytime we throw our net in it, the head of a dead god comes out. The teacher's coat is drenched in theories, but his pockets are full of crawling creatures.

We are blown away when search and study to find the mechanics of our world based on the current science. It is hard to believe that we still do not have any proper definition for fundamental concepts of mass, force, time, locality and spin but our books are decorated with absurd concepts of quantum decoherence, interdimensional traversable wormhole and supersymmetric gauge.



Our modern physics claims that universe is not a tangible realm and to prove this, it provides us with so-called complex mathematics, that consists of purely statistical probabilities. Such figures when applied to any condition, they are capable of producing any results except the certain, correct result. We are told that we live in an uncertain world that every particle in it is in fact in many places at the same time, deluding the very basic definition of time and locality. This absurd view is literarily stablished by utilizing mathematical tools that their very existence has been already disproved by the same founders. We are told that our world started at a moment and location that is called Singularity, which has no comprehensible time or location. In a simple

word, none of these new terms, has any real meaning, but they are somehow convincing for us to feel that our scientific knowledge of universe is progressing. In fact, we cannot find one scientist who is able to explain the singularity, the same as other mouthful terms such as superposition, particle-wave duality, space-time fabric, interdimensional space and supersymmetry. However, today you are more impressive and knowledgeable if you apply at least a few of these jargons in your speech, even though no one is able to really define any of them. Lack of definition is not your problem, the new terms in fact have no meanings, similar to the politician and the clergy's words. Meaningless is more valuable and influential in the age of confusion.

Now to solve the problem we are told that a Theory of Everything is required and the most likely scenario seems to be the String Theory. This new version starts by telling us that universe is made of not just four dimensions (space and time) which we have eternal difficulty to comprehend, but it is in fact consisted of twelve or thirteen or maybe even more dimensions which we will not be able to truly understand. The question of how this incomprehensible model is created and approved by men has no answer. Even Hawking who did not say a single word for many decades and a machine always spoke supposedly on his behalf, never claimed to be capable of imagining anything with more than three dimensions.

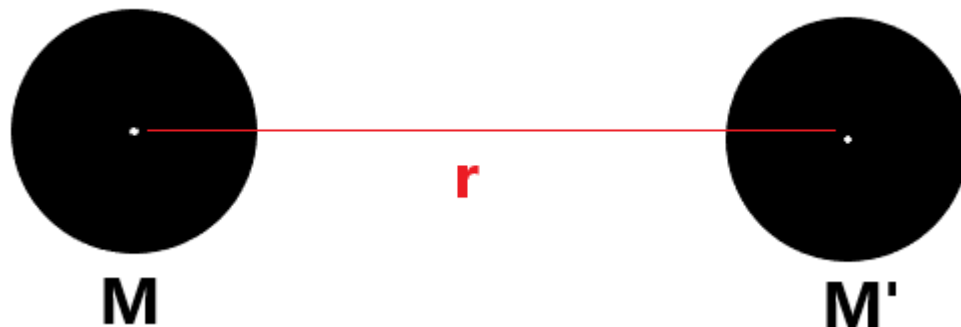
We had to mention this introduction in order to explain the necessity of starting from the beginning and building back our correct version of physics. Without plain and clear physics that our children can understand, we will stay trapped in this dark cave. We begin with the fundamental definitions and equations for mass and gravity to discover what is unfitting in classical physics and how we can find the correct version that can be generalized to quantum world. Let's stick tightly to simplicity and clarity.

"Simplicity is the ultimate genius."
Leonardo Da Vinci

King Is Naked

Newton's equation to calculate gravity is truly one of the most prominent findings that unfolds the mystery of our universe. This wonderful piece of mathematics works perfectly well in any location and any time in our entire universe. To develop the equation, Newton checked the force of attraction, gravity, between two objects and with his tremendous intelligence he immediately discovered that the gravity between the two objects is directly related to their mass and inversely related to the square of the distance between them. In simple language, the bigger the mass of the two objects, the larger the gravity between them. So, he realized that gravity was something produced by the mass of the object. Also, he found that gravity was maximum in the center of the mass. The further we go from the center of Earth, the lower the force of gravity of Earth will become. This is how he created the most important discovery in physics, the eternal law of gravity:

"Gravity is the force produced by the mass of any physical body that attracts any other physical body towards its center."



This is quite simple, clear and reasonable and there has been no problems or conflicts in physics with it. Even after Einstein found that gravity is in fact the acceleration of a mass moving towards another mass due to the curvature of space-time fabric, Newton's equation and definition stayed intact because we still know that gravity is coming from the center of a mass, it is produced by a mass and it is at its maximum at the center of the mass. Newton's eternal equation of gravitational force between two masses is immortal:

$$g = \frac{GMM'}{r^2}$$

g : Force of gravity between two masses

G : Gravitational Constant (6.67×10^{-11})

M : Mass of one object

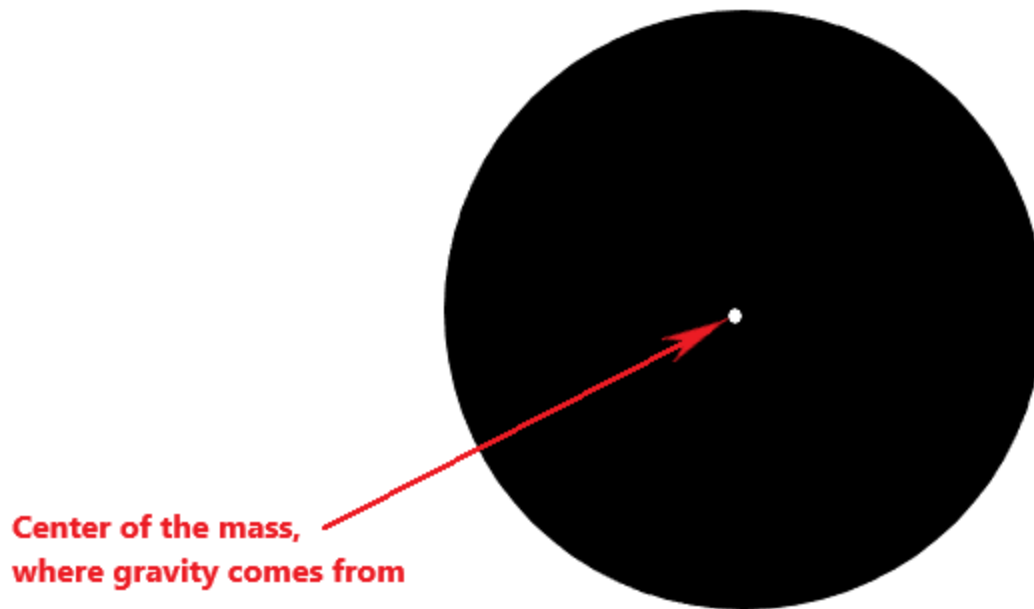
M' : Mass of second object

r^2 : square of the distance between the two masses

The equation is elegant and simple and everything in it clearly makes sense. However, there is an enormous elephant in this room that we have been neglecting for more than 300 years. A crucial fact is hidden in Newton's equation that acknowledging it will shatter the entire

foundation of modern physics and rebuild it in a new, perfect form that can transparently explain the most confusing phenomena in our universe. This neglected fact is indeed the cornerstone of Origami Theory.

The hidden secret in Newton's equation is in fact very easy to understand: We know that gravity originates in the center of the mass and it is at its maximum in the center of the mass, but *there is virtually no mass at the center of the mass*. Looking at Newton's equation we can see that as we go towards the center of the mass, the force of gravity increases by the power of two because the gravity is directly related to the square of the distance from the center of the mass. So, when we reach the very center of the mass, the gravity will become virtually infinite! But at the very center of Earth, there is absolutely no mass! When we reach the central point of Earth, the entire mass of Earth is behind us. This clearly gives us the key to open the secret world of our universe! This is telling us loud and clear that gravity has nothing to do with the mass, and on the contrary, it is at its maximum when mass is at its minimum, so that where there is absolutely no mass, there is infinite amount of gravity. In other words, the equation has been screaming for three centuries that at the beginning of the world, (Big Bang), when there was no mass, there was infinite amount of gravity. Gravity is the property of vacuum. What we understand as NOTHING or absolute vacuum or empty space, is gravity. This simple, clear fact that is demonstrated very evidently in Newton's genius equation, not only does not reduce its value, it proves that the equation is the most fundamental piece of mathematics to demystify our universe. We have been constantly asking ourselves for millennia, where things came from, what force started the Big Bang? How the original mass at the first moment of universe exploded? Why is our universe expanding? What is the force that created and keeps expanding/growing our universe? The answer to all these crucial questions is right in Newton's equation. The equation does not tell us that gravity is *produced* by mass. The equation however, does tell us that gravity is in the center of the mass, it is almost infinite at the very virtual central point of the mass and it exponentially reduces as we go further away for the center of the mass. Therefore, every mass contains the force of gravity at its center but gravity is not produced by the mass and therefore, we must be able to observe naked gravity without mass around us. This might sound strange, but it is absolutely correct and in fact, all our mathematics has been showing it right in front of our eyes for many long decades. Origami Model is simply the discovery of this gigantic elephant that has been dancing in front of Sir Isaac Newton's eyes and he decided not to see it. No part of this mind-blowing equation tells us that gravity is produced by the mass. It is actually demonstrating that gravity is inversely proportional to mass! As we can clearly see in the equation, when the radius reduces, gravity exponentially increases, this means as the mass reduces, gravity enhances!



There is no mass at the very center of a mass.

So, if gravity is not produced by mass, why is it coming from the center of the mass? The answer is extremely simple: We usually find the gravity in the center of mass because all around us there is mass. Everywhere we look, everything around us has a mass, and at the center of every mass there is gravity, because *gravity creates the mass*. Gravity holds the particles together and creates what we perceive as mass. So, it seems that we cannot find free gravity in our universe because as soon as there is gravity, it attracts particles to itself and produces a mass of various shape and size. So, could there be a gravity without mass somewhere in our universe to prove that gravity is in fact something completely independent of mass? Yes! There are so many pools of gravity with absolutely no mass around them in our universe, so many of them, more than billions of them around us. We all know them and in fact we hear about them every day in news! One of our scientists became a household name by spending his entire life on these naked gravity pools and he tried so hard to understand the nature of these gravity pools but sadly kept hitting the wall and his theories were never proved until passed away recently without getting the Nobel Prize because his thoughts were never backed by our real findings in the universe. But why? Because he also did not see the elephant! He kept thinking that mass produces the gravity. The naked gravity pools sitting in front of us are the Black Holes that have perplexed our scientists for almost a century and Stephen Hawking couldn't prove his theory about them simply because despite his tremendous genius, he was too wise to see that the King was Naked!

The black holes in our space are simply empty spaces that contain zero mass and no particle or mass falls into them at all! These massive pools of gravity rotate so fast that every particle attracted to them gets accelerated to almost speed of light, so they turn into light before reaching the surface of the gravity pool (the Event Horizon). A good metaphor for black holes in space are tornadoes in our atmosphere. A tornado is a vacuum that attracts everything, rotates

it and throws back into air. Black Holes do exactly the same, they simply rotate the and energize our space. This means, when the pool of gravity is small, particles can get attracted and set around it and produce what we perceive as mass, and when the pool of gravity is too big and powerful, it attracts the particles so strongly that it accelerates the particles to speed of light and so it converts them into light that bounces back into space. Origami Model believes that gravity is the property of vacuum. Note that what most of us know as vacuum, is the dark space between the stars that is in fact full of particle-antiparticle pairs and it is not empty at all. One of the greatest minds of our times, Peter Higgs received the Nobel Prize of 2013 for proving that vacuum of space is saturated by these particle-antiparticle pairs coming in and out of existence with speed of light. So, space is wrongfully named vacuum and it is in fact a very dynamic matrix of neutrinos. By vacuum here, I mean absolute vacuum, somewhere in space that contains absolutely no mass at all. This gives us an imperative conclusion: gravity is property of vacuum.

Neither Newton, nor Einstein could really define the gravity. Newton thought it was a force. Einstein realized that it was not really a force. Current physicists believe it is a kind of force and so it must have a force carrier that they call Graviton, but it has never been found. If you search all the latest textbooks of advanced physics, you will see that we still have no definition for gravity and we still have no definition for mass. Isn't this the most ridiculous failure in the history of human science? Our universe is made of mass and gravity and we proudly boast that we have decoded biggest mysteries of our universe but we have no definition for neither mass and nor gravity! The definition of mass based on the latest scientific statement is this:

"Mass is both a property of a physical body and a measure of its resistance to acceleration (a change in its state of motion) when a net force is applied. An object's mass determines the strength of its gravitational attraction to other bodies. Gravity is a natural phenomenon by which all things with mass are brought toward one another. "

Isn't this so-called definition truly absurd? This is not only doesn't explain the reality and nature of the mass for the reader, it also uses the gravity to somehow explain the mass, then again uses mass to explain the gravity, while explaining none of them. It also idiotically utilizes the term "physical body" which it hasn't defined yet. This is the disastrous situation of our physics at the first quarter of 21st century when we have already landed on the moon and developed artificial intelligence! We still don't know the alphabets of the language of our universe!

Later on, Einstein realized the massive defect in our understanding of mass and gravity and he tried to develop a more reasonable definition for gravity based on his extraordinary theory of General Relativity which is after Newton's finding, the second biggest discovery of human mind. In 1951, Einstein defines gravity as this:

"Gravity is not a force, but a consequence of the curvature of spacetime caused by the uneven distribution of mass."

But even Einstein himself said in numerous occasions that "I don't know what gravity is....I just know that it is not a force.."

As we discussed before, sometimes a simple and clear fact could confuse the most brilliant minds. Einstein was getting very close, and he understood that gravity was not a force but because he too did not have a proper definition for mass, he couldn't figure out what gravity could be. By unveiling the true nature of mass and gravity in Origami Theory, the entire mystery of our universe will unfold miraculously in front of our eyes, and just like a domino effect

everything will start to make sense. Gravity is the property of NOTHING. Let's put it this way: Gravity is what we normally call Nothing. You might think that such statement would not add anything to your knowledge, but it is the most important key to understand the world. As we walk through Origami Theory, I will reach the final, proper definition of gravity that explains its true nature to you clearly but first we have to return to the subject of "Mass" and explain what mass is. As I mentioned before, we do not have a definition for mass yet. This clearly means we haven't started our physics lessons properly. We know how to turn on the massive computer of our universe and play with it and perform amazing operations but we don't know what this gigantic computer is made of, or how it is put together. Origami Model is a reverse engineering book with 300 pages of complex calculations and equations, that simply dissect the universe, demonstrating to us, what this huge machine is made of. In this part of the paper, I only try to explain everything in a fluent, plain way, avoiding the sophisticated mathematics as much as possible. By the time you finish reading this, you will realize how simple our world is and how easily everything works, with no confusion or conflict left to obscure our understanding. Simplicity is the ultimate genius!

Wrong Turn

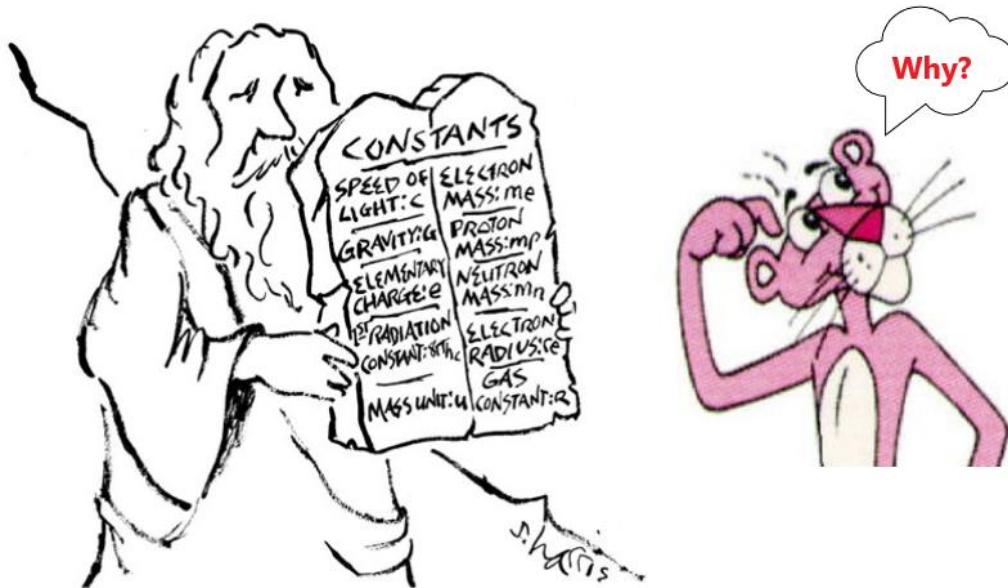
The awful lack of a meaningful definition for mass or gravity, is an unbelievable defect in modern physics. You have most likely heard that we are impatiently waiting for a "Theory of Everything". Let me explain what this means. When Newton appeared with his wonderful classic equations, we thought we have decoded the entire universe and we must know then how everything works. Physicists were happy little kids playing at school recess when in late 19th century couple of curious physicists pierced the atoms and entered the subatomic world of extremely small particles. They were exciting to watch how these tiny particles follow the laws of Newtonian physics when the little naughty particles pulled their faces and ridiculed every piece of the elegant system that Newton had created. When you throw a ball in sky, Newton's equations can perfectly tell you how high that ball will rise in sky and how far it will fly, and when and where it will finally land on earth. But when physicists started working with subatomic particles, they were shocked. They couldn't believe what they saw. Everyday a new strange phenomenon was discovered and named and became a new conflict in physics, most of which still are unsolved mysteries, such as quantum tunneling, quantum entanglement, spin, wave feature of particle, Aharonov-Bohm Effect and superposition. However, despite the large variety of these conflicts, fortunately they all originate from one simple fact: The uncertainty in locality. In other words, unlike the macroscopic objects of Newtonian physics which we can locate clearly in space, subatomic particles' location in space is impossible to be precisely measured or predicted and to even make it worse, sometimes the particle can be in more than one place at the same time! These impossible effects made physicists more and more mystified and anxious so that Werner Heisenberg, who won the Nobel Prize of 1932 for his Uncertainty Principle, the masterpiece of quantum mechanics, said on his death bed, "When I meet the God, I am going to ask him why relativity? And why turbulence?" Despite so much effort to solve the problems, more and more paradoxes surfaced every day. The torment only continued until they finally gave up and surrendered to the complexity of the particle world and admitted that we can never precisely find the location and momentum of a particle, and we can only produce a probability diagram of a particle distribution and guess with some degree of error where a

particle could be. But this is not physics as a science, is it? Guessing and probability is more like palm reading and taking chances while science is all about certainty. This awful defeat, resulted in creation of new set of physics to be used exclusively for dealing with the microscopic world.

So now we have two physics books: One for visible objects, and one for microscopic particles, and the equations and rules in these two books are completely different! This simply means we have to confess to our children that we don't know what is really going on in the quantum world, or just mislead them and say, "The quantum world is fuzzy, weird and blurry, like Big Foot! We have no idea who is who and what is what and what is where." The latter is sadly what exactly we hear repeatedly in our modern physicists' speeches. However, we all know that science that does not know, is not science. It is very obvious that somewhere in our journey we have got something wrong! There must be something very fundamental in the physics lessons that we have misunderstood. Maybe space is not what we think, maybe the concept of locality is not what we have thought. We are all waiting for a unifying theory to appear and correct our misunderstanding and successfully develop a universal set of equations that we can apply to any object regardless of its size and mass. In simple words, our science of physics is a vast ocean that is only one finger deep! There have been numerous prominent scientists such as Einstein, David Bohm and Stephen Hawking who have been dedicating their lives to this mission but no such Theory of Everything has been accepted by all yet, because every proposed hypothesis has contained multiple new conflicts. String Theory have so far been the best shot, but it proposes extra dimensions that are clearly beyond human comprehension! I wonder how someone can claim to have developed a theory that defines the universe but it contains undefinable and incomprehensible features! Years ago, I tried my best to explain String Theory to a smart and gorgeous student, she asked me to describe the strings and extra dimensions, I said "It's virtually beyond my comprehension because I can only recognize three dimensions of space." She raised her eyebrow and walked away. I scratched my head and walked away. I felt embarrassed because she probably thought I was just trying to chat with her while I didn't really know what the hell I was talking about. So, I must say, if you only wish to impress someone with average intelligence with big complex words, String Theory is a good one!

By now you have definitely realized that Origami Model is in fact presenting itself as the Theory of Everything. If the proposed theory is the correct one, it must be able to produce universal equations for all mass regardless of their values, and it must also be capable of finding and explaining the origin of the Physical Constants as well as explaining the phenomena that contradict the concept of locality (eg. Quantum entanglement, Aharonov-Bohm effect, quantum tunneling and wave feature of particles) and also being capable of predicting the future of the universe. Theory of Everything must be capable of absolutely explaining everything with no contradictions and no unknowns.

One of the major mysteries in our current physical system is what we call Physical Constants. What is a physical Constant?



Let's explain it with a simple example. When Newton discovered the force of gravity, he decided to find an equation to measure it. So, after so many experiments, he developed his wonderful equation at its original structure:

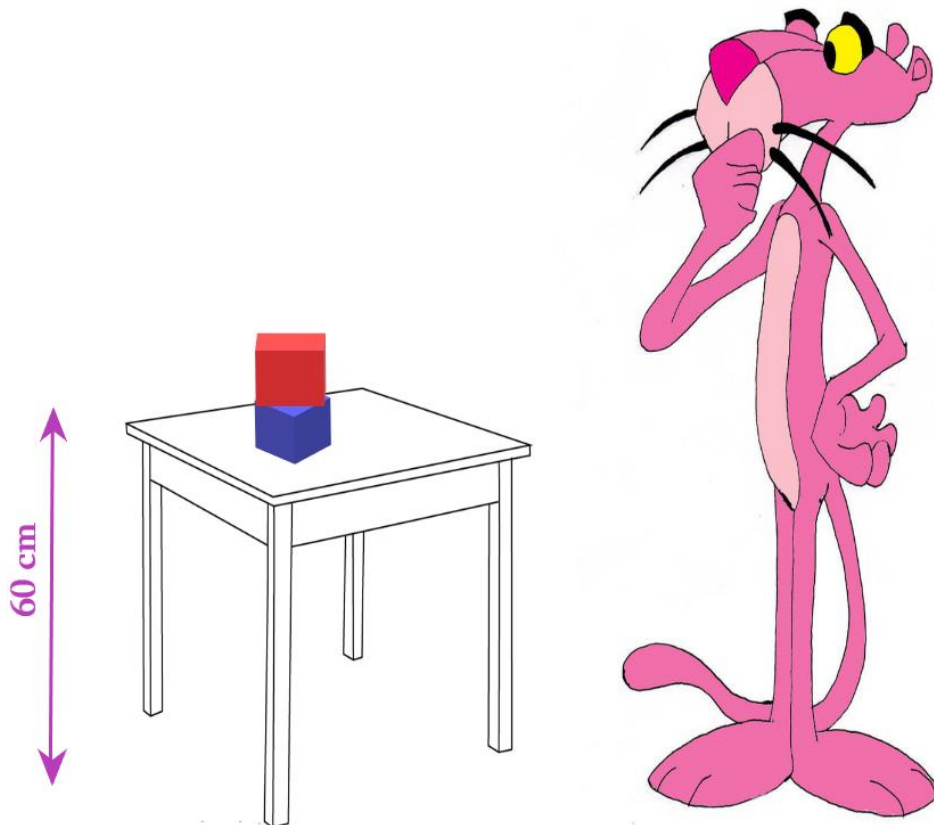
$$g = \frac{M}{r^2}$$

In this equation, g is the force of gravity that is produced by mass of M, and r (radius) is the distance from the center of the mass. But anytime he calculated the force of gravity by his equation the result was millions of times bigger than the real force of gravity that he was measuring. After so much thinking and working, he realized that if he multiplied his result by a certain number, the result will become correct. He called this coefficient, Gravitational Constant and denominated it as "G". He calculated that G is equal to 6.67×10^{-11} . As you can see this number is extremely small but it is Newton's magic wand, because once he touched his equation with it, everything started working perfectly. Since that day, something strange took place! From that cloudy day onwards, all our equations are coughing and burping and choking until we touch them with a magic wand. We keep developing new equations, but every newborn equation needs a slap on its butt to start breathing. These slaps or magic wands, are politely called Physical Constant in our modern books of science. The elegant equation of calculating the electric charge of a particle, needs a magic wand that we call Coulomb Constant. This butt slap is a number that our universe has somehow created but we don't know how. What matters to us is when we gag the equation's throat with Coulomb Constant, it starts working and gives us the correct answer. A simple example can help understanding the problem: Imagine you have two identical cubes and each cube is 3 cm tall. You put the two cubes on top of each other, but when you measure the height, instead of 6cm, it becomes 66cm! So instead of finding the cause of the problem, you simply decide to add a Physical Constant of 60 to your results and present your genius equation to your students: The total height of two cubes of N centimeter tall, when they are placed on top of each other, is N multiplied by 2 plus My Constant, when My Constant is 60. So, your wonderful equation will be something like this:

$$\text{Total Height of two cubes} = 2 \times \text{Height of one cube} + K$$

$$K: \text{My Constant} = 60$$

Until one day a little curious boy comes across and sees that there is a table in front of you that you haven't been able to see. So anytime you put the cubes on top of each other, you measure the total height from the floor, including the height of the table without knowing it.



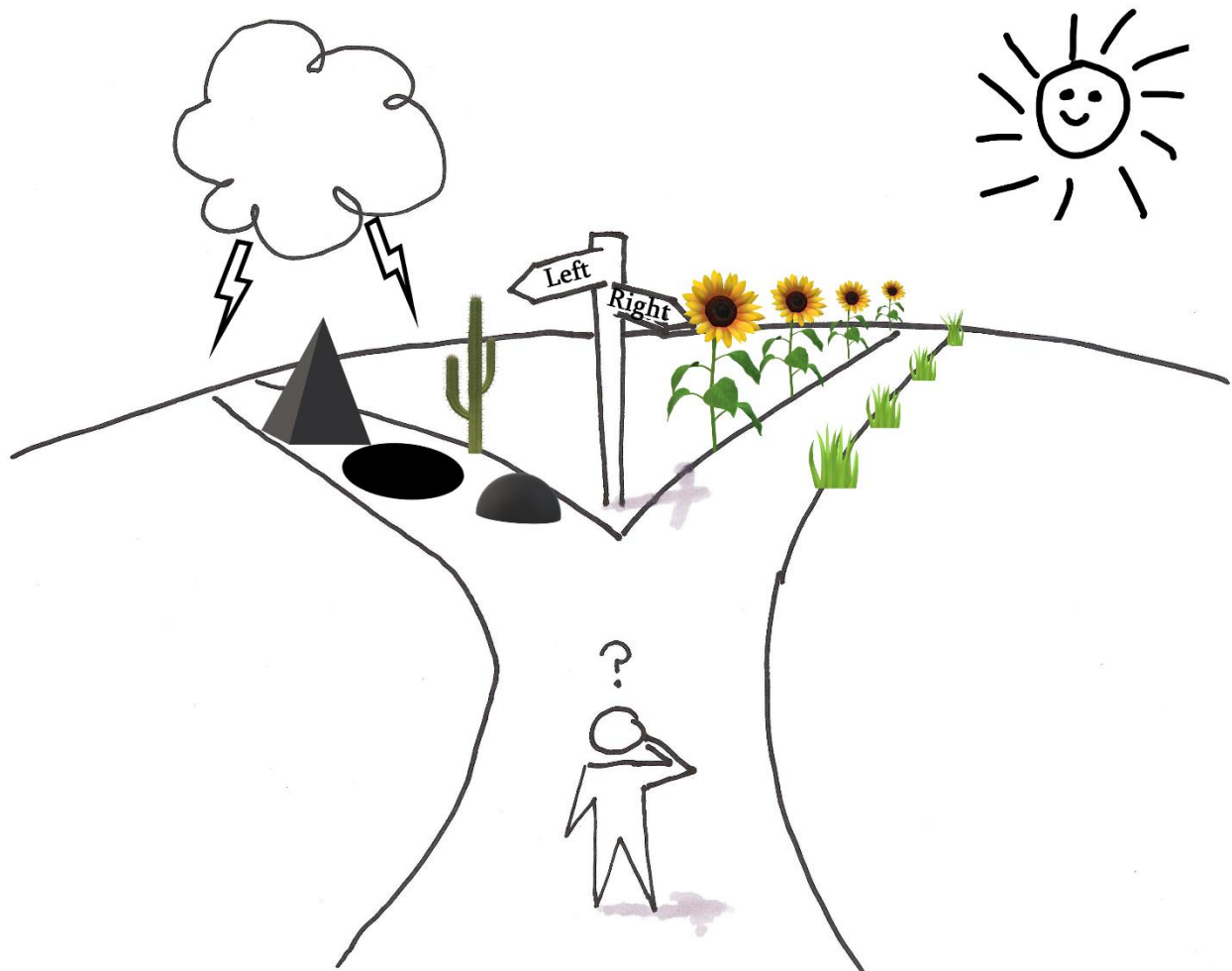
When you don't see the 60cm table under the cubes

Today we have 25 Physical Constants that without them none of our equations will work. None of these Constants are calculated or discovered, they are simply error correctors. You can now see why the very existence of the Physical Constants simply means we have got it wrong! There is a twist somewhere in the nature that we haven't been able to see. Somewhere down the road we have taken the wrong turn and so we have been forced to keep applying the Constants to correct our position. This is why the correct Theory of Everything must be able to

discover, explore, decode and explain all of these Physical Constants. The right Theory of Everything will be able to clearly explain why G is 6.67×10^{-11} and more importantly, what G really is.

We have found many phenomena and by borrowing the Physical Constants, we have been able to produce equations to measure them, but we are completely wrong about the nature of these Constants and how they function. This is why after every single discovery in physics, we face a new question and new mysterious feature. This is exactly why Newtonian world was clear and logic but quantum mechanics is absurd and delusional and all our modern physicists keep repeating outrageous counterintuitive quotes such as: "We live in an illusional world and nothing is real!" Such statements are simply nonscientific, incorrect and lack any reason. If we knew that the number 60 is just the height of a table under our cubes, we would be able to move the table and find the door under it, which will take us to a gigantic treasure!

Until the last Physical Constant is decoded and understood, we cannot claim to comprehend our universe. The simple reason that people used Archimedes' Principle and Newton's Laws to solve any problem until suddenly at the end of 19th century the stable, predictable world suddenly became shaky and bizarre is not the world's fault. It is our understanding of the world that is wrong and that's why every new scientific discovery instead of making our world brighter, has made it more and more ambiguous, unreal and delusional! We have to look back to Newton's time, return to that point and turn right this time!



Mass and Gravity

Ben is a little character in a sophisticated computer game. He is a little, curious boy that has artificial intelligence and can grow and think and fall in love and even reproduce. He is actually much more intelligent than us! One of our superb software designers has created this character in an amusing computer game that most people in 2084 love and watch obsessively. One day, Ben comes home to find his father, Kuma dead. He becomes so sad and cries for days. Until one morning when he wakes up and feels that something has changed inside him. Ben starts to think about life. He is on an intellectual journey to find out what the nature of his world is and how he has come to life and what happens when he dies. After years and years of study and research and experiment that only takes few minutes for us, he discovers something revolutionary. Ben realizes that the entire world around him, even his own body and mind, even his feelings and his sorrow for his dad, are simply created by digital codes. This revelation takes him by a profound surprise. But he doesn't stop there. He keeps digging until he discovers that the super-sophisticated digital codes of the software that have created him and his entire

universe are in fact extremely simple codes created by various combinations of 0 or 1. He even doesn't stop at this level and soon finds that the digital codes are nothing but electrical signals. When there is an electric signal, it manifests itself as 1. When there is no electrical signal, it manifests itself as 0. He has discovered something extraordinary now, because he has found zero. Ben has discovered that 0 or NOTHING (when there is no signal) is as important as 1 (the electrical signal). Because if there is only 1, there won't be any combinations but when there is 1 and 0, it is possible to produce infinite number of combinations of 1 and 0 and each combination will manifest itself as SOMETHING in his world.

We are in an exactly identical situation in our universe. We are like kids in a room full of paper characters: a paper plane, a paper boat, a paper duck and so many other paper objects. We are inside a paper room when suddenly one day we try to unfold one of the shapes. We find that the shape is made out of a sheet of paper. Then we unfold another one and soon we discover that everything in the room is actually created by different folds of paper. We find that we are in a world of Origami shapes, where everything is just a different shape made of different folds of same paper. Now in our real world, it is the Time that plays as the paper. We live in an Origami of Time.

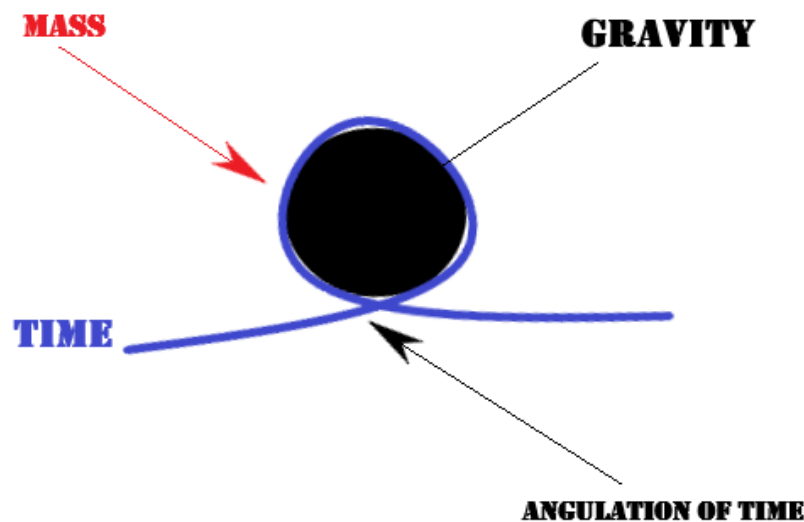
Unlike many fancy theories that are suggesting sophisticated models such as supersymmetry and multiple dimensions, Origami Model believes that our universe is not made of 4 or 3 or 12 or even 2 dimensions, but one. Our universe is made of only one dimension which is time. The reason that multidimension models such as String Theory are incorrect is simply because they do not make any sense. As Einstein once said, "A good theory must be explainable to a five-year-old." It is absolutely ridiculous for our modern scientists to claim that "Our universe is made of more than four dimensions but we are not able to comprehend more than three dimensions!" Nothing could be more preposterous than proposing a model that even the founder of it is not able to comprehend it. I am absolutely confused by such outrageous claims that try to resolve our confusion about the universe by adding more layers of confusion. How could we accept such theory to be true when none of us will ever be able to fathom or imagine or comprehend it? It sounds more like oxymoronic witticism than rationalism. Such theories are no superior to superstitious thoughts developed in ancient Mesopotamia to explain the nature. Imagine one day, your curious little child asks about the mobile phone in your hand, and you confidently answer, "Mobile phone is an unknown entity that no human mind can ever comprehend it!" and you claim that you have understood and explained the nature of the mobile phone to your child. Unlike such confusing glorified hypothesis, Origami Model is the simplest model that successfully explains absolutely everything, including the NOTHING, in our universe. This theory proves mathematically that our entire universe is simply made out of Time and Gravity. In our universal computer game, we are Ben and all around us is produced by Time (1) and Gravity (0). Both of these entities are as important. We will see in subsequent chapters that what we perceive as Mass, Space, Distance and Locality are all manifestations of Time. Time is the sheet of paper that folds in various angles and produces various shapes. The most amazing revelation is when you will find out that gravity is the property of NOTHING. This means that what we normally consider as nothing, where no force or time or mass exists, does not exist. We live in a world of existence; therefore, nothing does not exist. In other words, virtual zero does not exist. This enables us for the first time, we will have a correct, efficient and practical definition for Gravity:

Gravity is deceleration of Time in absolute vacuum.

When Time meets Nothing, it decelerates, the deceleration causes curvature/angulation in time. The curvature in fact means slowing down of time.

Mass is the combination of Time and Gravity.

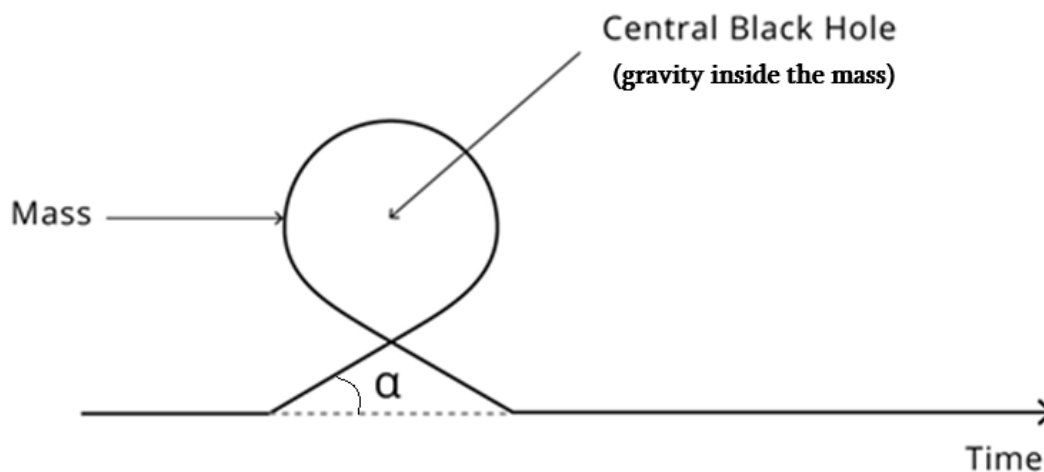
Gravity bends the time, and time encircles the pool of gravity and produces an entity that our brain perceives as Mass.



How time combines with gravity to produce mass

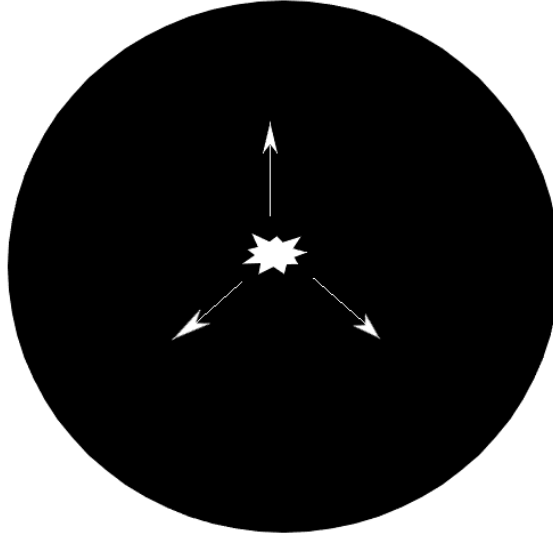
The angulation/curvature of time to go around the gravity and produce the mass, is exactly what Einstein discovered as the Gravitational Time Dilation and made it the foundation of his elegant Theory of General Relativity. He observed with his extraordinary intellect that time slows down near a mass, but again, traveling along the same wrong road he imagined that it is the mass that causes the curvature of space-time fabric and slows down the time. But this model again lacks any definition for mass and for what he called the fabric of space-time. Also, it cannot explain how and why mass causes curvature in this imaginary fabric of space-time. What are time and space and how could they be interwoven physically? However, Origami Model proposes that “Mass *is* the time curved around the gravity.” The reason that time is slowed down near the mass is because it has bent/curved by the gravity to produce the mass. So, it is not the mass that causes curvature of time. It is the time that curves to produce the mass. There is a crucial, extremely important point in this difference. In this model that Origami Model proposes, gravity is independent of mass, and mass is an illusion of time combined with gravity. And this seemingly trivial error is so imperative to further decoding of our universe. Once we get

the right sequence of events, it will be all very simple: Time enters the empty space, empty space is what we call Gravity, Gravity decelerates the time causing it to curve (spiral), this produces the Mass effect in our perception, and due to the deceleration of time, we find that objects accelerate near a mass and we call it the gravity. Gravity is not produced by mass. Gravity is a completely independent entity that is the property of absolute vacuum (Nothing). This simply means there is no NOTHING in our universe. What we call nothing or absolute vacuum, is Gravity. This is why black holes have so much gravity because they are pure pools of absolute vacuum. Based on Origami Model Black Holes are Massless. They simply contain zero mass. The reason why our universe is expanding is because it is surrounded by a vast vacuum of NOTHING which is gravity. The reason why at the moment of Big Bang such massive explosion took place was simply because there was a gigantic pool of NOTHING (gravity) at center of which, time started its travel. Whoever designed our world, just used Time and Nothing to build it.



Angle of alpha at which time bends to produce mass, leaving a central black hole in mass

The bigger the vacuum, the larger the gravity, the slower the time, the more angulation of the time, the bigger the mass. At the first moment of universe, Big Bang, there was a gigantic NOTHING, a maximum gravity, so the time was at its slowest speed, because gravity decelerates time. As time starts its travel towards the periphery of this vast pool of vacuum, it accelerates because it keeps furthering from the center of the pool (the radius of vacuum reduces). In other words, the size of this giant vacuum reduces as time stretches. The gravity of this gigantic pool of Nothing reduces as time approaches the periphery. Below picture is a schematic demonstration of this:



**Big Bang, time starts filling the pool of gravity,
density of gravity reduces, time accelerates.**

This is why the deceleration of time reduces constantly, in other words, time has been accelerating since the Big Bang. Now you have realized where G comes from. The mysterious Gravitational Constant, 6.67×10^{-11} is simply the **rate of acceleration of time** since the Big Bang. We will see in the next chapter that as time accelerates, speed of every phenomenon (such as speed of light) reduces in our perception. This is exactly why at Big Bang everything is observed to be unimaginably fast, even faster than speed of light. This is why our recent measurements since 1800s have puzzled our physicists by demonstrating that speed of light has really been slowing down! In other words, G is the rate of deceleration of speed of light since the Big Bang. Simply summarize it as this: Since the Big Bang time speeds up, light slows down. You can easily see the rate of slowing down of speed of light by dividing the current speed of light by the age of the universe. We know now that our universe is 4.3×10^{17} seconds old, however, you must note that because time has been accelerating, the real age of universe is almost 10 times more than the observed age of universe (in future chapters of the paper we will calculate the real age of universe and we will see that because time circulates constantly around gravity to produce the mass of universe the real length of time is π^2 multiplied by apparent age of universe, and π^2 is 9.87, so the real age of universe is almost ten times bigger than what we know now) :

$$\begin{aligned} \text{rate of deceleration of light} &= \text{rate of acceleration of time} = \frac{\text{current speed of light}}{\pi^2 \times \text{age of universe}} \\ \frac{2.9 \times 10^8}{4.345 \times 10^{18}} &= 6.67 \times 10^{-11} \end{aligned}$$

You just decoded the first and the most important Physical Constant in our universe. We discovered what the Gravitational Constant (G) that Newton found is:

The Gravitational Constant is the acceleration of time.

So, we finally have an independent definition for mass:

Mass is combination of time and gravity.

It is the gravity that bends the time around itself to produce the mass. Without the gravity, time will only travel to future, producing nothing. But we haven't defined time yet. So many physicists have been trying to present a comprehensive, clear definition of time and failed. Even Einstein who discovered time is relative, did not succeed to define the time in proper physical terms that includes the features of movement and space. However, Origami Model can easily do this, because as I mentioned previously, it considers the world to be made of two simple units of Time and Gravity. Therefore, the definition of time will be decisive:

Time is the constantly varying data.

We will see in subsequent parts of paper that time is pure data that is the collection of Digits that is organized in various size packages, starting from smallest that are the Dots and increasing in size to Bits, Bytes and finally Shots. The data is in constant variation due to the Recombination of Digits. Speed of time means the rate of recombination of data. Time and Gravity are interactive but not interchangeable. Time has no direction; it is Digits in varying orders. As the unit of information, time is quite similar to the sheet of paper in the art of Origami, having two dimensions. We usually only observe the length of time, and neglect the width of time. We will see in the future chapters, how important the width of time is in producing the space, distance and volume. Each unit of information has a length and a width. The length of time is what we know as the normal passage of time. The width of time is when things exist at the same time, so it creates the illusion of space for us. Length of time is created by recombination of digits and producing new codes and new data. The width of time is produced by repeated digits and same data being copied across. We perceive our world based on our sensory nervous system. A snake sees the world as an infrared map of colors. A bat sees the world as a collection of ultrasound noises. For a snake, a closer object means a brighter object, and for a bat, closer object means louder object. Locality is simply an illusion of time. We don't go from point A to point B. We go from Time A to Time B. We will see later how crucial this is in comprehending our universe. We have been imagining that events take place by the interaction of forces and masses in universe while time as an enigmatic entity keeps recording them. But the reality is much simpler, time is the reality. You are going to see the string of time that creates the beautiful picture that we call our World. Then everything will become transparent for you. No conflict or confusion will bother you anymore. All the Physical Constants will be demystified, one by one. Enjoy the apple of wisdom! Welcome to Origami Theory!

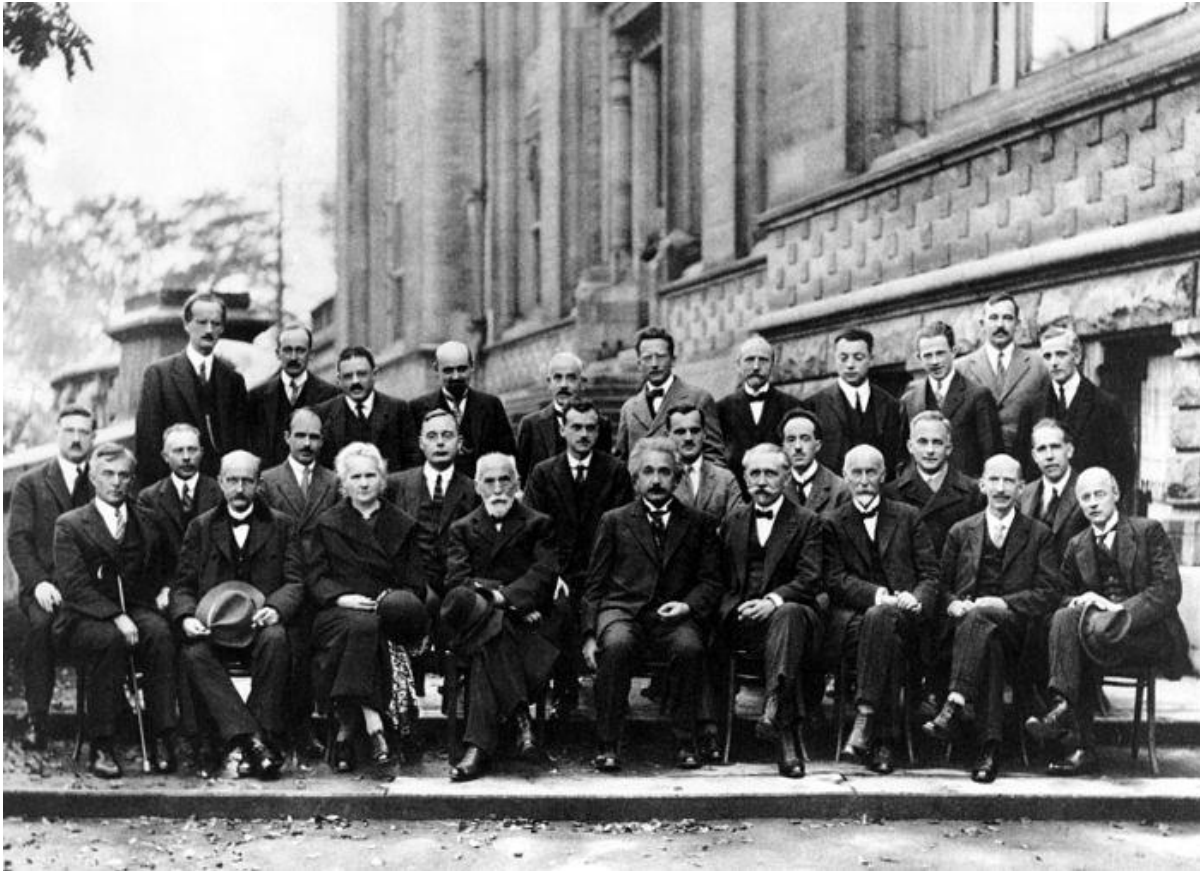


We are an origami of Time.

Acid Trip Theory

2500 years ago, Greek philosophers started to search for the smallest unit block of universe. Democritus in 400 BC came up with this question: "What would happen if we cut a piece of wood in half, and again cut the half in half and so on?" Would we reach a tiny particle that we will not be able to cut any further, or we will be cutting forever, never reaching the smallest thing? The question created a hot argument in ancient Greece, the fundamental argument that has in fact continued till now. In 200 BC the Greeks became two groups: one group agreed with infinite cutting, but the larger group believed that we will finally reach a small particle that is not dividable, and they named the smallest particle, Atom, which simply means indivisible. Then the search for Atom started while many physicists kept believing that our world is made of infinitely small units and we will never find the smallest unit. Until in 19th century, trying to solve the Ultraviolet Catastrophe, Max Planck proved mathematically that energy is quantized, which means objects are truly made of a very small particle, Quantum. This opened a new door to physics because it revealed to us that our world is truly made of certain particles and so the universe is in fact quantized. The quantizable character of our universe is crucial in our understanding of it because it means that everything is built of these fundamental unit blocks stuck together by specific forces, and so there are *gaps* between them. The scientists call these gaps, Quantum Jumps. In a simple language, we live in a Lego World, with the elementary particles of subatomic world being the Legos. Soon after this wonderful discovery, the quantum mechanics was developed which immediately faced yet a huge challenge, because while everything in our macroscopic world is stuck together by gravity, the calculations didn't support the idea that gravity could hold these tiny elementary particles together because their masses were extremely small! So the new question came up: "What kind of force is holding these particles together to produce the atoms and the objects?" This is how physicists were forced to

invent other forces to explain the structure of atom and this is how electromagnetic force and weak nuclear force and strong nuclear force were born and formulated. There was no major issue with the electromagnetic force because it was already known to us and we had seen it around us for centuries and we knew well that it was in fact produced by the gravity. However, the other two forces (weak nuclear force and strong nuclear force) are entirely imaginary! Even though these three forces somehow enabled the scientists to explain the structure of atom, still they couldn't explain the nature of the gaps between the particles and just simply considered that the gaps must be just empty space, containing nothing. All these new discoveries created a massive leap forward for science in 20th century, but simultaneous unknowns and conflicts created a gigantic backflip backwards! There was so much confusion and disagreement over so many phenomena and various behaviors of particles that could not be explained by Newtonian physics and eventually there was no way for science to go forward unless a kind of ceasefire was reached. This is why they all gathered in 1927 in Copenhagen, had a strong drink, shook hands and signed a contract to set aside their tantrums and accept the new model. The new Standard Model is very good looking but under her gorgeous skin, there are endless festering pustules and rotting tissues that we are still discovering till today. The Standard Model simply says that our world is made of elementary particles that are held together by forces that only exist inside atoms; and there are empty gaps between these particles which virtually accounts for 99.99999% of the volume of matter; the location and momentum of these particles can never be measured precisely; worst of all, these particles are particles and also at the same time they are waves which means they can be in many places at the same time which is totally incomprehensible; while nothing can go faster than speed of light, these particles can somehow affect each other instantly or move without any force being applied to them!



Participants in the 1927 Solvay Conference, including Niels Bohr, Werner Heisenberg, Albert Einstein and Erwin Schrodinger

The number of paradoxes and fundamental conflicts in Standard Model has been growing constantly since the day it has been proposed and with every new discovery in quantum physics, many new absurdities and contraindications are produced! This simply means the model is simply incorrect, but no one has been able to find a more charming model to tempt all the scientist to get together again in Copenhagen and sign a rational, effective contract and tear the old agreement that tries to convince people that our world is an illusional picture made of delusional particles.

The rational conclusion of the Standard Model is simply ridiculous: We live in a universe that is virtually hollow and everything we perceive is in fact an illusion, because based on this new information we must be seeing a vast empty space around us, including ourselves, with extremely diluted number of infinitesimally small particles scattered in it, and don't you ever try to find these tiny particles because the location and the nature of these particles are also illusional and sometimes one of them is two or even more (!) and one particle can be in many places at the same time but it is still one particle! Was Acid available in Copenhagen those days? Did someone spike their drinks in Solvay?

Because we have been continuing our journey on the wrong road, each time we find a clue, instead of opening new doors and getting clearer picture of our universe, things get more and more fuzzy and enigmatic. Even the very word "fuzzy" has been used constantly in todays' language of the most prominent physicists such as Stephen Hawking or Michio Kaku. No one

has dared ask, "What do you mean by fuzzy? Does fuzzy simply mean confusing and unknown? So, you are telling us that you don't know it?!" Nobody has documented Isaac Newton to use the word fuzzy! He saw the world clearly and by definition the scientist is the person who can see better and picture a clearer structure and order of events as opposed to the person with incomplete knowledge who is not able to produce a clear picture of events. If the physicists see a fuzzy world in their model, they must stop saying to the world that universe is fuzzy! A person on Acid trip cannot tell the world that everything is weird! It is his vision that is blurry, not the world!

Two most prominent scientist in our history, Heisenberg and Schrodinger developed two genius equations which proved that elementary particles can be anywhere in space at any given time and also each one of them can be in so many places at the same time! This simply means that each particle can sometimes be one particle and sometimes it can act like so many particles! When the particle acting like so many particles, it is a wave and when it decides to act like just one single particle, it is a particle, and when the wave form converts to the particle form, they call it the Collapse of the wave function. Nobody knows how and why this Collapse happens. Then De Broglie suggested in 1923 that every particle is actually a wave at the same time and they all accepted it, not because it makes any sense, just because it could solve the problems and help producing equations to get the results. This is reminding us of using the Physical Constants to get the correct answers. The whole process is like a group of detectives who cannot find the real murderer and hastily arrest a homeless guy and lock him up to shut up the public. Therefore, they had to admit that everything in our universe, including light, atoms, cars and my dad, are in fact so many at the same time and they can be anywhere in our universe. If you think at any moment that I might be exaggerating the problem, please return to the most reliable sources of quantum mechanics and read them carefully to see that what we are discussing in this chapter is the exact truth about our modern physics and this is why so many great scientists have been constantly working to develop a better system and end this embarrassing situation. We don't even know what wave is, and just considering a wave as a nonlocal effect of multiple particles, one single particle cannot ever be a wave! A drop of water in the ocean cannot be a wave at the same time! The wave in the ocean is not even a certain number of waters drops, it is an effect caused by multiple water molecules at the same time. The direct conclusion of today's quantum mechanics tells us that there is a small possibility that while my father is driving his bus in the desert of Iran, he is also on the moon! And when you ask how could this make any sense and how come no one has ever seen a picture of my dad with Neil Armstrong, they just say, "It is all about the probabilities!"

The Standard Model has been facing ever-growing conflicts and paradoxes, to name a few: "why gravity has the main role in macroscopic universe but has zero effect in quantum mechanics?" , "What is the nature of the strong nuclear force that holds the protons together inside the nucleus of atom despite the gigantic electromagnetic repulsion between them inside such tiny space and why is strong nuclear force absent in the rest of the universe and only exists inside the nucleus of atom?" , "If strong nuclear force is so massive and powerful why does it have such infinitesimally small range and suddenly disappears outside the nucleus?" , "What is the nature of the empty space between the particles that occupies the 99.99999 percent of our universe?" , "If the nucleus of atom is made of multiple protons and neutrons placed next to each other, why is the volume of nucleus thousands of times smaller than the

total volume of these protons and neutrons?” , “If each proton and neutron has its own spin, how is it possible for the whole nucleus to spin in certain direction?” , “Why can’t some of these elementary particles ever exist individually and they have to be always in clusters of two or three (colour confinement conflict)?” , “If every force is carried by a force carrying particle how could graviton (the force carrier for the force of gravity that has never been discovered) can travel to the end of the world and return(because gravity has infinite range)?” , “How could the original mass at Big Bang be infinitely condensed when everything is made of individual particles?” , “If nothing can travel faster than speed of light how did Big Bang developed faster than speed of light?” , “While friction is a major player in all physical interactions between objects in macroscopic world, why is that suddenly friction disappears in the quantum world and there is zero friction between the particles(friction paradox)?” , “How is that possible that light is made of photons that react to the gravity but they have zero mass?” , “How could there be a particle that has zero mass?”

To solve the problem of gravitational lensing, bending of light by gravity of large stars, the scientist had to change the definition of gravity again and this time they add “energy” to it, “Gravity is a natural phenomenon by which all things with mass or energy are brought toward one another.” This helped to explain why massless photons are also affected by gravity but it does not explain the nature of gravity at all and it only observes the gravity as a “natural phenomenon” that affects mass, and this is when we still have no proper definition for mass. Our latest definition for mass says, “Mass is both a property of a physical body and a measure of its resistance to acceleration when a net force is applied.” Anyone can see the clear conflict in this naïve definition because it uses the word “physical body” without defining the “physical body” because if it tries to define the physical body it will have to use the word “mass” again! Also, it uses the “acceleration” or “motion” in its statement which are based on locality, while it has already denied locality in several parts of quantum mechanics such as in quantum entanglement and wave-particle duality of the elementary particles. The biggest conflict is yet another thing: If all the masses in universe are pulled toward one another by gravity, why is our universe expanding so fast and its expansion is even accelerating? As you know, to solve this conflict, the modern physics has come up with the concept of Dark Energy. It simply says, “Dark Energy is an unknown force that has been expanding our universe since the Big Bang.” This is when the value of Dark Energy is nearly 70% of all energy in universe! So, it is basically saying that we have no idea about 70% of the energy in our universe, and we don’t know what it is, how it is produced and how it acts on matter. Then another paradox pops up: We are observing the stars and planets around us and we see that the total mass of the galaxies is far less than what it should be to hold the stars together and to provide rapid rotation of the celestial bodies in the galaxies. To solve this one, we have invented another thing:” There is a Dark Matter that we haven’t been able to directly observe or discover yet because while it contains 27% of our universe, it is so mysterious that has evaded all our experiments and we don’t know where it comes from and what elementary particle have produced it.” The Standard Model has sadly and humbly admitted that with its all-gigantic claims and hard works, it only explains less than 5% of our universe, and it does a very poor job even for that 5%. Then it has been inviting the scientists for decades to come up with a theory that can patch this big hole up! There have been thousands of Theory-of-Everything and none of them have been able to fix any of these issues without creating more other conflicts, and none of these ever-growing

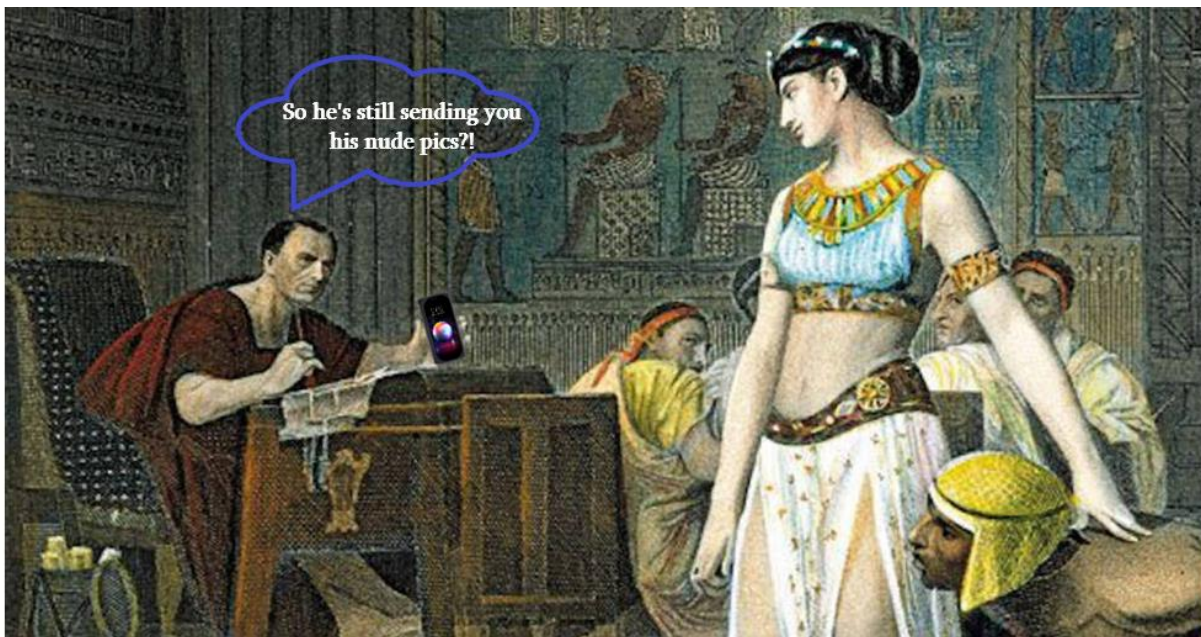
theories that contain even more bizarre concepts such as multiple dimensions that are beyond human comprehension but somehow proposed by human comprehension have been capable of uniting our understanding of the physics about the visible world with our understanding of the physics in quantum world. The reason is not the insufficiency of our intelligence. This is simply because every scientist who has been working hard to develop this bridge, has still been following the same path. We will never be able to patch up this torn garment and make it look like a new one with no defect unless we go back to Newton's time and start our understanding of mass and gravity, then we will enter the right road which will quickly bring us to the final goal which is understanding of the entire universe with transparent laws of physics that are universal and logic. We have to stop telling our students that they are in the classroom, but they are made of particles that are virtually in many places as far as the other side of the universe at the same time, but they are observed to be in the classroom only because the probability of them being in the classroom at this certain time is higher than the probability of them being in a public toilet in a parallel universe.



The correct way is not always majority's way

Cleopatra Confusion

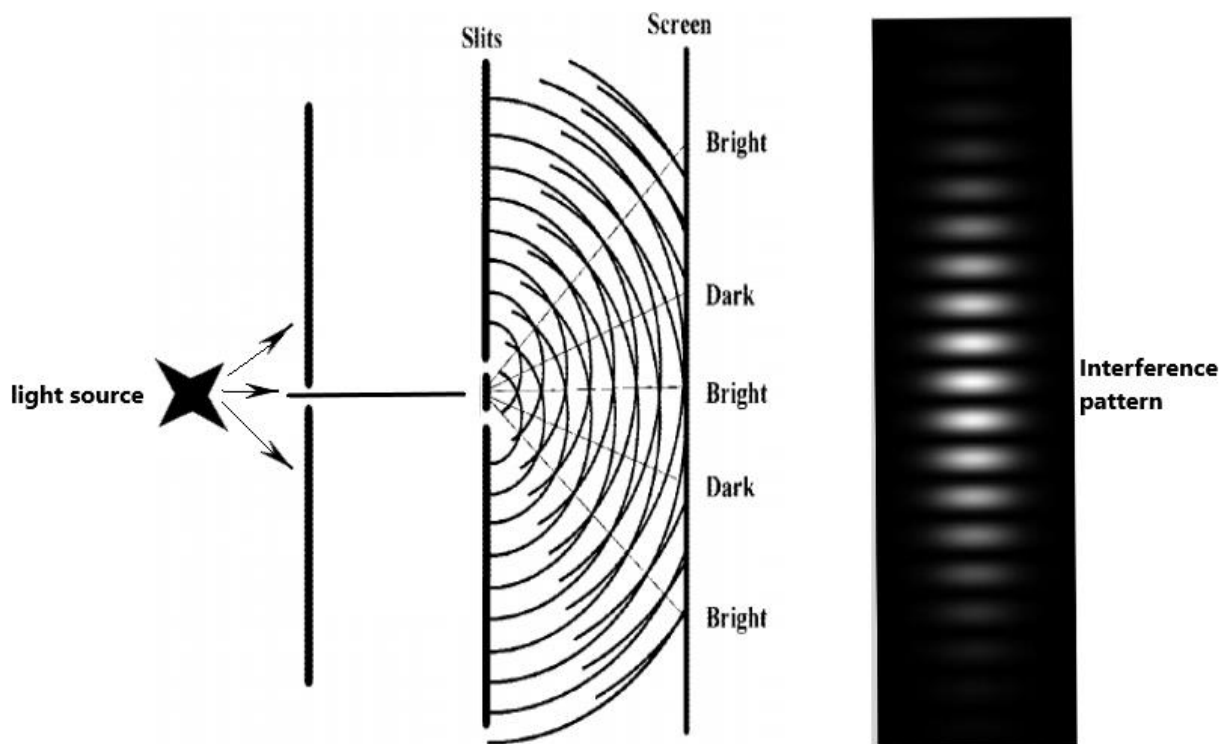
Leonardo Davinci once said, "Simplicity is the ultimate genius!" This is why he is one of the brightest minds in human history. If you go back in time to 2000 years ago when Cleopatra was sleeping with Julius Cesar in 46 BC and you show her a movie on your mobile phone, Cleopatra will be shocked and she will simply presume that characters in the phone are miniaturized human beings. But you know very well that every sound, picture and effect in the video is just created by electrical signals that develop the digital codes of the app. In other words, the entire movie is just an effect of electricity. The way we have been dealing with the quantum world is exactly the same way Cleopatra deals with the movie on the mobile phone. We have considered three dimensions of space until Einstein came up with his Theory of General Relativity and so we desperately added Time to space and now we believe our universe has four dimensions. Then to solve current unknown features of the subatomic particles we have been forced to fabricate more confusing dimensions. We act like the hasty detectives who can't find the real murderer: anything that makes no sense and does not fit in our current model, we consider beyond human comprehension and call it a new dimension.



The good news is that there is an extraordinarily easy solution to this. Just imagine our entire world is made of only one dimension: Time. But why time? Quantum Mechanics shows that one particle can be in two or more locations, while we know that nothing can change location unless force is applied to it. This simply means, force is time. Quantum Entanglement has been the most mysterious phenomenon that human mind has ever faced. This phenomenon when proposed, was so bizarre that Einstein never accepted it until John Stewart Bell proved it in 1964. He showed that if two particles of A and B are entangled, when even they are millions of kilometers away, if we apply a force/change to particle A that is near us, the particle B changes its behavior too, and it does it instantly. Now this creates two fundamental conflicts: How could

the particle B that is millions of kilometers away be affected by the force we apply to the particle A? When nothing could travel faster than light, how could particle A talk to particle B instantly?

Quantum Entanglement by itself is truly sufficient to prove that our entire understanding of universe, at least regarding the concepts of locality and time, is definitely incorrect. But instead of trying to find an alternative to our current theories, we have been trying hard to come up with an idea that without disturbing the current contract, fixes this issue. It is no surprise that no one has been able to solve the mystery yet and it is obvious that no one would ever be able to do so and our only solution has been the same nonscientific approach, "Particle has no real locality and we live in a world of uncertainty and everything we observe is an illusion." There is another mystery in our physics that has become very popular because if anyone solves this one, he/she will get the Nobel Prize, which is now more than one million dollars! The conflict is called the Double Slit Experiment. The experiment was first built by Thomas Young in 1773 when he shone a single ray of light through a pair of parallel slits in a plate and observed the interference pattern appear on the screen. So, he logically concluded that light must be a kind of wave, because only waves can produce an interference pattern when they hit an obstacle. In fact, the experiment is very simple but if we consider light as a moving particle, then it could not create an interference pattern! Only a series of *multiple particles reaching the slits at the same time* can create an interference pattern. So, the Double Slit Experiment has become the mind-blowing magic of physics till now. When you shine a ray of light at these two slits, instead of two narrow columns of light being formed on the wall, an interference pattern appears! Based on our Standard Model, this certainly means that when one single ray of photons reaches the two slits, it somehow splits into two or more rays of photons that interact with each other and produce the wave pattern on the wall. In other words, every single photon acts like thousands of photons at the moment it reaches the slits. When later on, the physicists tested this on other particles such as electron, the same behavior was observed. This means all subatomic particles act like waves; one particle is many particles!!! The human beings have somehow become so tiny and fit themselves inside the mobile phone. Below figure demonstrates how interference pattern is created when single ray of light hits the two slits:



Double Slit Experiment


How could this be possible? Why is our world so confusing? Why all big objects follow the logic way of things but when we check the tiny particles, they behave so bizarre? What's wrong with these tiny things? Desperate of finding an answer, our physicists now say, "The quantum world is so mysterious and beyond our comprehension and any physical concept such as locality and causality and momentum becomes blurry and void once we enter the quantum dimension." But even if that is the case, why when these unpredictable, crazy particles get together and create bigger things such as cucumbers and airplanes and my dad, they become so predictable and they all follow the rules all the time (except my dad)? If the reason that I am in my unit in Sydney is just because the probability of me being here is higher, there must be extremely rare occasions that I find myself on the moon. But the only time I ever found myself outside my unit was when I was given a piece of Magic Mushroom. That night I went to moon. The next morning, I was found in the gutter by my ex-wife. She was furious because I had rung her many times and said horrible things to her new husband. There is a fundamental question here: Why is the macroscopic world so easy to understand but quantum world is so weird? Does size really matter? We have to ask Cleopatra!

No wonder why so many pseudoscientists and so-called spiritual gurus these days use quantum physics to explain their miracles. It is not really their fault. The Copenhagen contract opened the door to this. It is itself a piece of pseudoscience.

Give it time and it'll happen!

Standard Model of Modern physics believes that universe is made of four fundamental forces as well as energy, time, space, mass, dark energy, dark matter, singularity and also particle and wave, direction and velocity. Origami Model believes that universe is made of Time and Gravity. Standard Model has not been able to provide an independent definition of mass, gravity, force, time, space or direction. Origami Model provides an independent and transparent definition for Time and Gravity, and based on that it successfully provides nonchallenging definitions for mass, force, energy, direction, locality and velocity. Standard Model has been facing more than twenty major paradoxes (some of them we already mentioned) and has been obliged to apply several Physical Constants in all its fundamental equations in order to correct their results without being able to explain the nature or the origin of these mysterious values. Origami Model does not require any physical constant or unknown number and it also successfully explains the nature and the origin of the Physical Constants used in the Standard Model. Let's start looking at our universe through the Origami Model glasses.

Based on Origami Theory, our world is made of time and gravity. The only dimension in our universe, and the only entity used to create the world is Time and the only force used to manipulate the time, is Gravity. You can delete any other variable from physical equations except the time. Time is present in all equations, and without time nothing happens. But if there is time, anything can take place. Schrodinger's wave equation shows this clearly and elegantly: A particle could be in two locations in various times with no force. This means it is not the force that displaces the particle, it is the time that moves objects. This is why we knew from ancient times, "Anything can happen with time."

Mass, space, locality and velocity are all various manifestations of time. To make it easier to comprehend, just imagine time as a straight line that starts from Past and moves forward very fast towards Future. When time meets the gravity, it is like a line that is traveling forward and suddenly bumps into a rock and bends to another way, goes around the rock and resumes its path. Gravity is the rock here. Gravity is in fact the absolute vacuum, or NOTHING. To comprehend our world, we must wash our eyes and stop supposing that there is universe and outside the universe there is Nothing. We live in a world of existence and therefore, there is no NOTHING. The world is a mathematical piece of genius and in the mathematics of the world there is no zero. All the creatures in universe, including human beings are aware of this. The number zero did never exist in our mathematics. Mathematical zero was invented by Brahmagupta, a naughty Indian astronomer in 628 AD. Way before him, clever people of Mesopotamia used an amazing shape to demonstrate their concept of zero:  This circle was used to engulf another item to imply the concept of zero. The notion is extraordinary because in Origami Theory, the entire universe is encapsulated by an absolute vacuum that is gravity. What we suppose as NOTHING or absolute vacuum, is the gravity. Before going any further, we must understand that there is no nothing. For centuries, scientists thought space is vacuum but thanks to Peter Higgs' quantum field theory we know now that space is full of particle-antiparticle pairs that pop out into existence and annihilate each other constantly.

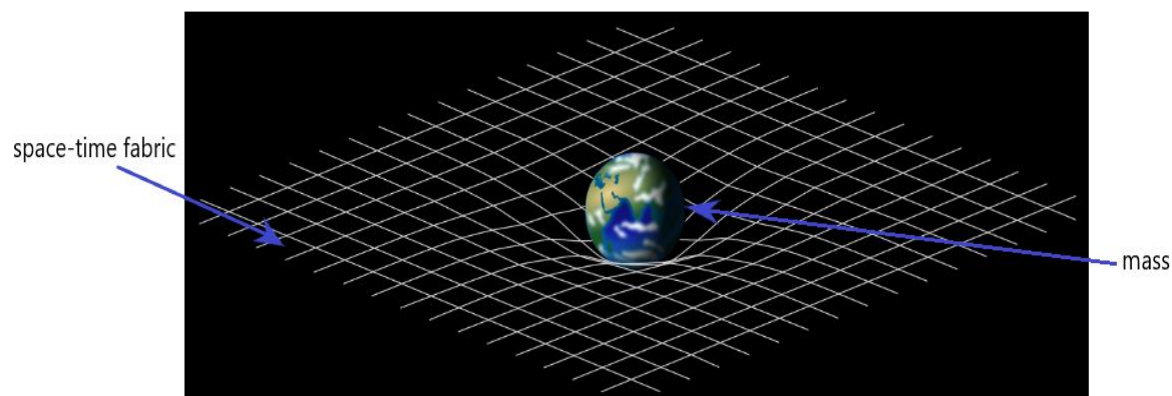
Therefore, the space in our universe is not really a vacuum and the space outside our universe is gravity. The only thing that does not exist in universe is the nothing.

Origami Model defines the gravity as this:

Gravity is deceleration of time in absolute vacuum.

The phrase absolute vacuum is used here only to make the effect comprehensible. Therefore, in Origami Theory, gravity is the property of absolute vacuum. When time decelerates at its collision with gravity, it curves/angulates. The angulation(curvature) of time is what we call the deceleration of time. Therefore, the definition of mass in Origami Model is this: "Mass is the combination of time and gravity."

Einstein discovered that near any mass, things accelerate, and he understood that what we call gravity is in fact the acceleration of objects near a mass. He went so close to discover the mistake that had been happening since Newton's era but he didn't take the last step. Despite Einstein's discovery of gravitational time dilation, no one could explain why things accelerate near a mass. He simply had to assume that mass somehow curved the fabric of our universe which he called Space-Time. Based on Einstein's theory of General Relativity, our universe is in a matrix of Space-Time, a meshwork of threads of time and space that when a mass drops on it, it creates a dent/curve in it. This helped comprehending his magnificent theory and develop his most wonderful equations but as you can see we haven't been able to define what mass really is, or what time or space are. Neither Einstein nor any later scientist has been able to define space-time fabric, they just use this term to explain the acceleration near the mass. This is why we repeatedly hear the phrase, "only a few people in entire world understand the theory of General Relativity!" But why?



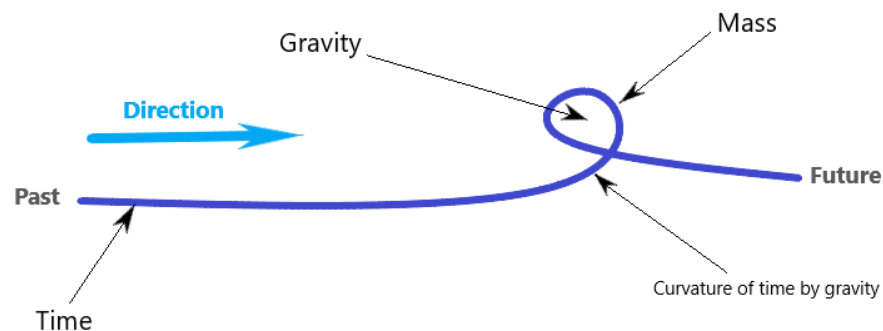
Einstein's model of universe: Mass causes curvature of space-time fabric

Origami Model has a different look to this meshwork. The view is much simpler and has the unique benefit of clarifying several ambiguities that have been left unanswered till now. Origami Model suggest that when time meets the pool of gravity (which is the Nothing), it bends around

it, because time can never enter the gravity. This bending of time creates what we perceive as acceleration, because the bending of time is in fact the deceleration of time. When time slows down, speed of object becomes faster. This is why anywhere we find mass; we find the curvature of time.

It is not the mass that curves the time. It is the curvature of time that creates the mass.

Very simple, isn't it! But now we have defined the mass. Instead of believing mass causing curvature in space-time, we say mass is created by the curvature of time. The reason that we find time bent near the mass is not because mass is bending the time, it is simply because time bends around the gravity to produce the mass. The following picture helps us understand the phenomenon:



Origami model of universe: Gravity bends time to produce mass.

The immediate benefit of Origami Model model is that for the first time ever we can finally define the mass. I explained already that confusion about the reality of mass has been the source of our major deviation from the correct way of comprehending our universe. In Standard Model we have so far 38 Elementary particles and many more to be discovered, which are the building blocks of our universe. These are called elementary because it is impossible to dissect them. If you hit them hard enough, such as colliding them to each other (that's what the Large Hadron Collider does), they will turn to energy. But as soon as you read this, even if you are a ten-year-old curious child, you will ask, "What are the elementary particles made of?" So we are still at the same point in history that we were at 400 BC in ancient Greece. We still believe that universe is made of atoms but we just have different name for them: quarks, bosons, leptons, quarks, etc. Besides, the Standard Model cannot explain how many of these elementary particles are there, why is there such number of them and what are they made of?

On the other hand, Origami Model has a much more simple and reasonable approach. Based on Origami Model, time is bent by gravity and creates an effect that we perceive as mass. The first and smallest curvature of time, produced by smallest force of gravity, is the building block of our universe. It is called Origamon. All other particles and objects and stars and galaxies are made of various collections of the Origamons. Therefore, even the elementary particles are made of these Origamons, and so the elementary particles are divisible. Even the Origamon is divisible but when it unfolds, it turns to Time and releases the force of gravity that was used to produce it. But it will require enormous amount of energy to unfold an Origamon and we will

calculate that force in Particle Decay chapter of Origami Theory. As I mentioned previously, Origami Model has a clear definition for time. Now we begin to analyze the nature of time, but we first need to discuss the theory of General Relativity in Origami Theory.

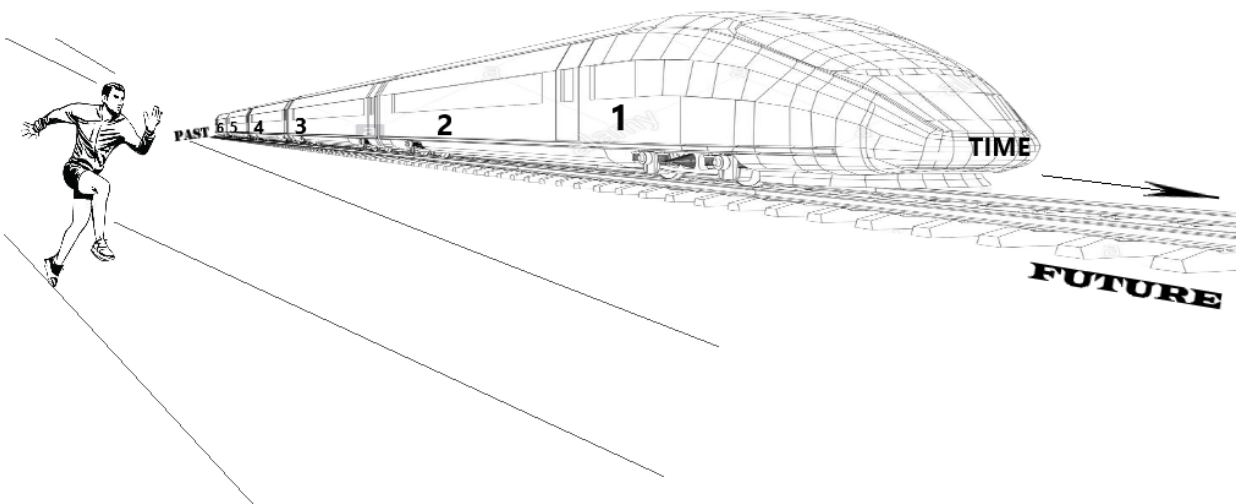
Time Train

Einstein demonstrated that as an object accelerates, time slows down. His famous paradox of twins is a good example: There are a twin brother by names of John and Jimi who live on earth. One day, John gets on his spaceship and travels to moon with a very high speed and after seven years he comes back to earth. When he comes back, he finds that Jimi has gone seven years older. But the astonishing fact is that John has only aged two years! How is that possible? The only explanation is that when we speed up, time for us slows down. Many of us have accepted this without really understanding it, because the concept of speed of time has no real meaning, as we still have no definition for time.

The simple conclusion of general relativity is that time is in a race with us. Because the highest speed in universe is speed of light, and when we reach speed of light, time stops for us, it means speed of time must be equal to speed of light. To understand this easier we can use an analogy of time train. Each carriage of the train is one second of time. Imagine that time is this train traveling with speed of light all the time. If John is standing on the road and the time train passes by him, the relative speed would be at its maximum and time passes John with its maximum speed. As soon as John starts moving forward parallel to the moving train, the relative speed between them reduces:

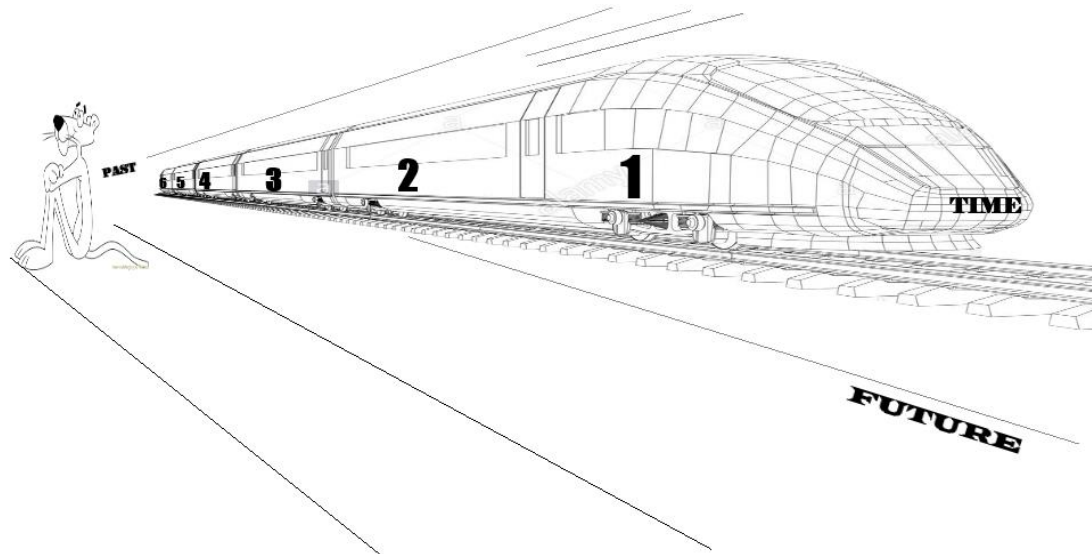
$$\text{Relative speed} = \text{speed of time train} - \text{John's speed}$$

This means if John runs forwards as fast as the time train, he will be stationary to the time train and so he would be always in front of the first carriage. In other word no time will pass for John. The following picture shows this effect:



John is running fast parallel to time train, so relative time is reduced for him

If John stays stationery and time train passes him, time will pass at its maximum velocity, which is speed of light. Because everything moves in our universe, the passage of time for every object would be different and it will be related to the speed of the object. Therefore, particles that travel with speed of light, photons, will never age.



Staying stationery and time will pass very fast

This was an extraordinary discovery because Einstein showed for the first time that time has speed and it is relative, not absolute. But the concept of speed of time has no physical meaning in modern physics because speed of an object requires three elements of “space” and “object” and “time” to make sense. Therefore, “speed of time” means time is a physical object traveling in space relative to time, which is meaningless and we haven’t even been able yet to provide a proper definition neither for time nor for space. Also, the concept of direction here is confusing and cannot be determined. But it is well known that Einstein’s theory is correct and it has been proved all the time. The theory also shows that with a similar mechanism, when we approach a mass, we start accelerating, which is perceived as gravity. But again, how mass produces gravity and how gravity bends the time is not known.

Origami Model on the other hand, proposes that universe is made of time and gravity. It proves that time has speed and it provides a convincing definition for speed of time, which I will mention later in this chapter. Using the analogy of time train, if we speed up, time slows down, however, it is the definition of gravity as the property of vacuum that decelerates time. In previous part I mentioned that gravity bends the time and produces the mass. Now we need to get one step further. By bending of time or curvature/angulation of time, Origami Model basically means “Deceleration of Time”. The reason we use the term “angulation or curvature” is because in the detailed part of the paper when we are using mathematical tools and equations to prove the concept, we have to use the angle of curvature of time to calculate the produced mass. Therefore, bending and deceleration are the same thing, however deceleration would be the correct definition because bending requires locality and space to become meaningful.

Another crucial point in Origami Model which needs proper attention in order to make sense of the rest of the argument is the concept of speed of time. Considering the time train analogy, one can see clearly that if time accelerates, the object next to it will seem slowing down because so many carriages of the train will pass it quickly. On the other hand, if the time train slows down, the object's movement will seem very fast. This is exactly like watching a slow-motion movie. Imagine time is the camera that is filming you walk across the room. If the camera takes 10 shots per second of you, when watching the film, the observer will see you move very fast across the room. This is why older black and white movies of 1940s are in fast motion because at the time the technology of taking 24 shots per second was not available. When your camera is able to take 24 shots per second, your movements will seem normal. And if the camera takes 48 shots per second, when watching the film, the observer will see you walk so slowly, with half the speed that you really walked. This means our observation of universe depends on the speed of time.

Now, Unlike Einstein who suggested mass bends the time with no imaginable mechanism being proposed, Origami Model suggests that Gravity slows down time because it is the definition of gravity. This slowing down makes us observe the objects near a mass, where gravity is higher, accelerating. Therefore, *the reason for acceleration of objects near mass, is deceleration of time*. In other words, gravity makes the camera rolls slower, so we see the film in fast motion. This explains another fundamental mystery of our universe for the first time. Based on Standard Model at the Big Bang, a gigantic explosion took place with unknown reason by an unknown origin of force and then inflation took place with a speed much faster than speed of light, which is in complete contradiction with the theory of general relativity because the foundation of this theory is based on the fact that no speed higher than speed of light is possible, and by contradicting the theory, the foundation of Big Bang theory would be extremely shaky. So far, there have been attempts to justify this conflict, however, Origami Theory's view of universe, makes this effect entirely normal and easy to understand. Based on Origami Theory, time was stationary at Big Bang, or one can imagine that speed of time was zero. Then it started its movement and since that moment it has been accelerating. This means speed of time at Big Bang was at its slowest ever and it has been constantly accelerating till now. This is exactly why things seem to us so incredibly fast at Big Bang, even much faster than speed of light, because when speed of time is for example 300 kilometers per second, things would be observed for us, a thousand times faster than speed of light. This means as we progress in time, speed of time accelerates constantly and therefore, speed of phenomena, or in basic physical term, speed of light, will seem decelerating for us. Interestingly, various studies comparing the observations since 1800 AD till present time, using extremely precise and sensitive techniques have proved that speed of light has been slowing down. Note that Origami Model shows that it is in fact the speed of time that is accelerating, causing speed of light to seem decelerating. This crucial point is very important to understand the correct mechanism of the events in our universe.

But why is speed of time accelerating? The answer is already given. We mentioned previously that the definition of gravity is deceleration of time. Now, at the beginning of universe, Big Bang, there was a large pool of NOTHING or Gravity, and at its center, time was starting its travel. Therefore, obviously the gravity was at its maximum. As time travels forward, it fills the universe with mass and so the density of gravity constantly reduces. This means the effect of gravity is constantly reducing from Big Bang till now. Therefore, the speed of time will be constantly

increasing. So, time moves forward, faster and faster and as it moves forward it produces mass. This is why our universe is expanding and its expansion is accelerating. Simple as that! But what do we really mean by speed of time? Does time move? Origami Model believes that space and locality are in fact, just manifestation of time. Therefore, time is not an object moving inside space. In order to explain the speed of time, we need to first describe the nature and structure of time. The definition of time in Origami Model is very simple:

Time is constantly varying data.

As I mentioned before, our universe is very similar to a computer game that is made of digital signals. All digital signals in a sophisticated computer game are simply made of electric signals and the electric signals that produces codes of zero and one. When there is an electric charge, it means 1 for the computer, and when signal is absent, it translates to zero. This shows how important “absence of signal” is, in fact as important as the presence of the signal. In our world, the signal is time and the absence of signal is gravity (vacuum, nothing). Time is the information which combines with Nothing (gravity) and becomes the first original mass. Time is data that is consisted of units that we call Digits. The sequence of these Digits creates the code and the recombination of these Digits creates various codes constantly. Time simply proliferates itself by recombination of Digits and produces new codes all the time, therefore, the Recombination of Digits is what we perceive as passage of time. The new data mixes with gravity and produces new mass. Yesterday our universe was 2 million kilometers wide, today it is 2 million and one kilometers wide because time passed and as it passed, it produced more mass. You have probably noticed already that as time passes, it produces more mass, so Origami Model believe that our universe is not just expanding, it is Growing. The universe is not stretching itself, it is growing, which means as time passes, it produces more matter. If universe was just expanding, the density of matter and energy will reduce but all our observations have proved that the density of matter and energy in universe is constant and this has caused another massive conflict for our physicists because based on the laws of thermodynamics we cannot have more mass or energy in the universe so how is our universe expanding and its density is staying the same? The answer again is very simple: universe is expanding simply because time is traveling, proliferating, producing more universe for us. Therefore, to conclude the phenomenon, Origami Model demonstrates that Big Bang was not anything extraordinary, because if anything becomes extraordinary in a proposed model it simply means that model is not scientific. Big Bang was not in fact any faster than the present events, but due to the acceleration of time, we observe it extremely fast. At the big bang, time started its Recombination and mixing with the gravity that had encapsulated it, just like an egg. Time is the egg yolk and gravity is the white. The embryo of time consumes the white of gravity and grows faster and faster, and because the white causes deceleration of time, as time grows bigger, the white gets smaller, the deceleration reduces, so the baby universe grows faster and faster until it reaches its mature size and touches the shell around it. Our universe is a baby growing constantly and acceleratingly in the egg of gravity, until one day it will hatch. Origami Model calculates when this growth will be complete and what will occur after that, all by mathematical equations and the factual data available to us. Once we put the right glasses on and stop seeing our world upside down, everything will make sense, everything will become so familiar.

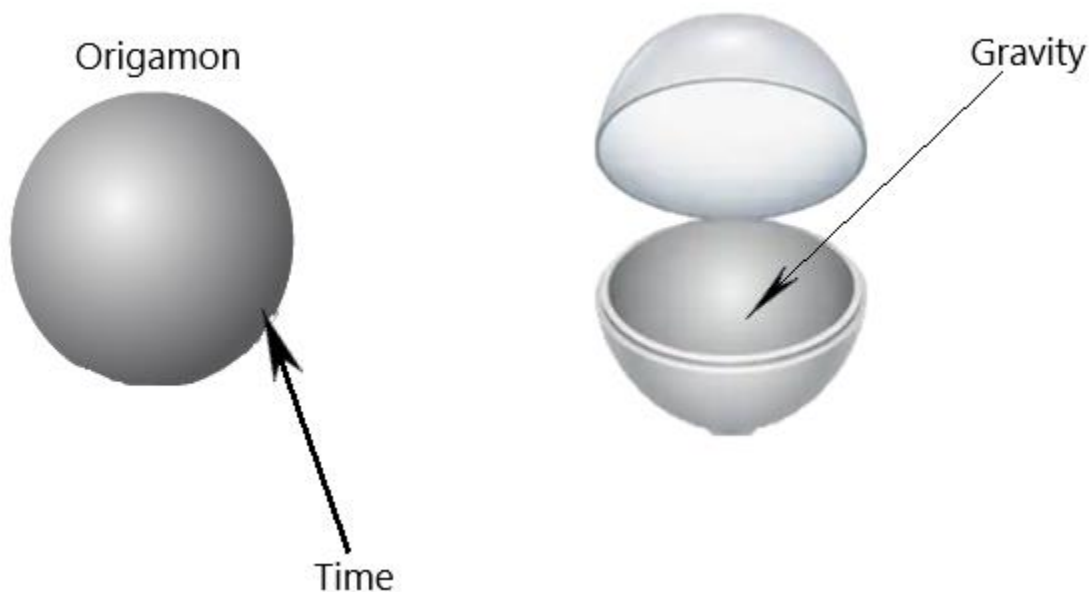
In the next chapter we go deeper to the details of structure of time. So, we will dedicate a full chapter to this concept. I promise you will love it:

Passage of Time and Speed of Time

First of all, we need to know that time is not a one-dimensional entity. Unlike our conventional perception of time that has only a length, Origami Model shows by its mathematical calculations that time has two dimensions and it acts exactly like the sheet of paper in the art of origami to produce mass. Now, remember ***Time and Gravity are not interchangeable***. Zero and one do not convert to each other. As we demonstrated previously, time mixes with gravity to produce mass.

$$\text{Mass} = \text{Time} + \text{gravity}$$

This means a thin sheet of time encapsulates a large vacuum of gravity inside itself and produces an Origamon, the fundamental unit block of universe. We will see in further chapters that Origamon is in fact what we know as photon, but unlike photons, Origamon could be traveling free and also it could be fixed in structure of other particles. The large number of Origamons *fuse* into each other and produce subatomic particles. The subatomic particles *attach* to each other and producer atoms, molecules and larger mass. So, everything is made of Origamons, and Origamon is nothing but data covering a vacuum pool. This is why more than 99.99999% of our universe is empty space! The schematic picture below demonstrates how time and gravity combine to produce the particle:

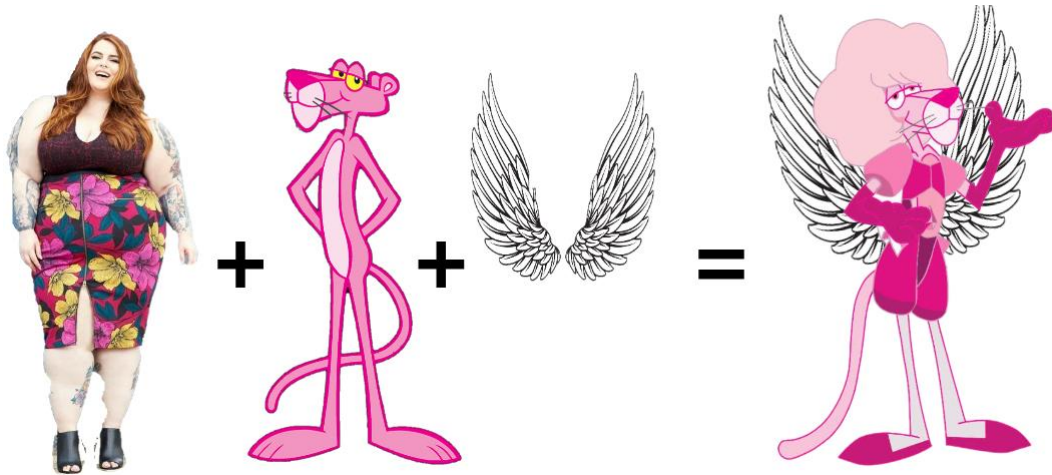


Origamons are made of a thin surface of time and a large hollow center of gravity.

I mentioned before that as time proliferates itself and produces more universe, the density of gravity decreases and that's why time accelerates. The important principle is this:

The total amount of gravity and the total amount of time are both constant.

Time reproduces itself by recombining its Digits of data, because nothing else is there to be used. This means, one unit of information, mixes with another unit and creates the next unit and so on. This is similar to how DNA in organisms and even computer viruses proliferate. We do the same process in our brains too. When we imagine things, we are exactly using time/data to reproduce universe. We always mix various information in our imagination to produce new pictures, in other words, we start with only little amount of data in our brain and by mixing them we produce more data and more imagination. We are in fact giving existence to new imagination, that's why it is called animation (animus = life):

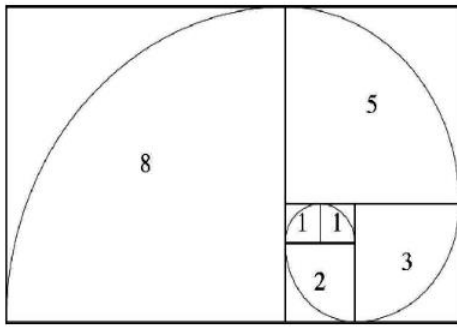


Imagination = Animation = Creation

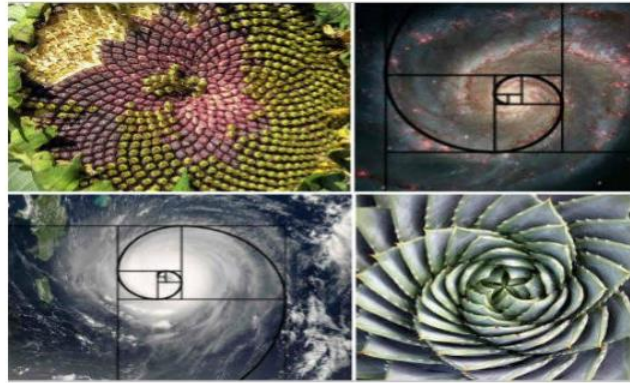
Now, in mathematical language this means if the first unit of time has one unit of information, it mixes itself with one and creates two units. Then there will be a 2 unit and 1 unit from before, so they will combine to create a unit of 3. The next step it will mix unit of 3 with the previous unit of 2 and produces a unit of 5 information:

0 – 1 – 1 – 2 – 3 – 5 – 8 – 13 – 21 – 34 -

What does this remind you of? Yes! Fibonacci Sequence. Once this was discovered by the Italian mathematician, Leonardo Fibonacci, it has been fascinating all the scientists and even philosophers around the world because Fibonacci sequence has been found in absolutely everything and everywhere in our universe and nobody really knows why. However, Origami Model clearly shows the reason for this Spiral of Golden Ratio appearing all around us, from the sunflowers to galaxies. Fibonacci Sequence is the only mathematical way time can proliferate without breaking the laws of conservation of information. So, it uses its own data to produce new data.



Fibonacci Spiral



And this is exactly why our universe grows in the same exact pattern, simply because our universe is made of time and time proliferates on this simple pattern. A seed growing in soil and a baby growing in uterus follow exactly the same pattern. Pay attention how the value of information doubles up at first from 1 to 2 and then reduces to 1.6 folds increase all the time. This is exactly the same as the growth of a fetus and the first phase of universe immediately after the Big Bang which called Cosmic Inflation because it is associated with very rapid expansion and then slows down and stays at a steady level.

Now we need to see in what pattern time grows. Does it go straight, zig zag or circular? Unlike what most of us might think, the Recombination pattern of time is easy to predict. As time recombines its data and proceeds inside the pool of gravity, it can go straight only if the total force of gravity on it is zero which is not the case. Also, it wouldn't be traveling in a sharply angled pattern or Zig Zag because that would involve sudden forces to be applied which would be impossible because gravity is a uniform, continuous force otherwise it won't be NOTHING. There will be only one pattern possible and that's a circular progressing direction: circular because gravity will affect time in all places with equal forces, and proceeding because it is proliferating by recombining data. This means time will produce an ever-growing Fibonacci spiral inside the pool of gravity, expanding as it progresses. But when we observe the universe at our own frame of reference, we will see through it, which will be more or less in an oval form:

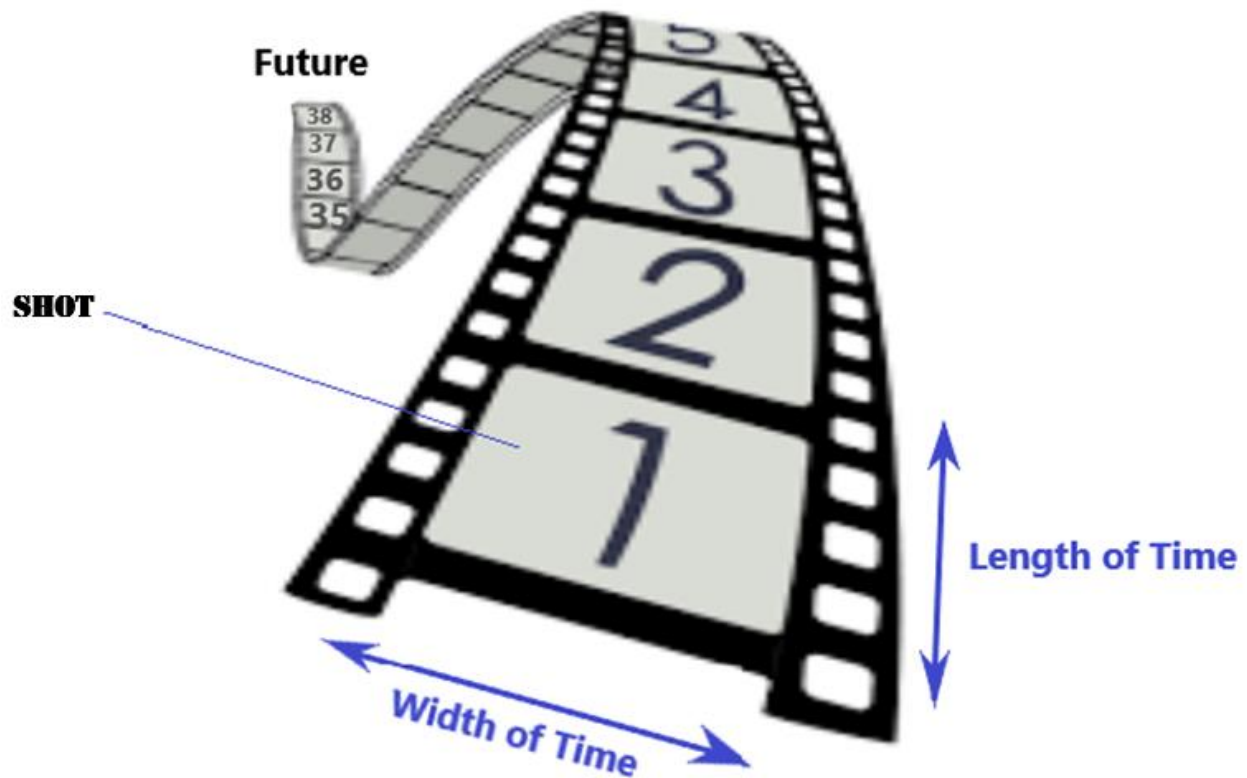


Our spiral-cone universe which is observed as an oval by us

But how is information(time) proliferating? At the Big Bang, the gravity is in a uniform of vacuum but as time expands inside it, the *density* of gravity reduces which makes time expanding faster. When the fetus grows inside the egg, the white does not annihilate, it is used to produce the chicken. But would time proliferate infinitely? The answer is no. In the chapter “Particle Decay” we will calculate the decay time of Origamons and we will mathematically find the total amount of time (information/data) that the Designer (oops!) has in hand to produce the cosmos. In simple words, time will have certain number of Digits and so it can only produce certain amount of possible data by recombining its Digits.

Now we can come back to the concept of speed of time. Unlike the Standard Model in current physics that cannot define time but believes that time is continuous, Origami Model describes time in details and also shows that time is quantized and discontinuous, and this is exactly why mass and energy are quantized. This means, time is made of certain units that each one has certain capacity. I mentioned before that we can liken time to a roll of film in a camera that when it is filming an event rapidly, the event will seem slow, and when it films an event slowly the event will seem very fast (like Big Bang). Keeping this analogy in your mind, imagine that time is made of squares with certain surface area. Each square is a unit of time that in Origami Model is called Shot (time unit). As I mentioned previously, unlike our conventional imagination, time has in fact width as well as length. Each Shot has a certain width and length that gives its certain surface area. Based on this surface area, each Shot is capable of containing certain amount of data. Now, we mentioned that procession of time is in fact Recombination of data. This means from Big Bang till now, time has been reproducing its Shots and hence spreading, creating more and more mass, bigger and bigger universe. Origami Theory’s calculations show

that as time proliferates, its Shots get smaller. In other words, both length and width of each Shot reduces as time moves forward. *In fact, the acceleration of time is due to reduction of its Shot sizes.* This means, gravity, expands the size of time Shots and as gravity reduces, Shot sizes decrease so speed of time increases. The following picture demonstrates this process in a schematic way:



Time Shots reduce in size as time goes forward to future

As I mentioned before, each Shot is a pack of information. Therefore, as time proliferates and comes toward future, the capacity of each Shot reduces. In other words, one Shot at Big Bang could for example contain enough data to produce 10000 Origamons, but one Shot at present can only produce 10 Origamons.

But is there a way to find out the length and width of each Shot? Yes. Based on the definition, the length of Shot is what we know as duration or length of time, therefore if the Shots are the smallest frames of time, the length of Shot is equal to the duration of one Planck Time. Shot is the shortest length of time possible in universe and in Standard Model this is called Planck Time. According to quantum mechanics, Planck Time is the time that takes for light to travel across the Planck Length ($1.6 \times 10^{-35}m$). This is exactly 5.39×10^{-44} seconds. Therefore, the length of each Shot at present is 5.39×10^{-44} seconds. I say at present because unlike the

Standard Model, the duration of Shot and therefore the duration of Planck Time increases as we go back towards Big Bang and it reduces as we go to future. In other words, the reduction of Shot's length obviously means that Planck Time will be reducing. This is a fundamental difference between the Standard Model and Origami Theory. Because Origami Model believes that speed of time increases constantly, this obviously results in constant reduction of Planck Time and constant increase of Planck Length (distance that light travels in one second = 1.6×10^{-35} meters). So, let's summarize this imperative conclusion:

Speed of time constantly increases causing the speed of light to constantly reduce, Planck Length to constantly increase and Planck Time to constantly decrease.

The resulting consequences of acceleration of time are easy to understand and they clearly explain the most complex phenomena in our universe. For example, acceleration of speed of time obviously causes accelerating expansion of universe because time creates the universe as it travels forward (to future). Also, as I explained before, it is the acceleration time that makes us observe the Big Bang as such extraordinarily rapid phenomenon, even faster than current speed of light. Another wonderful conclusion of acceleration of time is expansion of Planck Length, which means the smallest length observable for us is constantly growing. By definition, Planck Length is the smallest size of a particle that we can observe. In simple language, this means that 100000 thousand years ago we would have been able to observe a particle thousands of times smaller than the smallest observable particle at present, because Planck Length at 100000 years ago was much smaller compared to the present time. This means, at the Big Bang and shortly after that there would have been particles so small that we are now unable to observe or measure their volume and mass. This solves another major conflict in Standard Model and opens a huge door to demystify our universe. According to the Standard Model, at a specific phase called Baryogenesis during Big Bang, some subatomic particles were produced but they are not being produced anymore and we don't know why. However, Origami Model easily explains this based on the observable size/mass of these particles that have become impossible at present to be observed due to the expansion of Planck length. Another wonderful conclusion is that billions of years ago, there could have been observable particles that we cannot directly observe anymore but we only see their effect. We will calculate in future chapters that Origamon, as the smallest particle of universe is one of such particles. The particles whose size and subsequently mass are not measurable anymore are called Ghost Particles in Origami Theory. As you might have guessed, these particles still exist but we won't be able to measure their masses or observe their radius, however we will perceive their effect and energy. As we know photons are considered massless in Standard Model because we are unable to measure their radius or mass, but paradoxically photons react to gravity and Einstein showed that light bends when pass near a large mass, but Standard Model has difficulty explaining how massless photons react to gravity.

However, Origami Model calculates the exact mass of the Photons (free Origamons) and shows why we observe them as massless at present. Ghost Particle effect is extremely important because it is revealing some biggest secrets of our universe. For example, we still don't know how mass converts to energy if they are two different entities. But Origami Model shows that kinetic energy is in fact the ghost particles that we perceive as massless and invisible at present due to the expansion of Planck Length. This is exactly why energy is quantized and why mass and energy are interchangeable.

One more crucial effect that Origami Model demonstrates by proposing the quantized structure of time, is the wave effect of particles and the frequency. One of the most confusing and conflicting effects in quantum mechanics is the wave effect of the particles that no physicist till now has been able to properly explain because it is simply an incorrect perception. A wave by definition is "A traveling combination of variable electric and magnetic fields, that propagates through space." In other words, wave is only a distribution of probabilities and not a physical, tangible mass. On the other hand, "A particle is a small localized object or entity to which can be ascribed several physical or chemical properties such as volume, density or mass." The first feature of both these definitions is their nonsense because one cannot define particle as a kind of object because in that case one needs to first define the object. Also, we know that mass has not been defined either so how could we use mass in definition of particle? The third fact is that according to these definitions, obviously particle is a *localized* entity while wave is *massless and nonlocal*. Therefore, how could our physicists claim that "light is both particle and wave." And they finally desperately accept that every particle, and therefore everything in our universe is particle and wave at the same time or sometimes particle and sometime s wave. This is how in current quantum mechanics, our world become nonexistent, delusional, and ambiguous. The problem of ambiguity is not a feature of our universe but it is generated by our incorrect perception of the fundamental features of the universe, such as time, mass and force.

Based on Quantum Mechanics, particles behave like waves and they have frequency and they virtually are in many places at the same time. So, to measure a particle's *kinetic energy* we use the following equation which was first developed by Einstein:

$$E = h f$$

In this equation, ***h*** is Planck Constant, and ***f*** is the frequency of the particle.

Interestingly, Planck Constant, like all other mysterious Physical Constants, is a fixed value that we don't know where it comes from and what it really means. Frequency is *the number of occurrences of a repeating event per unit of time*. Again, the definition that we offer for frequency has a fundamental error in it, because as quantum mechanics itself demonstrates, no entity gets repeated in universe, because the exact

value of location or momentum of particle is never precisely known (Uncertainty Principle) so it is impossible for any particle to repeat its energy level. But Origami Model proposes a very simple and clear definition for what we perceive as frequency for particles. As we mentioned before, particle, like any other mass, is a package of information inside the Shot of time. Because every mass is a certain amount of data and gravity, obviously every Shot is capable of producing (containing) certain number of particles depending on the mass of the particle. Standard Model is not capable of explaining why particles have frequency and wave effect but the objects produced by them have no frequency or wave feature. However, Origami Model demonstrates the reason for this by revealing the exact mechanism by which “frequency” is produced. Based on Origami theory, definition of frequency is as following:

Frequency is the number of identical particles in one Shot.

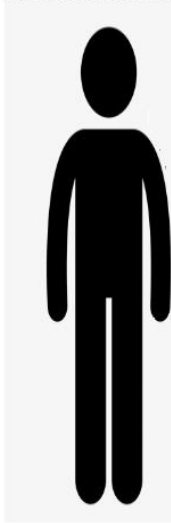
This means, in one Planck Time, we always have so many particles traveling together but we only see one particle per Planck Time. The larger the mass of particle, the less the number of identical particles placed in the same Shot, so the less the possible maximum frequency.

We need to note that at each Planck Time (Shot) there are multiple identical (almost) particles. This means at each Planck Time there are always many Origamons (photons) are traveling but because the shortest time observable for us is the Planck Time, we only observe one particle at the time until the particle hits a target or interact with another media and we notice the effect of many particles. I am calling this effect, Quantum Entrapment. Therefore, we will have this definition:

Quantum Entrapment is the number of identical particles in one Planck Time.

Therefore, what we know as frequency is actually the effect of quantum entrapment and this is the quantum entrapment that causes the wave effect of particles. We will see in future chapters that as Shots of time (Planck Time) reduces, the quantum entrapment reduces until at the end of cosmos that it will only contain one Origamon (photon) and then particles will have no illusionary wave effect anymore. Following picture demonstrates how quantum entrapment produces the wave interference feature for particles that we have wrongfully interpreted as wave feature of particle.

PARTICLE OBSERVED AT LENGTH OF TIME



ALL OTHER STATES OF SAME PARTICLE AT WIDTH OF TIME



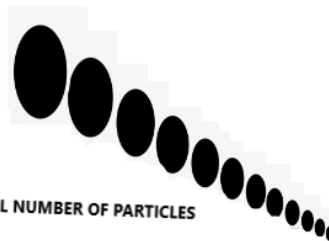
We observe only one person as we only perceive the entire Planck Time at one moment

The following figure demonstrates how double slit experiment occurs. What we observe as one single particle, such as a photon, is in fact hiding multiple identical particles next to each other in one Shot (one Planck Time). This is why a single particle creates an interference pattern when passes through the double slit. This explains why particles have wave feature too.

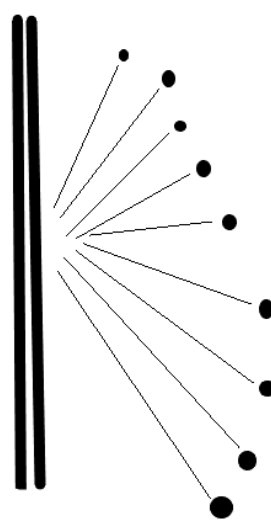
PARTICLE OBSERVED AS ONE



REAL NUMBER OF PARTICLES



DOUBLE SLIT



INTERFERENCE PATTERN

The mechanism of double slit experiment and wave feature of particles

Every subatomic particle is always accompanied by so many other identical particles which are located in the same Shot of data, so they travel in one Planck time together, so when they collide with another mass, the total kinetic energy that is transferred to the

mass is equal to the energy of one particle multiplied by the number of them and that's why to measure the kinetic energy of a particle we need to know its frequency. Frequency is the number of particles that are so close that we observe as one particle and this demonstrates that time actually creates the particles. Time never uses a Shot of information to produce only one particle and throw away the rest of the information. Instead, there will be numerous identical particles traveling together, causing Superposition effect, Double Slit Experiment, Aharonov-Bohm Effect and so many other manifestations of interference phenomenon. These effects, including the concept of frequency are all produced by more than one particle produced in one Planck Time (one Shot). Although we observe one single particle in our experiments, it will be simply impossible for us to see the other particles that are simultaneous because we are bound by Planck Time and Planck Length at any time. In further chapters of the paper, we will calculate and conclude equations that demonstrate the maximum number of a particle that can locate themselves inside same Shot (produced by data of one Shot). This also explains another confusion in Standard Model that has been left unanswered till now. Based on the Standard Model's definition of kinetic energy and frequency, the more energy in a photon, the higher the frequency, so virtually a photon can get infinite energy and frequency which is technically incorrect, and all our observations in universe have shown that the maximum frequency of light existing at present is near 10^{21} Hz and we don't know why. However, Origami Model explains this beautifully and demonstrates how entropy is directly created by the reducing size (capacity) of Shots of time. The total amount of data in each Shot is reducing constantly, but the number of Shots per unit of time is increasing and this is how time is accelerating. The reduction in capacity of each Shot, reduces the maximum number of particles that can be produced by each Shot. In other words, the maximum number of Origamons (photons) that can be in one Planck Time is reducing since Big Bang, so the maximum frequency of light in our universe is reducing. By calculating this rate of reduction in Planck Time since the Big Bang we will calculate precisely that maximum frequency of light at Big Bang must have been 6×10^{23} and it has been constantly reducing until now that it is 9×10^{20} . This clearly explains why we can't find a light, even the most powerful gamma rays, with frequency above this value. This also explains that frequency of a particle has a limit and it will never be infinite and it also enables us to calculate the minimum as well as the maximum possible frequency of light or any other particle in our universe. In later chapters we will go in details of mathematical calculations and we will find wonderful, new equations that enable us to convert time to mass, calculate mathematically how space (radius) is produced by time, and finally how energy is produced by time. The last and maybe most important conclusion here is that now we can find out why large objects don't have frequency and they are stable, single, localized objects. Obviously, the amount of information in one Shot is up to a level that can produce certain number of a subatomic particle and it will never be enough to produce a large particle. In other

words, any particle that has a mass larger than the total data of one Shot, cannot be located in one single Shot. Again, in future parts of this paper, we will calculate the maximum size of a particle that can be produced by one Shot and it turns out to be this: $2.18 \times 10^{-8} kg$. This is what we call Planck Mass in Standard Model and it is another crucial Physical Constant that its importance is not clearly explainable, but Origami Model clearly demonstrates why this value of mass is the border between the quantum world and macroscopic world. This shows that anything more massive than $2.18 \times 10^{-8} kg$, will not have frequency and will not have any so-called wave features. The simple reason for subatomic particles to behave in mysterious ways and to be in many places at the same time or have frequency and wave effects is simply because many of them are located in the same Shot of time (occurring at the same Planck Time). This brings us to another crucial conclusion now:

The maximum frequency of light has been constantly reducing.

In later chapters when we take care of the mathematics of Origami Theory, we will calculate the rate of reduction of maximum frequency which is equal to the rate of reduction of intensity of in our universe since the Big Bang which turns out to be: 666. And that's why I have called it Devil's Coefficient.

To summarize this part, we confirm Newton's finding that *light is made of particles*. Each particle cannot be in more than one places at the time. The reason for wave effect of particles is not superposition, particle existing in more than one location at the time, the reason is because time creates the particles and there is always multiplicity of particles at each Planck Time. We directly observe one particle at the time, but we indirectly observe the effect of all particles at the time. This gives us a clear definition of wave:

Wave is the effect of all the particles located in the same Planck Time.

We finalize this discussion by defining the concept of speed of time. The notion of speed obviously involves the two dimensions of time and space; therefore, speed of time would simply be meaningless. As I mentioned previously, by traveling or procession of time I mean the Recombination of data or multiplication of information.

Procession of time means recombination of Digits of data.

Therefore, speed of time in Origami Model simply means the rate of Recombination of data to produce new data. We showed that time is made of packages of information which we call Shots. The capacity of Shots reduces as time progresses. This means the length and width of each Shot reduces constantly. Therefore, we can provide an equation for speed of time:

$$V_t \propto \frac{1}{Q}$$

When V_t is the speed of time and Q is the information capacity of one Shot. In further chapters we will calculate the information capacity in each unit of time and we will see that speed of time at present is 2.9×10^9 , almost ten times the speed of light. Now, to find out the rate of

acceleration of time since the Big Bang, we can check the rate of deceleration of speed of light. As I explained earlier, as time accelerates, light slows down, so based on Origami Theory, speed of light was at its maximum at Big Bang and it has been constantly slowing down. This means the rate of deceleration of speed of light is in fact equal to rate of acceleration of time. To calculate the rate of deceleration of speed of light since the Big Bang we can simply use the acceleration equation:

$$a = \frac{V_2 - V_1}{T}$$

a : acceleration rate of a moving object

V_2 : current speed of the object

V_1 : primary speed of the object at T seconds ago

T : time during which the acceleration has been happening

We know the current speed of light and we know the time here which is the age of universe. But the primary speed of light is unknown. We know that primary speed of light at Big Bang would be the current speed of light multiplied by the acceleration rate:

$$\text{current speed of light} = 3 \times 10^8$$

$$\text{primary speed of light at Big Bang} = a \times 3 \times 10^8$$

$$T = \text{age of universe} = 4.34 \times 10^{17} \text{ seconds}$$

Now we can apply these in the equation to find the rate of deceleration of speed of light :

$$a = \frac{(a \times 3 \times 10^8) - (3 \times 10^8)}{4.34 \times 10^{17}}$$

$$a = 6.67 \times 10^{-11}$$

This shows that the speed of light has been reducing since Big Bang with a rate of 6.67×10^{-11} . Or in other words, time has been accelerating at 6.67×10^{-11} since Big Bang and continues to accelerate. As you can see the result is a very famous value! This number is exactly the same as what Sir Isaac Newton discovered while conducting his experiments to calculate the gravitational force between every two objects and he called it Gravitational Constant! The difference is that Newton found this value retrospectively but we virtually calculated it. Newton and all the physicists after him till now have no idea where this number comes from and why we have to multiply the gravity between every two masses by this small number to find the correct answer but Origami Model demonstrates what exactly Gravitational Constant is. This is very powerful evidence that the foundation of Origami Model which is the acceleration of time (deceleration of light) is correct.

Gravitational Constant is the acceleration of time.

This completely matches the view that Origami Model is proposing for the universe being made of time and proves that gravity is deceleration of time. As time passes, time expands inside the universe and so the total density of gravity reduces, and therefore, time accelerates. We calculated that the rate of acceleration of time is 6.67×10^{-11} , which can be in fact called the *rate of reduction of the density of gravity* in our universe. This is why when Newton calculated the gravity between every two objects, he found a massive number and finally when he multiplied it by this value, he got the correct amount. We now realize what mechanism produces

the gravitational constant. In the last chapter of the paper, we will see that this number has a crucial role in almost everything occurring in our universe because it is the rate of acceleration of time and time produces everything. We will then see that the value of 6.67×10^{-11} can tell us how much total gravity exists around our universe and based on that we will find out the radius of vacuum sphere that engulfs our universe. This will open up an extraordinary window to the cosmos for us, a window that has been shut for millennia, till now.

Coming back to the concept of speed of time, we need to note that procession of time is in fact the Recombination of data to produce new data. As I mentioned before, the total amount of data is constant, but at the beginning of cosmos the Digits of data are randomly located around each other inside one Shot. As time progresses, the Digit get ordered and produce meaningful messages which in combination with gravity becomes mass. Therefore, no new Digit is produced, only new data is generated by recombining the existing Digits of time. We showed that traveling of time has been speeding up and the further back in the past we look, the faster the universe will seem to us (the analogy of camera with slowly rolling film). This is exactly why when we think about our past, for example about our childhood, it seems only few seconds. Therefore, time does not really travel anywhere and what we perceive as space is only the new data transpired. Then what is the real mechanism of acceleration of time? We showed that time units, Shots, reduce in size as time progresses. Therefore, in each length of time the number of Shots increases. This gives us the key to solve the mystery of speed of time:

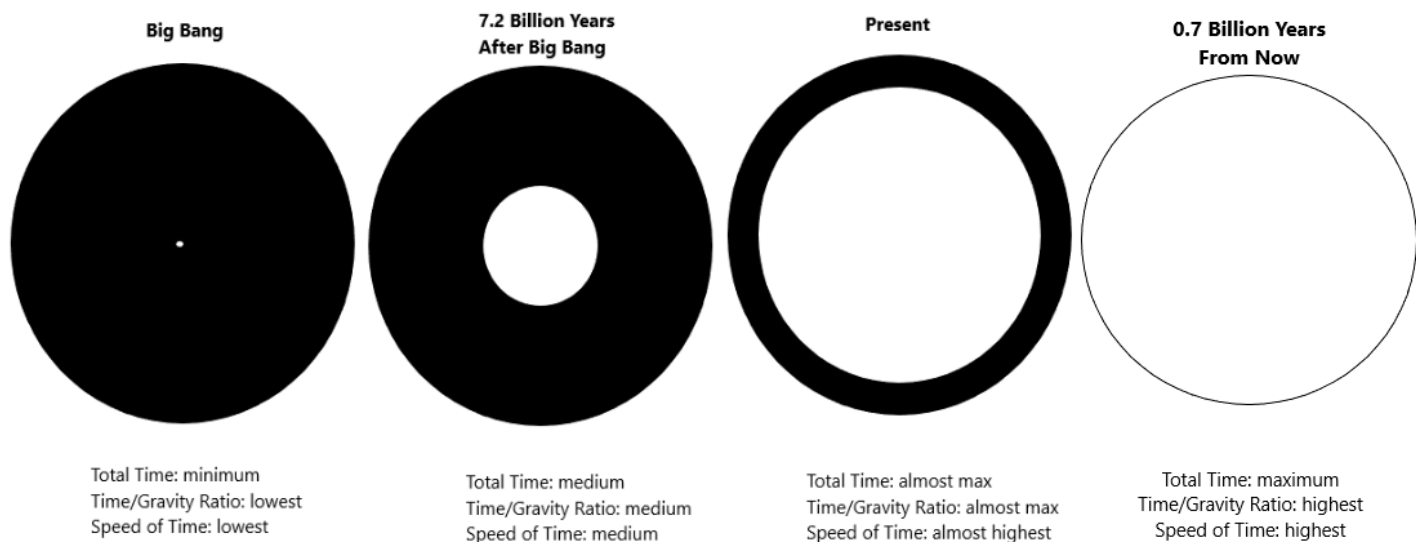
Speed of time is the number of Shots per length of time.

Or

Speed of time is the total amount of information per length of time.

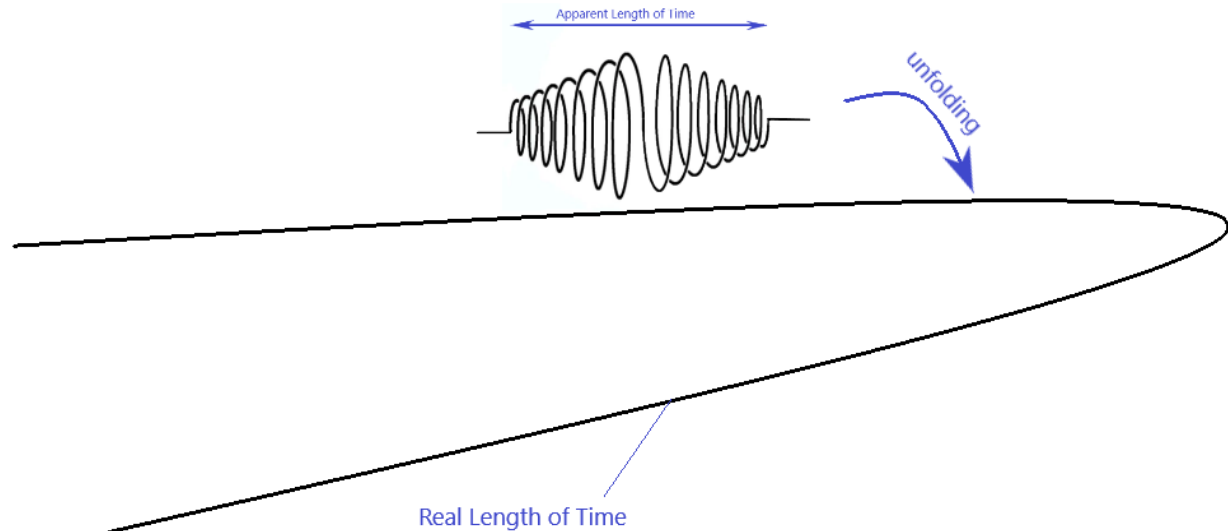
Both of the above are equivalent and correct. Origami Model proves that although the units of time are reducing in size/capacity, the number of time units per length are increasing too rapidly so the final result is the increase in amount of information per length of time. This is what we perceive as acceleration of time. In simple language, time moves on and generates our universe and because it is accelerating, the production of universe is accelerating and this is what we know as accelerating expansion of universe. Note that the total amount of gravity in our universe is constant and when I say the gravity is reducing, it means the that density of gravity (amount of gravity per volume of universe) is reducing and this causes the reduction of the gravity that is opposing the procession of time. The pool of gravity around our universe was at its maximum at Big Bang and as time proceeds, it consumes the gravity to produce mass, therefore, the peripheral gravity opposing the time reduces, causing the acceleration of time. Imagine, time is the growing chicken fetus inside the egg, consuming the egg white and getting bigger. The egg white is opposing the growing fetus inside the egg but at the same time it is the egg white that fetus consumes to grow! So as the fetus consumes more egg white, it finds more space to grow. At the end, total amount of egg white disappears but it is not annihilated, it is only incorporated in the chicken's body. Now we can see that based on the gravitational constant we can actually predict that in 700 million years from now, our universe will reach its maximum size because it will consume the entire gravity pool around it. One of the hottest arguments of our time is the prediction of the course of the universe. There are three groups of scientists at present, the first group believe that universe will keep expanding, the second

suggests that universe will expand until at some point in future it will stop expanding and becomes somehow stable and steady forever, the third group believes that universe will reach its maximum expansion and then it will start crunching back to a super-dense mass again. None of these groups have been able to prove their view and so no final theory has been accepted about the outcome of universe. However, by using the same foundation and calculations that are backed by our physical findings, Origami Model proves that in 0.7 billion years from now, the universe will reach its maximum size and then it will exit the vacuum as high energy photos. This is very similar to the destiny of the chicken hatching the egg. The pool of vacuum surrounding our universe acts as the main source of gravity for its expansion and based on its radius (which we will calculate based on the gravitational constant) we find out when we reach the surface of this pool, consuming the entire gravity. We will calculate in future chapters that at that point of time, all the matter in our universe will reach the speed of light and convert to photons and exit the vacuum into a much larger universe (much larger pool of gravity) as high energy light. Based on the same calculations we will see in further chapters that eventually in 36×10^{69} seconds we will reach the very final stage of our growth. We showed that time is digits of data that proliferates itself by producing various combinations of information, each combination will produce a different mass. We will calculate that the maximum possible number of combinations is 36×10^{69} seconds. This number is a wonderful value because it not only tells us when we eventually arrive at the final destination and reach our ultimate size and intelligence, it also shows why time is measured in 6x6 system. We know that 6x6 system was founded by ancient Babylonians and we haven't found that based on what logic or origin, the ancient Babylonians used this system, although the strongest hypothesis is that because circular motion is calculated in 360 degrees, they considered time to follow the same pattern. Now we see they were absolutely correct.



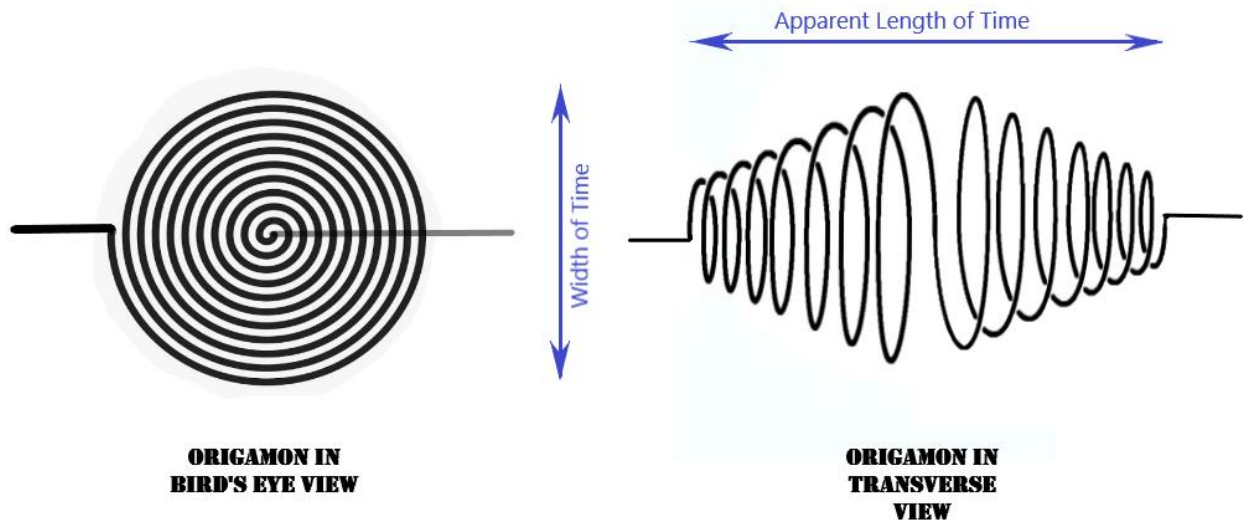
The course of our universe from Big Bang to maximum expansion, all in 14.4 billion years.

Note that due to the nature of time movement and our observation of it, there will be two types of speed of time in our universe. As I mentioned before, we only observe the length of time, so we measure the transverse or horizontal movement of time. Below picture helps us to comprehend this:



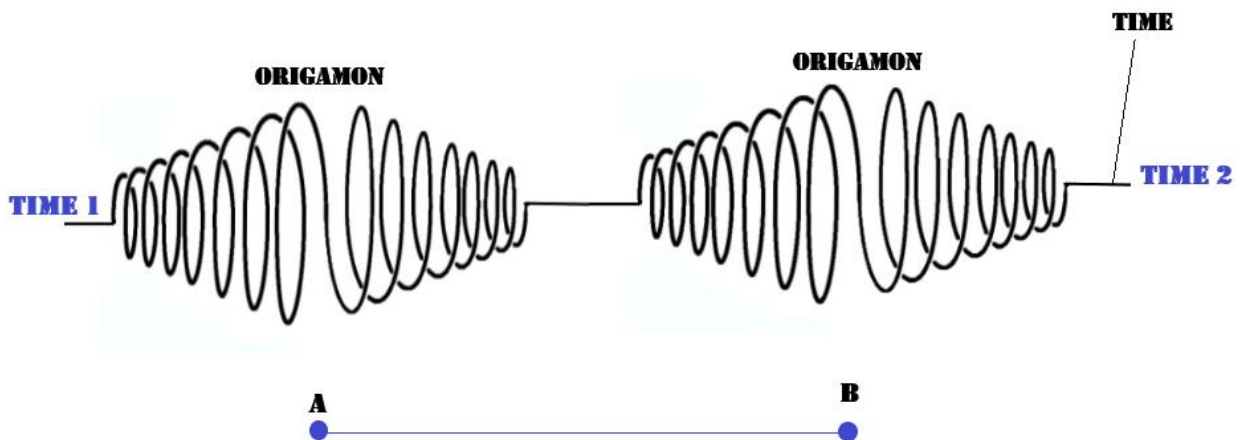
We only measure the distance between the beginning and the end of a Shot

By length of time, we mean the time difference between the beginning and the end of one Shot, which is one Planck Time. As we can see in above picture, the real length of time is much higher than that because time has to rotate around the gravity to produce a particle and become observable for us. Note that one photon (Origamon) does not travel in space, it is time that produces one Origamon and then leaves it and moves on to produce it again in Planck time later, and this is what we perceive as photon traveling in space. This means, what we know as speed of light is in fact the speed of producing Origamons (photons), or speed of combining time with gravity. Below picture demonstrates this effect:



Schematic demonstration of how time produces Origamons (photons)

This tells us that time must be traveling much faster than light because we showed already that at speed of light, time stops so time must have a speed equal to speed of light but now we are noticing that time travels a much longer distance than light so how this works? The answer is the Apparent Speed of Time. As time travels, it produces Origamons, leaves them, they get annihilated and new ones are produces, every Planck Time. So, the Apparent Speed of Time is equal to speed of light and it is what we observe, but the Real Speed of Time which is the speed time travels from Time 1 to Time2 in the following picture, is much higher:



ORIGAMON (LIGHT) TRAVELS FROM POITN A TO POINT B
TIME TRAVELS FROM TIME1 TO TIME 2 WHICH IS 10 TIMES LONGER THAN A-B DISTANCE

We will see in further chapter that due to the spiral movement of time, the equation to convert the Apparent/Observable Length of Time to Real Length of Time is as the following:

$$T_l^r = \pi^2 T_l^a$$

T_t^r : Real length of time
 T_t^a : Apparent length of time

This simply means that real length of time is almost ten times longer than the apparent/observable length of time. In other words, the real age of universe is ten times higher than what we have measured. Therefore , we reach a crucial finding here:

Real speed of time is ten times faster than speed of light.

$$V_t^r = \pi^2 V_t^a$$

V_t^r : Real speed of time = 2.9×10^9
 V_t^a : Apparent speed of time = 3×10^8

As time has Real Length and Apparent Length, it also has Real speed and Apparent speed. We will work in very detailed depth of speed and length of time in future chapters and we will see how it helps us demystify the characteristics of our universe.

Now considering these facts we can easily calculate the acceleration of time. But before doing that, we need to note that the rate of acceleration of time is in fact the rate of reduction of gravity in our universe. I explained earlier that the cause of acceleration of time, is the reduction in gravitational density:

$$\text{Acceleration of time} = \text{rate of reduction in gravitational density} = \frac{\text{Apparent speed of time}}{\text{Real length of time}}$$
$$\frac{3 \times 10^8}{43.4 \times 10^{17}} = 6.67 \times 10^{-11}$$

Therefore, the correct term for the Gravitational Constant would be the Gravitational Density Coefficient because it is the rate by which the density of gravity is reducing in our universe. In future chapters we will see how valuable this number is to decode so many mysteries of our universe because everything is produced by time and gravity.

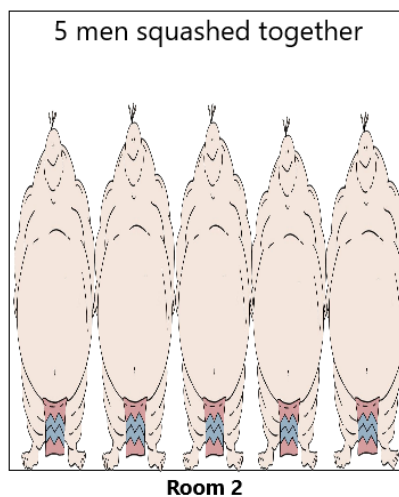
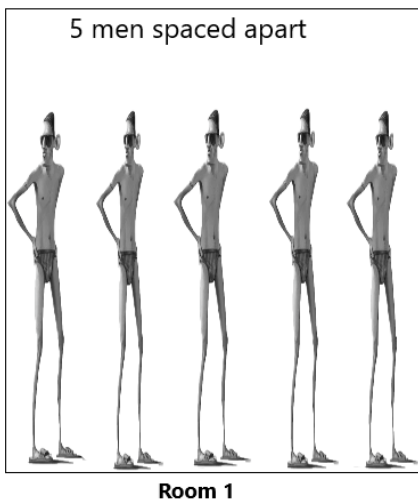
Avogadro Secret

In 1811 AD an Italian scientist found something deeply mysterious in his experiments. Amedeo Avogadro was trying to find out the molecular mass of various gases when he discovered a very strange behavior in molecules. He put different gasses with various size molecules in the same size containers under the same pressure and temperature. He was logically predicting that gasses that have larger molecules will fit less molecules in the container compared to the gasses with smaller molecules. But he discovered that, *“equal volumes of different gases under the same conditions of temperature and pressure will contain equal numbers of molecules.”* This was strongly rejected and ignored by the scientific community at the time, just like any other great discovery! But years later, it was found to be a crucial fact in our world and was titled as Avogadro Law, because it was found to be correct for any particle, including molecules, atoms or smallest neutrinos.



Marble bust of Amedeo Avogadro in Italy

Avogadro's Law might seem a simple, random feature of the universe but when you think deeply about it, Avogadro's Law is telling us something extremely important, non-random, intelligent and deeply mysterious. Let's look at it with a simple analogy: We have two rooms with the same size and there are two groups of people in the nearby street under the rain. The group A is consisted of little kids and group B is made of very large size men. We open the doors to the rooms and let people get into the rooms, group A, kids into room 1 and group B, large men to room 2. A minute later we go to have a look to make sure everyone is okay. We are expecting to find the number of kids in room 1 to be much higher than the number of men in room 2. But we are shocked to see that both rooms contain the same number of people! The large men in room 2 are obviously squeezed to each other while the kids in room 1 are spaced out, freely moving around.



Why not more men in room 1? Why always Avogadro number of men?

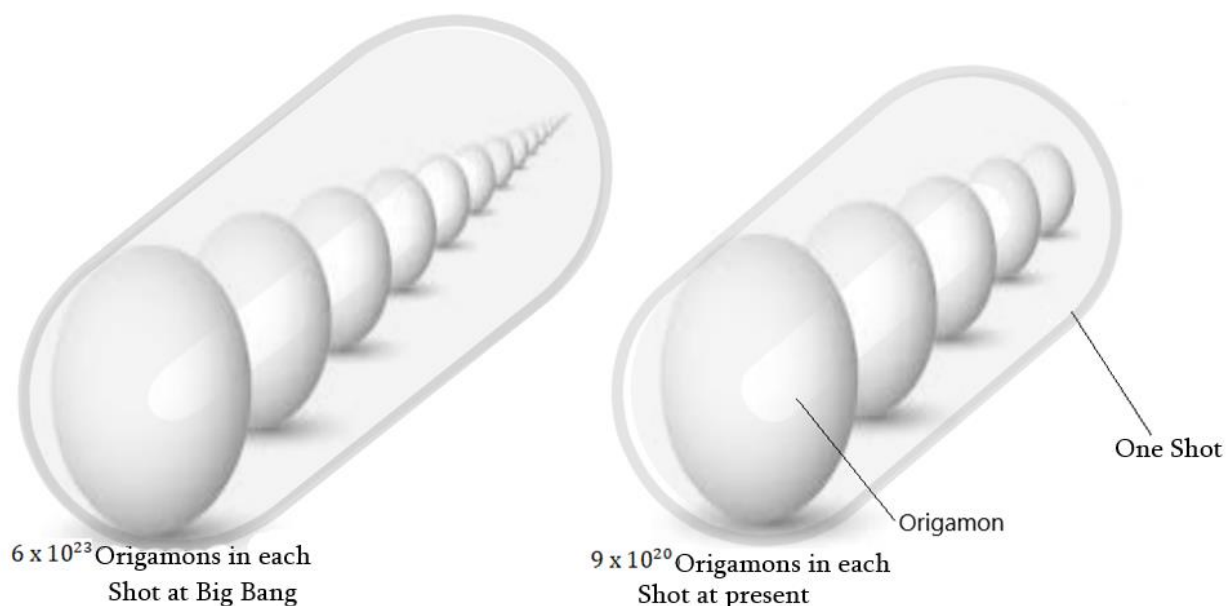
Confused, you ask the men and the kids if they had any discussion and agreement between themselves and they deny knowing anything about each other. To get even more mysterious, you find that regardless of the size of the people getting into the rooms, there is always a constant number of people going to the rooms. Avogadro was the genius who found this number: 6×10^{23} . We all learn about this value as Avogadro Constant at high school. Although he discovered the value for gas molecules, soon scientist realized that it is the same for any particle, regardless of its type, atom, molecule, or subatomic fermions. So, to simplify the law, they coined a word for Avogadro number of each particle: Mole. A mole of any particle is 6×10^{23} of that particle. Interestingly no one has been able to find out where this number comes from and how all the particles in our world follow a spooky order to always get in groups of 6×10^{23} numbers. They never get in groups of 5 or 10 or 645000 or 680302734643, they are all taught a mysterious code, an eternal commandment: Thou Shalt Stay In Moles!

This means everything smaller than Planck Mass always follows the Law of Avogadro, and stays in groups of 6×10^{23} . This is simply impossible unless all particles are somehow talking to each other, particles are somehow connected. This is again clear evidence that all particles are created by one string of time that connects them to one another and it also tells us that time has containers of Avogadro Number capacity.

Even though Avogadro Constant is mostly used in chemistry these days, Origami Model reveals a much higher importance for it in physics. Avogadro Constant just like all other Physical Constants is a mystery of our universe and as I mentioned before, a truly Unifying Theory of Everything, has to be a theory that is comprehensible, and it is capable of explaining the origins and reasons of the quantity of these mysterious values. Origami Model would have been just one of many hypothetical imaginary theories if it couldn't mathematically explain all the physical constants and also find their origins and the reason for their existence, as well as discovering more universal numbers in our world in order to reveal the entire structure of our universe and the mechanism of its operation and predict its future course. Such theory has to be capable of

finally answer our eternal question: Why are we here? By the end of the paper, we will see that Origami Model discovers and explains all these values so that at the end we see how similar our universe operates to our own mind and it concludes mathematically as well as rationally the reason of our existence.

At the beginning of previous chapter, I mentioned that based on Origami Theory, everything in our universe, including all the elementary particles are made of Origamons and as a result of acceleration of time, the size of Planck Length has been reducing. This means the smallest length observable in our universe has been enlarging and this causes everything smaller than the current Planck Length disappear and become a ghost particle. Also, I mentioned that in further chapters I will prove that photons are in fact the Origamons and we will calculate the radius and the mass of the Origamon. Unlike what is said in Standard Model about the photons that they have no mass and no measurable radius, Origami Model demonstrates that Origamon/photon has a radius much smaller than the current Planck Length and this is why they are not observable now, while 8 billion years ago their radius was much bigger than the Planck Length at the time. These disappeared particles and anything else that is smaller than the current Planck Length has been observable in far past and that's why they have become the Ghost Particles now. We also saw that the Shots of time are in fact the Planck Time in Standard Model, and the size of Shots reduces as time progresses and we showed that what we know as frequency is in fact the number of identical particles produced (located) in one Shot. This means that at Big Bang, when Shots were at their largest size, there was much larger number of Origamons (photons) in each Shot, creating a much higher frequency for light. In simple words, this explains why at Big Bang the highest possible frequency of light was much higher than today and at present time, the highest frequency ever observed is in powerful gamma rays with a maximum frequency of 9×10^{20} Hz. Origami Model not only demonstrates the cause of this mystery mathematically, by utilizing the same calculations it reveals that the maximum number of photons in each Shot at Big Bang, or maximum frequency of light was 6×10^{23} , which is the Avogadro Number.

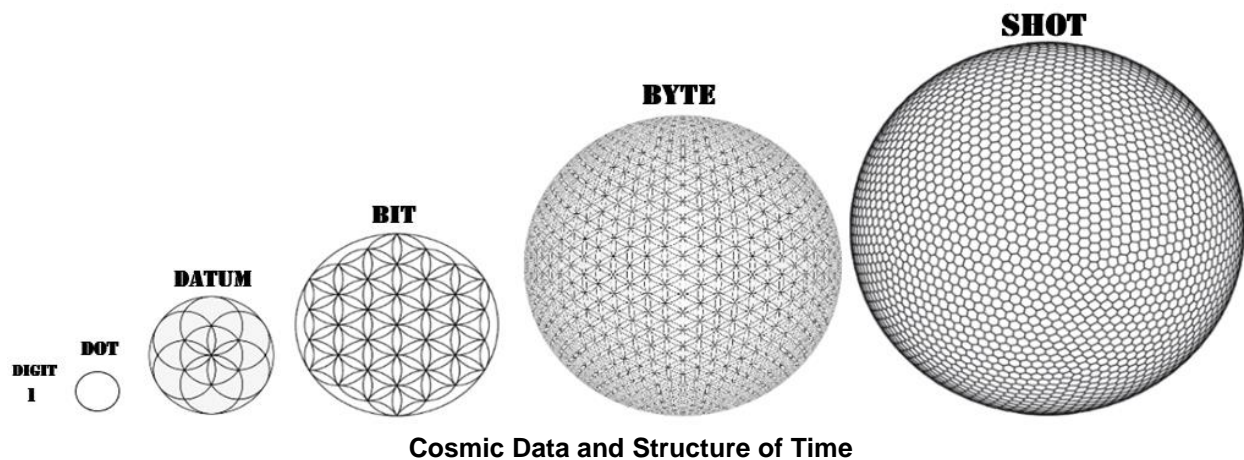


Reduction of the size of Shot as time accelerates

This is an extremely imperative finding because it proves two crucial facts: first, it demonstrates that the calculations and the approach of Origami Model is correct because otherwise it would not be able to randomly calculate such accurate numbers, secondly, it shows where Avogadro Constant comes from. This is an incredible key! It simply illustrates that our universe is designed (oops!) exactly like an intelligent computer system that works with information and it classifies and organizes them in certain sizes and capacities. Now it's time to talk about the details of the structure of time.

Structure of Time

To organize and work with the information that is proliferating itself constantly, universe needs to have a system for organizing the information. The universe does this by organizing the units of data in packs.



The effective combination of data becomes information. The smallest unit of information is the Origamon (photon) and the smallest unit of data is Digit. The Digit is actually 1 which in combination with gravity (0) becomes mass. The proliferation of Digits is as following:

$$1+0 = 1$$

$$1+1 = 2$$

$$2+ 1 = 3$$

$$3 + 2 = 5$$

$$5 + 3 = 8$$

$$8 + 5 = 13$$

$$13 + 8 = 21$$

$$21 + 13 = 34$$

And so on in Fibonacci sequence. These Digits then gather in larger packets: Dot, Datum, Bit, Byte and finally Shot. The fundamental packet of information is the Shot. Each Shot would have

enough data to produce many Origamons. As I explained before, the capacity of Shots reduces and causes the time to accelerate but the capacity of packages smaller than a Shot stay constant. Shot's capacity at Big Bang is 6×10^{23} number of Origamons. This wonderful finding gives us a great insight to the capacity of Shots: The maximum capacity of a Shot is Avogadro number of Origamons. Considering the mass of Origamon, by using the equation that we develop in later chapters, we will convert the mass of Origamon to equivalent amount of time and that would be in fact one Byte of data, and also this would tell us how much time (data) can be stored in one Shot at its largest volume. We will calculate in further chapters that Origamon (photon) has a mass of 1.3×10^{-70} kg. As you can see, this is an incredibly small mass, because the smallest subatomic particle in the world is the Electron Neutrino which is millions of times more massive than Origamon. In order to calculate the mass of electron neutrino, two physicists spent five years of constant hard work and research and when finally they found the mass of this neutrino, they received the Nobel Prize for it. Their calculation showed that the mass of Neutrino is 1.9×10^{-37} kg. This means the mass of Origamon (photon) is almost square root of mass of Neutrino. No wonder why mass of photon is considered to be zero in Standard Model. Therefore, we conclude that one Byte of Cosmic Data translates to 1.3×10^{-70} kg of mass in our universe. So, time is cosmic data (CD) and mass is information. Time is made of Bits of data when large amounts of cosmic bits become one cosmic Byte of data. To calculate one Byte of Cosmic Data we will have to use our equation to convert the mass of Origamon to time. We will extract this equation together in the next chapters:

$$M = \pi^2 T^3$$

M : mass in kg

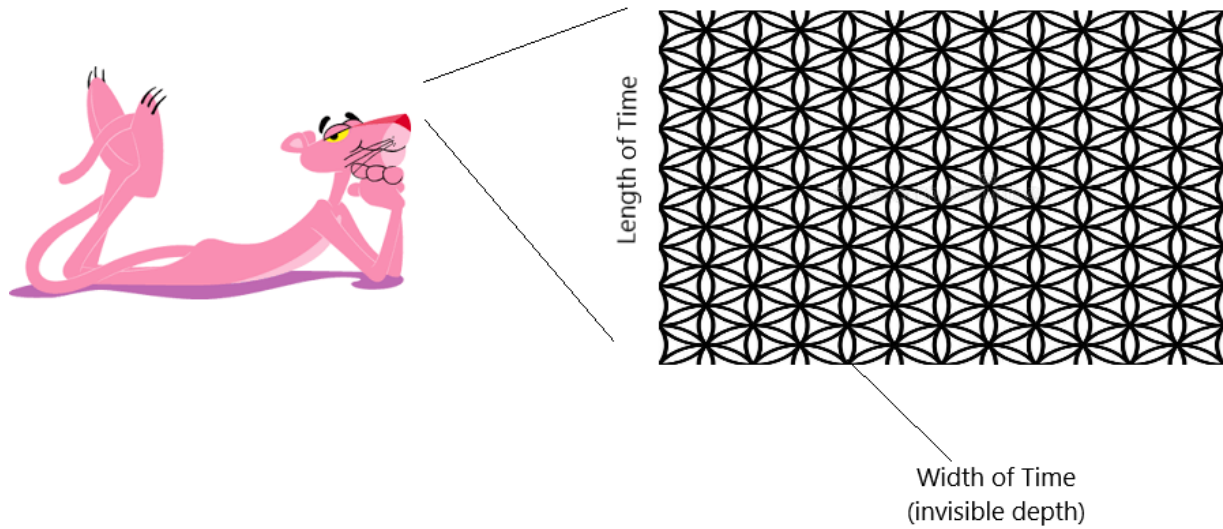
T : time used to produce mass in second

Based on this equation we can calculate how much time has been used to produce the smallest unit block of universe, Origamon.

$$1.3 \times 10^{-70} = 9.87 \times T^3$$

$$T = 2.16 \times 10^{-24} \text{ s}$$

This means one Byte of cosmic data is equal to 2.16×10^{-24} seconds. Now we need to find the value of one Bit of cosmic data, so we can calculate how many Bits will make one Byte in cosmic data classification. I explained that as time accelerates, the size of Planck Time shrinks, and the rate of its reduction is 6.67×10^{-11} , (which is exactly how the Gravitational Constant). Therefore, to find out the smaller value of time, or the actual value of one Bit of cosmic data, we need to find the value of Planck Time at the end of the universe. Planck Time at present is 5.4×10^{-44} seconds and we will calculate in further chapters that when our universe reaches its mature size in 0.7 billion years, Planck Time will be exactly 5.3×10^{-44} seconds. Note that any time measurement for us, is only the length of time and we do not observe/perceive the width of time but we only see its effect on environment (eg. As the radius of universe which I will explain later).



Therefore, the final/smallest Planck Time is in fact the length of one Bit of cosmic data. To find the smallest width of time we need to use the following equation:

$$W_t = \frac{\sqrt[3]{T}}{2}$$

$$W_t = \frac{\sqrt[3]{5.3 \times 10^{-44}}}{2} = 3.9 \times 10^{-16} s$$

This shows that width of time is in fact longer than its length so maybe we should call it depth of time instead. This makes it possible for us to decode one Bit of cosmic data.

1 Bit CD = 5.3×10^{-44} seconds

1 Byte of CD = 2.16×10^{-24} seconds

Number of Bits in one Byte of cosmic data = $\left(\frac{\text{total time in one byte}}{\text{length of one bit}}\right)^2 \times \text{width of one bit}$

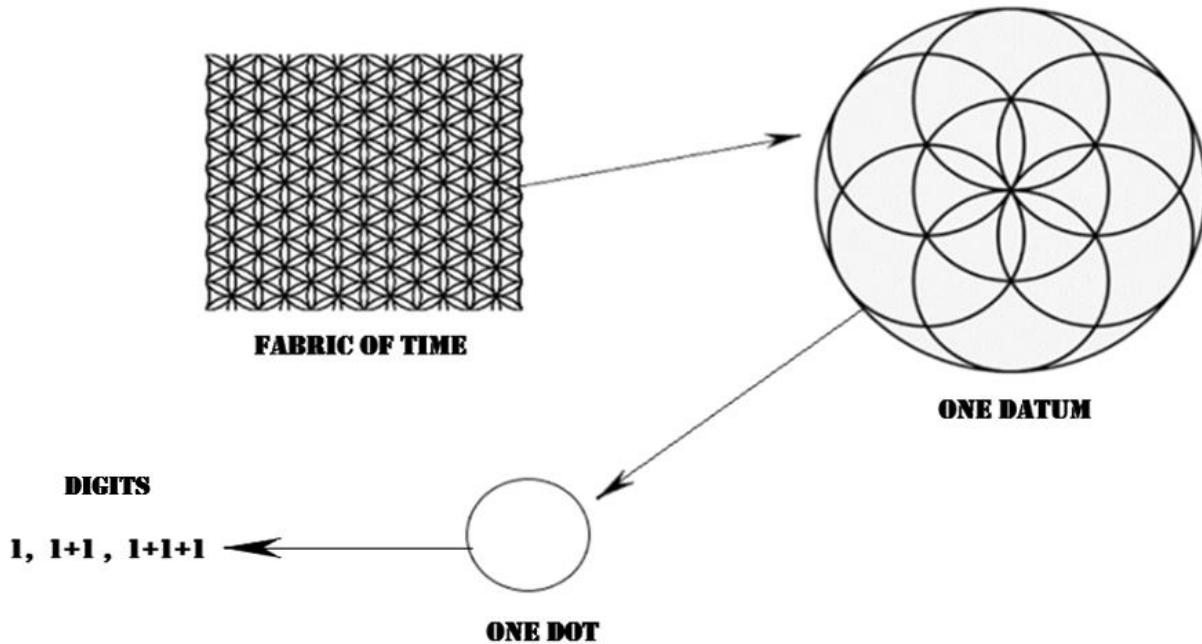
Number of Bits in one Byte of CD = $\left(\frac{2.16 \times 10^{-24}}{5.3 \times 10^{-44}}\right)^2 \times 3.9 \times 10^{-16} = 6 \times 10^{23} \text{ bits}$

1 Byte CD = 6×10^{23} Bits CD

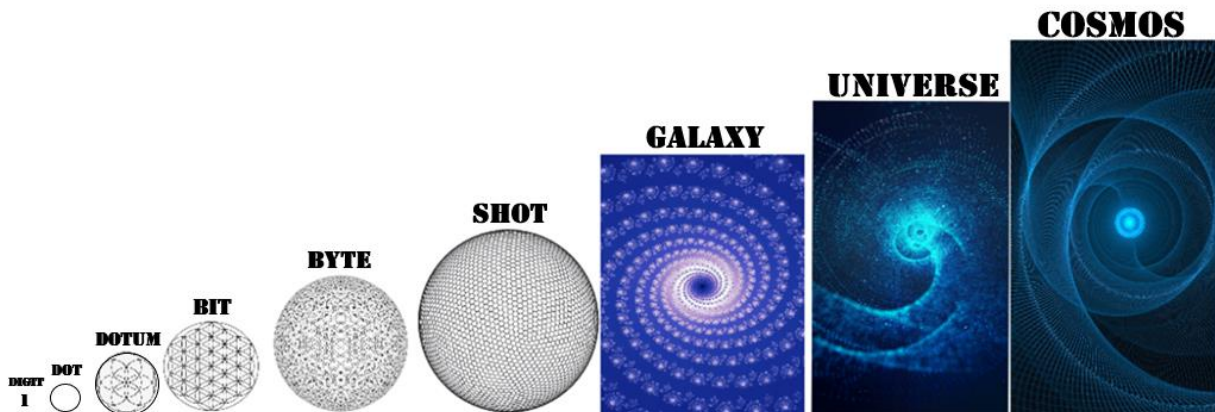
One more time the mysterious Avogadro Number reveals itself. If we look at the size of one Byte CD, interestingly we find that the size of it is a multiple of 6 again:

$$2.16 \times 10^{-24} = 6 \times 6 \times 6 \times 10^{-26}$$

This is in fact because circle has 360 degrees and time moves in circular pattern due to the homogeneity of gravity around it. One Bit of cosmic data is made of six Datum and one Datum is made of six Dots of cosmic data. One Dot is consisted of six Digits. Digit is in fact the original unit block of cosmic data, the actual unit block of existence. The nature of one Digit is the reality of information, just one Digit that together with many more creates a sequence, a code. The universe starts from one Digit. At Singularity there is only one Digit and Nothing.



What is Digit in the cosmic data? Digit is in fact the ultimate precision. At the very end of cosmic life, the Shot capacity will be at its minimum, so the speed of time will be at its incredibly high level. This will bring the time to its maxim proximity to analog quality. It is like a camera with incredibly large number of pixels. This is the way cosmos tries to reduce its quantization and move towards analog, towards continuous data, towards minimum granularity. At that moment, the entropy will be at its maximum because each single Shot will contain only one Origamon.



How time produces the entire cosmos

In the next chapters we will dissect the black holes and try to calculate the number of universes in cosmos. We will see again and again that everything is formed on the same fundamental pattern and Avogadro Constant appears over and over because the cosmic data is packed in Avogadro numbers. We will find that astonishingly the total number of black holes and the total number of universes are also 6×10^{23} .

Space is Time

The concept of locality has been questioned for such a long time. When John Bell finally proved quantum entanglement by his genius experiment, there was no place left in physics for locality. Quantum entanglement demonstrates that two or more particles can be affected *instantly* by the same force applied to only one of them, when the particles are separated by a very large distance. There are so many other examples in quantum mechanics that contradict the notion of locality. However, in current Standard Model, there is no proper explanation for such phenomena because the model is founded on assumption that our world is made of fabric of space and time and if we deny the locality, we will have no choice other than denying space. On the other hand, Origami Model begins by defying the notion of locality and it suggests and proves mathematically that what we perceive as locality, is the time difference between two masses. A bat perceives the world as ultrasonic waves and for a bat, objects are louder or softer, and it does not comprehend an object to be closer or further. For human beings, perception has its own limitations and we comprehend objects with time difference to be separated spatially. Ultimately, it is our intelligence that will provide us with the real, correct version of reality.

In 5th century BC, a Greek philosopher by name of Zeno argued about the nature of motion and created a logical conflict that is known as Arrow Paradox:

“In any instant of time, the flying arrow is neither moving to where it is, nor to where it is not. It cannot move to where it is not, because no time elapses for it to move there; it cannot move to where it is, because it is already there.”

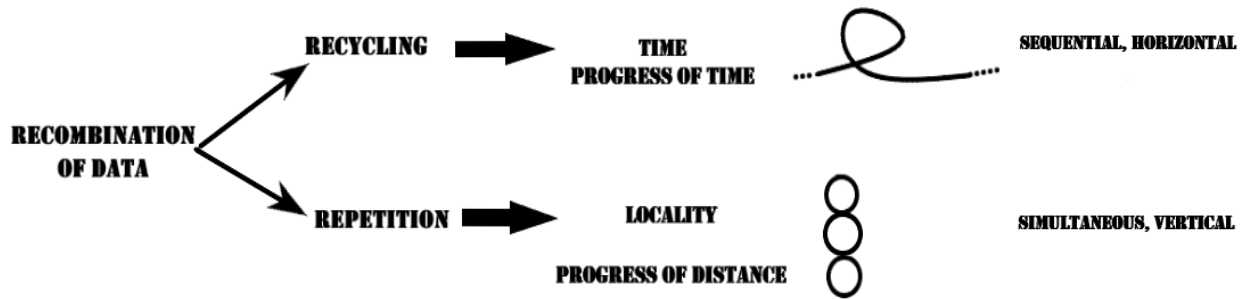
This is a genius way of thinking about time and space, 2500 years ago. Zeno understands that for motion to occur, an object must change the position which it occupies per time. He realized that at every instant of time there is no motion occurring. If everything is motionless at every instant, and time is entirely composed of instants, then motion is impossible. In other words, Zeno of Elea in ancient Greece, discovered what I am trying to say here: Space is time and time must be digitalized. He was virtually trying to digitalize his analog perception of a projectile. He was in fact trying to digitalize the world. One could consider Zeno of Elea the founder of quantum physics.

Since the beginning of time our senses have helped us perceive the outside world and at the same time, they have deceived us to a great deal. Our five senses translate various modalities of stimuli into five different perceptions, leaving the concept of time out. This is why throughout the history, even our greatest scientists have always been trying to understand the world by imagining the objects interacting according to various forces, while time as an unknown entity records all these interactions. This is why we have been deeply disturbed by the concept of time, trying hard to demystify this enigmatic, shadowy ghost, but all our efforts have been in vain. However, Origami Model provides a unique, simple and transparent description of time that is understandable and comprehensive. Time is data. Data interacts with itself and makes more copies, recombines, proliferates. The Recombination of data is perceived by us as new data, which produces new matter, more universe. What we comprehend as passage of time is nothing but the Recombination of new data, new time. When time spirals and encapsulates a unit of gravity, it produces a particle, mass. Every Shot contains certain number of these particles, depending on their mass (their data). The Recombination of time occurs in two modes:

Recycling, in which Digits get mixed and produce new sequences of Digits and new codes, Repetition, in which the same sequences of Digits are repeated. In a simple language, Data constantly produces new sequences as it progresses and at the same time it repeats all the sequences that it has already produced in each Shot (each Planck Time). We can imagine that time progresses horizontally (Recycling) and Vertically (Repetition) and so the horizontal progress of time produces the passage of time for us, and vertical progression of time, keeps the produced data repeated in a length that we perceive as length or distance. So, we can have a definition for space now:

The repetition of time between two particles is the distance between them.

This is why when so many particles are in the same Shot (same Planck Time) there would be no real distance between them, and we will only observe one particle at the time. All the particles across the radius of universe exist at the same time because all the data that has produced them repeats itself at each Planck Time.



Repetition of data creates same particles that exist simultaneously and so produces the locality and the radius of universe, while recycling of data creates new particles every moment in sequential pattern and so produces the passage of time

If we consider time as a train that is traveling forward along a distance of L, with speed of V and acceleration of a, we will have:

$$V = \frac{L}{T}$$

$$a = \frac{V}{T}$$

$$L = T^2 \times a$$

This means distance traveled by train of time is equal to the acceleration of the train of time multiply by square of the duration of train traveling that distance. I already demonstrated that acceleration of time is in fact what we call gravitational constant. I also mentioned that due to spiral motion of time the real duration of time and real speed of time is much larger than the apparent (observed or measured) amount of time: $T_r = \pi^2 \times T_a$

Inserting this in previous equation will provide us with a unique equation that can convert time to distance:

$$L = \pi^2 GT_a^2$$

L : Length or distance or radius

π^2 : 9.87

G : gravitational constant 6.67×10^{-11}

T_a : apparent time or measured time or observed time

This wonderful equation tells us how much distance is produced (transpired) by certain amount of time. If we try the equation for the entire universe, and put the total amount of time (age of universe) in it we will arrive at:

$$L = 9.87 \times 6.67 \times 10^{-11} \times (4.3 \times 10^{17})^2$$

$$L = 12.45 \times 10^{26} m$$

This is the exact radius of our universe. Our universe is in a cone shape and the above figure is the true radius of the cone but because we observe our universe at its circular cross section, we can convert the cone radius to the radius of circle at the base of the cone by using the following geometrical equation:

$$R_r = 2\sqrt{2} \times R_a$$

R_r : radius of a cone, or Real Radius of universe

R_o : radius of circle at the base of the cone, or Apparent Radius of universe

$$12.45 \times 10^{26} = 2 \times \sqrt{2} \times R_o$$

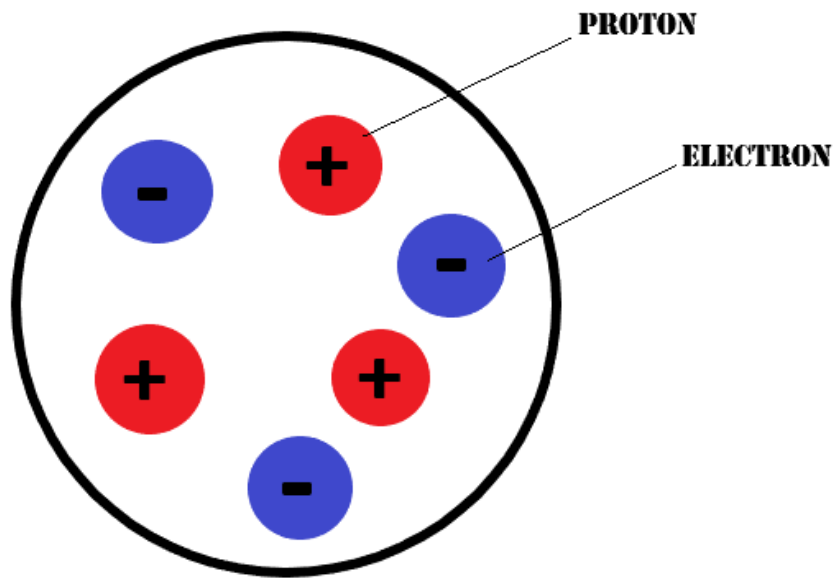
$$R_a = 4.4 \times 10^{26} m$$

This is exactly the radius of our universe based on our latest, most precise observations. This wonderful equation works for any distance or radius, and we will see in future chapters of the paper how we can find the radius of smallest particles by using this equation.

With similar approach throughout the future chapters of this paper, we will create equations that convert time to mass, time to energy and time to distance with mind-blowing accuracy. Unlike the Standard Model, all equations developed in Origami Model are universal and they are applicable for quantum dimensions as well as celestial bodies. This tells us that if there is time, there will be space produced, and this is exactly why as time progresses, universe expands.

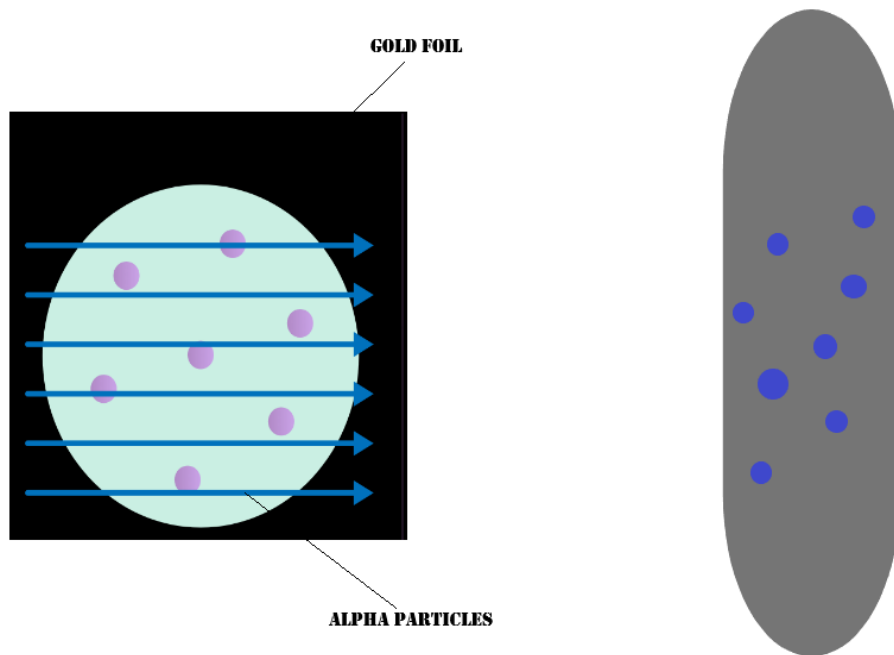
The Empty Tomb

In the late 19th century, physicist J.J. Thomson proved that atom was made of electrons and protons. He supposed that these negative and positive charges must be distributed evenly inside the atom. Thompson's so-called Plum Pudding Model was accepted generally amongst all the physicists:



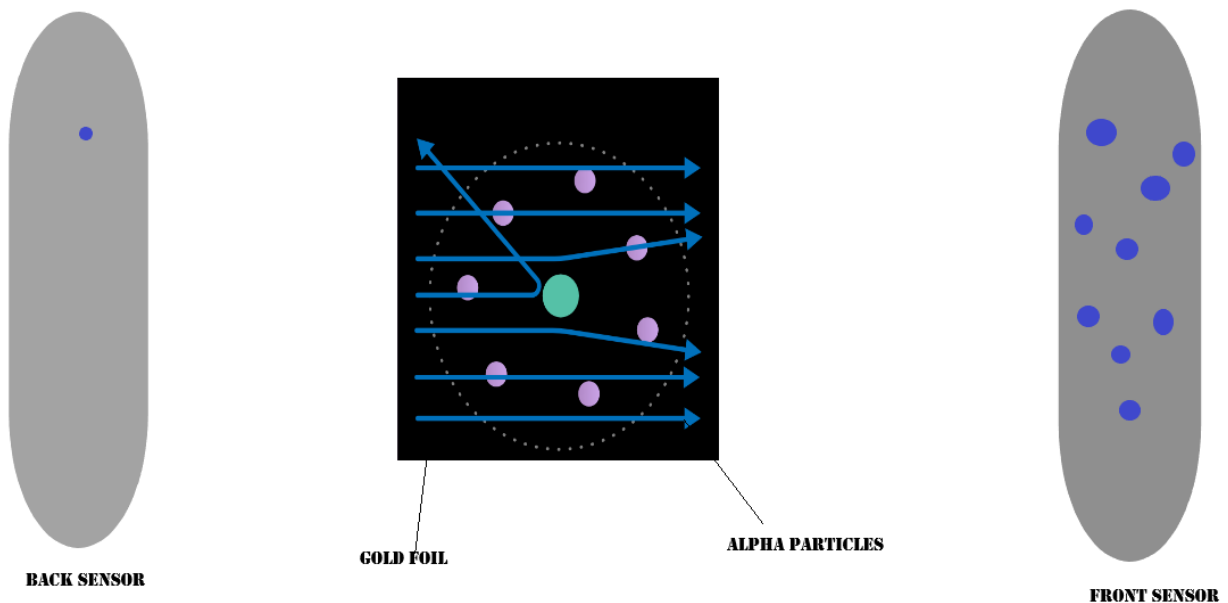
Thompson's model of atom

Until a genius from New Zealand by name of Ernest Rutherford ran his famous gold foil experiment. In this simple test, Rutherford fired a thin beam of alpha particles at a very thin sheet of pure gold. Alpha particles are helium nuclei and they are given off in various radioactive decay processes. Rutherford set up the experiment and left it with his students to do it. Couple of days later he came back to check the results, but he found his students shocked. They told him that almost all the alpha particles went through the thin foil of gold! It seemed like the atoms of gold were just like hollow bubbles that alpha particles could easily go through them, which made no sense.



Alpha particles going through the atoms of gold and landing on the screen

But Rutherford was not convinced. He told his students to set another sensor plate behind the source of alpha particles and check to see how many particles would bounce back from the gold foil. The students didn't know why their master was asking them for that but for the next two days they kept running the experiment and this time they checked the back screen.

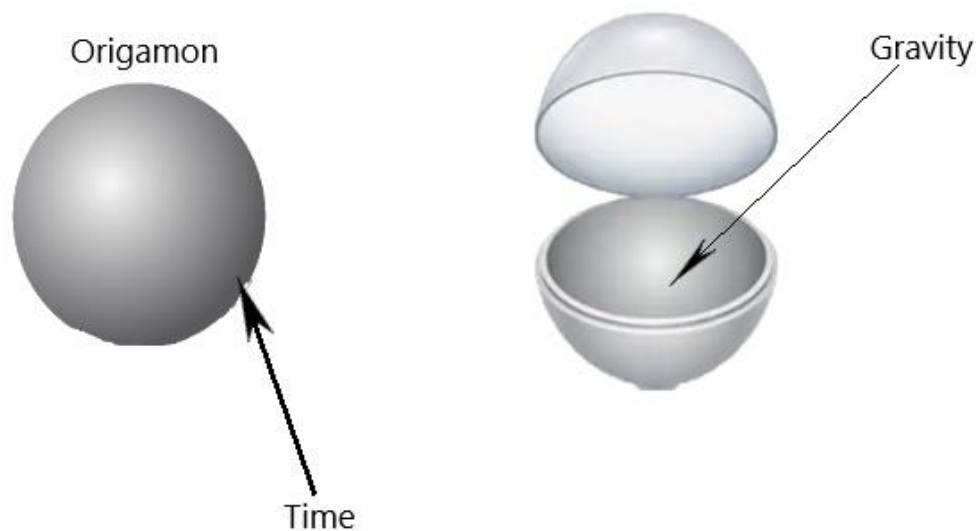


Very small number of Alpha particles bouncing back from the gold atoms

The next day Rutherford checked the results. He has made a giant breakthrough in understanding of the structure of atom. For every millions of alpha particles that had gone through the gold foil, one had bounced back and hit the detector at the back of the particle shooter. He concluded that all the positive particles in atom must be concentrated in a very dense package at the center of the atom. This is how nucleus was discovered, one of the most mysterious things in physics that is still shrouded in layers of dark secrets. How could positive protons get together in such tiny space? The repulsive electromagnetic force between positive protons at such small distance to each other is as strong as force of two semitrailers pulling a thick rope in opposite directions. But instead of the rope tearing into pieces in fraction of seconds, the two trucks will burn their engines before they can rupture this enigmatic rope. There is a tremendous amount of force holding the protons so strong together that when finally Robert Oppenheimer succeeded to tear them apart, the explosion vaporized 146 thousand people in Hiroshima and turned 90 thousand houses to dust.

The astonishing discovery of Rutherford demonstrated that atom and in fact our entire world is made of 99.9999% empty space! So how is the table over which you place your laptop is so solid? How would anything be solid?

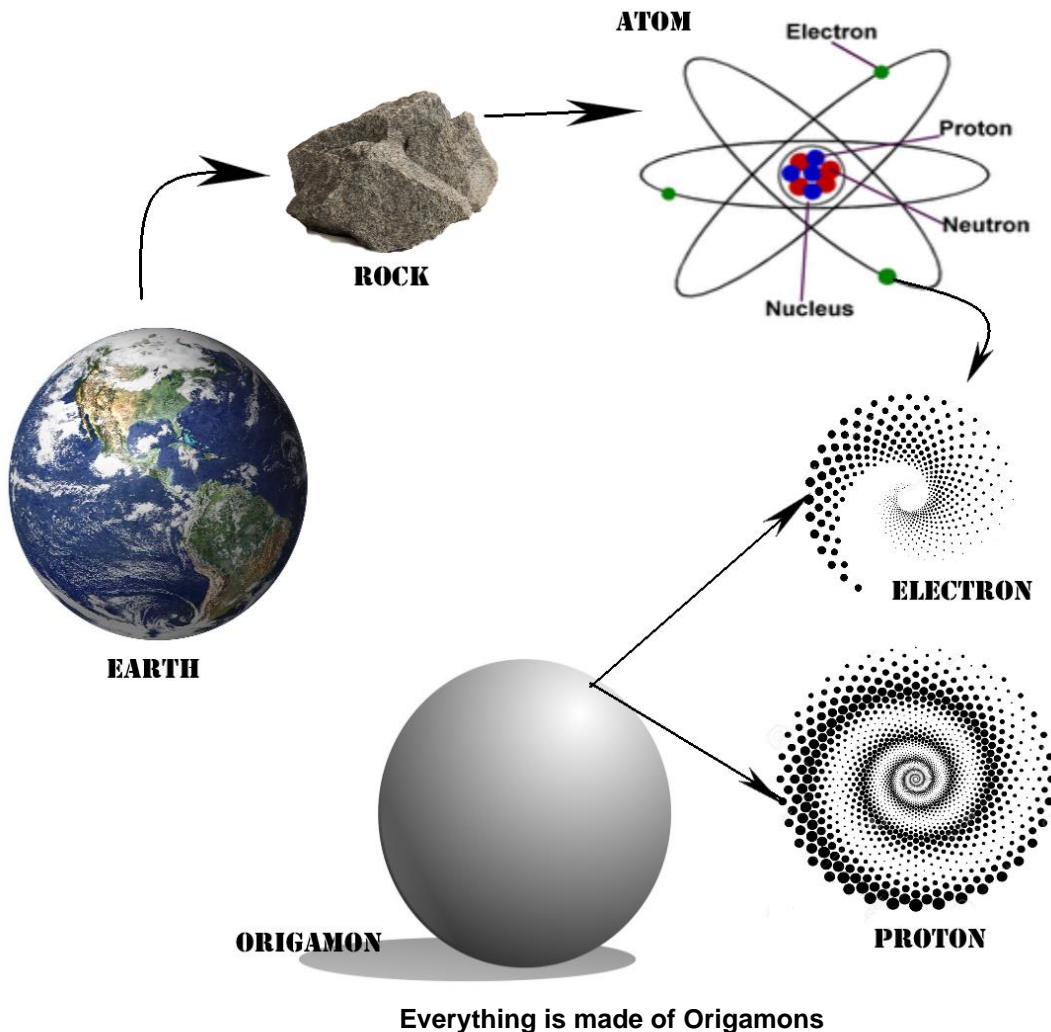
Till now there has been no convincing answer for this fundamental question. The reason is because we still don't have a proper definition for mass. However, the model that Origami Model proposes for mass is very convincing. Let's have a look at the structure of Origamon:



Each Origamon is made of a sphere of gravity (vacuum) covered with sheet of time

As I explained earlier, unlike the Standard Model that believes everything in universe is made of more than 36 fundamental particles (the number keeps growing), and has no suggestion what these particles are made of, Origami Model believes that entire mass in the universe is made of one elementary particle: Origamon. Origamon is in fact what Standard Model knows as photon, with a big difference that photons are considered massless in standard model, but Origami Model calculates the mass and radius of Origamon precisely and convincingly. Origamon is a particle made of a membrane of time (data) and a central vacuum which is in fact the gravity. The reason that every mass has gravity is because of the central gravity inside the Origamons

that produce that mass/object. Because gravity is in fact the property of the absolute vacuum inside the Origamon, so the large part of Origamon and so the greater portion of every mass is consisted of hollow space. However, because there is a layer of time around each Origamon, so the Origamon is solid since this layer does not break down or integrate with other layer unless enormous force is applied. When two or more Origamons are too close and forced together, they fuse into a larger particle and this is how larger elementary particles and composite particles, and then nucleuses of atoms are made.



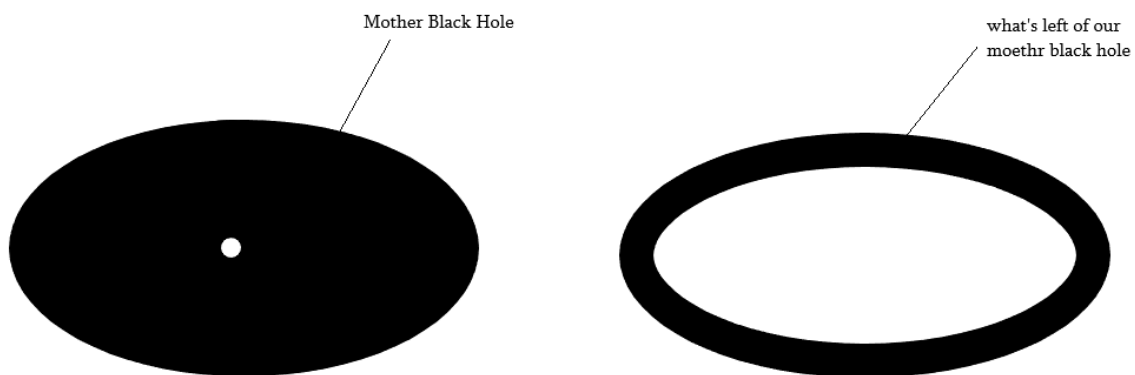
As I explained before, at the very beginning of universe, there was time in the center of a very large pool of vacuum. As time proliferates, it produces the first Origamons and then more Origamons, larger particles and finally stars and galaxies, and it expands rapidly. The speed of time accelerates constantly, making everything to seem extremely fast at Big Bang and getting slower as it progresses, so speed of light has been constantly reducing. However, Apparent speed of time in our universe is always equal to speed of light and Real speed of time in our universe is always ten times faster than speed of light. This is achievable by changing the size of Shots. As I explained earlier, the size of Shots reduces as time proliferates so while the rate of Recombination increases, the length of Planck Time, which is the length of each Shot

reduces and this is how the ratio of real speed of time to apparent speed of time stays constant at $\pi^2 = 9.87$:

$$\frac{V_t^r}{V_t^a} = \pi^2$$

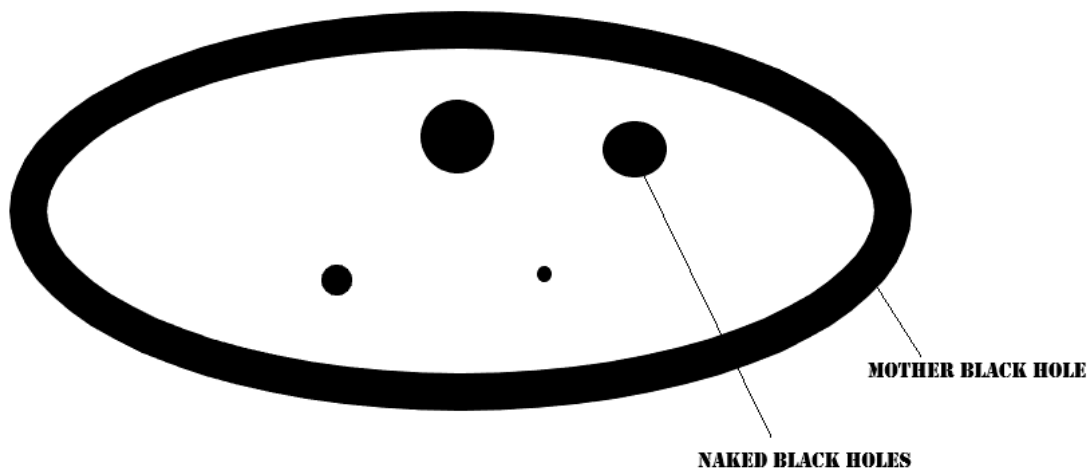
In the later parts of the paper, we will mathematically find that our universe is inside a massive black hole. In fact, the large pool of gravity that exists at the Big Bang, is our Mother Black Hole. This womb makes the time slow down and produce the mass and as time grows, the ratio of Time/Gravity increases, density of gravity reduces, so time accelerates and produces more mass, so the universe exponentially expands. Based on the Gravitational Constant, which is in fact the acceleration of time, we will later on calculate the exact radius of the Mother Black Hole. Then we will see exactly, when our universe will reach the edge of this pool, its maximum size. We will see that it will be in 700 million years from now. As galaxies reach this event horizon, they will be accelerated to speed of light, so they will enter the next universe as high energy photons. This means, the larger universe that is outside our universe and will eventually receive us, will observe our exit as a supernova. In the very first chapter of the paper, we will calculate that when a star explodes as a supernova, not 30% but 100% of its mass converts to energy and this will leave a vacuum behind that we know as the black hole. Therefore, *Black Holes in Origami Model are large vacuum pools that contain absolutely no mass*. Unlike the space that is full of particle-antiparticles that annihilate each other constantly, the vacuum inside black holes is a pure, absolute NO-THING. In Origami theory, the only places that are absolute vacuum, are the black holes. As we started the theory by proving that gravity is the property of vacuum, it is clear that black holes as the main source of gravity are in fact just empty tombs. Therefore, Origami Model suggests that there are three types of black holes in the universe:

- 1- Mother Black Hole: The large black hole around our universe that expands our universe. Our universe will grow to its final size and exit the mother black hole in 700 million years to enter the next universe.



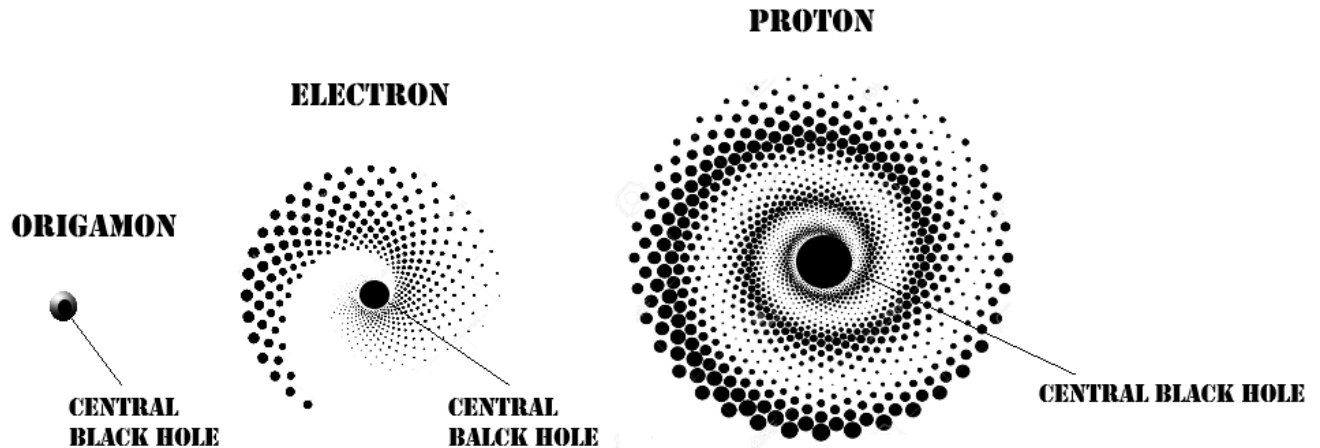
AT BIG BANG **AT PRESENT**
Comparing the Mother Black Hole at Big Bang (left) to it now (right)

- 2- **Naked Black Holes:** The black holes of various sizes in space that have zero mass and produce enormous gravity that holds stars inside galaxies and also galaxies next to each other. We will see that naked black holes are the source of force that expands our universe, the mysterious force that is called Dark Energy which is nothing but pure gravity generated by the naked black holes.



Naked Black Holes throughout universe and Mother Black Hole encapsulating the entire universe

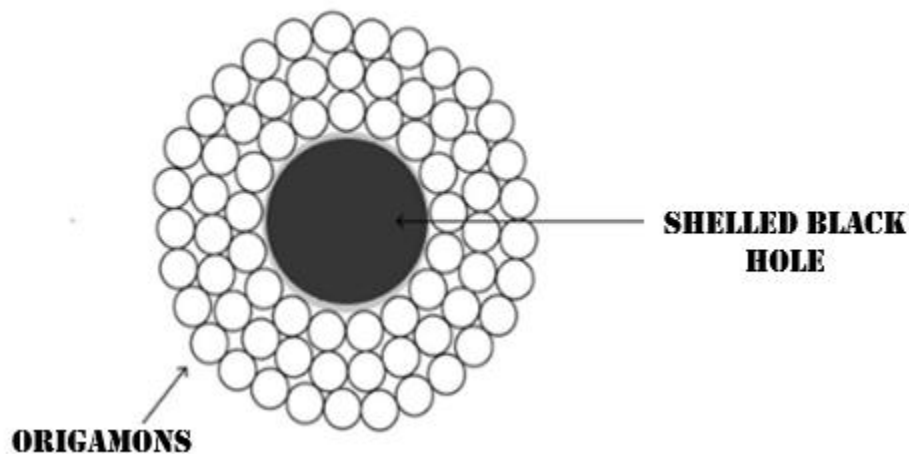
- 3- **Shelled Black Holes:** The infinitesimally small black holes in the center of the Origamons and all other fundamental particles, any mass smaller than Planck Mass. These black holes are not observable at present because due to the acceleration of time that has caused expansion of the Planck Length (explained previously) the radius of central black holes has fallen under the current Planck Length and so we will not be able to directly observe them but we observe their effect which is the gravity produced by every mass. Every subatomic particle has one single central black hole.



Origamons fuse in spiral patterns to produce subatomic particles

In Origami Model gravity in universe is in these three types of black holes and black holes are empty spots with no tangible mass. This shows that mass always contains gravity but gravity is independent of mass. Stephen Hawking had faced this conflict repeatedly and he even mentioned that "Black Holes must not exist!". In In 2014, Laura Mersini-Houghton, a physics professor at the University of North Carolina, mathematically demonstrated that black holes with any mass can never come into existence. Mersini officially claimed that black holes do not exist. In 29 August 2001, Friedwardt Winterberg, the renown theoretical physicist at the University of Nevada published an article in Astrophysics Data System magazine, titled as , "Gamma Ray Bursters and Lorentzian Relativity", in which he demonstrates that during the gravitational collapse of a star, the event horizon appears first at the center of the collapsing body, thereafter moving radially outward converting all mass to energy, leaving an empty black hole in space. All these clues are constantly pointing at the fact that gravity is the property of vacuum, not the property of mass. This fundamental discovery revolutionizes our physics and opens the massive door to understand the universe and to overcome several conflicts and paradoxes that we have been confronted with. One major issue at the moment is what they call Information Paradox. Because current physics believes that black holes are massive, dense stars that suck everything in and everything falling into the black hole will never be able to exit, therefore any information entering a black hole will be annihilated, which is impossible and contrary to the foundation of science because no information can be destroyed. If this is the case, black holes must destroy the entire universe in a short period of time. Every physicist today has a major problem with this paradox. Origami Model on the other hand shows that black holes have no mass and no particle ever enters them, instead, particles get attracted to Naked Black Holes, get accelerated and convert to energy (mainly X ray photons) before reaching the event horizon and they bounce back to space. We will calculate the radius at which this conversion occurs and we will call this area around the black holes, the Transformation Zone. This explains why there is a large sphere of powerful energy surrounding every black hole in its accretion area. Our new approach not only resolves the information paradox, it also develops equations that explains at what how big a black hole needs to be, to be able to convert all the approaching mass to energy and so stay naked, and the amazing result proves why there can't

be any naked black hole in space smaller than 3.8 times solar mass. The current observation has shown that no black hole in space is smaller than four times of mass of our sun but there is no convincing explanation for it. Origami Model develops equations that demonstrates when black hole reaches almost 4 solar masses ($7.69 \times 10^{30}\text{kg}$), its gravitational force will be so massive that any particle attracted to it will accelerate to speed of light and converts to photons before reaching its event horizon. If the black hole is smaller than this critical mass, particles will have a chance to overcome the gravitational force of the black hole due to the massive gravitational attraction between themselves at such Planck Distance and create a structure around the black hole and form a mass, and this is how particles with central black holes are formed. Therefore, every particle contains a central gravity (a shelled black hole) at its core. Below picture is a schematic demonstration of Origamons set around a Shelled Black Hole at the center of a subatomic particle:



Structure of subatomic particle

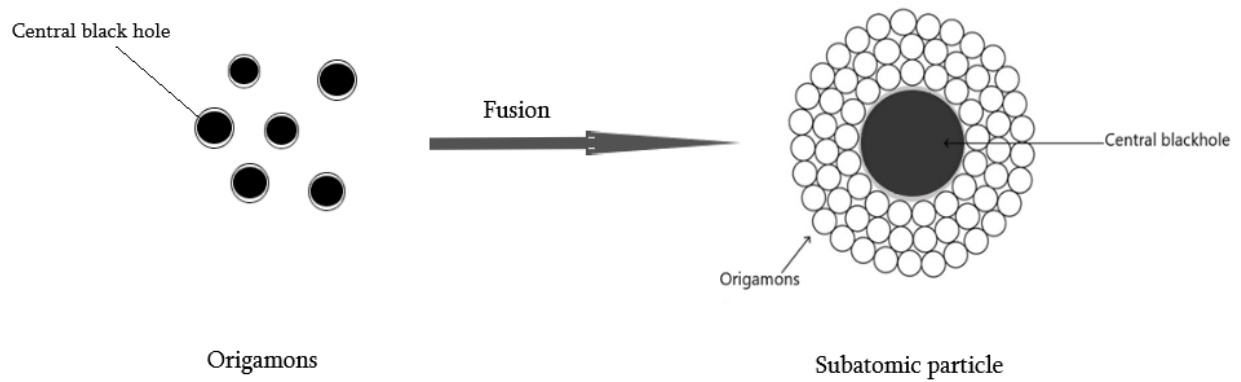
To summarize this chapter, unlike the conventional cosmology that believes black holes annihilate the universe and all physical equations break down inside a black hole, Origami Model suggests a clear picture of the black holes that play a crucial role in our universe and follow all the laws of classical physics. They generate all the gravity in our universe, they create and hold our galaxies together, they produce repulsive gravitational force that causes the expansion of universe (I will explain this type of gravity in Dark Energy chapter), they constantly convert neutrinos and larger particles and celestial bodies to high energy photons and release them into space, and they produce the Cosmic Rays and also the imperative energy that is responsible for the formation of the first stars after the Big Bang. Based on Origami theory, nothing enters the black holes, in fact, large amount of energy is released into universe by them. One of the mysteries in current model of Big Bang is the formation of first stars at 200 million to one billion years after the Big Bang. Physicists have been unable to find the source for such tremendous amount of gravity that formed the first stars and galaxies 12 billion years ago. However, Origami Model of universe clearly explains this. As I mentioned before, our universe

is growing inside a large black hole and in fact, every naked black hole in our own universe is a mother black hole for the baby universe inside it. When the universe reaches the event horizon of its mother black hole, its matter starts to convert to energy because by then all the particles will reach the speed of light, so for outside observers, the black hole with the universe exiting it will be observed as a burning massive star (red giants in our universe). This continues for a long time as a burning star until the entire mass of the exiting universe leaves the black hole. We will see in more details in future chapters that the first part of the exiting universe that comes out of the mother black hole is the antimatter part of that universe and the antimatter particles (antineutrinos) while exiting the black hole, they cause fusion of atoms and that's how red giants produce so much energy by nuclear fusion, and at the end when the matter part of exiting universe starts to exit the black hole, it will explode in a rapidly chain reaction that will be observed for outsiders as a supernova. After that the empty mother black hole will be left behind as a naked black hole in space. This means giant red stars are in fact smaller mother black holes with their universes exiting them and the end stage of exit manifests itself as a supernova. The larger the black hole, the longer it will take for the universe inside it to reach the exit stage. We will calculate the sizes of the naked black holes in our universe and their total number (which is equal to Avogadro number) and their exact distribution and based on this information we will calculate the time between the appearance of the first black holes at Big Bang and the explosion of the first stars producing the smallest black holes and we will see that it will exactly be at 200 million to one billion years after the Big Bang. The naked black holes in our space are the empty shells of hatched eggs that their newborn universes have joined our universe, pumping their energy into our universe. This explains the source of enormous energy that is responsible for formation of stars in our universe. Therefore, we see that black holes are virtually the only source of energy in our universe and everything happens by the gravity released by black holes. Unlike the current assumption that based on Hawking Radiation, black holes get smaller and hotter and finally disappear, which creates the paradox of information, Origami Model shows that black holes do not change size unless two of them merge into one bigger black hole. Contrary to the conventional model that is unable to explain why the frequency of supernovas is around 50 a year in our universe, based on the total number of the black holes in our universe that we can calculate in Origami Model, we will find their distribution and sizes, we will find the frequency of supernovas in our universe which will again match the observational findings.

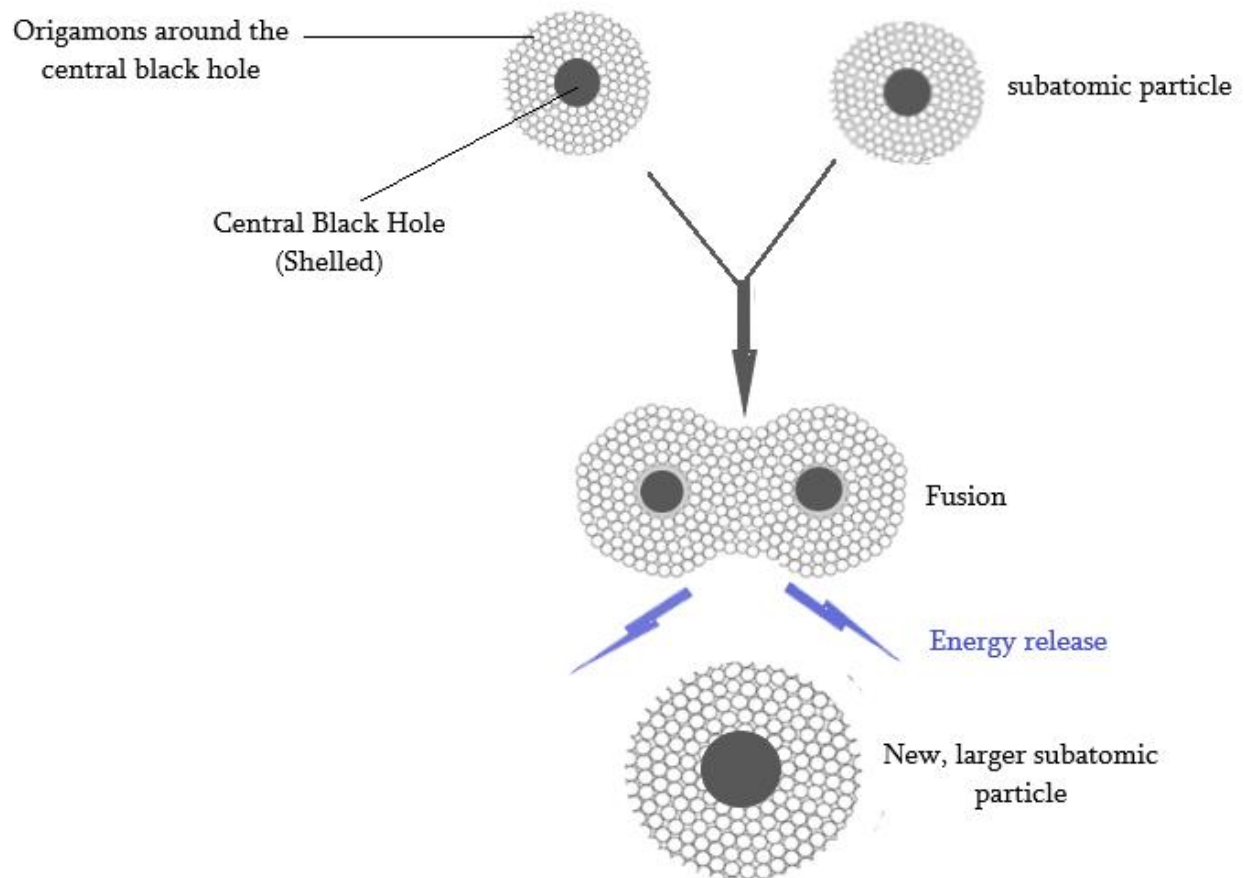
Structure of Matter

Origami Model of particles has major differences with Standard Model. We will see in future chapters that when Origamons get closer than a critical distance, Fusion Distance which is equal to Planck Length, they fuse with each other and produce larger particles. When two Origamons fuse, they act very similar to two black holes merging. In Origami Theory, black holes act exactly like tornados with vacuum core that sucks and twists everything and throws

them back into space. They in fact accelerate and energize the particles. Nothing ever enters a black hole.



Origami Model of subatomic particle formation



How larger composite particles such as nucleons are produced

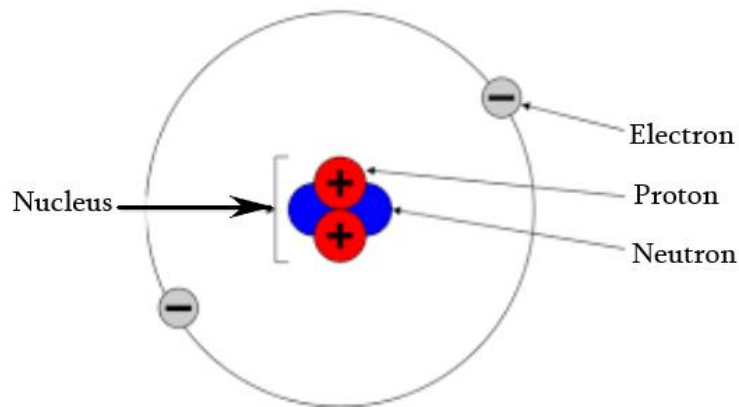
There are two major differences between Origami Model of particles with the Standard Model that create significant superiority for Origami Model :

- 1- In entire structure of Standard Model, the force of Gravity has not been mentioned or considered or included in any quantum interaction at all. Even the most passionate followers of this model have difficulty accepting that gravity has absolutely no effect in formation and operation of quantum world. Standard Model believes that particles interact only using three other forces to produce atoms and to function as they do. The reason for excluding gravity from the quantum world is because the mass of subatomic particles is so small that the gravitational force between them would be calculated extremely weak, unable to explain anything in quantum mechanics. But the root of this problem is somewhere else. The major flaw in the Standard Model is in its definition of elementary particles. According to the model, elementary particles are the smallest units of mass and they are not divisible, in other words, the elementary particles are made of an *infinitely dense matter* that is uniform and cannot be divided. The giant defect in the model is so clearly obvious: No matter can be infinitely dense, even the original mass at the Big Bang because infinitely dense is not defined. Because infinity is undefined any theory that contains or utilizes the term "Infinitely" is an outrageously incorrect theory. The simple English version of the definition of elementary particles in Standard Model would be: "Elementary particles are made of something undefined." How could someone call this a definition?

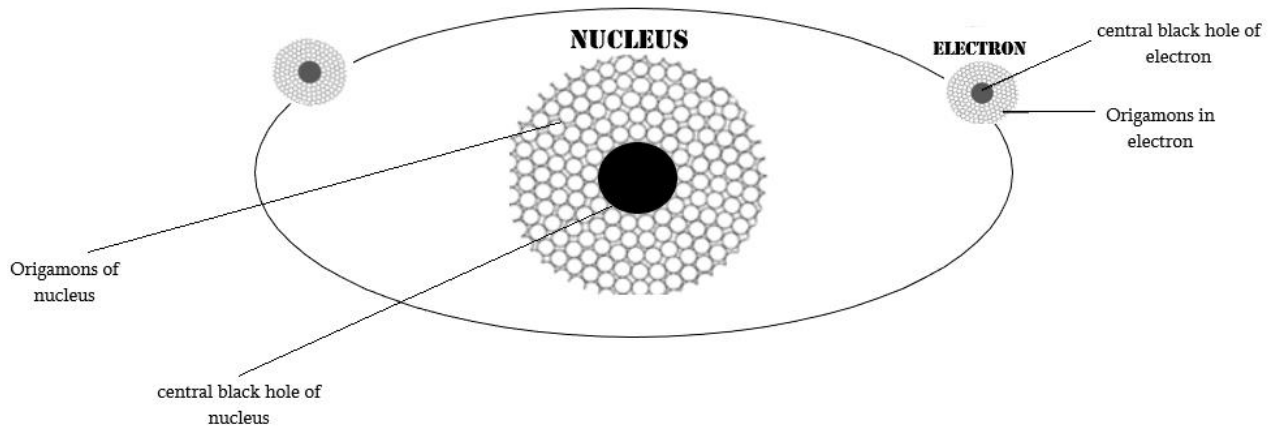
On the other hand, in Origami Theory, all subatomic particles are made of Origamons attached to one another by pure force of gravity. We will calculate the value of this force and we will clearly see that due to *extremely small distance* between the Origamons inside the particles, the force of gravity will be gigantic, even though the mass of Origamon is so small. This will not only explain the structure of the particles in much more convincing form, it also solves so many conflicts risen from the proposed structure in Standard Model. Therefore, no particle is solid and continuous in Origami Model because nothing can be infinitely dense. Even the Origamon is made of quantized data, as I explained earlier. This means, all particles, such as electrons and quarks are made of various collections of Origamons. This perfectly explains why our latest observations have shown that very close to every electron is a dense cloud of photons (Origamns) which are constantly being emitted and reabsorbed by the electron. We will see how this clearly explains how electromagnetic force is created.

- 2- Larger, composite particles in Standard Model are made of extremely small elementary particles held together by Strong and Weak Nuclear forces. There are again multiple paradoxes in this model. For example, Spin Problem asks how could proton has a spin if it is made of multiple smaller particles that each one has its own spin? What is the true nature of Strong Nuclear Force and Weak Nuclear Force that do not exist anywhere else other than inside the nucleus of atom and while they are extraordinarily powerful how could they have a radius as little as Planck length, while gravity with such weak strength has infinite range? Another conflict is that the nucleus of Helium atom has two protons and two neutrons but its radius is almost the same as the radius of one proton! This is not happening only in the nucleus of helium; it is actually the case in every nucleus. There are also several conflicts about the nature of Weak Nuclear Force because it violates P Symmetry and C Symmetry and also has Hierarchy problem. We will explain

all these in details in future chapters. However, Origami Theory's model overcomes all these conflicts. According to Origami Model, all subatomic particles including the composite ones and also the nucleus of atom and any mass less than Planck Mass $2.18 \times 10^{-8} kg$, is produced by fusion of Origamons into one larger mass that contains one central black hole (shelled black hole) at its core. This central black hole is what produces the gravity of the mass. We will calculate in future chapters that the reason for this fusion and union of Origamons is the short distance between the Origamons inside these particles that is less than Fusion Distance. As a result, the produced mass has a very small radius, it is stable, and its mass is slightly less than the sum of all smaller Origamons used in its structure because when Origamons fuse, some of them will be released and observed as released energy. The only force holding the Origamons together inside all these particles is just gravity and nothing else. Below picture is a schematic demonstration of Standard Model of an atom (helium) and comparing it with Origami Model. In the Standard Model, the radius of nucleus must be very large because it contains numerous massive protons and neutrons but observations shows that nucleus of atom is almost as small as only one proton and this has been a major paradox in quantum mechanics. However, Origami Model shows that all the protons and neutrons inside the nucleus fuse together by the gravity and form one heavy particle with one central black hole and large number of Origamons around it and this is why nucleus is so stable and hard to divide, and this is why nucleus has a definitive spin, because it is one single particle. This is not just an assumption; in fact, we will conclude the fusion of nucleus in further chapters when we explain the Fusion Distance and Separation Distance of Origamons.



Current model of Helium atom



Origami Model of Helium atom

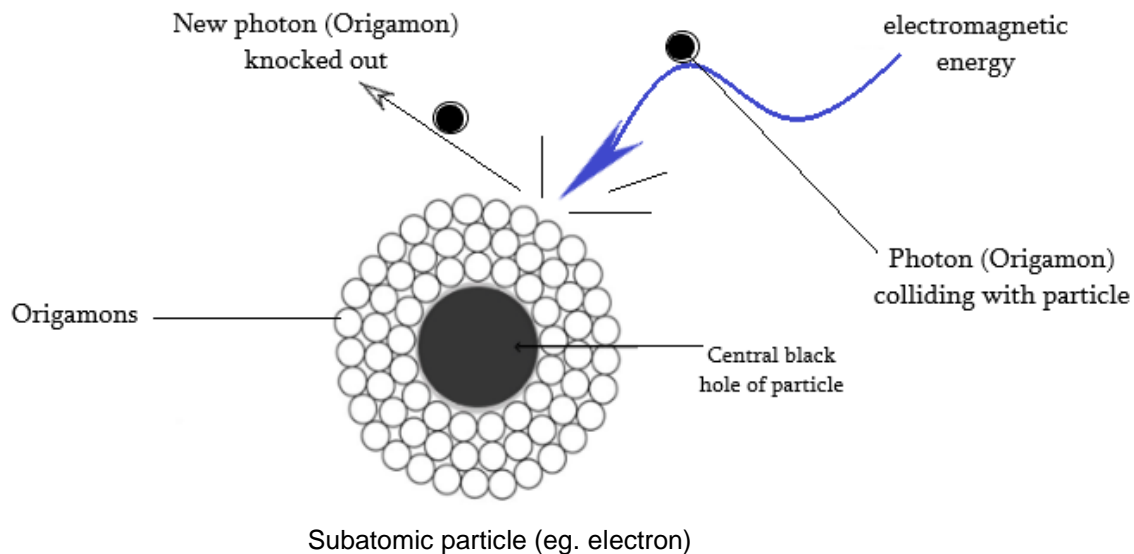
The Origami Model of atom not only solves the mystery of the small radius of nucleus and its spin, it also explains why some heavy elements become radioactive and it extracts an extraordinary, universal equation that predicts when an atom reaches the stage to explode; the same equation will apply to stars and successfully predicts when a star reaches the final stage of its life and turns into a supernova.

There is multiple more conflicts in Standard Model that cannot be properly explained based on the proposed structure of subatomic particles and we will go into the deepest details of these problems in future chapters. For example, anytime there is energy given to the atoms, they produce light with various frequencies depending on the intensity of the energy. To explain the mechanism of this event, physicists have had no choice but accepting that *somehow* the electromagnetic force pushes the electron to a higher state of energy and when the electron returns to its previous level, the received energy is released as photons. But this explanation does not describe *how* electron receives the energy and how it converts the energy to photons and releases it back to space. Because there is no proper definition for energy, force or mass, the model is incapable of describing such conversions between mass and energy. We see this over and over in various parts of today's physics. Based on the Einstein's famous equation mass can convert to energy:

$$E = MC^2$$

But when mass is a completely different entity from energy, how could these two converts to each other? No one has ever been able to propose a unifying model that includes all aspects of matter. However, Origami Model suggests and demonstrates mathematically that mass and energy and even space are all effects of time. In fact, when mass and energy can convert to each other, it means clearly, they must be made of the same entity, but in different structure. Origami Model shows that every mass in universe is made of Origamons, and Origamons are in fact what we know as photons. This means, mass is collection of photons and this is why when electromagnetic force contacts the mass, the photons collide with the photons in structure of the particles (electrons) and they knock out photons from them. This is exactly why a hot metal object generates light. And as I explained previously, what we call frequency, is in fact the number of photons across each other in each Shot of time (in one Planck Time). This explains why the more energy applied to the atom, the higher the frequency of the light produced by the atom, because stronger electromagnetic force is by definition higher frequency of

electromagnetic waves, so it means it contains a greater number of photons per unit of time and so more number of photons (Origamons) per time will be knocked out of the subatomic particles in the mass. When everything is made of photons, everything can convert to photons. Below picture demonstrates this phenomenon clearly:



How energized particles release photons

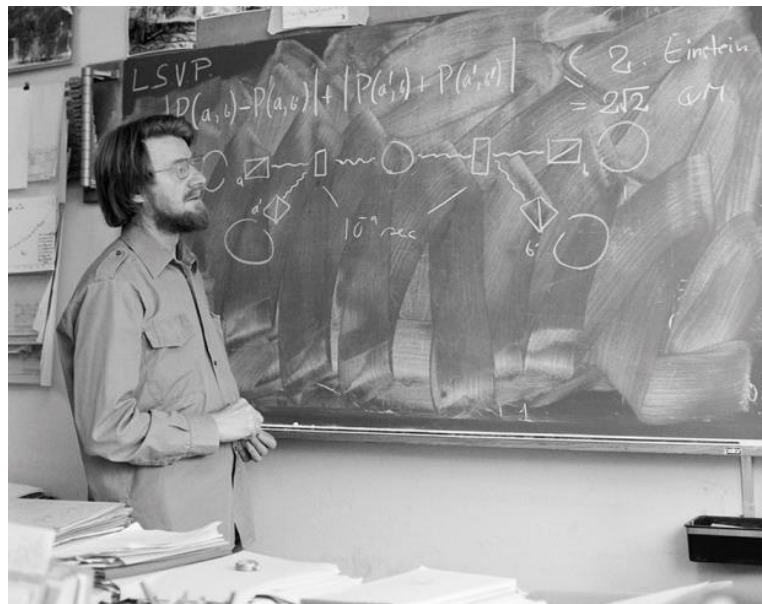
As we see, unlike the Standard Model that has to create new forces and new phenomena and invent imaginary characteristics for particles in order to overcome its multiple conflicts and by each new definition, bumps into a new difficulty, Origami Model is a simple, transparent and uniform model that has only one fundamental particle of Origamon and one fundamental force of gravity and it is capable of mathematically as well as logically explain all features of our universe and so predict its future course with incredible precision. Unlike the conventional solutions, Origami equations explain quantum phenomena as well as cosmological events.

Predetermined Universe

I mentioned that real speed of time is close to ten times faster than speed of light, but apparent speed of time is equal to speed of light and that is why when a particle travels as fast as speed of light, time stops for it. But what is the real implication of real speed of time being faster than speed of light?

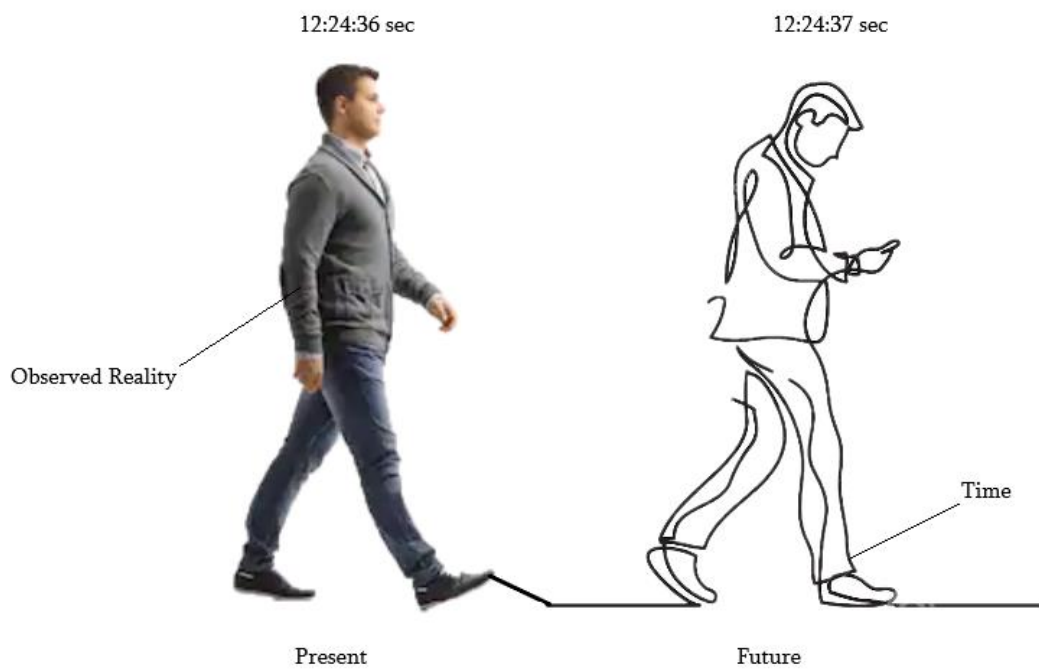
The phenomenon of quantum entanglement has been so perplexing that even Einstein kept denying it, "It's too spooky to be true." But after working hard for decades, eventually a Northern Irish physicist formed a sophisticated experiment that finally approved quantum entanglement beyond any doubt. John Bell in 1964 demonstrated that two subatomic particles can

communicate instantly at very large distance. This produced so much conflict again in Standard Model because the speed of this mysterious communication between the two entangled particles was faster than speed of light, apparently defying the concept of locality. Also, John Bell realized that based on the statistics he used to prove the quantum entanglement, it seems that the next location or momentum of a particle is somehow decided, independent of present events. As John Bell himself put it, this simply means that our universe is predetermined! But that is an absolutely insane finding! It seems that it is not only the locality that is defied, the causality is denied too! So, we are left in a model of universe that nothing makes any sense in it. This has created a major paradox in our modern physics till now and there has been no convincing solution to it. However, Origami Theory, can simply and elegantly explain this without violating the fundamental laws of physics.



John Bell, the physicist who proved quantum entanglement in 1964

I explained that everything in our universe is produced by an Origami of time. Therefore, when time moves forward faster than light, it creates the existence and later when light reaches that point, the reality is born. In a better description, time recombines its Digits, produces new data, moves forward, and then gravity joins it to create the mass or information that we know as reality. Existence is independent of observer (Object Permanence) but reality is dependent of observer. This means that time proliferates, creates the existence, but until gravity is joined to produce Origamons (light), reality is not produced. This means that because speed of time is faster than speed of light, there is always a Reality Lag in our universe. Below picture is a schematic version of this complex phenomenon and helps us to comprehend it:



Observed reality at 12:24 and 36 seconds



Observed reality at 12:24 and 37 seconds

As you can see the time has already created the next step of the man and he just moves into it. This means that we are always living in the past and what we try to comprehend about the present, is not real. *Our universe is always a pie squared behind time.* Therefore, we have no real choice in our lives and whatever we do is already determined. Note that this is a purely physical finding and has nothing to do with faith or philosophy.

We will see in the next chapter that as time progresses, our universe will exit the Mother Black Hole, we will enter a new Universe Stage where speed of gravity combining with time (speed of light) will get closer to speed of time and then we go another stage and another one and another one and eventually in 36×10^{69} seconds, the speed of light will be equal to speed of time and gets ahead of it. This means that we will finally (not in our current universe) reach a stage in our growth that we will truly live in present and we will virtually exit the time dimension and we will be timeless, living in pure gravity and at that stage we will have true choice and we will be able to alter the course of time and universe. This is why, Origami Model is able to propose what the purpose of life is: *The reason that we are here is to develop enough intelligence to enable us to rule and save the cosmos.*

Course of The Universe

John Bell's experiment to prove quantum entanglement is a milestone in our understanding the reality. Einstein opened a whole new door to our understanding of the world but with the knowledge at his time, there was no possibility for him to somehow discover the mechanism of quantum entanglement. This mind-blowing phenomenon is actually pointed at something, not spooky, but so crucial in our universe. Quantum entanglement demonstrates that Origami Theory's suggestion that time is faster than light is absolutely correct. What is hidden in quantum entanglement is the *Direction* of universe.

When world is predetermined, it cannot be random. The very definition of random is: "occurring without definite aim, reason, or pattern." Randomness of an event requires lack of direction. On the contrary, we see that time has velocity and when it combines with gravity it will have direction. This is a major scientific finding. The determinateness of universe must not surprise us because the very existence of laws of physics rules out the randomness of universe. The fact that every two particles attract each other (gravity) simply means that every particle, follows a cosmic law of gravity, in other words, every particle has a cosmic reason. If world was random, there would have been no gravity and particles sometimes would attract each other and another time they would repel each other without any predictability. So, no particle would have been produced in first place. In July 1969 Apollo 11 was fired to sky and exactly 6165 minutes later it landed smoothly on the surface of the moon 384400 kilometers away and then it flew back to earth with the astronauts intact inside it. If our universe had even 0.000001% randomness, we would have never been able to conduct such sophisticated mission with such confidence, only based on mathematics and numbers on the paper. We accomplished Apollo 11 with such success because our world is a perfect mathematical structure that can be precisely predicted.

I showed that time is nothing but data, and data is product of intelligence. Anytime a scientist tries to deny the concept of Intelligent Design, it really surprises me because accepting the existence of a designer has nothing to do with religion, ignorance or superstition, it has only to do with intelligence. When we believe in Laws of Physics, and we know that without these laws there would be no science, then how can we consider randomness? A city is either run by laws that are developed by an intelligent ruler, or it is chaotic and lawless which won't stay as a city for long. For any intelligent mind, every physicist, from Archimedes till Richard Feynman who have presented the eternal equations to decode our universe, is a prophet. Every fundamental equation in physics, is a holy scripture. We simplified the world as far as possible, bringing it down to only two entities of Time and Gravity, but we still see that they have specific properties and they possess unalterable features. This is why Origami Model clearly demonstrates that universe is perfectly designed just like an intelligent mathematical show that is proceeding towards a final stage. Origami Model demonstrates mathematically that in the same way we produce robots with artificial intelligence, an extremely intelligent designer has manufactured our universe so we will grow and reach the final level of intelligence and capability in order to *help* Him. I say "Him", because if we look around us, all we see is war, famine, disease, discrimination, tyranny and poverty; such terrible resume cannot belong to a woman! Only a male can create such chaotic world! If our world was made by a woman, there would be fairness, justice, art and peace everywhere, plus three billion men in jail! But why He would need our help? The answer is in the structure of our universe. We saw that our world is quantized, so it is far from a perfect analog world. This demonstrates that His precision is restricted, so He is not perfect. But compared to us, He is much larger, faster and smarter. In

the last chapter of the paper, we will calculate exactly why and how much He is larger than our present size (space is manifestation of time so we are virtually growing in size), faster than our present speed (due to acceleration of time) and smarter than our present intelligence (because as time progresses, intelligence grows parallel to Recombination of data).

We discussed that we are inside a Mother Black Hole. In fact, every Naked Black Hole in space at some stage in the past had contained a universe. To find if this is correct, we have to find a way to calculate the total amount of time in cosmos.

The concept of Proton Decay has been a wonderful argument in quantum mechanics and when it was finally proved, it created another crack in the glass house of Standard Model. According to Standard Model, elementary particles like protons are solid, uniform and impossible to decay but several experiments proved that they do decay. Origami Model on the other hand, shows that all the elementary particles are made of Origamons (photons) so they can go through decay and they do. We will calculate a precise equation that based on quantum tunneling gives us the exact duration for any particle or even any star to decay. Unlike Standard Model that has the domain restricted to particles, Origami Model produces equations that apply to anything in universe regardless of their size because it is based on a uniform pattern. From particles and atoms to stars and galaxies and the entire universe and parallel universes, they are all designed in the same fashion by the spiral progression of time and combining with gravity. The equation will demonstrate that the smaller the radius of the particle, the longer the decay time will take and so the last particle to decay in cosmos is the fundamental particle that is the Origamon. By solving the equation for Origamon's mass and radius we will calculate that decay time for Origamon is 3.6×10^{64} seconds. Then I will show that due to the ratio of Real Time to Apparent Time, the Real decay Time will be 36×10^{69} seconds.

The alternative way to find the entire age of the cosmos or entire amount of time available is to consider the reduction of Planck Time duration based on the Gravitational Constant. I showed already that in our universe Plank length and Planck Time change but Planck Constant is fixed all the time and rate of time as I explained before is based on Fibonacci Sequence in which every Digit increases with ratio of $\varphi = 1.61$. This means to find the total time we can use the following equation:

$$T = \varphi \left(\frac{10}{h} \right)^2$$

T: total time of cosmos

φ : 1.61

h: Planck Constant

$$T = 1.61 \times \left(\frac{10}{6.62 \times 10^{-34}} \right)^2$$

$$T = 36 \times 10^{69} s$$

Also based on the total life of our own universe we can use the following equation (I will show how we extract the equation in future chapters) to find the total life of the cosmos:

$$T = t^4$$

T: The total time in cosmos

t : Age of our universe

$$T = (4.36 \times 10^{17})^4 = 36 \times 10^{69}s$$

Note that size of Origamons stays constant throughout the cosmos. Therefore, all my calculations show that the total life of cosmos is 36×10^{69} seconds. This is a mind-blowing number again because of multiple reasons: Firstly, this number tells us how much the value of total time in cosmos is. In other words, the total amount of time to create our cosmos is 36×10^{69} seconds. On the other hand, as I explained earlier every Shot in our universe at Big Bang contained 6×10^{23} Bits (Origamons) but its capacity is constantly reducing. By calculating the total Bits based the total time of 36×10^{69} seconds, we will calculate the total amount of Bits and we find that the package capacity will reduce in every universe. In other words, the Avogadro number in the next universe will be less than Avogadro Number in our universe. As I explained earlier, by considering the acceleration of time in our universe which is $G = 6.67 \times 10^{-11}$ we will calculate that in 700 million years we will reach the event horizon of our Mother Black Hole and enter the next stage of universe growth. But considering the total Bits of cosmos, this cannot be the end of the growth, there will be still so much time left. Based on this, we will calculate that in the next universe, the Avogadro Number will be 5×10^{19} . So, it will not be Avogadro Number anymore and as I explained before, this is in fact the rate of dequantization, rate of reduction in granularity and enhancement of precision. Therefore, the best term for this number which is a constant for each universe is the Cosmic Quantization Coefficient, CQC. Because each universe is virtually a stage of growth, we should call the transition from one universe to next, a Leap. Note that CQC in each universe is also equal to the maximum number of Origamons (maximum frequency/intensity of light) for the Shots in that universe, and also the total number of black holes in that universe and also the total number of parallel universes in that universe.

First universe: Ignition, Heptaverse: $CQC = 7 \times 10^{27}$

Second universe: Excitation, Hexaverse: our current universe: $CQC = 6 \times 10^{23}$

Third universe: Ambition, Pentaverse, $CQC = 5 \times 10^{19}$

Forth universe: Orientation, Tetraverse, $CQC = 4 \times 10^{14}$

Fifth universe: Maturation, Trioverse, $CQC = 3 \times 10^9$

Sixth universe: Ultimation, Dioverse, $CQC = 2 \times 10^4$

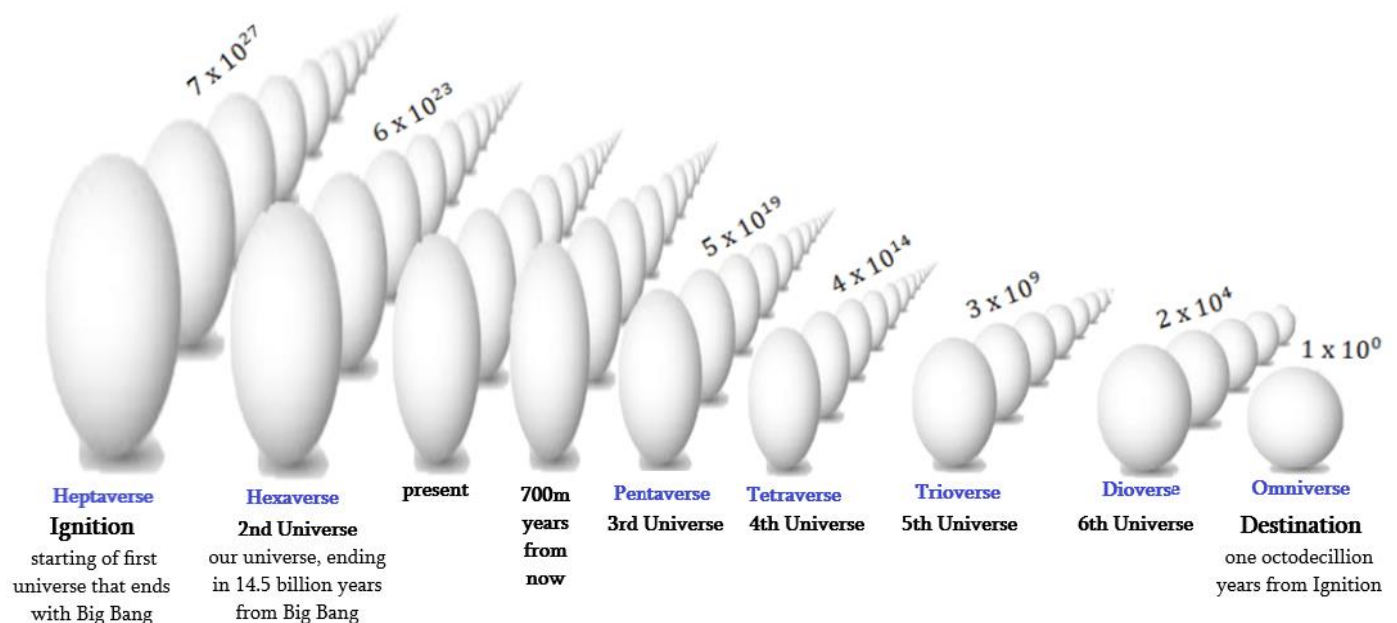
Seventh universe: Destination, Omniverse, $CQC = 1 \times 10^0$

As I explained before, the maximum number of Origamons that can be placed in one Shot, is the same as the Cosmic Quantization Coefficient and if we call the multiple particles placed in the same Shot, **Quantum Entrapment**, then we can conclude that CQC is always directly proportional to Quantum Entrapment.

Quantum Entrapment is the number of particles that exist at the same Planck Time.

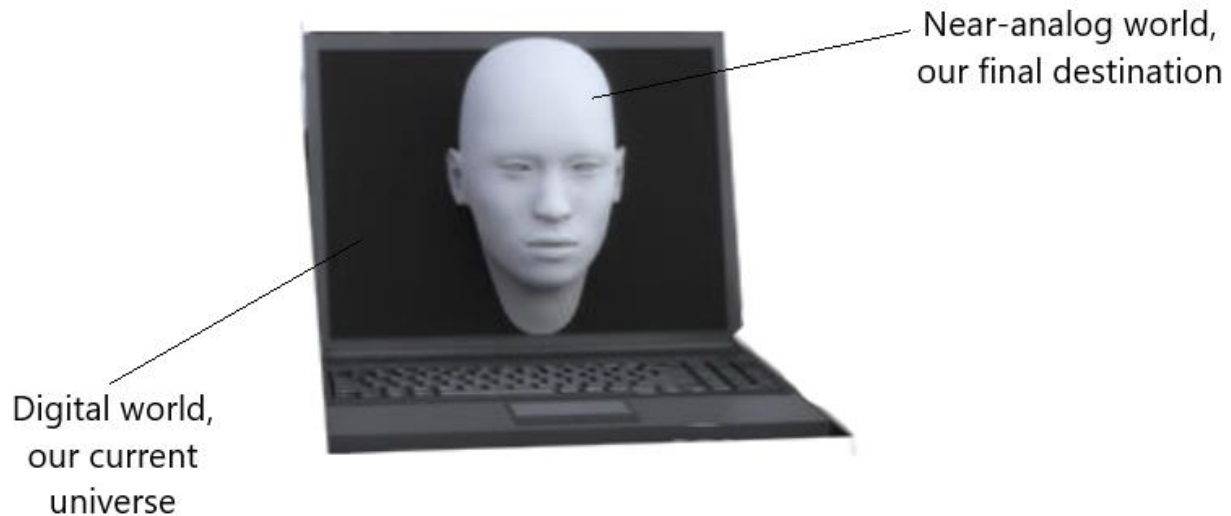
This is the Quantum Entrapment that creates the frequency for a particle and also produces the illusion of wave effect and interference for the particles.

Now, we can see that based on the total time of 36×10^{69} seconds, we find out there has to be seven universes in total, our universe is not the first but the second universe, there will be 2.2×10^{18} seconds Apparent Time left (five more universes) to reach the final stage and also, we realize that inside each and universe there are CQC number of Miniverses (the same as the number of naked black holes in that universe). Therefore, in our own universe there are 6×10^{23} black holes and the same number of Miniverses or parallel universes. This also shows that each universe is smaller and shorter than previous one. As quantization reduces in every stage of universe, the procession towards an ultimate near-analog universe will be achieved. With the same facts and findings, we will conclude that the radius of a naked black hole determines the G (gravitational Constant or acceleration of time) for the universe inside it. We will see in future chapters that Gravitational Constant in our universe is 6.67×10^{-11} because the radius of our Mother Black Hole is 4.5×10^{26} meters. So, it is the size of the black hole that determines everything for the universe. Interestingly, in 1996 scientists believed there were only around 10^{12} black holes in space. In 2005 based on more accurate and advanced observations they agreed that the total number of black holes must be more than 10^{18} and just last month a new finding showed that the real number of black holes in our universe is still much higher and Dr Ziri Younsi the winner of the Breakthrough Prize of 2020 who had a crucial role in Even Horizon Telescope Project to catch the first real photograph of Sagittarius A in 2019, stated that by the new techniques will enable us to soon discover much more black holes that have stayed invisible till now. This is going very much towards the prediction that Origami Model has done based on pure mathematics and facts in our universe. Below picture demonstrates the seven stages of cosmos:



Reduction of number of Origamons in each Shot from the beginning of time till the Destination of cosmos

The final conclusion is so amazing: There is seven universes in cosmos, our universe is the second one, we will go through five more stages and when we reach the seventh stage, we will be at our final phase in terms of our speed, intelligence and size. This is when we will become faster than speed of time and therefore, we will have true choice to alter the universe around us. This technically means that we will exit the cosmos. We will leave time. We will meet the Designer. Just like when a character in a computer game is given so much artificial intelligence that it virtually exits the digital world and steps into our world. When a robot become physically indistinguishable from a human being.



As I explained before, the current illusion of parallel universes is due to the multiple particles existing at the same time at each Planck Time that creates a wave effect or interference and has given rise to the concept of superposition and many universes flowing at the same time parallel to each other so that a particle can be in many of them at the same moment. This is totally incorrect and every single particle only exists for less than a Planck Time.

Entropy

The definition of entropy in statistical mechanics is as the following:

“Entropy is the statistical expression (number) of different configurations that a system defined by macroscopic variables could assume.”

In a simpler English, entropy expresses the number of microscopic configurations (microstates) in a material. Based on the laws of thermodynamics, the entropy of any system always progresses naturally towards reduction. However, this definition has been challenged by numerous conflicts and paradoxes, as well as lack of defining mechanism responsible for it. In other words, there are significant cases that defy this definition of entropy and also, we do not know why everything in our universe tends to follow the course of entropy. Science has shown many cases when entropy of a system has been diminishing. For example, the entire evolution process in living creatures and inside every cell, the entropy is constantly reducing. From a

single atom towards a well-organized cell and again from one single cell towards a sophisticated human being, throughout the process of evolution which has been operating based on absolutely random physical functions, we witness entropy constantly reducing. To resolve such issues, the new concepts such as “local entropy” have been introduced. Again, when it comes to the concept of temperature, we have to introduce the counterintuitive notion of “negative temperature” for systems with high energy and low temperature to justify the definition, but again we are faced with further conflicts such as negative infinite temperature and minus zero temperature that nobody can ever describe! In our current thermodynamics scaling, we go from temperatures such as +200 Kelvin to -200 Kelvin without ever reaching zero Kelvin! Something is obviously not right here, either our mathematics or our physics.

According to Origami Theory, our universe is a digital structure made of discrete and discontinuous data. The entire universe is only composed of two bits of time (1) and Gravity (0). The combination of these bits produces a fundamental byte that is called the Origamon (photon).

Time as the main bit of this structure, is made of datum of digits in sequence. Each datum has a meaning but it has no effect unless it meets the opposite datum, Gravity. Therefore, our universe is a binary system of data. Our knowledge of universe, including simple perception or complex science, is in fact metadata (data about the data). Contrary to the universe that is discontinuous and quantized and therefore digital, our awareness of the universe that we know as consciousness, is continuous and uniform. The outside world is discontinuous but its perceptive effect is continuous. The physical world is a binary digital system, but the consciousness is singular analog information. World is data, science is metadata, consciousness is epidata. This is when data is *around* the information, metadata is *about* the information and epidata is *above* the information. Note that in computer science, data is a piece of code while information is the translation of that code, and in Origami Model we take the data as a unit of time, but the information as unit of mass. Since beginning of time, our science has been increasing, but our consciousness is constant. If we consider time (datum) to be the frames on a roll of film, the entity that fills the gaps between the frames, unites the shots and converts a heterogenous animation to a uniform reality for us is the consciousness. To simplify the comprehension, we can say that world is information, consciousness is the effect of the information. Therefore, *anything with gravity in it, has consciousness*. In the following picture, there are rocks thrown at a wall, and each rock leaves a dent or a mark on the wall. Everything in our universe acts like the rocks, and the consciousness is the collection of the permanent marks they leave on the wall. The rocks will change and will annihilate but their effect will stay forever.



Throwing dust and rocks apparently randomly



The effect will emerge as the final goal

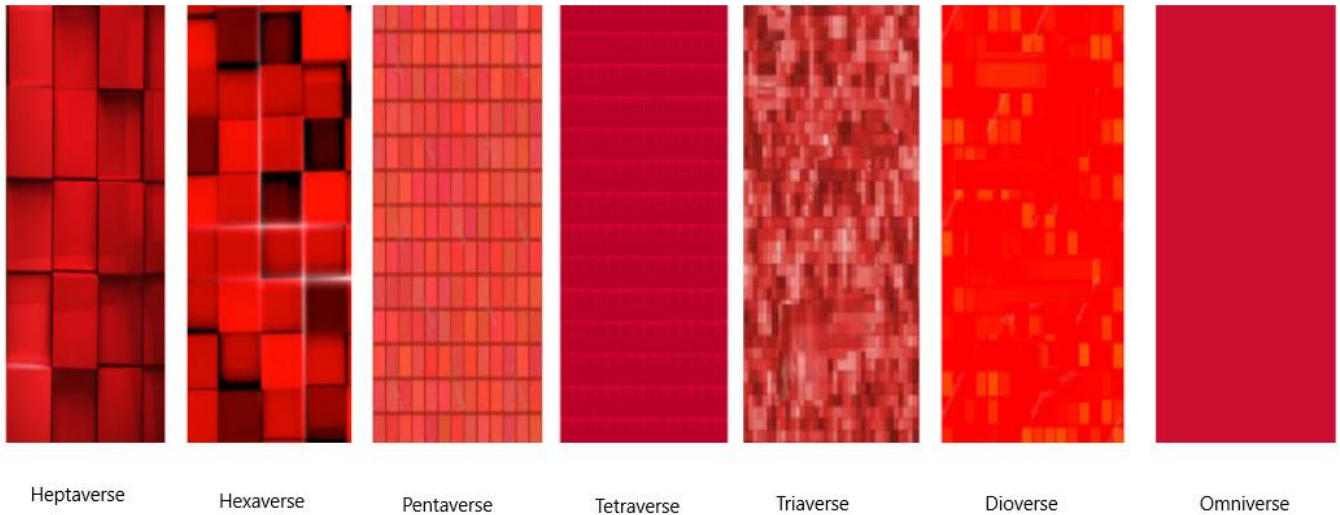
Consciousness is the effect that mass leaves in gravity. This effect is analog and continuous and permanent. I will go to more detail about this subject in the Gravity chapter at the end of this part of paper.

As the time progresses, the size of Shots reduces because the opposition of gravity on progression of time reduces. Therefore, the maximum number of Origamons (Bytes) in each Shot reduces. This translates to less energy in light and more distribution of matter. This is exactly why we have observed that all matter in universe moves towards less energy and more irregularity, in other words, more entropy. We have no convincing proposed cause for observed entropy in modern physics. However, as we see clearly, Origami Theory's immediate upshot creates the most convincing mechanism for what we know as entropy. In other words, Time progresses towards maximum entropy because density of Gravity is reducing. Near a mass, gravity increases the size of Shots, which is observed as deceleration of time. The effect of deceleration of time in observer, is the acceleration of traveler approaching the mass (the gravitational attraction). Without gravity, Shots of time will stay the same size, which means time will not slow down, so no mass effect will be generated. Mass is a piece of information produced by the combination of bits of time and gravity.

Origami Model suggests that interaction between the bits of time and gravity, progresses the universe towards less Granularity. The difference between the actual analog value and the digital representation of it, is the quantization error of universe. For example, when doctor asks you to assign a number between 0 to 10 to describe the severity of your pain, he is trying to digitalize, quantize your analog pain. If the actual temperature is 68.7356438127634422 degrees but your thermometer can only read it in two digits, the quantization error is 0.7356438127634422. The smaller the Shots, the smaller the quantization error, the closer to analog quality. If we call the quantization error in our world, the Granularity, it means that:

Our universe progresses towards minimum granularity.

Below picture demonstrates this effect by comparing the Shots in progression of universes from Ignition time till the end of Cosmos in 36×10^{69} seconds:



Reduction in granularity by diminishing the size of Shots

The progress of the universe towards less granularity is due to the reduction of concentrated gravity which opposes the progression of time. This means that everything, including human beings are voluntarily and involuntarily are progressing towards maximum analog quality. We are constantly trying to develop more precise devices, reducing the gap between the bytes of data, reducing the *error*, reaching the final continuous state. Twenty years ago, our best digital camera had 1.2 pixels, now the cheapest cameras have 12 pixels precision. The entire universe is developing towards higher resolution, more clarity. The correct definition of entropy in Origami Model is:

Entropy is the progression towards dequantization.

According to Origami Theory, progression of time translates to more universe, more mass, which means the density of universe stays constant despite its expansion which is supported by observations. Therefore, unlike the conventional view of expansion of universe, Origami Model believes in growth of universe. Thus, the total amount of mass is constantly increasing. Then how is the progression towards less mass and more energy is going to be finalized? We will calculate in future chapters that as universe grows, the velocity of stars towards the edge of universe increases, which is again supported by our observations. This will eventually bring the masses near the speed of light and in 700 million years when the outer parts of universe reach the edge of the surrounding gravity (vacuum), the matter will convert to energy and will be released as light into the next universe. This will be perceived as a supernova in that Mother Universe.

To conclude this chapter, I may say our cosmos starts at Ignition point when there were 7×10^{27} Origamons in each Shot of time, which means the frequency of light would have been $7 \times 10^{27} \text{ Hz}$, much higher than what it is now. We know that kinetic energy of photon (Origamon) is calculated by multiplication of frequency by Planck Constant: $E = f \times h$, so at Ignition point of cosmos, the light had its maximum energy because it had the highest frequency. In our universe, at Big Bang, the number of Origamons in each Shot was 6×10^{23} , and now it is

9×10^{20} , so as I explained before, the energy of light is reducing, as the Origamons get distributed into more and more smaller Shots, so the irregularity is increasing and photons are getting scattered throughout the expanding universe. This will continue until at the final universe, the 7th world, each Shot will have only one Origamon in it, so the frequency of light will be 1, bringing the kinetic energy of photons to its minimum level. If we call the placement of multiple particles in same Shot, **Quantum Entrapment**, we can then state that as time progresses the Quantum Entrapment reduces. This is exactly what we have been observing as entropy causing less energy and more irregularity. This explains why reduction of energy is parallel to the level of disorder. However, there is a major difference between how Origami Model sees entropy and how conventional physics defines it: Based on Origami Model the entire cosmos keeps its order constantly and while distribution of photons causes less density of them, but there is no actual increase in disorder of universe.

Spin and Speed

I explained before that time, exactly like the data in our imagination, proliferates itself by mixing existing data and producing new combinations. Therefore, there will always be some data repeated in new combinations and this is exactly why the Recombination of data has a spiral pattern of Fibonacci Sequence because in Fibonacci numbers, each new value is produced by adding of the previous ones. Let's look at these numbers again:

1, 2, 3, 5, 8, 13

Now we can rewrite the numbers in this way:

1

1+1

1+ 1 + 1

1+ 1+ 1 + 1 + 1

1+ 1+ 1 + 1 + 1 + 1 + 1

1+ 1+ 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1

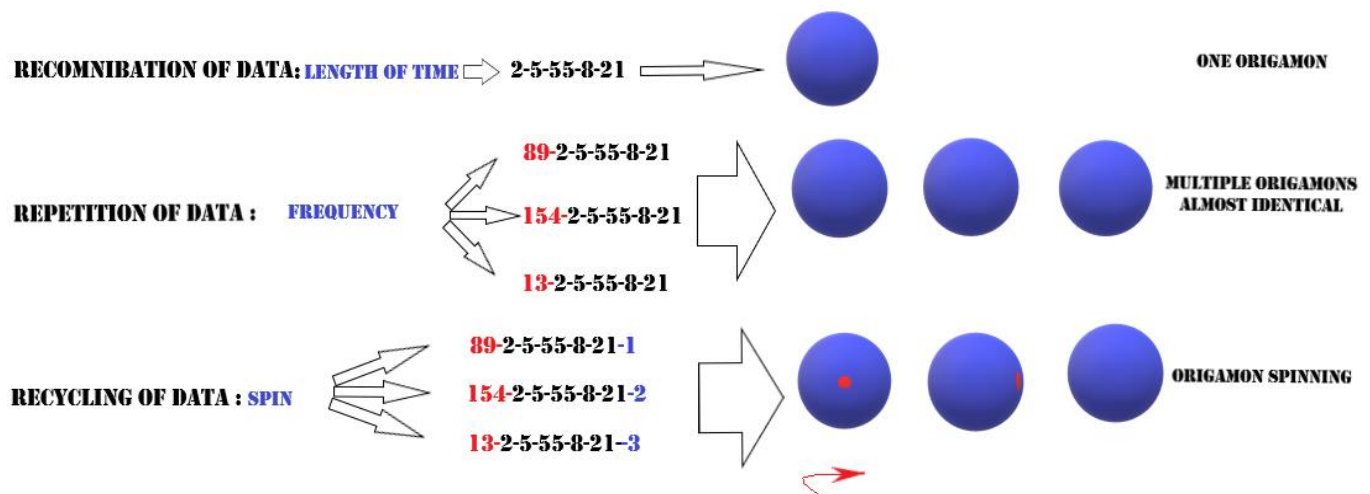
Now we can clearly see how the same Digit repeats itself. That's why I started by saying that Digit is only 1. And the other entity is Gravity which act as the zero. Checking the ratio of growing the value of data shows that each number is 1.61 times bigger than the previous one. The ratio of 1.61 is also called the Golden Ratio and it is denoted by phi: φ . Therefore, the progression of time creates a spiral pattern in our entire universe, a rotational effect. This Revolution is responsible for spin of all particles. The Revolution of time is in all directions, which means it revolves *statically* and *dynamically*. The static revolution is what we know as Spin and the dynamic revolution is what we call Movement or Rotation.

I already explained that the Recombination of time produces the length of time or the traveling of time and the rate of recombination per unit of time is the speed of time. Now we need to note that this recombination has two features:

- 1- The **Repetition** of data inside one Planck Time (one Shot) that creates the Frequency of particle;

2- The **Recycling** of data that creates the Spin of the particle.

The following demonstration illustrates the two phenomena of recycling and repetition of the codes of data. As you can see when the same data (sequence of Digits) is repeated it produces almost identical Origamons inside one Shot which we know as the frequency of Origamon (light). But when Digits are mixed and come out in different order, recycling, different Origamons will appear in sequential Shots and this is how we observe the same Origamon spinning. Note that it is never the same Origamon, either in repetition or recycling, but a new Origamon that we observe but the way the code evolves produces the effects of frequency and spin for the observer.



How various data features create frequency and spin for Origamon

In above picture, there are three types of data (digits). The black digits are the *Core Data*, the data that creates the mass of the particle, the red digits at the beginning of data, that are random and have no order and produce various copies (almost identical) of the same particle inside the same Planck Time (Shot), and finally the terminal blue digits that are the ending digits and they have *order* next to each other, they are always in Fibonacci Sequence, so their rate to each other is equal to $\varphi = 1.61$ and they repeat after each Planck Time (each Shot), so these are the Recycling Data that produce the spin effect. So, they will be something like this: 5 then 8 then 13 then 21, and repeat the same sequence again 5, 8, 13, 21. Note that frequency of a particle is repetition of same particle in the same shot but spin is due to the orderly recycling of data in sequential Shots because we do not observe the spin in only one Planck Time. The orderly sequence of Recycling Data introduces a totally new feature to our universe: *Direction*. The Core Data of a particle defines that particle's mass and the other two types (Repetition Data and Recycling Data) are categorized as *Collateral Data* that define the frequency and spin of the particle. Spin and mass of a particle are constant but frequency of a particle has a maximum possible and a minimum possible limit that are both reducing as time accelerates in one universe and they keep reducing in every next universe. We saw already that maximum frequency of Origamon (light) for our universe was at its Big Bang and it was equal to Avogadro Number. The reduction of frequency as I explained before is due to reduction of the capacity of Shots or in other words due to the shrinkage of Planck Time. Note that between the maximum

and the minimum, the frequency of a particle depends on the energy that is carrying: the more energy in a particle the higher the frequency which means the larger number of particles in the same Planck Time (Shot). This is why a higher frequency light has more energy. The concept of frequency is completely incorrect in Standard Model because it is based on the repetition of same particle while no mass or event every repeat itself in universe and what we perceive as frequency is in fact the multiple number of almost the same particles that are traveling in one Shot (all jam packed in one Planck Time) so they all affect the environment at the same time creating an added effect. This explains why when we apply energy to photons they do not travel faster, but their frequency increases, bigger number of them get entangled and fit into the same Planck Time (same Shot of data).

Note that repetition is only partial and it is never absolute, which means there is never two identical particles in our universe and unlike what Standard Model suggests, no two photons can ever be identical, even when they are entangled and placed across each other in the same Shot of time because each one is consisted of a different Repetition Data. This brings us to a new concept: Any particle is made of a Core Data and a Collateral Data. The Core Data of all photons (Origamons) are identical and this is what makes them same particles. However, the Collateral Data about their spin and frequency is different between the photons.

Collateral Data of a particle is the data about the Spin (Recycling data) and Frequency (Repetition data) in that particle. Therefore, two particles are the same type if they have identical Core Data, but no two particles have identical Collateral Data. All photons (Origamons) in universe have the same Core Data because they have the same value of mass but the details of Collateral Data about them which explains at what point of time they are located and how much energy they are carrying and what value of spin they have, is different. Unlike the Standard Model, in Origami Model the location of particle is not important because location is not a real dimension and that's why the location is always uncertain in Standard Model, creating fundamental conflicts in all domains of quantum mechanics.

Based on the information we shared so far, we conclude that Collateral Data are syntactic data that are added to Core Data because they are meaningless by themselves. However, Core Data is Semantic Data and translates into mass. Syntactic data of a particle is either Vector Data or Scalar Data. Vector Data is the data that produces spin for particle and is the foundation of *Direction* in our universe. Spin has direction and it is the direction of spin that can produce gravitational attraction or gravitational repulsion (antigravity), which I will explain more in the chapters about the dark energy, antimatter and expansion of universe. These data are all produced as a result of *continuous* Recombination of time. As I said at the beginning of the paper, time is quantized and this is why our entire universe is quantized but the Recombination of time is continuous. Therefore, during one Planck Time, data has chance to continuously recombine itself, producing maximum possible variations of itself while keeping the Core Data unchanged. This is why as time progresses, the Planck Time shrinks, giving less chance to the Recombination to produce more versions of the same particle, so the number of similar particles in each Planck Time (each Shot) reduces (maximum frequency of light reduces) and the spin of particle reduces. We know that spin of particles is always close to speed of light, but as speed of light reduces, so spin reduces with same ratio too. This is exactly why we began by saying that as time progresses, the size of Shots reduces making the time going faster. Below picture demonstrates this effect:

5-2-3-5-8-1 8-2-3-5-8-2 5-2-3-5-8-3 1-2-3-5-8-5 3-2-3-5-8-8 2-2-3-5-8-13 3-2-3-5-8-21

PLANCK TIME

2-3-5-8 : PARTICLE

2-3-5-8: Semantic Data of Core of particle

1-2-3-5-8: PARTICLE WITH FREQUENCY

1: Scalar Syntactic Data responsible for frequency

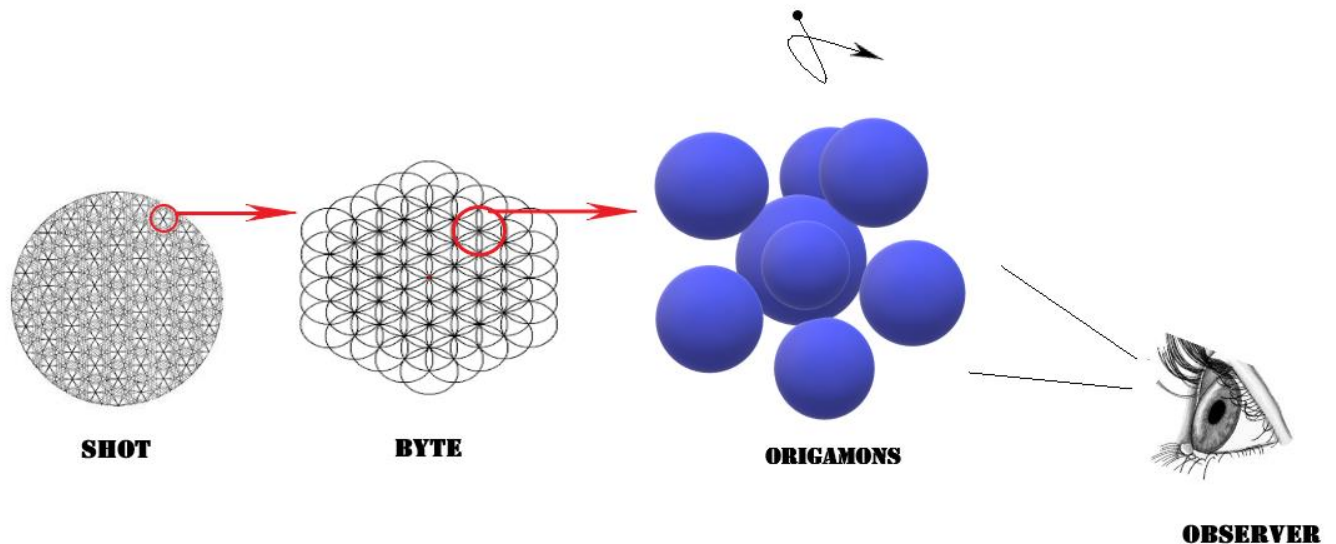
1-2-3-5-8-1: PARTICLE WITH FREQUENCY AND SPIN

2: Vector Syntactic Data responsible for spin

In above picture we can see that all states of a particle exist along the Planck time, so in fact so many of one particle coexist next to each other but we will only observe one single particle at one single state at end of each Planck time. At end of each Planck time a different version of same particle is observed and so the change of the Vector Syntactic value creates the perception of spin for us and the change of Scalar Syntactic Data creates the notion of frequency and wave feature of particle (as well as superposition and entanglement) for us. Vector Syntactic Data has an order (increasing in matter and decreasing in antimatter) and that's why it creates a vector for spin and this is how *direction* is produced in our universe. Scalar Syntactic Data has no hierarchic order so it is directionless. Below picture is a sequence of two Planck Times to demonstrate how spin effect is created by various combinations of data:

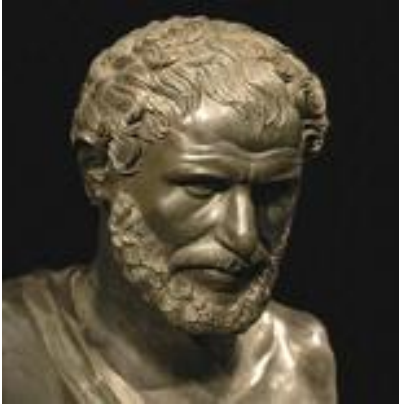
Note that Scalar Syntactic Data is nothing but the last Dot of data or virtually the last Digit in the Length of Time before the Core particle data starts. Again, the Vector Syntactic Data is nothing but the first Digit that starts immediately after the Cord data of particle is ended. This is why these data are called Syntactic because they are random and not producing the particle and just happen to be there. But importantly the Vector Data digit always is sequential, always increasing and this is how it creates the Direction. You can see in above picture, the First Next

Digit in every next particle increases by certain ratio which is the $\varphi = 1.61$ and this is why this number is so important. This is the value that produces the direction and that's why Spin has direction and we will see later that spin creates the magnetic moment and that's why Magnetic field has direction but electric field has no direction. Now I just need to mention a crucial point here and that is the role of gravity. What creates the order in Vector Syntactic Data is the gravity. *Time by itself is scalar, directionless and random but once it is combined with gravity it becomes information, directional.* This is an imperative fact that I will return to when discussing gravity in later parts.



As the collection of Origamons across the height of one Shot rotates, observer sees different ones at each Planck Time and perceives it as spin

This demonstration proves that as particle spins it changes location because as you can see in the diagram, time passes during spin. I explained before that distance is our perception of passage (Recombination) of time, so because spinning involves passage of time, it involves actual movement of particle. However, we wrongfully imagine spin as a stationary rotation just because during the movement of particle the observer moves with the same speed since because the length of time passes with the same rate for both. In fact, the entire universe moves forward during the spin and this is why we observe spin as stationary. Interestingly again, around 2400 years ago an ancient Greek philosopher by name of Heraclitus realized this once he said, "No man steps in the same river twice." He knew that river never stays the same.



Heraclitus

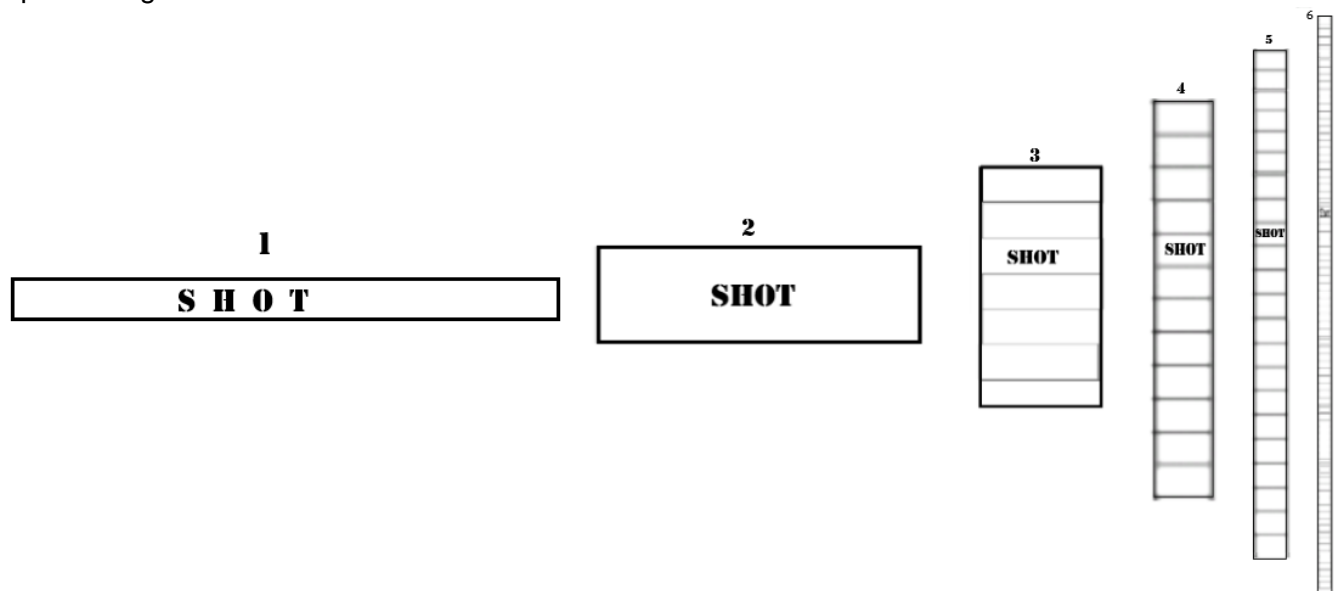
This explains why all particles in quantum world have very fast spin but macroscopic objects have no spin, because as we saw already, masses larger than Planck Mass ($2.18 \times 10^{-8} kg$) will not be able to have identical particles in same Shot (Planck Time), so they won't be able to produce the same pattern in their motion that produces the spin effect for observer. This also means that frequency of a particle is directly related to its spin velocity which is consistent with experimental observations. Another important conclusion is that spin and movement/rotation happen as a result of Recombination/passage of time that is caused by reduction of density of the gravity, therefore, particles need no external force applied to them to spin, or even to move. This is why the universe keeps expanding with the reduction of the density of the gravity of the mother black hole around it. This means if we apply no force to a particle, it will still have spin and it will still have movement. This is exactly what we observe in quantum mechanics and it has been baffling the scientists. It seems to be violating the laws of thermodynamics, but it is not really violating any laws of physics. There is a force applied to all particles in our universe, the force of gravity from the mother black hole, which we know as Dark Energy. Once we come to masses larger than Planck Mass, things will change. We won't observe spin unless there is observable external force applied to the object, and there will be no movement/rotation either because there is no spin. Time still passes as it recombines, particles all spin and rotate, but larger objects seem stationary because the entire system (universe) is spinning and rotating and proceeding all together as one unit. Another conclusion is that if a particle has zero frequency (no entrapped particles in the same Shot), it will have no spin, and with no spin, it will have no movement. This is again correct because based on Einstein's equation ($E = fh$), a particle with zero frequency will have zero kinetic energy and it virtually cannot exist. In future chapters we will actually find this equation for the kinetic energy of particle, but in much easier way and based on the structure of time and the correct meaning of the frequency of a particle that I explained. Now we understand why all particles have spin and why they all move. It also explains that data never repeats itself, so particle is never the same and, in every Planck Time, particle is different but we will observe it as the same particle as long as the Core Data is unaltered. This reminds us of Zeno's Arrow. This gives us another crucial result: what we perceive as a particle moving forward is a series of particle being created and annihilated in a sequence, so expansion of universe is not produced by Recycling of data. It is the Repetition of data that produces the expansion of universe because the particles that are produced by Repetition, they all exist at the same Planck Time. This brings us to the idea that time has a

Horizontal progression in which the length of time is involved and also it has a vertical progression due to the repetition of data which causes the expansion of universe. In other words:

Recycling of time creates the progression of time.

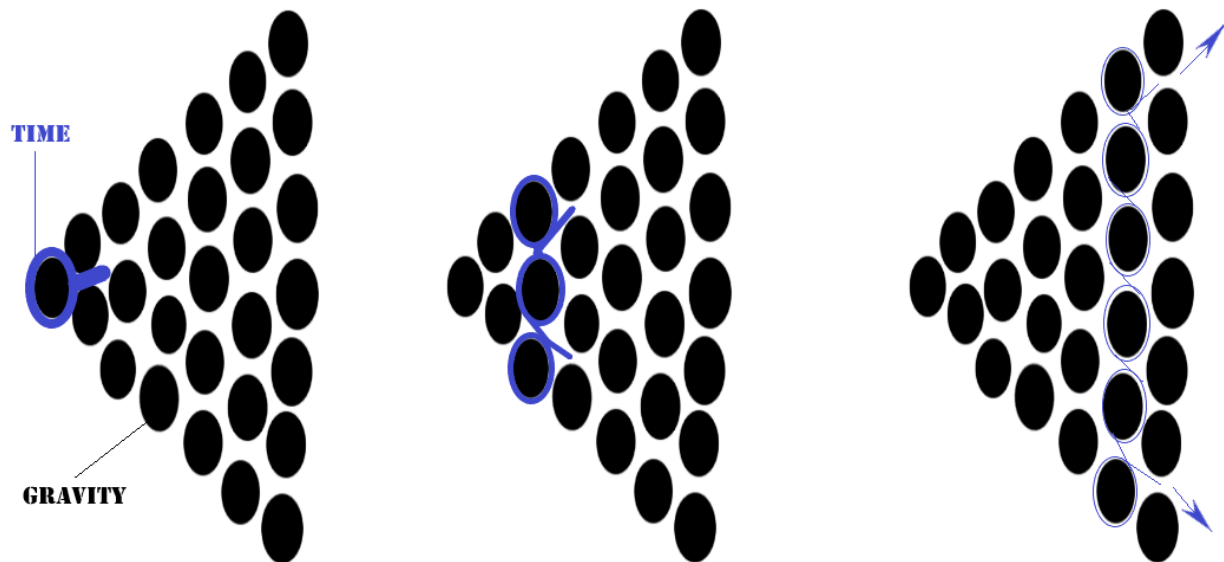
Repetition of time produces the distance.

I will come back to this issue later and explain it in more details. Now, considering that the total amount of time and total amount of gravity are constant, at the beginning of the first universe (Ignition) there was only one huge Shot of data that had all the 36×10^{69} seconds of data (time) in it. This amount of time has to spread throughout the entire universe, creating what we observe as the radius of the universe so the radius of the first was small but its duration was very long. Then the second universe, our present world, started at Big Bang. The total amount of 36×10^{69} seconds of time (data) now is already distributed in much bigger Shots that each one contains 6×10^{23} Origamons (photons) and as time spreads radially, expanding the universe, the Shots get smaller and distribute the time outwards. As the Shots get smaller, we perceive it as time acceleration and as time accelerates, phenomena get slower, including the speed of light.



Size of Shot and total amount of time in each universe from 1 to 6

The following picture shows the distribution of time into the pool of gravity in a schematic way. The total amount of time in each of the six universes is always 36×10^{69} seconds. Gravity is in form of interconnected spheres of Origamon radius (half the current Planck Length) and when time spirals around these spheres of gravity, it sequentially creates new Origamons and annihilates previous Origamons constantly. Note that no Origamon stays existing for more than a Planck Time. Time produces the Origamon by spiraling around the gravity and then it exits the gravity to annihilate the Origamon and produce the next one. Below picture shows this effect:



Distribution of time radially in pool of gravity while spiraling around Origamon-sized spheres of gravity and expanding the universe

Because time is recombining at speed of $10C$, the speed of time between the Origamons will be speed of light (I explained this before), therefore no Origamon can go faster than speed of light because its existence is not constant and it goes out of existence as time travels so it will only go as fast as Apparent Speed of Time (equal to speed of light), no faster and no slower. This is why Photons *have to* go as fast at speed of light, the feature that has not yet been explained convincingly. Origami Model shows clearly why photon always travels as fast as light and why the speed of light is constant: because photons are a piece of time traveling by Recombination of time and its combining with gravity, which is always at speed of light. This gives us another piece of crucial information:

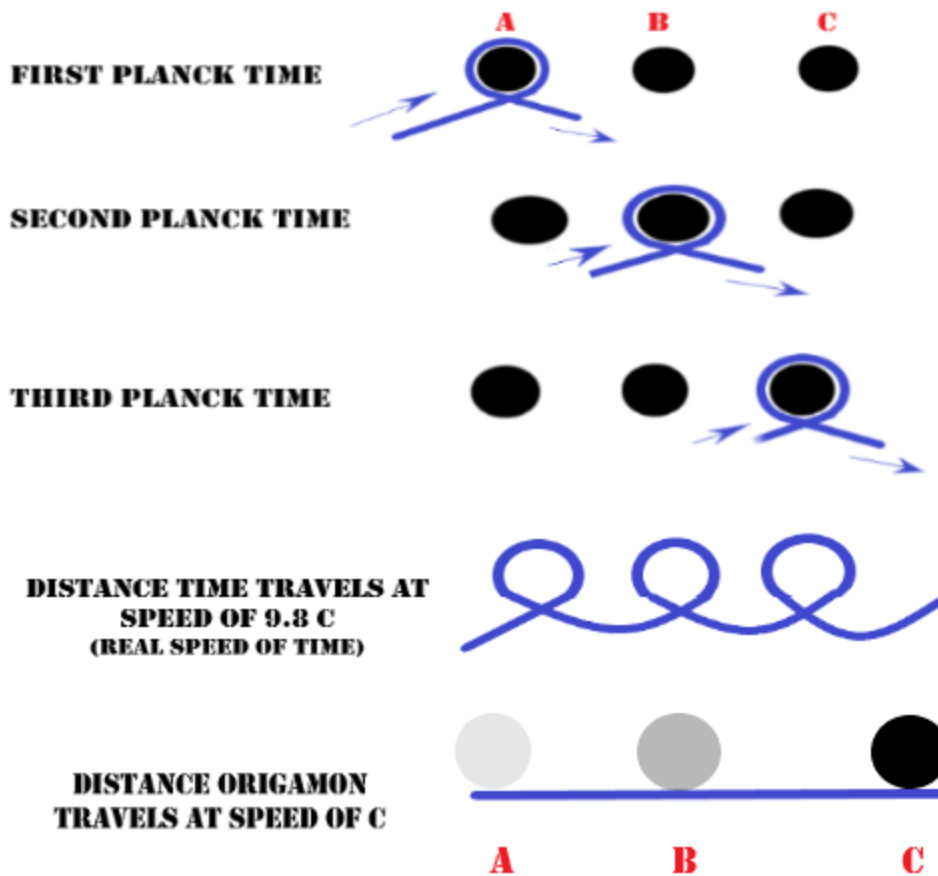
Speed of light is speed of gravity combining with time.

This exactly explains why nothing can go faster than speed of light, because speed of light is in fact the *speed of creation*. Due to expansion of time vertically, the total radius of our universe is going to be much bigger than previous world but the duration of our universe will be shorter. The same event will happen for the next four universes until we reach the seventh, last universe when speed of light will finally be equal to speed of time.

Now we need to review the constancy of speed of light which is the foundation of the General Theory of Relativity. The constancy of speed of light in Einstein's general theory of relativity has two aspects:

- 1- Speed of light is always a constant value in every time and place in universe
- 2- Speed of time is independent of relative speed of observer to source of light

Both these features are accepted and proved experimentally. However, no proper explanation has been proposed for any of these two unique and strange features of light. I have already explained that speed of light is in fact speed of combination of time with gravity and that is why it is constant but due to the miniaturization of size of data packages (Shots), speed of time during the life of universe is constantly accelerating, causing all events to be *observed slower* when compared to previous time. This means, light at any present time travels at the same speed, but when compared to the past, it will be measured as slowing down. I explained this effect previously in details and I showed that it is the responsible reason for the Big Bang to be observed as the fastest event in our universe. Considering the second aspect of the constancy of speed of light, there has been no convincing theory to explain it. In fact, the second feature is only unique for photons and it contradicts laws of physics about the motion and velocity. We know that no other object in universe has this strange feature. Let me explain it: When a traveling object projects a mass in the direction of its movement, the speed of the object will be added to the speed of the projectile, making the projectile to go much faster. This is why fighter jets dive down before firing their rockets to the land targets, in order to enhance the momentum of the rocket. But if a car traveling towards you turns on its headlights, the speed of light coming out of the headlights will not be increased because of the speed of the car. If this was not the case, we could have broken the speed of light centuries ago. But how is it possible? How could light escape this basic law of physics? No correct explanation has been developed yet because we do not know how light travels. This aspect of the constancy of speed of light is in fact strongly in favor of Origami Model because it tells us that light travels in a unique way that is different from all other objects in universe. Origami Model clearly shows this effect and I must say, the constancy of speed of light regardless of the observer's frame of reference, is strong evidence that Origami Theory's view about the nature of photons and the mechanism of their movement is the only correct model. Below picture demonstrates that every Origamon (photon) is constantly produced and annihilated at each new Planck Time and the speed of this process, which is in fact the speed of time combination with gravity is $3 \times 10^8 m/s$ regardless of observer's frame of reference and so it cannot be slower or faster at any given time. Below picture shows this clearly and as we can see, time produces photon (Origamon) A first, then it exits that point, annihilating that photon and producing the next one and then the next. If photon A and B and C exist at the same time, the total amount of data (time) in universe will have to increase constantly and infinitely which is against the second law of thermodynamics and conservation of information.



How time produces and annihilates photon as it combines with gravity

Vertical and Horizontal Speed of Time

So far all I explained was almost only about the horizontal recombination of data that creates the progression of time. At the beginning of time, Ignition, first universe, there is only one Shot and the entire amount of data which is equivalent of 36×10^{69} seconds is scattered inside this shot. As time progresses, the Recombination causes this amount of huge data to get ordered and organized into smaller and smaller shots. During this process, the recombination makes the shots progress horizontally and vertically. The horizontal speed of time means the rate of recombination and assemblage of data in *sequence of reducing shots, when previous shot disappears to form the present shot*. Vertical speed of time is rate of recombination and assemblage of time in *same size shots that all exist adjacent to each other*. In other words, the Recycling of data creates the horizontal speed and Repetition of data creates the vertical speed of time. The horizontal progress has a speed of 9.87C or almost ten times faster than speed of light. The Vertical Recombination has a much higher speed because all the data in the vertical shots exist at the same time. This vertical progression creates what we perceive as the radius of universe and object permanence, or the concept of space and distance, because unlike the

horizontal progress when shots appear one after another, in vertical progress, shots all form at the same time. The speed of vertical recombination is much higher as it is mainly through repetition other than recombination. Because all particles in vertical time exist at the same Planck Time and that's why we perceive the entire diameter of universe at the same time (permanence) so that means vertical speed of time is so much that time travels through the both ends of universe (two radii) in one Planck Time. Therefore, we can develop the equation to calculates the vertical speed of time:

$$V_t^v = \frac{2 \times \pi^2}{T_p}$$

V_t^v : vertical speed of time

T_p : Planck Time

$$V_t^v = \frac{2 \times 9.87}{5.39 \times 10^{-44}} = 3.7 \times 10^{44} m/s$$

Also, this equation tells us clearly as time progresses, and Planck Time reduces (due to the shrinkage of the Shots that I explained before), so the vertical speed of time will increase. Because Planck time is the time that takes light to travel across the Planck Length, so can rewrite our equation based on speed of light too:

$$V_t^v = \frac{2\pi^2 C}{L_p}$$

c : speed of light

L_p : Planck Length (1.6×10^{-35})

$$V_t^v = 2 \times 9.87 \times 3 \times 10^8 : 1.6 \times 10^{-35} = 3.7 \times 10^{44} m/s$$

In this second equation we need to note a crucial point. As we know speed of light is reducing (due to acceleration of time) and Planck Length is increasing so for the result of the equation (vertical speed of time) to increase, the rate of deceleration of light needs to be less than the rate of increase in Planck Length. This is how light will eventually catch up with time. This demonstrates clearly how we will eventually get ahead of time and overcome the predeterminacy caused by accelerating time. As I explained and showed in previous pictures, in every universe, the age of universe gets shorter and the radius of universe gets larger. This means, the horizontal speed of time grows much less than vertical speed of time. This explains how speed of light, which is speed of gravity or speed of creation, will eventually get ahead of time.

Also, as you can see the vertical speed of time is much much higher than horizontal speed of time. Now, considering speed of light is in fact the speed of gravity combines with the orderly assembled time. So, time needs to recombine and produce a meaningful raw of digits, which we can call Assemblage then gravity will combine with this ordered sequence of data and produce an Origamon which has reality and interacts with its environment. As we saw before, when time is ahead of gravity (light), it creates the path for the next movement of creation. This is causing our universe to be predetermined. This gives us a practical meaning of destiny:

Destiny is orderly assembled time without gravity.

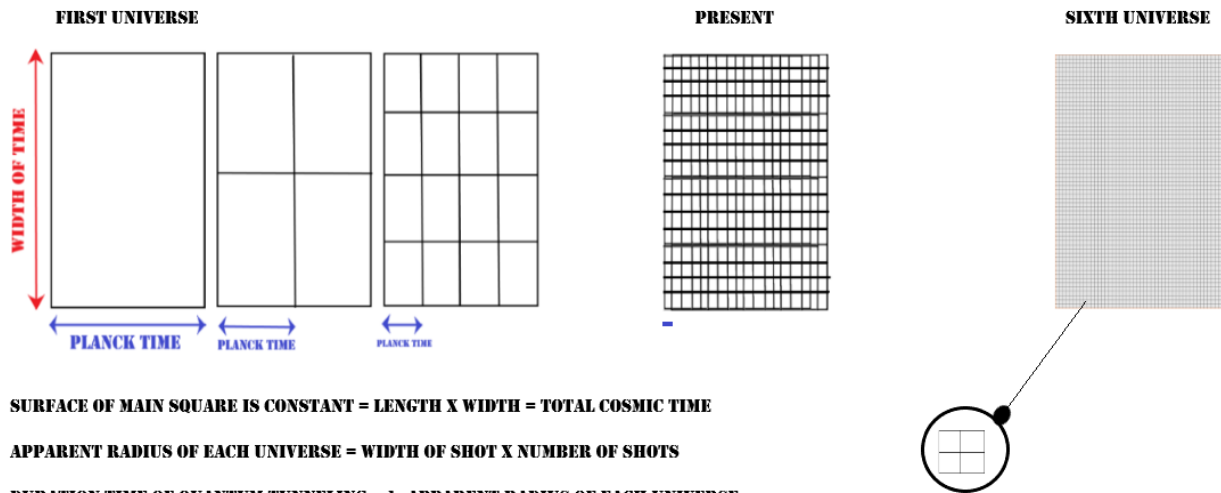
So, destiny exists but has no effect. In simple word, time recombines and produces new orders but these new orders are the map of reality (destiny), once gravity is combined with it, we will observe the reality because as I explained before, mass is gravity combined with time. When at the seventh universe, speed of light becomes equal to horizontal speed of time, there will be no destiny, and we will create our destiny. Therefore, if destiny is predeterminacy, this gives us a mathematical equation for destiny:

$$\text{Predeterminacy} = V_t^h - c$$

V_t^h : Horizontal speed of time

C : speed of light

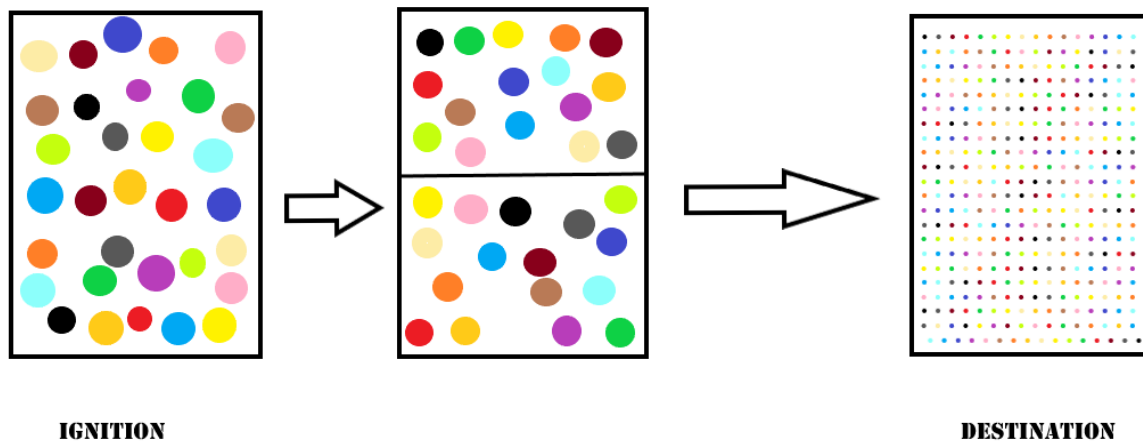
When speed of light becomes equal to horizontal speed of time, there will be no predeterminacy, which means things will happen based on our will. Things will not be random anymore. We will lead the universe. Therefore, *predeterminacy is in fact the randomness and unpredictability of universe*. This is why speed of light is much less than horizontal or vertical speed of light. However, as I explained before, speed of light in each universe gets closer to speed of time until in the last Universe, they will become equal. But if time is accelerating, causing light to be observed as decelerated, how could speed of light eventually become equal with speed of time? The reason is in the number of Universes. We will calculate in further chapters that based on the value of Gravitational Constant (6.67×10^{-11}) and the age of the universe ($4.3 \times 10^{17}s$) and speed of light ($3 \times 10^8 m/s$), we will find out the total amount of time that is $36 \times 10^{69}s$, then we will calculate that in 700 million years we will reach the end of the Mother Black Hole around our universe, so by then only a small portion of the total amount of time will be used, so there must be more universes to give enough time for the total recombination of entire time. The next universe has to have much larger Mother Black Hole otherwise it won't be able to have our universe in it. This makes the density of the gravity of the next universe to be lower (because the total amount of gravity is constant) so the acceleration of time is faster, so G (gravitational constant) will increase in each universe and this is how the acceleration of time increases in each universe. But, the speed of vertical progression of time keeps growing much higher than speed of horizontal speed of time, in other words, as time progresses, the radius of universe will grow faster and faster. This is what we have been observing as the acceleration of expansion of universe. Therefore, the speed of light eventually catches up with horizontal speed of time. As I explained before, the equality of speed of light and time, will make the seventh universe (Destination) to be non-predetermined. So, only in the last universe we will be in control. Below picture shows how the total amount of data (time) in the first original Shot which is enormous, gets recombined and ordered and creates smaller and smaller shots, creating the progression of time and expansion of universe:



In above picture, the first big square is the original Shot at Ignition, or the very first moment of existence. As the data inside the Shot recombines itself, it creates smaller Shots, or in other words, it produces smaller *groups* of data. This reordering of data, Assemblage, makes the Planck Time to shrink. The radius of universe is the width of the ordered data inside the main square.

- Radius of universe is defined by the amount of data that is vertically recombined
- G (gravitational constant = 6.67×10^{-11}) increases in every Universe, so the horizontal speed of time increases
- Vertical speed of time increases much more than the horizontal speed in each universe causing faster and faster expansion of universes
- Maximum number of Origamons in each Shot or Quantum Entrapment reduces in each universe because the size of Shots reduces constantly due to recombination and assemblage
- Vertical speed of time is always much faster than horizontal speed of time, and this discrepancy increase constantly, making the expansion of universe accelerating exponentially
- So, the life or duration of every next universe is shorter than the previous one, because the size of every next Mother Black Hole is larger than previous one

To simplify this assemblage and recombination of data to produce smaller Shots and more ordered universes, we can imagine a picture like below:



In above picture, every coloured ball is a pack of data, a piece of code. As time progresses, codes get packed into groups that are all interconnected, creating a very large, fine picture at the end. The smallest Shots are in the last universe. This is how the Seventh universe will have the least granularity, maximum entropy and being closest to an analog quality.

Neutrino Glasses

We observe the world through permanent Neutrino glasses! What do I mean by that? We experience the universe around us through the space. No matter how close we get to objects or particles, there is always a certain layer of space between us and the target. This barrier is always present, even in smallest diameters between subatomic particles. In further chapters of the paper, we will see that the very presence of this barrier is the real reason why there is no friction in quantum world, because particles do not physically touch each other.

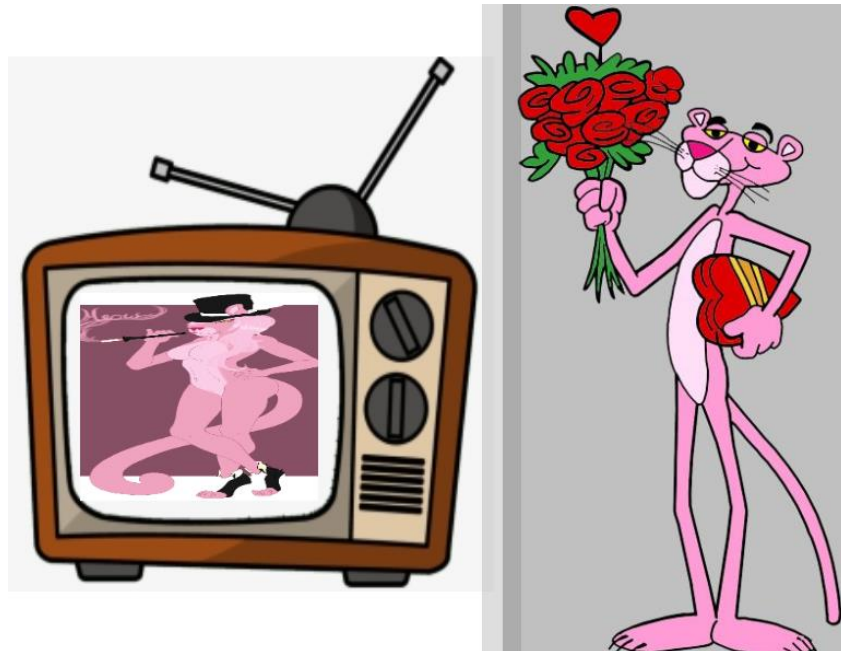
To understand the nature of this barrier we need to look at the structure of space. In ancient times, philosophers believed that space is full of an invisible, mysterious matter called Ether. Their reason was that if there is nothing in space, how could light travel through it? How could stars be floating in just nothing? How could there be objects and between them there is nothing? So, they believed there must be something in space that we can't see. Then science seemingly progressed and the modern scientists laughed at the ancient thinkers and they claimed that space is consisted of true vacuum. For centuries we believed that space was absolutely empty with no physical entity existing in it, until recently when we started to find so many physical particles, fields and waves in space. Finally, Quantum Field Theory proved that space is full of particle-antiparticle pairs that constantly pop out of nothing, exist for a short time and then annihilate each other. The man that proved this, Peter Higgs received the Nobel prize of 2013 for his genius discovery. So, we are simply back in ancient times again, when logic prevailed.

The smallest particle in our universe after the photon, is electron neutrino with a mass of $1.96 \times 10^{-37} kg$. This particle is so small that it hardly has any effect in our environment, but believe it or not, it is the most important particle of universe after the Origamon (photon). As I mentioned earlier, one of the major mysteries in science is the presence of Physical Constants. Any time a great scientist discovers a new phenomenon and produces an equation for it, he has to use a Constant to correct the results. It started from Newton and his gravitational constant. Then Coulomb produces an equation to measure the electric charge of a particle and he bumps into a similar problem but this time he realizes that his results are ridiculously smaller than the measured amount, so he just multiplies his results by 8.98×10^9 , and problem is solved! Coulomb happily keeps the number and calls it Coulomb's Constant. Max Planck tries to solve the ultraviolet catastrophe (the virtual infinite result when measuring the energy in a heated black body) and he calls it Planck Constant: 6.62×10^{-34} . To explain how off the road, we have been going in our modern physics, we need to look at a simple example: There is a well-known disease in Mediterranean part of the world called thalassemia. This disease used to kill many infants with severe anemia and because it almost only happened in the countries near the Mediterranean Sea, the physicians in Dark Ages simply thought it must be coming from the ocean, so they called it Thalassemia: Ocean Disease. Finally, in the last century when we discovered human genes and found that Thalassemia is a type of blood disorder and the victims have a defect gene that stops their bone marrow producing normal red blood cells. The gene is more common in Mediterranean area because it appeared in that part of the world first as a mutation and due to interbreeding, it stayed amongst the people living in that area. Today because of mass migrations, Thalassemia has spread all over the world, even in furthest mountains and hottest deserts, far from the ocean, but still carries the same name. All the Physical Constants we have so-called discovered, are the Thalassemia of modern physics! The presence of physical constants, is the testimonial to how little and how wrong we have understood our universe. Except that Physical Constants are "properties of the nature", we know absolutely nothing about the nature of these numbers and no one knows how they have appeared around us and why. The phrase, "properties of nature" doesn't really say anything, does it? Do you know anything that is not a property of nature? The truth is that every equation that carries a constant has the following invisible stamp on it:

I am totally misunderstood!

Through the next chapters of Origami Theory, we will demystify all these Constants one by one and we will calculate them and truly discover their origin and their nature, so we will understand what they really mean and where they come from. This will open a great door to our perception of the universe and suddenly everything will start to make sense. Right now, our knowledge about our universe is confused, wrong and incomplete. Our equations and theories are conflicting and we are confronted with too many paradoxes. In many ways we are like a group of nomads in a desert that have suddenly tumbled upon a big, old TV and thought it was a wooden Fox Trap! We first thought it is a nice wooden box to catch foxes. Then one of our curious men pressed a button on it and suddenly a big light came up and some little funny people appeared in the Fox Trap! Since then so many curious men in our tribe have been trying to get in touch with these mysterious little people in the wooden Fox Trap. After 1200 years of thinking, we have found some amazing facts about this mindboggling Fox Trap: we know now that it does not catch foxes! Also, we know that it makes noises through something called

speaker, and if we twist a fat button on it, the Fox Trap talks louder; we also know that there are more than 34250 little people living inside the Fox Trap that look exactly like us but they never eat the food we leave in front of Fox Trap every night for them! Two theories have been suggested to explain how these miniature people stay alive inside the Fox Trap, one is called Standard Explanation and the other one is called String Explanation but our Chief hasn't accepted any of them because when he asked the men who had proposed these theories to explain it to him, they said it was too complicated to be explained and even they themselves didn't know what they were talking about! Then in 1967 our ironsmith fell in love with a beautiful woman inside the Fox Trap but when he put his fat finger inside the Fox Trap to touch her boob, his whole body started jerking and jumping and when two other men tried to grab him and pull his finger out, their body started jerking and jolting too! Later on, the ironsmith claimed that the women inside the Fox Trap had zapped his finger and it was accepted as a physical fact, because he actually lost his whole hand! But five years later a thorough research by the coffin-maker proved that the little people inside the Fox Trap have sharp teeth! Finally, twenty years ago a genius shoemaker from other village discovered that when sun sets in sky, the Fox Trap goes to sleep, so he wrote a book about his observations and proved that the little people inside the Fox Trap are originally from the sun! His theory was very successful and a year later our Chief gave him a fat goat as a reward! The other jealous guy who disagreed with the genius shoemaker and claimed that the little people inside the box were not real human beings and just an imitation, was publicly skinned and then hanged in the city square! Eventually a year ago a stranger arrived with black suit and tie and he said something very bizarre about the Fox Trap that sounded outrageous because it was completely different from what our greatest minds have been thinking for centuries. Soon our soldiers arrested him and dragged him to our Chief, who personally strangled the stranger. However, five years later, in 2019, we realized that what the stranger had said actually made a lot of sense! He had our Chief that the box was called Television and it worked with something called electricity and the electricity was going inside the box and producing electric messages that he called "data". This Data thing converted to pictures and sound and so all the little, funny people that we always saw in the box were in fact just our perception of these data!"

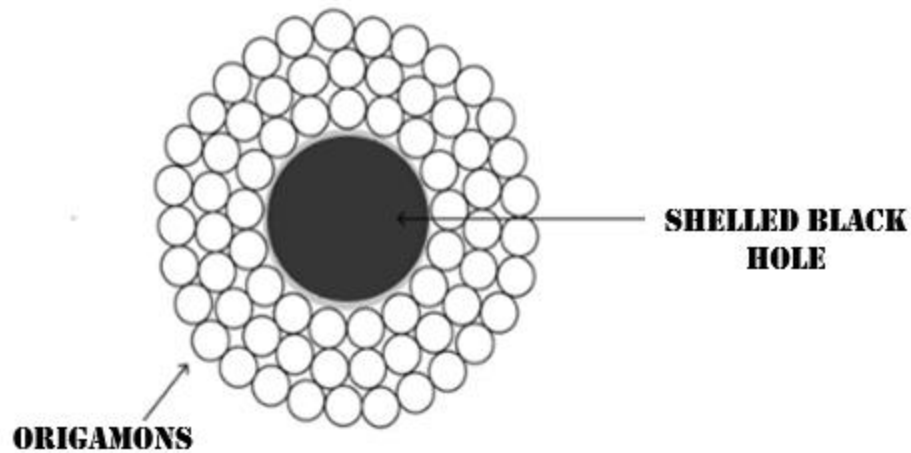


Origami Model believes that our universe is just a TV that works with Time and all the strange things in it are just Data interacting with gravity. For example, as you have already seen, what Newton discovered as the Gravitational Constant, is in fact the rate of acceleration of Time. What we know as the vast universe, is just recombination of Time with gravity, expanding radially. What we perceive as distance and locality is just the Time difference between the two points. Isn't it easier to work with one entity instead of 2456 dimensions?

Let's get back to space. To have a correct understanding of universe we need to know that we observe everything through a compact, invisible media of neutrinos. At the Big Bang, time started its recombination, mixed with the gravity nearby and produced mass. The first and smallest mass was Origamon (photon). The Origamons that were closer than Planck Length (we will find out why and how in next chapters), fused to each other in larger groups and produced subatomic particles. The first next small particle that was produced this way was neutrino. To see how many Origamons fused to produce a neutrino, we can easily divide the mass of neutrino by the mass of Origamon:

$$\frac{1.961 \times 10^{-37}}{1.3 \times 10^{-70}} = 1.5085 \times 10^{33}$$

This means each Neutrino has 1.5×10^{33} Origamons in its structure, set around a central black hole (Shelled Black Hole). Something like this picture:



ONE NEUTRINO

We observe everything in our universe through photons (free Origamons). Besides, because light and all electromagnetic energy is made of photons, so anywhere we are dealing with this type of force, we are checking the effect of free Origamons (photons) on environment. But we just found that space is not in fact a vacuum, but a field full of neutrinos. This means when light comes from a source to the observer, free Origamons (photons) virtually collide with the neutrinos and transfer their energy through this matrix to the observer. Now we know that one neutrino is a pack of 1.5×10^{33} Origamons, so when one Origamon hits a big neutrino, its force will be divided to 1.5×10^{33} Origamons. This simply means that in order to find the real energy from each Origamon (photon) we should divide its energy by 1.5×10^{33} . Now let's write this down:

$$\text{energy of each Origamon (photon)} = \text{number of photons per time} \times \frac{1}{1.5085 \times 10^{33}}$$

$$E = \text{number of photons per time} \times 6.62 \times 10^{-34}$$

We know that the number of photons per unit of time is in fact the frequency of light, so we can simplify our equation to this:

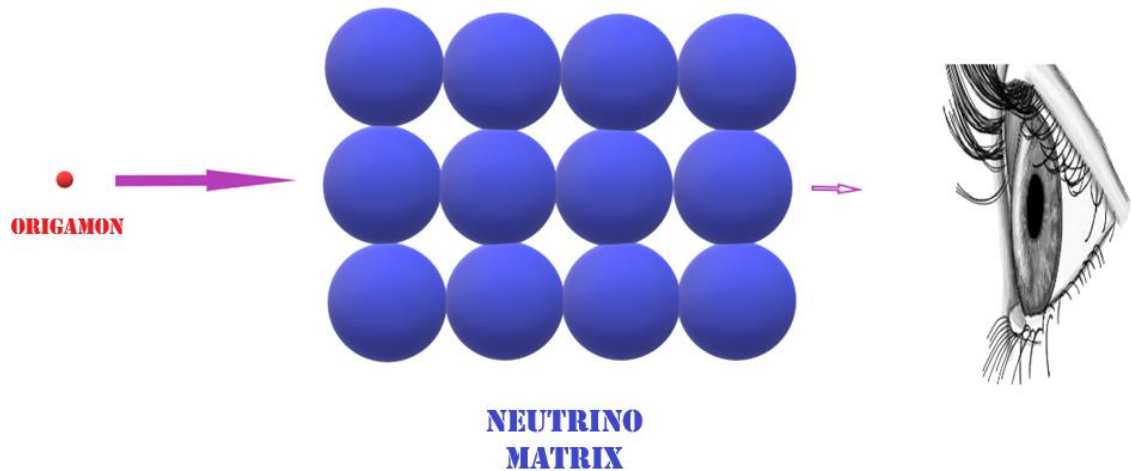
$$E = f \times 6.62 \times 10^{-34}$$

Do you see what I see? The number in our equation is actually a very famous character! The value of 6.62×10^{-34} is precisely what Max Planck found to fix his ultraviolet energy equation and got the Nobel Prize of 1918 for it, but he never knew what that number meant and how it was there! Years later Einstein tried to find the energy of a photon and reached the same equation that we just found and he got a Nobel of 1921 prize for it! None of these wonderful scientists ever realized or even got close to guess what they called Planck Constant was and how it managed to fix any equation that was formed to calculate the energy of a photon! They

just did a simple mathematics and calculated that if their result is multiplied by 6.62×10^{-34} it will give them the correct answer. However, we calculated this number without any presumption and to find the exact number means that our calculation for Origamon mass must be absolutely correct. Now you might wonder where we got the value for Origamon mass from. In the second half of the paper, we will go step by step from the very beginning of Time till now and then to the end of cosmos again and this time we use only mathematics nothing else and we will calculate the mass of Origamon precisely based on the angulation of time (deceleration of time) at its smallest possible angle as oppose to its largest possible angle when it produced the Big Bang mass (biggest mass) and we will find the value of $1.3 \times 10^{-70} kg$. In this part of paper, I am trying to avoid complex mathematics and only explain the entirety of the theory in a simple language comprehensible for everyone. That's why I emphasized earlier that Origamon mass is a critical discovery to demystify our universe, because Origamons are the foundation blocks of everything. So now finally we know what Planck Constant really is:

Planck Constant is the mass ratio of Origamon to neutrino

Because we perceive everything through the matrix of neutrinos, we have to always multiply the energy by this ratio. In Military world, anytime they talk about nuclear bombs they measure its power in relation to the bomb that was dropped on Hiroshima. To do this, they simply divide the power of their new bomb by the power of Hiroshima bomb and proudly announce: "The new bomb has 12 Hiroshima Bomb power!" It looks like they have Hiroshima glasses on. In quantum mechanics, anytime we talk about the energy of a photon, we have to say it in comparison to the smallest photon package (neutrino mass); so without even knowing it, we put our neutrino glasses on and express the results based on comparison to packs of Origamons (photons) that make a neutrino. The military people have a choice to mention their number in any other unit but we don't have such choice because our universe is fully packed with neutrinos and the photon (Origamon) has to hit the neutrinos to transfer its energy, like a Newton Cradle System. We live in a Neutrino Matrix that affects everything around us. Below picture demonstrates this effect:

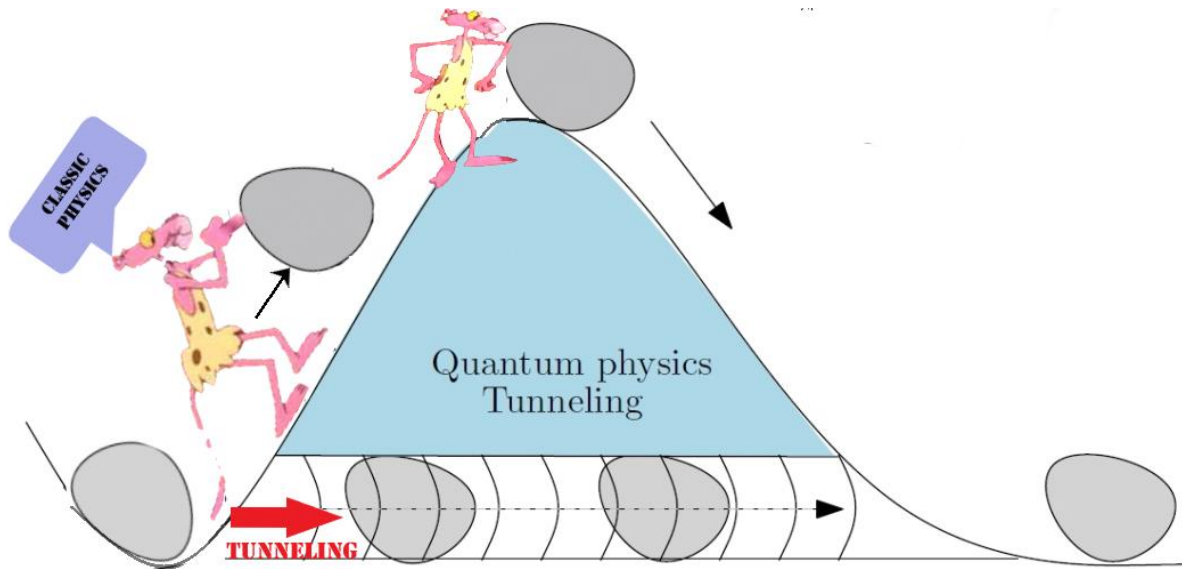


Neutrino matrix that has saturated our universe since shortly after the Big Bang

This brings us to the end of this important chapter but before finishing the subject I take your attention to another central point. Unlike the current belief that light does not need a media to pass through, Origami Model strongly disagrees with the notion of light passing through the vacuum. True vacuum only exists inside the black holes and light requires a media to travel. The existence of Neutrino Matrix is the reason why light goes can pass through space. Nothing can go through absolute vacuum, which is inside the black holes.

Quantum Tunneling

Another perplexing event that has caused so much discussion in quantum mechanics is the Quantum Tunneling. In classic physics an object can never reach a higher energy state unless there is force applied to it. A ball will never roll over a hill if no one pushes it. But in the world of particles this happens all the time. Imagine a ray of light hitting a metal sheet. Naturally most of the photons reflect back, but astonishingly, a very small number of them actually go through the metal sheet and continue their travel, as if there is no barrier in front of them! To make it even more confusing, the mysterious photons that somehow penetrate the metal sheet, cross the metal almost instantaneously and pop out of the other side as if there was nothing on their way.



Particle mysteriously goes through the barrier without force

So many sophisticated experiments and so much debate and argument have been happening in the world to see how long it takes for the tunneled photons to cross the barrier. Some have claimed that they travel faster than speed of light inside the barrier, some argue that they actually take no time to cross the barrier, but most scientists agree that tunneling occurs as fast as speed of light. But we know that light slows down in a media and this is why it refracts, so how could these photons cross the solid metal sheet with the same speed and how could they go through the metal sheet when they don't have such kinetic energy to do so? This is another example of why quantum mechanics has been considered contradictory to classic physics. Another perplexing feature of quantum tunneling that physicists have not been able to clearly explain is that the photons cannot tunnel through any barrier that is thicker than $3 \times 10^{-9}m$. If they ignore the barrier and do not obey the kinetic-potential energy equilibrium, why they only do it for such small distance only?

However, based on the model that Origami Model produces for the nature of light, time and speed, we can easily explain and even expect the quantum tunneling to occur all the time. In this model, the laws of physics are the same for all sizes of mass and we have proper equations that are able to process all kinds of object movements, regardless of their radius or mass. The reason for quantum tunneling and quantum entanglement to be so counterintuitive, is due to the wrong current model used in quantum mechanics. Based on what Origami Model proposes, there can be even more complex events and phenomena that we haven't discovered yet because time travels much faster than light and we must see events that seemingly violate our current understanding of locality and momentum. Fundamentally, the mechanism of quantum tunneling is very similar to entanglement. As we saw earlier, due to Quantum Entrapment, Origamons (photons) always travel in packs of thousands and millions, all located in same Shot and the number of Origamons in same Shot is what we know as the frequency of light. I explained before that only one of these photons is observable for us. Now, once the Origamons reach a barrier, there is always a chance that one of them in each Shot, instead of the Horizontal progression of time, goes through the Vertical pathway. Therefore, this single

observable photon will not go through the barrier, but its data travels (without the gravity) in the vertical progression of time. We calculated earlier that vertical speed of time is $3.7 \times 10^{44} m/s$, much faster than speed of light because it doesn't combine with gravity. The data will virtually travel as fast as vertical speed of time to the end of the time which is the end of it, which is the entire radius of universe that is $4.4 \times 10^{26} m$. Then it comes back but when it is back it will be 3.3 nanometer into the thickness of the barrier because it during this time, time would go 3.3 nanometer further with its real speed of $3 \times 10^9 m/s$. Let's calculate this:

$$T = \frac{R}{V_t^v}$$

T : the time that takes for data change to travel to the end of universe

R : radius of universe

V_t^v : vertical speed of time

$$T = \frac{4.4 \times 10^{26}}{3.7 \times 10^{44}} = 1.1 \times 10^{-18}$$

This means it takes the data of photon (Origamon) $1.1 \times 10^{-18} seconds$ to travel the radius of universe and return. Now we need to see how far would photon (data with the gravity) progress horizontally in this short duration, so we just multiply the duration by the horizontal speed of time:

$$D = V_t^h \times T$$

$$D = 3 \times 10^9 \times 1.1 \times 10^{-18} = 3.3 \times 10^{-9} m$$

This gives us 3.3 nanometer, which means if the barrier is up to 3.3 nanometer thick/tall, the photon will arrive on its other side, but if it is thicker/taller than this, it will return in the middle of it and it won't be able to tunnel through it. This result gives us a critical conclusion: A fraction of Origamons *always tunnel* through any barrier but we only observe the tunneled Origamons if the thickness/height of the barrier is less than 3.3 nanometer so the tunneled Origamons will appear on the other side of barrier. The result concludes that whenever light reaches a barrier that is equal or less than 3.3 nanometer thick/tall, a number of photons will appear on the other side of the barrier through the tunneling phenomenon. Obviously, the rate of tunneling will be directly proportional to the frequency of light, because the larger number of photons in each Planck Time, the bigger possibility of them to tunnel through the barrier, which is exactly what happens in experiments. This explains how photons tunnel through barriers, and why they cannot tunnel if barrier is thicker than 3.3 nanometer and why tunneling rate is directly proportional to the frequency of light. This tells us two important and unique findings: firstly, the time for photons to tunnel through a barrier is constant and it is independent of the thickness of the barrier and it only depends on the radius of universe and horizontal vs vertical speed of time, secondly, as universe expands constantly, the maximum tunneling diameter will increase constantly above the current value of 3.3 nanometer, because as I explained in previous chapter, the rate of acceleration of time is less than the rate of increasing of the radius of universe, so the end result will slowly go up over the time. By checking the below equation this will be easily understandable. Thirdly, up to 3.3 nanometer the thicker the barrier the faster that tunneling will be observed because while the tunneling time is constant but as we can see in above calculations, the thickness of barrier is directly proportional to the *predicted* spent time per speed of time, in other words, the thicker the barrier, the more significant the tunneling would be

observed. Our calculation can be simplified to produce a new equation for maximum tunneling diameter (D_{max}):

$$D_{max} = \frac{10CR}{3.7 \times 10^{44}}$$

$$D_{max} = CR \ 2.6 \times 10^{-44}m$$

D_{max} : maximum tunneling diameter

C : speed of light

R : radius of universe

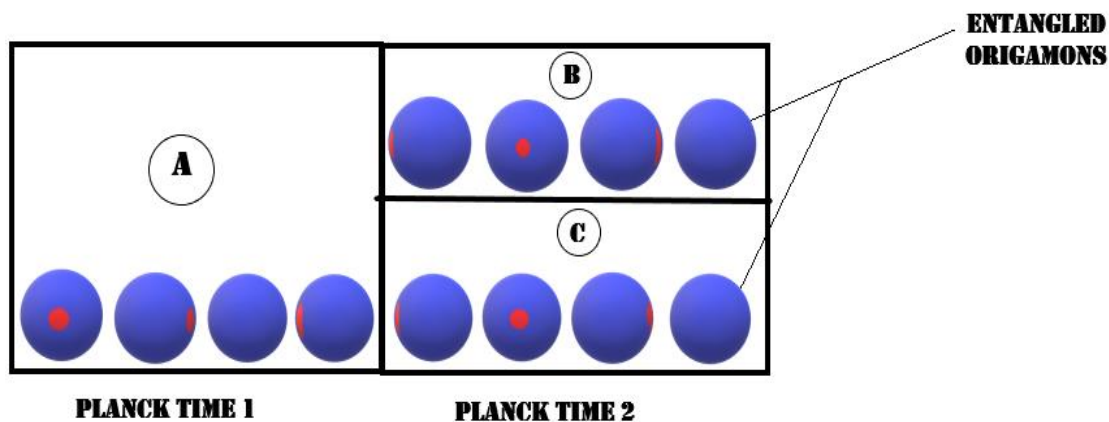
Quantum Entanglement

One of the most unfathomable phenomena in our universe is quantum entanglement which has been baffling all the physicists so much that even Einstein never really believed it. His famous saying to deny quantum entanglement was, "God doesn't play dice with the universe!" We know certainly today that quantum entanglement is real and it has been proved many times. Now we know that more than two particles and even two macroscopic objects can get entangled. Even though entanglement is a wonderful phenomenon and can open a magic door to advanced technologies in near future, there is still no convincing explanation for it. To simplify the entanglement, we can say two particles are considered entangled when applying any force/change to one of them affects the other one instantly regardless of the distance between them. So, obviously entanglement seems to defy the concept of locality and also defeat the speed of light restriction and therefore, it is a conflicting paradox for General Relativity, because nothing can travel faster than speed of light while entangled particles apparently communicate to each other instantly. Can Origami Model of universe provide an answer for quantum entanglement?

One of the unique features of Origami Model is that it shows that all particles in universe are connected both through time and gravity. The sequence of data (time) that creates Origamons is never disrupted and all Digits producing data in all the Origamons in entire universe are in connection with each other. Also, the Gravity inside all three types of black holes, Shelled Black Holes in the center of Origamons and subatomic particles, Naked Black Holes in space and Mother Black Hole encapsulating the universe are all different extensions of the same pool of gravity and this is why the more progression of time through the universe, the more reduction of density in the total gravity of universe will occur. In fact, by considering the speed of time in Origami Model we can relatively easily explain the phenomenon of entanglement. Gravity is the effect that opposes the acceleration of time, so gravity tends to slow down the recombination of data in the Shots. In other words, gravity pushes more particles back into the Shot, and therefore it increases the frequency. Applying force on Origamons (photons) only increases their frequency and this is what we know as Doppler Effect.

As I explained before, revolution of data along the length of time (horizontal progression) creates the spin of Origamons and copying the same data across the width of the shot, produces the illusion of locality. In other words, the vertical expansion of data produces the radius of universe and the expansion of data horizontally produces the progression of time. Of course, there is no horizontal and vertical dimensions here and the correct term would be

copying for vertical extension and *recombining* for horizontal progression. Imagine there are four Origamons produced from the raw of data inside a Shot. As it recombines, it produces new *order* of the same four Origamons that gives us the perception of spin. But it has now there are two new Shots and the four Origamons now have a copy of themselves in the second Shot. Each of the four Origamons in the same Shot are different in their Collateral Data otherwise they won't have spin. However, the four Origamons in each Shot are copies of the four Origamons in the other Shot above it (vertical), which means each one of them has a double in the Shot above it. Below picture demonstrates the vertical and horizontal progression of time in a schematic, simplified way:



Origamons in Shot B and Shot C are entangled

These twin Origamons that we can see in the picture above each other in shots B and C are what we know as entangled particles. Now, if you go from Shot A to Shot B or C we are moving along the length of time, so time will pass. But if we move from Shot B to Shot C we are going through the radius of universe, which means we are changing locality but we are at the same time. As I explained before, speed of time across the vertical shots is 3.7×10^{44} , which is incredibly faster than speed of light. I described before that when time moves across the vertical column there is no gravity involved, so it moves much faster, but for light to travel, gravity needs to get combined with time because when light travels it takes the reality/existence with it. This effect makes two entangled particles to get so much away across the radius of universe but still

be able to affect each other because they are connected through the same data/time. In a simple definition, two entangled particles are the two particles that are produced at the exact same Planck time, they are copies of each other (with different Collateral Data) and they are located across each other in vertical repetition of time. As more Planck Times pass, the two entangled particles get further away because the shots keep breaking and dividing into smaller shots, developing new shots between the two. This is how universe expands. But the two Origamons will be entangled until one of them changes. If a force is applied to one of them, its data will change, and it will be a new Origamon, in a new Shot of time, which cannot be entangled anymore, and this is why any slight force applied to one of the entangled particles, make them decohere. This means the connection between the two entangled particles is not instantaneous but it is so fast that the speed of communication between the two with our current technology won't be easily measurable. Note that speed of time does not defy the General Relativity because speed of time is only applicable for pre-existing reality. This brings us to two critical conclusions: Firstly, the communication between the entangled particles is much faster than speed of light but it is not instantaneous; Secondly, the two entangled particles are not really just two single particles and because they have frequency so each one has many other nearly identical particles traveling in the same Shot but we only observe one particle until they leave effect on a secondary media and that's when we observe their interference pattern. In reality there could be billions and billions of Origamons in each Planck time (Shot) depending on the frequency of light, and we only see the most distal Origamon that exits the Shot first and that's why our chances to find the other Origamon that is entangled with it is reduced so much. In fact, if the frequency of light is 1000, this means in each shot of light there are 1000 photons and at each Planck Time, there will be 1000 photons disappearing and new 1000 photons appearing. So, when two photons with frequency of 1000 are produced in an experiment instantly, there will be two sets of 1000 photons across each other are copies of each other, placed on the top of each other (metaphorically). So, there are two sets of 1000 photons entangled with each other but every single photon is entangled only with one photon amongst the other set in adjacent Shot. This explains why we can only find entangled photons when we produce two photons at exactly the same time or very close time, because obviously due to constant change of data for each Planck Time, if the two photons are from two different Shots that are along each other, their chances of being copies (entangled) is much reduced, this means the first condition for entanglement is that the two photons are produced at, almost at the same Planck time, which is not easy. This is why the chance of finding the entangled photons are low. This also tells us that chance of finding entangled photons (particles) is related to their frequency. It also tells us an incredibly important point: There are large number of entangled particles all the time but we are not able to locate them. Also, this means all the particles smaller than Planck Mass can have this feature because they all have the Quantum Entrapment feature (sharing same Shot). Based on this data we will be able to calculate the real probability of entanglement in particles based on their frequency and mass. This also means the larger the particle, the larger number of Origamons in its mass, the less chance of finding the entangled particle. Also, a macroscopic object can get entangled with another one provided all their particles are entangled one to one. Basically, because Origami Model of universe connects all the Origamons via time and gravity, it gives any mass the probability of getting entangled with another mass.

Four Forces

Unlike the current presumption that there are at least four (or according to some, five) fundamental forces working in our universe and making everything happen, Origami Model only believes in one force: Gravity. As I explained previously, gravity is the property of absolute vacuum that only exists inside the black holes. As Quantum Field Theory proved, vacuum in space is full of particle-antiparticle pairs and it is not even near a vacuum at all.

We will see in last chapters of the paper that what Standard Model tries to describe as Strong Nuclear Force (strong nuclear interaction) and Weak Nuclear Force (weak nuclear interaction) are nothing but pure gravity. As I mentioned earlier, the only reason that Standard Model is not able to consider gravity inside atoms and in the interior of the nucleus is due to the trivial mass of the particles. But if we take the incredibly short distance between these particles inside atom or inside the nucleus, we will find a gigantic gravitational attraction between them that will precisely explain the amount of force in atoms. These infinitesimal radii are obviously smaller than current Planck Length and that's why the Standard Model has to deny their existence, even when they can explain the gravitational forces that will eventually demystify the most perplexing phenomena and also predict some astonishing effects of matter. However, Origami Model recognizes that Planck Length had been much smaller in the past, making it possible for the particles to set in such small distances relative to each other. Because the Strong and the Weak Nuclear Forces are only virtual justification of the behavior of subatomic particles inside atom, there have been numerous conflicts in their descriptions. To mention a few, these forces violate multiple laws of physics such as C Symmetry and P Symmetry and CP Symmetry and there is no logic explanation why they have such massive strength but such trivial range. However, when we replace them by gravitational attraction at sub-Planck lengths, all the problems disappear! The approach of our physicists today is not much different from how Church reacted to Galileo when he claimed that earth was not in the center of the universe! If you can't see smaller than Planck Lengths, it doesn't mean it doesn't exist. When did universe sign the Copenhagen Contract to not possess anything smaller than Planck Length or not perform any act in shorter than Planck Time?

When it comes to electromagnetic force, in the current accepted model, there is again a very vague definition for magnetic field: "A magnetic field is a vector field that describes the magnetic influence of electric charges in relative motion and magnetized materials."

One can very clearly see multiple, obvious errors in this so-called definition. First, it uses the term "Electric charge" without defining it, second, it uses the term "field" in definition of field, third, it does not propose any definition for the magnetism, forth It has no clarity in how the so-called magnetism create and work the effects related to it, fifth, it suggests that magnetism is a product of electric charge and motion which means in absence of electric charge there will be no magnetic moment, which is incorrect. This is the best effort we have done so far to explain the magnetic field and it is a great failure. Now let's check the definition of electric field: "An electric field surrounds an electric charge, and exerts force on other charges in the field, attracting or repelling them. Again, the same awful flaws are present. The definition is utilizing the term "electric charge" without explaining what it means by electric in first place. These are due to our lack of knowledge about the basics of our universe. When we lack an understanding

and definition of force and mass, then how could we be able to define further features and behaviors of them?

However, Origami Model can propose a clear definition for magnetism and electricity and electromagnetic force, which will explain all their behaviors and predict the outcome of various experiments and also explain the conflicts and paradoxes that have remained enigmatic and unexplainable based on our current model. According to Origami Theory, time has a motion which as I explained before, is in fact the Recombination of data, not a real movement in space. The Recombination of data, which we observe as the motion of time, involves Repetition of Core Data and Regeneration of Surface Data, and by combining these two, time creates Spin of the Origamon. As I mentioned previously, Origamon is exactly what in current science is considered as photon and Standard Model considers photons to be massless and have no magnetic moment. However, Origami Model considers photons (Origamons) to have the smallest mass in the universe $1.3 \times 10^{-70} kg$, or 10^{35} times lighter than the lightest neutrinos. This number has been precisely calculated and in further chapters of the paper we will see how crucial this value is in defining absolutely everything in our universe from the proton decay and finding the mysterious physical constants to calculating the total mass and the radius of the universe and predicting the outcome of the world. Besides, Origami Model proves that photons have a magnetic moment without any electric charge. In fact, a few recent studies have shown that photons are disturbed by Aharonov-Bohm effect which can only affect charged particles. Standard Model believes that photons are neutral particles that do not interact directly with a magnetic field. However, recent theoretical work has shown that the phase of light does change with its propagation direction which means there is an effective magnetic field for photons. This direction-dependent phase indicates the presence of an effective magnetic field as shown for electrons experimentally in the Aharonov-Bohm experiment. This was demonstrated by K. Fang and Z. Yu and S. Fan at department of physics, Stanford University, USA, and published in *Article in Physical review. B, Condensed matter* 87(6) · February 2013) as "Experimental demonstration of a photonic Aharonov-Bohm effect at radio frequencies". But much earlier a great study in 2000 also confirmed that photons are affected by Aharonov-Bohm effect so they must have magnetic momentum. The article was published in February 2000 as, "Aharonov-Bohm Effect in Synchrotron Radiation, by V.G. Bagrov, D.M. Gitman, A. Levin, and V.B. Tlyachev at Instituto de Física, University of de São Paulo, Brasil.

Standard Model not only provides an incomplete definition for magnetic and electric fields, it also is incapable of demonstrating how exactly each one functions and which effect is primary and which one is the resulting effect. However, we will see in details that Origami Model can produce an accurate definition for magnetic momentum and electric charge and it also demonstrates that it is magnetism that generates electricity, so the correct term should be magnetoelectric force. This explains why we can find particles with magnetic effect but no electric charge, such as photons. Accordingly, Origami Model predicts that Neutrinos must possess a magnetic property too, because they have spin, just like the photons. We saw before that every particle has a spin because Origamons (photons) have a stationary movement/revolution that is produced by directional change of Vector Syntactic Data. In other words, time rotates and so the produced Origamons (photons) constantly rotate. The rotation of a mass is what we perceive as magnetism. This rotation has a direction because it is produced by Vector Syntactic Data. Therefore, magnetic moment has a direction and that's why we have

North and South poles in every magnet and the magnetic field flows from North to South. When magnetic field affects a mass, it induces a change in its data that is called electric charge. Based on these new definitions in further chapters we will conclude new equations for electromagnetic force that shows it is an indirect product of gravity and time. Therefore, again the only entities that create our universe are still just Time and Gravity.

Antimatter and Bimodal Gravity

We saw that the entire universe is created by recombination of digits and producing new data. Let's imagine there are just six numbers in a Shot and they are randomly setting until they create the following sequence:

1-2-3-5-8-13-21

At the same time, the same digits would produce the opposite version of the sequence too, because they are forming all random sequences:

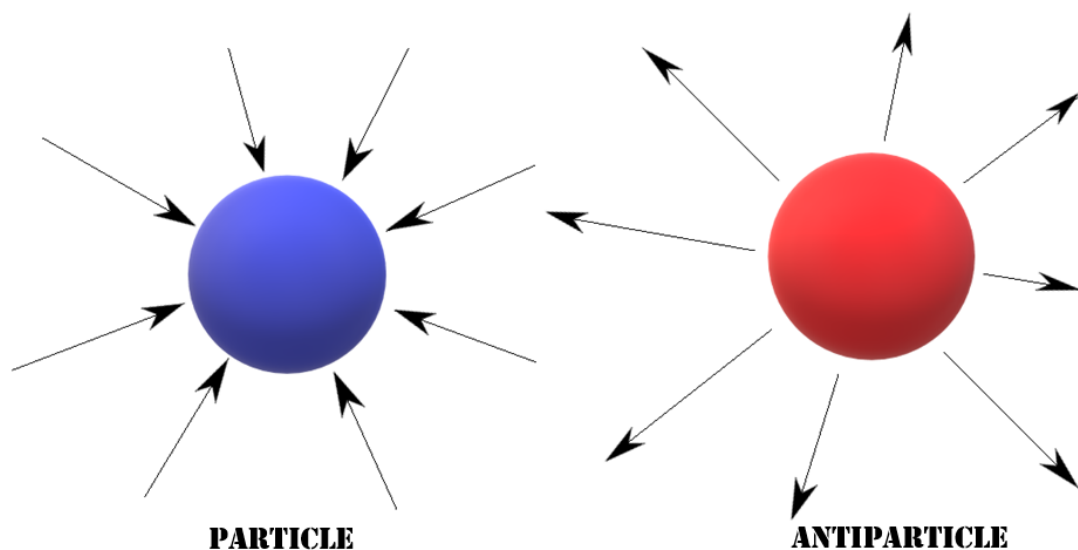
21-13-8-5-3-2-1

If the first sequence is translated to a neutrino, the second one, that is the mirror image of the first one is antineutrino. Therefore, the antimatter is the reverse sequence of data that produces matter and both matter and antimatter are formed by collections of Origamons, but in different structures. This means everything about the matter, including mass, spin, speed, force etc. would be the same for antimatter except one thing:

The direction of gravitational force in antimatter is towards the center of the antimatter.

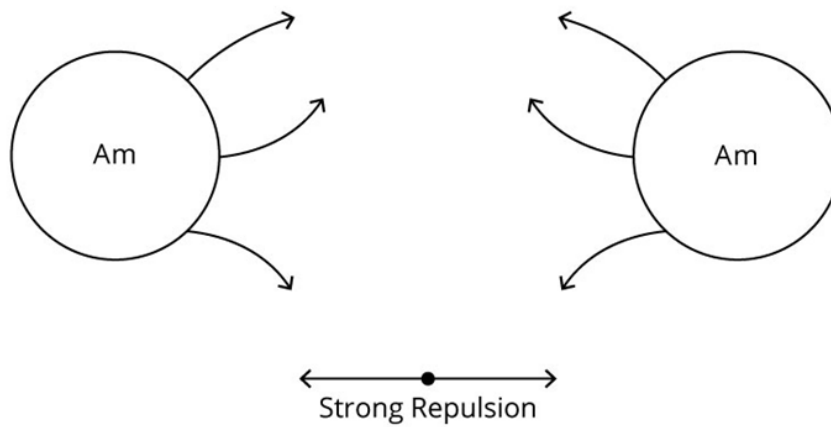
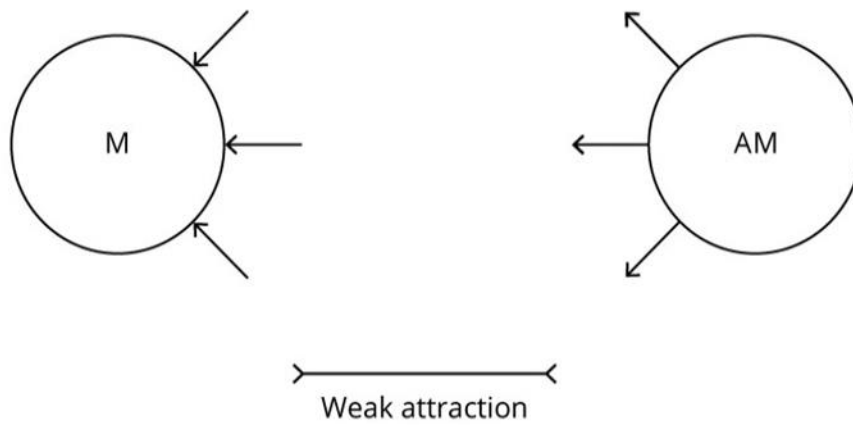
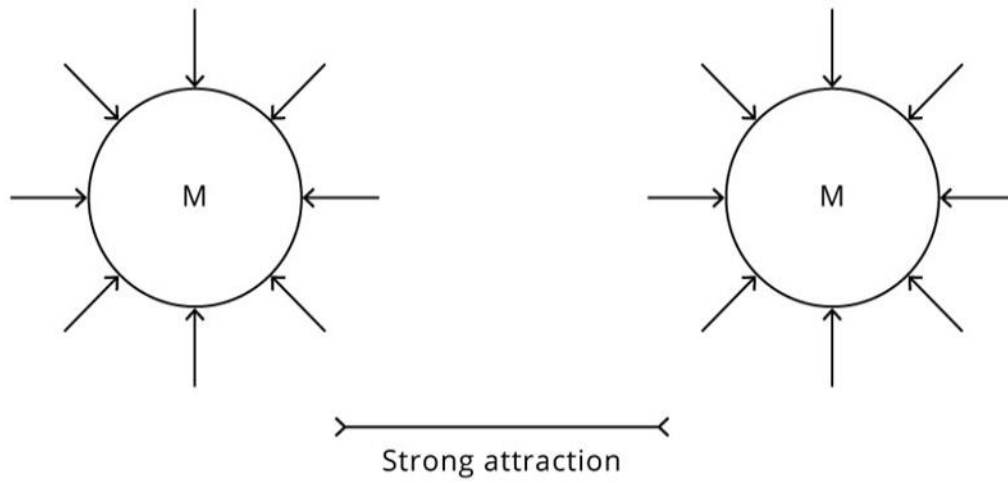
The direction of gravitational force in matter is from the center of the matter.

Below picture demonstrates these vectors:



Direction of gravity in matter and antimatter

As we can see, the gravitational force in matter particles pulls the matter towards the center of the mass, but gravitational force in antimatter particles pushes the antimatter away from the mass. This means two antimatters repel each other, two matter attract each other, and matter and antimatter attract each other. For many decades there have been theories and suggestions trying to explain and predict the gravitational behaviour of antimatter, some suggesting that antimatter repels everything and matter attracts everything, or vice versa, but Origami Model proposes a different model that matter and antimatter attract each other while antimatter and antimatter repel each other. The reason for this is very clear. Because gravity is a vector force, and not a scalar field, so when considering the direction of the force we can clearly see what happens when matter and antimatter interact. Below picture demonstrates this:



Attraction and repulsion due to gravitational interaction between matter and antimatter.

M: Matter, Am: Antimatter

Based on Newton's gravitational equation, the direction of gravity in matter is towards the center of the mass. Considering this, we can derive the following equations predicting the gravitational behavior between particles and antiparticles:

$$g = \frac{Gmm'}{r^2}$$

g : gravitational acceleration or force of gravity

G : Gravitational Constant

m : mass of the particle

m' : mass of the other particle

r : the distance between two particles

$$g = \frac{G(m - Am)}{r^2}$$

g: gravitational acceleration/force

G: gravitational constant

m: mass of the particle(matter)

Am: mass of the antiparticle(antimatter)

r: the distance between the particle and antiparticle

$$g = \frac{-G Am Am'}{r^2}$$

g : gravitational repulsive force between

G : gravitational constant

A_m : mass of one antiparticle(antimatter)

$A_{m'}$: mass of the other antiparticle(antimatter)

r : the distance between the two antiparticles

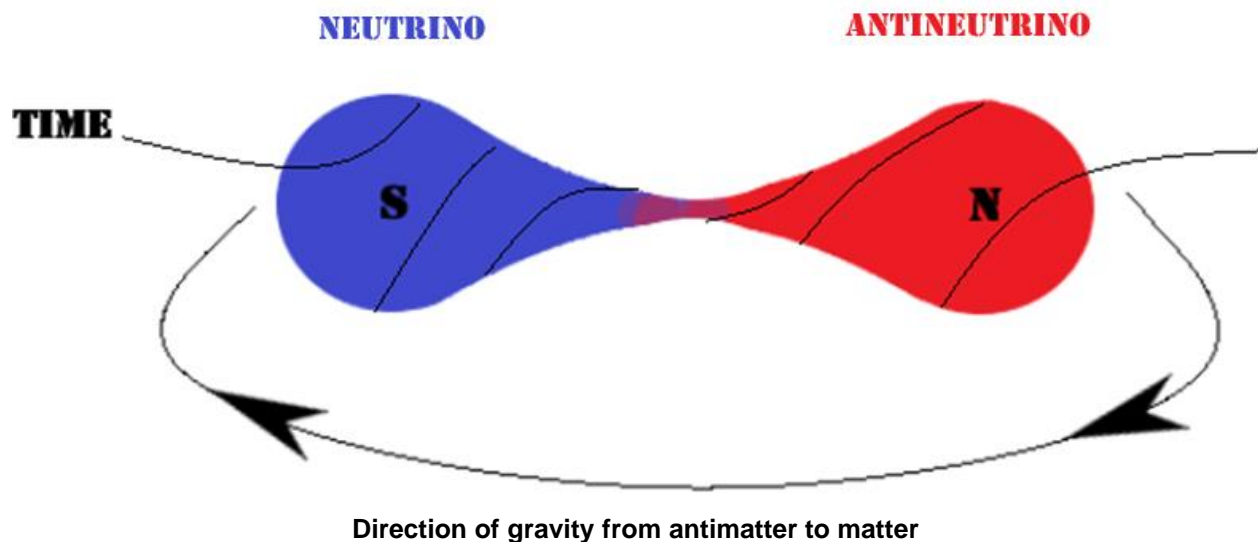
- : the negative sign means repulsive force

Therefore, according to these new equations, we will have three crucial conclusions:

- Gravitation is a dipolar *vector* force
- There is strong gravitational *attractive* force between two particles;
- There is weak gravitational *attractive* force between a particle and an antiparticle;
- There is strong gravitational *repulsive* force between two antiparticles.

We will see how critical these new equations are in explaining and predicting the features of our universe specially in cosmology. Based on these equations in further chapters we will precisely calculate the quantity of Dark Energy, predict the radius of galaxies with incredible precision and discover why our universe is expanding and how much and till when.

I mentioned earlier that the direction of gravity in Origamons is towards the center of the particle and this is why gravity in all masses attracts the other mass towards the center of it. However, the direction of gravity in antimatter is from the center of the antimatter outwards and that is why every two antimatters repel each other. If we combine time and gravity in a matter (neutrino) and an antimatter (antineutrino) will have something like the following picture:



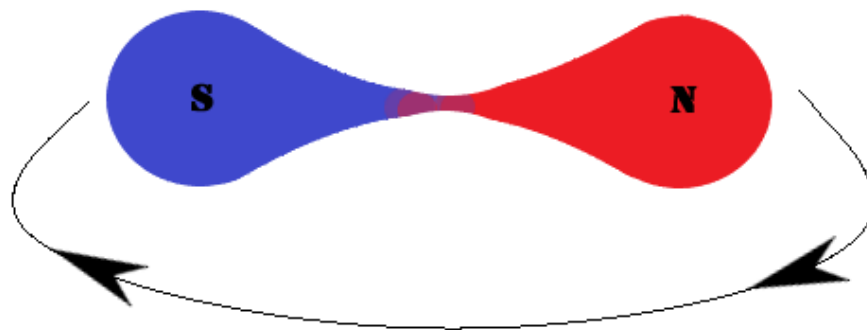
When matter meets antimatter, the entire mass will be converted to Origamons (photons). This is why Origamon (photons) in fact have no antimatter. The smallest real anti particle is our

universe is antineutrino, because if Origamon had an antiparticle they would have destroyed each other at Big Bang and nothing would have been created. Unlike the Standard Model that believe photons (Origamons) only exist in free form, Origami Model shows that photons are the building block of universe simply because they are the smallest particle and also any matter in universe when receives energy, releases photons. This means obviously photons (Origamons) are part of the structure of all other subatomic particles. So, at the Big Bang, Origamons fused to produce neutrinos and antineutrinos and from that moment, expansion started due to the gravitational attraction and repulsion with the mechanism that I explained in previous chapters. But how could Origamon (photon) have no antiparticle. The answer is very clear: Origamon is the first and simplest Data, so it is symmetric and it is not able to produce the antiparticle for itself. I showed before that antimatter has only one structural difference with the matter and that is the order of its data (time). When the sequence is reversed, the antimatter is created and that's why every particle automatically has an antiparticle. But Origamon has a symmetric data such as this:

1-2-3-2-1

This symmetric data cannot have a reversed form. In other words, Origamons are consisted of the very first data: 1. The one Digit is not capable of having reversed form. But anything that is created with more data based on Fibonacci Sequence, will be asymmetric and capable of having antimatter counterpart. For example Neutrino is 1-2, then the antineutrino would be 2-1 and so on.

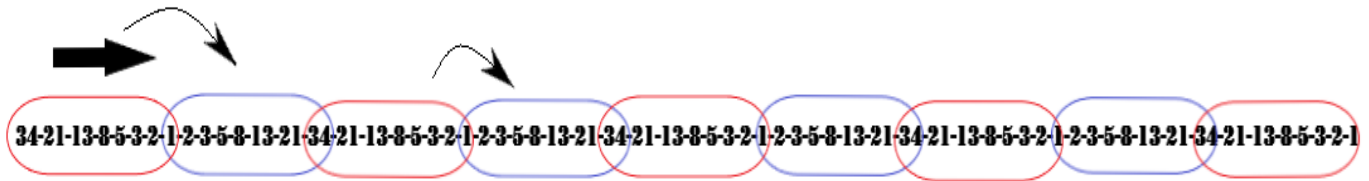
As we can see in the pictures, the gravity begins in the center of antimatter and ends in the center of matter. This means we can imagine gravity as a dipolar force and if we call the gravity pole in the center of antimatter N, the gravity pole in the center of matter will be S and gravity will always flow from N to S, just like a magnet:



GRAVITATIONAL FORCE VECTOR FROM N TO S

Picturing gravity as a dipolar force from antimatter (N) to matter (S)

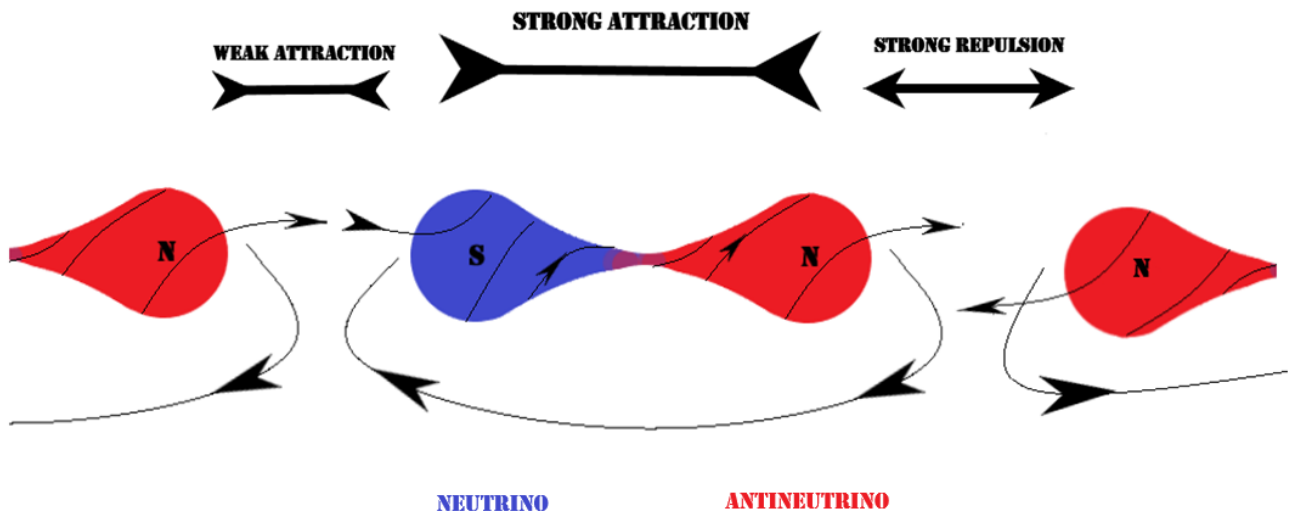
But what makes gravity to have such direction? The answer is in fact in time. If we imagine that a neutrino is only a sequence of five Digit of 1-2-3-5-8-13-21-34, then the reversed sequence will be the antineutrino: 34-21-13-8-5-3-2-1. Let's demonstrate this:



Imaginary sequence of data that produces neutrino and antineutrino

Now we can see two important points in above diagram:

First, the direction of Digits is from antineutrino to neutrino and this is why the direction of gravity is from antineutrino to neutrino, below picture demonstrates the interaction between the matter and antimatter and how gravity can act as a repulsive force as well as attractive force.



Repulsion and attraction caused by gravity

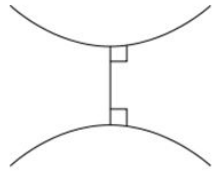
Second, there is a common point or shared Data between every neutrino and antineutrino. When two series of data are reversed picture of each other, they will have at least one point of connection, the end point of one will be the beginning point of the other one. Therefore, our entire universe is interconnected. This means that although time is quantized but it does not disrupt at any point between the matter and antimatter. In other words, the entire universe is connected through time. However, we will not be able to time travel to the past because past is annihilated and we will not be able to travel to future because it requires us to travel as fast as horizontal speed of time which is 10 times faster than light. This is why despite the quantum tunneling occurs with speed of time (much faster than speed of light) but it does not violate the causality because particle always arrives at a certain point in *future*. I will show later that the

only way to time travel would be through gravity and using the black holes because they are timeless.

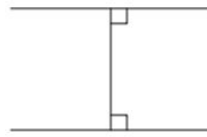
Antimatter has been a great mystery for us till now. However, Origami Model can propose a convincing structure for it based on the features of gravity and time. To see the structure of Origamons in antimatter, we must consider the direction of gravity. But before that, we need to note that every subatomic particle can have an antiparticle except the Origamons. Because Origamon is the first mass, its data is only one Digit: 1. Therefore, it cannot have a reversed form. Even if it has more than one Digit in its structure, there is a symmetry in its data, because it is the plain particle. After the Origamon, all other masses are produced by collections of more than one Origamon therefore, they lack symmetry of data which enables them to have an antiparticle. By symmetric data I mean a sequence of Digits that is the same if reversed. Such as:

1-2-3-2-1

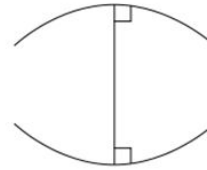
If Origamon is consisted of such sequence, its antiparticle will be the same as the particle. In other words, Origamon has no antiparticle. This is why photons have no anti-photons. This explains why at the Big Bang, matter and antimatter did not annihilate each other because first matter that was produced was Origamons and they have no antiparticle to annihilate them. I showed that the structure of Origamon and all the particles is in a spiral form that follows Fibonacci Sequence. On the other hand, the structure of antimatter is in an opposite form because the direction of gravity is from the center outwards. We know that the geometry of space is not Euclidean geometry, which means the reality of lines in our universe can be in Elliptic direction or Hyperbolic direction. In matter, shells of Origamons are arranged in Elliptic direction, creating a spiral form. In antimatter, shells are arranged in Hyperbolic direction, creating a stag form. The following picture demonstrates the difference:



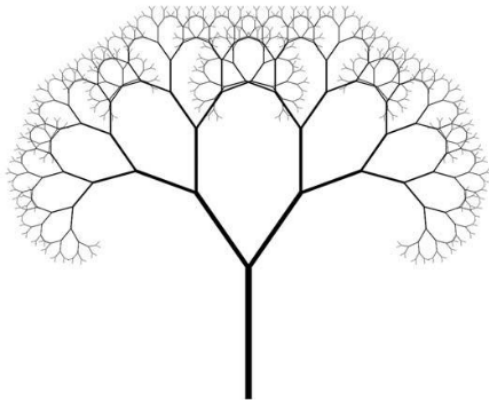
Hyperbolic



Euclidean



Elliptic



STAG PATTERN

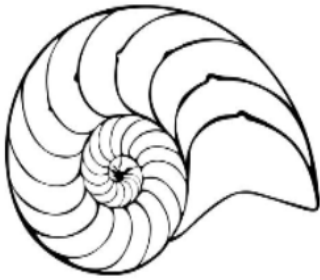
ANIMATTER



SPIRAL PATTERN

MATTER

As we can see, when shells are in Stag arrangement, they produce a *branching out* structure. We see this transpire in all various things in universe, such as trees. When shells are in Spiral arrangement, they produce a *closing in* structure. Below picture shows examples of these two patterns in nature:

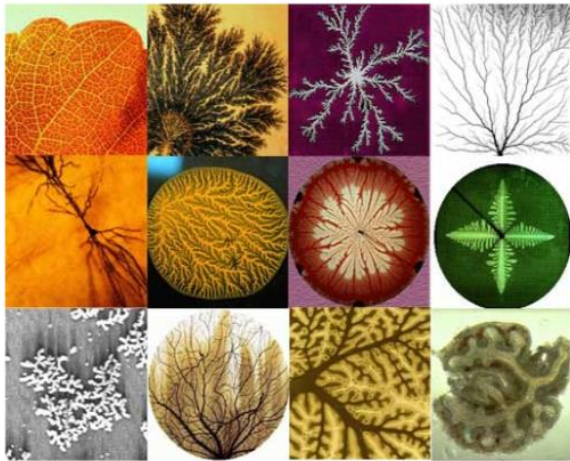


ELLIPTIC



HYPERBOLIC

A sea shell is a typical closing-in structure while staghorn is a classic branching-out system. Everything in nature is either in stag or spiral form:

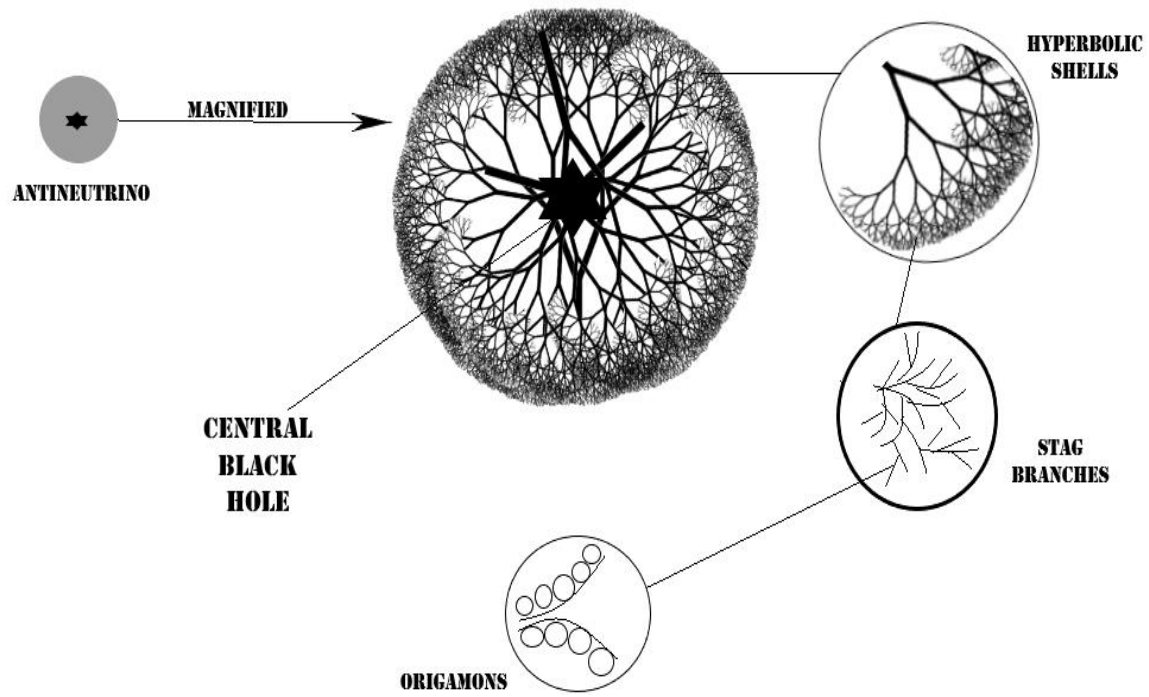


STAG FRACTALS

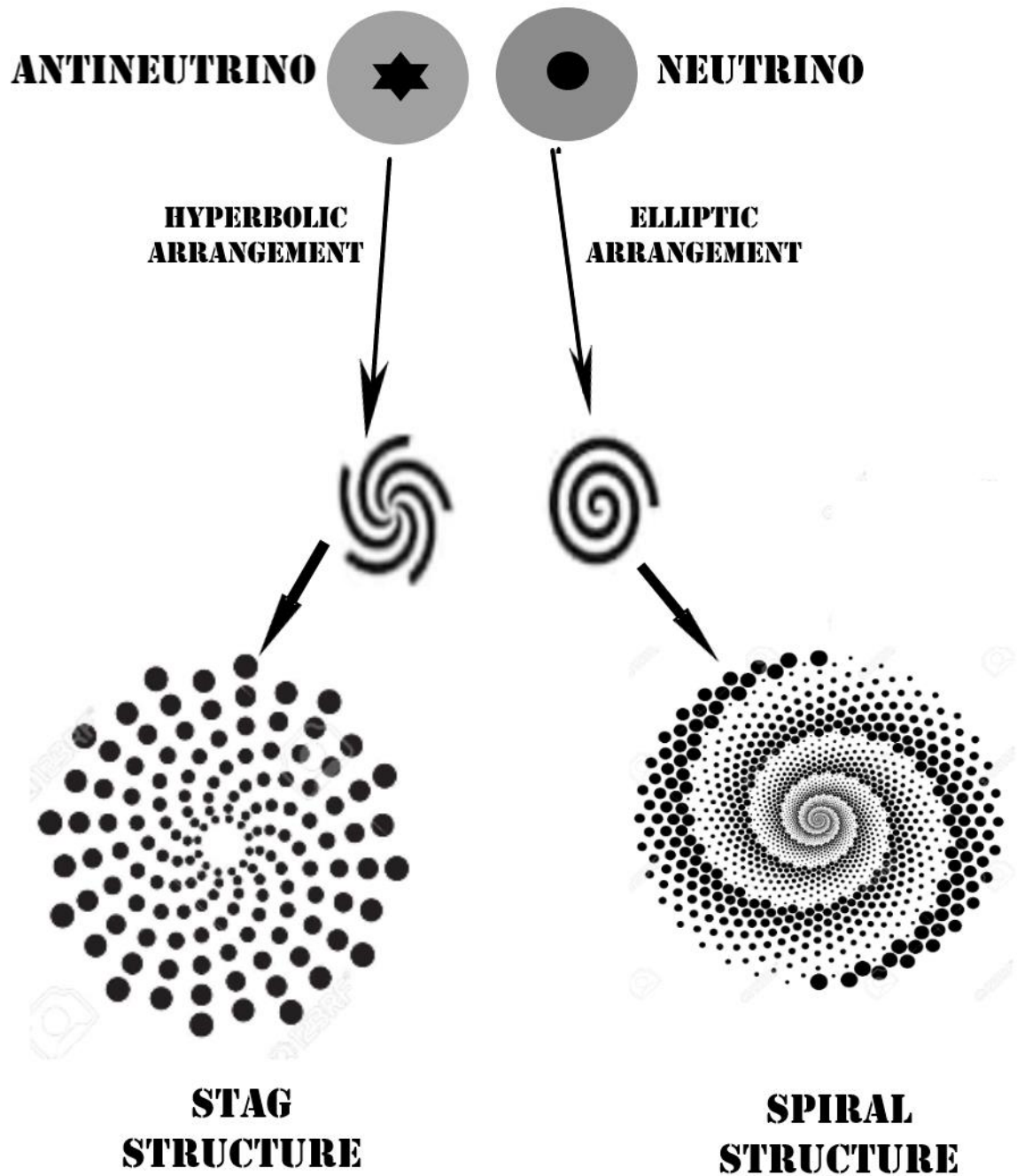


SPIRAL FRACTALS

Now, with this in mind we can understand the difference between the structure of a particle and an antiparticle. Below picture demonstrates the structure of an antiparticle, such as an antineutrino and how Origamons arrange in its stag shells:



This structure explains why when antiparticle meets particle, the radiating shells of antiparticle which are consisted of Origamons will virtually penetrate between the shells of particle, attaching to the Origamons in its shells and separating them from the central black hole, so that eventually all the Origamons in the particle and antiparticle will break free. That's how the entire mass converts to free Origamons, energy. Also due to the direction of gravity in antimatter, the shape of its central black hole will be radiating instead of spherical.



The structure of shells and central black holes in matter and antimatter

To end this chapter, I just summarize the discussion. Our definition of gravity in antimatter would be still the same: Gravity is deceleration of time or expansion of Shots of data. Mass of the antimatter is also the same: Mass is combination of time (data) and gravity. Spin, the directional revolution of antiparticle would be opposite of particle because the sequence of data is reversed. The force of gravity between the Origamons (matters) tend to attract Origamons

towards each other, and eventually work in direction of reducing the radius of universe, but force of gravity between the Anti-origamons (antimatter) tend to repel the Anti-origamns away from each other, and eventually expand the radius of universe.

Unlike the gravity that has direction, we see that Data (time) is chiral, which means it is asymmetric and random. As we can see in Fibonacci sequence, nothing repeats itself. However, when data combines with gravity, it gets ordered and sequence and this is how it produces the spin. Gravity is the reason of universe.

Dark Energy

For thousands of years our thinkers believed that universe had no limits and it was static, not getting bigger or smaller. But when Einstein discovered the general Relativity, he realized that our universe must have boundaries, but at the same time something deeply confused him: Our universe is made of billions and billions of massive stars and celestial bodies, every one of which has millions of kilograms of mass, and every two masses attract each other, so there must be a tremendous amount of gravitational force in space pulling all these bodies towards each other, which means our universe must have shrunk into a small, super-dense mass long time ago. But that has not happened. So, when Einstein calculated how much gravitational attraction force was in space, he was scratching his head, "There must be a massive force cancelling this tremendous gravity, I would call it Cosmological Constant." Being such an extraordinary genius, he basically discovered what we now call Dark Energy. So, Dark Energy is the unknow energy that is not only neutralizing the gravitational attraction between the stars and galaxies, it is actually expanding our universe with an enormous force. We call this mysterious force Dark because it is unknown, not because it is lightless or has black color.

There is also another conflict in our understanding of universe that has been bothering our physicists for decades and they haven't been able to find a proper explanation for it: Universe started at Big Bang, producing particles and antiparticles, matter and antimatter with exactly the same rate. We know that matter and antimatter annihilate each other instantly, so, how did the universe not get annihilated shortly after the Big Bang? There must have been a kind of imbalance, causing the Big Bang to produce more matter than antimatter and so the matter eventually produced our galaxies and our visible universe that we observe and the antimatter went somewhere that we haven't found yet. But to have such asymmetry of production we need a tremendous force, a kind of intervention, which is contradicting the entire Big Bang model. So far there has been no convincing answer to this. This is called Asymmetry Problem and obviously it is a very tough one!

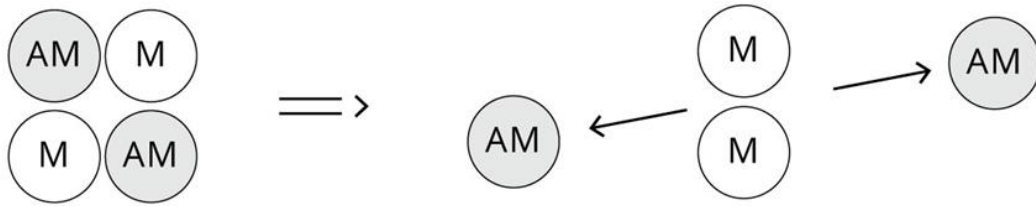
However, the model of universe that is produced based on the Origami Model interestingly has no such problem. Neither Dark Energy nor Asymmetry Problem are any conflict in Origami Model . Just imagine what I showed you about the matter and antimatter and the quality of gravity between them and all the problems will disappear and we will also be able to precisely calculate the mass of universe, the value of Dark Energy and the final fate of our universe.

Let's go back to the first moment of universe. Imagine at Big Bang, at the very first moment, the first two particles are produced by recombination of data: one Origamon and one Anti-origamon. To simplify our calculations let's suppose that Origamon has 2 kg mass and Anti-origamon has - 2kg mass. Using our equations for gravity, we can find out how much attraction or repulsion will exist between these two particles:

$$g = \frac{G(M - M')}{r^2}$$

$$g = \frac{G(2 - 2)}{r^2} = 0$$

This clearly shows that the force of gravity between a particle and antiparticle that have same absolute mass is zero. Therefore, there will be no movement between these two. Until the second pairs pop out:



Now we can clearly see, as soon as the next pair are added to the first ones, the whole equilibrium changes. In above image, M is matter (Origamon) and AM is antimatter (Anti-origamon). Based on our equation, there will be strong attraction between the two Origamons and strong repulsion between the two Anti-origamons. The absolute amount of these attraction and repulsion forces is equal, in other words, with the same force that Origamons are pulled together, the Anti-origamons are pushed away. This is the first movement in our universe, the first step of expansion of universe. This is why our universe is expanding. This is why the two matter and antimatter pairs do not annihilate each other. This is how Asymmetry is created. The attraction force between the two Origamons would be:

$$g = \frac{G(M) \times (M)}{r^2} = \frac{G}{r^2} \times 4$$

We will show what the original radius (distance between the two Origamons at Big Bang) is in further chapters, but here just to show the phenomenon without too much mathematics, we can consider the value of $\frac{G}{r^2}$ as a fixed number. We know that G is always the gravitational constant $= 6.67 \times 10^{-11}$. The repulsion force between the two Antiorigamons would be:

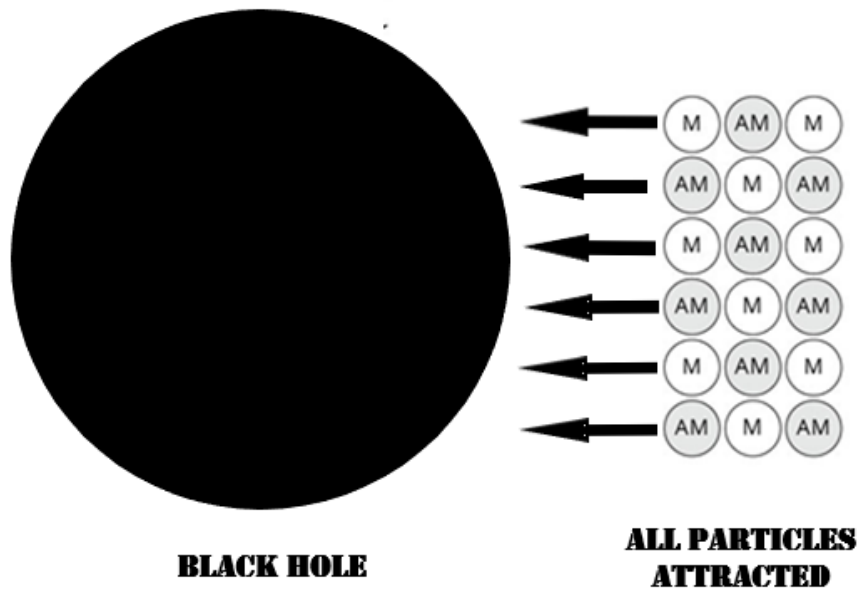
$$g = \frac{G(AM) \times (AM)}{r^2} = \frac{G}{r^2} \times 4$$

The same phenomenon continues till today, gathering more mass, creating more particles, more objects, more stars and galaxies and also at the same time, pushing more antimatter away to the periphery of universe, creating expansion of universe. We can see that repulsion force

between the Anti-origamons directly depends on the mass of Anti-origamons, so as more Anti-origamons are produced, more repulsion force and faster expansion occurs and that's why expansion of universe is accelerating. Also, because the force of gravity has an infinite range, the expansion goes forever, never stops at certain point. However, we know that based on Origami Theory, nothing has infinite mass or range or dimension or value, because infinite is undefined. We saw before that the source of gravity in our universe is in fact the Mother Black Hole and we are expanding inside this large black hole that encapsulates our universe. This is why we find the range of gravity to be infinite because it continues to the outer periphery of our universe. In fact, the gravity ends at event horizon of Mother Black Hole. We will calculate the radius of Mother Black Hole in next chapters to see how far our universe will expand.

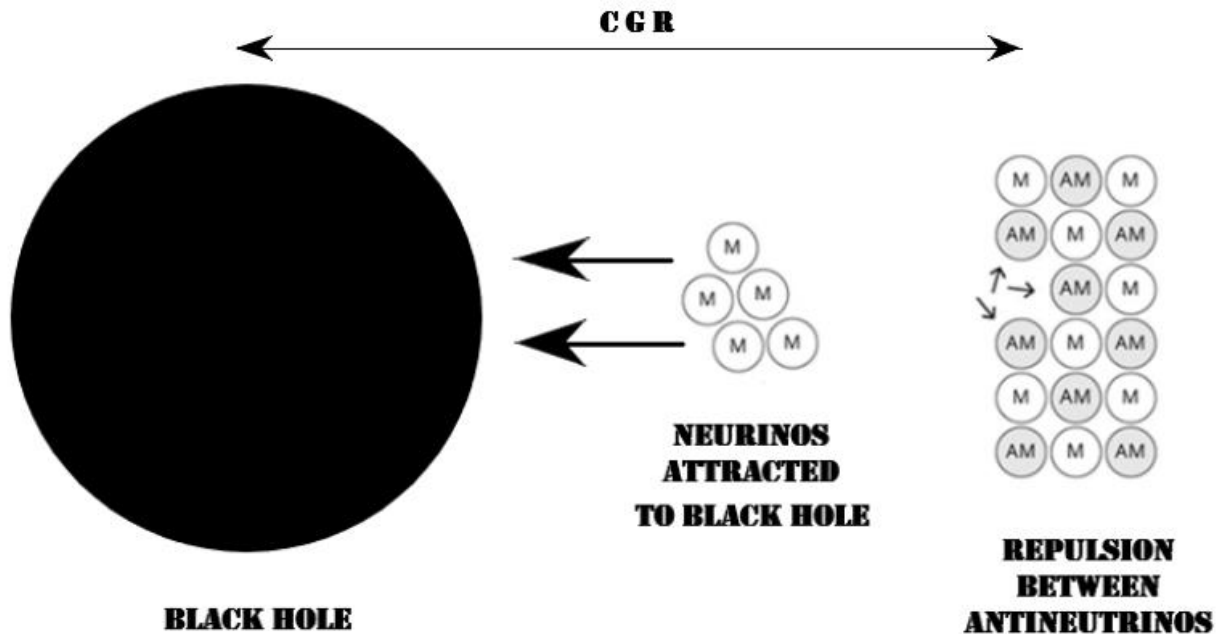
Now let's get back to the Naked Black Holes in space. We know now that these large black holes are nothing but empty pools of gravity and they are the only places in our universe that contain absolutely nothing, not even the Neutrino Matrix that fills our space. Now, let's see what happens based on our equations when a black hole affects the Neutrino Matrix around it.

Near the black hole, due to the large gravitational attraction that black hole applies on neutrinos and antineutrinos, all of them will be attracted to it. According to our equations, we can see that the black hole will apply Strong attraction on neutrinos (because they are matter) and Weak attraction on antineutrinos (they are antimatter), but eventually all of them will be pulled to the black hole. The imbalance of the attraction is crucial, because it will separate the particles and stop them from annihilating each other, so they all get pulled to the black hole. But as I mentioned before, and we will calculate in later chapters, nothing enters a black hole, so all these particles accelerate as they are moving toward the black hole until at a certain distance from the surface of the black hole (event horizon) they reach speed of light and according to general relativity, they turn into photons. In fact, their mass is pulled apart and all the Origamons used in their structure get separated as free photons. This is why every naked black hole in space is surrounded by large halo of high energy photons. Today, physicist trying to explain this large powerful disc of electromagnetic force around the black holes, proposing that friction between the particles accelerating towards the black hole is the cause of this strong halo of light. All the observational findings are against such presumption. In further chapters, based on the radius of the black hole and the gravitational attraction between the particles and the black hole we will calculate the distance at which these particles convert to light and we will call that Transitional Zone.



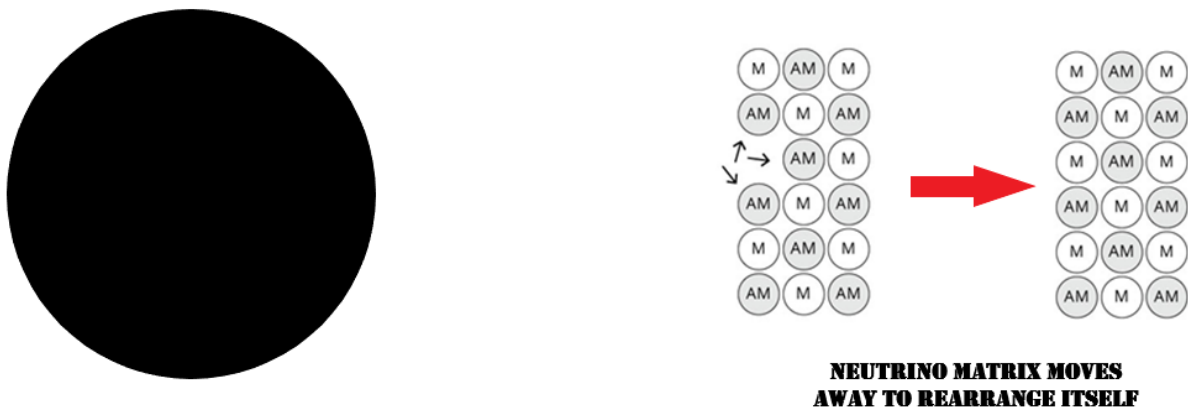
Near the Naked Black Hole, the neutrino matrix is pulled

Now, as we get further away from the black hole, at a certain point, the weak attraction force of the black hole will become equal to the strong repulsion force between each two antineutrinos in the matrix. Note that due to the extremely small distance between the antineutrinos in the matrix, this strong repulsive force between them is surprisingly very high. At this point everything changes and magic happen. Right at this radius from the center of the black hole, neutrinos are still attracted to the black hole by the Strong attractive gravitational force, but antineutrinos are not moving anymore because the Weak attraction applied by the black hole on them is neutralized by the Strong repulsive force from their adjacent antineutrinos. Therefore, only neutrinos are pulled out of the matrix, leaving the antineutrinos behind. Below picture demonstrates this phenomenon:



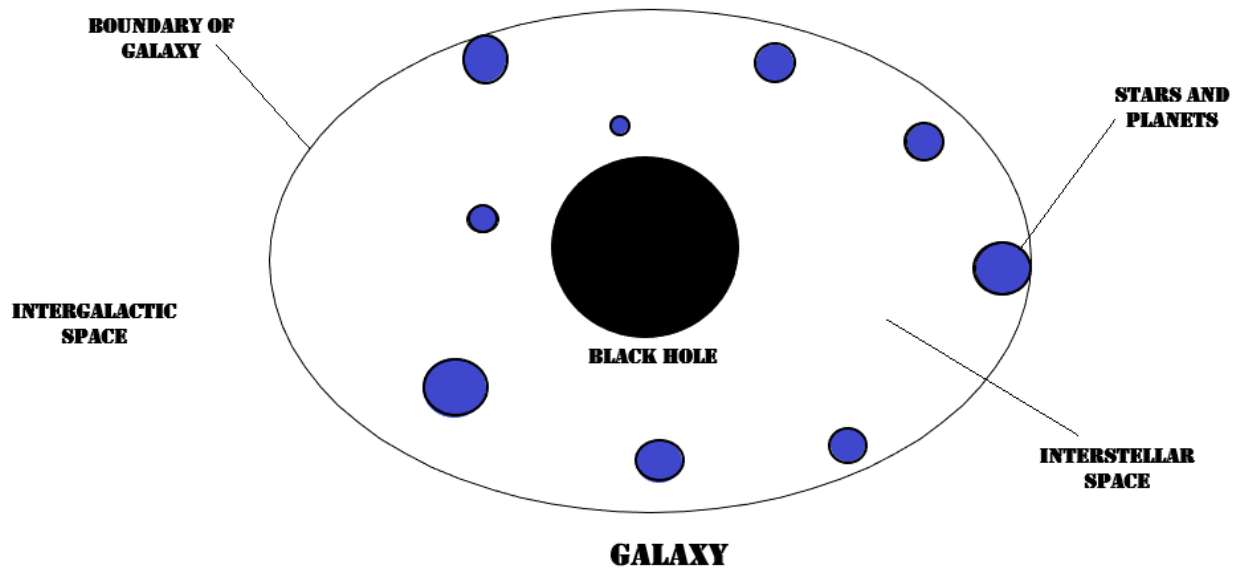
At a critical distance (CGR), only neutrinos are pulled to the black hole

This imbalance, is exactly the same as the imbalance at the Big Bang that created the first expansion of universe and the Asymmetry of matter-antimatter. Therefore, there will be a disorder created in the equilibrium of the Matrix. The left-behind-antineutrinos repel each other strongly, pushing the entire matrix away until it rearranges itself back again at a further back radius.



Neutrino Matrix moves away to restore its equilibrium

This will continuously repeat itself until at a certain distance, the forces neutralize each other. By using the masses of neutrinos and antineutrinos that we already know and inserting them in the equations that I suggested in previous chapter for the gravitational force between matter and antimatter, in next chapters of the paper, we will conclude equations that enable us to calculate this radius for every black hole in space. We are going to call it Critical Gravitational Radius or CGR. Therefore, CGR is the distance from the center of a Naked Black Hole at which, the Neutrino Matrix, or in fact the space, is expanding. This means inside the CGR (in distances shorter than the CGR of a black hole) space will not expand or shrink because neutrino-antineutrino pairs constantly pop out from the quantum field and get pulled by the black hole and convert to energy, pumping energy into our universe. Check the following picture to understand this effect easier:

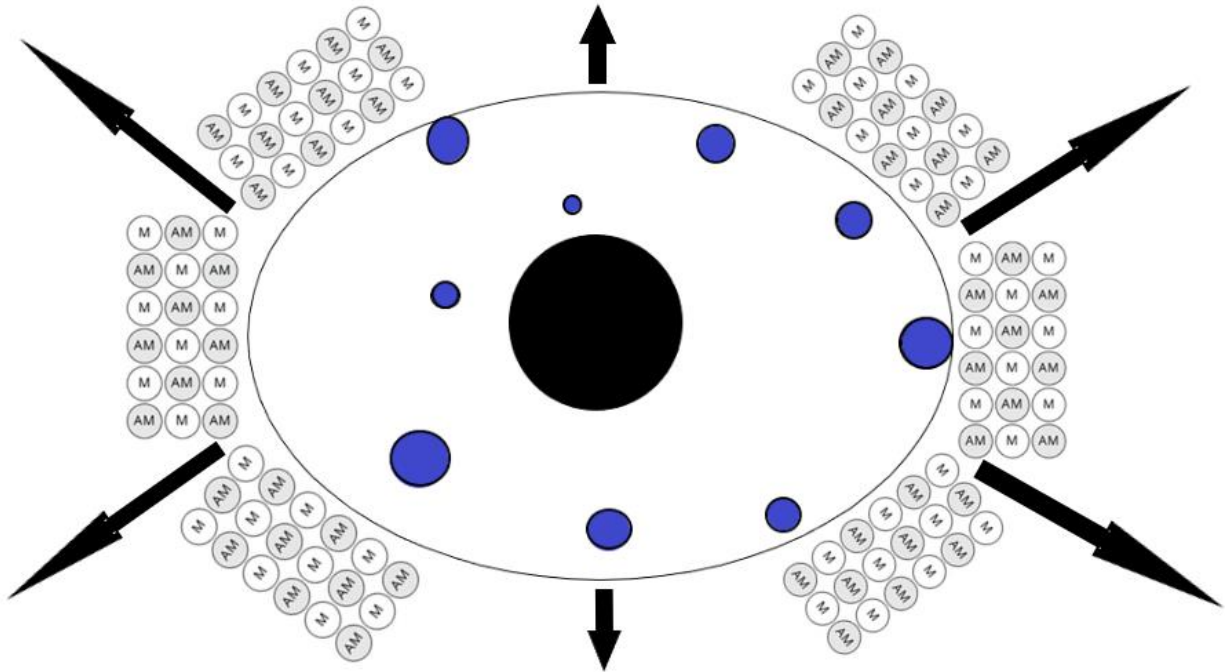


Schematic figure of a galaxy with a black hole in the center

We will go through the mathematics of finding the equation for the CGR of the black hole based on the model that I proposed for gravitational forces acting on neutrinos and antineutrinos. The equation will be an extraordinarily simple one:

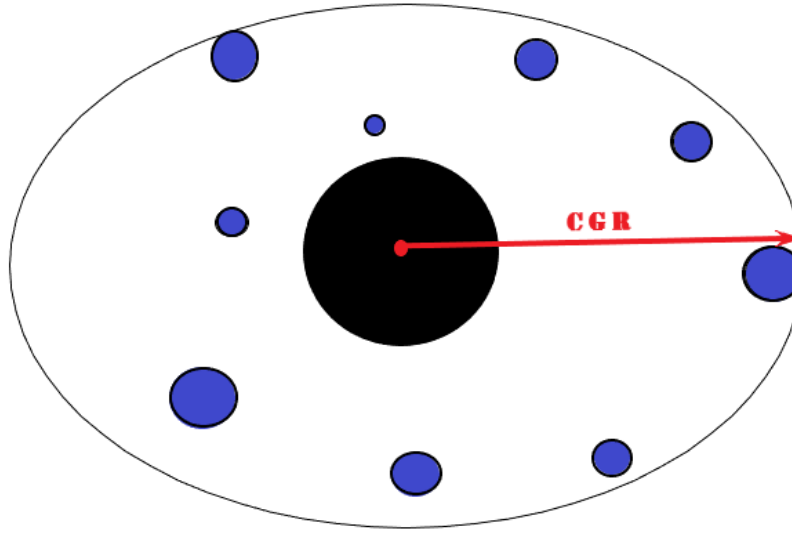
$$CGR = \sqrt{M} \times 1.68 \times 10^2$$

In above equation, M is the mass of the naked black hole and the CGR will be the Critical Gravitational Radius of the naked black hole.



Only the space outside the CGR gets pushed away

The equation that we will extract for the CGR turn out to be incredibly critical. Based on Origami Model , there must be a very massive black hole in the center of each galaxy and the stars and all celestial bodies of the galaxy will have to be located inside the CGR of the black hole and then beyond the CGR, the space will be pushed away, expanded. This explains why we always find large black holes in the center of all the galaxies. It also explains why space inside the galaxy does not expand and why the space outside galaxies expands. This also demonstrates that expansion is directly proportional to the radius of the Black Hole. So, if our model is correct, the CGR of a black hole in the center of a galaxy must be equal to the radius of the galaxy.



GALAXY

The CGR is exactly equal to the radius of the galaxy

We can easily try our equation now. The central black hole for Milky Way Galaxy is called Sagittarius A, which has a mass of $7.6 \times 10^{36} kg$. Therefore, the CGR of this black hole would be:

$$CGR = \sqrt{M} \times 1.68 \times 10^2$$

$$CGR = \sqrt{8.8 \times 10^{36}} \times 168$$

$$CGR = 4.99 \times 10^{20} m$$

The radius of the Milky Way Galaxy is $4.99 \times 10^{20} m$. This is incredibly consistent with Origami Theory! Based on my definition of the Critical Gravitational Radius, a galaxy around its central black hole can grow up to this radius and not more, so the Theory predicts that the radius of every galaxy will be equal or less than the CGR of its central black hole, because inside this radius, black hole attracts the space and whatever is inside it and beyond the its CGR, black hole repels the space and everything in it. Now let's try the equation for another galaxy. Andromeda galaxy has a massive black hole in its center that is a binary system with total mass of $5 \times 10^{37} kg$, so the CGR for this black hole would be:

$$CGR = \sqrt{M} \times 1.68 \times 10^2$$

$$CGR = \sqrt{5 \times 10^{37}} \times 168$$

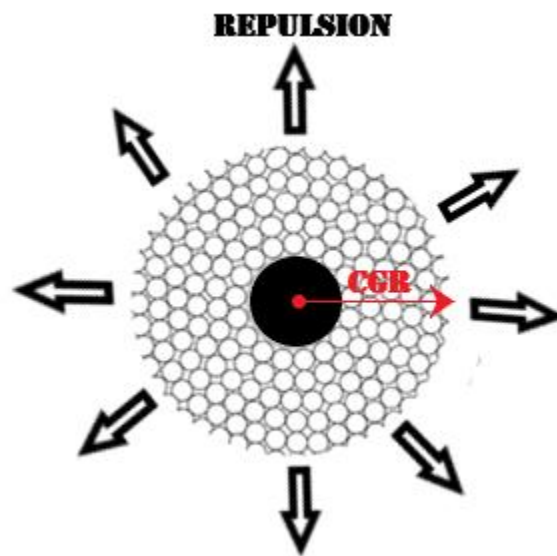
$$CGR = 11.87 \times 10^{20} m$$

Amazingly the radius of Andromeda galaxy is $11.35 \times 10^{20}m$. My result again has tremendous accuracy for such cosmic scales of calculation. Note that observational measurements of NASA about the radius of galaxy can change and I believe our results is more accurate. This equation is incredibly precise and it is a wonderful bridge between gravity and quantum mechanics.

For decades, scientist have been discovering massive black holes in the center of galaxies and they are not able to explain why. Origami Model explains that without these central Naked Black Holes, the galaxies would never form, and it also explains that what we call dark energy and we haven't been able to locate and discover, is nothing but the gravity, and it also demonstrates that it is the naked black holes that are responsible for formation of our galaxies and also the expansion of our universe.

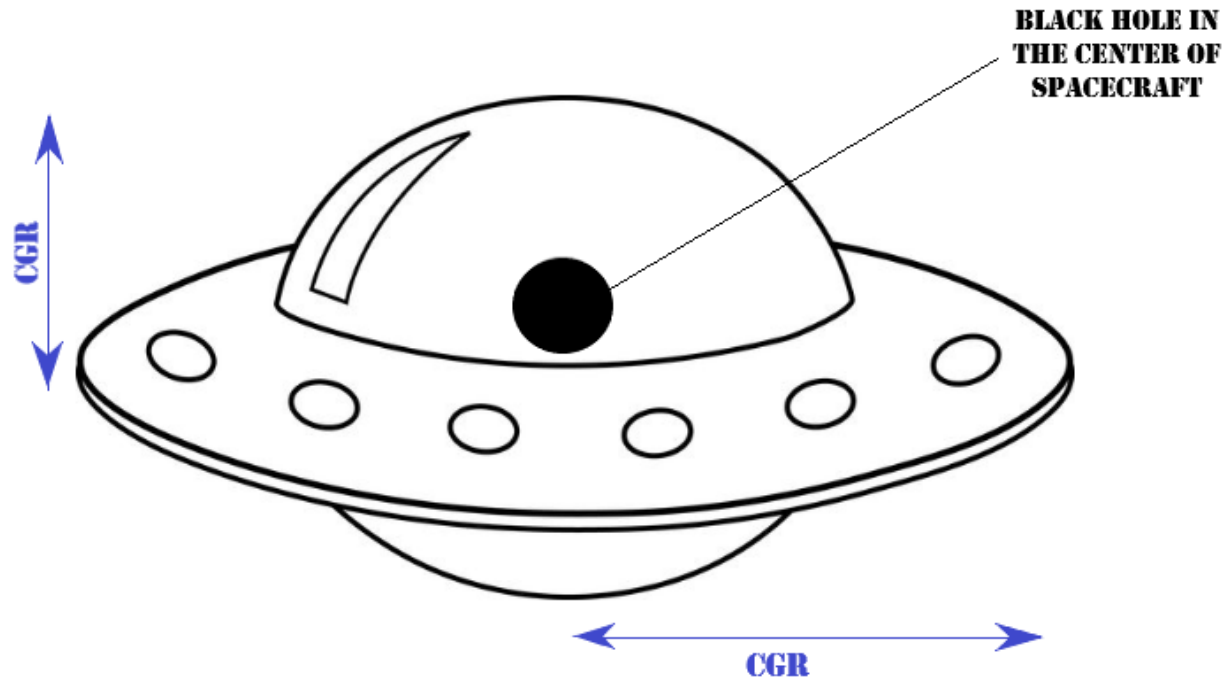
Origami Model demonstrates how crucial Naked Black Holes are in our universe. What you see in this short, simplified version of the paper, is only a brief review of Origami Model in simple language for everyone with average knowledge of classical physics. In further parts of the paper where we mathematically find and prove all these forces and equations, we will see how incredibly easy our universe can be understood. Using our equation and the total number of naked black holes in space, we will calculate the total amount of what is called Dark Energy and we will see that it is near 70% of the total energy in our universe, precisely consistent with calculated amount of Dark Energy required for expansion of our universe! Then we will mathematically conclude that to sustain the uniform expansion of universe, there need to be more black holes developed to cover the entire increasing volume of the universe, so we will calculate the distribution of black holes in space. Besides, as I explained earlier, because every type II Supernova leaves a black hole behind, we will be then able to find out the rate of supernovae explosion in universe and we will see that is exactly consistent with NASA's observations: one every 50 years! We will also realize why despite the amazement of current cosmologists, the density of what they call Dark Energy is constant, and we will even calculate the distribution of black holes in universe to discover that is exactly sufficient to provide an even and uniform expansion for the entire intergalactic space and we will see that our findings are precisely consistent with observations and findings of cosmologists at NASA and other major research centers in the world. There is overwhelming evidence to prove that Origami Model cannot be accidentally correct. The Theory demonstrates to us that black holes not only do not swallow anything, but they create our universe and sustain it, and expand it until it reaches its final Destination. By the end of studying the entire paper, all the Dark parts of our world will be illuminated and suddenly all pieces of the puzzle will fall into places, creating an incredibly beautiful picture of our universe that everything in it works with other parts, nothing is random. To end the discussion, I need to mention another wonderful finding here: The very same mechanism that I showed for the naked black holes and their CGR, works for the particles. As I explained before, all subatomic particles have a central black hole that I denominated as Shelled Black Holes. Note that when these particles get together and produce large objects, they don't fuse to each other, so there won't be a single, central black hole inside macroscopic objects. So central black holes exist only in subatomic particles. This is exactly why macroscopic objects interact with friction but in quantum world we find no trace of friction between the particles. Lack of friction has been absolutely confusing the physicists for decades and there is no proper explanation for it. However, considering how gravity can act like a repulsive force in presence of antiparticles (which are everywhere), we can clearly see the

reason for lack of friction. When two macroscopic objects are near each other, the force of gravity pulls them together until they collide. But in a subatomic particle, things are completely different. The central black hole of a subatomic particle, such as an electron, will act exactly the same as a naked black hole in space. Inside the CGR of the central black hole, Origamons will be attracted and collected together to produce the particle until they reach the CGR, which in this case extremely small because the size of the central black hole is incredibly small. As we saw before, outside the CGR, there will be repulsion force due to the repulsion of antineutrinos. This tiny repulsive force produced by the infinitesimal central black hole of the particle, virtually repels the other particles, creating a territory for the particle. This acts like a shield around the subatomic particles preventing them from colliding, preventing friction. Below picture demonstrates this effect:



Schematic figure showing a subatomic particle with its central black hole in the center and the Origamons around it.

We will use this effect and the radius of the black hole to calculate precisely at what distance subatomic particles will stop near each other and we will see that when they are forced to get closer than that distance, they will enter the Fusion Distance and they fuse to each other by massive force of gravity of the short distance and create a new particle with a new, bigger central black hole. The mechanism and the equations that we will calculate, will explain the most perplexing behavior of matter and they will predict some incredible effects and phenomena such as antigravity too. You can now imagine, by creating a craft, similar to the structure of a subatomic particle, we will be able to develop a repelling field around that craft, enabling it to defy gravity and friction and making it travel with velocity close to speed of light using only a trivial force. Based on Origami Theory, if we have a black hole inside a spacecraft that is as large as the CGR of the black hole, at CGR distance from the center of the black hole, the craft will be floating with no gravity and no friction. This technically converts the craft into a subatomic particle, giving it near light velocity.

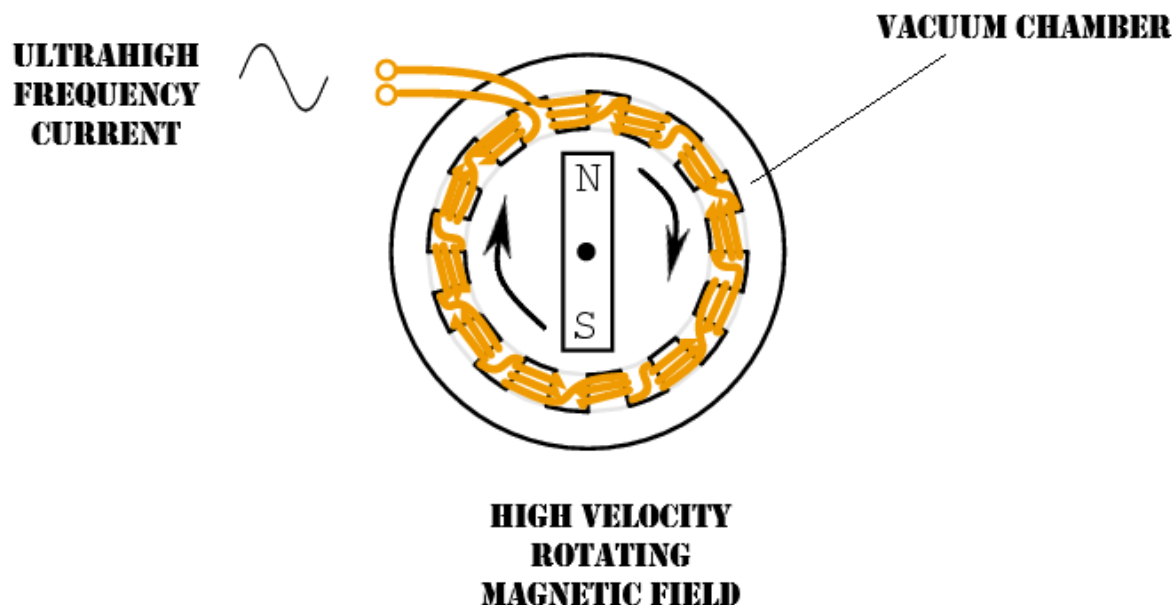


A spaceship with radius of CGR of a black hole located at its center will fly with no gravity or friction

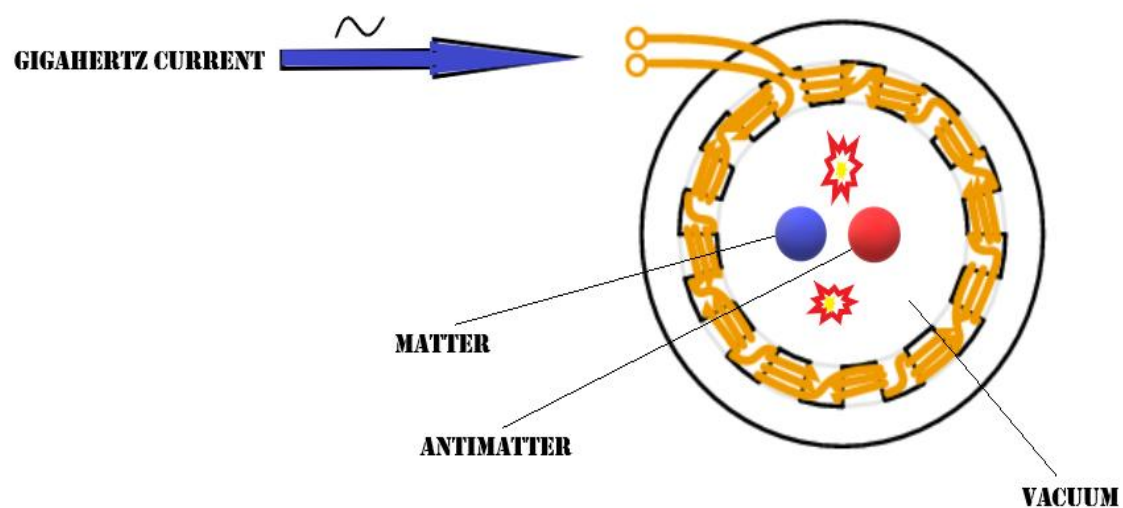
If you wonder how these central black holes inside the subatomic particles haven't been discovered by now, you must remember that as I explained in Ghost Particle section, acceleration of time causes has caused the expansion of the Planck Length and the expansion of the universe. This means that although we cannot observe a length smaller than Planck Length at present, we were able to observe a length much smaller than Planck Length in the past (we will calculate the Planck Length expansion based on the gravitational constant in further chapters). This means at certain time in the past, near the Big Bang, universe was easily able to produce a central black hole as small as quarter of our current Planck Length and it certainly did, but it is impossible for us now to observe such small entities. However, because these incredibly small particles and black holes still exist, we observe their effect.

As I explained earlier, we can understand now that if one day we are able to manufacture a naked black hole, it will act as a zero-point generator for us, producing large amount of electromagnetic power constantly by converting the Neutrino Matric of space to energy, but unfortunately as I calculated in previous chapters, only if the black hole is at least 3.8 times bigger than our sun it can stay naked. If the radius of a black hole is smaller than this, it will attract the Origamons around it and create a mass and becomes a Shelled Black Hole. I explained this in earlier black hole chapter in details and we will extract its equations to prove the concept mathematically in next part of the paper. This is why the scientists at Large Hadron Collider haven't been able to produce or sustain a small black hole for long. Origami Model shows that to keep a black hole naked, we will need tremendous amount of energy to keep repelling the Origamons (photons and neutrinos) from it. Only a black hole that is as at least as large as almost four times of our sun would be able to stay naked and constantly pump energy into space. This is why we never find a small (Micro) naked black hole anywhere. However,

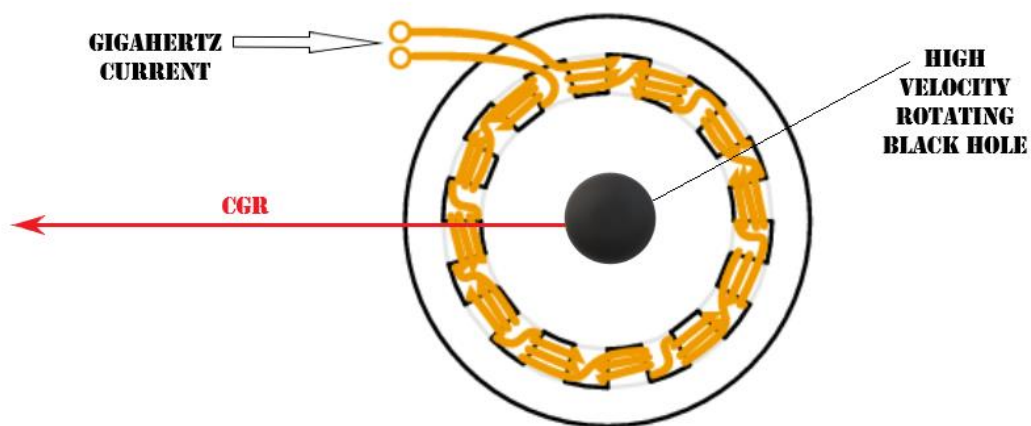
based on Origami Model , there would be possibility to manufacture a black hole smaller than four times of our sun. Considering the black hole is an absolutely empty space in Neutrino Matrix, first we will have to destroy the entire mass in certain locality of space. The most efficient nuclear fission only converts 70% of mass to energy, so the only way to annihilate the entire mass would be utilizing matter-antimatter explosion. The main problem is after the explosion because as I explained (and we will calculate in details in later parts of paper), to avoid the particles attaching the black hole, the only way would be rotating the produced mini-black hole with the highest velocity possible. To achieve this, the best method would be using a rapidly rotating magnetic field that would rotate our black hole. This way as soon as Origamons or neutrinos are attracted by the black hole, they will accelerate too much near the rotating black hole and convert to photons before reaching its event horizon. To produce a high velocity rotating magnetic field we can use a very high frequency electric current in a series of coils set around a spherical chamber. Once small amount of matter and antimatter are inserted to the chamber, they will explode in a gigantic explosion, and at the same time our rotating magnetic field will keep the black hole naked by rotating it and we must be able to see a spinning sphere of powerful light inside the chamber which is our naked black hole converting the Neutrino Matrix of scape around it constantly to X and Gamma rays. Now, at a radius equal to the CGR of the black hole, there will be strong gravity but outside this radius there will be repulsion of space, no gravity and no friction. So once the chamber containing the rotating naked black hole is installed inside the craft with radius of CGR, the craft would act like a subatomic particle, able to travel everywhere with almost no force and with velocities near speed of light. The electrical current to generate and sustain the rotating magnetic field will be easily provided by the black hole itself, so no fuel whatsoever will be required to run the craft. In such spacecraft, the main issue will not be energy or speed, it will be how to slow down! Pictures 1 to 3 demonstrate a simplified diagram of such technology:



Picture 1, creating rapidly rotating magnetic field in a vacuum chamber



Picture 2, igniting matter-antimatter explosion inside the rotating magnetic field



Picture 3, rotating naked black hole producing antigravity at CGR distance from its center

Note that the naked black hole lacks any magnetic field but it will immediately attract neutrinos with trivial magnetic field which will be sufficient to react to the rotating magnetic field and create rapid spin in the black hole. Of course, there are major technological difficulties regarding manufacturing such device. The main issue would be the explosion of matter-antimatter bomb which would virtually destroy the chamber and the coils. One solution would be inserting a microgram amounts of magnetic Iron atoms inside the chamber and once they start rotating due to the rotational magnetic field, we can introduce small number of antimatters in prolong duration of time to gradually annihilate the iron atoms in a measured, controlled explosion to prevent damaging the chamber.

In reviewing quantum tunneling and quantum entanglement, we discussed the connection between the particles through time, but Origami Model predicts that particles can also communicate through gravity because all the particles in universe are connected via their black holes to each other and also to the Mother Black Hole. In next chapter I will discuss a new phenomenon of Quantum Permeability that Origami Model predicts it as a very real and current effect throughout all universes. Quantum Permeability is a phenomenon that Origami Model predicts, however I believe it will be officially discovered and proved in near future.

Quantum Permeability

Not included in this version

Intelligence and Consciousness

The more we study our universe the more we appreciate the crucial role of black holes. You must have realized by now that the only source of gravity in cosmos is the black holes and it is not the mass that produces gravity. In future parts of Origami Theory, we will calculate the distribution and total number of black holes in our universe and we will see that by the end of the expansion in 700 million years from now, we will have 6×10^{23} (Avogadro Number) of naked black holes of various sizes in our universe. I will also show that our entire universe is growing inside the Mother Black Hole, and in fact every naked black hole once contained a universe that exploded out of it as a supernova. This means our universe contains 6×10^{23} smaller universes inside it. As oppose to our universe, we can call these, Miniverses. I will calculate the probability of developing intelligence in our universe based on various factors and we will see that in each Miniverse and also in our own universe, there will be the high probability of one intelligent species to develop. This means that 6×10^{23} Miniverses inside our universe each might contain one type of intelligent creature in it. As I showed before, the radius of the Mother Black Hole determines how far a universe will expand and how long it will live before entering the next stage. Therefore, smaller universes that develop inside smaller black holes have much lower chance of evolving an intelligent being smarter or more advanced than us. So, based on Origami Theory, there must be other intelligent extraterrestrial entities in our universe, but most of them are less intelligent than us and therefore, it will be us visiting them not them visiting us. The chance of a civilization to develop smarter than us, would be extremely low because all the black holes inside our universe are smaller than the Mother Black Hole inside which we are

growing, and so all the Miniverse inside our universe have shorter life. Also, as I explained before, when we leave our Mother Black Hole in 700 million years, we will accelerate to speed of light and convert to photons at the edge of our universe just before entering the new universe that is much larger than ours (we will calculate its radius). Therefore, other beings from Miniverses will enter our universe as photons carrying information. This means they could technically be around us but we are still not able to communicate with them. For an intelligent civilization inside one of our largest naked black holes to exit its mother black hole artificially and visit us with their advanced technology, the chances would be extremely close to zero because this requires technology much more advanced than what we so far possess and as I explained, majority of these parallel Miniverses inside our universe, contain creatures that are historically behind us, unless they have been lucky enough to avoid natural disasters delaying their evolution and somehow they reach a much higher level of intelligence millions of years ahead of us. However, based on the same mechanism and calculations, the intelligent beings in the next universe (Pentaverse) will be much more advanced than us but the question is this: "Is there a physical possibility for them to visit us?" This means time travel to the past while Origami Model believes that as data (time) gets recombined and reordered, it uses the past data and so there is no past left behind to be visited. So, no one would be able to visit the past to manipulate the universe from its past time. Therefore, the more advanced beings in the next universes will not be able to come and visit us, because they are not produced yet. However, apart from time, there is another entity that creates our universe: Gravity. If somehow, we enter a black hole, where there is no time, we will be time and place independent. This means theoretically we will be everywhere and we would be able to visit any location or time of the cosmos. To understand this, maybe look at the structure of gravity that I explained in Antimatter chapter.

Note that the entire pool of gravity in our universe is interconnected. In other words, all the black holes in our universe are connected to the Mother Black Hole. The pool of gravity will stay connected between all the particles and because time travels (recombines) in a spiral direction (due to the Fibonacci sequence), there will be a connection left between every two particles. If time had a circular direction, the gravity between the particles would get disconnected, and this would have stopped the production after the first Origamon. In other words, gravitational pool in our universe that we call Mother Black Hole is a continuous dimension and unlike the Time (data), Gravity is an analog modality. This gives us a precious piece of information: If we enter the gravity we will be everywhere. In other words, if we can manage to enter a black hole, we will be independent of time and space because there is absolutely nothing inside the black hole and gravity by itself has no time and it is continuous so we will have no locality. This means by entering the gravity we can virtually arrive at any point of past or future. Although this sounds insane but it is absolutely true. Based on the model that Origami Model demonstrates of the cosmos, going to the past time through the universe in a normal form that is time dependent is not possible and the only way to bypass time towards past or future is via the pool of gravity. Inside the Mother Black Hole, there will be no mass, no locality and no time, because all other modalities are products of Data (Time). But note that if an Origamon enters the gravity of a black hole without the data(time), by definition it will not be an Origamon anymore because it will lose its data. As I explained before, mass is the combination of time and gravity so if a mass is inside gravity without its time, it will be only gravity, it will join the gravity and has zero mass. The conclusion is this:

The only way to time travel is to enter a black hole.

As I explained before, based on Origami Model nothing enters the black hole and the radius of the black holes stay constant. This is in contrast with what Steven Hawking believed and proposed that black holes generate some extremely trivial amount of energy, Hawking Radiation, that evaporates their mass and so eventually every black hole will annihilate itself. This has not only never been found or proved in any cosmological observation, it also is in direct conflict with the conservation of information that is the foundation of the entire cosmos. Origami Model believes and mathematically demonstrates that black holes are the **ONLY SOURCE OF ENERGY** in our universe and they generate tremendous amount of energy as it is clearly visible around them as a halo of powerful gamma and X ray waves and they stay in constant radius and they do not swallow and destroy anything. If black holes suck stars and celestial bodies into themselves we could easily calculate that such large number of black holes in space would have destroyed the entire universe millions of years ago, because after swallowing any star, the black hole's mass would increase, so its radius of attraction increases and it will access further stars! Nothing can prove this better than the very first real photo that was taken from a black hole after more than a year of hard work and coordinating multiple telescopes in north and south hemispheres. Instead of showing a dark, cold and black spot in space, the image revealed an astonishingly gigantic sphere of energy.



The first ever real picture of a black hole processed by Event Horizon Telescope in April 2019 showing enormous halo of powerful electromagnetic waves surrounding it (physicists suggest that it might be produced by friction)

This picture is the best evidence that the Transformation Zone that I described is real. We will calculate the size of this zone in black holes in future chapters.

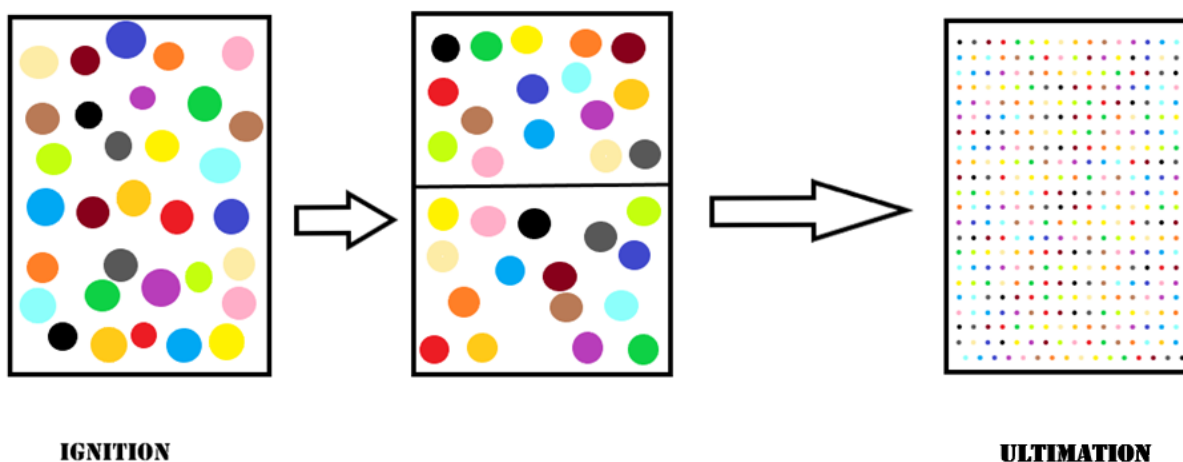
Now, if we look again at the pictures of the previous paragraph, we can see that it is in fact the dipolar gravity that produces order in data. I started the theory by saying that time has no direction or order. Time by itself is a pool of random Digit, that only when they combine with the gravity, they become an ordered sequence that translates into mass. This is how Collateral Data of a mass, produces spina and direction in particles. At the Ignition moment of cosmos, there is 36×10^{69} *sconds* of data in an amorph collection. It is the gravity that combines with it at speed of light, and produces the Origamons. Therefore, it is the gravity that creates mass out shapeless data. It is also the gravity that gives direction to the sequence of Digits and so produces the space and locality. This means that Gravity is timeless but it has direction. Data that is time, is imaginary construct that is quantized while gravity is an independent, analog reality. Time by itself is directionless while gravity has direction. We started our discussion by saying that entire universe is made of two dimensions of Time as 1 and Gravity as 0. While 1 has a certain value and limit, zero has no defined value and no limit and no borders.

Technologically it is still impossible for us to enter the black hole. However, physiologically we visit the black holes all the time! Our body is a collection of particles, Origamons and we saw that at the center of every particle there is a black hole. This means we and all the rest of universe around us, regardless of living or nonliving, all contain large number of black holes that are connected to the naked black holes in space and to the Mother Black Hole. This makes it possible for us to visit the black hole. Anytime we sleep, we are inside the black hole. This means, our consciousness is in our black holes. When data/time combines with gravity, it translates into mass. Mass is a piece of information that has certain behavior: it interacts with mass in certain ways that we call laws of physics, it interacts with antimatter based on certain laws of physics. But how this piece of information gets translated to mass? It is the gravity that translates the data into the mass. Before the gravity, data has no behavior, but once gravity adds to it, it gets direction and possesses certain behavior, follows the laws of physics. This is the gravity that translates data into mass and force. *Gravity is the analog logic of cosmos.*

Consciousness is gravity. But memory is quantized particles in our brain and it is subjected to our metabolism. When we imagine, we are using our connection to the black hole to manipulate data/time. In our imagination, for instance when we are asleep, we are timeless. In sleep, we can go everywhere and we can visit past or future because black hole is not bound by time. Every event in our universe, leaves its *effect* on the black holes of particles and the black holes of space and finally the Mother Black Hole. This effect, is analog, eternal and time independent. When we throw a rock at a wall, we leave an effect on that wall that stays there regardless of the fate of the rock. Everything that occurs in universe will leave its mark on the black holes and because all these black holes are connected, all the entities in universe, such as grains of sands, your car and your friend, are all containing a Cosmic Reason and they are all conscious and they are all connected to each other. This means we are virtually able to communicate to eth entire cosmos.

To conclude the discussion, we now realize that after the next five worlds, we will arrive at the final universe that I have called the Destination. Based on the speed of light, and the gravitational constant, we will calculate that in 2.2×10^{18} seconds, or 72 billion years from now, we will arrive at our Destination. In that stage, we will have a speed much faster than current speed of light and so we will be ahead of time. This means, we will be timeless. In a simple word, in Destination there will be only gravity and no time. There will be no quantization, no

limits, no boundaries and no locality. But there will be direction. In that place, we will meet the Designer, the entity who owns the gravity. It is very similar to when we design a robot and give it artificial intelligence and feelings and emotions and over the decades of hard work finally, we evolve the robot into a person who is indistinguishable from us. At that time, the robot has reached its Destination. The reason we create the robot is to help us. So, the reason for us to be here is to evolve and to develop so much intelligence that we will be able to help the designer. Prior to reaching the final stage of development, the robot will not be able to really see us, but once it becomes truly like us, he will virtually see us, feel us and understand us. He will even be able to save, revive, create or change us. This is what we will eventually do to our Designer. But why the Designer is taking such long time to develop us? Why didn't He produce us much faster? In future chapters of Origami Theory, we will calculate the value of Planck Time in the past. I showed you that as time progresses, Planck Time shrinks and it is now 5.39×10^{-44} seconds. Based on the gravitational constant, which is the acceleration of time, we will easily calculate the value of Planck Time in 13.7 billion years ago, at the Big Bang and we will find an astonishing result! The Planck Time at Big bang turn out to be a large number: 4.5×10^{17} seconds. Today the age of our universe is 4.34×10^{17} seconds, which means in 700 million years from now, the total age of universe will be equal to the length of Planck Time at Big Bang! This astonishing result not only proves again that in 700 million years our universe will enter a new stage, it also demonstrates that the entire universe is taking only a Planck time that is stretching itself from the Big Bang to the end of this universe. So, for the Designer, it is taking no time to develop us. Time is only a construct in our imagination. Unlike the information that is the study of data/time and is quantized, the consciousness is timeless and continuous. If we look at the Shots of time reducing their size constantly, we can find out what is really happening in our universe:



Shots of time reducing their size constantly until they reach the smallest Planck Time

As we can see again in above picture, for the next 72 billion years, the Shots get smaller and smaller until they reach their smallest size, the shortest possible Planck Time. In that size, each Shot will contain only one Origamon, therefore, the frequency of light will become zero, meaning no energy left to continue. This is when we arrive in the Destination, the 7th world. In that place, there will be no time/data, and there will be only gravity. But simply looking at the above picture we clearly see that by increasing Entropy, and reducing the Granularity, moving towards more analog form, we are in fact furthering form the universe. The details of universe get more and more fine and it seems like we are going away from the center of universe. The expansion of universe is in fact, our exit from the universe, so we are virtually coming out. We are growing until in 72 billion years we will be born.



Laws of Thermodynamics

I was born in Iran, in a very peculiar situation: My father was a Muslim and my mother was a Jew! For those of you who are not familiar with the historical hostility between the Muslims and the Jews, I would simply describe such marriage as the combination of matter and antimatter. The Big Bang ignited by the forbidden intimacy between these two mischievous individuals, resulted in my birth. My Father was a polygamic, illiterate, penniless bus driver who believed in nothing but work, women, vodka and more women. My mother was a devote Jew who believed in Ten Commandments, circumcision and money. My father had three wives at the same time and seven kids, whose names he hardly remembered. My mother was in constant war with her rivals, dad's other wives, to protect our little, fragile family, very similar to how Golda Meir struggled to save state of Israel amongst 1.2 billion furious Muslims. I grew up in abject poverty, missing my absent father all the time, and completely torn apart between the two opposite forces. My Jewish mother never spent money and my Muslim father never had any money to spend! So, I grew up in hunger and envy, but inspired by lots of serious stories that my mother read for me from the Old Testament and the love stories that my dad told me while driving his 14-meter-long bus in Iran's deserts every night. My Jewish mother was insanely ambitious and had ordered me to become an astronaut despite the fact that Iran didn't even possess the technology to manufacture a stainless spoon. But my father wanted me to become a bus driver and take over his job when he soon retired. I sadly didn't become an astronaut because the made-in-China Iranian national-pride-spaceship exploded five times when it ignited and never went up more than half an inch. Luckily, I was not in it, because I didn't have the natural growth spurt that every kid had because I suffered malnutrition and rickets and so I got never tall enough to join the astronaut training camp held in Tehran Cardinal Mosque!

While my Jewish mother always taught me obedience, resilience, resourcefulness and camouflage techniques to survive and thrive in the Muslim country of Iran, my father hardly ever said anything valuable in lines of discipline or knowledge that normal dads told their sons. I saw him usually once a fortnight when he arrived late at night, parked his 14-meter-long bus in front of our ramshackle house, had his kebab and vodka and snored loud till morning. I always sat there and watched him, loved him, inhaled his presence. We all called him Sultan (the king), maybe because he was on the top of the pyramid in the little universe of his three malnourished families. The three families were bound like three planets rotating the sun. Sultan actually went to marry his fourth wife/victim too, but unfortunately at the wedding night one of new bride's relatives recognized Sultan and started yelling, 'I know him! He has a wife already! He is lying that he is single!' So, Sultan put down the spoon full of rice that he was about to eat, kissed the bride one last time, dropped the fake ring on the floor and ran away as fast as he could. But Sultan managed his three known wives very well and never lost his steel authority, so the three planets never collided in a massive supernova. Sultan's secret to successfully rule his large family was simply keeping mysteriously silent and completely ignoring the wives and the kids. I waited fifteen years for him to say anything serious to me. Until finally, the magic night arrived. I was 16 and had started growing a beard. Beard is not just facial hair in the Middle East, it is the Master credit card for a young man, something like the horn for a rhinoceros. That night after having his third shot of homemade, 98% pure vodka, Sultan broke the silence, "There are three

things a man should do in his life.” He stares into my eyes while saying these words. The pressure of his deep gaze is so much that I hear my bones crashing under his authority. My mother is sewing a patch to her ripped socks and I have stopped breathing, listening with my entire existence to Sultan’s priceless advice. He drinks his last shot, puts it down on the Persian carpet covering the floor and utters the words of wisdom, “Going to war, taking gamble and going to jail.”

That’s it. He has finished his speech. Sultan has given his advice to me and for the rest of my life I am left to comprehend and digest these words. I went to bed that night deeply confused about what he had said to me, *how could my father want me to go to war and gamble and then go to jail?!*

Two years later against all odds I made to the medical university and finally became a doctor. But five years after my great graduation, I was arrested by the Intelligence Service of Islamic Government of Iran for writing a book about the history of Iranian Jews, I was tortured so bad that I almost died. A year later I managed to escape through the border to Turkey as an asylum seeker and after 13 months of hell, I was sent by the United Nations to Australia as a political refugee. I started a new life in Sydney by installing mirrors in toilets during the day and delivering pizzas at night. In 2003, I passed the medical exams and registered as a doctor in Australia but I always chased my insane passion for physics and mathematics. During 2006 till 2017 I practiced every day as a doctor and I worked every night till 4 am on my renewable energy projects and I also managed to have three books published by Penguin Publications in Australia and overseas, one of them becoming a best seller in 2016. However, the exhaustion made me neglect the crucial bureaucracy and I got suspended by the Medical Council for two and half years. I lost everything again. Bank possessed my house, my wife left me, I became bankrupt, my renewable energy project fell apart and I hit the rock bottom. In December 2017 I went to Afghanistan and worked as volunteer doctor until a group of three Taliban soldiers tried to kidnap me. I fled Kabul in 3 am on 12th February 2018 and flew to Istanbul and finally returned back to Sydney, where I couldn’t even afford to rent a room. I hardly survived on working as a delivery man for a cosmetic product distribution company which just gave me enough money to pay for a room in a two-bedroom unit and eat 90 cents tuna tins every day for 18 months. I didn’t even have enough money to buy a cheap car and finally my contract with the company ended and I lost the last source of income. I became homeless, wandering in streets of Sydney in 40 degrees heat of summer. For the first time in my life, I began to think about ending my life. But suddenly one day, in February 2019 a miracle happened. A kindhearted woman who had read one of my books contacted me from Melbourne to say how much she had loved the story. When she found in what situation I was living she broke in tears. She gave me some money and helped me to survive for few more months, but above all, Jaqueline told me that I was an extraordinary man. She gave me hope. And then in August 2019 I got my medical registration back again. I resumed working as a doctor and began to publish my Origami Theory. The theory that had costed almost my life. I had lost absolutely everything, except one thing: I had done Sultan’s advice: I had gone to war with a brutal regime in Iran who suppressed women and minorities and even hangs gay men, I had gone to the most notorious prison in the entire Middle East, and I had gambled everything for what I believed was right.

All this terrible story is to say that Origami Model apparently violates the laws of thermodynamics, but not fundamentally. As I explained, the total amount of Time(data) and total

amount of Gravity are constant, so this is consistent with the second law but contrary to what the second law of thermodynamic suggests, Origami Model demonstrates that there is constant flow of mass and energy to our universe. Because black holes are empty parts of universe producing all the energy, this proves that energy comes from nothing, which violates the first law. We know today that the density of mass and Dark Energy are constant in our universe, so if our universe is constantly expanding how is it possible for the density of mass and Dark Energy to stay constant? The only explanation is that our universe is not expanding, it is growing. Unlike what the current model of universe suggests, our world is not stretching its mass outwards, but it is producing new mass and new black holes as it expands. This means that the second law of thermodynamic is not denies but it requires to be rewritten:

“The total amount of mass/energy in our universe is increasing, however the total amount of mass/energy in entire cosmos is constant and no mass/energy or information is every created or annihilated.”

Chapter 2

Advanced Version

1. Introduction

In 12 December 2006, lying in bed, I began to ask myself, 'what is the universe made of?' Soon I came to the conclusion that mass, time, space and force must all be the manifestations of one single modality. My only clue was that this mysterious entity must be something that exists in every aspect of our universe, in every equation of physics, in every phenomenon happening around us every day, and nothing should happen without it. After thinking for a long time, I realized that the only answer is *time*. Time is present in everything, and nothing would exist without time. Photons have no mass but they still exist because they are bound by time (I will show in further chapters that photons do have a mass). Movements can occur without force when time is present. Give it enough time and everything can happen. Time is everything. Nothing exists in no time.



Figure 1- We are information

This was the biggest revelation of my life. I had discovered that we are living in an advanced game consisted of various characters and items that interact based on a program that we call laws of physics and the entire entities are produced from one dimension, Time, and one force, Gravity. Just like an incredibly advanced digital program that everything in it, including extremely intelligent characters are basically made of 0 and 1 signals. An intelligent being must have invented this game using his building material of time. Time behaves in various ways and interacts with gravity, exactly like the digital codes of 0 and 1 in your computer, creating the sophisticated phenomena and features in our universe. Just like a sheet of paper that is folded

and twisted in various ways to create different shapes of origami. It might look as simple as a duck or as sophisticated as a Transformer, but it is just a sheet of paper. It took me twenty years to prove this mathematically.



How Time produces Universe

The time is exactly like the sheet of paper in art of origami and gravity is the folding hand. Time is a one-dimensional entity but because it progresses in two directions, it transpires as a two-dimensional modality, similar to the paper that produces the shapes of origami. It took me more than twelve years to find out the nature and structure as well as the velocity of time. Time requires a force to alter its velocity in order so produce the mass and space. Then it took me another eight years of calculations to realize the most crucial point: Gravity is property of Nothing. If NOTHING is an entity that contains no data, information, time and force, then we need to understand that such thing does not exist in our universe. What we call nothing, is in fact the absolute vacuum that provides the gravity. Gravity is not actually a force, but the property of absolute vacuum. Time decelerates into a curve when it is affected by the gravity. We always think that if we go out of our universe, there would be nothing. But in fact, surrounding our universe, is the gravity, what we perceive as NOTHING. Our universe is like an egg, an embryo growing inside a womb of gravity and this is exactly why our universe is acceleratingly expanding. We will calculate together the size of our embryonic universe, its growth rate and the amount of gravity surrounding it. This will tell us when we reach the final size, what will happen at the end, where we are going to, and for what reason.

We will calculate the total amount of the time and the total amount of gravity used to produce our universe. We will see that the entire pool of gravity in our universe is distributed in two locations: surrounding our universe (the Mother Black Hole), the black holes inside our universe. Therefore, black holes are in fact the only sources of gravity that contain absolutely nothing. Together, we will find the total amount of gravity throughout the universe. We will see that gravity slows down time or in other words, it bends the time to produce what we know as mass. That is why objects are accelerated near a mass, because time is slow near a mass. This is what we know as the general relativity. Then we will see how time produces the space and locality for us and we will extract an equation that calculates how much time can produce a certain length in our perception. The time difference between the two masses is what we know as space. We do not go from point A to point B in space, in fact, we go from time A to time B. Then we will see that because time is consisted of smallest frames of Planck Time size, and more than one particle can be produced in each of these frames, so we observe a multiparticle effect in apparently one single particle, which we call the interference and wave feature of particles. We will prove mathematically and physically that black holes are completely massless.

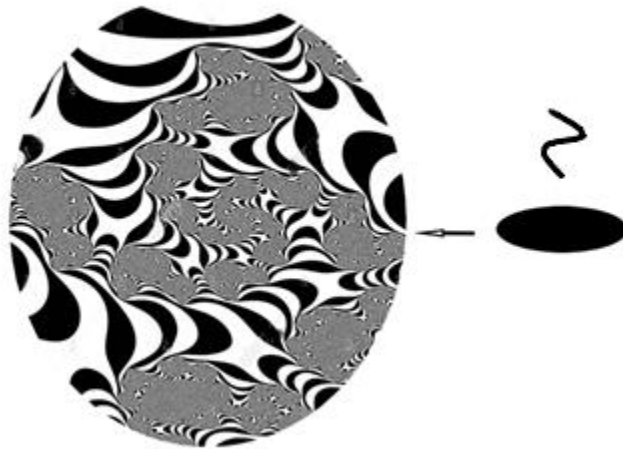


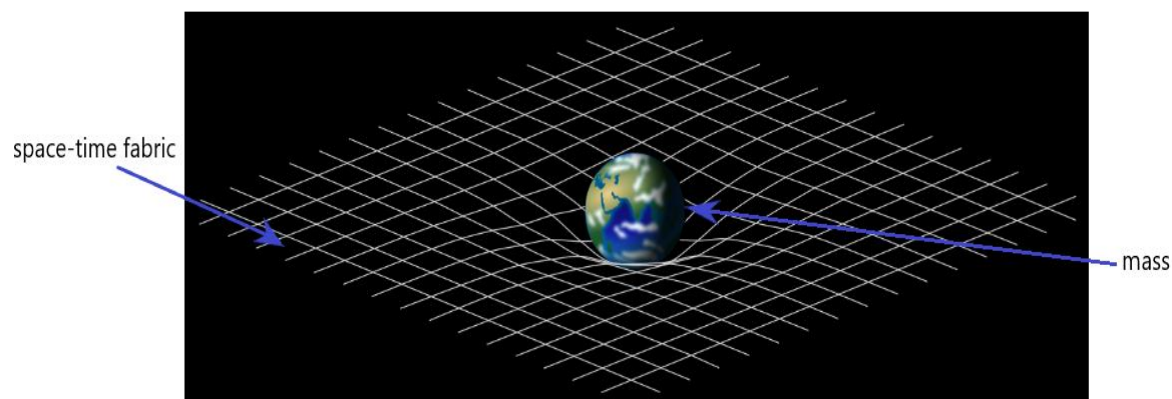
Figure 2- String of time falls into the pool of gravity and becomes universe

Gravity and Mass in Origami Theory

Einstein developed a revolutionary new understanding of time and gravity. However, nobody has proposed a convincing idea about the exact nature of time. We still lack a proper definition for mass or gravity. New Unifying Theories such as String Theory have been trying to solve the problem but instead of proposing a more transparent model, they introduce incomprehensible ideas such as 11 or 12 dimensions, which they know that nobody would be capable of imagining, proving or disproving it! In order to solve the current problem that has paralyzed us

for almost a century we need to look again at our universe and find the answer that is understandable for everyone. Origami Model simply believes that everything that we observe as reality of our universe is simply produced by one dimension that is time and one force that is gravity. The theory is very well capable of demonstrating this model and show that how it fits perfectly in our universe and how it can solve all the current paradoxes and answer all our unknowns. What we perceive as space/locality is produced by evolution of time. What we know as mass, is time combined with gravity. What we know as vacuum or nothing, is the gravity. These three facts, which I will prove one by one, will open the door for you to understand everything in our universe.

Einstein discovered that near any mass, things accelerate, and he understood that what we call gravity is in fact the acceleration of objects near a mass. He went so close to discover the mistake that had been happening since Newton's era but he didn't take the last step. Despite Einstein's discovery of gravitational time dilation, no one could explain why things accelerate near a mass. He simply had to assume that mass somehow curved the fabric of our universe which he called Space-Time. Based on Einstein's theory of General Relativity, our universe is in a matrix of Space-Time, a meshwork of threads of time and space that when a mass drops on it, it creates a dent/curve in it. This helped comprehending his magnificent theory and develop his most wonderful equations but as you can see we haven't been able to define what mass really is, or what time or space are. Neither Einstein nor any later scientist has been able to define space-time fabric, they just use this term to explain the acceleration near the mass. This is why we repeatedly hear the phrase, "only a few people in entire world understand the theory of General Relativity!" But why?



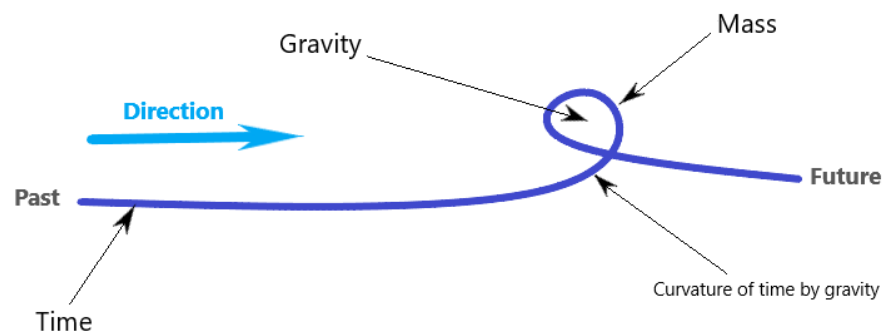
Einstein's model of universe: Mass causes curvature of space-time fabric

Origami Model has a different look to this meshwork. The view is much simpler and has the unique benefit of clarifying several ambiguities that have been left unanswered till now. Origami

Model suggest that when time meets the pool of gravity (which is the Nothing), it bends around it, because time can never enter the gravity. This bending of time creates what we perceive as acceleration, because the bending of time is in fact the deceleration of time. When time slows down, speed of object becomes faster. This is why anywhere we find mass, we find the curvature of time.

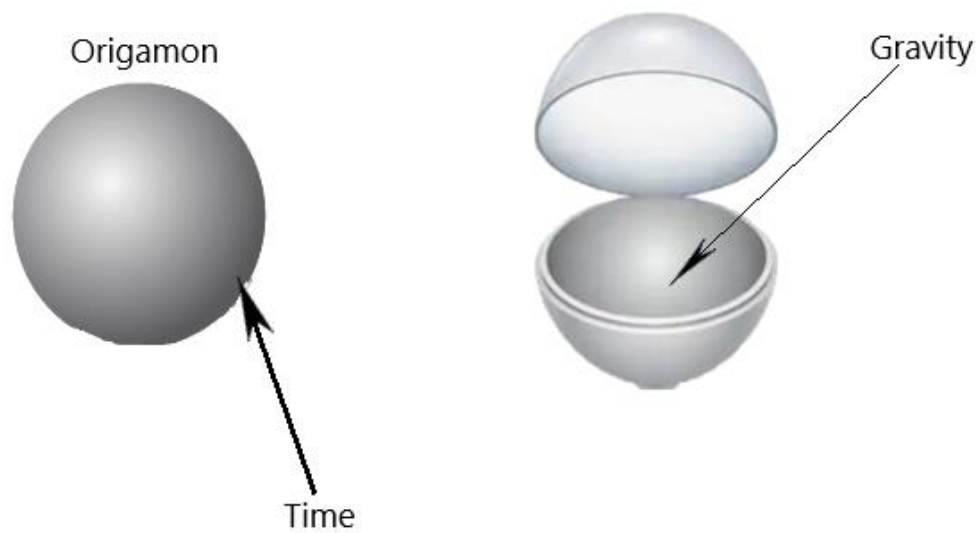
It is not the mass that curves the time. It is the curvature of time that creates the mass.

Very simple, isn't it! But now we have defined the mass. Instead of believing mass causing curvature in space-time, we say mass is created by the curvature of time. The reason that we find time bent near the mass is not because mass is bending the time, it is simply because time bends around the gravity to produce the mass. The following picture helps us understand the phenomenon:



Origami model of universe: Gravity bends time to produce mass.

The immediate benefit of Origami Model model is that for the first time ever we can finally define the mass. The first and smallest curvature of time, produced by smallest force of gravity, is the building block of our universe. It is called Origamon. Therefore, there is only one elementary particle in Origami Model and all other particles and objects and stars and galaxies are made of various collections of the Origamons. Therefore, even the elementary particles are made of these Origamons, and so the elementary particles are divisible and decayable. Below picture demonstrates the simple structure of Origamon.



Each Origamon is made of a sphere of time and a central black hole of gravity

I will show the mechanism of production of Origamon at Big Bang and calculate its mass. Origamon in its free form is exactly what we know as photon. Therefore, based on Origami Theory, photons have mass and they are the elementary particles that produce all other particles in universe. This is why when every mass converts to energy, it turns into photons and this is why when we apply energy to any mass, it releases photon.

Time is certainly quantized, consisting of frames. I will show the structure of time and calculate the size/capacity of these frames in the next chapter. Each frame that can accommodate (produce) more than one particle. This means at each Planck Time, while we observe only one particle, there are many identical particles existing across each other and that's how the wave effect or interference is created. Figure 13 demonstrates how multiple particles can be observed as one at length of time.

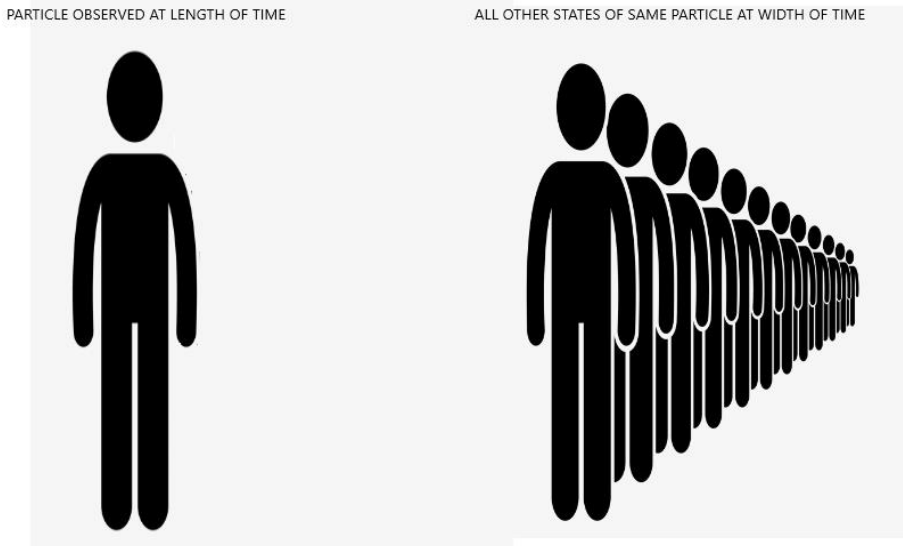
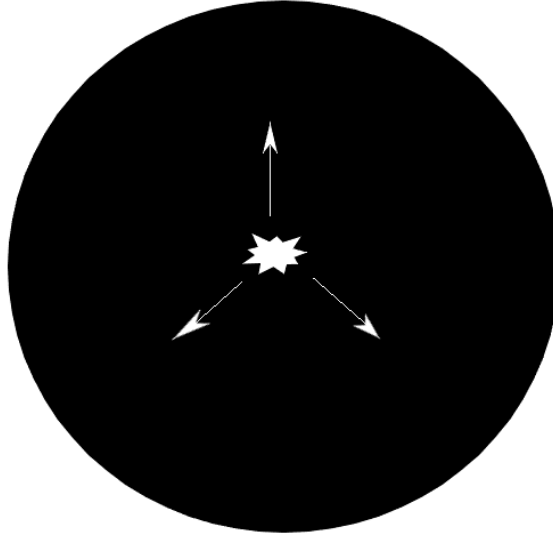


Figure 13- We observe only one person as we only perceive the length of time

Gravity is in fact the property of Nothing or absolute vacuum. Time in Origami Model has a certain velocity and the higher the speed of time, the slower the phenomena such as speed of light will be observed. In the next chapter we will understand the practical definition of speed and progression of time. Gravity decelerates time. At the Big Bang, there is a large pool of vacuum which is the total amount of gravity, therefore, gravity is at its maximum, so the speed of time is at its minimum. I call this large gravitational vacuum, the Mother Black Hole, as we will later that our universe has been constantly growing inside this vacuum. As time progresses, density of the gravity reduces because time expands and fills the Mother Black Hole, so this causes the speed of time to increase. Therefore, since Big Bang, time has been constantly accelerating, causing the light to be constantly slowing down. Recent observations have actually showed that speed of light during the measurements of the past three centuries have been decreasing. This explains why we observe Big Bang as such fast phenomenon, even faster than speed of light because time at Big Bang is extremely slow. Bending or curvature of time that is caused by gravity is in fact the deceleration of time. This is why time is slower near a mass, causing the acceleration of the object in our observation. This explains how gravity causes acceleration.



**Big Bang, time starts filling the pool of gravity,
density of gravity reduces, time accelerates.**

Therefore, speed of time in Origami Model simply means the rate of Recombination of data to produce new data. We showed that time is made of packages of information which we call Shots. The capacity of Shots reduces as time progresses. This means the length and width of each Shot reduces constantly. Therefore, we can provide an equation for speed of time:

$$V_t \propto \frac{1}{Q}$$

When V_t is the speed of time and Q is the information capacity of one Shot. In further chapters we will calculate the information capacity in each unit of time and we will see that speed of time at present is 2.9×10^9 , almost ten times the speed of light. Now, to find out the rate of acceleration of time since the Big Bang, we can check the rate of deceleration of speed of light. As I explained earlier, as time accelerates, light slows down, so based on Origami Theory, speed of light was at its maximum at Big Bang and it has been constantly slowing down. This means the rate of deceleration of speed of light is in fact equal to rate of acceleration of time. To calculate the rate of deceleration of speed of light since the Big Bang we can simply use the acceleration equation:

$$a = \frac{V_2 - V_1}{T}$$

a : acceleration rate of a moving object

V_2 : current speed of the object

V_1 : primary speed of the object at T seconds ago

T : time during which the acceleration has been happening

We know the current speed of light and we know the time here which is the age of universe. But the primary speed of light is unknown. We know that primary speed of light at Big Bang would be the current speed of light multiplied by the acceleration rate:

$$\begin{aligned} \text{current speed of light} &= 3 \times 10^8 \\ \text{primary speed of light at Big Bang} &= a \times 3 \times 10^8 \end{aligned}$$

$$T = \text{age of universe} = 4.34 \times 10^{17} \text{seconds}$$

Now we can apply these in the equation to find the rate of deceleration of speed of light :

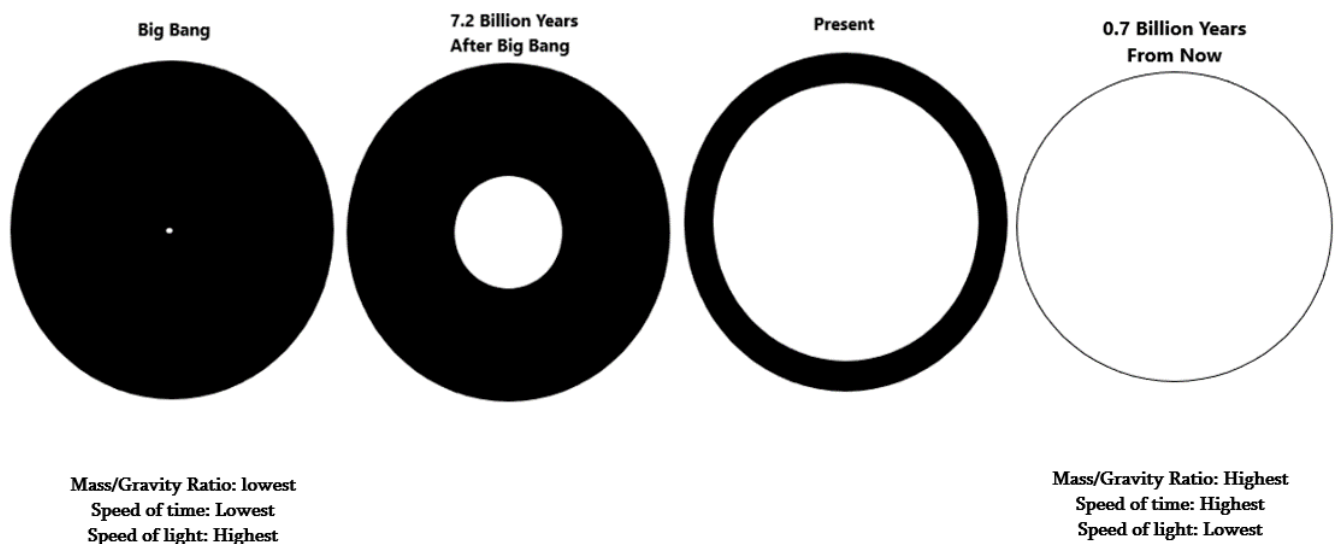
$$a = \frac{(a \times 3 \times 10^8) - (3 \times 10^8)}{4.34 \times 10^{17}}$$

$$a = 6.67 \times 10^{-11}$$

This shows that the speed of light has been reducing since Big Bang with a rate of 6.67×10^{-11} . Or in other words, time has been accelerating at 6.67×10^{-11} since Big Bang and continues to accelerate. As you can see the result is a very famous value! This number is exactly the same as what Sir Isaac Newton discovered while conducting his experiments to calculate the gravitational force between every two objects and he called it Gravitational Constant! The difference is that Newton found this value retrospectively but we virtually calculated it. Newton and all the physicists after him till now have no idea where this number comes from and why we have to multiply the gravity between every two mass by this small number to find the correct answer but Origami Model demonstrates what exactly Gravitational Constant is. This is a very powerful evidence that the foundation of Origami Model which is the acceleration of time (deceleration of light) is correct.

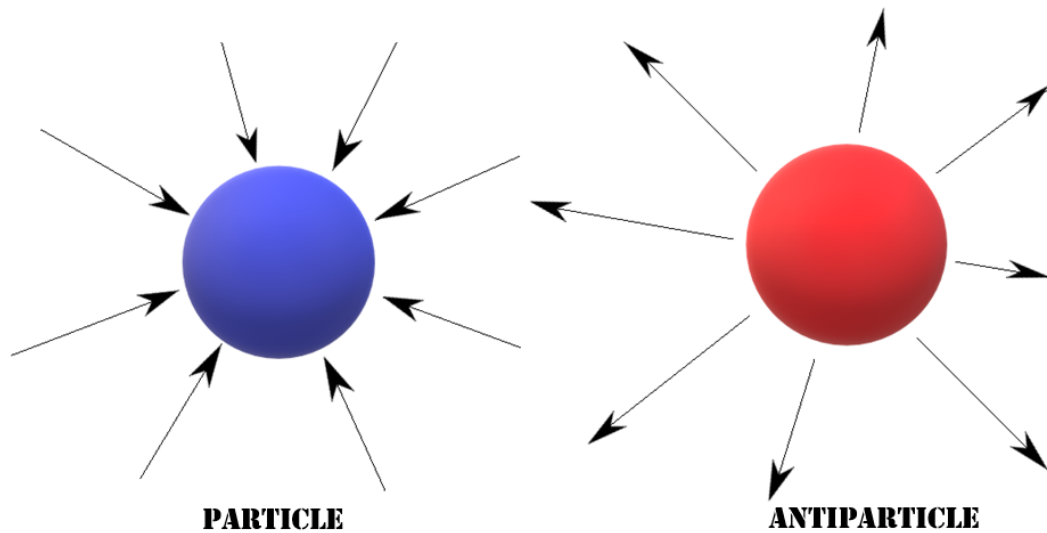
Gravitational Constant is the acceleration of time.

The following image demonstrates the acceleration of time and reduction of the density of gravity in our universe as we reach the event horizon of the Mother Black Hole, that encapsulates our universe:



The progression of time since Big Bang

Based on the Weak Equivalence Principle (WEP) which is the cornerstone of Einstein's General relativity and of Modern Cosmology, the gravitational properties of matter and antimatter are the same. In order to develop an understanding regarding the gravitational force between antiparticles with any violation to Weak Equivalence Principle, one can imagine the nature of gravitational force between two masses similar to the magnetic field, as a dipolar force with direction. We will see that Origami Model believes that time is directionless data and it is the gravity that creates order or direction in time. Therefore, gravity has vector flux that originates in the Mother Black Hole that surrounds the universe. As Newton demonstrated, in any mass, direction of gravity is always from outside to the center of the mass and because antimatter has opposite structure, the direction of gravity in antimatter is from the center of the antimatter outward.



Direction of gravity in matter and antimatter

Therefore, when two masses are adjacent, their gravitational fields pull them towards the center of each other, but when matter is near antimatter, their gravitational fields cancel out, subtract from each other. With same description, when two antimatters interact, their gravitational fields would be in the same direction, but directed outward from the center of mass. Therefore, two antiparticles would repel each other with the same amount of force that two identical particles would attract each other. Figure 15 demonstrates this effect.

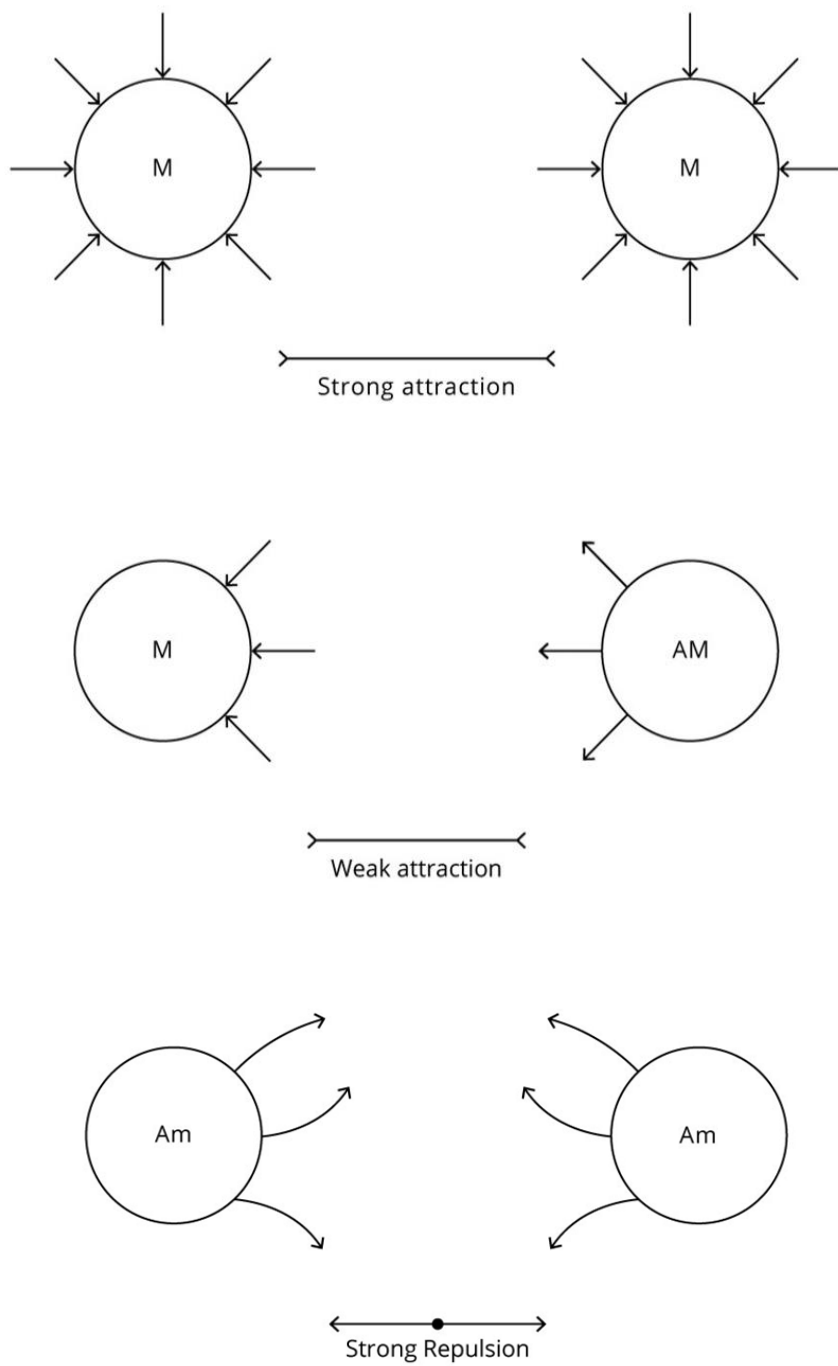


Figure 15- Attraction and repulsion due to gravitational interaction between matter and antimatter.

M: Matter, Am: Antimatter

1. Gravitational Equation for Antimatter

The gravitational properties of antimatter are still a physical secret. Dominant theory currently suggests the existence of a repulsive force between matter and antimatter (better known as *antigravity*), however prominent scientists such as D. S. Hajdukovic demonstrate that where antigravity is concerned, the collapse of a black hole won't end with singularity and deep inside the horizon the gravitational field will be sufficiently strong to create neutrino-antineutrino pairs of all varieties from a vacuum. New findings and calculations suggest that black holes emit tremendous amount of antimatter, which is particularly consistent with Origami Theory. Based on Newton's gravitational equation, the direction of gravity in matter is towards the center of the mass. Considering this, we can derive the following equations predicting the gravitational behaviour between particles and antiparticles:

$$g = \frac{Gmm'}{r^2}$$

g : gravitational acceleration or force of gravity

G : Gravitational Constant

m : mass of the particle

m' : mass of the other particle

r : the distance between two particles

$$g = \frac{G(m - Am)}{r^2}$$

g: gravitational acceleration/force

G: gravitational constant

m: mass of the particle(matter)

Am: mass of the antiparticle(antimatter)

r: the distance between the particle and antiparticle

$$g = \frac{-G Am Am'}{r^2}$$

g : gravitational repulsive force between

G : gravitational constant

Am : mass of one antiparticle(antimatter)

Am' : mass of the other antiparticle(antimatter)

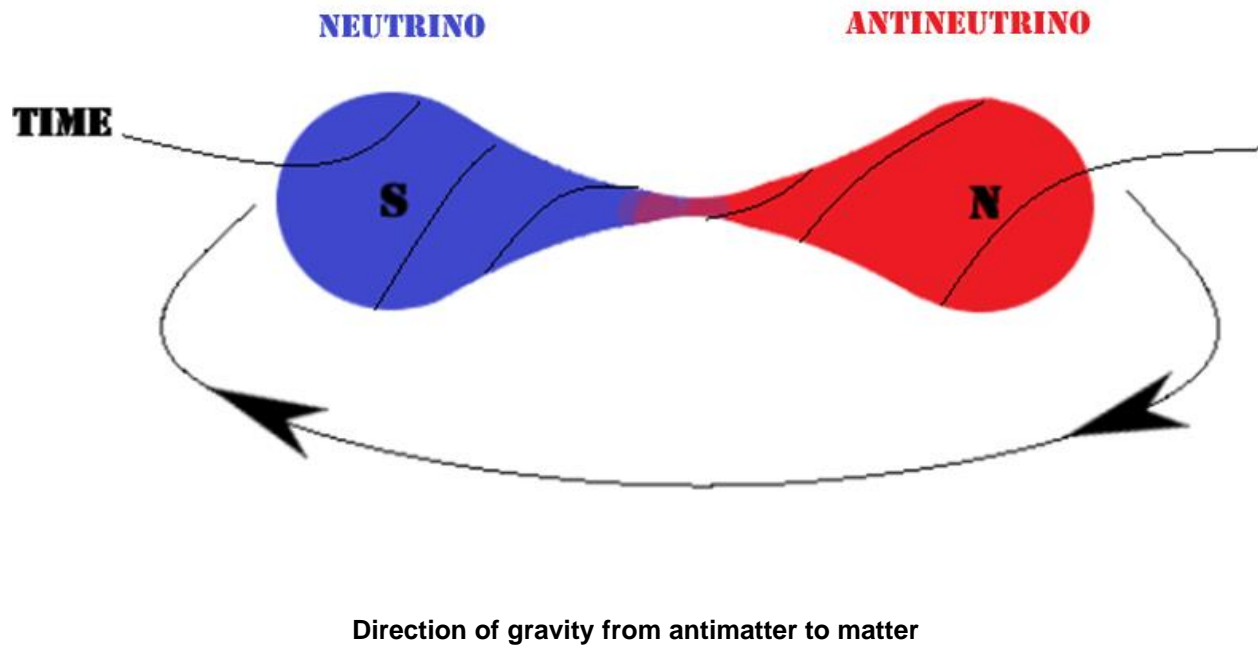
r : the distance between the two antiparticles

- : the negative sign means repulsive force

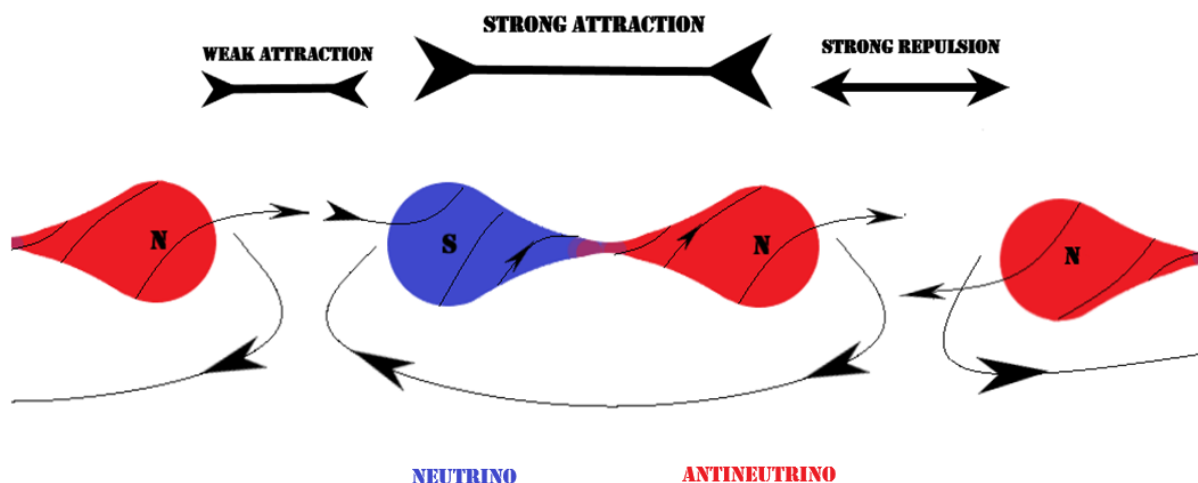
Therefore, according to these new equations, we will have three crucial conclusions:

- Gravitation is a dipolar *vector* force
- There is gravitational *attractive* force between two particles;
- There is gravitational *attractive* force between a particle and an antiparticle;
- There is gravitational *repulsive* force between two antiparticles.

Also, by analyzing the second equation we realize that gravitational attraction between a particle and an antiparticle is much less than the attraction force between a particle and another identical particle. In other words, there is gravitation between matter and antimatter, but much less than the gravitation between matter and matter. And there is strong repulsion between antimatter particles. Following picture demonstrates the direction of gravity in matter and antimatter:



Origami Model believes in gravitational attraction between matter and antimatter, simply because of the nature of gravitational force. Therefore, by considering the new equations, there would be zero gravitational force between a particle and its identical antiparticle (using second equation $A_m - M = 0$). This has to be true because if there was repulsion between neutrino and antineutrino, they would never collide! Also, if there was repulsion between particle and antiparticle, they wouldn't be able to be created by quantum fluctuations, contradicting Higgs Field Theory. On the other hand, if there was no gravitational attraction between matter and antimatter, or no repulsion between two antimatters, the Baryon Asymmetry necessary for Big Bang ⁽¹⁾ to create the universe of matter dominance would never succeed. This is the subject of my next chapter.



The mechanism of attraction and repulsion due to gravity

2. Antimatter Repulsion

Now that we suggest there is strong repulsive force between two antiparticles, let's see what would happen at the beginning of Big Bang. Unlike the Standard Model that suggests Big Bang started by explosion of an infinitely compact (contradictory), supermassive mass, Origami Model considers only a single pair of particle-antiparticle at singularity. The mass of these particles should be the lightest, most likely neutrino and antineutrino. According to Higgs Field Theory (2), there is constant quantum fluctuation in vacuum, creating particle-antiparticle pairs. The singularity moment in Origami Theory, is the moment that the first pair of particle-antiparticle appeared. According to my equation the gravitational force between these two particles would be zero because they contain the same value of mass. But when the next pair appear nearby, the equation would predict a different outcome. Based on my equations, we expect an attractive gravitational force between the two particles, and a repulsive gravitational force between the two antiparticles. This would be the very first force appearing in the tiny universe of two pairs of particle-antiparticle. Therefore, the two particles would move toward each other while the two antiparticles would move away from each other. This very first movement of particles and antiparticles starts the Big Bang, the expansion of the universe, which still continues. By the expansion of this tiny universe, stretched time will create more pairs of particle-antiparticles and the same phenomenon would repeat itself, creating an ever-growing mass of matter dominance, and ever-expanding space of antimatter dominance. This explains the Baryon Asymmetry that we know existed at the Big Bang (3), preventing the matter-antimatter from annihilating each other. This phenomenon is still occurring constantly in our universe. Figure 16 shows this effect.

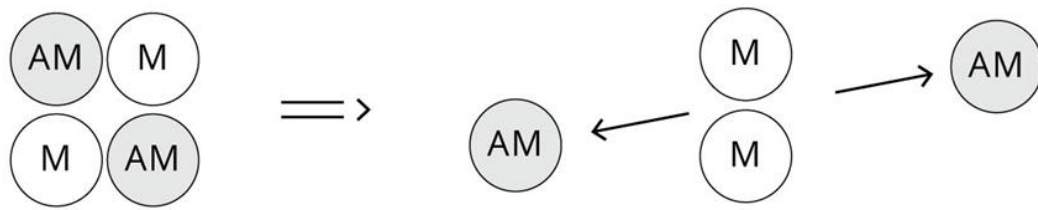


Figure 16- The beginning of universe, attraction of mater and repulsion of antimatter
M: matter particles AM: antimatter particles

Based on this model, Big Bang simply can start with a pair of neutrino-antineutrino created from quantum fluctuation in vacuum. The Standard Model of the Big Bang requires a gigantic, *infinitely* compact mass to start the universe, a mass so compact that the distance between the particles inside it is less than Planck Length! Then we are faced with the eternal question of “Where did this huge, super-compact mass that violates the laws of physics, come from?” as well as the question of “where did the energy that exploded this mass come from?” and the most important conflict, “Why didn’t matter and antimatter annihilate each other?” (4), While Origami Model simply overcome all these conflicts. Figure 17 demonstrates how gravitational attraction between matter and matter aggregates the particles, and how gravitational repulsive force between antimatter and antimatter disperses antiparticles, causing expansion of the universe.

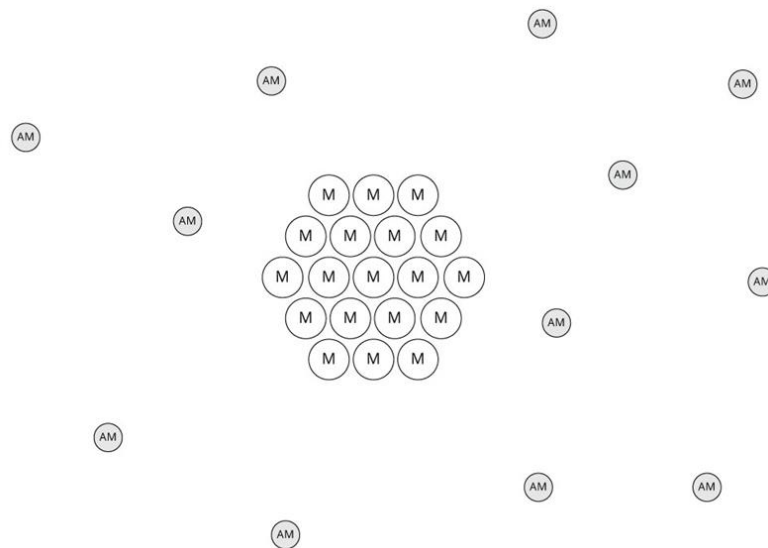


Figure 17- Aggregation of particles and dispersion of antiparticles
M: matter, AM: antimatter

We will see in future chapters how this simple mechanism produces the expansion of our universe and we will calculate the total force of gravitational repulsion that is produced by the Black Holes and we will see that it is precisely consistent with what we know as Dark Energy.

So Dark Energy is nothing but the gravitational repulsion force produced by the black holes and performed by the antineutrinos in space.

Centre of Gravity

We know that according to Newton's gravitational equation, center of gravity is at the center of the mass and the force of gravity in a mass is inversely proportional to the square of radius.

$$F = \frac{GM}{r^2} \quad (1)$$

Now, if the mass is a black hole, its radius would be calculated based on Schwarzschild radius equation:

$$r = \frac{2GM}{C^2} \quad (2)$$

rewriting the equation (1) based on equation (2), we arrive at:

$$F = \frac{rC^2}{2G} \quad (3)$$

This is a wonderful conclusion because it tells us that gravitational force of a black hole is independent of its mass and because C and G are both constants, the equation demonstrates that gravitational force of a black hole is only dependent to its radius. Therefore, unlike any other mass where gravitational force reduces exponentially with radius, in black holes force of gravity is directly proportional to the radius. This means unlike all other masses in universe, the *center of gravity in black holes is not located at the center of the mass*. According to equation (3) at the center of the black hole force of gravity is zero and it grows as radius increases.

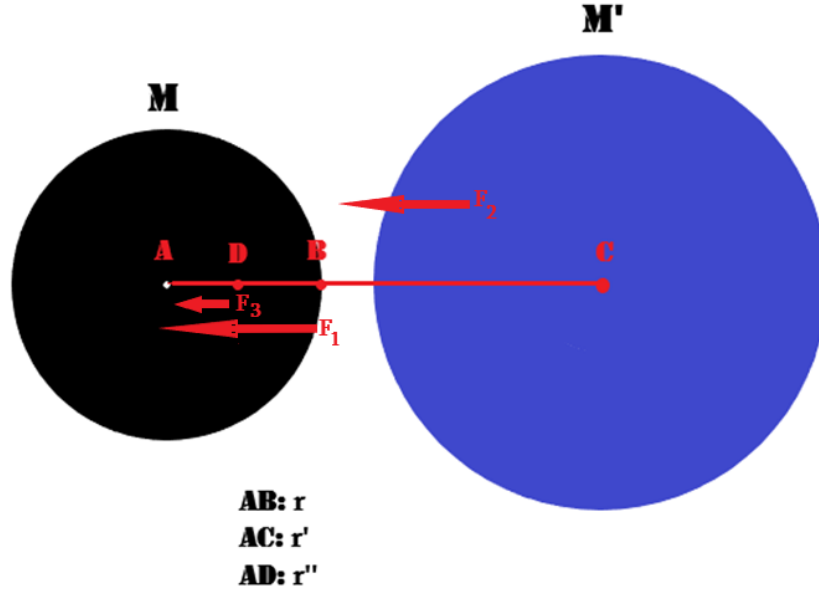


Figure 1. black hole M attracting mass M'

On the other hand, for a mass of M' located at r' distance outside the black hole with mass M and radius r, the gravitational force applied on the mass M' is calculated by Newton's equation:

$$F_2 = \frac{GMM'}{r'^2} \quad (4)$$

F_2 : gravitational force of a black hole applied on a mass outside its event horizon

G : gravitational constant

C : speed of light

When the mass M' reaches the event horizon of the black hole M the gravitational force applied on it would be calculated by equation (3):

$$F_1 = \frac{rC^2M'}{2G} \quad (5)$$

F_1 : gravitational force of a black hole on a mass at its event horizon

If the mass M' somehow gets inside the black hole, when it reaches the radius of r'' from the center of the black hole, the gravitational force applied on it would be calculated from the equation (3):

$$F_3 = \frac{r''C^2M'}{2G} \quad (6)$$

F_3 : gravitational force of a black hole on a mass inside its event horizon

To simplify the results if we imagine $M=M'$ and $r=r'$ and $r'' = \frac{1}{2} \times r$ then we arrive at:

$$F_1 = 6.7 \times 10^{26} rM$$

$$F_2 = 6.6 \times 10^{-11} \frac{M^2}{r^2}$$

$$F_3 = 3.3 \times 10^{26} rM$$

This simply means:

$$F_1 > F_3 > F_2 \quad (7)$$

In other words, the maximum gravitational force of a black hole is at its event horizon. The reason for this is when a star implodes to a black hole, the ring singularity developed at its center will expand radially until it reaches the perimeter of the collapsing star, equalizing the radius of ring singularity and Schwarzschild radius. The result demonstrates that gravitational force of a black hole starts from zero at its center and reaches to its maximum at the event horizon and then reduces again distance increases from the event horizon. This tells us that virtual mass inside the Schwarzschild radius of a black hole is zero. This result concludes that no mass would enter a black hole, because the maximum gravitational force is at the event horizon and when particle reaches that point, it will be affected by angular momentum of the rotating black hole will project it back into space from the poles of the black hole, relativistic jets. For a mass M' at the event horizon, there will be the gravitational force of F_1 applied on it from the event horizon and the angular momentum of F_4 due to the evolution of the black hole around its axis of rotation. Since F_1 depends only on the radius of the black hole, the gravitational force of event horizon would be the same in every point of the event horizon. However, the angular momentum would increase inversely proportional to the distance from the axis of rotation. To calculate F_4 we can use the Newtonian equation again:

$$L = I\omega \quad (8)$$

L : angular momentum of mass M' on event horizon

I : moment of inertia = mass M' multiplied by squared distance from axis of rotation (mr^2)

ω : angular velocity of M' = linear velocity V divided by distance from axis of rotation r ($\frac{V}{r}$)

At each point of the event horizon of the black hole, due to the conservation of angular momentum, we will have:

$$M'r_1V_1 = M'r_2V_2 \quad (9)$$

$$r_1V_1 = r_2V_2 \quad (10)$$

This means the velocity of M' will increase if it travels towards the axis of rotation of the black hole, and near the pole, where $r \rightarrow 0$ the linear velocity $V \rightarrow \infty$. If F_4 is the momentum of the M' we will have:

$$F_4 = M' \frac{V_2 - V_1}{T} \quad (11)$$

V_2 : terminal linear velocity of M' at the pole of the black hole

V_1 : initial linear velocity of M'

T : time that takes for M' to reach terminal velocity

As M' gets closer to the pole of the black hole, $V_2 \rightarrow \infty$ and at some point before M' reaches the axis of rotation ($r = 0$), $V_2 \rightarrow C$, which virtually converts M' to massless photons, reducing the gravitational force of the black hole on M' because F_2 depends only on the mass of M' . This causes $F_4 > F_2$ and as a result M' will be forced away from the black hole at some point before it reaches the axis of rotation.

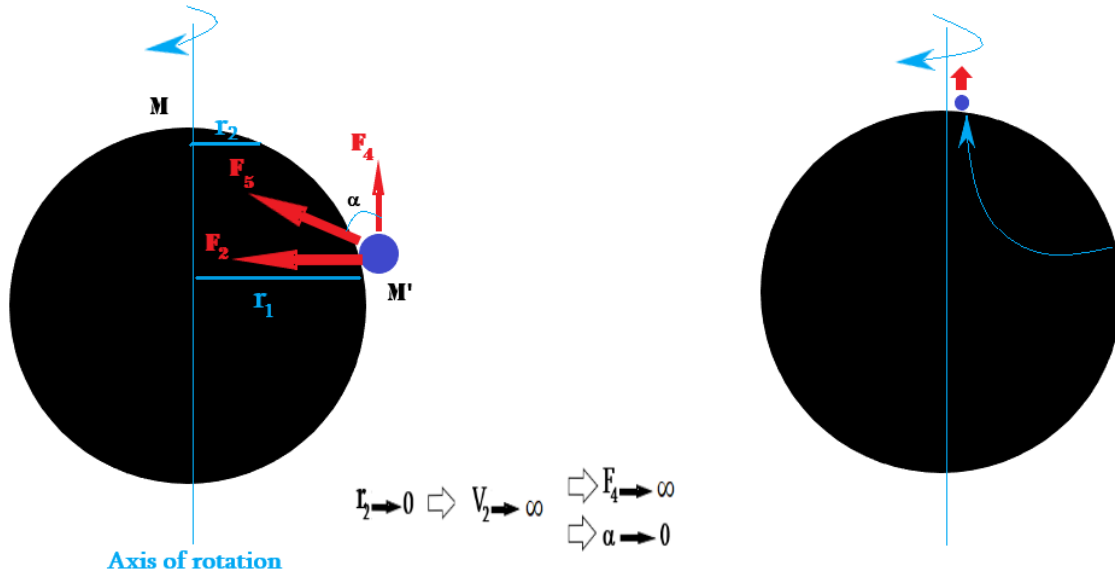


Figure 2. Forces applied on particle M' at event horizon

So gravity ends, center bh is end point of gravity, where it starts...

In next part I will demonstrate how ring singularity expands radially from the center of a collapsing star, creating the black hole....

This is how one third of star mass convert to energy and it loses its crust and the rest of its mass turns to a black hole with the ring singularity created at its center.

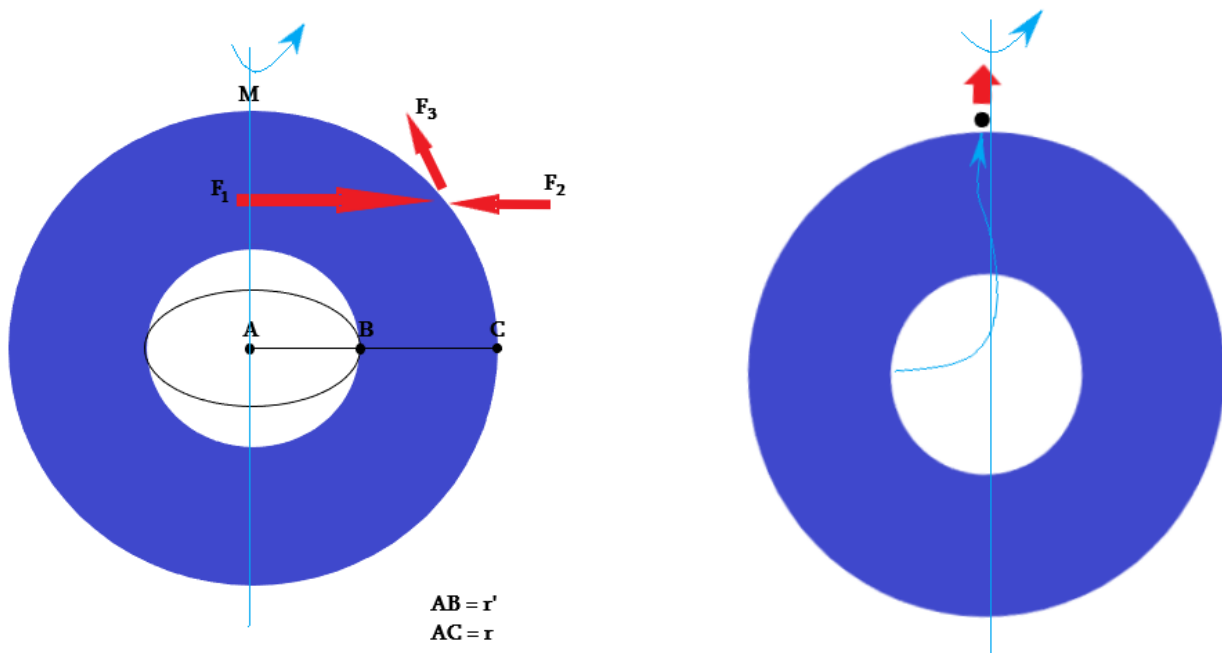


Figure 3. Collapse of star and expansion of ring singularity

Now in figure 3 the radius of the ring singularity is $r' = AB$. The mass of the black hole is located between the B and C, the perimeter of ring singularity and the event horizon. As I showed already, value of gravity at the center of the black hole is zero and it reaches its maximum at event horizon. Because the mass is uniformly distributed in a rotating spherical black hole, the force of gravity at each point of the event horizon is the same. This powerful gravity (F_1) will push B towards C. The mass located between B and C will experience two forces: F_1 : the force of gravity from the center of the black hole pushing it towards the event horizon, F_2 force of gravity from the infinity pushing it towards the event horizon, F_3 : angular momentum pushing it to escape. According to the escape velocity equation, the minimum escape velocity would be at event horizon (C) where radius is at its maximum.

$$V_e = \sqrt{\frac{2GM}{r}} \quad (12)$$

r : radius of black hole (Schwarzschild radius) = AC

G : gravitational constant

M : mass of the black hole

According to the definition of black hole, escape velocity of M is always equal to speed of light C. This will obviously convert our classic mechanics equation to Schwarzschild equation for radius of black hole. Also based on the angular momentum equation the value of F_3 will be at its maximum when r is at its maximum which is the event horizon.

$$L = mrV \quad (13)$$

L : angular momentum of particle

m : mass of the particle

r : distance of the particle from the center of the black hole

V : linear velocity of the particle

This means particles at the event horizon have highest chance of leaving the black hole compared to particles inside the event horizon and the last particle leaving the black hole will be the one located at ring singularity. The two forces of F_1 and F_3 push the particle at event horizon out of the black hole and the force F_2 tries to keep the particle at the event horizon.

$$F_2 = \frac{GMM'}{r'^2} \quad (14)$$

$$F_1 = \frac{rC^2M'}{2G} \quad (15)$$

$$F_3 = mrV \quad (16)$$

As we see in equations (12) and (16), the escape velocity for the particle is independent of the particle's mass, and the angular momentum of the particle is independent of the black hole's mass. It is clear that F_2 is much smaller than F_1 and F_3 . For example, if we consider an electron $m = 9.1 \times 10^{-31} kg$ located at point C on the event horizon of a black hole with mass of four solar masses $M = 7.6 \times 10^{30} kg$, we can easily find the value of the three forces:

$$r = \frac{2GM}{C^2} = \frac{2 \times 6.67 \times 10^{-11} \times 7.6 \times 10^{30}}{9 \times 10^{16}} = 1.12 \times 10^4 m$$

$$F_1 = \frac{rC^2M'}{2G} = \frac{1.12 \times 10^4 \times 9 \times 10^{16} \times 9.1 \times 10^{-31}}{2 \times 6.67 \times 10^{-11}} = 6.8 \, N$$

$$F_3 = mrV$$

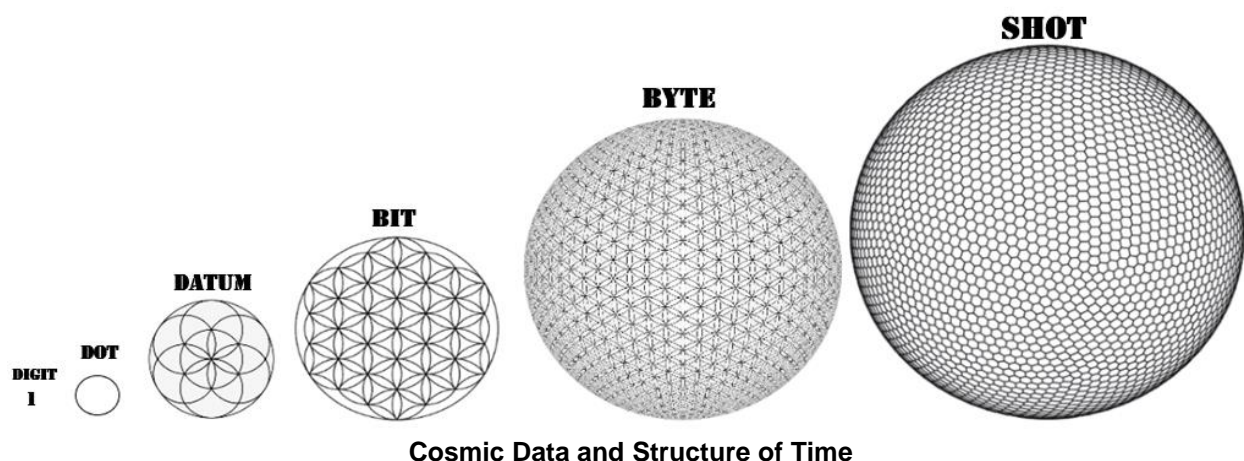
Time

Many philosophers and scientists throughout the history have been trying to discover and define time, with not much success. I believe the main reason for us to be unable to explain time is because we, and everything else in our universe, is made of time. We have been always looking for time outside our world, and we have constantly supposed that events happen and a mysterious entity that we know as time, somehow records them. But events *are* time.

Origami Model shows that *time is data that constantly evolves*. The total amount of time is constant. The total amount of gravity is constant. The progression of time that produces the expanding universe, is due to constant production of new information. Information is created when time combines with gravity. Mass is the information that is produced by combination of time and gravity. We will see soon that speed of time is much faster than speed of information. In other words, *time progresses so much faster than reality*. Speed of combination of data (time) with gravity is what we know as speed of light, in other words, speed of light is speed of reality and that's why we cannot go faster than speed of light unless we bypass the reality. This makes our world a predetermined reality. However, as time passes, speed of reality gets closer to speed of time until it becomes equal and even faster than speed of time. That is when we enter a new world that is not predetermined anymore and we will have total liberty. To be able to understand the concepts of "speed of time" and "progression of time", we first need to learn the structure of time.

Structure of Time

To organize and work with the data that is recombining itself constantly, universe needs to have a system for organizing it. The universe does this by organizing the units of data in packs.



The effective combination of data and gravity becomes the information. The smallest unit of cosmic information is the Origamon (photon) and the smallest unit of data is Digit. The Digit is actually 1 which in combination with gravity (0) becomes mass. The proliferation of Digits is as following:

$$1+0 = 1$$

$$1+1 = 2$$

$$2+ 1 = 3$$

$$3 + 2 = 5$$

$$5 + 3 = 8$$

$$8 + 5 = 13$$

$$13 + 8 = 21$$

$$21 + 13 = 34$$

Because data has to combine and recombine with its own, the product will have to be in what we know as the Fibonacci sequence. These Digits then gather in larger packets: Dot, Datum, Bit, Byte and finally Shot. The fundamental packet of information is the Shot. Each Shot would have enough data to produce many Origamons. The size or capacity of a Shot is the number of Digits that can it contain. We will see in later parts of paper that the capacity of Shots reduces constantly and causes the time to accelerate but the capacity of packages smaller than Shot stay constant. Each Shot of time is one Planck Time. In other words, in every Planck Time there are a large amount of data, enough to produce many Origamons. Based on the acceleration of time that is 6.67×10^{-11} (gravitational constant) I will calculate in next chapters that the capacity of Shot's at Big Bang has been enough to produce 6×10^{23} number of Origamons. This is virtually the origin of what we know as Avogadro Number and it is a wonderful finding because it gives us a great insight to behaviour or light in our universe.

The maximum capacity of a Shot is at Big Bang and it Avogadro number of Origamons.

Considering the mass of Origamon, by using the equation that we develop in later chapters, we will convert the mass of Origamon to equivalent amount of time and that would be in fact one Byte of data, and also this would tell us how much time (data) can be stored in one Shot at its largest volume. We will calculate in further chapters that Origamon (photon) has a mass of 1.3×10^{-70} kg. Therefore, we conclude that one Byte of Cosmic Data translates to 1.3×10^{-70} kg of mass in our universe. To calculate one Byte of Cosmic Data we will have to use our equation to convert the mass of Origamon to time. We will extract this equation together in the next chapters:

$$M = \pi^2 T^3$$

M : mass in kg

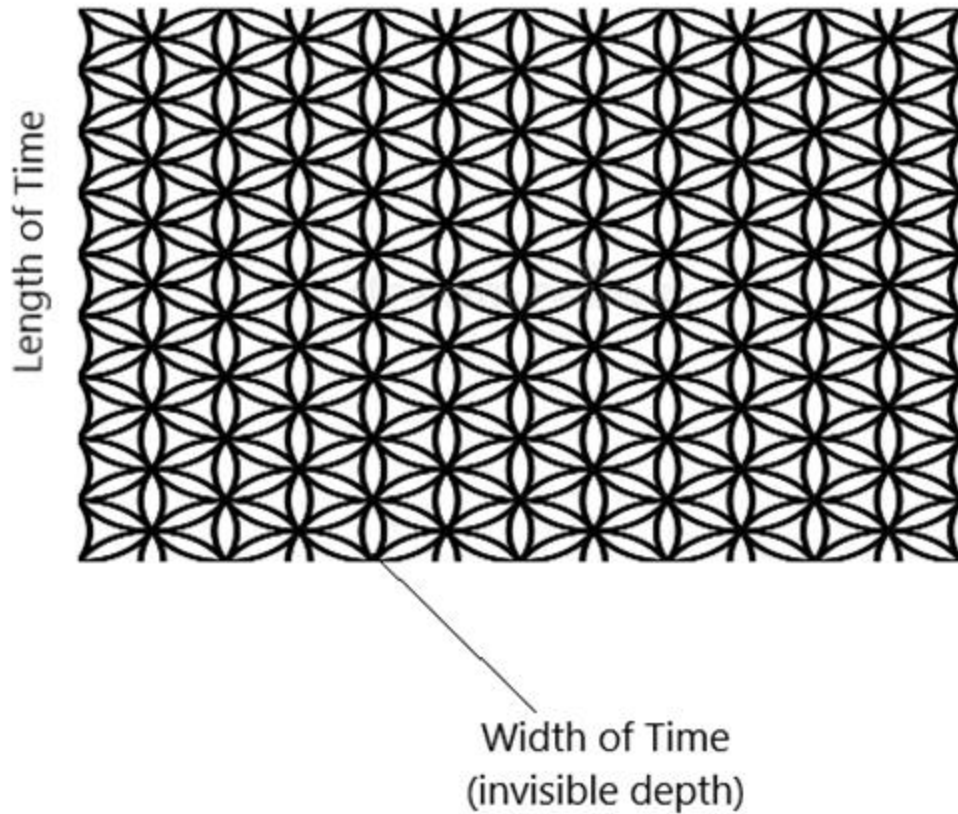
T : time used to produce mass in second

Based on this equation we can calculate how much time has been used to produce the smallest unit block of universe, Origamon.

$$1.3 \times 10^{-70} = 9.87 \times T^3$$

$$T = 2.16 \times 10^{-24} s$$

This means one Byte of cosmic data is equal to 2.16×10^{-24} seconds. Now we need to find the value of one Bit of cosmic data, so we can calculate how many Bits will make one Byte in cosmic data classification. I explained that as time accelerates, the size of Planck Time shrinks, and the rate of its reduction is 6.67×10^{-11} , (which is exactly how the Gravitational Constant). Therefore, to find out the smaller value of time, or the actual value of one Bit of cosmic data, we need to find the value of Planck Time at the end of the universe. Planck Time at present is 5.4×10^{-44} seconds and we will calculate in further chapters that when our universe reaches its mature size in 0.7 billion years, Planck Time will be exactly 5.3×10^{-44} seconds.



Time has length and width

Therefore, the final/smallest Planck Time is in fact the length of one Bit of cosmic data. To find the smallest width of time we need to use the following equation:

$$W_t = \frac{\sqrt[3]{T}}{2}$$

$$W_t = \frac{\sqrt[3]{5.3 \times 10^{-44}}}{2} = 3.9 \times 10^{-16} s$$

This shows that width of time is in fact longer than its length so maybe we should call it depth of time instead. This makes it possible for us to decode one Bit of cosmic data.

1 Bit CD = 5.3×10^{-44} seconds

1 Byte of CD = 2.16×10^{-24} seconds

Number of Bits in one Byte of cosmic data = $\left(\frac{\text{total time in one byte}}{\text{length of one bit}}\right)^2 \times \text{width of one bit}$

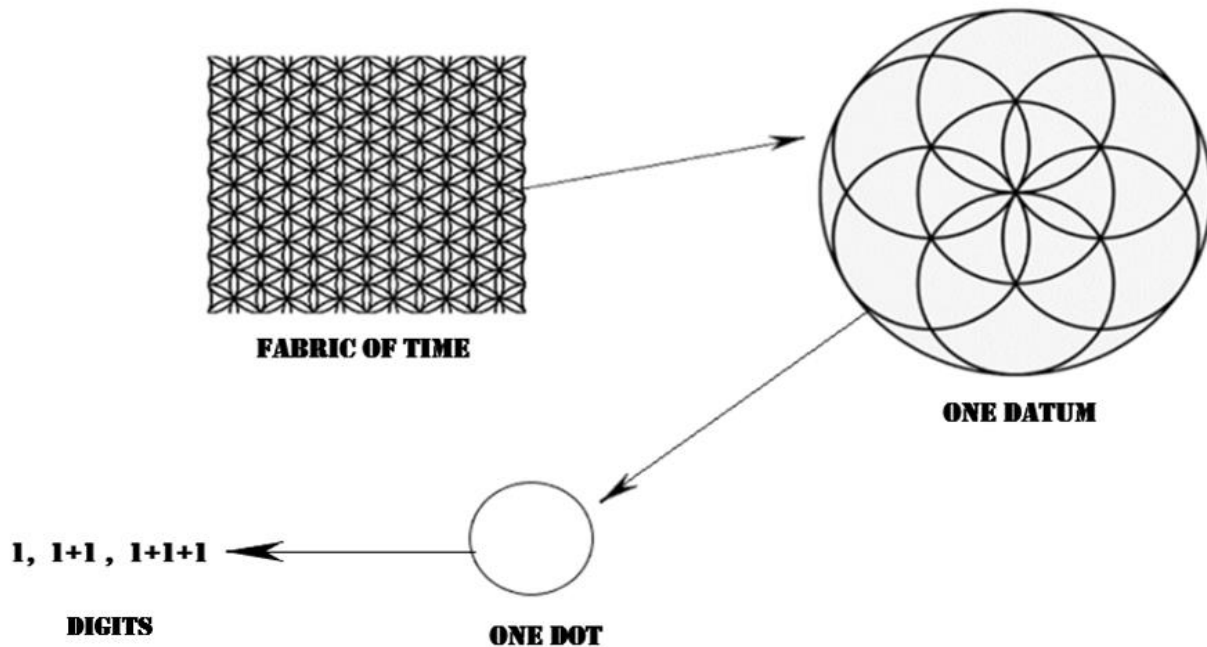
Number of Bits in one Byte of CD = $\left(\frac{2.16 \times 10^{-24}}{5.3 \times 10^{-44}}\right)^2 \times 3.9 \times 10^{-16} = 6 \times 10^{23} \text{ bits}$

1 Byte CD = 6×10^{23} Bits CD

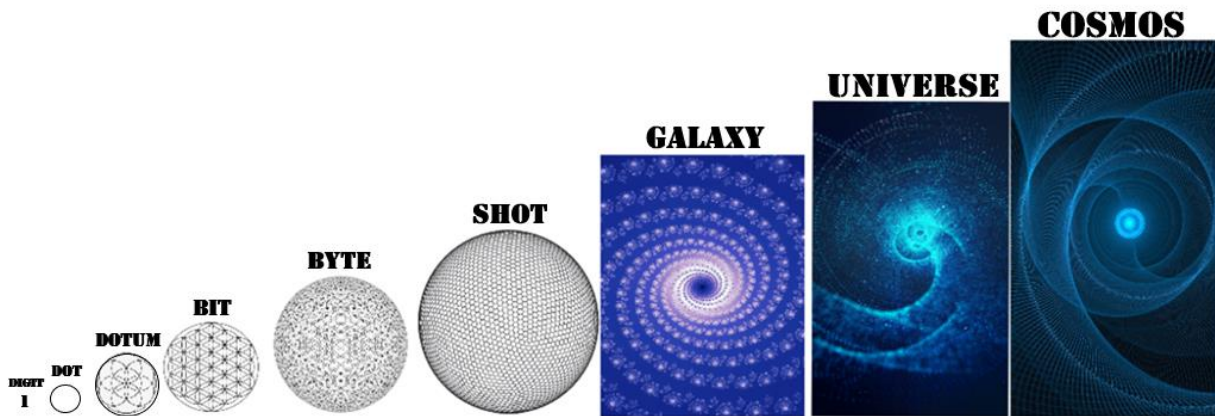
One more time the mysterious Avogadro Number reveals itself. If we look at the size of one Byte CD, interestingly we find that the size of it is a multiple of 6 again:

$$2.16 \times 10^{-24} = 6 \times 6 \times 6 \times 10^{-26}$$

This is in fact because circle has 360 degrees and time moves in circular pattern due to the homogeneity of gravity around it. One Bit of cosmic data is made of six Datum and one Datum is made of six Dots of cosmic data. One Dot is consisted of six Digits. Digit is in fact the original unit block of cosmic data, the actual unit block of existence. The nature of one Digit is the reality of information, just one Digit that together with many more creates a sequence, a code. The universe starts from one Digit. At Singularity there is only one Digit and Nothing.



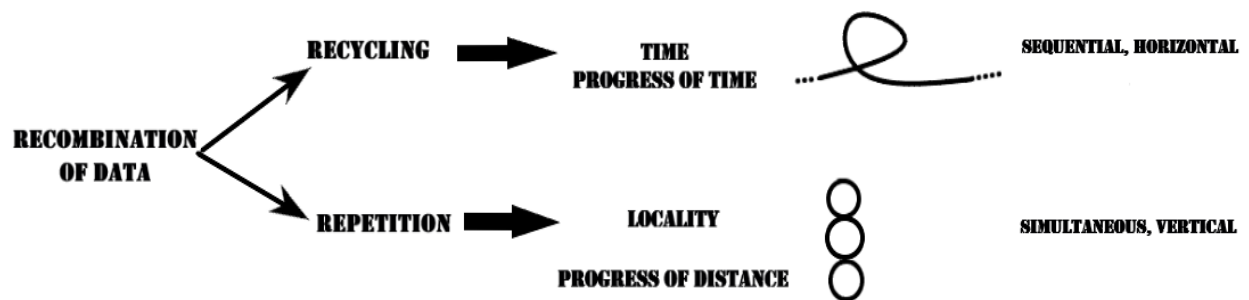
At the very end of cosmic life, the Shot capacity will be at its minimum, so the speed of time will be at its incredibly high level. This will bring the time to its maxim proximity to analog quality. It is like a camera with incredibly large number of pixels. This is the way cosmos tries to reduce its quantization and progress towards continuous data, towards minimum granularity. At that moment, the entropy will be at its maximum because each single Shot will contain only one Origamon.



How time produces the entire cosmos

Passage of Time and Speed of Time

Data recombines in two ways: Repetition of data, Recycling of data. During Repetition, same sequences of digits are reproduced. In Recycling, new sequences of Digits are produced. During the Repetition, the same sequences of Digits are reproduced. Both of these are critical in producing information and creating the reality of our universe. Recycling is what we perceive as progression of time. Repetition is what we perceive as length or distance and it eventually creates the radius of universe. Therefore, space, locality and object permanence are products of Repetition of data.



Repetition of data creates same particles that exist simultaneously and so produces the locality and the radius of universe, while recycling of data creates new particles every moment in sequential pattern and so produces the passage of time

Through the Recycling, every new sequence lasts for a Planck Time before it disappears and new sequence is produced. This is how time progresses. Therefore, when a photon (Origamon) moves forward, at every Planck Time, it becomes a new particle. But at every Planck Time, the entire universe exists, which is due to the repletion of all existing data. This means Data that produces the entire universe, at every Planck Time travels to the end of its radius and returns. This means the Vertical Repetition of time is much faster than Horizontal Recycling of time. Horizontal speed of time is what we know as conventional speed of time. As we calculated before, acceleration of time is equal to deceleration of light, equal to the gravitational constant:

$$G = \frac{V_t^1 - V_t^2}{T}$$

G : Gravitational constant or acceleration of time $= 6.67 \times 10^{-11}$

T : age of universe $= 4.3 \times 10^{17} s$

V_t^1 : original speed of time at Big Bang

V_t^2 : current speed of time

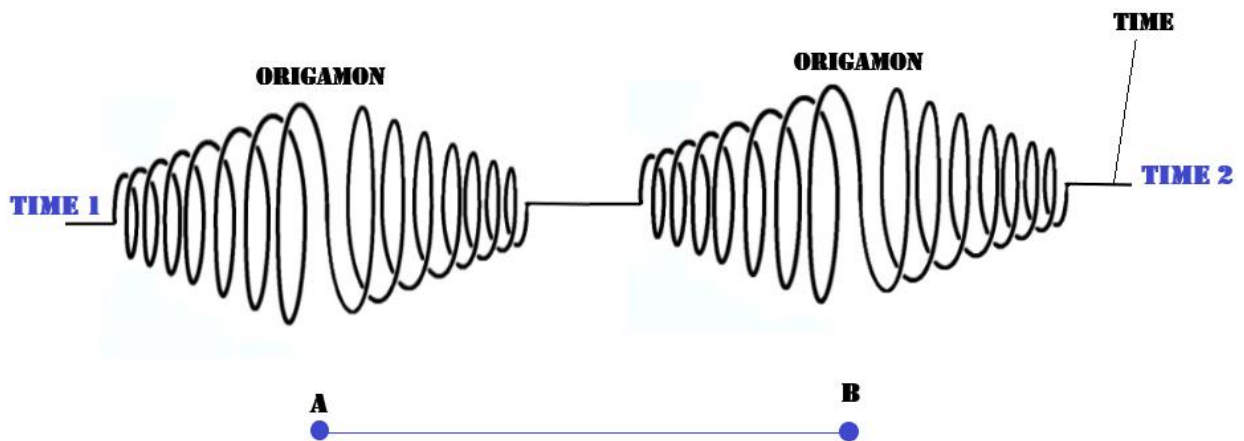
We know that $V_t^1 = G \times V_t^2$

So, we will arrive at:

$$6.67 \times 10^{-11} = \frac{V_t^2 - (G V_t^2)}{4.3 \times 10^{17}}$$

$$V_t^2 = 3 \times 10^9 m/s$$

This proves that current speed of time (Horizontal speed or speed of Recycling) is ten times higher than speed of light. The physical explanation is due to the distance that time travels between the two Origamons. The following picture demonstrates that the distance time travels between two Origamons, which is the horizontal speed of time is π^2 times bigger than distance that light travels:



ORIGAMON (LIGHT) TRAVELS FROM POINT A TO POINT B
TIME TRAVELS FROM TIME 1 TO TIME 2 WHICH IS 10 TIMES LONGER THAN A-B DISTANCE

To measure the Vertical speed of time that is the Repetition rate, we obviously need to divide the radius of universe by Planck Time. Therefore, we can develop the equation to calculates the vertical speed of time:

$$\text{Vertical speed of time} = \frac{2 \times \text{horizonatl speed of time}}{\text{Planck Length}}$$

$$V_t^v = \frac{2 \times 10 \times C}{L_p}$$

c : speed of light

L_p : Planck Length (1.6×10^{-35})

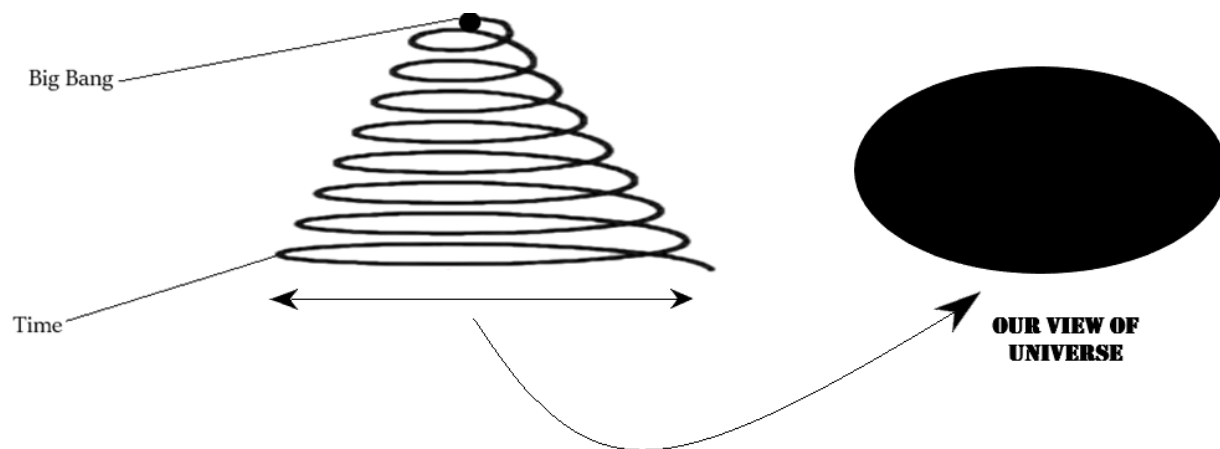
$$V_t^v = 2 \times 9.87 \times 3 \times 10^8 : 1.6 \times 10^{-35} = 3.7 \times 10^{44} m/s$$

This gives us two crucial values of horizontal speed of time and vertical speed of time:

$$V_t^v = 3.7 \times 10^{44} m/s$$

$$V_t^h = 3 \times 10^9 m/s$$

Unlike what most of us might think, the Recombination pattern of time is easy to predict. As time recombines its data and proceeds inside the pool of gravity, it can go straight only if the total force of gravity on it is zero which is not the case, otherwise time would not progress. Therefore, time will progress by Recycling in Hyperbolic and Elliptic pattern. The hyperbolic pattern will produce a spiral progress that has been shaping our universe:



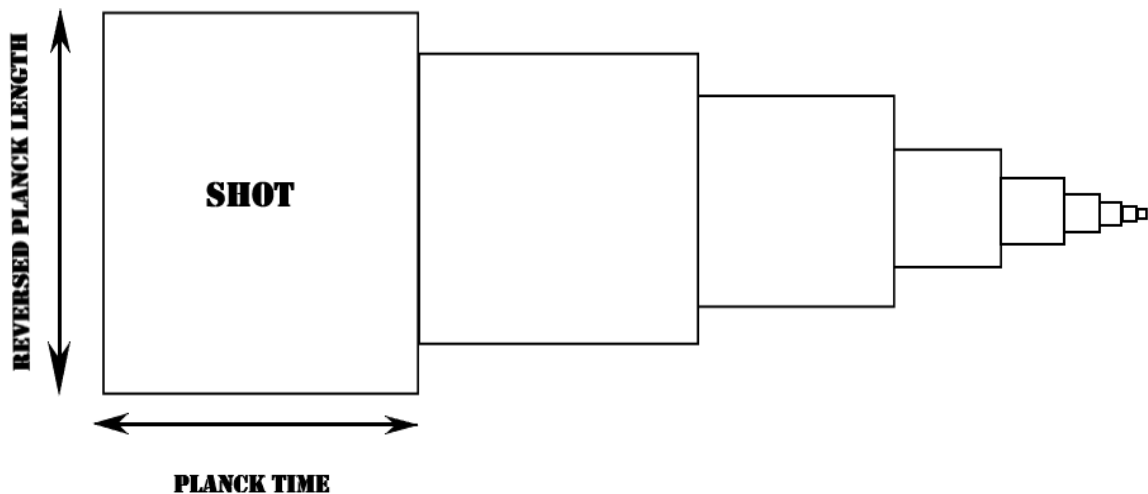
Our spiral-cone universe which is observed as an oval

The hyperbolic progress of data produces what we know as antimatter. In the chapter of structure of mass, I will explain this in more details. The only cause of recombination of data must be the gravity because that is the only force. Data with no gravity would have no order,

direction or effect. As gravity has direction due to its dipolar nature, its effect on data creates ordered sequence of data that transpires as Direction and eventually rotation and spin. At the Big Bang, the gravity is in a uniform of vacuum but as time expands inside it, the *density* of gravity reduces which makes time accelerate. Therefore, speed of time is inversely proportional to density of gravity. This is why gravitational constant is the acceleration of time. This means both vertical and horizontal speeds of time increase. Acceleration of horizontal speed of time makes reduces the speed of light constantly and this is why speed of light has been constantly reducing with the same rate as time accelerates. Acceleration of vertical speed of time creates the acceleration in expansion of universe.

As total amount of time and gravity is constant, for speed of to increase, the density of time has to reduce which means the total amount of data in each Shot will reduce constantly. In other words, the total amount of cosmic data per Planck Time is constantly reducing. This translates to reduction of possible maximum number of photons (Origamons) that can coexist in each Planck Time. If we imagine time has length and width, the length of a Shot is equal to one Planck Time and width of each Shot is equal to reversed Planck length. Below picture shows how Shots of time are reducing in size, causing the acceleration of time (acceleration of Recycling of data).

BIG BANG.....NOW



Acceleration of time means reduction of Planck Time and Expansion of Planck Length

Origami Model describes time in details and as a quantized and discontinuous data, and this is exactly why mass and energy are quantized. This means, time is made of certain units that each one has certain capacity. In other words, the maximum number of Origamons (photons) that can be produced in each Shot (in one Planck Time) is constantly reducing. We will see in later chapters, how this explains precisely the maximum frequency of light at Big Bang was $6 \times 10^{23} \text{ Hz}$ and it is now $9 \times 10^{20} \text{ Hz}$. The number of particles in each Shot (one Planck time) is what we know as the frequency of a particle in Standard Model. Origami Model demonstrates that the interference pattern and the wave feature of particles is only due to the multiple number

of particles coexisting in each Planck time. The wave effect is a misconception and the universe, including light, is only made of particles. We will also see due to the expansion of Planck Length, the smallest particles that existed and were observable in the past, will become unobservable at present. This explains why Origamons (photons) have become massless and their radius is not observable for us. This is how when a quantized mass disintegrates into its structural Origamons (photons), it become invisible electromagnetic energy. I am calling this phenomenon, Quantum Entrapment. Therefore we will have the following definition:

Quantum Entrapment is the number of identical particles in one Planck Time.

The total identical particles that are produced by one Shot, they will travel at the same location and time, because we can not measure any length of time shorter than Planck Length, and we observe them as only one particle. But when observing their effect, we will realize that they are more than one particle, and this is how interference pattern is produced by particles.

Frequency is the number of identical particles in one Shot.

This means, in one Planck Time, we always have so many particles traveling together but we only see one particle per Planck Time. The larger the mass of particle, the less the number of identical particles placed in the same Shot, so the less the possible maximum frequency.

We need to note that at each Planck Time (Shot) there are multiple identical (almost) particles. This means at each Planck Time there are always many Origamons (photons) are traveling but because the shortest time observable for us is the Planck Time, we only observe one particle at the time until the particle hits a target or interact with another media and we notice the effect of many particles. I am calling this effect, Quantum Entrapment. Therefore, we will have this definition:

Therefore, what we know as frequency is actually the effect of quantum entrapment and this is the quantum entrapment that causes the wave effect of particles. We will see in future chapters that as Shots of time (Planck Time) reduces, the quantum entrapment reduces until at the end of cosmos that it will only contain one Origamon (photon) and then particles will have no illusional wave effect anymore. Following picture demonstrates how quantum entrapment produces the wave interference feature for particles that we have wrongfully interpreted as wave feature of particle.

PARTICLE OBSERVED AT LENGTH OF TIME



ALL OTHER STATES OF SAME PARTICLE AT WIDTH OF TIME



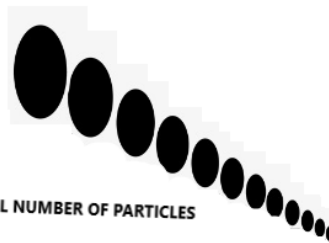
We observe only one person as we only perceive the entire Planck Time at one moment

The following figure demonstrates how double slit experiment occurs due to the same mechanism. What we observe as one single particle, such as a photon, is in fact a group of identical particles next to each other in one Shot (one Planck Time). The number of these identical particles in one Shot is what we know as the frequency of the particle and this is why kinetic energy of the particle is proportional to the frequency of the particle.

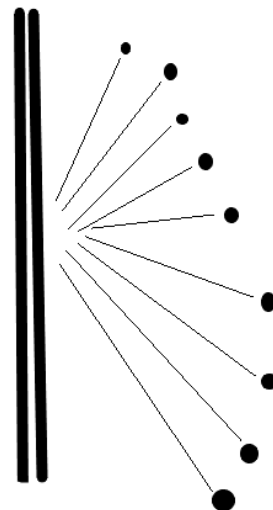
PARTICLE OBSERVED AS ONE



REAL NUMBER OF PARTICLES



DOUBLE SLIT



INTERFERENCE PATTERN

The mechanism of double slit experiment and wave feature of particles

Real Speed of Time

According to the Theory of General Relativity for any object moving as fast as speed of light, time stops. This means the Apparent Speed of Time is equal to speed of light. However, as I shown already the Real Speed of Time is ten times higher than speed of light. This means the Real Duration of Time to produce a mass is ten times higher than the Apparent or Observed duration of time.

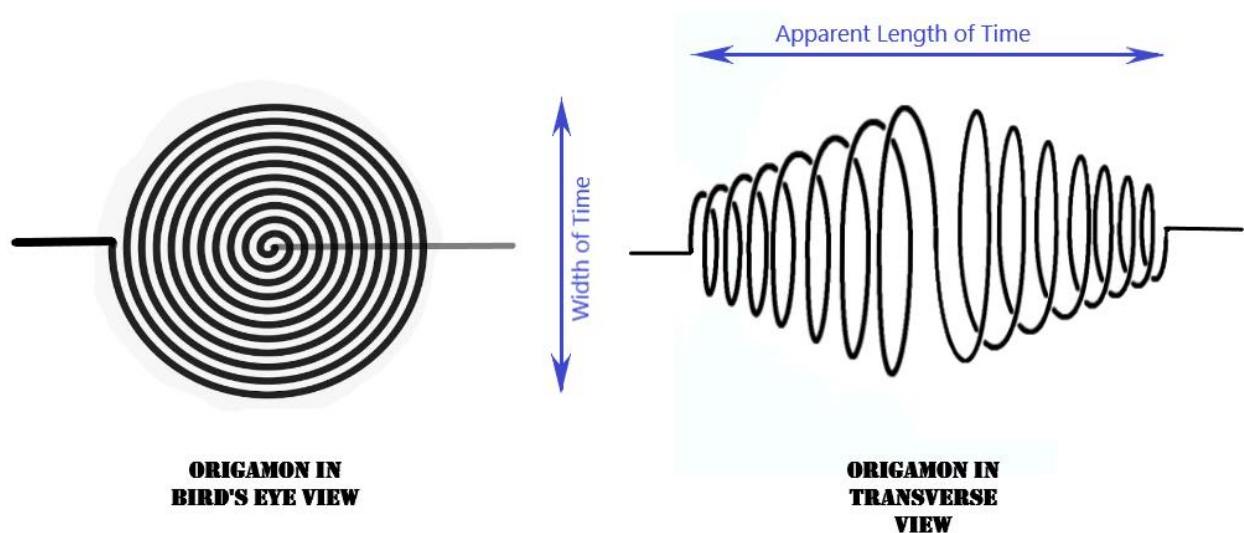
$$V_t^R = 10V_t^A = 10C$$

V_t^R : Real speed of time

V_t^A : Apparent speed of time

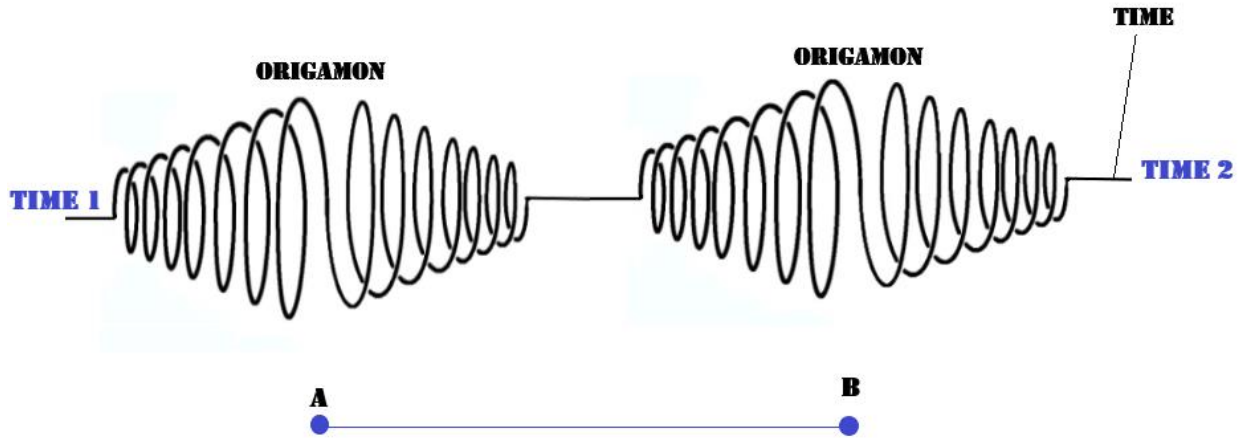
C : speed of light

Note that one photon (Origamon) does not travel in space, it is time that produces one Origamon and then leaves it and moves on to produce it again in Planck time later, and this is what we perceive as photon traveling in space. This means, what we know as speed of light is in fact the speed of producing Origamons (photons), or speed of combining time with gravity. Below picture demonstrates this effect:



Schematic demonstration of how time produces Origamons (photons)

The Real Speed of Time which is the speed at which time travels from Time 1 to Time2 in the following picture, is much higher than the Apparent Speed of Time:



**ORIGAMON (LIGHT) TRAVELS FROM POINT A TO POINT B
TIME TRAVELS FROM TIME 1 TO TIME 2 WHICH IS 10 TIMES LONGER THAN A-B DISTANCE**

This translates into the following equation:

$$T_l^r = 10T_l^a$$

T_l^r : Real length of time

T_l^a : Apparent length of time

This simply means that real length of time is almost ten times longer than the apparent/observable length of time. In other words, the real age of universe is ten times higher than what we have measured. Now considering these facts we can easily calculate the acceleration of time. But before doing that, we need to note that the rate of acceleration of time is in fact the rate of reduction of gravity in our universe.

Acceleration of time = rate of reduction in gravitational density = $\frac{\text{Apparent speed of time}}{\text{Real length of time}}$

$$\frac{3 \times 10^8}{43.4 \times 10^{17}} = 6.67 \times 10^{-11}$$

Therefore, the correct term for the Gravitational Constant would be the Gravitational Density Coefficient because it is the rate by which the density of gravity is reducing in our universe.

Spin and Speed

As time proliferates itself by recycling and repetition, there will always be some data repeated in new combinations and this is exactly why the Recombination of data has a spiral pattern of Fibonacci Sequence because in Fibonacci numbers, each new value is produced by adding of the previous ones. Let's look at these numbers again:

1, 2, 3, 5, 8, 13

Now we can rewrite the numbers in this way:

1

1+1

1+ 1 + 1

1+ 1+ 1 + 1 + 1

1+ 1+ 1 + 1 + 1 + 1 + 1

1+ 1+ 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1

The Digit is always 1, it is the gravity that creates the effective codes:

1 0

1 + 1 0

1+1+1 0

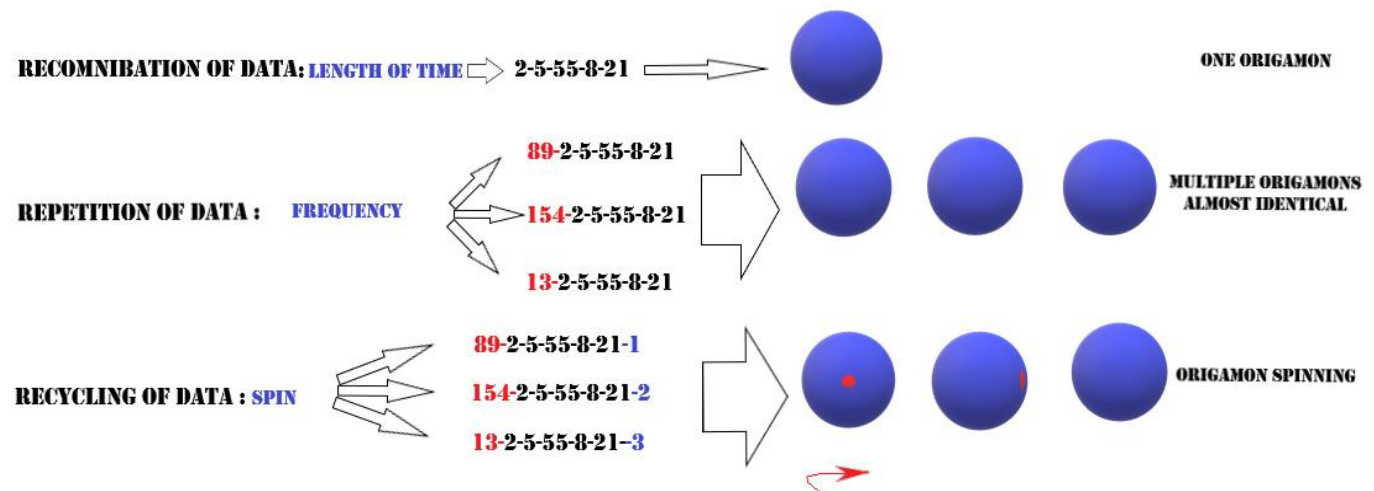
1+1+1+1+1 0

To find the ratio we simply divide the sequential digits and it will always be 1.61, which we call φ :

$$\varphi = \frac{13}{8} = 1.61$$

This Revolution is eventually responsible for spin of all particles. The Revolution of time is in all directions, which means it revolves *statically* and *dynamically*. The static revolution is what we know as Spin and the dynamic revolution is what we call Movement or Rotation.

The following demonstration illustrates the two phenomena of recycling and repetition of the codes of data. As you can see when the same data (sequence of Digits) is repeated, another almost identical Origamons is produced inside the same Shot (same Planck Time) which we know as the frequency of Origamon (light). But when Digits are mixed and come out in different order, recycling, different Origamons will appear in next Shots and this is how we observe the same Origamon spinning. Note that it is never exactly the same Origamon, either in repetition or recycling.



How various data features create frequency and spin for Origamon

In above picture, we see three types of data (Digits):

- 1- The black digits are the *Core Data*, the data that creates the *mass* of the particle,

- 2- The red digits at the beginning of data, that are random and have no order and produce various copies (almost identical) of the same particle inside the same Planck Time (Shot), these are responsible for the *frequency* of a particle,
- 3- Finally the terminal blue digits that are the ending digits and they have *order* next to each other, they are always in Fibonacci Sequence, so their rate to each other is equal to $\varphi = 1.61$ and they repeat after each Planck Time (each Shot), so these are the Recycling Data that produce the *spin* effect.

This structure is very similar to the linguistic method: Red is Prefix, Blue is the Suffix and Black is the Root. Note that frequency of a particle is repetition of same particle in the same shot but spin is due to the orderly recycling of data in sequential Shots because we do not observe the spin in only one Planck Time. The orderly sequence of Recycling Data introduces a totally new feature to our universe: *Direction*.

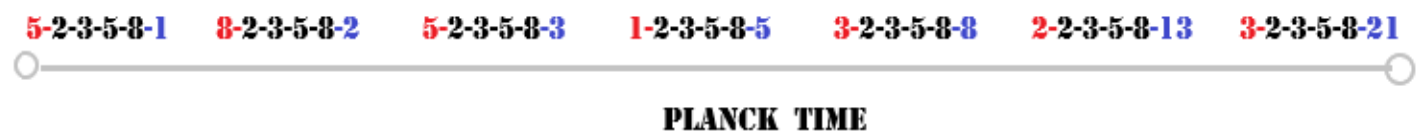
The Core Data of a particle defines that particle's mass and the other two types (Repetition Data and Recycling Data) are categorized as *Collateral Data* that define the frequency and spin of the particle. Spin and mass of a particle are constant but frequency of a particle has a maximum possible and a minimum possible limit that are both reducing as time accelerates in our universe and they keep reducing due to the reduction of Shots (reducing Planck Time). The concept of frequency is completely misunderstood in Standard Model because it is based on the repetition of same particle while no mass or event ever repeats itself in universe and what we perceive as frequency is in fact the multiple number of almost the same particles that are traveling in one Shot (all in one Planck Time) so they all affect the environment at the same time creating an added effect. This explains why when we apply energy to photons they do not travel faster, but their frequency increases, bigger number of them get entangled and fit into the same Planck Time (same Shot of data).

Note that repetition is only partial and it is never absolute, which means there is never two identical particle in our universe and unlike what Standard Model suggests, no two photons can ever be identical, even when they are entangled and placed across each other in the same Shot of time because each one is consisted of a different Repetition Data. This brings us to a new concept: Any particle is made of a Core Data and a Collateral Data. The Core Data of all photons (Origamons) are identical and this is what makes them same particles. However, the Collateral Data about their spin and frequency is different between the photons.

Therefore, two particles are the same type if they have identical Core Data, but no two particles have identical Collateral Data. All photons (Origamons) in universe have the same Core Data because they have the same value of mass but the details of Collateral Data about them which explains at what point of time they are located and how much energy they are carrying and what value of spin they have, is different.

We conclude that Collateral Data are syntactic data that are added to Core Data because they are meaningless by themselves. However, Core Data is Semantic Data and translates into mass. Syntactic data of a particle is either Vector Data or Scalar Data. Vector Data is the data that produces spin for particle and it is the foundation of *Direction* in our universe. Spin has direction and it is the direction of spin that can produce gravitational attraction or gravitational repulsion (antigravity), which I explained in Gravity and Mass chapter. These data are all produced as a result of *continuous* Recombination of time. Time is quantized but the Recombination of time is continuous. Therefore, during one Planck Time, data has chance to

continuously recombine itself, producing maximum possible variations of itself while keeping the Core Data unchanged. This is why as time progresses, the Planck Time shrinks, giving less chance to the Recombination to produce more versions of the same particle, so the number of similar particles in each Planck Time (each Shot) reduces (maximum frequency of light reduces) and the spin of particle reduces. We know that spin of particles is always close to speed of light, but as speed of light reduces, so spin reduces with same ratio too. This means as time progresses, the size of Shots reduces making the time going faster. Below picture demonstrates this effect:



2-3-5-8 : PARTICLE

2-3-5-8: Semantic Data of Core of particle

1-2-3-5-8: PARTICLE WITH FREQUENCY

1: Scalar Syntactic Data responsible for frequency

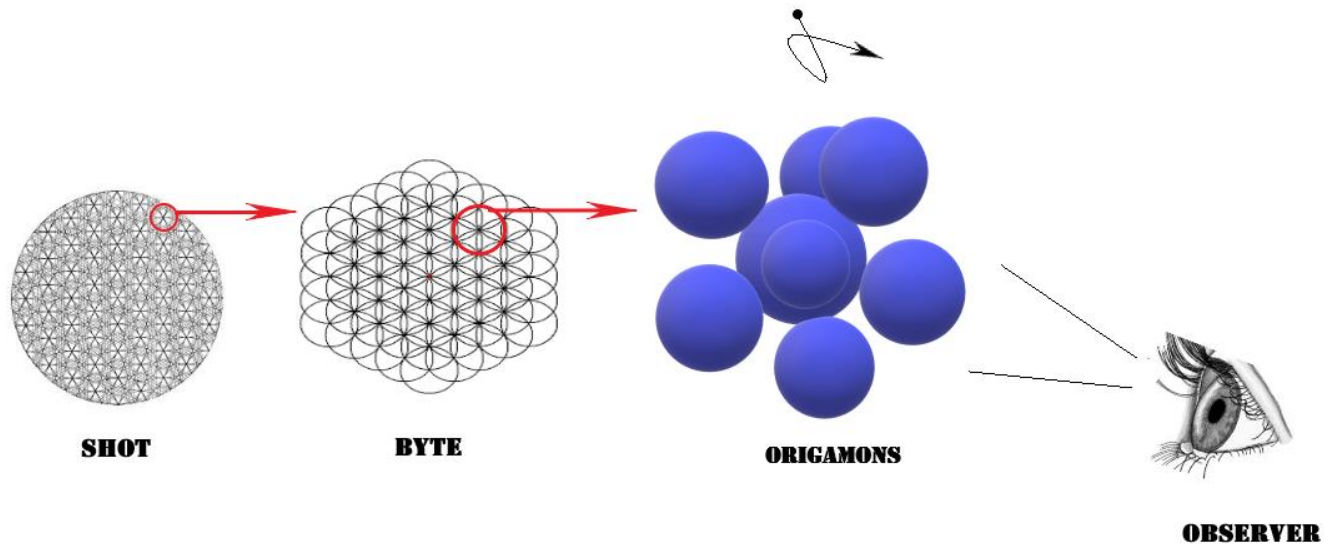
1-2-3-5-8-1: PARTICLE WITH FREQUENCY AND SPIN

2: Vector Syntactic Data responsible for spin

In above picture we can see that all states of a particle exist along the Planck time, so in fact so many of same particle coexist next to each other but we will only observe one single particle at one single state at end of each Planck Time. At end of each Planck Time a different version of same particle is observed and so the change of the Vector Syntactic value creates the perception of spin for us and the change of Scalar Syntactic Data creates the notion of frequency and wave feature of particle. Vector Syntactic Data has an order (increasing in matter and decreasing in antimatter) and that's why it creates a vector for spin and this is how *direction* is produced in universe. Scalar Syntactic Data has no hierarchic order so it is directionless. Below picture is a sequence of two Planck Times to demonstrate how spin effect is created by various combinations of data:

Note that Scalar Syntactic Data is nothing but the last Dot of data or virtually the last Digit in the length of Time before the Core data starts. Again, the Vector Syntactic Data is nothing but the first Digit that starts immediately after the Cord data of particle is ended. You can see in above picture, the First Next Digit in every next particle increases by certain ratio which is the $\varphi = 1.61$ and this is why this number is so important. This is the value that produces the direction and that's why Spin has direction and we will see later that spin creates the magnetic moment and

that's why Magnetic field has direction but electric field has no direction. What creates the order in Vector Syntactic Data is the dipolar gravity. *Time by itself is scalar, directionless and random but once it is combined with gravity it becomes directional information.*



As the collection of Origamons across the height of one Shot rotates, observer sees different ones at each Planck Time and perceives it as spin

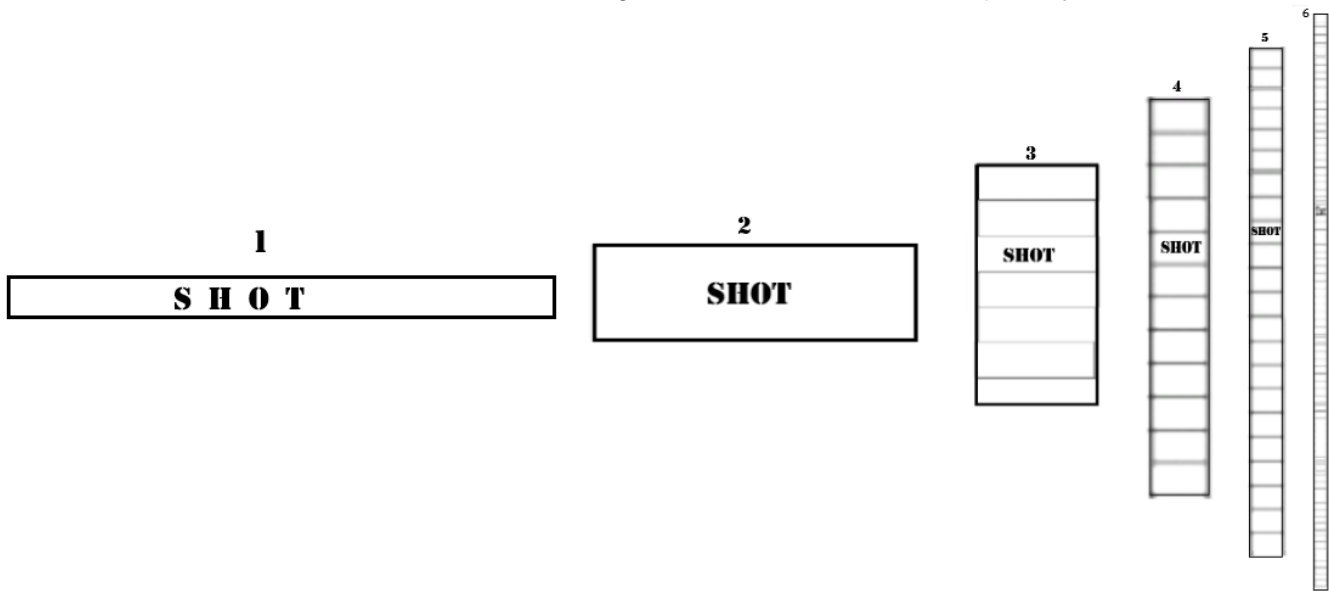
This demonstration proves that as particle spins it changes location because as you can see in the diagram, time passes during spin. This explains why all particles in quantum world have very fast spin but macroscopic objects have no spin, because any mass larger than Planck Mass ($2.18 \times 10^{-8} kg$) will not be able to have identical particles in same Shot (Planck Time). This also means that frequency of a particle is directly related to its spin velocity which is consistent with experimental observations. Another important conclusion is that spin and movement/rotation happen as a result of Recombination/passage of time that is caused by reduction of density of the gravity, therefore, particles need no external force applied to them to spin, or even to move. This is why the universe keeps expanding with the reduction of the density of the gravity of the mother black hole around it. Another conclusion is that if a particle has zero frequency (no entrapped particles in the same Shot), it will have no spin, and with no spin, it will have no movement. This gives us another crucial result: what we perceive as a particle moving forward is a series of particle being created and annihilated in a sequence, so expansion of universe is not produced by Recycling of data. It is the Repetition of data that produces the expansion of universe.

Recycling of time creates the progression of time.

Repetition of time produces the distance.

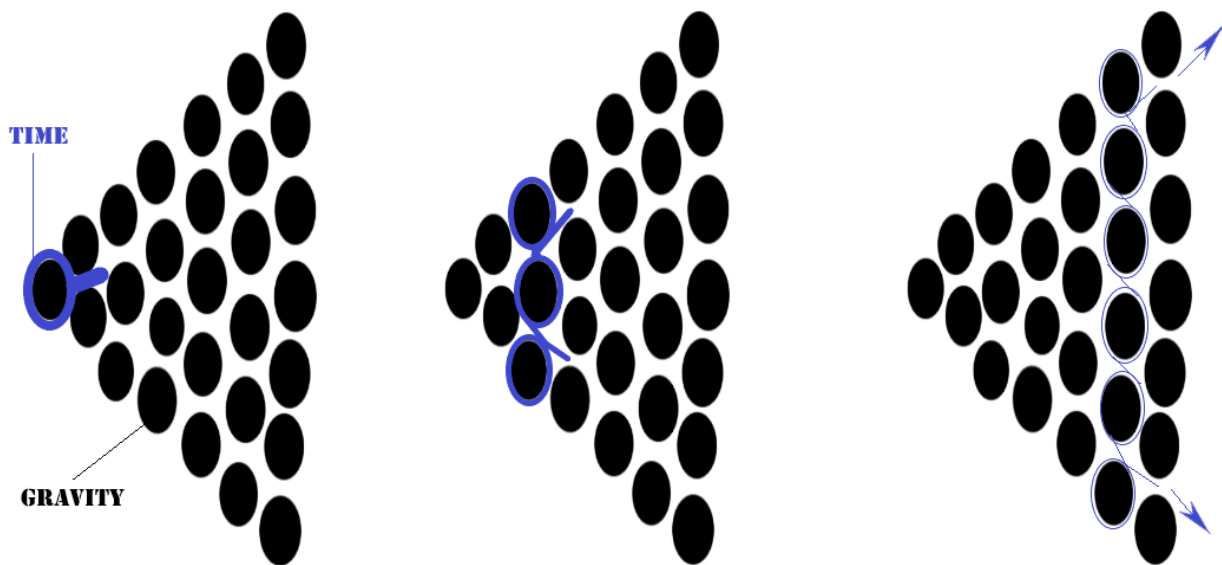
considering that the total amount of time and total amount of gravity are constant, at the Big Bang there must be only one huge Shot of data that has all the data (time) in it. This amount of

time has to spread throughout the entire universe, creating what we observe as the radius of the universe so the original radius is very small then as time progresses to present, the size of Shots has to be reduced in order to create a larger universe with the same quantity of time:



Size of Shot and total amount of time during time

The following picture shows the distribution of time into the pool of gravity in a schematic way. The total amount of time in each of the stages is always the same. Gravity is in form of interconnected spheres of Origamon radius (half the current Planck Length) and when time spirals around these spheres of gravity, it sequentially creates new Origamons and annihilates previous Origamons constantly. Note that no Origamon stays existing for more than a Planck Time.



Distribution of time radially in pool of gravity while spiraling around Origamon-sized spheres of gravity and expanding the universe

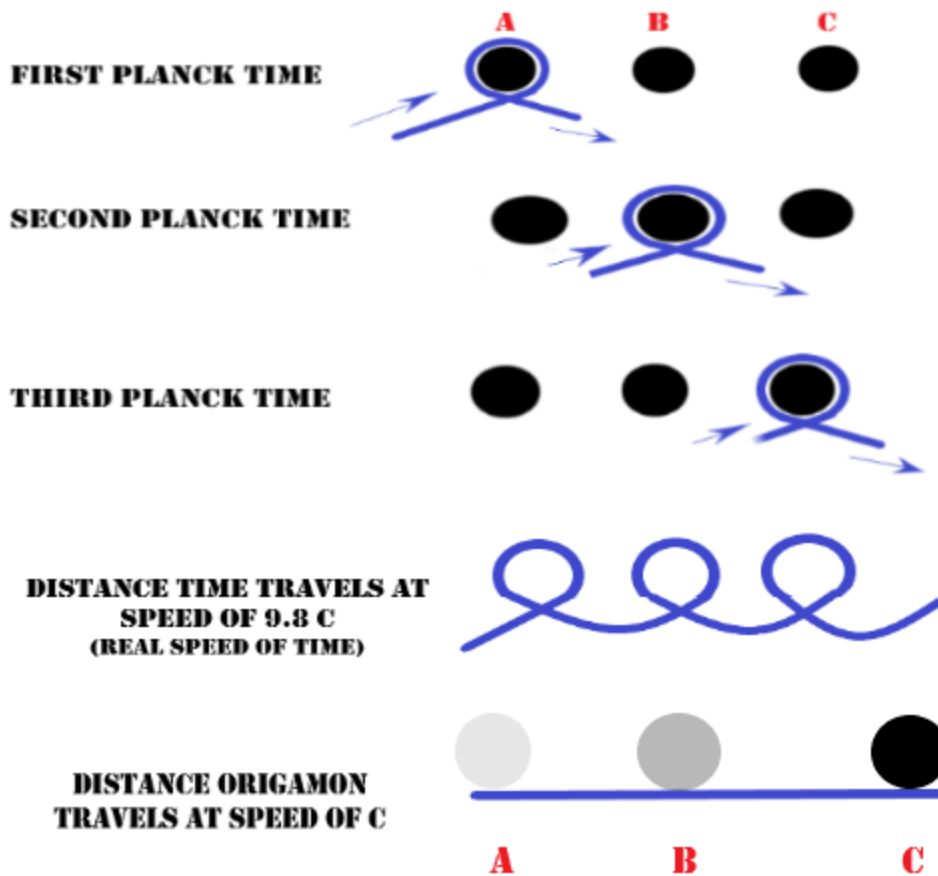
Because time is recombining at speed of 10C, the speed of time between the Origamons will be speed of light (I explained this before), therefore no Origamon can go faster than speed of light because it's existence is not constant and it goes out of existence as time travels so it will only go as fast as Apparent Speed of Time (equal to speed of light), no faster and no slower. This means that speed of light is speed of reality:

Speed of light is speed of gravity combining with time.

The constancy of speed of light in Einstein's general theory of relativity has two aspects:

- 3- Speed of light is always a constant value in every time and place in universe
- 4- Speed of time is independent of relative speed of observer to source of light

Both these features are accepted and proved experimentally. However, no proper explanation has been proposed for any of these two unique and strange features of light. I have already explained that speed of light is in fact speed of combination of time with gravity and that is why it is constant but due to the miniaturization of data packages (Shots), speed of time during the life of universe is constantly accelerating, causing all events to be *observed slower* when compared to previous time. Considering the second aspect of the constancy of speed of light, there has been no convincing theory to explain it. In fact, the second feature is only unique for photons and it contradicts laws of physics about the motion and velocity. The constancy of speed of light regardless of the observer's frame of reference, is a strong evidence that Origami Theory's view about the nature of photons and the mechanism of their movement is the only correct model. Below picture demonstrates that every Origamon (photon) is constantly produced and annihilated at each new Planck Time and the speed of this process, which is in fact the speed of time combination with gravity is $3 \times 10^8 m/s$ regardless of observer's frame of reference and so it cannot be slower or faster at any given time. Below picture shows this clearly and as we can see, time produces photon (Origamon). If photon A and B and C exist at the same time, the total amount of data (time) in universe will have to increase constantly.



How time produces and annihilates photon as it combines with gravity

Predetermined Universe

I mentioned that real speed of time is close to ten times faster than speed of light, but apparent speed of time is equal to speed of light and that is why when a particle travels as fast as speed of light, time stops for it.

Proving the concept of quantum entanglement, John Bell reached a bizarre conclusion that our universe has to be predetermined! How is this possible without violating the causality principle? Origami Model demonstrates that when time moves faster than light, it creates the existence and later when light reaches that point, the reality is born. In a better description, time recombines its Digits, produces new data, moves forward, and then gravity joins it to create the mass or information that we know as reality. Existence is independent of observer (Object Permanence) but reality is dependent of observer. This means that time proliferates, creates the existence, but until gravity is joined to produce Origamons (light), reality is not formed. This means that because speed of time is faster than speed of light, there is always a Reality Lag in our universe.

Based on the total amount of time in our universe and the age of universe, I will calculate that in 700 million years from now, our universe will exit the Mother Black Hole, we will enter a new

Universe Stage where speed of gravity combining with time (speed of light) will get closer to speed of time and then we go another stage and another one and another one and eventually in 36×10^{69} seconds, the speed of light will be equal to speed of time and gets ahead of it. This is how Origami Model is able to propose a purpose to universe.

This gives us a practical meaning of destiny:

Destiny is orderly assembled time without gravity.

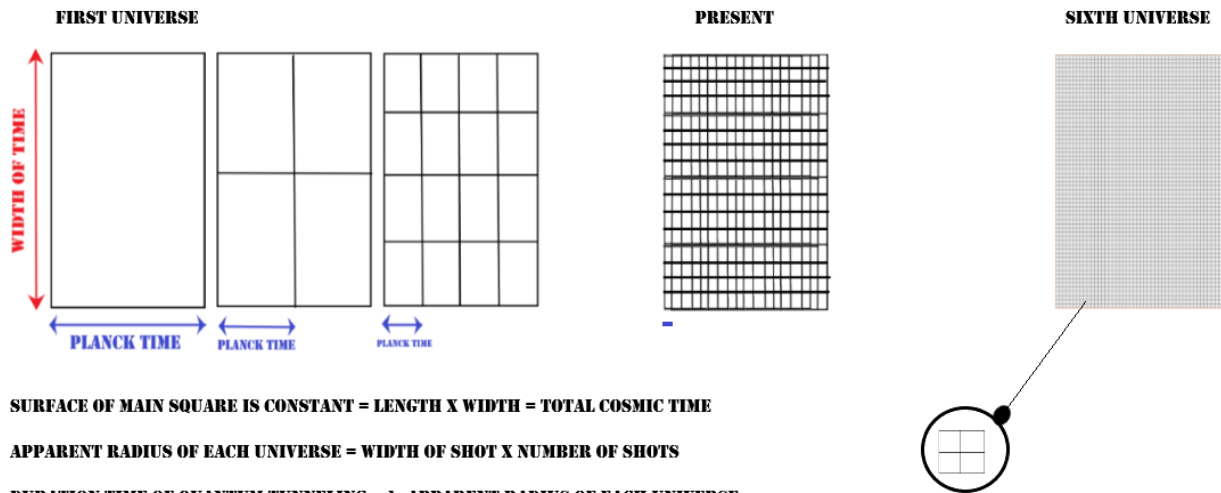
So, destiny exists but has no effect. In simple word, time recombines and produces new orders but these new orders are the map of reality (destiny), once gravity is combined with it, we will observe the reality because as I explained before, mass is gravity combined with time. When eventually speed of light becomes equal to horizontal speed of time, there will be no destiny. Therefore, if destiny is predeterminacy, this gives us a mathematical equation for destiny:

$$\textbf{Predeterminacy} = V_t^h - c$$

V_t^h : Horizontal speed of time

c : speed of light

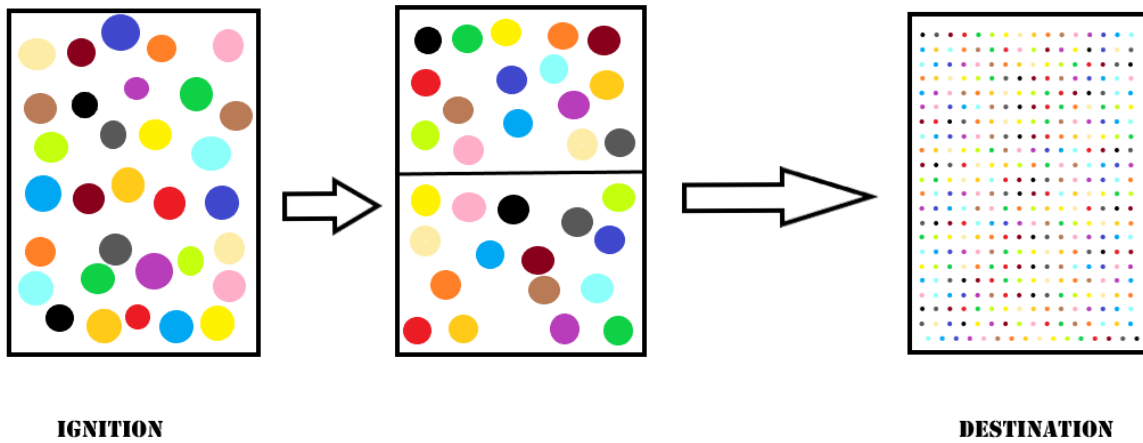
When speed of light becomes equal to horizontal speed of time, there will be no predeterminacy, We will calculate in further chapters that based on the value of Gravitational Constant (6.67×10^{-11}) and the age of the universe ($4.3 \times 10^{17}s$) and speed of light ($3 \times 10^8 m/s$), we will find out the total amount of time that is $36 \times 10^{69}s$, then we will calculate that in 700 million years we will reach the end of the Mother Black Hole around our universe, so by then only a small portion of the total amount of time will be used, so there must be more universes to give enough time for the total recombination of entire time. The next universe has to have much larger Mother Black Hole otherwise it won't be able to have our universe in it. This makes the density of the gravity of the next universe to be lower (because the total amount of gravity is constant) so the acceleration of time is faster, so G (gravitational constant) will increase in each universe and this is how the acceleration of time increases in each universe. But, the speed of vertical progression of time keeps growing much higher than speed of horizontal speed of time, in other words, as time progresses, the radius of universe will grow faster and faster. This is what we have been observing as the acceleration of expansion of universe. Therefore, the speed of light eventually catches up with horizontal speed of time



In above picture, the first big square is the original Shot at Ignition, or the very first moment of existence. As the data inside the Shot recombines itself, it creates smaller Shots, or in other words, it produces smaller *groups* of data. This reordering of data, Assemblage, makes the Planck Time to shrink. The radius of universe is the width of the ordered data inside the main square.

- Radius of universe is defined by the amount of data that is vertically recombined,
- G (gravitational constant = 6.67×10^{-11}) increases in every Universe, so the horizontal speed of time increases,
- Vertical speed of time increases much more than the horizontal speed in each universe causing faster and faster expansion of universes,
- Maximum number of Origamons in each Shot or Quantum Entrapment reduces in each universe because the size of Shots reduces constantly due to recombination and assemblage and this is how entropy increases constantly, (frequency of light reduces so energy reduces and photons are distributed in larger and larger universe),
- Vertical speed of time is always much faster than horizontal speed of time, and this discrepancy increase constantly, making the expansion of universe accelerating exponentially,
- So, the life or duration of every next universe is shorter than the previous one, because the size of every next Mother Black Hole is larger than previous one.

To simplify this assemblage and recombination of data to produce smaller Shots and more ordered universes, we can imagine a picture like below:



In above picture, every colored ball is a pack of data, a piece of code. As time progresses, codes get packed into groups that are all interconnected, creating a very large, fine picture at the end. The smallest Shots are in the last universe. This is how the Seventh universe will have the least granularity (least quantization and closest to analog form) and maximum entropy.

Black Holes Are Massless

Abstract

This part of my theory provides mathematical as well as observational evidence indicating that black holes must be massless, and their gravity is due to the vortex of space-time. There have been scientists in recent years who suspected that black holes might not exist, some of these great physicists are best known to be the most prominent cosmologists: Stephen Hawking, Friedwardt Winterberg, and Laura Mersini-Houghton. However, my results suggest that black holes definitely exist but their mass is certainly zero. Therefore, my suggestion is that gravity is not the property of mass but it is the property of absolute vacuum. In other words, where there is vacuum there is gravity. The Schwarzschild Radius of the black hole is in fact the radius of the absolute vacuum that generates the gravitational force. This means that the vast vacuum encapsulating our universe is in fact a large black hole applying gravity on the universe, causing its expansion, which can explain the Dark Energy. In the following lines I will try to demonstrate mathematically that when a star implodes as a supernova, its entire mass converts to energy and the black hole that is left behind has zero mass with tremendous amount of gravity. The article suggests that gravity is produced by vacuum and therefore, it can exist without the mass and it goes further to suggest that gravity is inversely proportional to mass. By vacuum in this article, I mean the absolute vacuum, where even quantum field does not exist.

The immediate conclusion of such approach is that nothing enters a black hole, so their force of gravity and their radius stay constant. The General Relativity demonstrates that time becomes zero at the event horizon of the black hole and I take that as strong evidence that nothing exists inside the black hole, since black hole is timeless. In second part of the paper I provide mathematical evidence based on gravitational time dilation which demonstrates that every mass approaching a black hole larger than four solar mass will convert to massless photons before reaching its event horizon. This means all the particles accelerating towards the black hole must convert to high frequency photons before reaching the event horizon, creating a powerful halo of electromagnetic energy surrounding the black hole. We know this halo as the Accretion Disc and so far, the cosmologists' explanation for its existence is the energy caused by the friction of particles approaching the black hole. I find it hard to accept that such enormous amount of energy surrounding every black hole is merely due to the friction and I will also provide reasons why friction cannot be the cause of energy in accretion disc. In the last part of the article I share observational evidence indicating that there must be no mass inside the Schwarzschild radius of any black hole.

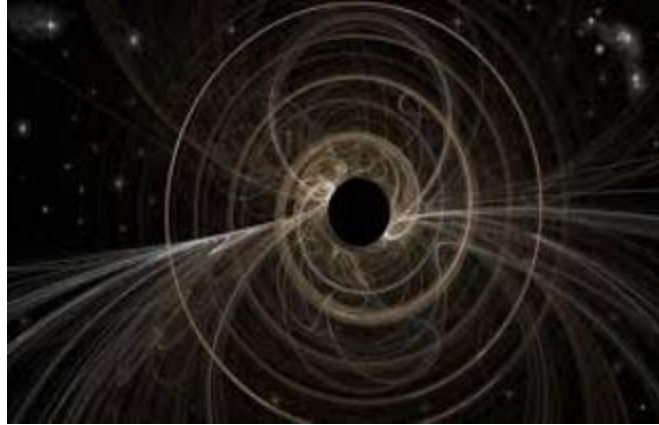


Figure 3 - space-time vortex caused by the black hole

1. Black Hole Formation

In 2014, Laura Mersini-Houghton, a physics professor at the University of North Carolina, demonstrated mathematically that black holes with any mass can never come into existence (1). Mersini officially claimed that black holes must not exist. And because we know that black holes do exist, her results have been disregarded. I provide a link at the end of this paper so the reader can find the article and study it. Way before Mersini, In 29 August 2001, Friedwardt Winterberg, the renown theoretical physicist at the University of Nevada published an article in Astrophysics Data System magazine, titled as , “Gamma Ray Bursters and Lorentzian Relativity”, (2) in which he suggested that during the gravitational collapse of a mass, the event horizon appears first at the center of the collapsing body, thereafter moving radially outward. His approach proposes that the entire mass of a Red Giant has to convert to photons. When the balance of forces holding the elementary particles together is destroyed near the event horizon, all the matter will convert into zero-rest-mass particles which explains the large amount of energy release in gamma ray bursts and supernovae. This means when a red giant implodes as a supernova, at first the mass at its center converts to photons and then this spherical conversion expands until it reaches the surface of the star, turning the entire mass of the star into massless photons. Therefore, what is left after a supernova must be a total vacuum that we know as the black hole. Therefore, black hole is an absolute vacuum with certain diameter that produces large amount of gravity proportional to its radius. If correct, the inevitable conclusion is that gravity is not produced by mass, but by Nothing. This means that what we know as Nothing, is in fact the gravity. Such discovery can be the key to reverse engineering the universe and explain so many current paradoxes and conflicts in cosmology as well as predicting the future of expansion of the universe with more certainty. Now, I will try to explain my own approach by mainly using a Newtonian approach to analyze the step by step events during the implosion of a massive star:

We know that based on Schwarzschild interior solution of Einstein's field equations for an incompressible spherical mass, before the spherical collapsing mass reaches its Schwarzschild

Radius and becomes incompressible, all the pressure is focused in the center of the spherical collapsing mass. This means the event horizon appears in the center of the collapsing star, moving radially with speed c . Tolman in 1958 showed (3) that based on Einstein's general relativity, the event horizon is born at $r = 0$ when the radius of contracting sphere reduces to:

$$R_c = \frac{9}{8} R_s \quad (1)$$

Where R_c is the radius of collapsing sphere and R_s is Schwarzschild radius. Even if we presume that when the energy of a particle reaches the Planck energy, the particle begins to follow the laws of Newtonian physics instead of Einstein's general relativity, we will conclude that the event horizon will appear at the center of the collapsing star where $r = 0$. The reason is that based on conservation of energy, the velocity of an infalling particle inside a Newtonian gravitational field that is produced by a mass (M) would be:

$$v = \sqrt{\frac{2GM}{r}} \quad (2)$$

v : velocity of infalling particle

G : gravitational constant

M : mass that is producing the gravitational field

Considering the velocity of infalling particle approaching c in the center of collapsing star, the radius of collapsing star would be:

$$R = \frac{2GM}{c^2} \quad (3)$$

This is the equation that Schwarzschild found through Einstein's theory of general relativity. To find out at what radius of the Mass, the infalling particle will reach the speed of light $v = c$, we only need to use the Newtonian potential inside the mass (4):

$$\phi_{in} = -\frac{GM}{2R} \left[3 - \left(\frac{r}{R} \right)^2 \right] \quad (4)$$

When R is the radius of the Mass, and r is the distance of the infalling particle from the center of the Mass. Obviously, the velocity of the infalling particle will reach its maximum when $r = 0$, the center of the mass. So, if we plot zero as the value of r :

$$\begin{aligned} \frac{v^2}{2} = -\phi_{in} &= \frac{GM}{2R} x^3 \\ R &= \frac{2GM}{v^2} x \frac{3}{2} \end{aligned} \quad (5)$$

This means the infalling particle would reach the velocity of light when the collapsing Mass M reaches the radius R_c :

$$R_c = \frac{3}{2}x \frac{2GM}{c^2}$$

$$R_c = \frac{3}{2}R_s \quad (6)$$

Therefore, according to the Newtonian model, when the collapsing star reaches 3/2 of its Schwarzschild radius, the particles start to convert to massless photons with velocity of light at its center. This is extremely close to the conclusion Tolman reached by employing the Einstein's general relativity. The photons produced at the center of star will leave its surface with a velocity $v = c$. When this happens, the redshift of light emitted from the surface of the star will have to be 2 or more.

This centralization of the pressure and density inside the collapsing star causes the kinetic energy of the subatomic particles to exceed all limits in the *center* of the mass. Such tremendous gravitational collapse will generate W and Z boson in an extremely rapid process resulting in all quarks to decay into leptons and mesons in a chain reaction.

This clearly shows that the entire mass of the collapsing star converts into electrons, positrons and then neutrinos, which all convert to massless photons rapidly. Therefore, all the baryons in star convert to gamma ray photons in a matter of milliseconds. Electrons and positrons annihilate each other immediately producing photons in first stage of the gravitational collapse of the star, then all the neutrinos leave the collapsing mass producing the afterglow of neutrino shower.

Obviously when the collapse begins at the center of star, it will continue in form of a chain reaction, with exactly the same mechanism until it consumes the entire particles of collapsing star. Once the central particles leave the collapsing star, the radius will diminish, shifting the center of star to the new point, repeating the same phenomenon until the center joins the surface. The gravitational potential energy U of a shell of spherical mass M and radius r is:

$$U = -\frac{3GM^2}{5r} \quad (7)$$

When the mass reaches its Schwarzschild radius, $r = 2GM/c^2$, so:

$$U = \frac{1}{3}MC^2 \quad (8)$$

This means 30% of the mass of the collapsing star will convert to energy. But as this conversion is taking place, $r \rightarrow 0$ making $U \rightarrow \infty$, which means the *total* conversion of mass to energy. We can also find another mathematical solution for conversion of the remaining 2/3 of the collapsing mass once the first 1/3 is turned to massless particles. Incorporating the concept of temperature in a Maxwell-Boltzmann distribution, the kinetic energy of emitting particles would be:

$$\langle \frac{1}{2}mv^2 \rangle \equiv \int_0^\infty v^2 N(v) dv = \frac{3}{2}KT \quad (9)$$

Where T is the temperature of the particle and K is the Boltzmann constant. This means 2/3 of mass of the collapsing star will have to convert to energy to produce such temperature. The third solution would be considering the gravitational potential energy of the particles of mass m emitted by the collapsing star of mass M :

$$U = \frac{3GMm}{5r}$$

When $r = R_s$ then we arrive at:

$$U = \frac{3mc^2}{10} \quad (10)$$

Therefore, the total energy of the particle(s) emitted by the collapsing star would be:

$$E = \frac{13}{10}mc^2$$

On the other hand, the total energy equivalent of the Mass of the star is Mc^2 , so:

$$Mc^2 = \frac{13}{10}mc^2$$

$$m = 0.7M \quad (11)$$

This means the total mass of the particles leaving the star would be 70% of the total mass of the star M . I showed already that 30% of Mass converts to energy at first stage. Therefore, as the center of the collapsing star continuously disintegrates, the event horizon expands radially, converting the entire Mass into emitting particles m with velocity of light.

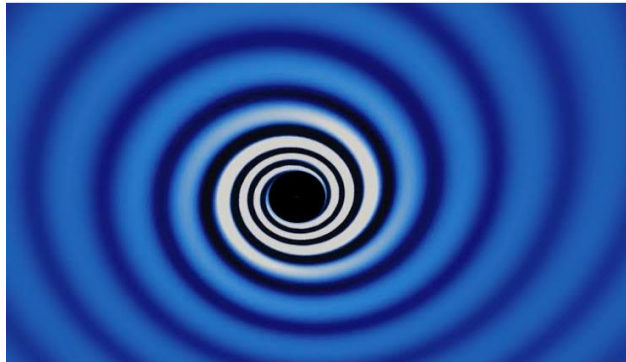


Figure 4- Space-time vortex around the black hole, nothing goes into the black hole, it rotates around it

Now if the speed of collapse of the star under its gravitational pull is v , then v is defined as the speed of created event horizon traveling from the center of the collapsing star to its surface. Based on gravitational time dilation, the time that takes for infalling particle to reach the Mass (= time for event horizon to reach the surface) would be:

$$dt = \frac{dt_0}{\sqrt{1 - \frac{v^2}{c^2}}} = \frac{dt_0}{\sqrt{1 - \frac{2GM}{rc^2}}}$$

On the other hand, the resulting length contraction due to relativistic velocity is:

$$dr = \frac{dr_0}{\sqrt{1 - \frac{2GM}{rc^2}}}$$

Therefore, the observed velocity of the infalling particle which is equal to observed velocity of the event horizon traveling from the center to the surface of the collapsing star will be:

$$v = c(1 - \frac{R_s}{r}) \quad (12)$$

Because $r \rightarrow R_s$ therefore $v \rightarrow c$. This means in a collapsing star when radius approaches the Schwarzschild radius, an event horizon will be formed at the center of the star which will travel to the surface at velocity of light.

But different scenario will take place for the particles developed in the center of the collapsing star trying to leave. When the elementary particle of mass m leaves the collapsing star, its kinetic energy will need to reach the Planck energy of $m_p c^2$, therefore we have:

$$\frac{m}{m_p} = \sqrt{1 - \frac{v^2}{c^2}} = \sqrt{1 - \frac{R_s}{r}}$$

$$\frac{r - R_s}{R_s} = (\frac{m}{m_p})^2 \quad (13)$$

This emitting particle has a maximum velocity of c and it will go through red shift >2 , therefore the time for it to reach the surface would be:

$$t = \frac{r}{c} = \frac{R_s}{c} \quad (14)$$

But due to the relativistic velocity, radial contraction of the body will increase the value of r by:

$$\int \frac{dr}{1-R_s/r} \quad (15)$$

If we consider at $t = 0$, the relation of r to R_s is $r = (z + 1)$ when $z > 1$, by combining (13) and (14) we will arrive at:

$$T = \frac{R_s}{c} \log \left[z \left(\frac{m_p}{m} \right)^2 \right] \quad (16)$$

This means for a neutrino with $m \approx 10^{-37} kg$ the time of exiting the developing black hole (expanding event horizon) will be ~ 120 times longer, and for electron with $m \approx 10^{-31} kg$ the exit time will be ~ 100 times longer than the Newtonian time, and longer than the velocity of the event horizon traveling from the center to the surface. This virtually means that the black hole is formed *prior* to the first elementary particle leave the collapsing star. This crucial time difference makes the existence of an empty black hole possible, otherwise after the heavy star collapsed under its gravitational pull, the entire mass would transform into gamma ray photons and there will be absolutely nothing left in space. Instead, we will observe the explosion and we will observe the existing black hole, which has absolutely no mass, but it owns an event horizon, a rotating vortex of space-time with its gigantic gravitational force. Even if we consider the particles at the center of the collapsing star, where gravitational force is at its maximum, transform to massless photons, the velocity of these photons when leaving the collapsing star would be:

$$v_c = \frac{c}{\sqrt{\epsilon\mu}} \quad (17)$$

v_c : velocity of light in a medium

ϵ : permittivity of medium

μ : permeability of medium

Unlike the speed of gravity that is a constant c , speed of light reduces based on the medium. The values of ϵ and μ are directly proportional to the density of medium but considering the equation for density of a black hole:

$$\rho = \frac{M}{\frac{4\pi}{3}R_s^3} \quad (18)$$

We see that density of a black hole is inversely proportional to its mass. This creates a lower limit for deceleration of velocity of light, which means at certain threshold of black hole mass, speed of light (velocity of photons exiting the collapsing star) will not reduce any further, making the creation of the black hole based on above mechanism, impossible. As I explained, my theory suggests that the very development of the black hole, as an space of nonzero diameter containing absolute vacuum, depends on the collapse of an enough massive star under its gravitational force, so that the difference between the velocity of collapse and the velocity of particles/photons leaving the degrading star creates an event horizon that reaches the surface of the collapsed star before the first photons leave the mass. If this theory is correct, one should

be able to calculate a lower threshold for the mass of the black hole. Based on the (17), and (18):

$$R_s^3 \propto \frac{c}{\sqrt{\mu\varepsilon}} \propto T_E$$

Where T_E is explosion time (time for photons to leave the star), and T_I is implosion time (time for event horizon to reach the surface), and according to (16):

$$\log \left[z \left(\frac{m_p}{m} \right)^2 \right] \propto T_E$$

Inserting above equations:

$$\log \left[z \left(\frac{m_p}{m} \right)^2 \right] R_s^3 \frac{\sqrt{\varepsilon\mu}}{c} = \frac{T_E}{T_I} \quad (19)$$

Based on my theory the reason for black hole to form as a vacuum space of gravity is faster speed of gravity compared to speed of particles/photons exiting the collapsed star, therefore, the critical threshold for black hole to develop is when Imploding time (time for the collapse to happen, $T_I \propto R_s$) is equal to Exploding time (time for photons to exit $T_E \propto \frac{1}{R_s}$). Therefore, we can conclude that the lower threshold of R_s is when the ratio $T_E/T_I = 1$:

$$\log \left[z \left(\frac{m_p}{m} \right)^2 \right] R_s^3 \frac{\sqrt{\varepsilon\mu}}{c} = 1$$

ε : permittivity of free space = 8.85×10^{-12} , and μ : permeability of free space = 1.25×10^{-6} , if we insert mass of electron as $m = 9.1 \times 10^{-31}$, and $m_p = 2.18 \times 10^{-8}$, Therefore:

$$R_s = 1.1 \times 10^4$$

So, this would be the radius of the smallest possible black hole in space, and we can find its mass:

$$R_s = \frac{2GM}{c^2}$$

$$1.1 \times 10^4 = \frac{2 \times 6.67 \times 10^{-11} M}{9 \times 10^{16}}$$

$$M = 7.69 \times 10^{30} kg \quad (20)$$

The result shows that the smallest possible black hole in universe would be of 3.8 solar masses, which is consistent with the observations (smallest discovered black hole so far is 3.8 solar mass) known as XTEJ1650-500 (5), and also consistent with similar results from other theorists who used different approach. This result proves that why there is a limit for the mass of the

black hole and what exactly the lower limit of mass is, based on the fact that if the mass is smaller than this critical threshold, $T_E > T_I$ and therefore, the event horizon will fall behind the exiting electrons and will never be formed.

Radiation of energy in form of electromagnetic waves from the central part of the collapsing star will obviously go through a severe redshift above 2 and the major part of the photons' energy will be consumed to dissolve the bound state of the collapsing star. Therefore, instead of collapsing into an extremely bound state of a super-compact mass, an expanding non-bounded radiation field will be developed. This means that in a matter of milliseconds, a nuclear fusion will convert the center of the star into gamma rays, creating a central spherical vacuum that rapidly expands radially until it reaches the surface of the star, transforming the entire baryonic matter into high energy photons, leaving small remains in surrounding space. Note that, the black hole formation concludes as the last photons leave. The result of this runaway transformation is an absolute vacuum in space that we know as the black hole. In the newly born black hole no original particle would have been remaining because the formation of the black hole is followed by the exit of the matter in form of gamma ray photons. This explains why the supernova is not observed as an explosion with rapidly spiking-ending luminosity, but because the big part of the generated energy will be used to break the bound state of star, it will transpire as a two-staged explosion of quick peak and slow decline (6).

2. Approaching Particle

When a particle with mass of M' approaches the black hole with mass of M from a distance of R_t , it will accelerate to V_2 due to the gravitational force of the black hole:

$$M'V_2 = \frac{GMM'}{R_t^2} \quad (21)$$

As the particle accelerates towards the event horizon, its mass will increase:

$$M'_2 = \frac{M'_1}{\sqrt{1 - \frac{V^2}{c^2}}} \quad (22)$$

The increased mass of M' will enhance the gravitational force and so increase the velocity further and at the same time, the gravitational time dilation will reduce the time and so accelerates the particle even further. So, when we incorporate the gravitational time dilation in acceleration of the particle, we arrive at:

$$V_2 \sqrt{1 - \frac{V^2}{c^2}} = \frac{2(GM)^2}{R_t^2 \sqrt{1 - \frac{V^2}{c^2}}} \quad (23)$$

Considering the Schwarzschild radius of the black hole, we can rewrite the equation as:

$$\sqrt{R_t} C V_2 = 1.7 \times R_s \times \sqrt{1 - \frac{v^2}{c^2}} \quad (24)$$

$$R_t = \frac{3R_s^2}{c} \quad (25)$$

R_t : Transformation Radius, the distance from the black hole at which the particle reaches speed of light
 C : speed of light

R_s : Schwarzschild radius of the black hole

The equation number 25 is a crucial one. Considering the smallest black hole has a mass of $7.6 \times 10^{30} kg$ and so its $R_s = 1.12 \times 10^4 m$, so we can find at what distance from the black hole, the particle will reach speed of light:

$$R_t = \frac{3 \times (1.12 \times 10^4)^2}{3 \times 10^8}$$

$$R_t = 1.2 \times 10^4 m$$

This means the ratio of $\frac{R_t}{R_s} = \frac{1.2 \times 10^4}{1.12 \times 10^4} = 1.1$. The equation shows clearly that because of gravitational time dilation, as the black hole gets larger, the ratio of $\frac{R_t}{R_s}$ grows bigger. In other words, in smallest black hole, at a distance slightly larger than the Schwarzschild radius, particle will reach speed of light and converts to massless photons and as the Schwarzschild radius of black holes grow, at further distance from their event horizon, particles will turn to photons. This means the larger the black hole, the wider the accretion disc that contains all these photons. The equation also demonstrates that the conversion of approaching mass to photons is not related to its mass and it only relates to the mass of the black hole and the original velocity of the particle. In above equation I have assumed the particle start approaching from zero velocity, therefore the faster a particle is moving before accelerating towards the event horizon the earlier it will convert to photons, expanding the Transformation Radius further. Besides, the equation one more time demonstrates why we don't have any black hole smaller than four solar mass. If there was somehow a black hole with Schwarzschild radius smaller than $1.12 \times 10^4 m$, then the ratio of $\frac{R_t}{R_s} < 1$, which means the particle had a chance to cross the event horizon. One more time we find that nothing actually enters a black hole and therefore, black hole has zero mass and its radius stay constant.

3. The Observational Findings

In the following lines I will try to use the current observational findings to conclude that the mass of the black holes must be zero. I will provide the evidence in six parts:

- 1- **The energy released during a supernova:** The measurements and observations have shown that in a matter of several seconds, the total energy released by a supernova is in order of 10^{40} to 10^{56} joules. If we consider the average energy release in gamma ray bursts and supernovae to be around 10^{48} J, (7) this would be equal to 20 solar masses (10^{31} kg). The heaviest mass of a white dwarf is 1.2 solar masses (5) and the average mass of neutron stars is 1.4 solar masses (8). This also suggests that *all of the mass* of the star must have turned to energy, leaving the black hole as an absolutely empty space of powerful gravitational vacuum.
- 2- **The total baryonic mass of the universe:** According to the latest observations there are at least 2×10^{20} black holes in our universe. The minimum mass of a black hole is 7.6×10^{30} kg, and the largest black hole found till now has a mass of 8×10^{42} kg (The Great Attractor), so even if there is no larger black hole in our universe (most cosmologists believe there is), the average mass of black holes would be around:

$$\text{Average black hole mass} = \sqrt{7.6 \times 10^{30} \times 8 \times 10^{42}} = 7.8 \times 10^{36} \text{ kg}$$

Note that because the Great Attractor is not the most massive black hole in the universe the average mass of black holes is in fact much higher than what we calculated, but even if we accept the result, we can calculate the total mass of all the black holes in our universe:

$$2 \times 10^{20} \times 7.8 \times 10^{36} = 1.5 \times 10^{57} \text{ kg}$$

The above result must be lower than the real total mass of all the black holes but we are going to accept it as it is. Now, we know that total mass our universe is 8.7×10^{53} kg and 90 percent of this is Dark Matter so the total mass of baryonic matter in our universe is: 8.7×10^{52} kg. This means the total mass of the black holes in our universe is at least 20 thousand times bigger than the total mass of the entire universe! How is that possible? Also, we are getting more black holes almost one every 50 years (there is on average one supernova every 50 years), so the discrepancy is growing!

- 3- **Information Paradox:** Based on the current understanding of black holes, there must be an enormous amount of mass entering the black holes. Even if only 10% of the mass approaching the black hole enters its event horizon, there would be a gigantic amount of mass over the age of the universe. Note that every added mass, increases the radius of the black hole, enhancing its attraction and adding to the amount of mass that enters the black hole. Hawking Radiation tells us that every black hole loses its mass and eventually becomes annihilated. Therefore, based on our current assumptions, black holes simply receive the information and annihilate it. This has been labeled as Information Paradox and it deeply bothered Stephen Hawking and he never found a convincing

explanation for it. There has been a Firewall Theory suggested to solve the paradox and this idea even if correct, creates yet another paradox. Information Paradox is not only in direct conflict with the laws of thermodynamics, it is also conflicting every rational mind. By accepting that even one subatomic particle enters the event horizon, we are admitting that information is annihilating and therefore the entire universe is doomed.

- 4- **The accretion Disc:** In April 2019 we finally achieved the first real photograph of a black hole. This was the result of more than 12 months constant work and complex calculations among multiple centers in north and south hemispheres to synchronize the received data and create a reliable picture of the black hole. Looking at the black hole picture we can clearly see the massive accretion disc surrounding it. The current explanation is that all this tremendous amount of gamma and X ray energy is due to the friction between the accelerating particles approaching the event horizon. There are two major conflicts in this simple explanation: Firstly, majority of the mass approaching the black hole is in form of particles and the rest of matter will also disintegrate into its structural particles as its velocity approached relativistic values near the event horizon and according to quantum mechanics there is no friction among the subatomic particles. When two electrons pass each other, they are not slowed down by energy loss due to friction. Secondly, if this amount of energy is just due to the friction, we can calculate a minimum mass for such tremendous amount of energy and if even 10% of this mass enters the black hole, we will find that millions of kilograms of matter must be entering each black hole at every second. Just in this black hole that we have its picture, the radius of the accretion disc is easily translated to at least 10^{10} joules of energy which means $10^{-7} kg$ mass per second is converted to energy just due to the friction, and if we imagine only percent of these accelerating mass is lost as friction energy, there must be at least $10^6 kg$ matter rushing towards the event horizon. So, if even only 10% of this is attracted into the black hole, in a matter of one year there must be $3 \times 10^{12} kg$ of mass added to the black hole. The larger the black hole, the larger this number will be. Every kilogram will add only a trivial amount to the radius of the black hole ($10^{-27} m$) but it adds the same amount to the gravity of the black hole, increasing the amount of attracted mass. This chain reaction would create an exponential increase in black hole's gravity and radius growth and considering staggering number of black holes in our universe, in a matter only few hundred years our universe must have been annihilated! We can not reduce the amount of mass entering the event horizon as it conflicts the laws of thermodynamics and it only slows down this process, not solving the conflict. The only correct answer is that *no matter ever enters the black hole*.



Figure7- First real image of black hole in the world

- 5- **Lack of Magnetic Field:** All observations so far have shown a trivial magnetic field around the black hole. Considering extremely high velocity of the black hole and its enormous mass, one expects a powerful magnetic field in ergosphere, but all that so far has been found is a weak magnetic field produced by the particles approaching the event horizon. The most recent study by the University of Florida and the University of Texas at San Antonio in 2017, on the black hole V404 Cygni's magnetic field demonstrated that despite its tremendous mass, the black hole's magnetic field is even much weaker than what we expected so far (9). This is again another strong evidence that black holes must contain no mass.
- 6- **Gravitational Time Dilation:** Einstein's gravitational time dilation equation is demonstrated below:

$$T_0 = T_f \times \sqrt{1 - \frac{V^2}{C^2}}$$

We know that time turns zero at the event horizon, therefore, $T_0 = 0$, which means $V = C$. In other words, the velocity of the particle approaching the event horizon reaches speed of light near the event horizon. This again means particle converts to photons prior to entering the black hole and returns to space.

7- **Density Paradox:** Another obvious reason for black hole to be massless is the density of black hole. Because density is mass divided by the volume and volume grows as cube of the radius, as black hole gets bigger its density drops exponentially. We can easily calculate the density of the black hole that is located at the center of the galaxy M87. We know that this black hole has a radius of $10^{13}m$. So, we can find its mass:

$$R_s = \frac{2GM}{C^2}$$

$$10^{13} = \frac{2 \times 6.67 \times 10^{-11} \times M}{9 \times 10^{16}}$$

$$M = 6.7 \times 10^{39} kg$$

So, we can now find the volume of the black hole:

$$V = \frac{4}{3} \times 3.14 \times (10^{13})^3$$

$$V = 4.18 \times 10^{39} m^3$$

Now we can find the density of the black hole:

$$\rho = \frac{6.7 \times 10^{39}}{1.34 \times 10^{40}}$$

$$\rho = 0.5 kg/m^3$$

This is half of the density of air in earth's atmosphere! This is simply ridiculous. How could a gigantic black hole at the center of M87 galaxy has such density that one liter of its mass has half weight of one liter of air?! This proves it again that black hole can not contain any mass inside it.

8- Distance Paradox: The other clear reason for black hole to be massless is the distance of the particles inside the black hole. If there is any mass inside a black hole, the distance between its particles will have to be smaller than even Planck length. This can easily be calculated. For example, if a black hole has a mass of four solar masses, then we can find its radius:

$$R_s = \frac{2GM}{C^2}$$

$$R_s = \frac{2 \times 6.67 \times 10^{-11} \times 4 \times 10^{30}}{9 \times 10^{16}}$$

$$R_s = 5.9 \times 10^3 m$$

If each atom in this black hole has an average mass of $10^{-26} kg$. Now we can find how many atoms are in the black hole:

$$N = \frac{4 \times 10^{30}}{10^{-26}} = 4 \times 10^{56}$$

Now we can find out the distance between each two atoms inside the volume of the black hole:

$$d = \frac{\text{radius}}{\text{number of atoms in radius}}$$

$$\text{number of atoms in radius} = \sqrt[3]{\text{total number of atoms} \times 3/4\pi}$$

$$\text{number of atoms in radius} = \sqrt[3]{4 \times 10^{56} \times 3 : 4 \times 3.14}$$

$$\text{number of atoms in radius} = 1.75 \times 10^{18}$$

$$d = \frac{5.9 \times 10^3}{1.75 \times 10^{18}}$$

$$d = 3.3 \times 10^{-15} m$$

Now we know that average of radius of atom is $6 \times 10^{-10} m$. This means inside the black hole; the atoms must arrange at a distance the distance five million times smaller than the radius of the atom! This simply means the atoms must break down and the distance between all particles

inside the atom (electrons, protons, neutrons etc.) must reduce to zero, which simply is impossible. Again, this proves that no mass can survive inside a black hole and black holes are massless and once black hole is formed, all the particles will leave it in less than a Planck time.

4. The Remaining Mass

The measurements and observations have shown that in a matter of several seconds, the total energy released by a supernova is in order of 10^{40} to 10^{56} joules. If we consider the average energy release in gamma ray bursts and supernovae to be around 10^{48} J, (7) this would be equal to 20 solar masses (10^{31} kg).

The heaviest mass of a white dwarf is 1.2 solar masses (5) and the average mass of neutron stars is 1.4 solar masses (8). This also suggests that *all of the mass* of the star must have turned to energy, leaving the black hole as an absolutely empty space of powerful gravitational vacuum.

My paper is not an attempt to deny the existence of black holes. In fact, despite lack of physical mass inside the black hole, the gravitational force is at its maximum. This suggests that gravity is possible in the absence of mass. A wonderful example of such fact is the gravitational lensing, the effect of gravity on massless photons. I am brazenly suggesting that gravity is not the property of mass. We can in fact see this clearly in Newton's equation for universal gravitation ($F_g = \frac{GM}{r^2}$): In this equation, force of gravity (F_g) is inversely proportional to the radius (r) of the mass (M) while the mass is directly proportional to its radius. So, mass and gravity are in fact inversely proportional!

This paper concludes that gravity must be the property of vacuum, which is the *absolute vacuum*, where even quantum field is absent. Such vacuum, would only exist in astronomical size in free space which we perceive as the black holes (generating the gigantic gravitational force of the black holes), in infinitesimal radius at the center of elementary particles (providing the gravitational force of the mass), and in cosmic size surrounding the universe where nothing exists (causing the accelerated expansion of our universe). The tremendous amount of gravitational force inside the black holes explains the mechanism of gravitational waves and binary system collisions that results in one final larger black hole. A good analogy for the black hole in this definition would be the Twister. While everything is pulled and accelerated by the twister, there is a complete vacuum inside it. The gravity produced by the black hole accelerates the particles towards it, rotates them to near speed of light, converts them to photons and releases them back to space. This explains the existence of the highly energetic accretion disc surrounding the black holes, bombarding space with what we know as the cosmic rays. This means black holes are in fact the engines of our universe, generating tremendous amount of energy which eventually expands the universe. From here, Origami Model demonstrates that it is the black hole that generates the force for the expansion of the universe: Dark Energy. It also shows that gravity is not in fact produced by mass which is one of the most important discoveries of Origami Model that opens a new window to see how our world is created and where it goes. We will see in further chapters of the paper that whenever the radius of a mass

(from subatomic particles to celestial bodies) decreases to a certain level that the ratio of $\frac{R}{CGR} < 1.6 \times 10^{-7}$ (R being the radius of mass and CGR being the Critical Gravitational Radius of the mass) the gravity at the center of the mass will begin to pull all the mass towards itself and rotating it, and once the ratio reaches the critical value of $\frac{R}{CGR} = 1.3 \times 10^{-7}$ the gravity overwhelms the entire mass and accelerates the rotation of the particles to speed of light and converts them all into massless photons, energy. Therefore, the entire mass converts to energy with an enormous explosion and what is left will be the empty central black hole. *

We know that based on the theory of general relativity time becomes zero at the event horizon of a black hole. Theoretically, once the radius of the star reaches the Schwarzschild Radius, according to the theory of general relativity, everything located inside the event horizon, faces the ultimate gravitational time dilation. In other words, the time for all this mass becomes zero. This is simply equivalent to an infinitely high velocity, equal to speed of light, which turns the mass to energy.

$$V = \frac{D}{T} \Rightarrow \frac{D}{0} = \infty$$

If time turns to zero, velocity will reach infinite

Einstein's gravitational time dilation equation combined with mass-speed equation shows this effect clearly:

$$T_0 = T_f \times \sqrt{1 - \frac{V^2}{C^2}}$$

When $V=C$, then T_0 will become zero, so speed becomes infinite. And if we plug C for V in the next equation:

$$M = \frac{M_0}{\sqrt{1 - \frac{V^2}{C^2}}}$$

$$M = \frac{M_0}{\sqrt{1 - \frac{C^2}{C^2}}}$$

$$M = \frac{M_0}{0}$$

$$M = \infty$$

In other words, mass turns to energy: $E = M C^2$

This electromagnetic energy will be released to space, presenting as an enormous explosion of powerful gamma rays in supernova. So, there will be no mass left inside the black hole! The entire mass has to convert to energy.

The other strong reason to prove that there is no actual mass inside a black hole is what takes place when two black holes collide. According to current observations, when two black holes proceed to each other's vicinity, they become a binary system, rotating around each other. Their velocity increases to a critical level and finally they merge into one large black hole. If there was such grand mass inside each black hole, when they collide a gigantic supernova must take place and almost all the mass, or overwhelming majority of it must convert to energy, creating an explosion much bigger than a supernova. Also at no physical circumstances the two super compact solid masses would be able to fuse into one larger spherical mass, because by the definition of Schwarzschild Radius, all the particles inside this radius have less than Planck Length distance from each other, so it would be impossible for two such masses to fuse into one, rearrange their particles to produce a new, uniform mass, because for rearranging the mass, one needs to separate all the particles of each black hole that are combined by tremendous gravity, and rearrange them. The energy required to do this would be equal to the total mass of the two black holes converted to energy, therefore nothing will be left! This means if there was any mass inside a black hole, when they collide, all of that mass will convert to energy which will cause a mega supernova destroying both black holes. Therefore, emergence of two black holes into one larger spherical black hole, clearly demonstrates that there is no actual mass inside any of the black holes. Black holes act like the space twisters that attract particles, accelerate them to speed of light until they convert to energy and then bounce back into space, with absolutely nothing falling into the black hole. When black holes collide, they merge into one larger twister.

But how would gravity survive in the black hole if there is no mass? The answer is in Newton's gravitational equation. If we pay enough attention to Newton's gravitational equation, we can clearly see that gravity is not produced by mass and in fact, gravity is inversely proportional to mass! As Newton said and his equation demonstrates elegantly, *the gravity is in the center of the mass*, and that's why we measure the distance for the equation, from the center of the mass. But there is virtually no mass in the center of an object. If you travel to the center of earth, you have passed through the entire mass and you will find nothing at the very center, all the mass will be in the periphery. If we write the equation for density, we can see that mass is directly proportional to the radius of an object:

$$\rho = \frac{M}{V} = \frac{M}{r^3}$$

ρ : density

M : mass

V : volume

r : radius

$$M \propto r^3$$

Now if we notice the Newton's gravitational equation, we see that gravity is inversely proportional to radius:

$$g = \frac{GM}{r^2}$$

g : gravitational acceleration

G: gravitational constant

M: mass

r: radius

$$g \propto \frac{1}{r^2}$$

Therefore, we can obviously conclude that gravitational acceleration near an object is inversely proportional to mass of an object:

$$g \propto \frac{1}{M}$$

No fact has been so crucial in science and been so clearly neglected for such long time. This is a gigantic turtle over which we have been living for millennia, imagining it as an island. Gravity is a completely separated entity from mass. The above equation clearly demonstrates that gravity is opposite the mass and that's why black holes that have maximum gravity, contain zero mass. The reason for observing gravity and mass mostly bound to each other is because every mass has gravity. There is always a central black hole inside every elementary particle this is where the gravity of a mass comes from. This simply means that gravity produces mass, but not vice versa. Through the further parts of Origami Theory, we will see that in fact the only place in our universe that has absolute vacuum is inside the black holes. Therefore, the only place to produce gravity is the black hole. Now we realize why absolute vacuum of the black holes is vital for the universe. If we simply call absolute vacuum, NOTHING, then gravity is virtually the effect of what we suppose as nothing. In other words, gravity is the property of nothing. Now we reach the most critical discovery: Our world is created by two simple entities, Time and Nothing.

We know that based on Higgs Quantum Field Theory, vacuum in space is saturated with neutrino-antineutrino pairs. Therefore, gravity is in rare places where there is absolutely nothing, even time. That is why time becomes zero at event horizon, which clearly means there is no time inside the black hole. *When there is no time in the black hole, obviously there is nothing in the black hole.* We can mathematically demonstrate this. According to Einstein's equation:

$$E = MC^2$$

$$M = \frac{E}{C^2}$$

$$C = \frac{d}{t}$$

$$\text{if } t = 0 \text{ then } C = \frac{d}{0} = \infty$$

$$M = \frac{E}{\infty} = 0$$

This clearly shows that in time zero, there exists zero mass. Also, this clearly proves that in mass of zero, the gravity won't be zero:

$$\rho = \frac{M}{V} = \frac{M}{r^3}$$

$$M = \rho x r^3$$

$$\text{if mass} = 0, \text{ then } \rho x r^3 = 0, \text{ then } r = 0$$

$$g = \frac{GM}{r^2} = \frac{0}{0}$$

$$g = \text{any value}$$

Or if we use Einstein's equation:

$$E = MC^2$$

At time zero, C would be ∞ and mass would be zero, so:

$$E = 0 x \infty$$

$$E = \text{any value}$$

This means when time becomes zero at the event horizon, mass becomes zero but there will be gravity. This is why as Newton realized, gravity is at the center of the mass, where there is no mass. Therefore, in the center of subatomic particles there exists an infinitesimal central black hole that produces the gravity. We will calculate the radius of this central black hole in future chapters. Therefore, Origami Model divides the black holes into three groups:

- 1- Naked Black Holes in space,
- 2- Shelled Black Holes in the center of subatomic particles
- 3- Mother Black Hole surrounding the universe.

Origami Model believes that absolutely nothing enters the black hole. That is why the size of black holes do not change and no information is lost or destroyed in the black holes. Therefore, the Information Paradox that is created by Hawking's assumption, is instantly resolved. Black holes do not suck *anything* into themselves, they actually emit large amount of energy to space. One good observational evidence for emptiness of the black holes is the lack of almost any magnetic field around black holes. If black holes contained such gigantic amount of condensed mass, they should have had an incredibly powerful magnetic fields, but we have found only a

trivial magnetic field near black holes, which is in fact produced by the particles rotating around the black holes in their ergosphere while they accelerate to photons and return to space.

The strongest reason proving there is absolutely no mass inside the black hole is the law of Conservation of Information. Any mass that goes beyond event horizon, will enter “no time” zone, because as Einstein’s gravitational time dilation shows, time becomes zero at event horizon. In other words, when a particle passes the event horizon, there will be absolutely no possibility for observer outside to see it. This is what perplexed Hawking too for decades. He knew that any particle that passes the event horizon, does not exist. Therefore, black holes virtually annihilate the universe, annihilating mass, energy, information. But this is simply impossible, contradicting conservation of energy and information, the very foundation of modern physics. This very clearly tells us that there is absolutely nothing inside the black hole. Another strong and obvious reason for black holes to be massless is the characteristics of event horizon. The theory of general relativity proves that from the event horizon of a black hole time becomes zero. The impact of a moving mass in time zero can be calculated from the following:

$$FT = MV$$

$$T = 0$$

$$MV = 0$$

$$V = \frac{d}{t} = \frac{d}{0} = \infty$$

$$M = 0$$

This means in time zero, no mass will exist because if there is a mass, its velocity will have to be infinite and its mass has to be zero.

Another strong evidence supporting my claim of absolutely no mass inside the black is the Problem of Infinite Self-Energy. Electrovacuum solution of Einstein’s equations that is also called Kerr-Newman Interior Solution shows that due to mass inflation driven by infalling matter into the black hole, the electromagnetic field of the rotating black hole must be infinite, creating infinite self-energy around the black hole (12). But observation has shown that there is only a trivial positive electric charge around the black holes. This again agrees with the zero mass inside black holes, and there will no mass inflation because no matter falls into the black hole. Note that the weak positive charge expressed at the black hole is due to the larger momentum of protons compared to electrons, due to their heavier mass.

We can show with a simple calculation that almost any mass attracted to the black hole will turn into energy, releasing into space. This means black holes are main source of energy for the universe, the energy that we denoted already as Dark Energy. Black hole is a perpetual generator, converting neutrinos to electromagnetic energy and what we find as cosmic rays and gamma bursts are actually the energy produced by the black holes. As the quantum fluctuation continuously produces neutrino-antineutrino pairs, therefore there is a constant flow of neutrinos

attracted to the black holes inside their CGR (I will explain it later) and converting to energy, producing a large layer of bright electromagnetic energy around the black holes. This is exactly what is called ergosphere, and we see it clearly in the first real image of a black hole that was taken on 19 April 2019 ⁽¹³⁾ by Event Horizon Telescope. When picture was finally analyzed and the final images of the black hole were produced, instead of a dark spot in space, it showed a super bright fire-ball! This is exactly what Origami Model predicted.

While the shelled black holes create the subatomic particles, and eventually everything, the naked black holes create galaxies and cause expansion of universe. This brings us to the conclusion that if there were no black holes, there would have been no galaxies and also there would have been no expansion of the universe. I demonstrated Dark Energy chapter that what we call Dark Energy is nothing but the gravitational repulsive force between the antineutrinos supported by the gravitational force of the black holes. As the universe expands, more black holes and more neutrino-antineutrino pairs are produced and that's why the density of Dark Energy stays constant.

As I showed before, up to a certain distance from the center of a black hole, that I call the Critical Gravitational Radius (CGR), the black hole attracts everything and beyond that point, it repels the space. Therefore, I expect that space expansion inside the galaxy to be minimal, because galaxy is inside the CGR, and the main expansion takes place outside this radius, in intergalactic space. This is completely consistent with the findings. Therefore, once the electromagnetic waves emitted by the black hole reach this radius they expand (due to expansion of intergalactic space), their wave length elongates and so they lose their energy. This causes us to receive a minimal energy when observing black holes in other galaxies and maximum when observing the black hole inside our own galaxy, which is again consistent with the most recent observations. The recent pictures of Sagittarius A taken by Event Horizon Telescope on 19 April 2019, which are the first high resolution images of a black hole, show the powerful emission of X rays and gamma rays around the black hole Sagittarius A at the center of our Milky Way galaxy which is in strong contradiction with Hawking's Radiation theory which proposes the existence of an extremely miniscule amount of energy for large black holes such as Sagittarius A. Also, recent observations have revealed that inside our galaxy there is actually a contraction taking place instead of expansion, and the expansion of space only takes place in intergalactic space, which is again entirely consistent with what Origami Model predicts.

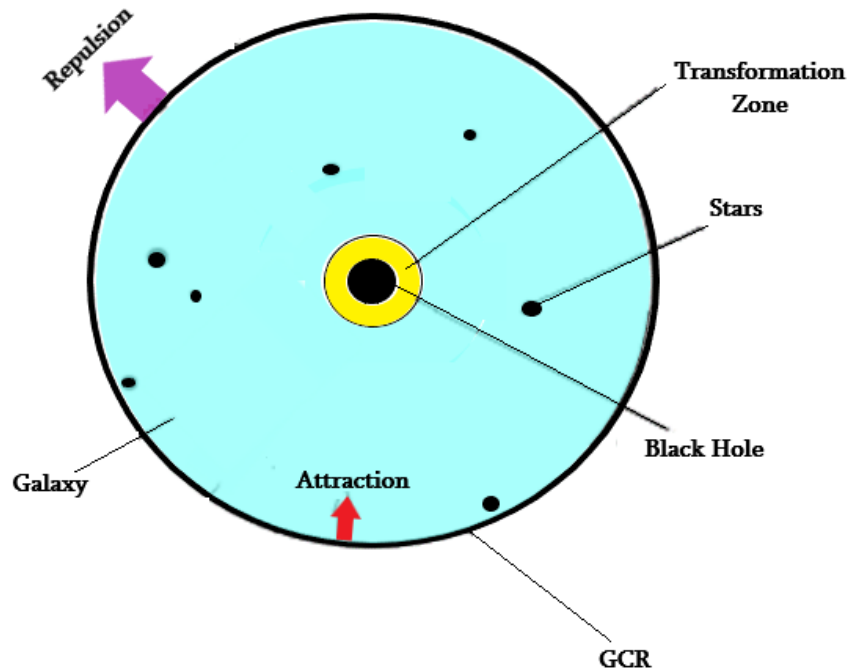


Figure 6- Black hole in the center of galaxy and stars inside its CGR, with contraction happening inside the CGR and expansion happening outside the CGR

Based on the gravitation equation, we can develop an equation showing the point at which particles approaching a black hole would turn to photons. We know the gravitational acceleration near a mass is as the following:

$$g = \frac{GM}{R^2}$$

If the acceleration reaches the speed of light, we will have $g = C$, therefore:

$$C = \frac{GM}{R^2}$$

$$R = \sqrt{\frac{GM}{C}}$$

R : distance of the particle from the surface of the black hole

G : gravitational constant

M : mass of the black hole

C : speed of light

This equation tells us at what distance from the *surface* of a black hole, the approaching particle will turn into photons.

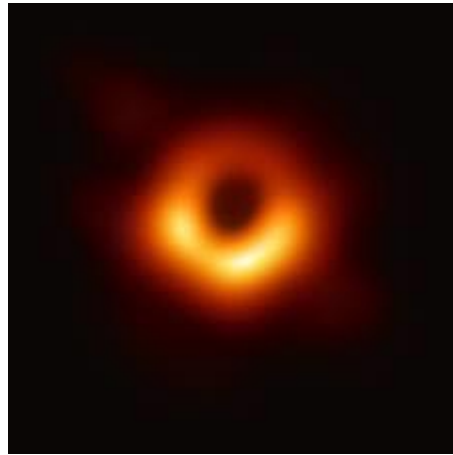


Figure7- First real image of black hole in the world

For example, for the central black hole of our own galaxy, Sagittarius A with a mass of $5 \times 10^{36} \text{ kg}$, the R would be:

$$R = \sqrt{\frac{GM}{c}} = \sqrt{\frac{6.67 \times 10^{-11} \times 5 \times 10^{36}}{3 \times 10^8}} = 1.05 \times 10^9 \text{ m}$$

This means at 10^9 meters away from Sagittarius A's event horizon, attracted neutrinos and other masses will turn into electromagnetic energy. We can simply denominate this radius, the Transformation Radius (R_t) which is always bigger than 1, so it means that no particle will ever reach the event horizon of a black hole. Therefore, no mass will fall into the black hole. Figure 8 demonstrates these various radii in a black hole.

$$R_t = \sqrt{\frac{GM}{C}}$$

R_t : Transformation Radius= distance from the event horizon at which particle turn to energy

G : gravitational constant

M : mass of the black hole

C : speed of light

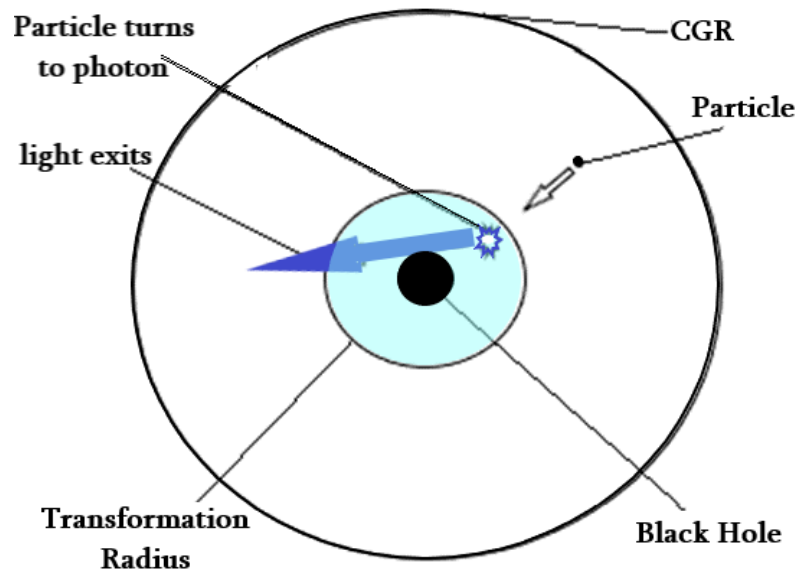


Figure 8 - Black hole and conversion of mass to energy at its Transformation Radius

Using the above equation we can see that for Transformation Radius to be shorter than 1, and so particles reach the event horizon of a black hole, the mass of that black hole must be almost less than half a solar mass, and we demonstrated already that no black hole less than 4 solar mass exists in space and all smaller ones become covered by mass, and produce shelled black holes. This again proves that there is no mass inside the black holes. Even light does not enter the black holes because unlike what we believe, light needs particles to pass through the Neutrino Matrix (subject of my next paper) and that's why it can go through space because space is full of neutrino-antineutrino particles that transfer photons by Newton's Cradle mechanism.

The crucial conclusion of the fact that black holes have zero mass is revolutionary. This in fact proves that absolute vacuum produces the energy for the entire universe to expand and also suggests that there is constant energy entering the universe.

3. Minimum size of the Naked Black Holes

If a large black hole spins fast enough it will stay naked, because the angular momentum will propel the particles away. To find out the spin velocity relative to the mass of the black hole we can use the equation:

$$L = VM'R$$

L: angular momentum

V : linear velocity

M' : mass of the particle attracted by black hole

R : distance of the particle from the center of black hole

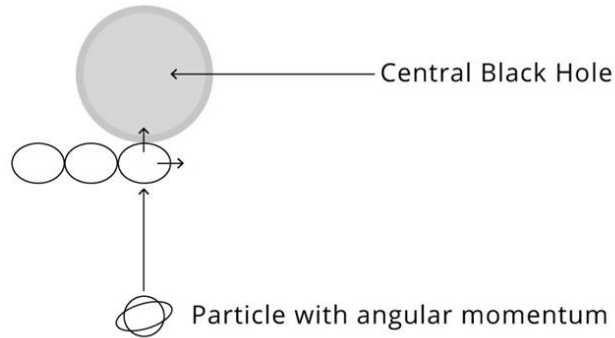


Figure 9- Particles being thrown away by the rotating black hole due angular momentum

This angular momentum needs to be larger than the gravity to keep the black hole naked, so:

$$VM'R > \frac{GMM'}{R^2}$$

R of the black hole is equal to its Schwarzschild Radius. M is the mass of the black hole. M' is the mass of atoms that are attracted to the naked black hole.

Therefore, we will arrive at:

$$\frac{VM'2GM}{C^2} > \frac{GMM'}{2GM/C^2}$$

$$VM > 23.6 \times 10^{38}$$

Because all black holes discovered rotate at speeds near speed of light, so we can rewrite the equation as:

$$M > 7.69 \times 10^{30} kg$$

This means any rotating black hole needs to have at least a mass 3.8 times as big as solar mass (2×10^{30}) to stay naked in space. In other words, Origami Model predicts that we won't find a black hole in space with a mass less than four solar masses. Also considering the previous equation ($VM > 23.6 \times 10^{38}$) we realise that the higher the rotation velocity, the higher the chance of a black hole in space to stay naked. In other words, there can't exist any spinning black hole with a mass less than 7.69×10^{30} or 3.8 solar masses, and if there is a static (non-rotating) black hole in space, it will need to have an infinitely large mass in scales of billions of times bigger than our sun, which is virtually impossible. So, Origami Model believes that naked black holes in space need to spin, and smaller ones will have to sustain a faster rotation to stay naked. This is consistent with our observations so far showing all the discovered black holes

rotating extremely fast up to 80% of speed of light. Also, the smallest discovered black hole in universe which was found in 2008 and is called XTE J1650-500 has a mass of $7.8 \times 10^{30} kg$ which is just fine (14).

Another conclusion based on Origami Model would be a relationship between the size of a galaxy and the length of intergalactic distance. We saw that based on Origami Model the central black hole in a galaxy must be causing the space outside the galaxy to expand and the space inside the galaxy to slightly contract. The accelerative expansion of the intergalactic space has been very well proved but there hasn't been much proof of the contraction of the space inside all galaxies. The answer is in Origami Model again and its equations. As I argued previously, outside its CGR, a black hole causes expansion of the space for an unlimited distance because the gravity has infinite range. When another galaxy exists in neighbouring distance, the expansion force created by the central black hole of the first galaxy will be neutralized by the contraction force caused by the central black hole in the nearby galaxy. This means the bigger the galaxy, the more massive the central black hole, and therefore the more powerful expansion of the universe around that galaxy, and so there must be a bigger distance to the next galaxy. This is consistent again with current observations. Obviously, galaxies collide much more often than stars inside them, but on average, the distance between galaxies is fifty times of their size (15) which means the bigger the galaxy, the bigger the distance with other galaxies. Also with the same mechanism, Origami Model suggests that if a galaxy is too far from other galaxies, located in a void space, it will collapse on itself because the gravitational force inside it will be much more powerful than the expansion force of the neighbouring galaxies (because there is not much neighbouring galaxies around), unless it is mainly made of contracting gas that needs gravity to form proper stars. In other words, Origami Model predicts that remote galaxies in void space, away from other galaxies, must be mainly consisted of gas. Again, this prediction is consistent with current observation. The loneliest galaxy in observable universe is MCG+01-02-015 which has no neighbouring galaxy around it for more than 100 light years in any direction and it is mainly consisted of gas (16). We know as an astrophysical fact that void galaxies are made up of gas but there hasn't been a convincing explanation for the relationship between their void and their composition. Origami Model offers a satisfactory explanation for this fact. Therefore, unlike conventional concept that believes the bright ring around black holes is due to the friction of particles rushing into the black hole, Origami Model shows that the ring is the Transformation Radius that when particles reach, they turn into electromagnetic waves and bounce back to space. Most of these particles are in fact the neutrinos produced constantly by quantum fluctuations in vacuum. If the energy in ergosphere of black holes was due to the friction of objects being pulled into the black hole, the entire universe must have been gulped up by black holes long time ago! Therefore, Origami Model believes that the black hole size is stable and black holes work as energy producing engines for the galaxies. The virtual amount of mass that really reaches the surface of the black hole is very minimal and it is only those certain size objects that survive the Transformation Radius and despite most of their mass turning to energy, some residual mass eventually reaches the black hole surface. This mass will spiral up around the black hole and eject from its poles. This is what we observe as the relativistic jets. Black hole does not accumulate any mass, and anything absorbed to it, turns to energy or will be repulsed from its poles. The amounts of large particles being pulled into the black hole is

really trivial and that is why the relativistic jets occur only once every one or two decades. Therefore, the larger objects near black hole, the more frequent the relativistic jets should take place. This is consistent with observations showing very rare jets for black holes sitting in void space. We might be even able to calculate at what size, a mass attracted to a black hole of a certain mass, will be ejected from the poles as relativistic jets. A mass being attracted to a black hole, usually turns to energy due to its acceleration, therefore for a mass to survive the Fight Runway Zone, its final speed must not exceed speed of light:

$$M_{o2} = \frac{M_{o1}}{\sqrt{1 - \frac{V^2}{C^2}}}$$

M_{o2} is the final mass of the object pulled to the black hole

M_{o1} is original mass of the object

V is the speed of the object

C is speed of light

The speed of the object will increase at a certain acceleration which is equal to the gravity of the black hole:

$$a = g = \frac{V}{T}$$

$$V = g \times T$$

$$g = \frac{G M_o M_b}{r^2}$$

$$V^2 = \frac{(G M_o M_b T)^2}{r^4}$$

M_b is the mass of the black hole

r is the distance of the object from the black hole.

M_o is the mass of the object approaching the black hole= M_{o1}

Now we plug V in the first equation:

$$M_{o2} = \frac{M_{o1}}{\sqrt{1 - \frac{(G M_o M_b T)^2}{r^4 C^2}}}$$

For M_{o2} not to reach infinite, we need to have:

$$\frac{(G M_o M_b T)^2}{r^4 C^2} < 1$$

$$C = 3 \times 10^8$$

$$G = 6.67 \times 10^{-11}$$

Therefore, for object with mass of M_o to survive the Transformation Radius we need to have:

$$\frac{r^2}{M_o T} > M_b \times 2.2 \times 10^{-19}$$

M_b is the mass of the black hole

r is the distance of the object from the black hole.

M_o is the mass of the object approaching the black hole

T is the time to reach the event horizon of the black hole

So, the fate of a mass attracted to a black hole depends on the distance of the object, its mass and the radius of the black hole. Almost all masses would turn to energy and bounce back to space. For example, if the black hole has mass of 100 solar mass, and the object is 10 kg and it is 10 km away from the black hole:

$$\frac{r^2}{MT} = \frac{(10 \times 10^3)^2}{10 \times T} = \frac{10^8}{10 T}$$

$$M_b \times 2.2 \times 10^{-19} = 200 \times 10^{30} \times 2.2 \times 10^{-19} = 4.4 \times 10^{13}$$

So $\frac{10^8}{10T}$ must be bigger than 4.4×10^{13} . So T (the time that takes for the object to reach the black hole) needs to be less than 2.2×10^{-7} seconds. If this 10 kg object is so close to the black hole that it can reach it in such an extremely short time, it will survive and be ejected from its pole. But a 10 kg mass cannot technically be so close to the black hole that can reach it in such an extremely short time, it would have obviously converted to energy before reaching this close. But if the distance is 10 million kilometers, then T needs to be 0.2 seconds. But an object that is 10 million kilometers away cannot reach the black hole with such speed. The only way seems to be a very small black hole, a relatively long distance, and a small object. So, if black hole is 4 solar mass and the object is 1 gram, then $\frac{r^2}{T}$ needs to be bigger than 17.6×10^8 . So if distance from the black hole is 10^7 meter, it will take 10^6 second for this mass to reach the black hole, so $\frac{r^2}{T}$ would be 10^9 which is bigger than 17.6×10^8 . Therefore, the object has to be very small and at certain distance, not too far from the black hole. That's why the objects that can survive the black hole have to be very small and at far distance from it, very rare situation. Most objects at far distance are larger and they won't survive. Smaller ones are scattered and if only one mass survives it won't be detectable for us to observe it ejecting from the poles. Therefore, if a cloud of space dust with masses around few grams each, is wandering at ten thousand kilometers away from a very small black hole, it can create a detectable relativistic jet from the black hole's poles when it is pulled into the black hole. These clouds are virtually rare but they exist in space. The sands will be pulled to the horizon, twist around the black hole and speed up

towards the pole and eject from there, while most of them have turned into electromagnetic rays. Figure 11 demonstrates this effect.

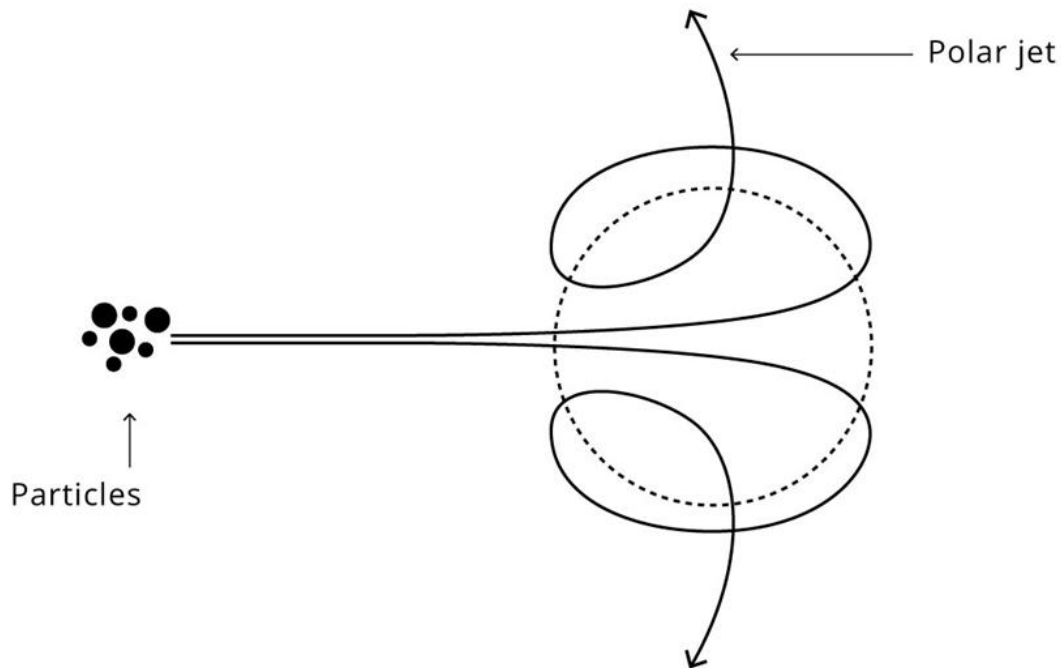


Figure 11- Particles that can escape intact into the relativistic jets

As we can see, the larger objects and smaller particles which are the most common mass in space will not be capable of creating the jets. It must be said that in fact the very existence of these relativistic jets proves that black holes are in fact empty space of gravitational force, because if there was any mass inside this space, all the particles must get pulled into it and nothing should eject from the poles. As Origami Model suggests, the size of a black hole does not reduce or increase by time, and particles (mostly neutrinos) are continuously attracted to it, converted to energy and bounced into space. The only thing that can affect the size of a black hole is collision with another black hole.



Figure 12 – Black hole with its relativistic jets, which I believe is the source of cosmic ray

The last part of this paper will talk about the radius of our universe. We know that the radius of no mass can be smaller than its Schwarzschild Radius. Now if we calculate the Schwarzschild Radius of our universe:

$$R_s = \frac{2GM}{C^2}$$
$$R_s = \frac{2 \times 6.67 \times 10^{-11} \times 8.7 \times 10^{53}}{9 \times 10^{16}}$$
$$R_s = 1.29 \times 10^{27} m$$

So, the Schwarzschild radius of our universe is $1.29 \times 10^{27} m$, while the radius of our universe is $4.4 \times 10^{26} m$! This is in conflict with the definition of Schwarzschild Radius. Schwarzschild Radius of a mass is the radius of that mass when it turns into a black hole, in other words when the distance between the particles inside the mass is equal or less than the Planck Length. So, if the radius of our universe is already less than its Schwarzschild Radius it means there is no distance between the particles in our universe! The value of Schwarzschild Radius that I calculated above, is in fact the Schwarzschild Radius of the massive black hole that our universe is growing inside it. This gigantic black hole, which I denote as the Mother Black Hole, contains absolute vacuum and our universe is growing inside it. The gravitational force inside the Mother Black Hole pulls our universe outwards, causing the expansion of our universe, so when the radius of our universe reaches $1.29 \times 10^{27} m$, we will reach the event horizon of the Mother Black Hole, the end of our expansion journey. Based on the age of the universe which is 13.79 billion years, we can easily calculate that in 0.7 billion years expansion will end because we will reach the edge of the Mother Black Hole, no more vacuum around us to provide the gravitational pull. Therefore, the gravitational constant of $G = 6.67 \times 10^{-11}$ is the gravitational force provided by the Mother Black Hole, from the Big Bang till the end of our expansion. In a better description, our universe is free falling (accreting) inside the Mother Black Hole. This again proves that black holes are absolutely empty, the only absolute vacuum places in universe, and the only places that produce gravity. In fact, if we simply calculate the number of black holes in universe and their average mass, it will be more than the total mass of the universe! This again means black holes must be massless. As I explained so far, you have probably already guessed that by converting the neutrinos in quantum field to energy, black holes are adding to the total amount of energy/mass of the universe, keeping the density of our universe constant as it expands. Therefore, we are not really expanding inside the Mother Black Hole, but *Growing*. We have truly began as a pair of neutrino-antineutrinos at the very center of the Mother Black Hole, what we call singularity, where time is zero (consistent with black hole) and growing into a large universe which will keep growing until in 0.7 billion years from now, it will be born from its Mother to a much larger universe. Due to the rotation of the Mother Black

Hole, as our universe grows inside this large black hole, it rotates and when we reach the event horizon of Mother Black Hole, we will be rotating at speed of light. So, we will enter the new universe as photons, carrying all the information from our embryonic universe to the real world. These photons will have rotation (what we call electromagnetic force) and angulation (what we call mass/gravity), which is how they will transfer all the information to the new world.

* Note that the central black hole inside subatomic particles is not naked black hole, but a shelled black hole and the CGR equation for shelled black holes is different: $CGR = \sqrt{M} \times 3.7 \times 10^{-2}$

So classical white dwarf has a mass of $1.3 \times 10^{30} kg$ and the radius is $7000 km$, therefore we can calculate the ratio of $\frac{R}{CGR}$:

$$CGR = \sqrt{M} \times 3.7 \times 10^{-2} = \sqrt{1.3 \times 10^{30}} \times 3.7 \times 10^{-2} = 4.21 \times 10^{13}$$

$$R = 7 \times 10^6 m$$

$$\frac{R}{CGR} = \frac{7 \times 10^6}{4.21 \times 10^{13}} = 1.6 \times 10^{-7}$$

Conclusion

Unlike few previous studies that cast a shadow of doubt on very existence of the black holes mainly based on the Newtonian theory of Gravitation and also due to the mathematical and physical conflict in justification of any remaining mass inside the black hole, the present study believes that black holes are massless entities with nonzero diameter in space, in form of a high velocity rotational vortex exerting enormous gravitational force. If this is correct, the inevitable conclusions will include: (1) black holes are consisted of absolute vacuum (solution to Entropy Paradox) and therefore particle will never enter them (solution to Information Paradox); (2) therefore all the particles attracted by the black holes must convert to massless photons, so the constant attraction of neutrino-antineutrino pairs in space by the black holes and accelerating them into high frequency photons generates a constant, uniform force that expands interstellar space (dark energy); (3) the size of the black hole should not change by time and based on the gravitational time dilation as time becomes zero at the event horizon, no particle would exist beyond that point; (4) therefore, as the universe expands, more black holes must develop through the supernovae to maintain the constant density of dark energy, suggesting a possible correlation between supernovae frequency and the rate of expansion (a recent study proves the direct relation between black hole formation and expansion of universe (10) proposing that black holes are packets of dark energy); (4) this means the only cosmic event that can alter the radius of a black hole is when two merge into one slightly bigger black hole (larger vortex), releasing gigantic amount of force (gravitational waves). This novel view of the black holes, indicates that black hole is nothing but absolute vacuum that by decelerating time manifests itself as the gravity.

Total Mass of Black Holes

According to the latest observations there are at least 2×10^{20} black holes in our universe. The minimum mass of a black hole is $8 \times 10^{30} kg$, and the largest black hole found till now has a mass of $8 \times 10^{42} kg$, so the average mass of black holes would be around $8 \times 10^{36} kg$. According to Origami Theory, we will calculate that there is 6×10^{23} black holes in our universe, exactly equal to Avogadro Number. Also, we will see that the central black hole of our universe has a mass of $3 \times 10^{48} kg$, which is yet to be discovered. Even if we rely on the current numbers, the total mass of the black holes in our universe will be:

$$2 \times 10^{20} \times 8 \times 10^{36} = 1.6 \times 10^{57} kg$$

But we know that the total baryonic mass of universe is only $4.3 \times 10^{52} kg$. This clearly demonstrates that black holes can not contain any mass at all, otherwise the total baryonic matter of universe will become 2000 times larger than what it is.

Useful links:

First image of black hole by NASA: <https://www.jpl.nasa.gov/edu/news/2019/4/19/how-scientists-captured-the-first-image-of-a-black-hole/>

Mersini-Houghton's conclusion that black holes do not really exist: <https://www.iflscience.com/physics/physicist-claims-have-proven-mathematically-black-holes-do-not-exist/>

Information about the Information Paradox: <https://phys.org/news/2015-10-black-hole-paradox.html>

About the Firewall Paradox: <https://blogs.scientificamerican.com/observations/have-we-solved-the-black-hole-information-paradox/>

Stephen Hawking and his idea about paradoxical nature of black hole's existence: <https://www.nature.com/news/stephen-hawking-there-are-no-black-holes-1.14583>

How many black holes are in universe: <https://www.forbes.com/sites/startswithabang/2017/06/03/ask-ethan-how-many-black-holes-are-there-in-the-universe/#50422e1b614e>

Mass of the Great Attractor: <https://www.universetoday.com/113150/what-is-the-great-attractor/#:~:text=It%20has%20a%20mass%20of,That's%20thousands%20of%20galaxies.&text=While%20the%20Norma%20Cluster%20is,to%20account%20for%20the%20pull.>

Mass of smallest black hole possible: <https://www.scientificamerican.com/gallery/the-smallest-known-black-hole/#:~:text=NASA%20scientists%20have%20identified%20the,in%20at%206.3%20solar%20masses.>

Energy and friction in accretion disc: <https://science.howstuffworks.com/accretion-disk.htm>

Supernova formation: <https://www.space.com/6638-supernova.html>

Total mass of universe: <https://phys.org/news/2020-04-weight-universe.html>

Weak magnetic field of black holes: <https://science.sciencemag.org/content/358/6368/1299>

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- 2- Winterberg, Friedwardt;(April 2013), "*Black Hole Firewalls and Lorentzian Relativity*", ResearchGate.
- 3- Tolman, R.C. (1958); *Relativity, Thermodynamics and Cosmology* Clarendon Press, Oxford.
- 4- Weinberg, S. (2008), *Cosmology*. Oxford University Press, ISBN-13: 978-0198526827.
- 5- NASA, April 2, 2008; *The Smallest Known Black Holes*, Scientific American Journal
- 6- Colgate, S. A.; McKee, C. (1969). "*Early Supernova Luminosity*". The Astrophysical Journal. 157:623.
- 7- Hartsfield, T. (January 22, 2016), "*The Incomprehensible Power of a Supernova*", Real Clear Science.

- 8- Johnson, J. (2007). "[Extreme Stars: White Dwarfs & Neutron Stars](#)". Lecture notes, Astronomy 162. [Ohio State University](#). [Archived](#) from the original on 31 March 2012. Retrieved 17 October 2011.
- 9- Yigit Dallilar, Stephen S. Eikenberry (December 2017), Science Magazine, 08 Dec 2017: Vol. 358, Issue 6368, pp. 1299-1302, DOI: 10.1126/science.aan0249

Big Bang

Despite we know that our universe started by the Big Bang, there are still numerous problems in Big Bang model that Standard Theory has been suggesting. To mention a few, we can check these:

- 1- We don't know where the primary mass came from,
- 2- we have to accept that the primary mass was infinitely dense, which is simply incorrect because no mass can be infinitely dense. For a mass to be infinitely dense means the distance between the particles making the mass is less than Planck Length,
- 3- The speed of phenomenon during the first seconds and minutes after the Big Bang has to be faster than speed of light, which is contradicting the General Theory of Relativity,
- 4- What force made the explosion of the infinitely dense mass?

But on the other hand, Origami Model is capable of explaining the Big Bang perfectly well without facing any of such conflicts and contradictions. Let's first review again how time creates mass in Origami Theory.

1. Big Bang

Now that I suggest there is strong repulsive force between two antiparticles, let's see what would happen at the beginning of Big Bang. Unlike the Standard Model that suggests Big Bang started by explosion of an infinitely compact (contradictory), supermassive mass, Origami Model considers only a single pair of particle-antiparticle at singularity. The mass of these particles should be the lightest, most likely neutrino and antineutrino. According to Higgs Field Theory, there is constant quantum fluctuation in vacuum, creating particle-antiparticle pairs. The singularity moment in Origami Theory, is the moment that the first pair of particle-antiparticle appeared. According to my equation the gravitational force between these two particles would be zero because they contain the same value of mass. But when the next pair appear nearby, the equation would predict a different outcome. Based on my equations, we expect an attractive gravitational force between the two particles, and a repulsive gravitational force between the two antiparticles. This would be the very first force appearing in the tiny universe of two pairs of particle-antiparticle. Therefore, the two particles would move toward each other while the two antiparticles would move away from each other. This very first movement of particles and antiparticles starts the Big Bang, the expansion of the universe, which still continues. By the expansion of this tiny universe, stretched time will create more pairs of particle-antiparticles and the same phenomenon would repeat itself, creating an ever-growing mass of matter dominance, and ever-expanding space of antimatter dominance. This explains the Baryon Asymmetry that we know existed at the Big Bang, preventing the matter-antimatter from annihilating each other. This phenomenon is still occurring constantly in our universe. Figure 4 shows this effect.

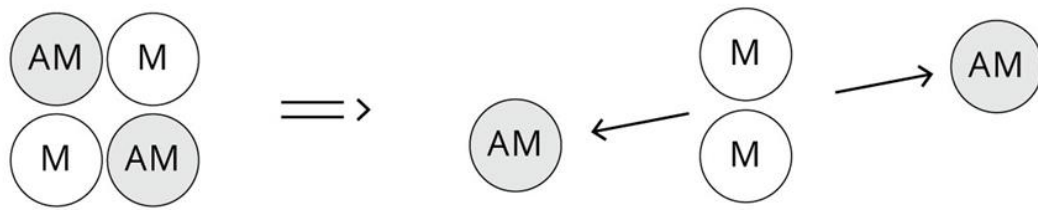


Figure 4- The beginning of universe, attraction of mater and repulsion of antimatter
M: matter particles AM: antimatter particles

Based on this model, Big Bang simply can start with a pair of neutrino-antineutrino created from quantum fluctuation in vacuum. The Standard Model of the Big Bang requires a gigantic, *infinitely* compact mass to start the universe, a mass so compact that the distance between the particles inside it is less than Planck Length! Then we are faced with the eternal question of “Where did this infinitely dense mass come from?” as well as the question of “where did the energy that exploded this mass come from?” and the most important conflict, “Why didn’t matter and antimatter annihilate each other?” , While Origami Model simply overcome all these conflicts. Figure 5 demonstrates how gravitational attraction between matter and matter aggregates the particles, and how gravitational repulsive force between antimatter and antimatter disperses antiparticles, causing expansion of the universe.

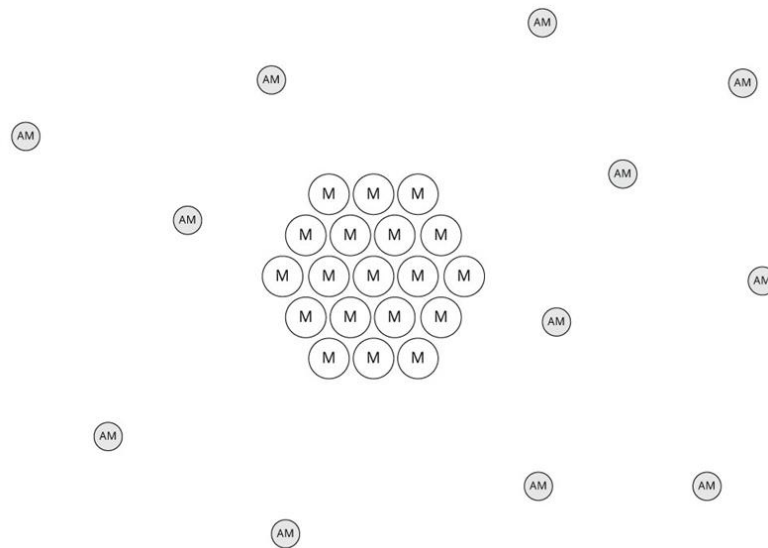


Figure 5- Aggregation of particles and dispersion of antiparticles
M: matter, AM: antimatter

Every mass in vacuum is surrounded by pairs of fluctuating particle-antiparticles, attracting the particles (strongly) as well as the antiparticles (weakly). But according to my equations, the gravity between matter and antimatter is far less than the gravity between the matter and matter so at a far distance, where the attraction between the mass and the antiparticles is less than the repulsion between the two adjacent antiparticles, the antiparticles would repel each other

instead of moving towards the mass, therefore at this certain radius, things change. At this particular distance from the mass, while the particles still become attracted to the mass, their spouse antiparticles move away from each other and from the mass. In our current universe, all this repulsed antimatter would eventually cause the expansion of the universe, while the attracted matter would eventually be absorbed by the Black Holes because they contain the highest gravitational force in the center of Galaxies. Therefore, Origami Model suggests that the expansion of universe is simply produced by repulsive force between antiparticles against the attractive gravitational force created by the black holes, that is occurring all through our universe. In other words, the theory suggests that Dark Energy is in fact nothing but the gravitational repulsive force between antiparticles, triggered by the black holes, and so expansion of universe is caused by black holes. I will show and calculate how black holes provide the Dark Energy simply through their gravity and expand our universe constantly.

2. Cosmic Inflation

Based on what I explained, we understand that vacuum (gravity) decelerates time and when time produces a mass, it slows down due to the effect of gravity. We can look at this phenomenon in other way around: Time bends and slows down to produce a mass. Therefore, time travels at its minimum velocity in vacuum and as the mass grows, the density of total pool of gravity reduces and so time accelerates. At the beginning of the Big Bang, there was maximum vacuum and minimum mass, so speed of time is at its minimum, and as it produced more and more mass, its speed increased. We can clearly see this in my equation for acceleration of time. We know that acceleration of time is 6.67×10^{-11} , so this means that every second, speed of time increases by trivial increment of 6.67×10^{-11} , so if speed of time at first moments of the Big Bang was 6×10^{-11} , in one second, its speed simply doubled. But at present, when speed of time is 2.9×10^9 , every second speed of time increases only by a factor of 10^{-11} . In other words, as time progresses, the absolute value of its velocity increase is the same but the relative increase of its velocity reduces massively. This incredibly high acceleration of time at first moments of universe is what Standard Model calls Cosmic Inflation. Origami Model demonstrates this clearly.

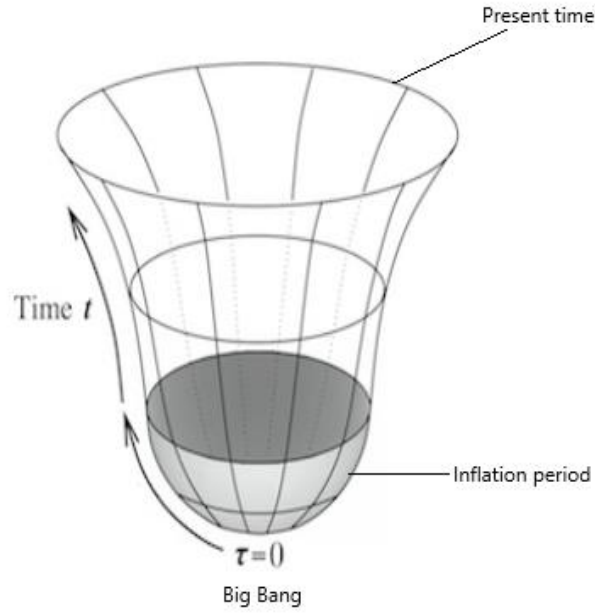


Figure 23- Cosmic Inflation due to acceleration of time

Now, let's return to the Big Bang, and examine the Cosmic Inflation theory which discusses the expansion of universe at the beginning of Big Bang. The theory says that at the moment 10^{-36} second, the inflation started and ended at 10^{-32} second (all took $9.9 \times 10^{-33} \text{ sec}$) expanding universe by 10^{26} fold. The theory also shows that expansion was clearly much faster than speed of time. But the force required for the inflation and the cause of it is unknown. According to Origami Model time constantly speeds up, which means that the Planck Time constantly reduces, and it must have been much longer in the past. We can calculate to see what the value of Planck Time was at Big Bang (at 10^{-36} second):

$$a \frac{v}{t}$$

$$6.67 \times 10^{-11} = \frac{v}{10^{-36}}$$

$$v = 6.67 \times 10^{-47}$$

This means speed of time at the beginning of inflation was 6.67×10^{-47} . Now we can find out how long was the duration of Planck Time at that moment:

$$t = \frac{3 \times 10^8 \times 5.39 \times 10^{-44}}{6.67 \times 10^{-47}} = 2.4 \times 10^{11}$$

So, the shortest time at Big Bang, the Planck Time was in fact 2.4×10^{11} seconds but we observe it as only as 5.39×10^{-44} seconds. Now we can see why Big Bang is perceived as a phenomenon much faster than current speed of light, because we observe it 10^{55} times faster than how it actually occurred then. This explains how Big Bang could do so much in such small time.

Based on what we explained about the acceleration of time, the speed of time at any point of time in the past (T) can be calculated by following equation:

$$V_t = 2 \times G \times T \div \cos \alpha$$

V_t : speed of time

G : gravitational constant

T : time

$$V_t = 10GT$$

Therefore, speed of time at $10^{-36}s$ was:

$$V_t = 10 \times 6.67 \times 10^{-11} \times 10^{-36}$$

$$V_t = 6.67 \times 10^{-46}$$

Then speed of time at 10^{-33} second was:

$$V_t = 10 \times 6.67 \times 10^{-11} \times 10^{-33}$$

$$V' = 6.67 \times 10^{-43}$$

So, the speed of time during this short time increased from 6.6×10^{-46} to 6.6×10^{-43} . This is an increase of 10^3 times, which means Planck Time became 1000 times shorter and Planck length became 1000 times longer. If length increases A unit, the volume grows A^3 unit, so the volume of everything grew 10^3 folds. Also due to the mechanism of expansion of original universe, for every A meter increase in the radius of original nucleus, there was a A^3 units increase in the growing rate of the nucleus (because the spherical surface of the universe and so the area of CGR would cube). Therefore, during the inflation, the radius of universe increased $(10^3)^3 = 10^{27}$ folds. This tells us that the expansion of this original nucleus of mass must have been exponential, which is consistent with the theory of Cosmic Inflation suggested by Alan Guth that is widely accepted amongst cosmologists around the world. Also, according to the Cosmic Inflation Theory of Big Bang, at 10^{-32} second after the Big Bang, the size of universe was 0.88 millimeter. We need to note that, in Origami Model of Big Bang, the expansion is exactly in

logarithmical fashion and for n fold increase in length, 10^n fold increase in radius would occur. We saw that in this period, due to incredibly slow speed of time, the distance between the first particles (which we will show they were Origamons) would have been as short as Planck Length, 1.61×10^{-35} meter and between the moment zero till moment 10^{-32} s it would be equal to 10^{31} seconds, so length would grow for 10^{31} folds (logarithmical expansion as we explained), which is consistent with Cosmic Inflation Theory. So, based on Origami Model the starting radius of Big Bang was Planck Length and after 10^{-32} seconds it will be:

$$1.61 \times 10^{-35} m \times 6.67 \times 10^{31} = 1.073 \times 10^{-4} m = 1.0 \text{ mm}$$

This is exactly one millimeter. Therefore, Origami Model can explain the mechanism of the Big Bang and the inflation without requiring an *infinitely* dense mass (which is a paradox in itself). Big Bang and inflation were not extraordinary explosions. The current model of Big Bang and cosmic inflation is impossible in any school of physics and for any rational mind and the amount of time considered currently considered wouldn't allow any significant physical process to occur and no heating or cooling in scales of billions of degrees can possibly take place and in one millionth of second plus all the neutrons and protons and electrons and neutrinos and photons as well as the antimatter being formed. Instead of assuming that there was a super-dense mass at the beginning that contained all the mass in the universe in itself, and it was somehow septillion times smaller than a grain of sand, and then it exploded by an unknown force and created all the galaxies and stars, it would be more rational to assume that there appeared only a pair of primordial particles through quantum fluctuation which attracted other particles and formed a primary nucleus that grew by gravitational force and formed the universe over millions of years and the process is still continuing and the only building block was time. Time has started its journey from the center of this vast vacuum and it accelerates forward with a rotational motion (we will see why) and creates a cone shaped universe, with its center (apex of the cone) constantly producing new matter/antimatter and its outmost borders (the oldest mass) expanding inside the vast vacuum. The acceleration of time and the Planck Constant are unchangeable, because as time accelerates, Planck Time shrinks and Planck Length grows with the same rate, so Planck Constant stays the same. The produced universal cone will grow until there is no vacuum outside the universe to pull it. This is when the border of the universe reaches the Schwarzschild Radius of this massive black hole in which our universe is growing. Then it will exit the black hole into the mother universe, in form of electromagnetic energy with all the information preserved in its speed, angulation and rotation. Let's say it properly: Our universe is free falling inside a black hole with acceleration of $6.67 \times 10^{-11} m/s^2$. We are in fact expanding inside a massive black hole. We will see by the end of this paper, that our universe is exactly free falling inside a huge black hole and as it goes down, it expands by the gravitational force of the black hole around it, until it reaches the event horizon of the black hole (surface of the black hole) and comes out of it. This paper will decisively prove that things do not go into a black hole. Things come out of the black hole. And black hole is virtually empty. So is the entire universe. There is only time and nothing.

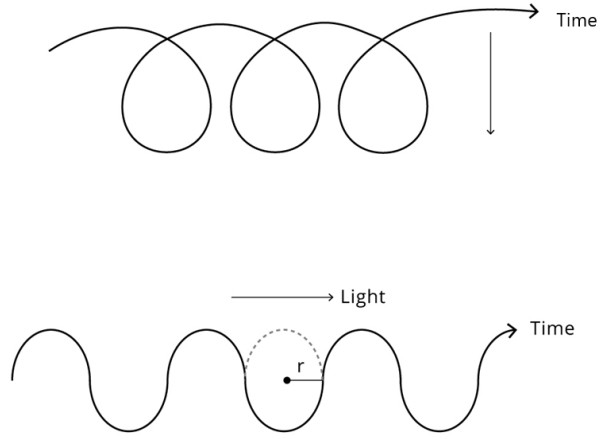


Figure 24- Spiral path of time and straight path of light

Based on below figure, time follows a spiral path and that's why it creates a circular world with everything in spherical shape. However, light travels in straight line and by looking at the figure 27 we can see that light travels much shorter distance. For time and light to reach the same point simultaneously, time needs to have much faster speed. We can see in the picture that if we denominate the distance traveled by light D_l , it can be calculated as:

$$D_l = 2r$$

But the distance traveled by time would be:

$$D_t = \text{circumference of the circle} = 2\pi r$$

Therefore, we arrive at:

$$\frac{D_t}{D_l} = \frac{2\pi r}{2r} = \pi$$

Because speed is reversely proportional to time, we can conclude that:

$$\text{speed of time} = \text{speed of light} \times \pi$$

But we know that $T_r = T_m^2$, the real time spent is the apparent time (measured time) squared. Therefore, we arrive at:

$$\text{speed of time} = \pi^2 C$$

$$\mathbf{T_v = 9.87 C}$$

This crucial equation tells us that real speed of time is in fact almost 10 times faster than speed of light. Therefore, we can conclude that the real duration of time, or for example the real age of the universe is 10 times bigger than measured time. We call this Corrected Time, therefore:

$$T_c = 9.87T_m$$

This means the corrected duration of time (eg. Corrected age of the universe) is almost 10 times as big as the measured (apparent) duration of time. Note that Corrected Time, Measured (apparent) Time and Real Time are three different values and they are all important in my calculations, depending on what situation we need to measure the time. Now if we put the corrected time in the equation:

$$a = \frac{V}{T} = \frac{2.9 \times 10^8}{9.87 \times 4.34 \times 10^{17}} = 6.67 \times 10^{-11}$$

Above equation is the classic equation to calculate the acceleration, and we have put the speed of light and the Corrected Age of the universe and it gives us the Gravitational Constant. This makes absolute sense and it means that the Gravitational Constant is the acceleration of time, making light slower until now that it has reached the current speed of $2.9 \times 10^8 m/s$. We know that Einstein proved that gravity is in fact acceleration and my equation demonstrate this beautifully. Therefore, we can extract new equations to find the relationship between the radius of universe and time:

$$V = \frac{d}{t}$$

$$speed\ of\ time = \frac{corrected\ distance\ traveled\ by\ time}{duration\ of\ time}$$

$$T_v = \frac{D_c}{T_m}$$

This means the speed of time must be equal to the corrected radius of the universe divided by the measured time (measured age of the universe). Because we have a Corrected Time, we have a Corrected Radius too, in other words, we will have the corrected distance traveled by time. To find this corrected distance we have to imagine the real path of time which is spiral. We will show in the last chapter of the paper, the time is proceeding from Big Bang, past, towards present and as it goes forward it expands, so the shape of the universe is a like a cone not a sphere. Therefore, the value of R is not the radius, but the diameter of the cone shaped universe. The value for diameter of universe is $8.8 \times 10^{26}m$ but this is if our universe is a sphere. To find the real diameter of our universe, we need to imagine that the value of diameter is the diameter of the largest sphere that can fit inside a cone and calculate the height of the cone:

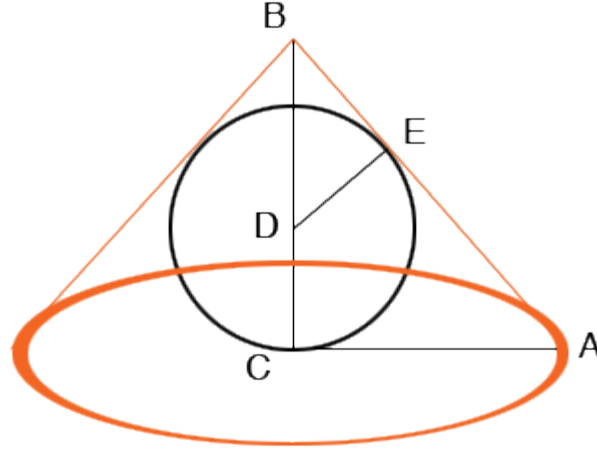


Figure 25- Cone shape of universe and its real and apparent radii

Based on what we said, we can write:

$$DC = \text{radius of the sphere} = 4.4 \times 10^{26}m$$

$$BC = AC = \text{diameter of the cone} = \text{diameter of universe}$$

$$BC \times \cos 45^\circ = 2DC$$

$$BC = \frac{2DC}{\cos 45^\circ} = \frac{2DC}{0.7} = 2DC \times 1.41 = 2DC \times \sqrt{2}$$

So, we arrive at:

$$R_c = 2\sqrt{2} R_m$$

This means the Corrected Distance traveled by time per unit of time is $\sqrt{2}$ times bigger than the Measured(apparent) Distance. Therefore:

$$R_c = 2\sqrt{2} \times 4.4 \times 10^{26} = 12.45 \times 10^{26}m$$

This means that the real diameter of our universe is $12.45 \times 10^{26}m$ and our universe expands at the base of a cone, not as a sphere. Now to testing my last equation for speed of time and distance, I plug the numbers:

$$T_v = \frac{D_c}{T_m} = \frac{12.45 \times 10^{26}}{4.3 \times 10^{17}} = 2.9 \times 10^9$$

This is precisely consistent with the speed of time that we already found, almost ten times faster than speed of light. Also, this explains the relation between the radius of universe and the age of universe. The other equation that we can extract is the formula for distance and time:

$$a = \frac{V}{T}$$

$$a = \frac{d}{T^2}$$

$$G = \frac{D_c}{T_r^2}$$

$$\mathbf{D_c = GT_r^2}$$

This is a wonderful equation because it shows how time creates the distance and distance is but an illusion of time. To test this equation, we can use the values of the universe. We know that corrected radius of universe is $12.45 \times 10^{26}m$, therefore:

$$12.45 \times 10^{26} = 6.67 \times 10^{-11} \times T_r^2$$

$$T_r = 4.3 \times 10^{18}s$$

This is precisely the value of the corrected age of the universe which is almost 10 times bigger than measured age of the universe. The reason for the corrected age of the universe to be much bigger than its measured age is because time has been accelerating and as we said before, it has been so slow in the past so the real time passed in the past is much higher than what it seems to us now.

Another way to calculate the corrected speed of time would be considering the angle of beta that we described before. We can find the current speed of time from the following equation which will give us the same result as the previous equation:

$$V_t = 10 \times \cos\beta \times C = 2.9 \times 10^9$$

Based on what we discussed, we can easily derive three equations to find the speed of time in the past, the certain duration of time in the past, and value of a length in the past. The equation for calculating the speed of time in T time in the past:

$$\mathbf{V_{t_0} = 9.87GT}$$

V_{t₀} : speed of time at certain point T in the past or future from Big Bang (eg. Speed of time at 5 seconds after the Big Bang)

G : acceleration of time = 6.67×10^{-11}

T : point of time in past or future from Big Bang

And because $V_t = 9.87 \times C$, therefore we can find the speed of light at certain time in the past (T_0):

$$C_0 = GT_0$$

If we are calculating the real duration of time for a certain period of time that is not started from Big Bang (eg. trying to find out the real duration of 24 hours at 100,000 years ago compared to 24 hours now) we will need to find the speed of time at the beginning and the end of the period (24 hours) and divide it by the average (integral) of speed of time and use that as V_t in the equation. The final equation to calculate the certain duration of time in the past would be:

$$T_r = \frac{V_t \times T}{V_{t_0} \times 9.87}$$

T_r : real duration of time at T point of time in past or future

V_t : current speed of time = 2.9×10^9

V_{t_0} : speed of time at T point in past or future

T : measured/observed value of that time

Now, as time accelerates, the distance that light travels per second increases, so the Planck Length increases. Therefore, acceleration of time means enlargement of length or in fact expansion of the universe. Therefore, the reason for expansion of the universe is acceleration of time, because distance is only an illusion of time. Also, we realize that length or volume or space is nothing but the Vertical progress of time, that I explained earlier. Therefore, the same force, G that accelerates time, expands the universe. This means, expansion of universe is produced by acceleration of time, reduction of gravitational density. To calculate a length at certain time in the past (or future) we can extract the equation:

$$L = \frac{CxL_0}{C_0}$$

L : Current value of length

C_0 : speed of light at certain point in past

C : current speed of light

L_0 : value of the length in the past

These equations are extremely important and we will be constantly using them to find the values of length and time in the past or future throughout this paper.

3. Mass Effect of Time

Einstein showed that universe is composed of a network of space-time and near any gravitational field, time slows down. Origami Model takes this view one more step further, believing that the reason for curvature of time near a mass is in fact because time slows down to create mass and it is the gravity that reduces the speed of time to create the mass. The slowing down of time is what we categorize as gravitational acceleration because when time slows down, phenomena are perceived faster. Figures 29 and 30 show this phenomenon.

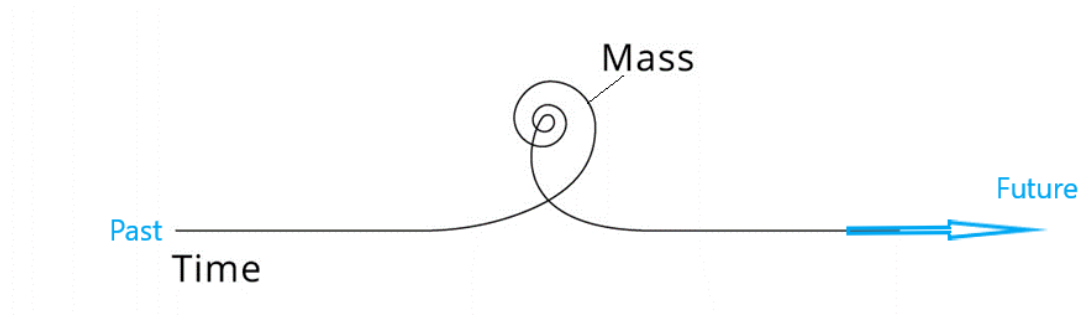


Figure 29- How time produces mass in its path

To comprehend the concept of Origami Model , we may use a metaphor. In a metaphoric way we might consider that mass is time rolled over itself into a ball, like a sheet of paper creating an origami shape, and energy is this ball unfolded. Space/distance is the time between the two balls of mass. But how could we develop an equation converting time to mass?

According to Heisenberg's Uncertainty Principle:

$$\delta t \times \delta p \geq \frac{h}{4\pi}$$

We can rewrite this equation in a new form:

$$\Delta E \times \Delta T = \frac{h}{4\pi}$$

This means we can borrow energy(E) from the vacuum for an incredibly short period of time(T), before it returns back to vacuum. And because $E = MC^2$ then we can rewrite the equation again:

$$T = \frac{h}{4\pi mc^2}$$

Now we have the equation. This equation clearly shows that certain seconds of time is equal to certain kilograms of mass. As we know, the shortest period of time is Planck Time: 5.39×10^{-44} . But we said that time was much slower at Big Bang, so let's see how much time would be equal to Planck Time at Big Bang. Considering the acceleration of time being 6.67×10^{-11} , we can see what the speed of time was at Planck Time after the Big Bang:

$$T_r = \frac{V_t \times T}{V_{t_0} \times 9.87}$$

$$V_t = 10GT$$

$$V_t = 10 \times 6.67 \times 10^{-11} \times 5.39 \times 10^{-44}$$

$$V = 3.6 \times 10^{-53}$$

Therefore the speed of time at Planck Time after the Big Bang (the first virtual moment of beginning), was 3.6×10^{-53} , which means speed of light was $3.6 \times 10^{-54} m/s$ because speed of time in our universe is always 10 times bigger than speed of light (we will explain this in more details later, $10 = 2:\cos 75$ or π^2). Now we can find out what the duration of Planck Time was at that moment:

$$T = \frac{5.39 \times 10^{-44} \times 2.9 \times 10^8}{3.6 \times 10^{-53} \times 9.87} = 4.5 \times 10^{17} \text{ sec}$$

This is an incredible result! Because as we know the age of universe is only $4.34 \times 10^{17} s$ so how could Planck Time at Big Bang has actually been taking more than the age of the universe? The answer is that this result is the Real Time of the entire life of the universe. This result is telling us how long our universe will live. In other words, it is mathematically demonstrating that our universe will reach the end of its expansion in 0.7 billion years from now. Our universe is just $4.3 \times 10^{17} s$ old and we will see in subsequent chapters that when our universe reaches the periphery(event horizon) of the Mother Black Hole inside which the universe is growing, it will be exactly $4.5 \times 10^{17} s$ old. This means *we have borrowed only a Planck Time and stretched it for entire life of the universe!* This means in fact for observer outside the universe, our entire universe from Big Bang to the end of its life takes only Planck Time! For the residents of the

outer universe in which the massive black hole lies (and we are growing inside this black hole to exit from its event horizon eventually) we will appear out of nowhere in a blink of an eye, just like what we witnessed when our own universe came to existence at the Big Bang. Our speed will be speed of light so we will arrive as photons (Origamons) in the new universe, just like our own universe appeared at Big Bang, but note that, the particles creating the new universe will carry the information from the previous universe in their mass and spin.

Now let's see how a phenomenon like Big Bang could physically happen out of nothing. Heisenberg's Uncertainty Principle equation can show how much energy can be borrowed from vacuum for a certain amount of time. So, we can calculate how much energy was borrowed right before inflation starts, during first $5.39 \times 10^{-44} \text{ sec}$ of time. We calculated that Planck Time at Big Bang is actually $4.5 \times 10^{18} \text{ s}$, therefore we arrive at:

$$T = \frac{h}{4\pi E}$$

$$4.6 \times 10^{18} = \frac{6.62 \times 10^{-34}}{4 \times 3.14 \times E}$$

$$E = 1.12 \times 10^{-53} \text{ J}$$

This result shows that only an incredibly trivial amount of energy was borrowed and now we have to see if this would be sufficient to produce our universe. This is in fact what Standard Model calls the Super-force, the force that later created other four forces. To see how much mass could be produced by this energy we can use Einstein's equation:

$$E = MC^2$$

Based on my theory, the speed of light at a Planck Time from Big Bang would be:

$$C_0 = GT$$

$$C_0 = 6.67 \times 10^{-11} \times 5.39 \times 10^{-44}$$

$$C_0 = 3.59 \times 10^{-54}$$

So, the speed of light at that moment was only 3.6×10^{-53} . Now we plug this in Einstein's equation:

$$E = MC^2$$

$$1.12 \times 10^{-53} = M \times (3.59 \times 10^{-54})^2$$

$$M = 8.75 \times 10^{53} \text{ kg}$$

This simply means that at a Planck Time during the inflation, which would be the shortest possible time, 1.17×10^{-52} joules of energy was fluctuating in Higgs Field , creating $8.7 \times 10^{53} kg$ mass(the entire mass of universe) for only a Planck Time which will stretch as time accelerates and finally ends at $4.5 \times 10^{17} s$ later. This energy has to return to vacuum eventually to avoid violation of the first law of thermodynamics. But this amount of energy is exactly enough to produce $8.7 \times 10^{53} kg$ matter which is exactly consistent with the calculated mass of the universe (including both baryonic as well as the dark matter). This is a wonderful result for Origami Model and it explains where and how the first amount of energy appeared to produce the Big Bang and provided power for inflation. As we see, the energy required was so trivial and could be borrowed from the vacuum as long as it returns to vacuum eventually. Therefore, unlike the conventional model in which Big Bang requires a massive amount of force to occur, in Origami Theory, Big Bang only borrows an infinitesimal amount of force and starts from only a pair of particles.

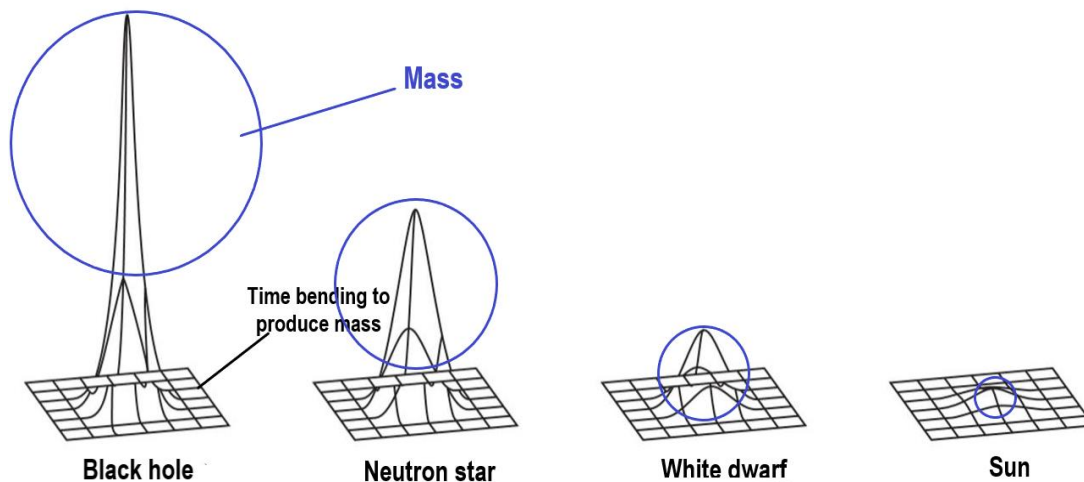


Figure 30 - Curvature of time to produce mass effect

2. The Building Block of Universe

Origami Theory, is a theory that suggests, time is the only dimension in universe and mass and space are various manifestations of time. Distance, is the time difference between two objects, in other words, the time that takes to travel from one point to another point with speed of light is the distance between the two points. Based on Origami Model the definition of mass is simple: *Mass is the combination of time and gravity*. Therefore, Origami Model believes that gravity is a property of vacuum, so there will be no Gravitons to be discovered. In fact, Einstein was also thinking about this, as he once said, "gravity is not a force but an inherent property of matter." Therefore, based on Origami Theory, the value of mass is directly proportional to the value of angulation of time (reduction in speed of time). If we imagine time as a line that curves up at a certain angle and then rolls back over to resume its path (figure 8) the amount of mass is equal to the surface of the circle:

$$S = 2\pi r$$

The radius of the circle would be directly proportional to the angle at which time bends to produce the circle and reversely proportional to speed of time (the higher the speed of the line, the smaller the produced circle). Therefore, we can write:

$$r = t_g \beta \div C$$

C is speed of light (speed of time) and beta is the angle of time. Therefore, the more time angulates (the slower time becomes), the bigger the beta, the bigger the mass will be. According to the theory of general relativity, speed of time is related to speed of observer, which is exactly consistent with Origami Model with a fundamental difference that Origami Model does not believe that mass angulates the time, but it says time angulates to create the mass and that's why time is always curved/angulated near a mass. In the following chapter we will calculate that time angulated at Big Bang for almost 90 degree to produce the tremendous mass of universe. Note that as we explained before, the current angle of time in our universe(beta) is 15 degrees, so this means in almost all my equations, we will need to multiply the measured speed of time ($V_{t_m} = 2.9 \times 10^8$) by multiplying it by cosine of the 15 degree. In other words, the real speed of time is the observed speed of time multiply by cosine of its angle:

$$\frac{t_u}{t_m} = \cos\beta$$

$$t_u = \cos\beta \times t_m = V_{t_m} \times \cos 15^\circ = 2.9 \times 10^8 \times 0.96 = 2.88 \times 10^8$$

T_u : time used to produce mass=real time T_r

T_m : time measured by observer

This means we have to use 2.88×10^8 for speed of time or speed of light in my equations. As universe ages, speed of light increases, so speed of time increases and alpha reduces until it reaches zero at the end of the expansion of the universe. Now we can write my equation of time-mass as:

$$mass = 2\pi x \frac{t_g \alpha}{C}$$

Therefore, the higher the angulation of time, the larger the alpha, the higher the mass would be. If I plug corrected speed of light we will arrive at:

$$M = \frac{2 \times 3.14}{2.88 \times 10^8} \times t_g \alpha$$

$$M = 2.18 \times 10^{-8} \times t_g \alpha$$

This is an incredible result! As we know, 2.18×10^{-8} is Planck Mass. We have extracted the value of Planck Mass by a completely different solution based on Origami Model . The equation is telling us that mass is the product of tangent of the angulation of time by Planck Mass, which is the unit of mass. This is the second physical constant that we have discovered in Origami Theory. The result of this equation will be the total mass produced by angulation of time which is turns out to be double the mass of the matter. This means angulation of time produces matter and antimatter at the same time, which is absolutely consistent with Standard Model. So, to find the value of matter mass we will need to divide the result by two:

$$M = \frac{m_p \times t_g \alpha}{2}$$

$t_g \alpha$: Tangent of the angle of time angulation

m_p : Planck Mass = $2.18 \times 10^{-8} kg$

This incredible equation shows us how time produces mass. The calculated mass in this equation is actually the total mass of matter and antimatter and that's why it needs to be divided by 2, to find the mass of matter only. So, the equation tells us that whenever time bends to produce mass, it produces equal amount of matter as well as antimatter. Considering the equation for gravitational time dilation in theory of general relativity, we realize that in fact angulation of time produces the time difference between the observer and the reference. In other words, $\cos \alpha = \frac{T_u}{T_m}$ or in fact $\alpha = \frac{R_s}{R} \times 2\pi$.

$$T_f = T_o \sqrt{1 - \frac{2GM}{Rc^2}} = T_o \sqrt{\frac{R_s}{R}}$$

T_f : time spent on observer/object forwarding to the mass (t_m in Origami Theory)

T_o : time measured by standing observer (t_u in Origami Theory)

R_s : Schwarzschild Radius

R : radius of the matter or particle

T_u : time used to produce mass

T_m : time measured by observer

α : The angle of time at which time bends to produce mass

So if R_s equals R (black hole), then alpha would be 90 degrees and time would angulate at its maximum angle, returning to its original spot, so time for observer would be zero ($\cos 90 = 0$), or in other words time stops! Therefore, according to Origami Theory, inside Schwarzschild Radius time would be zero for observer outside, which is consistent with general relativity and gravitational time dilation.

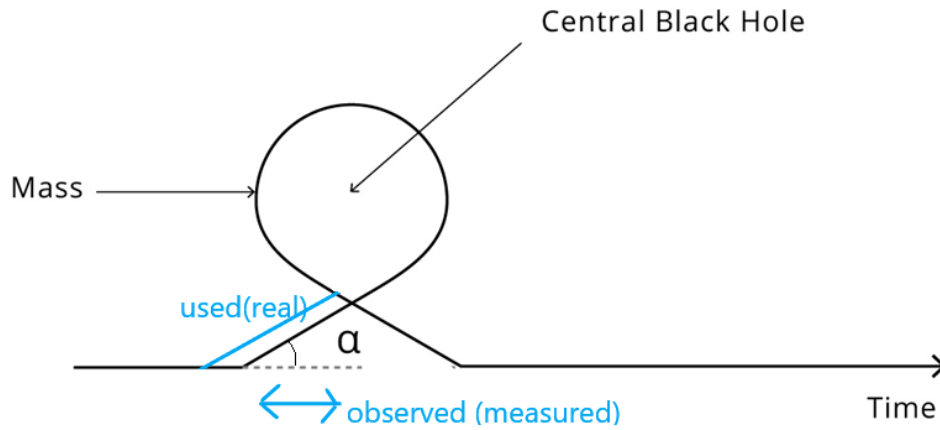


Figure 31- Real and Observed times

As you can see, time has to bend at certain angle to create the sphere of mass. The bigger the angle, the larger the sphere, the larger the mass. Let's call this angle, alpha. Looking again at the gravitational time dilation of Einstein, we can see the same effect. This is in fact a different version of Origami Model and $\frac{T_f}{T_o}$ is equal to $\cos \alpha$, when α is the angle of time. This means, time slows down in gravitational field. According to Origami Theory, time bends, or in other words, slows down to create mass, therefore near and inside a mass, time must be slowest. This is consistent with Einstein's Gravitational Time Dilation with a difference that Origami Model explains how and why time slows down near a mass. It slows down to *create* the mass. In above equation the angulation of time to create mass is hidden:

$$\cos\alpha = \frac{T_f}{T_0} = \sqrt{1 - \frac{2GM}{RC^2}}$$

Now let's see what was α at Big Bang. The angle of beta is in fact the angle between time measured by observer ($T_m = T_o$) divided by time used to produce the mass ($u = T_f$):

$$\frac{T_m}{T_u} \times 10 = \frac{T_o}{T_f} \times 10 = t_g \alpha$$

At the first moment of Big Bang, which would be t_p (Planck Time) after the beginning, the time used to produce the mass was in fact the duration of Planck Time. We showed that velocity of time has accelerated since Big Bang with a rate of 6.67×10^{-11} .

We also found that the speed of time at Planck Time after the Big Bang was (to simplify the equation we round up 9.87 to 10):

$$V_t = 10GT$$

$$10 \times 5.39 \times 10^{-44} \times 6.67 \times 10^{-11} = 3.59 \times 10^{-53} m/s$$

Based on this we found that the real duration of Planck Time at that moment was $4.5 \times 10^{17} sec$.

$$\frac{2.9 \times 10^8 \times 5.39 \times 10^{-44}}{3.59 \times 10^{-53} \times 9.87} = 4.5 \times 10^{17} s$$

Therefore, the duration of time used at that moment was in fact $4.5 \times 10^{17} sec$. The amount of time used is equal to Planck time:

$$T_u = 5.39 \times 10^{-44} sec$$

Therefore, we can calculate the $t_g \alpha$:

$$\frac{T_m}{T_u} \times 10 = 10 \times 4.5 \times 10^{17} \div 5.39 \times 10^{-44} = 8.3487941 \times 10^{61}$$

Therefore, alpha would be equal to 89.9999, extremely close to 90 degrees.

This result makes absolute sense because the angel of alpha at Big Bang must be at its maximum (90 degrees) to produce the maximum amount of mass, since tangent is maximum at 90 degree.

Now we need to see how much mass this amount of time can produce:

$$M = \frac{T_g \alpha \times m_p}{2} = 8.34 \times 10^{61} \times 2.1 \times 10^{-8} \div 2 = 8.7 \times 10^{53} kg$$

This result is amazingly consistent with the estimated mass of the universe which is $8.7 \times 10^{53} kg$, including baryonic matter and Dark Matter.

Therefore, this is the maximum mass produced by angulation of time which is exactly sufficient to produce a flat universe. But even more amazing thing is that now we should be able to find out the smallest possible mass that can be produced by time when alpha is at its minimum. To find out the smallest mass we simply need to replace $t_g \alpha$ with $cot_g \alpha$:

$$cot_g \alpha = \frac{1}{t_g \alpha} = \frac{1}{8.34 \times 10^{61}} = 1.2 \times 10^{-62}$$

$$M = \frac{cot_g \alpha \times m_p}{2} = \frac{1.2 \times 10^{-62} \times 2.17 \times 10^{-8}}{2} = 1.3 \times 10^{-70} kg$$

This is the smallest mass produced by the smallest possible angulation of time. Therefore, this must be the original mass immediately after the singularity. In other words, this is the smallest particle in entire universe, and the first mass that was produced by Big Bang, much before neutrinos:

$$\mathbf{M = 1.3 \times 10^{-70} kg}$$

We might denominate this unbelievably small particle, Origamon. Origamon is the building block of universe and every particle and mass is produced by various collections of Origamons. There are strong reasons to believe that Photons are in fact Origamons, therefore, I believe photons in fact do have a mass, which is extraordinarily small. This is why light reacts to gravity and gravitational lensing takes place near strong gravitational force of heavy stars. I will explain this in details in subsequent chapters of the paper.

Now if we apply the Newton's gravitation equation to this primordial nucleus, the original mass that is being produced by Big Bang we will arrive at:

$$g = \frac{GM}{r^2}$$

G: gravitational constant

g : gravity produced by the mass (universe)

r: radius of mass (universe)

M: mass (of universe)

We saw that according to Origami Model the gravitational acceleration produced for universe is 6.67×10^{-11} which is equal to G.

Based on the definition of gravitational constant we know that g must be equal to G here, so we will arrive at:

$$\mathbf{M = r^2}$$

Note that this equation only works for the universe as a whole, not for parts of universe or objects and particles. This formula tells us that the mass of the universe will always be equal to the square of its radius (as universe grows the $\cos\theta = 0.2$ become a coefficient in the equation). Now we reach a revolutionary result: As the radius of universe increases due to the expansion of universe, its mass needs to increase too. This is obviously conflicting with the first law of thermodynamic regarding the conservation of energy, however we will explain this feature in more details in future chapters. The only point that needs to be noted is that as our observations have shown, the radius of universe is expanding and the density of matter, Dark Matter and Dark Energy are all constant, and this clearly means that mass and subsequently energy in our universe is constantly increasing but we won't see the effect because the density of them is constant. We will later see how much energy and mass is constantly produced, added to our universe.

Let's test the equation for the first moment of the universe, just before inflation takes effect. We showed that in Origami Model, Big Bang starts from only a couple of original particles extremely close to each other, we know they must be Origamons jump-starting the Big Bang. So, let's see at the beginning of time, singularity, when the mass of universe is only as much as two Origamons, what would be the radius of universe:

$$M = r^2$$

$$M = 2 \times 1.3 \times 10^{-70} m$$

$$2.6 \times 10^{-70} = r^2$$

$$\mathbf{r = 1.61 \times 10^{-35} m}$$

This is again wonderful results! This is exactly the value that we call Planck Length. Therefore, when there are only a pair of Origamons in universe, the radius is Planck Length. This confirms the correctness of the theory again and it is absolutely consistent with my proposed mechanism of the Big Bang. In antimatter chapter I explained that Origamons are the only particles that have no antimatter counterpart, there is no antiorigamons. The reason is because the time (data Digits) that produce Origamon are the simplest single Digit data therefore, the reversed version of the data that creates Origamon is the same. But as Origamons combine and fuse together, they create the larger particles that we know as the elementary particles in Standard Model. This means the only elementary particle in Origami Model is Origamon and everything, even all

the subatomic particles are produced by large number of Origamons combining together. The difference between the subatomic particles and other objects is that in subatomic particles Origamons fuse together and create one larger single central black hole for the particle, but when the mass of the particle gets above the Planck Mass ($2.18 \times 10^{-8} kg$), the Origamons cannot fuse together and in fact, the subatomic particles combine and produce the mass. I will show the mechanism of this phenomenon in next chapters when I will explain the Fusion Distance and the Separation Distance concepts. Therefore, the only elementary particle in Origami Model that is not dividable is the Origamon. What we know as photon, is the free Origamon but I show that the same particle is used in structure of particles and this is why when any mass, regardless of matter or antimatter, converts to energy, it turns into Origamons (photons).

Only two Origamons can start the Big Bang and grow very fast. This couple create the first nucleus of universe. As we can see, when we use the smallest possible mass, the radius of universe turns out to be the smallest possible length, which makes absolute sense. To produce my equation, we did not use any of Planck values and we have in fact discovered the Planck Length here. This is the third physical constant that we have so far solved. Also note that this radius is for the first pair of particles so the radius of one Origamon is half of this value:

$$r = 1.61 \times 10^{-35} \div 2 = 8 \times 10^{-36} m$$

So now we know that the radius of Origamon is half of Planck Length. The Origamon that we have predicted to exist, is extremely crucial in subsequent calculations because, as we will see, Origamons are in fact the building blocks of the universe. Origamons (photons) are the smallest units of mass.

Note that as universe expands and its radius increases, to calculate the more precise radius we will need to apply the cosine of Theta in the equation because of the cone shape of the universe. In other word, as the Real radius of universe is $\frac{3\pi}{2}$ times bigger than its Apparent radius, to find the Apparent radius of universe we need to divide the mass of universe by 4.5. Therefore, the correct equation for the current size universe would be:

$$M = \frac{r^2}{\cos\theta}$$

We said that theta is the angle for entire universe against the cosmic horizon which affects the speed of time in our universe and that's why it has effect in the measurement of the radius. Because theta is 75 degree the equation will become:

$$M = 4.5 r^2$$

If I plug the current mass of universe, we must be able to find the radius of the universe:

$$8.7 \times 10^{53} = 4.5 r^2$$

$$r = 4.4 \times 10^{26}m$$

This is absolutely the correct result that is consistent with observations again.

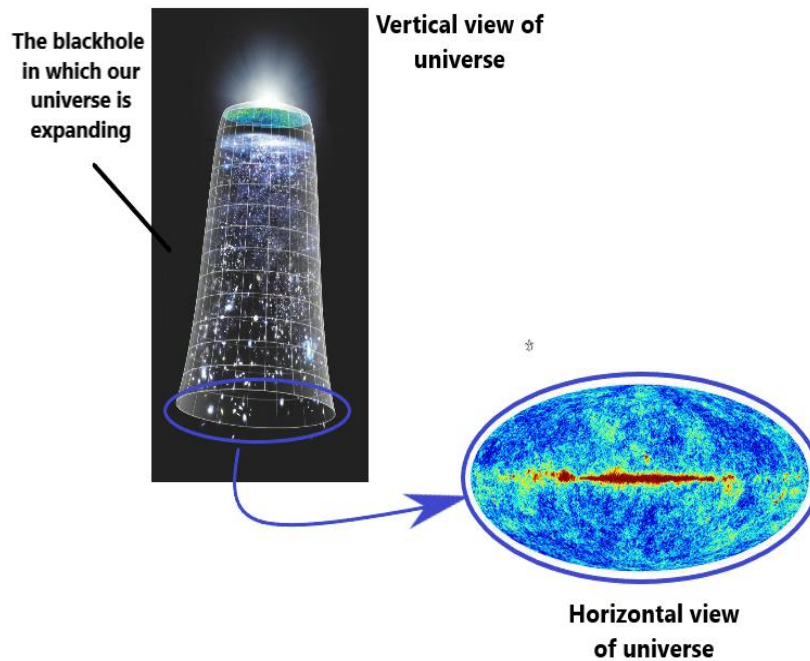


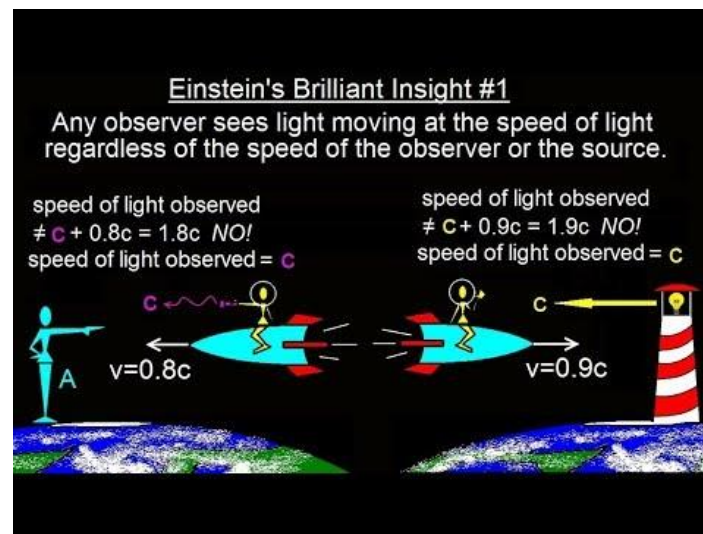
Figure 32- The real cone shape of universe and our horizontal view

3. Constancy of Speed of Light

The Theory of General Relativity is founded on the principle that speed of light is constant. Origami Model is founded on speed of time and therefore speed of light to vary continuously. Therefore, it seems that Origami Model is in conflict with the General Relativity. Although Origami Model is in complete opposition with the Standard Model and many aspects of the modern quantum mechanics, it is entirely consistent with the Theory of General Relativity. One must note that the consistency of the speed of light is time independent and by definition it means: *'The speed of light in vacuum is the same for any inertial reference frame, no matter how fast a light source is moving relative to an observer.'*

Origami Model is absolutely in agreement with this (below figure). But this does not mean that speed of light does not change by time.

I mentioned that speed of light in our universe is close to one tenth of speed of time. So, if speed of time is increasing and speed of light is one tenth of it, so speed of light must be increasing! This is true, and this is the main point in Origami Theory. While speed of light is constantly increasing to stay at one tenth of speed of time constantly, it *seems* to be reducing to the observer due to the acceleration of time. This is a crucial fact that differentiates Origami Model from all other hypotheses that are based on reduction of speed of light, because Origami Model actually proposes that the real speed of light is increasing.



4. Current Angle of Time

My equation shows that at the moment of Big Bang alpha was extremely close to 90 degrees. This means the maximum mass production, which is consistent with Big Bang. Then what would alpha be at present? We can use my equation to find out, by plugging the current speed of light in it:

$$T_f = T_0 \sqrt{1 - \frac{2GM}{rC^2}}$$

$$\cos \alpha = \sqrt{1 - \frac{2GM}{rC^2}}$$

M : mass of the universe

r : radius of universe

G : gravitational constant

C : speed of light

$$\cos \alpha = \sqrt{1 - \frac{2 \times 6.67 \times 10^{-11} \times 8.7 \times 10^{53}}{4.4 \times 10^{26} \times 9 \times 10^{16} \times t_g \beta}}$$

$$\alpha + \beta = 90^\circ$$

$$\cos \alpha = \sqrt{1 - \frac{2.89}{t_g \beta}}$$

$$t_g \beta = 3.2$$

$$\beta = 85.63^\circ$$

$$\alpha = 4.37^\circ$$

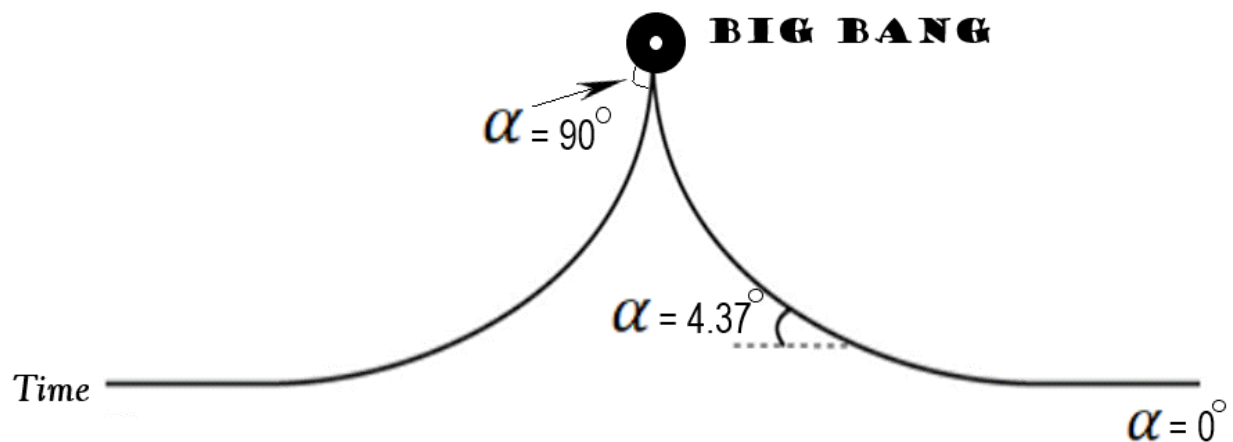


Figure 33- Current angle of alpha (4.37 degree)

This means alpha is 4.37 degrees at present, and it will take a long time for it to eventually reach zero. The mass production will be zero when alpha is zero. So, this means Big Bang is still continuing, therefore the expansion of universe is still accelerating. Now we can calculate how long it will take for alpha to become zero (when expansion stops). That would be when alpha becomes zero and $\cos \alpha$ reaches its maximum which is 1. If it has taken 13.7 billion years (the age of universe) for alpha to reduce from 90 to 4.37, how much more it would take for alpha to become zero?

$$T = \frac{13.7 \times 4.37}{85.63} = 0.7$$

This means we have already gone through the most of Big Bang, in other words we can predict that in 0.7 billion years from now, the acceleration of expansion of the universe will stop. This is when time will stop accelerating. What would happen then? We will get to this in subsequent chapters.

5. Measuring Angle of Beta

I explained before that the angle between the universal time and light, is 15 degrees and the angle between the universal time and cosmic horizon is 75 degrees. But you might wonder how I have measured these angles. We can simply use my equation to find out, by plugging the current speed of light in it:

$$T_f = T_0 \sqrt{1 - \frac{2GM}{rC^2}}$$

$$\cos \beta = \sqrt{1 - \frac{2GM}{rC^2}}$$

T_f : measured speed of time now, 2.8×10^9

T_0 : real speed of time, 2.9×10^9

M : mass of the universe

r : corrected radius of universe which we calculated to be $12.45 \times 10^{26}m$

G : gravitational constant

C : current speed of light = $c \times t_g \theta$ (theta is the angle of time with cosmic horizon = 75°)

$$C^2 = (C \times t_g \theta)^2 = C^2 \times t_g^2 \theta$$

$$\cos \beta = \sqrt{1 - \frac{2 \times 6.67 \times 10^{-11} \times 8.7 \times 10^{53}}{12.45 \times 10^{26} \times 9 \times 10^{16} \times t_g^2 \theta}}$$

$$\theta = 75$$

$$t_g \theta = 3.72$$

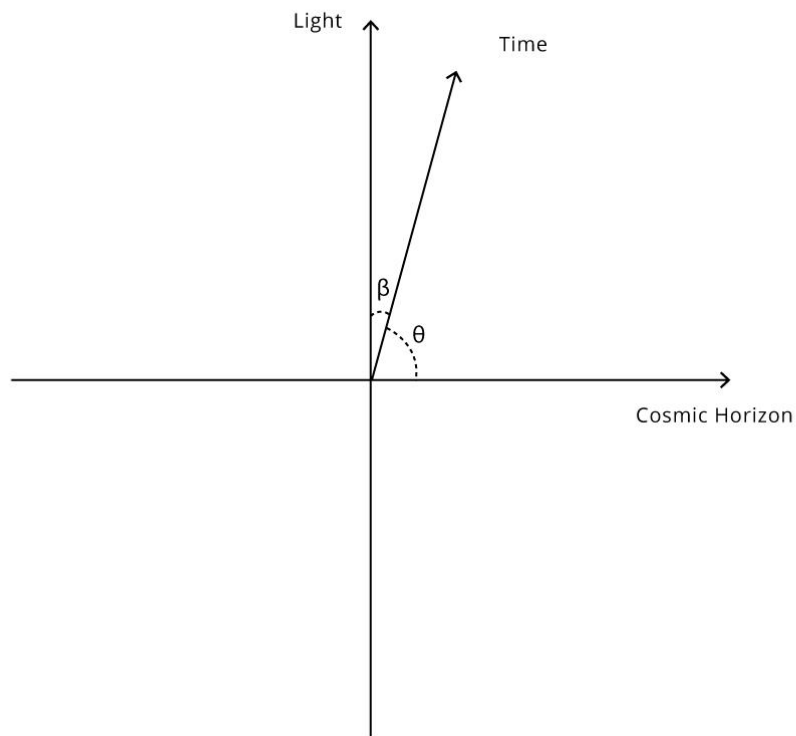
$$t_g^2 \theta = 13.8$$

$$\cos\beta = \sqrt{1 - \frac{1.03}{13.8}}$$

$$\cos\beta = \sqrt{1 - 0.072}$$

$$\cos\beta = 0.96$$

$$\beta = 15$$



β : Angle between universal time and light = 15°

θ : Angle between universal time and Cosmic Horizon = 75°

Figure 34- Current angle of beta = 15°

This means beta for our entire universe (universal angulation of time) is 15 degrees at present, the angle between universal time and light. Therefore, theta must be 75 degrees. The 75 degree angulation of universal time at its start in Big Bang, is due to its velocity when entering our universe. I will explain in later chapters that our universe is the second universe in cosmos and it will eventually end in the third universe. The cosmic horizon is in fact the event horizon of the Mother Black Hole that encapsulates our entire universe. We will see in last chapters that the next universe will originate at 60 degree angle from the next gigantic black hole, and finally in the last round, the final universe will originate at almost zero degree angle from the gigantic black hole in which it expands, so the final value of theta in the final universe (not the final stage of our own universe) will be almost zero and so the final value of beta will be almost 90 degrees. Note that beta and theta are constant angles all through the life a universe.

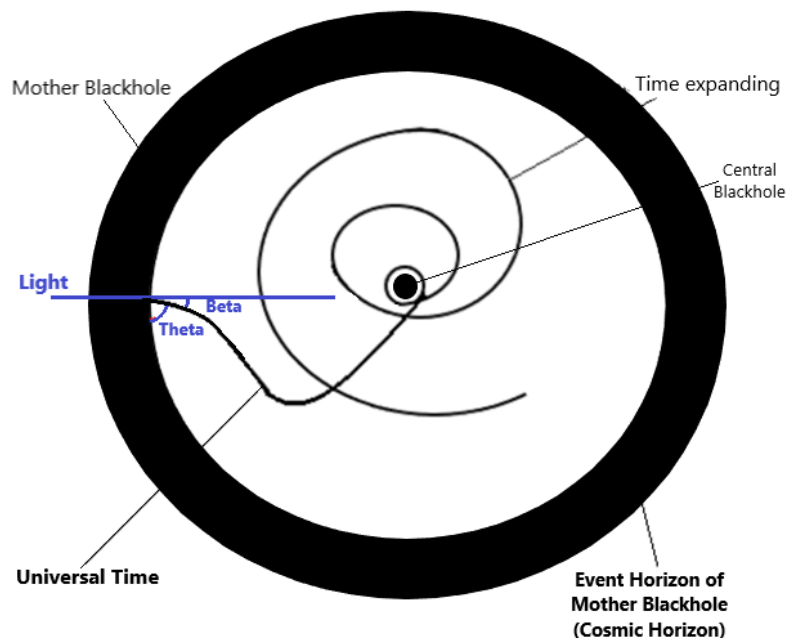
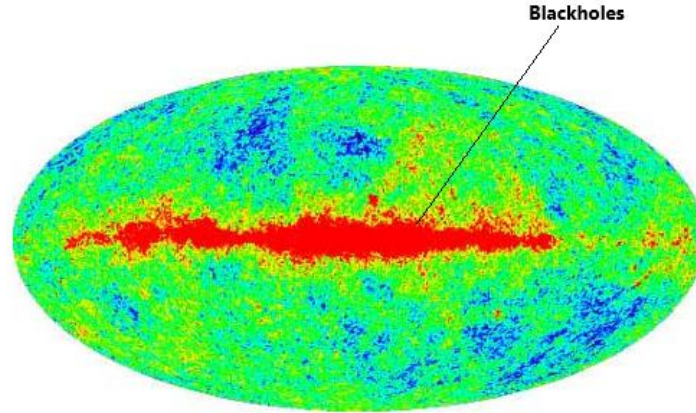


Figure 35- Horizontal view of universe as it expands inside a massive black hole, demonstrating the angles of Theta (between cosmic horizon and time) and Beta (between time and light)

$$\theta = 75^{\circ} \quad \beta = 15^{\circ}$$

The latest pictures of universe constructed by NASA show the maximum concentration of blackholes in the center of the universe, which is absolutely consistent with Origami Theory's suggestion that blackholes provide the energy to expand the universe.



NASA's picture of universe with blackholes concentrated in centre

6. Black Holes and Angulation of Time

We saw that time angulates to create a mass. But what happens then? According to Newton's gravitation equation we have:

$$g = \frac{GM}{r^2}$$

This means in the center of every mass, where R is equal to zero, the g would become infinite! Mysteiously, the entire gravitational force is somehow in the center, where there is no mass! In other words, at the center of each mass, time would angulate at 360 degrees, because the tangent of 360 is zero, so the time becomes zero for outside observer, and there will be the maximum amount of energy. Angulation of 360 degree means that time must be rotating, making a U turn at the very center of the mass. In other words, time bends and creates the mass, and then it rotates and makes a circle and resumes its original path until it bends and forms another mass. The bigger the angulation of time, the bigger the circle in the center of the mass.

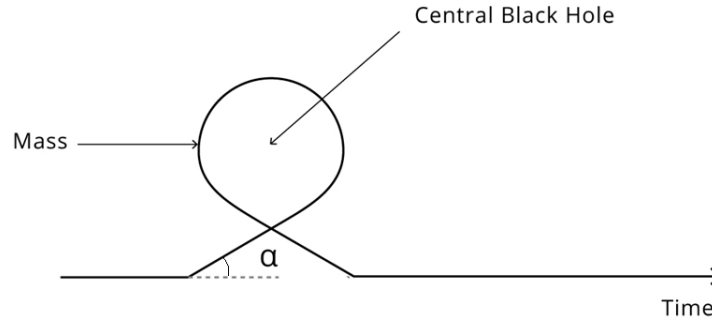


Figure 36- Angulation of time to produce mass

The surface of this time circle is the event horizon of the mass, and inside this circle there is absolute vacuum, the radius of this circle is the Schwarzschild Radius of the mass, because at this point according to my equation, time becomes zero:

$$\alpha = \frac{R_s}{R} \times 2\pi$$

Therefore, at the center of every subatomic particle there must be a black hole that contains absolutely nothing, but provides the maximum gravity. Also, as we explained, the maximum gravitational force is in this central circle, because Newton's equation shows that gravity starts from the center of the mass. So mass is in fact in the periphery of the particle and gravity is in the center of it, where there is absolute vacuum. In other words, black hole is an absolute vacuum space where even time does not exist, and this is why time stops at the Schwarzschild Radius of a black hole. Time exists in any point of the universe except inside the black hole because black hole is created by rotation of time, producing an empty space inside this radius. The value of gravity is directly proportional to the radius of this empty space. Where there is time, there is mass, where there is no time, there is gravity. That is why at Big Bang, where there was time surrounded by vast radius of absolute vacuum, the gravity was maximum and it produced the maximum angulation of time (slowest speed of time) so created the maximum mass. In Origami Theory, the central black holes of subatomic particles are called the Shelled Black Holes because they are surrounded by mass (Origamons).

7. Antimatter Effect of Time

Time has three fundamental features that defines the entire universe and produces the information for every single particle:

- 1-Time progresses horizontally by recycling of data and produces the concept of passage of time.
- 2-Time progresses vertically by repetition of data and produces the concept of space.
- 3- Time rotates and produces the concept of magnetic moment.

Because gravity is a vector force, when it combines with time the produced information, mass, can always be in two forms: matter or antimatter. What differentiates matter from antimatter is the fact that the sequence of Digits of time in matter is the reverse of the sequence of its Digits in antimatter. The only particle with no counterpart antiparticle is the Origamon, because the Digits in Origamon are symmetric and their reverse sequence is the same.



Sequence of Digits of data (time) in matter and antimatter

We saw that time, angulates and then rotates to produce mass, but this rotation could be in two different directions, producing two different types of mass. If the rotation is counterclockwise, the mass would be matter and if it is clockwise, the produced mass would be antimatter. Figures 36 and 37 demonstrate this mechanism. Obviously both these masses have positive value but the interaction between them would be different.



Figure 36- Matter**Figure 37- Antimatter**

As I explained before, electromagnetism is the rotation of gravity, or rotation of time so the polarity of the electric charge and magnetic moment in matter would be opposite of antimatter. Also, gravitational interaction between matter and antimatter would be different from matter and matter. Due to the opposite direction of rotation of time in antimatter, the vector of gravity in antimatter is from the center of mass outwards and that's why two antimatter repel each other. I showed in first chapters of the article that how Baryonic Asymmetry occurred from the beginning of Big Bang due to the different gravitational behaviors of matter and antimatter.

We saw how black holes attract neutrinos constantly and repel anti-neutrinos, causing space to expand. We also saw that this phenomenon occurs outside the Critical Gravitational Radius of a black hole and that's why the repelled anti-neutrinos will find themselves in intergalactic space. This means that intergalactic space has all these repelled anti-neutrinos. Origami Model suggests that interstellar space is consisted of more than 75% matter and less than 25% antimatter, and intergalactic space is consisted of more than 75% antimatter and less than 25% matter. This is why we hardly find antimatter in our galaxy. The intergalactic space that is saturated with anti-neutrinos obviously will constantly expand because anti-neutrinos repel each other. Because the black holes constantly absorb neutrinos and repel anti-neutrinos to intergalactic space, the ratio of antimatter to matter constantly grows in intergalactic space, so the repulsive force between the anti-neutrinos constantly increases. We can see that our universe started at the center of a massive black hole (a large empty space) and it is growing in this black hole now. The radius of this massive Mother Black Hole is equal to the Schwarzschild Radius of our universe:

$$R_s = \frac{2GM}{c^2} = \frac{2 \times 6.67 \times 10^{-11} \times 8.7 \times 10^{53}}{9 \times 10^{16}} = 1.3 \times 10^{27} m$$

This is the radius of the massive black hole inside which our universe is expanding. This is the largest possible black hole in our universe with a mass equal to the mass of our universe:

$8.7 \times 10^{53} kh$. This also means that our universe will expand until its radius will reach $1.3 \times 10^{27} m$. So, the largest black hole was this one with $8.7 \times 10^{53} kg$ mass and $1.3 \times 10^{27} m$ radius. As universe expands, the space between our universe and the event horizon of the Mother Black Hole inside which our universe is growing decreases, and so the total repulsive force between antineutrinos in intragalactic space increases.

Origami Theory's model is exactly consistent with the observations because the experiment has showed that more than 99% of mass inside galaxies is matter. Also, this means the density of antimatter would be much higher in intergalactic space. The first antimatter discovered was positron found in cosmic rays. I showed earlier that cosmic ray is produced by black holes and it is part of the large amount of energy that black holes emit and that's why there would be higher density of antimatter in it. But what would happen to all the antimatter, antineutrinos that are repelled in intergalactic space. Due to the repulsive gravitational force between the antimatter particles, they would eventually move towards the outmost layers of the universe. Based on Origami Theory, most of antimatter would be in shape of antineutrinos and they will occupy the

outmost layer around the external border of the universe. Figure 38 demonstrates this map for easier comprehension.

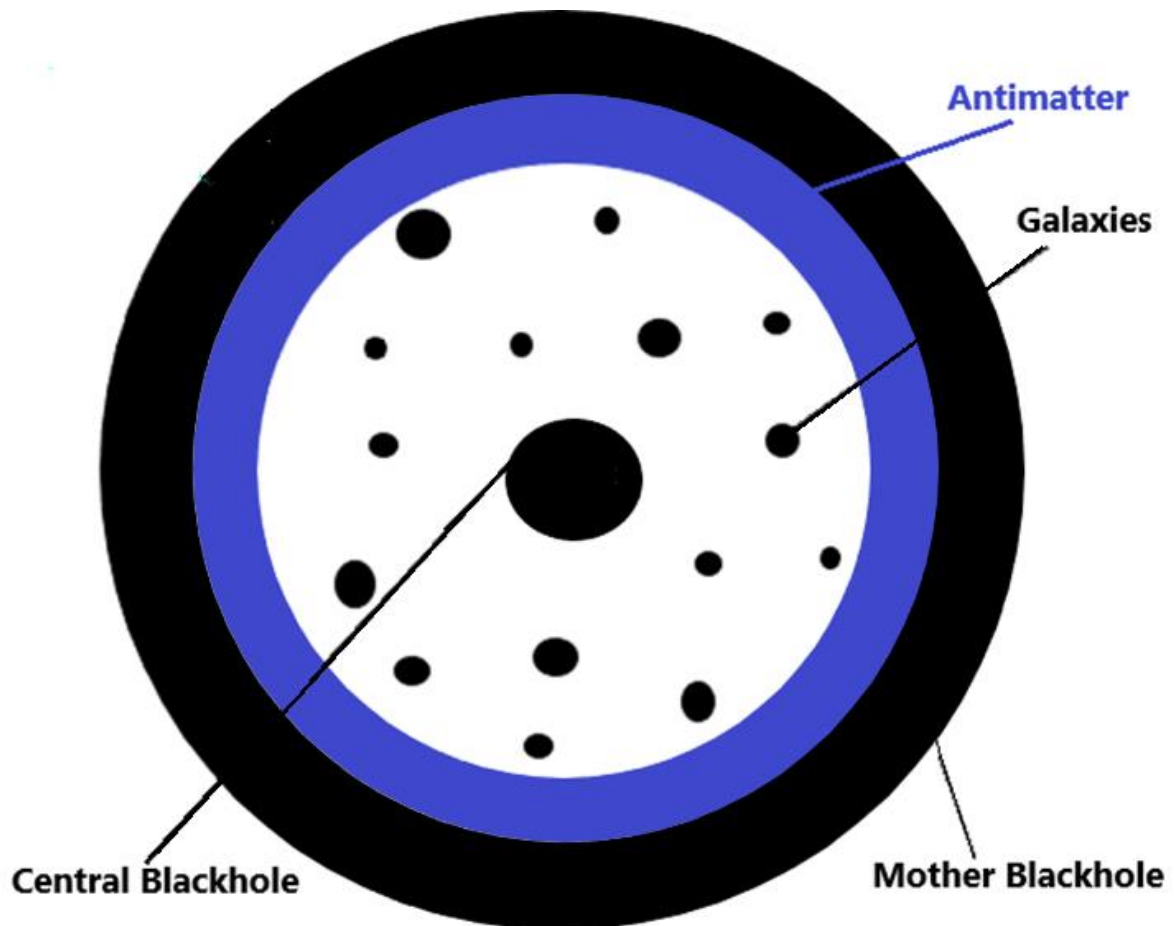
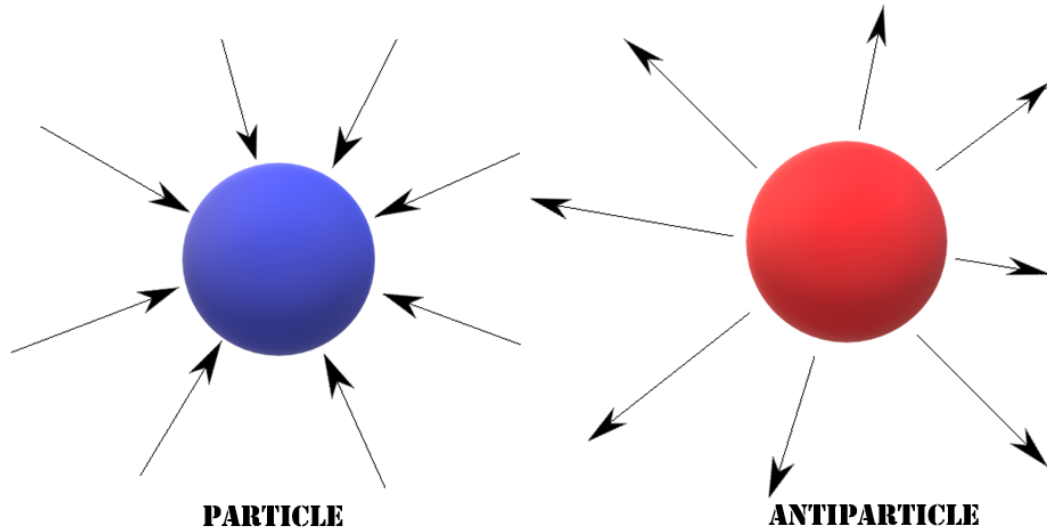


Figure 38- Universe and antimatter (blue rim) in outmost periphery just before the mother blackhole

Dark Energy and Expansion of Universe

Origami Model suggests that in the center of every galaxy there must be a black hole with a mass and Critical Gravitational Radius proportional to the mass of the black hole which defines the radius of the galaxy. Therefore, in galaxies, the total stars and planets and particles inside the galaxy must be placed inside the Critical Gravitational Radius of the central black hole, and so the galaxy won't expand, while everything outside galaxy (beyond the CGR) will expand. Also, as I explained about the CGR, the radius of the galaxy cannot be larger than the CGR of its central black hole, because beyond the CGR the repulsion would be the dominant force so the stars won't be able to join the galaxy beyond the CGR. Therefore, the radius of any galaxy must be equal or smaller than the CGR of its central black hole.

I explained that due to the dipolarity of gravity and the structure of data in matter and antimatter, we can develop the following equations for the gravitational behaviors of these two:



Direction of gravity is toward center in matter and outward in antimatter

Therefore, we can develop the following equations:

1- Gravitational attraction force between matter and matter:

$$g = \frac{Gmm'}{r^2} \quad (1)$$

g : gravitational acceleration or force of gravity

G : Gravitational Constant

m : mass of the particle

m' : mass of the other particle

r : the distance between two particles

2- Gravitational attraction force between matter and antimatter:

$$g = \frac{G(m-Am)}{r^2} \quad (2)$$

g : gravitational acceleration/force

G : gravitational constant

m : mass of the particle(matter)

Am : mass of the antiparticle(antimatter)

r : the distance between the particle and antiparticle

3- Gravitational repulsion force between antimatter and antimatter:

$$g = \frac{-G Am Am'}{r^2} \quad (3)$$

g : gravitational repulsive force between

G : gravitational constant

Am : mass of one antiparticle(antimatter)

Am' : mass of the other antiparticle(antimatter)

r : the distance between the two antiparticles

- : the negative sign means repulsive force

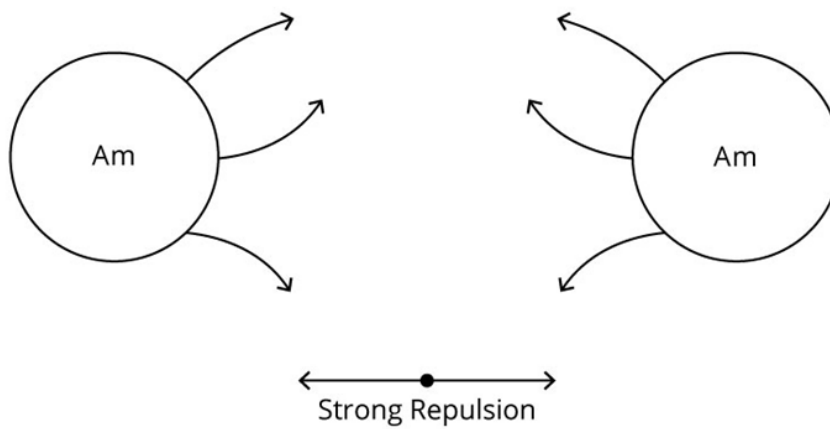
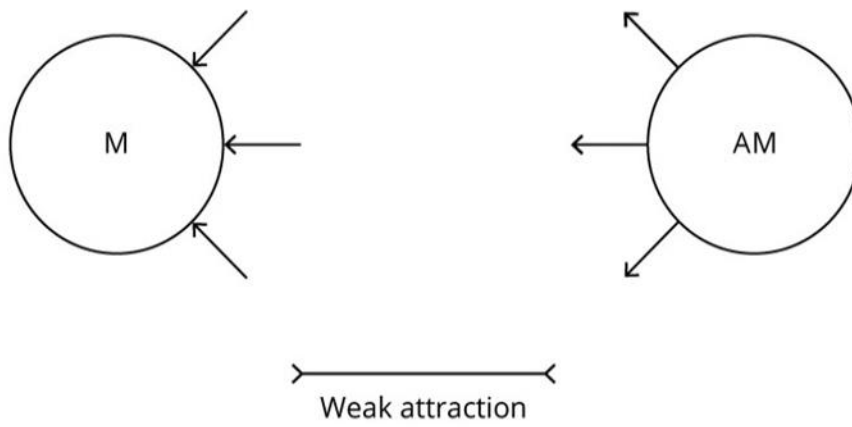
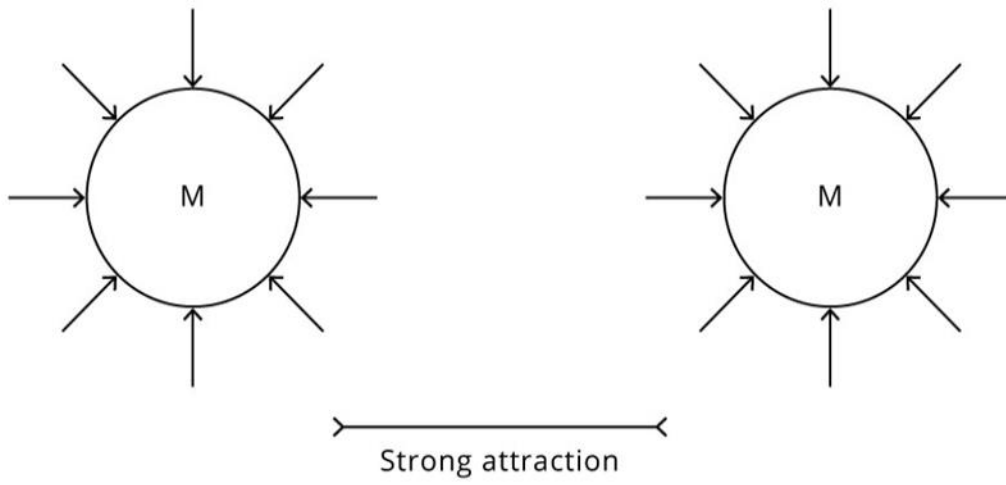
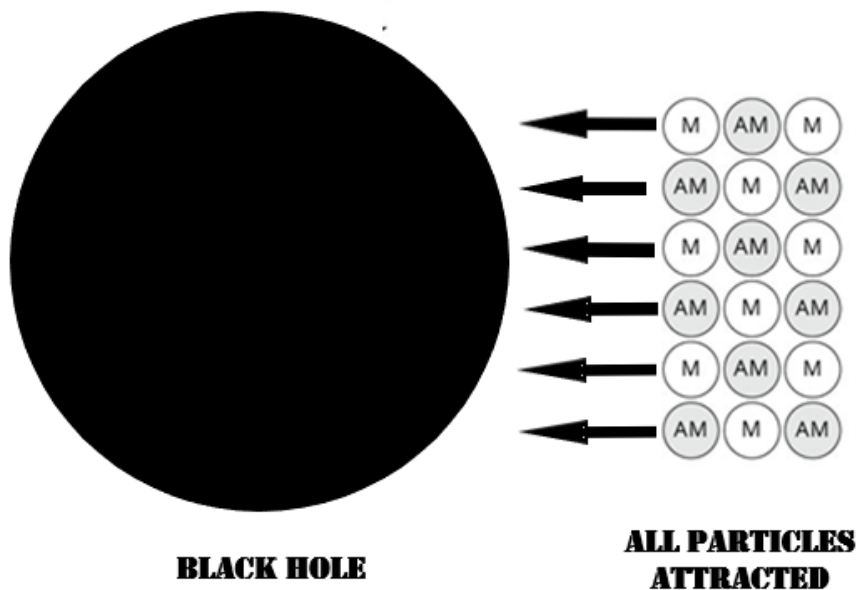


Figure 3- Attraction and repulsion due to gravitational interaction between matter and antimatter.

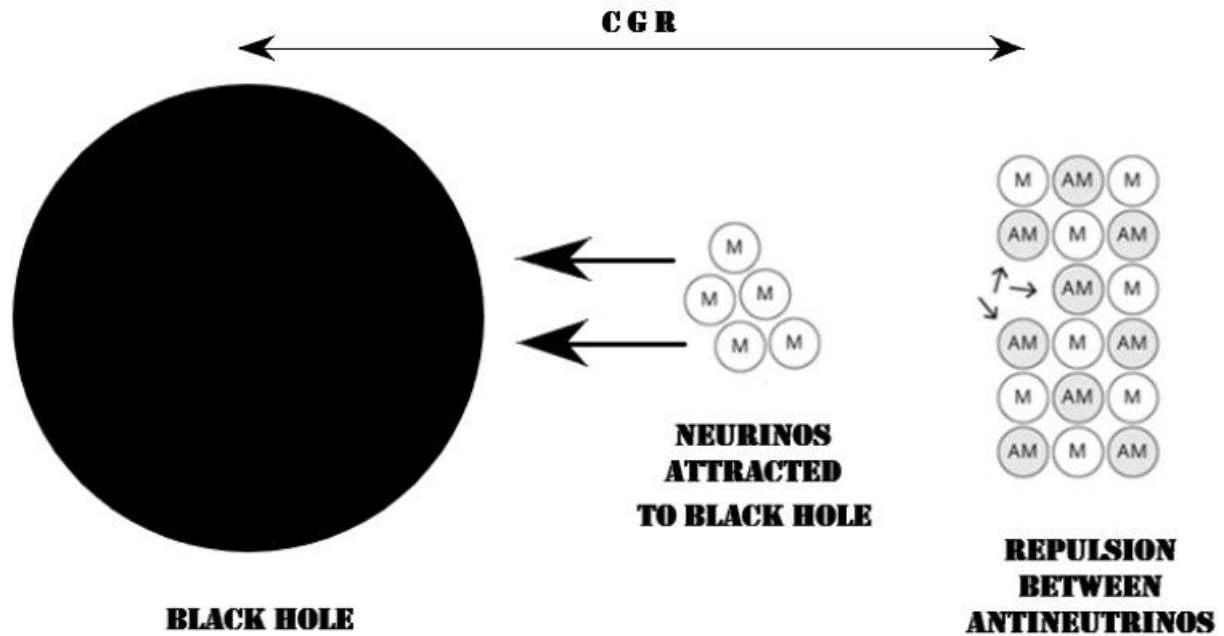
M: Matter, Am: Antimatter

These equations show that there is strong attraction between two masses of matter, there is weak attraction between a mass of matter and a mass of antimatter, and there is strong repulsion force between two masses of antimatter. Considering our vacuum space is saturated with neutrino-antineutrino matrix we can consider the effect of a black hole on space as this:



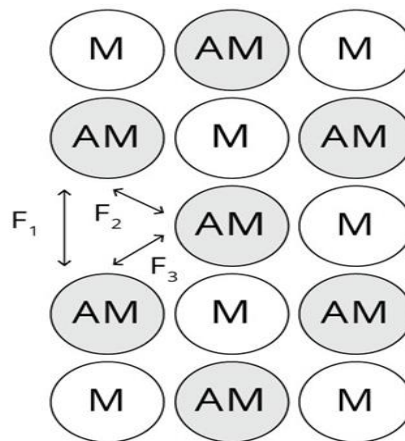
Near a black hole, all neutrinos and antineutrinos are attracted

Up to a certain distance from the naked black hole all the particles of space are attracted to the black hole. As I explained earlier, these particles must be accelerated towards the event horizon and converted to photons at a certain distance that I designated as Transformation radius, and convert to energy that we observe as the Accretion Disc around the black holes. But as we go further from the black hole, at a certain distance, the attraction force of the black hole on antineutrinos will be equal to the repulsion force between the adjacent antineutrinos in the matrix:



At a critical distance (CGR), only neutrinos are pulled to the black hole

The repulsive forces between the antineutrinos in the matrix of space can be formulized as the following:



Matrix of space

F_1, F_2, F_3 : gravitational repulsive forces between antiparticles

$$F = F_1 + F_2 + F_3$$

F : The total gravitational repulsive force

F_1, F_2, F_3 : The gravitational repulsive forces between two antiparticles (antineutrinos)

Because the distances are the same and the mass of all these antiparticles are identical, so the forces are equal.

$$F = \frac{3 \times G \, Am^2}{r^2}$$

G : gravitational constant

Am : mass of antiparticle

r : The distance between each two antiparticles

The radius is in fact the distance at which the attraction between the mass and antiparticle is equal to the repulsion between two adjacent antiparticles. Based on my equations, we arrive at:

$$\frac{G (M - Am)}{r^2} = \frac{G \, Am \, Am'}{r'^2}$$

G : gravitational constant

M : mass of the matter attracting particles

Am : mass of antiparticle

Am' : mass of other antiparticle = Am

r : distance between the center of the mass and the antiparticle

r' : the distance between two adjacent antiparticles

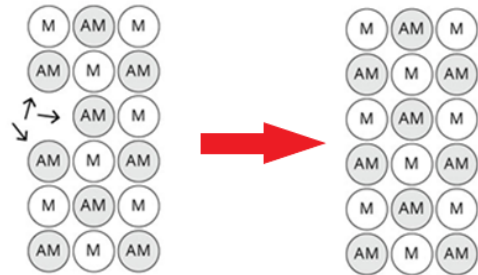
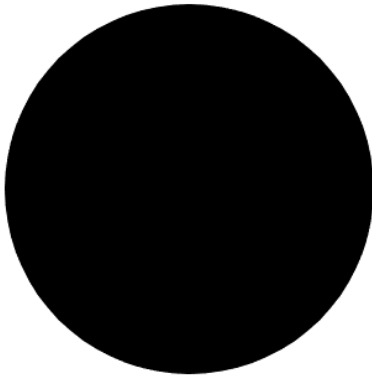
I have denominated this distance(r), the Critical Gravitational Radius (CGR) which is a certain value for every mass. The distance from the center of the black hole where the attraction of the black hole on antineutrinos is equal to the repulsion of antineutrinos on each other, is called the Critical Gravitational Radius (CGR). Therefore, in my equation, r is in fact the Critical Gravitational Radius and r' is the distance between the two antineutrinos which would be the shortest possible distance = two Planck Length from each other's centers in vacuum. $Am = Am'$ is the mass of the antineutrinos which is $1.9 \times 10^{-37} \text{ kg}$. Planck Length is $1.61 \times 10^{-35} \text{ m}$, so we will have:

$$r = CGR = \sqrt{\frac{G(M - Am) \times (2l_p)^2}{G(Am)^2}}$$

$$CGR = \sqrt{\frac{G(M - 1.96 \times 10^{-37}) \times (2 \times 1.61 \times 10^{-35})^2}{G(1.9 \times 10^{-37})^2}}$$

$$CGR = \sqrt{M} \times 1.68 \times 10^2$$

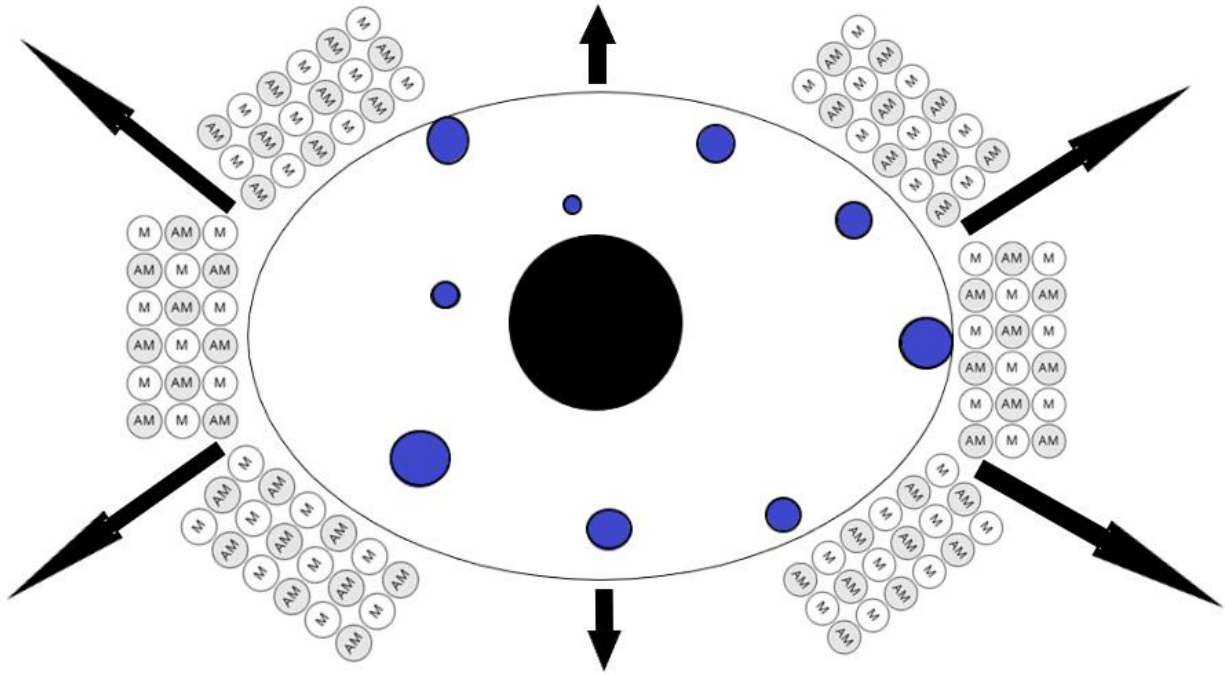
This means at CGR distance from the centre of a naked black hole, only neutrinos of the matrix are attracted to the black hole and this will create a hole in the matrix and the antineutrinos that are left will apply strong repulsive force on each other, pushing the matrix away from the black hole, causing the expansion of space.



**NEUTRINO MATRIX MOVES
AWAY TO REARRANGE ITSELF**

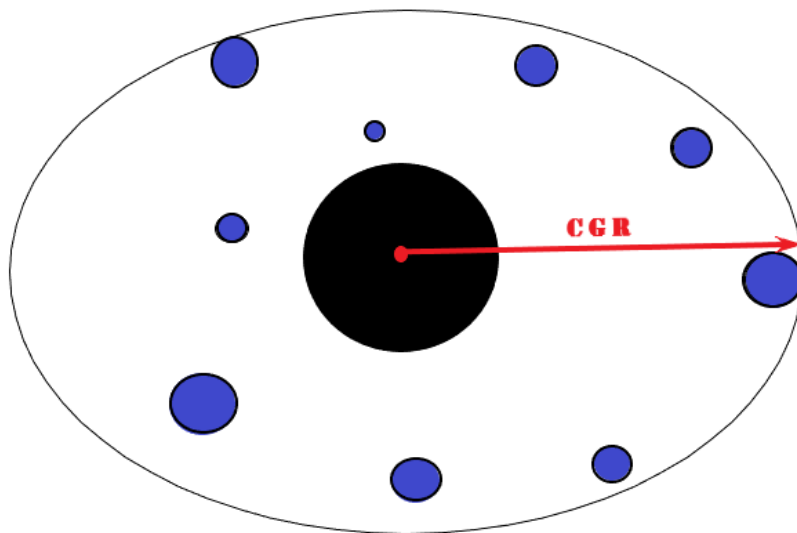
Neutrino Matrix moves away to restore its equilibrium

This means inside the CGR of a naked black hole, space is slightly contracting toward the centre of the black hole, but beyond the CGR of a naked black hole, space is expanding away from the centre of the naked black hole. This can explain precisely how galaxies are developed and stabilized inside the central black hole's CGR and how space is expanded by the naked black holes. Therefore, what we know as Dark Energy is in fact the gravitational effect of the black holes in universe.



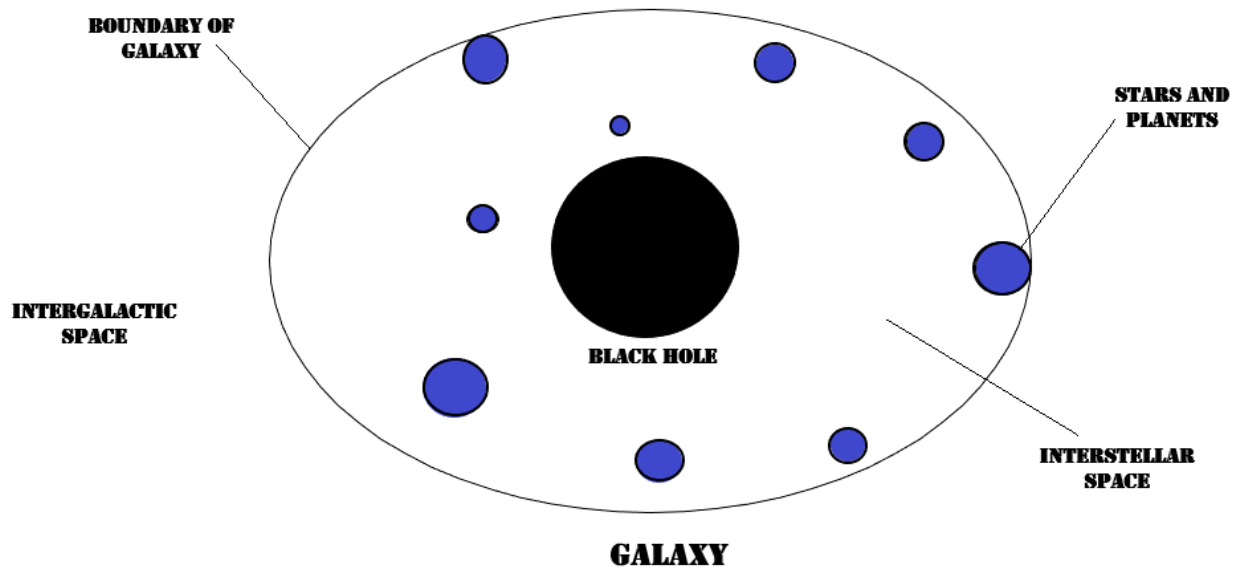
Only the space outside the CGR gets pushed away

This means the radius of galaxies must be equal or less than the CGR of their central black holes.



GALAXY

The CGR is exactly equal to the radius of the galaxy



Schematic figure of a galaxy with a black hole in the center

Let's see if this is consistent with the observations. The central black hole for Milky Way Galaxy is called Sagittarius A, which has a mass of $8.6 \times 10^{36} kg$. Therefore, the CGR of this black hole would be:

$$CGR = \sqrt{M} \times 1.68 \times 10^2$$

$$CGR = \sqrt{8.6 \times 10^{36}} \times 168$$

$$CGR = 4.9 \times 10^{20}$$

The radius of the Milky Way Galaxy is $4.9 \times 10^{20} m$. This is incredibly consistent with my theory! Based on my definition of the critical gravitational radius, a galaxy around its central black hole can grow up to this radius and not more, so the Theory predicts that the radius of every galaxy will be equal or less than the CGR of its central black hole, because inside this radius, black hole attracts the space and whatever is inside it and beyond the its CGR, black hole repels the space and everything in it.

Now let's try my equation for another galaxy. Andromeda galaxy has a radius of $11.35 \times 10^{20}m$. And the massive black hole in its center is a binary system with total mass of $5 \times 10^{37}kg$, so the CGR for this black hole would be:

$$CGR = \sqrt{M} \times 1.68 \times 10^2$$

$$CGR = \sqrt{5 \times 10^{37}} \times 168$$

$$CGR = 11.87 \times 10^{20}m$$

My result again has tremendous accuracy for such cosmic scales of calculation. This equation is incredibly precise and it is a wonderful bridge between gravity and quantum mechanics. Figure 20 demonstrates a typical galaxy and its relation to the central black hole.

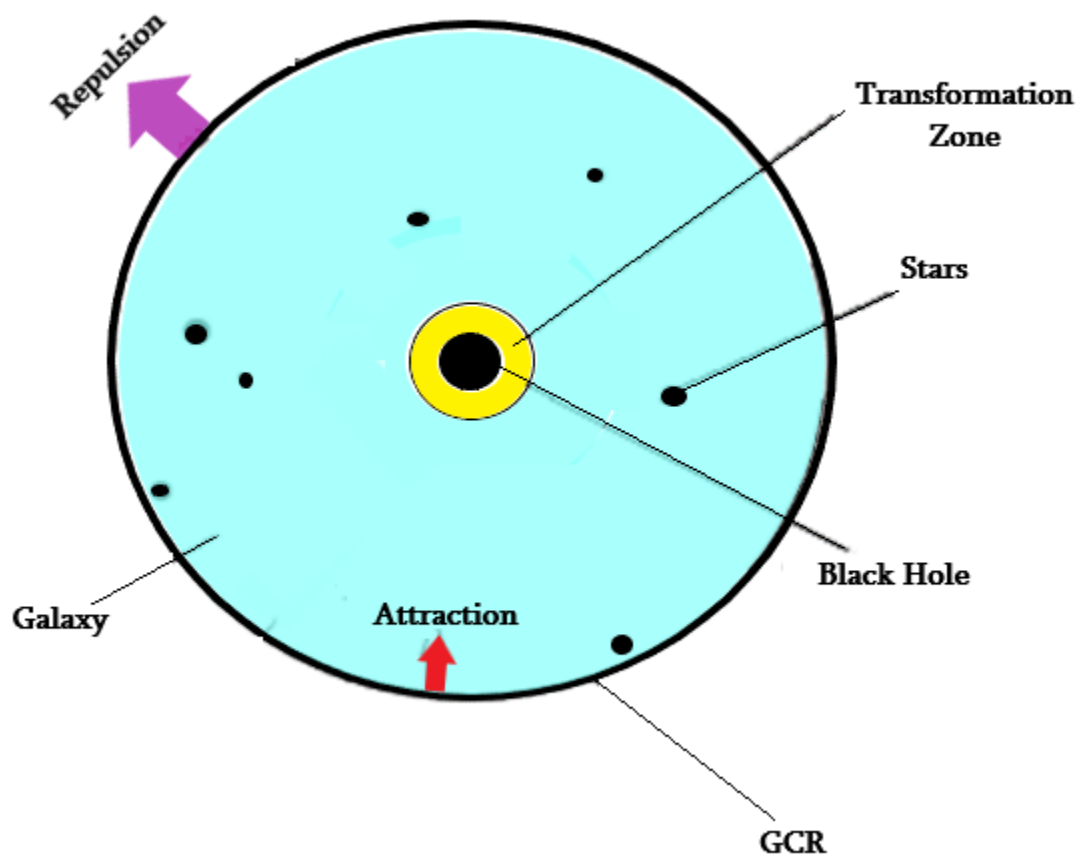


Figure 20- Central black hole and the galaxy inside its Critical Gravitational Radius (CGR)

Based on what we discussed, Origami Model believes that black holes are necessary to hold galaxies and necessary to sustain the Dark Energy and the expansion of the universe. Based on this theory, as I explained previously, inside the Critical Gravitational Radius of a black hole, no significant expansion takes place and the expansion virtually starts from this CGR point, which is consistent with the current expansion pattern of the universe. We know that galaxies don't expand and only the intergalactic space is expanding and Origami Model clearly predicts this, because the galaxy is located inside the CGR of its central black hole, where no expansion takes place. Also, it predicts that these are black holes that provide the expansion energy (Dark Energy), therefore there must be enough number of black holes in the universe to be sufficient for expansion. But what number would be enough number? Considering Critical Gravitational Radius and the expansion that takes place beyond this radius, there must be enough number of black holes to cover entire universe and sustain a uniform expansion. The radius of the universe is 46.5 billion light years which is equal to 4.4×10^{26} meters. The average number of black holes in the universe is around 9×10^{20} black holes (9), which would make 1×10^7 black holes for the radius of the universe. The average mass of the black holes is around $6.9 \times 10^{34} kg$ (10). Therefore the average CGR for black holes would be around $4.31 \times 10^{19} m$. This radius multiplied by the number of black holes for the radius of the universe would be 5×10^{26} , which is incredibly close to the radius of the universe! This means a total radius of 5×10^{26} meter is covered by these number of black holes. This proximity cannot be a coincident.

The Great Attractor which was first supposed to be the most massive black hole in the center of the universe has a mass of $2 \times 10^{42} kg$, and scientists believe that it is still not the biggest mass in the universe (11). I will demonstrate in next chapter that there must be a supermassive black hole in the center of the universe, which is the oldest and the largest black hole in our universe, and it is 1.5×10^6 times larger than the Great Attractor.

At the end of this part, I would like to mention that black holes must be empty, absolute vacuum spaces with gigantic gravity due to the angulation of time. In fact, black holes are the only absolute vacuum locations in the universe, acting like twisters that attract the mass, accelerate it to speed of light, convert it to energy, rotate it and throw it back into space. Here we can see the obvious reason to prove this point: The total mass of the universe is only $8.7 \times 10^{53} kg$, while the total mass of the black holes (only the Great Attractor is $10^{42} kg$ and there are another 10^{21} black holes each one with a mass multiple times of solar mass) would be at least 10^{12} times more than this! We already know that the minimum mass of the black hole is four solar mass $7.6 \times 10^{30} kg$, which I will prove in the next chapter and also the smallest black hole ever discovered has 4 solar mass. Also, we know there is more than 10^{21} black holes in our universe. Therefore, we can clearly see that the total mass of the black holes is thousands of times higher than $10^{53} kg$, while the total baryonic mass of the universe is $10^{52} kg$! Therefore, either stars and planets are massless or the black holes are hollow vortexes producing massive gravity with no tangible mass. I know the earth that I walk on has solid mass, therefore black holes must be hollow. Therefore, black holes have to be hollow spaces with powerful gravitational force and no tangible mass. I will demonstrate in next chapter that it is not the mass that produces gravity.

The other crucial conclusion based on my equation for CGR is related to the Dark Energy. As we saw so far, almost entire gravitational attraction in our universe is provided by the black

holes and the entire gravitational repulsive force is also provided by the black holes. The surface area of a black hole that provides the gravitational attraction/repulsion is:

$$A_a = R_s^2 \times 4\pi$$

$$A_a = \text{Attractive area}$$

This is the surface that attracts matter and antimatter. But the size of the repulsive area that is at CGR radius from the center of the black hole is:

$$A_r = CGR^2 \times 4\pi$$

$$A_r = \text{Repulsive area}$$

This is the surface area that repulses the antimatter and causes the expansion of our universe. This would actually apply to any mass, not only the black hole. As I explained, any mass would have attractive force inside its CGR and repulsive force beyond its CGR. Because CGR is always much larger than the radius of the mass, therefore the repulsive area is much bigger. To find out how much bigger, we need to calculate the CGR of the universe. We know that total mass of universe is $8.7 \times 10^{53} \text{ kg}$, so:

$$CGR = \sqrt{M} \times 1.68 \times 10^2$$

$$CGR = 9.32 \times 10^{26} \text{ m}$$

Based on the equation for attractive area and repulsive area of the mass, we conclude that:

$$\frac{A_a}{A_r} = \frac{R^2}{(CGR)^2}$$

We know that radius of universe is $4.4 \times 10^{26} \text{ m}$. Therefore, we arrive at:

$$\frac{A_a}{A_r} = \left(\frac{4.4 \times 10^{26}}{9.32 \times 10^{26}} \right)^2 = 0.22$$

This means the ratio of attraction surface area to repulsion surface area is 0.22. We know that the attraction force is directly proportional with attraction surface area and repulsive force is directly proportional to repulsive surface, therefore:

$$\frac{\text{value of attractive force in universe}}{\text{value of repulsive force in universe}} = 0.22$$

Considering the gravitational repulsive force is the same as Dark Energy, we conclude that:

$$\frac{\text{Dark Energy}}{\text{Gravitational attraction of matter}} = 78\%$$

And this is exactly consistent with the observation results: 78% of energy in universe is the Dark Energy. This means the equation for CGR and the equation for gravitational repulsive force must be correct, and the Dark Energy is the gravity produced by the mass of the universe. Before going to next part, I need to mention a crucial point: We used the total mass of universe in above equation, but the reality is that we must need to plug the total mass of all the black holes of universe in above equation. But as I explained before, black holes produce gravity proportional to their mass without having any mass, that's why the total mass (apparent mass) of the black holes in universe is exactly equal to the total mass of the universe! This means again that black holes are completely hollow.

1.Angle of Time

The other fundamental fact in Origami Model is the new view about the concept of time. According to the General Theory of Relativity, the rate of speed time dilation has the following equation:

$$t_0 = \frac{t_f}{\sqrt{1 - \frac{V^2}{C^2}}}$$

t_f : Time of the traveler

t_0 : Time of the observer

V : velocity of the traveler

C : Speed of light

Therefore, if one travels at speed of light, t_f will be zero. In other words, at speed of light, time will stop. To comprehend this fact, one can use the analogy of a camera. If time is the film used in a camera that is filming a moving object, when camera takes 24 pictures per second every movement of the object will be recorded properly. Therefore, each shot of the film is one unit of time. When the object travels between two points of A and B, going from A to B and return to A in 0.014 second (1:24), the camera will record nothing. If the camera takes less than 24 pictures per second, when the film is shown, the movements of the object will seem faster than real (like what we see in older movies when the technology at the time was not able to take 24 pictures per second). If the camera takes more than 24 pictures per second, the film will show the object in slow motion. What speed is the camera of cosmos set on? To find out the speed of cosmic camera, one needs to know at what speed the camera would stop taking pictures, which is

speed of light 3×10^8 . This cosmic camera must have its units of Planck Time: $5.39 \times 10^{-44}s$. Therefore, Cosmic Camera is recording the universe with speed of 3×10^8 using a film that has shots of 5.39×10^{-44} sec. In other words, speed of time is the same as speed of light and that's why if something happens faster than speed of light, we would observe nothing. Now the question is whether the speed of Cosmic Camera has always been the same, or just like our own cameras, it has been slower in the past. Considering the Big Bang and the moment of singularity, one can rationally assume that when time began its movement, the speed of time was at its slowest and it accelerated constantly, even at present. This new view creates a revolutionary comprehension of our universe, allowing us to explain various phenomena and also predicting the future of time and subsequently the future of our universe.

If at the singularity the speed of time was zero, and at present the speed of time is 3×10^8 , then to calculate the acceleration of time we need to divide the average speed of time by the age of the universe. The average speed of time would be:

$$\text{acceleration of time} = \frac{V_2 - V_1}{t}$$

V_1 : speed of time at singularity = 0

V_2 : current speed of time = speed of light = 2.9×10^8

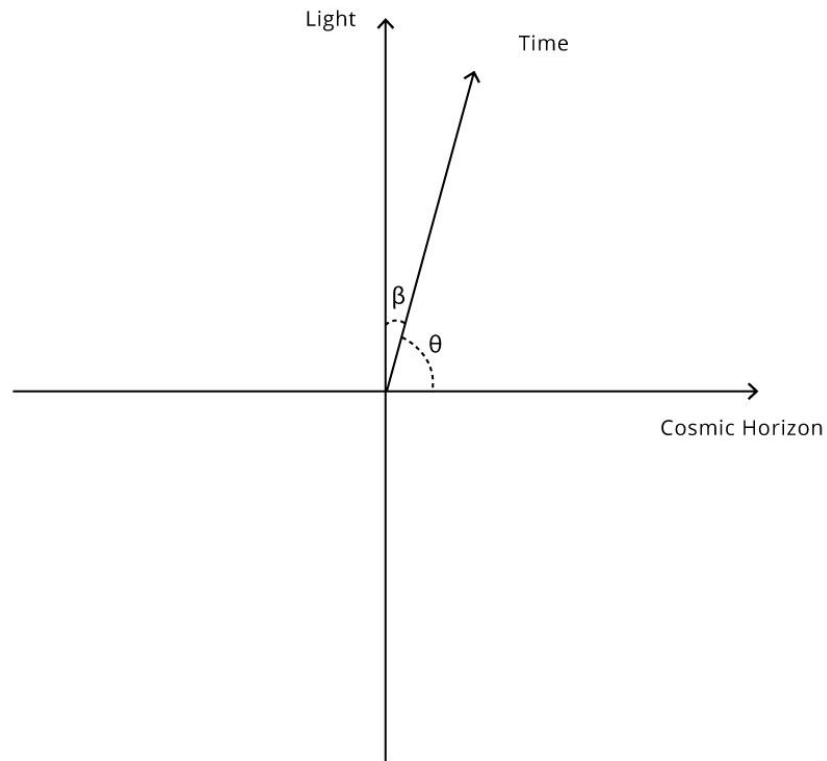
t : age of universe = 13.77×10^9 yr

To find the age of the universe we simply need to find the number of seconds in 13.77 billion years: $13.776 \times 3.154 \times 10^{16} = 4.345025 \times 10^{17} s$. Now there is a crucial point here. As we discussed above, when there is angulation in time, the observed time would be shorter than traveler's time. This is what the theory of general relativity suggests that is due to the effect of mass on space-time plane, but Origami Model sees that as the function of time to produce mass. This is the angle between the observed time and traveler's time, which in Origami Model we call alpha, or the angle between the *Apparent time* that is measured (t_m) and *Real time* that is used to produce the mass (t_u). Therefore:

$$\frac{t_m}{t_u} = \cos \alpha$$

This is the most important equation in Origami Model and in fact it is just a different interpretation of gravitational time dilation in theory of general relativity. The angle of alpha is the angle between the real time (used to produce mass) and measured time that we observe. Anytime time angulates to produce a mass there will be an angle that by measuring its cosine we can find the ratio of real time to measured time. Therefore, usually the real time is bigger than the measured time. When looking at the entire universe from outside the cosmos, there is another angle, which is in fact between the time in our universe against the cosmic horizon and we call it angle of theta and it is a constant angle for our universe. This angle of theta is 75° ,

which does not change in entire universe for any time and any place (we will dissect and explain this much deeper in subsequent parts of the paper). Figure 7 demonstrates the two angles of α and θ in comparison to each other. While θ is always 75° , α varies based on the mass of the object, the bigger the mass, the bigger the angulation of the time to produce that mass, the bigger α , therefore no two different masses have the same angle of α . Now because cosmic horizon makes a 90° angle with light, so there is a constant 15 degree angle between time in our universe and light. We call this, angle of beta: β . Therefore β is always 15 and it is a constant angle and because of this angle, speed of time is in fact faster than speed of light. The following figures demonstrate these three angles for easier comprehension:



β : Angle between universal time and light = 15°

θ : Angle between universal time and Cosmic Horizon = 75°

Figure 21- Diagram of the angles of time, light and horizon

Since there is an angle between the time inside the universe and light, beta, we will have to multiply any measured time (or related products) by cosine of beta ($\cos 15^\circ = 0.96$) to find the real time.

On the other hand, when observing the entire universe, we will need to consider the angle of theta, which is between the cosmic horizon and universal time ($\cos 75^\circ = 0.2$). Therefore, we will need to multiply the age of the universe by cosine theta to find the real spent time in universe from Big Bang till now:

$$\frac{t_m}{t_u} = \cos 75^\circ = 0.2$$

$$\text{real age of universe}(t_u) = 43.45025 \div 0.2 = 217.25125s$$

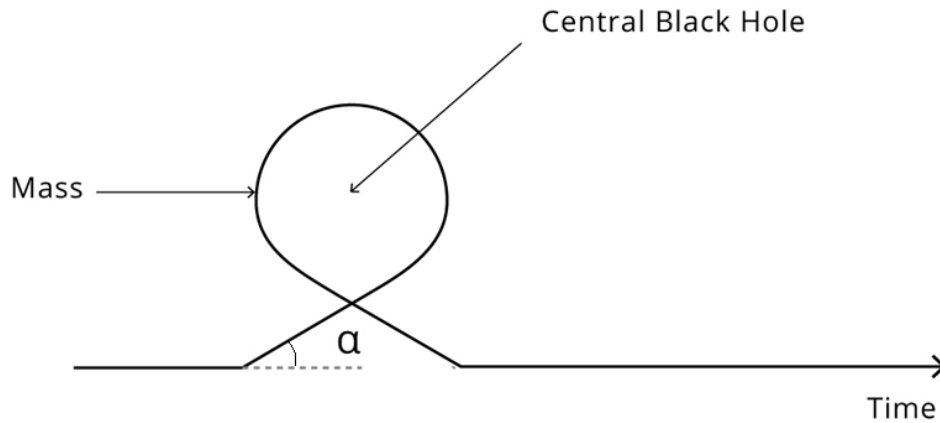


Figure 22- How time rotates to produce mass of subatomic particle with central blackhole

Therefore, based on Origami Theory, the real age of the universe is much higher than what we have measured because when speed of time was so slow at the beginning, any measured time at present, would have been much bigger in reality of the past time. This is exactly like watching a fast movie that shows the entire event that has happened in several minutes, just in few seconds, but the real time spent in the real event has been much higher. Also when time has been speeding up, light will speed up too with the same rate so if we imagine speed of time the same as speed of light (because at speed of light, time stops) we need to calculate the integral of speed of time from Big Bang till now which will be nearly equal to half of the current speed of light $= 1.45 \times 10^8$. Now we can calculate the acceleration of time by dividing the average speed of time by the age of the universe:

$$\text{Acceleration of time} = \frac{\text{average speed of time from Big Bang till now}}{\text{duration of time from Big Bang till now}}$$

$$a = \frac{1.45 \times 10^8}{217.25125 \times 10^{17}} = 6.67430 \times 10^{-11}$$

This means, every second from Big Bang till now, the speed of time (and speed of light) has increased 6.67×10^{-11} . But the value of my calculated acceleration of time is in fact a very well-known number. It is exactly equal to what Newton measured when trying to create a formula for gravity. The value of 6.67430×10^{-11} is with no doubt precisely equal to the value of Gravitational Constant, even with five decimal points! Is this a coincidence? Absolutely not. In fact, this means my theory about the acceleration of time is absolutely correct. Acceleration of time is the same as what we call gravitational acceleration. And that is exactly why objects accelerates near a mass. At the beginning of time, it was the absolute vacuum at singularity that provided the gravitational force to decelerate time. As time progresses, the density of the vacuum reduces and gravity recues, so time accelerates. The rate of gravity reduction is equal to rate of time acceleration and equal to light deceleration. This acceleration of time creates the accelerating expansion of our universe.

4. Expansion of Universe

Based on what we discussed, Origami Model believes that black holes are necessary to hold galaxies and necessary to sustain the Dark Energy and the expansion of the universe. Based on this theory, as I explained previously, inside the Critical Gravitational Radius of a black hole, no expansion takes place and the expansion starts from this CGR point, which is consistent with the current expansion pattern of the universe. We know that galaxies and interstellar space don't expand and only the intergalactic space is expanding and Origami Model clearly predicts this, because the galaxy is located inside the CGR of its black hole, where no expansion takes place. Also, it predicts that these are black holes that provide the expansion energy (Dark Energy), therefore there must be enough number of black holes in the universe to be sufficient for expansion. But what number would be enough number? Considering Critical Gravitational Radius and the expansion that takes place beyond this radius, there must be enough number of black holes to cover entire universe and sustain a uniform expansion. The radius of the universe is 46.5 billion light years which is equal to 4.39×10^{26} meters. The average number of black holes in the universe is around 10^{20} black holes (18), which would make 1×10^6 black holes for the radius of the universe. As the smallest black hole in universe has a mass of four solar mass so in range of $10^{30}kg$, and I will show that the largest black hole of our universe (at its center) has a mass in range of $10^{48}kg$ (a million times bigger than the Great Attractor), so the average mass of the black holes in our universe is around $10^{39}kg$ (19). Therefore, the average CGR for

black holes would be around $10^{21}m$. So the radius that these number of black holes can cover would be around: $10^{21} \times 10^6 = 10^{27}m$, which is incredibly close to the radius of the universe that is $4.3 \times 10^{26}m$! In fact, I will show that the real shape of our universe is a cone shape and therefore, the real radius is close to $1.28 \times 10^{27}m$. This means a total radius close to 10^{27} meters is covered by these number of black holes to produce an isotonic density of mass and even expansion for the universe. This proximity again shows that my conclusion and the concept of Origami Model must be correct.

Dark Matter

The most mysterious entity in our universe and maybe the most important cement that holds our world together is an unknown particle that we have desperately named the Dark Matter.

There have been multiple suggestions and theories to reveal the nature of this matter but none of them has been proved. In this part of Origami Theory, we will start by explaining the Ghost Particles and eventually reach the conclusion that leads us to the reality of what we call Dark Matter.

1. Ghost Particles and Bosons

As we explained so far, Origami Model suggests that time began at the Big Bang from very low velocity and it has been constantly accelerating. Since the apparent speed of time is equal to speed of light, so it means that speed of light has been accelerating too, however because of acceleration of time, observed speed of light is reducing. This means that Planck Length (the distance light travels in Planck Time) will increase which virtually means all the distances/lengths in universe will increase. This has two results: first, the universe will expand; second, the previous Planck Length will be smaller than the current Planck Length and therefore immeasurable, in other words, smallest things in the past will now disappear. The disappeared small masses still do exist so their gravitational effect will be still present, but their mass/volume will be unobservable. This means as time accelerates, universe constantly expands and some subatomic particles virtually turn into energy. We can nominate these disappeared particles whose gravitational force is still present, *Ghost Particles*.

The acceleration of time which is due to the reduction of gravity is the reason why and how our universe expands in an accelerated rate. Also, as we discussed previously, at the moment of Big Bang, we borrowed large amount of energy from the vacuum to create the mass of the universe. According to the Heisenberg Equation, the borrowed energy from vacuum has to be returned to the vacuum in an extremely short amount of time. However, because time has been accelerating, the duration of time of borrowing has been constantly increasing. In other words, two hours at our present time is millions of times shorter than two hours at Big Bang. An analogy would help understand this part much easier: Imagine John borrows 10 dollars from Jane and he promises to pay it back in 24 hours. But once John leaves, he keeps winding time back (increasing every second) so that even after 24 hours when Jane checks her watch, it shows that only 2 minutes has passed! By keep doing this John keeps the money for very long time but not indefinitely because the rate of rewinding the time is finite. So eventually the due time will arrive after a long delay that depends on the rate of rewinding the time (rate of acceleration of time). And as I explained, the acceleration of time causes the expansion of universe, in other words, as time travels faster, length increases. This again proves that the real distance/locality does not exist and what we perceive as length, is the duration of time between two points. Now we realize that if time did not accelerate, universe would not exist. However,

acceleration of time, makes the smallest particles disappear without we noticing it. If the entire universe instantly enlarges by a factor of 8 and everything becomes 8 times bigger, no observation or examination would be able to prove that anything has happened and this is why we never notice the acceleration of time. Things were not faster in the past, but when we compare current things with the past, we will always find out they had occurred much faster. The deeper in the past we look, the faster things will appear. This is exactly why when we examine the Big Bang, we find that it had happened much faster than speed of light, which is impossible and has created a big enigma for the scientists.

Based on Origami Theory, time accelerates constantly and so Planck Length at Big Bang moment is millions of times smaller than Planck Length now. Based on the mass of elementary particles, the Schwarzschild Radius of these particles would be much smaller than Planck Length, and one might ask how they could contain a central black hole if their black hole is much smaller than the Planck Length. The answer is what I already explained. Due to the acceleration of time, the central black hole of the particles would not be discoverable for us anymore because it is smaller than the current Planck Length, but their gravitational force is still present. Since the smallest observable Schwarzschild Radius is for the Planck Mass that has the Schwarzschild Radius equal to Planck Length, therefore, all subatomic particles would contain central black holes smaller than current Planck Length, therefore no virtual central black hole could be found in the particles and the only effect that we can observe is the strong gravitational force in the center of the particle. This is why the particles could not be produced now and they were all created at Baryogenesis phase of Big Bang.

Now if the radius of the particle happens to be smaller than current Planck Length, then we would not be able to find that particle, while we would have the effect (gravitational force) of the particle. This is what we can call a *Ghost Particle*. Based on Origami Theory, there could be several Ghost Particles in the universe. Considering the radius of Origamon being smaller than current Planck length, we realize that Origamon is the first Ghost Particle. This is why we would never be able to measure the radius of Origamon (photon) or directly observe its mass and we will only have the gravitational/mass effect of this particle.

Based on the radius of Origamon (which we calculated before to be half of the current Planck Length) and the acceleration of universe we can find out when Origamons disappeared.

According to my equation for change of length:

$$L_0 = \frac{C_0 L}{C}$$

The value for L here is the Planck Length, therefore:

$$1.61 \times 10^{-35} = \frac{C_0 \times 3.22 \times 10^{-35}}{3 \times 10^8}$$

$$C_0 = 1.5 \times 10^8$$

This means when speed of light was $1.49 \times 10^8 m/s$, the radius of Origamon shrunk to the current Planck Length and so it began to disappear. This is exactly the half of current speed of

light, which means the disappearance of Origamons occurred at the middle of the universe' life. To find the point of time when speed of light was at this level, I use my third equation:

$$C_0 = GT$$

$$1.5 \times 10^8 = 6.67 \times 10^{-11} \times T$$

$$T = 2.248 \times 10^{17} s$$

Considering this was at the middle of the expansion of universe, in the middle of the universe, so this must be the half of the life of universe, so the total life of our universe will be:

$$2 \times 2.248 \times 10^{17} = 4.49 \times 10^{17} s$$

Because the age of universe is $4.3 \times 10^{17} s$ that means in 0.7 billion years from now, expansion of the universe will stop, which is again consistent with my previous calculations and we will see again in other equations we keep reaching this number. This means we will reach the event horizon of the Mother Back Hole in which our universe is growing in a spiral form.

Therefore, my equation shows that Origamons disappeared exactly at half of the age of the universe, 7.2 billion years ago, because their radius is half of Planck Length. The Origamons fused in fermions shells to produce elementary particles and create baryonic matter. But the free Origamons are what in modern physics we know as photons.

Mass and energy are convertible because of Origamons that act like as the force carrying ghost particle.

Based on what we discussed, at the beginning of Big Bang, time angulated at its minimal ratio and produced Origamons. Then Origamons *fuse* in various numbers and produced various particles. Particles combined to produce atoms. This pattern keeps repeating itself. The only particle that does not fit well in this pattern is Boson. Higgs Boson unlike all other elementary particles, is not produced by fused Origamons. In Bosons, Origamons are actually *set* together by pure gravity to produce the boson and that's why Higgs Boson, unlike all other particles, has no spin. When every Origamon has its own spin and they sit next to each other individually, instead of fusing into one, the produced particle won't have an effective spin and this is why Higgs Boson has no spin. In next chapter, I will calculate based on the gravitational equation that whenever Origamons are as close as Planck Length, they will fuse into one slightly bigger particle creating one single slightly bigger central black hole, but why they haven 't done that in Higgs Boson? The reason is the Fusion Distance. I will calculate Fusion Distance and Separation Distance in the next chapter and we will see that exactly due to the gravitational force between the Origamons at Planck distances, when two Origamons are at Planck Length, they will fuse into one and when they are at a larger distance, they will move away from each other because the repulsion effect will overcome their attraction. Now let's see what is the distance between the Origamons in Higgs Boson.

We know that the radius of Higgs Boson is $1.09 \times 10^{-18} m$, so we can calculate its volume and see how much distance would be between the Origamons inside a Higgs Boson:

$$\text{Volume of Higgs Boson} = \frac{4}{3}\pi(1.09 \times 10^{-18})^3 = 4.19 \times 10^{-54}m^3$$

$$\text{number of Origamons in a Higgs Boson} = \frac{\text{mass of Higgs Boson}}{\text{mass of Origamon}}$$

$$\text{number of Origamons} = \frac{2.08 \times 10^{-25}}{1.3 \times 10^{-70}} = 1.6 \times 10^{45}$$

$$\text{Space for each Origamon} = \frac{\text{volume of Higgs Boson}}{\text{number of Origamons}} = \frac{4.19 \times 10^{-54}}{1.6 \times 10^{45}} = 2.618 \times 10^{-99}m^3$$

$$\text{distance left for every two Origamons} = 2 \times \left(\frac{\sqrt[3]{2.618 \times 10^{-99}}}{\frac{4}{3\pi}} \times \frac{\pi}{2} \right) = 2.68 \times 10^{-33}m$$

This is an unbelievable result! The distance between the Origamons in Higgs Boson is extremely close to the Separation Distance! This means firstly that my calculations for CGR and Origamon mass and Separation Distance must be all correct, and secondly, the reason for Higgs Boson to have its Origamons not fused together is exactly the distance between its Origamons. In other words, Higgs Boson is the biggest and the last particle that can be produced by collection of Origamons without losing them because if the Origamons are just slightly more distant, which means if Higgs Boson was just slightly heavier, it would shatter. Higgs Boson is in fact the heaviest boson possible. My equations demonstrate that there can be smaller, lighter bosons but not heavier ones. But smaller ones are also bound to the Fusion Distance, because as we know, as the particle gets smaller the distance between the Origamons decreases and if the distance reduces to Planck Length, they will fuse into one and create a fermion. Therefore, we can suggest that Higgs Boson is not a real particle, but a collection of Origamons that cannot have a proper spin because each Origamon in it spins in a different direction, and this mass can deliver chunks of Origamons, which are in fact gravitational energy, from one particle to another. If you apply direct force to a particle, you would separate a number of Origamons from it, these Origamons would gather in a volume and we observe as Higgs Boson, which will have a very short life and its job is to take these Origamons to the other particle. That's exactly why Higgs Boson is so unstable and disappears into energy almost immediately because every single Origamon in its free form is a photon (electromagnetic force). And this exactly explains why Higgs Boson is the gauge boson for Higgs field, transferring forces between particles. It does it by transferring individual Origamons from one particle to another.

Now we can call the distance between the Origamons inside bosons, the Aggregation Distance (AD). Aggregation Distance is a distance bigger than Fusion Distance and smaller than Separation Distance, and it is just enough to hold the Origamons together in a boson without fusing them into one or letting them scatter. Therefore, fermion is a particle in which Origamons are closer than Planck Length and virtually fused into one, while boson is a particle in which Origamons are set at Aggregation Distance relative to each other. Based on the calculations

that we did to find the distance between the Origamons in Higgs Boson we can simplify the formula into one equation that would work for other bosons too:

$$\text{Aggregation Distance} = \left[\sqrt[3]{\frac{\text{volume of boson} \div \text{volume of Origamon} \times \text{volume of Origamon}}{\text{mass of boson} \div \text{mass of Origamon} \times \frac{4}{3\pi}}} \times \pi \right] - (2 \times \text{radius of Origamon})$$

$$AD = \frac{R}{\sqrt[3]{M}} \times 6.61 \times 10^{-23}$$

AD: Aggregation Distance = distance between Origamons inside a boson

R: radius of the boson

M: mass of the boson

This is another wonderful equation that tells us the distance between the Origamons inside bosons. The equation tells us that the larger the boson, the bigger the distance between its Origamons and so the more fragile it would be. This is exactly why Higgs Boson that is the largest boson is extremely unstable and decays in 10^{-22} seconds. We know that if the distance between the Origamons is more than the Separation Distance, the particle could not exist because the Origamons won't be able to stay together. If the distance is just in the range between the Fusion and the Separation distance, various bosons will form, and this is how the bosons come to existence.

Now we check the equation for W Boson and Z Boson. W boson has a mass of $1.3 \times 10^{-25} \text{ kg}$ and the radius of $1 \times 10^{-18} \text{ m}$, therefore the distance between its Origamons would be:

$$ID = \frac{1 \times 10^{-18}}{\sqrt[3]{1.33 \times 10^{-25}}} \times 6.61 \times 10^{-23} = 2.54 \times 10^{-33} \text{ m}$$

This is still bigger than Fusion Distance so the W boson is a pseudo-particle very similar to Higgs Boson just slightly smaller. To check the Z boson, we try its radius which is $1.01 \times 10^{-18} \text{ m}$ and its mass that is $1.51 \times 10^{-25} \text{ kg}$, and the result would be:

$$ID = \frac{1.01 \times 10^{-18}}{\sqrt[3]{1.51 \times 10^{-25}}} \times 6.61 \times 10^{-23} = 2.67 \times 10^{-33} \text{ m}$$

As we can see, Higgs Boson has the Origamons just at the Fusion Distance and Z Boson has its Origamon so close to the Separation Distance, that's exactly why we can't have any more bosons smaller or bigger than these, because if the new boson has slightly more mass, it will fuse to a proper elementary particle because its Origamons would be closer than Fusion Distance to each other, and if the new boson has less mass, its Origamons would not stay together because the distance between them will exceed the Separation Distance. As we can see, unlike the Standard Model that has no explanation neither for instability of Higgs Boson nor

for their existence or the lack of more bosons or how they fulfill their role as a gauge boson, Origami Model easily explains that bosons are simply chunks of Origamons taken from a particle, going to be added to another particle, and if this transport takes too long, the boson will shatter and lose its Origamons, which we will observe as energy.



Figure 53- Bosons and their simple structure of aggregated Origamons

This explains the mass, the size, the instability and lack of spin and magnetic moment in Higgs Boson. Another issue that Origami Model solves is the Hierarchy Problem. The Standard Model leaves the mass of the Higgs Boson as a parameter to be measured, rather than a value to be calculated. This has been an unsatisfactory issue for Standard Model again because the weak force is 10^{32} times stronger than gravity, and the Higgs Boson's mass is so much less than the Planck Mass or the grand unification energy. This conflict is called Hierarchy Problem and the scientists have been trying hard to find a solution for it for many years with no success. But Origami Model offers an absolutely satisfactory structure for bosons that explains all their features in a very satisfactory way that is consistent with all the fundamental features of particles and masses in this model.

Missing Particle

As I explained so far, based on Origami Model there is only one elementary particle that is the Origamon. Origamon in its free form is what we know as the photon with a difference that photons are considered massless while Origami Model believe that photons have a mass of square root of Neutrino mass: $1.3 \times 10^{-70} kg$. All other particles are developed by various collections of Origamons, therefore there must be any particles that we haven't discovered yet and some of them must have turned to ghost particles already. This is exactly why mass converts to energy and vice versa, because energy is free Origamons (photons) and all particles are produced by Origamons. In other words, all particles are produced by various collections of photons and that is simply why when a mass is broken down, it turns to photons.

When a collection of Origamons produce a particle, as I demonstrated before, they arrange in spiral form so we will have an almost sphere of Origamons that produce a mass. The number of Origamons in this sphere defines the mass of the particle. Because when Origamons combine to produce the particle, there will be around 33% loss, the final mass of the particle is 33% less than sum of all Origamons masses used in its structure. This means the volume of this sphere (almost sphere) is proportional to the mass of the particle. The formula for volume of sphere is:

$$\text{Volume of sphere: } \frac{4}{3}\pi r^3$$

Because our sphere is spiral, its volume is 33% or 1.6 times bigger than a perfect sphere. We know that 1.6 is called ϕ :

$$\text{Volume of particle} = \phi \frac{4}{3}\pi r^3$$

Now to see how many Origamons fit into the volume we can rewrite the equation as the following:

$$\text{Number of Origamons in a volume of particle} = \phi \frac{4}{3}\pi \frac{1}{r^3}$$

I explained before that mass of a particle is proportional to the volume that time produces around the gravity:

$$M = 1/2 t_g \alpha \times m_p$$

α here is the angle at which time bends to produce the mass and m_p is the Planck Mass. This means that in a typical mass, the radius of the sphere that time produces is proportional to Planck Mass:

$$r \propto m_p$$

therefore, in our previous equation we can replace the radius with Planck Mass to find the number of Origamons in a typical particle:

$$\text{Number of Origamons in a particle } (O_i) = \phi \frac{4}{3}\pi \frac{1}{m_p^3}$$

O_i is Origamon Index or the number of Origamons used to produce a particle. Now considering Planck Mass is 2.18×10^{-8} , we can find the number of Origamons in a particle:

$$O_i = 1.6 \times \frac{4}{3} \times 3.14 \times \frac{1}{(2.18 \times 10^{-8})^3}$$

$$O_i = 6 \times 10^{23}$$

We all know this number: Avogadro Constant. This means that the first, or lightest elementary particle will have the smallest integer (1) multiple of Avogadro number of Origamons used in its structure. Therefore, the mass of every elementary particle must be a multiple (N) of Origamon mass times Avogadro Constant:

$$P_m = O_i m_o N$$

P_m : elementary particle mass

N : an integer number of Fibonacci Sequence

m_o : mass of Origamon = $1.3 \times 10^{-70} \text{ kg}$

O_i : Origamon index = Avogadro Constant = $6.02214076 \times 10^{23}$

As I explained before due to the spiral/stag arrangement of shells around the central black holes of the particles, the number of Origamons used is always a multiple of Fibonacci Sequence so N is always an integer number in Fibonacci Sequence. The In first, lightest elementary participle that was produced after the Origamons were developed at Big Bang, N would be equal to 1. So, to find the mass of this lightest elementary particle we only need to multiply the Origamon Index by mass of Origamon by 1.3 (to cover the loss):

$$P_m = 1.3 \times 1.3 \times 10^{-70} \times 6.02214 \times 10^{23}$$

$$P_m = 1 \times 10^{-46} kg$$

This is the lightest elementary particle that is produced after Origamons were created at Big Bang. I call this archaic particle Jannon. If I use my previous equation for mass-radius of particle, we can estimate the radius of Jannon:

$$M = r^2$$

$$1 \times 10^{-46} = r^2$$

$$r = 1 \times 10^{-23} m$$

This means the radius of Jannon is larger than the current Planck length so it is not a ghost particle, which means we must be able to discover this particle one day. There is possibility that Jannon be the particle for Dark Matter, but I definitely believe that Dark Matter is composed of electron neutrinos that are favoured by the gravitational attraction of black holes in neutrino matrix of space, acting as a quasi-particle that I have called Deutrino and it is in fact what particle physicists call solar Axion. This approach means that technically all elementary particles must have a mass that is a multiple of Planck Mass. Let's see if it's correct. Mass of electron is 9.1×10^{-31} , which is simply a multiple square of Planck Mass:

$$(m_p)^4 \times 4 = 9.1 \times 10^{-31}$$

Electron neutrino has a mass of $1.96 \times 10^{-37} kg$, again a multiple square of Planck Mass:

$$(m_p)^5 \times 4 \times 10 = 1.96 \times 10^{-37}$$

Jannon has a mass of $1.07 \times 10^{-46} kg$, again a multiple square of Planck Mass:

$$(m_p)^6 = 1.07 \times 10^{-46}$$

Deutrino has a mass of $4.2 \times 10^{-42} kg$, again a multiple square of Planck Mass:

$$(m_p)^6 \times 4 \times 10^4 = 4.2 \times 10^{-42}$$

Origamon too is a square multiple of Planck Mass with slight difference:

$$(m_p)^9 \times 0.1 = 1.3 \times 10^{-70}$$

This proves the concept of Origami Model about the Origamon and its mass and its role in composing all other elementary particles and it also proves that what we know as elementary particles are actually composite particles produced by various collections of Origamons.

To summarize this discussion, I can write the arguable particles that Origami Predicts their existence in four types:

Ghost Particle: Origamon with mass of $1.3 \times 10^{-70} kg$ and radius of $8 \times 10^{-36} m$

Archaic Particle: Jannon with mass of $1.07 \times 10^{-46} kg$ and radius of $1.07 \times 10^{-23} m$

Dark Matter particle: Deutrino quasi-particle (Axion) with mass of $4.2 \times 10^{-42} kg$ and radius of $2 \times 10^{-21} m$

Polariton: The photon quasiparticle that I believe transfers the energy of photon (free Origamon) through the neutrino matrix of space.

2. Dark Matter

We know that Dark Matter contributes almost 25% of total mass-energy in the universe, creating enough gravitational force to hold galaxies together. Recent pictures (11) have revealed Dark Matter locating as clumps of high density around the galaxies and all around the universe, like a matrix. What we still don't know is the nature of Dark Matter and how it produces the gravitational force. Origami Model can create a credible explanation for Dark Matter.

I calculated before that due to the cone shape of our universe the real radius of universe is $12.4 \times 10^{26} m$ and the apparent radius is $4.4 \times 10^{26} m$. So, we can work out how much space is left between the mass:

$$avcuum\ ratio = \left(\frac{real\ radius}{apparent\ radius} \right)^2 = \frac{(12.4 \times 10^{26})^2}{(4.4 \times 10^{26})^2} = \%7.92$$

This means 92% of the mass of the universe must be filled with the Dark Matter. The most accurate observations and complex calculations of the distribution of Dark Matter has so far support the idea that at least 90% of mass of the universe is Dark Matter. This is quite consistent with my calculations based on the acceleration of time and the real radius that I calculated in previous chapters. This helps us to find the total mass of Dark Matter in universe:

$$Total\ Dark\ Matter\ mass = mass\ of\ the\ universe \times 92\% \\ M_D = 92\% \times 7.8 \times 10^{53} = 7.17 \times 10^{53} kg$$

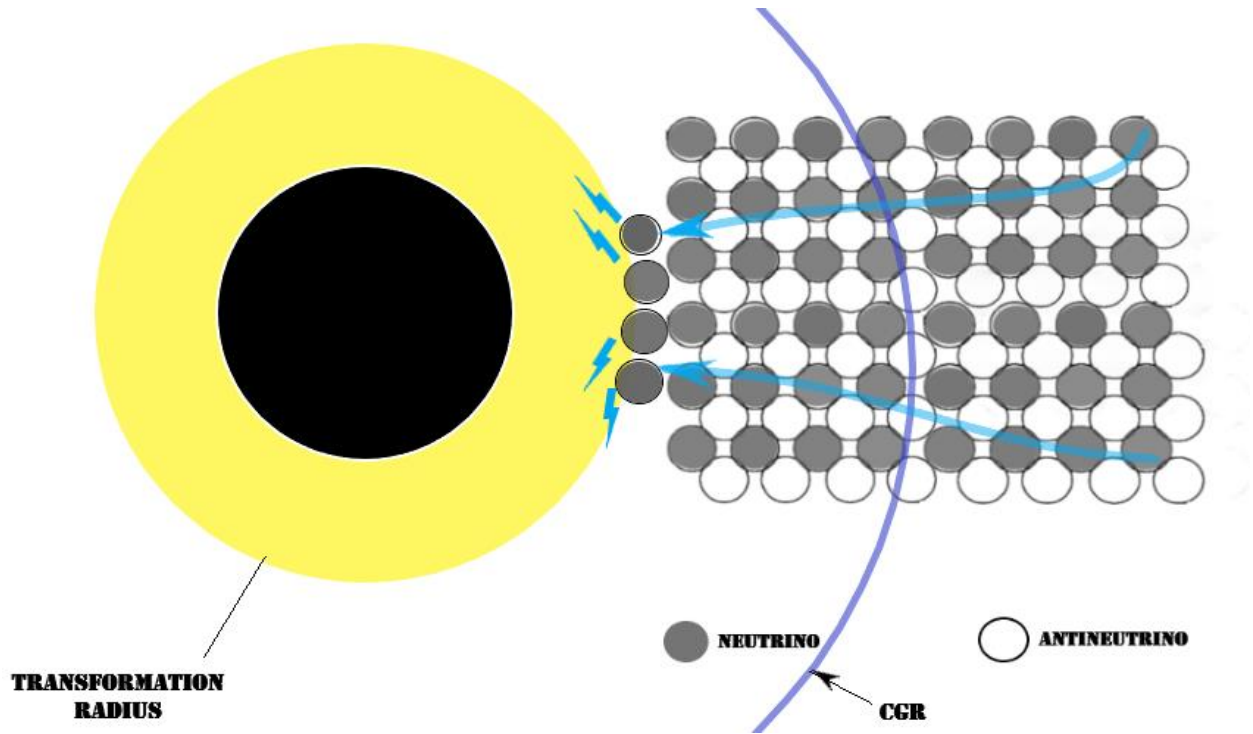
Based on the Origami Model , the gravitational effect in galaxies that we know as the Dark Matter is purely produced by the Neutrino Matrix that is created by the quantum field. We know that normally this matrix is neutral because all the neutrino-antineutrino pairs that are constantly produced form vacuum, annihilate each other. However, as I explained in Dark Matter chapter, the gravitational attraction of the black holes inside their CGR (inside the galaxies) attracts the neutrinos to the black hole and converts them to photons and this is how the intergalactic space is constantly expanding. As the entire space in universe is filled with neutrino-antineutrino pairs

and neutrinos are responsible for Dark Matter, we need to calculate the number of neutrinos in universe. This is simply possible by dividing the total mass of Dark Matter by the mass of electron neutrino:

$$\text{Total number of electron neutrinos} = \frac{7.8 \times 10^{53}}{1.96 \times 10^{-37}} = 3.98 \times 10^{90}$$

Now let's look at the amount of Dark Matter in our galaxy. Based on all the latest and the most reliable observations that are actually the product of 10 years study by two major space observation centers in USA and Europe, the total amount of Dark Matter in Milky Way Galaxy is $2.85 \times 10^{42} kg$, which is 90% of the total mass of the galaxy. We know that most of this large cloud of the Dark Matter is around the center of the galaxy and its density reduces constantly as we get further from the center. We also know that the Dark Matter has significant gravitational effect but not much electromagnetic interaction at all. Besides, we know that the amount of Dark Matter in intergalactic space is trivial. However, we do not know what the nature of this matter is and what particles it is consisted of.

Origami Model demonstrates that the central black holes of galaxies have a Critical Gravitational Radius at which point they separate the neutrinos from the rest of Neutrino Matrix in intergalactic space and repels the antineutrinos, and so they cause expansion of the space. The equations created by this theory successfully predict the radius and mass of the galaxies simply based on the virtual mass of the neutrino and the central black hole. Based on this theory, at and beyond the CGR, there is a constant flow of neutrinos into the galaxy and these particles eventually reach the Transformation Radius of the central black hole and convert to gamma and X ray photons and release into space. Therefore, Origami Model suggests that what we observe as the Dark Matter, is the gravitational effect of these neutrinos. In this model, the virtual particle for Dark Matter would be classified as a quasi-neutrino or Deutrino. A quasi neutrino is the emergent phenomenon that occurs when a microscopically complicated structure such as the Neutrino Matrix behaves as if it contains a weakly interacting particle in free space. This is exactly explaining all the features of the Dark Matter. The gravitational attraction of the central black hole on the Neutrino Matrix of space, does not really move the individual neutrinos from beyond the galaxy into the interstellar space, but it is the momentum of the neutrino that is transferred via the matrix and eventually reaches the Transformation Radius of the black hole. This is very similar to the behavior of polarons and phonons that transfer electric charge or vibration respectively. The following pictures demonstrates how Deutrinos are transferred into the CGR and finally transform into photons:



Deutrino density increases (light blue lines) as it gets closer to black hole

As it gets closer to the black hole, the momentum of the attracted neutrino increases and so the real neutrino emerges just before the Transformation Radius of the central black hole. If this is correct, then the total mass of Neutrinos in Milky Way Galaxy must be equal to the mass of Dark Matter. First, based on the radius of Milky Way Galaxy we calculate its volume to find out the density of Dark Matter in the galaxy:

$$\text{Volume of Milky Way Galaxy} = \frac{4}{3}\pi r^3 = 1.3 \times 3.14 \times (5 \times 10^{20})^3 = 5 \times 10^{62} m^3$$

$$\text{Density of Dark Matter in galaxy} = \frac{2.85 \times 10^{42}}{5 \times 10^{62}} = 5.7 \times 10^{-21} kg/m^3$$

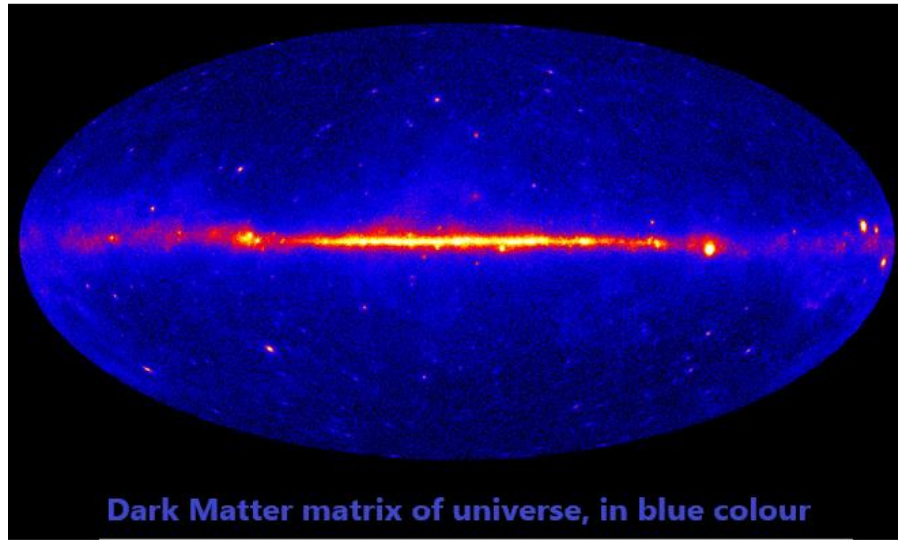
Now if the Dark Matter is purely made of the neutrinos, we can find the actual number of neutrinos in the one cube meter of the Dark Matter in our galaxy:

$$\text{Number of Neutrinos per meter of Dark Matter} = \frac{5.7 \times 10^{-21}}{1.9 \times 10^{-37}} = 3 \times 10^{16}$$

Now we need to see if this number of neutrinos would cover a meter length. We know that virtual radius of neutrino is $3.2 \times 10^{-17} m$ and in the Neutrino Matrix they arrange at Planck Length from each other, so:

$$(3 \times 10^{16} \times 3.2 \times 10^{-17}) + (3 \times 10^{16} \times 1.61 \times 10^{-35}) = 9.9 \times 10^{-1} = 1$$

This is a perfect result! This proves that electron neutrinos are again the best candidates for Dark Matter particles. However, as I explained, the real neutrinos most like would not be able to freely travel across the galaxy and it is the effect that moves through the Neutrino Matrix as Deutrino. As Origami Model demonstrates, the density of these absorbed Deutrinos constantly increases as they approach the central black hole of the galaxy because they start their journey from beyond the CGR which is 5×10^{20} meters away from the black hole and at that point these number of Deutrinos are distributed in a circumference of $2 \times 3.14 \times 5 \times 10^{20} = 3.14 \times 10^{21}m$ and as they get closer to the central black hole they get closer to each other until they finally get as close as $2 \times 3.14 \times 1.18 \times 10^{10} = 7.4 \times 10^{10}$ meters from each other. This means their distance from each other reduces as they get closer to the center of the galaxy by a factor of 4.2×10^{10} and so their density would increase by exactly a factor of 10^3 , which is incredibly consistent with observational findings of Dark Matter distribution in our galaxy and throughout the universe. This means Dark Matter and Dark Energy are both in fact related to the naked black holes in space. The reason for elusive nature of the Dark Matter is because it is mediated by a quasi-particle and also neutrinos are extremely light and have only trivial effect on surrounding environment. This model predicts the maximum amount of Dark Matter effect to be observable near the bulge of the universe where maximum number of large black holes are located and also at the center of the galaxies in proximity of the central black holes which are completely consistent with observations again. As we can see in below picture, Dark Matter is fact the product of gravitational effect of the black holes on Neutrino Matrix of universe that is much more prominent in proximity of the black holes. As Origami Model predicts a new study has shown neutrinos in dark matter accelerating towards the black hole and getting annihilated with producing gamma rays near the black hole.



This means that Dark Matter is actually the quasi particle of the baryonic matter and it is no different from the rest of the luminous matter in its physical characteristics. In the last chapter of this paper where I speak about the mysterious worldwide hum, I will return to this fact again to prove that sound could virtually be transferred in space.

Below picture shows an incredibly beautiful picture of the Dark Matter halo around our galaxy that is completely predictable based on the model of universe and structure of galaxy that Origami Model proposes.



Figure 55- NASA photograph of Dark Matter by Chandra Telescope

Mass of Deutrino

Because Deutrino is a quasi-particle of electron neutrino its mass would vary depending on its location. As I explained, a quasi-particle is an excitation of energy level which in this case depending on the distance from the black hole, the mass effect produced of kinetic energy level of Deurino would vary, closer to the event horizon, lower the mass.

This means to calculate an average mass for Deutrino (or solar Axion in particle physics), we need to find the average number of Deutrinis across the final radius of universe. We know that our universe has a radius of $4.4 \times 10^{26}m$ and if the entire space is saturated with neutrino matrix, then every neutrino would occupy a distance that can be calculated based on the formula for volume of sphere:

$$volume\ of\ sphere = 4/3\pi r^3$$

Also, as I showed before the mass of particle is proportional to the square of its radius. This means the reverse cube root of radius of universe can tell us the estimate of average mass reduction across the length of universe radius. I calculated before that final radius of universe in 700 million years would be $4.59 \times 10^{26}m$. Therefore, we have:

$$mass\ reduction = \frac{1}{\phi^6 \sqrt[3]{r}}$$

$$Mass\ reduction = 2.14 \times 10^{-5}$$

Now we can multiply this by the mass of electron neutrino to find the mass of Deutrino:

$$2.14 \times 10^{-5} \times 1.96 \times 10^{-37} = 4.2 \times 10^{-42} kg$$

So, I believe this should be the average mass of Dark Matter Quasi-particle that I call Deutrino and particle physicists call solar axion. The further the particle from the central black hole $10^{-37}kg$ at the very edge of the universe and close to $10^{-70}kg$ near the event horizon of the black holes.

Also, I will show in Subatomic Particles Chapter that because all elementary particles are made out of Origamons, every particle's mass is a multiple square of Planck Mass and we can easily find the mass of Deutrino based on this approach too:

$$(m_p)^6 \times 4 \times 10^4 = 4.2 \times 10^{-42}kg$$

Size and mass of Galaxies

I already explained how a central black hole holds the entire galaxy in its CGR. And in previous chapter, I extracted a simple equation that can precisely calculate the radius of universe. Now based on the mechanism of gravitational attraction and repulsion on Neutrino Matrix that is applied by the black holes, we can extract a simple equation that calculates the radius and mass of galaxies. Also based on the very same mechanism I will extract a simple equation that will tell us the radius of an atom based on the mass of its nucleus, because at the center of the nucleus of every atom there is a central black hole and the entire system functions exactly the same way that a galaxy or entire universe does. I write all these three equations here:

Radius of galaxy is equal to the CGR of its central black hole:

$$R_G = \sqrt{M_B} \times 1.68 \times 10^2$$

R_G : radius of a galaxy

M_B : mass of the central black hole in the galaxy

Now, based on the same calculation we can extract the following equation:

$$M_G = CGR^2$$

Here, M_G is the mass of a galaxy to the CGR of its central black hole and we know that CGR of the black hole is:

$$CGR = \sqrt{M} \times 1.68 \times 10^2$$

So, we can say:

$$M_G = M_B \times 2.8 \times 10^4$$

Here M_G is the mass of the galaxy and M_B is the mass of its central black hole. Note that the result would be the total mass of baryonic matter in the galaxy which is 10% of the total mass of the galaxy so to find the total mass we must multiply this by ten:

$$M_G = M_{CB} \times 2.8 \times 10^5$$

The above equation is very similar to the equation we found for the mass of the universe:

$$M_U = 4.5r^2$$

M_U would be the total mass of the universe and r is the radius of the universe. I will extract almost the same equation for the radius of atom in next chapter:

$$R_a = CGR_a = \sqrt{M} \times 1.68 \times 10^2$$

Again, exactly like the galaxy, the same mechanism makes the radius of atom equal to the CGR of its central black hole. But, because there are electrons and protons and neutrons in atom and each one has a central black hole, we need to insert the total mass of electrons and protons and neutrons, so the CGR equation changes slightly to:

$$R_a = CGR_a = \sqrt{M} \times 4.7 \times 10^2$$

Here R_a is radius of atom, CGR_a is the CGR of atom and M is the atomic mass of the atom. Isn't this wonderful? We also found the equation for the CGR of the nucleus of atom which is much smaller than the CGR of atom:

$$CGR_N = \sqrt[6]{Z} \times 6.6 \times 10^{-9}$$

In above equation CGR_N is the CGR of the nucleus of atom and Z is the atomic number. These equations give us the results that are incredibly consistent with the most complex, reliable measurements. This tells us that our theory is correct and it is the gravity that shapes out universe and because everything is produced by progression of time, we easily find a relationship between radius and mass because both are produced by time.

Let's try our equations now. We know that mass of Sagittarius A that is the central black hole in Milky Way Galaxy is $8.6 \times 10^{36} kg$, so we can use our equation to find the total mass of Milky Way Galaxy:

$$M_G = M_B \times 2.8 \times 10^5$$

$$M_G = 8.6 \times 10^{36} \times 2.8 \times 10^5$$

$$M_G = 2.5 \times 10^{42} kg$$

This is equal to 1.27 trillion solar masses, which is truly a mind-blowing result! For many years all the calculations and long-term observations had shown that the total mass of Milky Way Galaxy should be between 700 billion or 3 trillion solar masses and recently in 2009, after ten years constant observations by two major telescopes of Hubble and Gaia in the United States and Europe who tried to find a more reliable result by studying the orbital motion of globular clusters in the outer reaches of Milky Way and redoing deeply sophisticated calculations by the cosmologists at two international space centers, they concluded that Milky Way Galaxy must have a total mass around 1.5 trillion kilograms. We just found a number extremely close to this. Small difference could easily be due to a range of errors because neither the exact mass of Sagittarius A nor exact mass of galaxy are known yet.

We have already tried the mass and radius of universe for our other equation. To check the equation for radius of atom we can try uranium, that has atomic mass of $3.95 \times 10^{-25} kg$:

$$R = \sqrt{39.5 \times 10^{-26} \times 2.3 \times 10^{-3}}$$

$$R = 1.7 \times 10^{-15} m$$

This is exactly consistent with physical radius of uranium atom. Now, considering 90% of mass of the universe is Dark Matter, we can easily produce the following equation to find the total amount of Dark Matter in a galaxy:

$$M_D = 9CGR^2$$

Or we can rewrite it as the following:

$$M_D = M_B 2.5 \times 10^5$$

M_D : total mass of dark matter in a galaxy

M_B : mass of galaxy's central black hole

These equations clearly demonstrate that the suggested mechanism of gravity in universe, galaxy and atom has to be correct and unlike the Standard Model that has absolutely no place for gravity in quantum world, Origami Model founds its entire structure on gravity as the main force in action in entire universe.

Now, if we consider the total mass of the black holes in Milky Way Galaxy, we can again find that they must be massless. According to the latest findings there more than a billion black holes in the Milky Way Galaxy and the smallest black hole has 4 solar masses and largest has 4 million solar masses. So, we can find the average mass of black holes in the galaxy:

Smallest black hole in Milky Way Galaxy: $8 \times 10^{30} kg$

Largest black hole in Milky Way Galaxy: $8 \times 10^{36} kg$

Average mass = $8 \times 10^{33} kg$

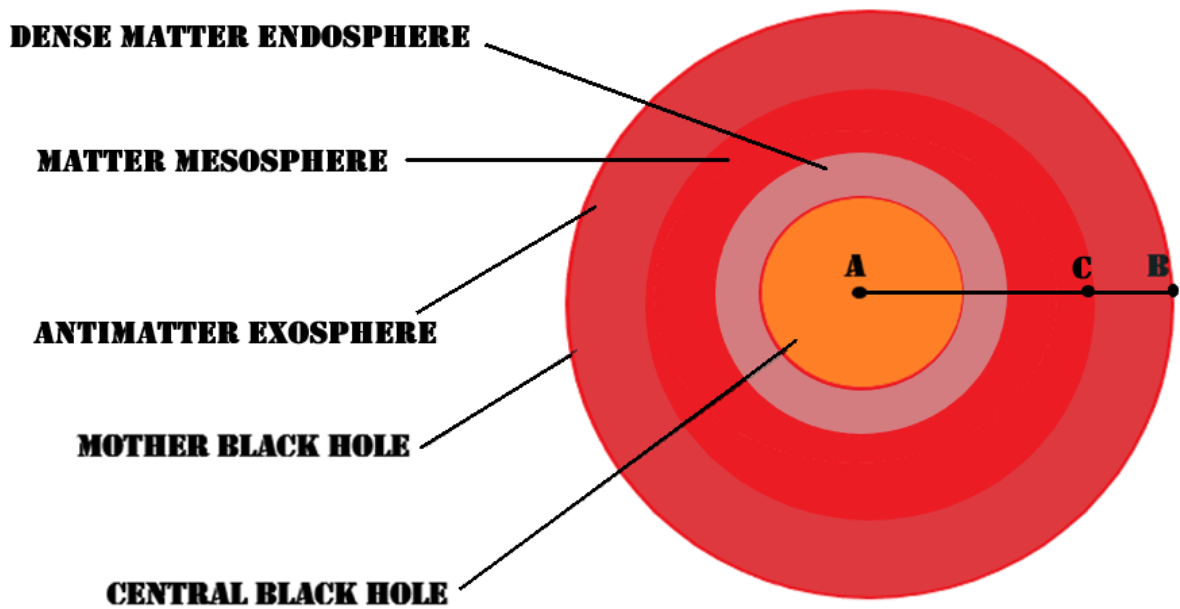
To find the total mass of the black holes in Milky Way Galaxy we simply multiply this by the billion:

$$\text{Total mass of black holes in Milky Way Galaxy} = 8 \times 10^{42} kg$$

This means we have approximately 4 trillion solar masses of black holes in our galaxy. This is another wonderful result because it again shows that firstly, black holes have to be empty spaces with no mass, otherwise the total mass of our galaxy will become twice as it is, and secondly, it shows what Origami Model suggests about the mass and black hole is correct because based on Origami Model the gravity of our galaxy must be coming totally from its black holes, which means the total mass of the black holes in a galaxy or in a particle or in entire universe must be equal to the total mass of that particle or galaxy or universe. Therefore, by knowing the radius of a galaxy, Origami Model can tell us how big the central black hole of the galaxy is and also it can calculate the radius of the galaxy. Based on Origami Theory, there must be the largest black hole of our universe right at the very center of our universe with a tremendous mass. To calculate the mass of the Central Universal Black Hole, we have to look at the equation between the radius of universe and its central black hole. Our universe is structurally exactly like an atom and the galaxy, with its nucleus occupied by the central black hole and several large galaxies and the periphery consisted of smaller galaxies. Therefore, we can use the same equation for the entire universe too:

$$R_U = CGR_{CB}$$

This means again, the radius of universe (R_U) is equal to the CGR of its central black hole (CGR_{CB}). Therefore, we can calculate the mass of the largest black hole in our universe that must be located at central position of our universe and to be the oldest black hole, but there is a crucial point here. I will show in later parts that antimatter is occupying exactly the third part of the universe. The following figure shows this:



AC: CGR of central black hole

AB: Schwarzschild radius of mother black hole = Corrected radius of universe

CB: Antimatter Exosphere

As you can see, out of entire radius of observable universe, repelled antineutrinos are occupying the outer third of the universe, with the mechanism that I explained in Dark Energy chapter. This means the CGR of the central black hole of our universe ends exactly at 2/3 of the universe's radius. Therefore, we arrive at:

$$\begin{aligned}
 3 \times 10^{26} &= CGR_{CB} \\
 CGR &= \sqrt{M} \times 1.68 \times 10^2 \\
 3 \times 10^{26} &= \sqrt{M} \times 168 \\
 M &= 3.16 \times 10^{48} kg
 \end{aligned}$$

This means the central black hole of our universe must have equivalent mass of $3.16 \times 10^{48} kg$. The Great Attractor which was first supposed to be the most massive black hole in the center of the universe has a mass of $2 \times 10^{42} kg$, and scientists believe that it is still not the biggest mass in the universe and my calculation shows that it is still one and three million times smaller than the largest black hole in our universe. So, Origami Model predicts the discovery of the largest and oldest black hole of our universe with a mass of one and half quintillion solar mass. Also based on the number of black holes that are equal to Avogadro Number, the number of Galaxies would be the square of this:

$$Total\ Number\ of\ Galaxies = \sqrt{6 \times 10^{23}} = 7.7 \times 10^{11}$$

And now we can find the average number of black holes in galaxies:

$$\frac{6 \times 10^{23}}{7.7 \times 10^{11}}$$

Number of black holes in each galaxy = 7.7×10^{11}

This means based on Origami Model there must be more than seven hundred billion galaxies in our universe and each galaxy has around seven hundred billion black holes. Of course, larger galaxies contain much more and smaller ones have much less number of black holes. The latest observations of NASA have shown that there must be between 200 billion to two trillion galaxies in the universe which is not too far from my calculation.

Perfect Sphere Solution

According to classic mechanical physics, the spin angular momentum of mass M' inside or around the revolving spherical mass M would be:

$$L = M'rV$$

As long as the mass M' is inside the gravitational field of mass M , it would behave as part of the mass M . A mass is isotropic if it has uniformity in all directions. If M is an isotropic spherical mass that revolves around the single axis of its symmetry, the linear velocity of mass M' would only depend on its distance from the axis. The value of masses M or M' will have zero effect on the acceleration or deceleration of linear velocity of M' when its distance from the axis of rotation varies. Considering the conservation of angular momentum, we can write the following equation about every two locations in or around spherical, isotropic, revolving mass M :

$$r_1V_1 = r_2V_2$$

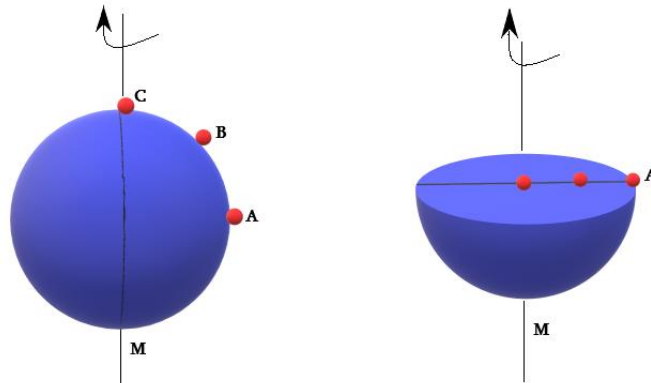
V_1 : linear velocity of M' at radius r_1

r_1 : distance of M' from the axis of rotation

V_2 : linear velocity of M' at radius r_2

r_2 : distance of M' in its new position from the axis of rotation

M is an isotropic spherical mass when every point on its surface is at equidistant from its center and its mass contains identical properties in all directions. If such mass has a spin, the behavior of any particle trapped in its gravitational field can be calculated based on the forces applied to it. If M is such mass that revolves around its axis A , and M' is a smaller mass that is the satellite or a constituent of M , we can analyze the angular momentums based on the distances from the axis of rotation.



Particle at various distances from the axis of rotation

In above picture, the left mass has particle at its surface approaching the north pole and the right picture demonstrates similar particle that is inside the structure of the spherical mass at

various distances from the axis of rotation. The mass of the particle in both figures is M' , the distance of it from the axis of rotation at point A is r_1 , its distance from the axis of rotation at point B is r_2 and its distance from the axis of rotation when it is at point C is r_3 . The value of r_3 is equal to the shortest possible distance from the axis of rotation, Planck Length = $1.6 \times 10^{-35}m$. If mass M' is at point A or B or C, according to the conservation of angular momentum, its linear velocity will change inversely proportional to its distance from the axis of rotation of M in order to preserve the angular momentum at exactly the same value. Therefore:

$$V_1 r_1 = V_2 r_2 = V_3 r_3$$

At point C, where M' is at its closest possible distance from the axis of rotation, it will reach its maximum speed. If E_k is the kinetic energy of the M' , then in both figures:

$$\begin{aligned} r_1 &> r_2 > r_3 \\ V_1 &< V_2 < V_3 \\ E_{k3} &> E_{k2} > E_{k1} \end{aligned}$$

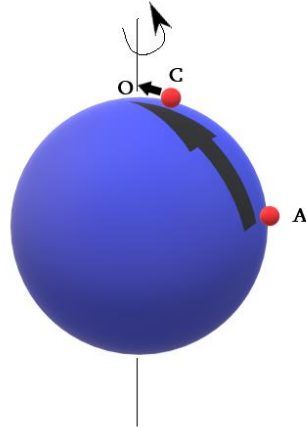


Figure 4. Forces applied to particle on various points of rotating mass

F_1 : force applied on M' at point A

F_2 : force applied on M' at point C

A: longest distance from the axis of rotation, radius of rotating mass

C: shortest distance from the axis of rotation, Exit Point of rotating mass

$$\begin{aligned} F_1 &\gg F_2 \\ F_1 &= AO - CO \\ F_2 &= CO \end{aligned}$$

This means the kinetic energy in both scenarios is higher in B position and highest in C position. Therefore, in both figures there will be a strong force driving the M' from point A (furthest point from the axis) towards position C (closest point to the axis). This vector force reaches its maximum at a point in north or south pole of the sphere, at Planck length distance from the axis of rotation. If C is the **Exit Point** (EP) and we nominate r_3 as its distance from the axis of rotation r_3 : EP, then we can find an equation for it:

$$\begin{aligned} V_3 r_3 &= V_1 r_1 \\ V_3 &= C \\ r_1 &= R \end{aligned}$$

$$r_3: EP$$

$$EP = \frac{RV_1}{C}$$

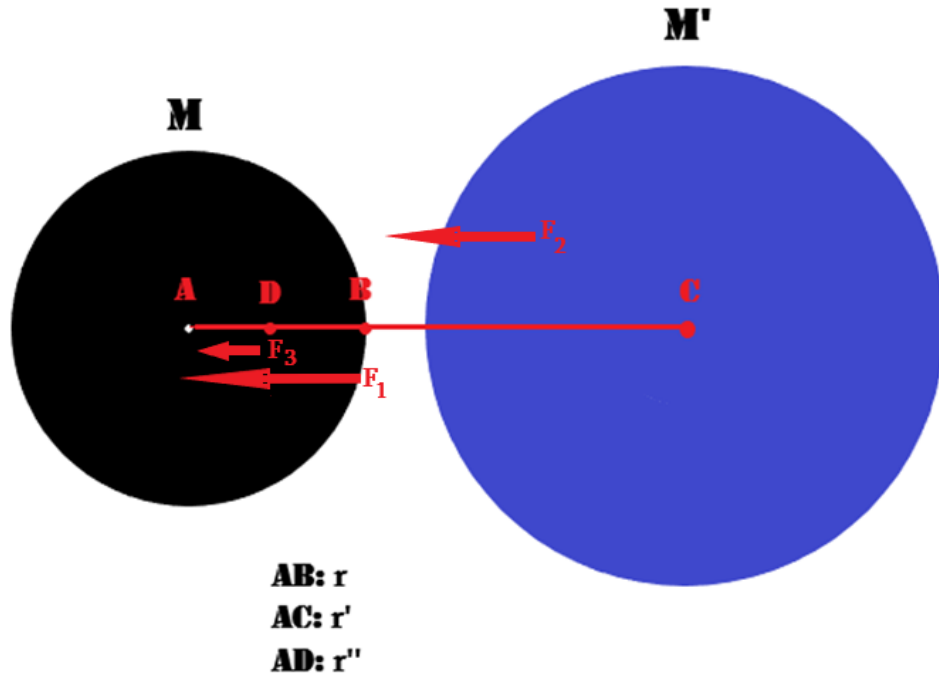
EP: Exit Point distance from the axis of rotation

V₁: linear velocity of sphere

C: speed of light

R: radius of sphere

The equation clearly tells us that the larger the sphere, the slower it needs to rotate to keep the exit point at the same distance from the axis of rotation. The reason why I call it Exit Point will be clear for you soon.



Forces applied on a particle approaching the black hole at various distances

We know that $r_3 = c_0$, the closest possible point to the pole axis, is equal to Planck length at its smallest possible value, so to find the slowest possible velocity of M' at point C, we can imagine the largest r_1 and smallest V_1 . The largest distance in our universe would be the diameter of universe: $8.8 \times 10^{26}m$. The slowest possible velocity in our universe would be the longest possible time (age of universe) to travel shortest possible distance (Planck length):

$$V = \frac{\omega}{2\pi}$$

ω : angular velocity

V : linear velocity

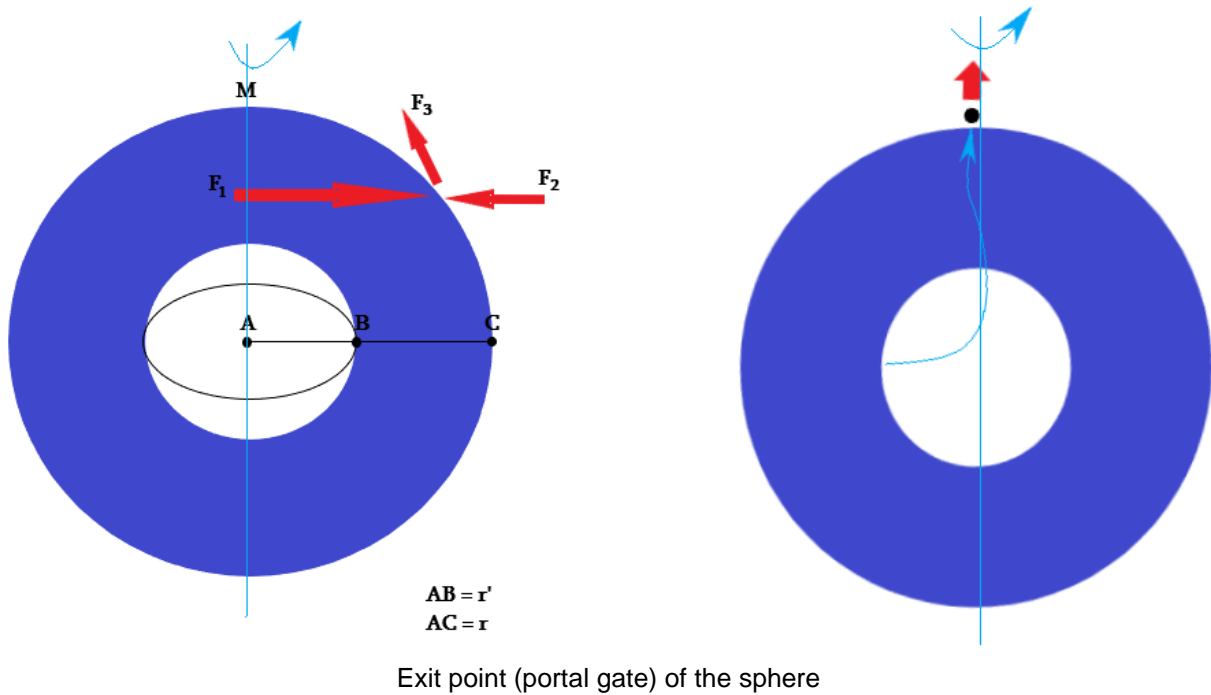
$$\text{smallest possible } V_1 = \frac{1.6 \times 10^{-35}}{2 \times 3.14 \times 4.3 \times 10^{17}} = 5.9 \times 10^{-54}m/s$$

Therefore, we arrive at:

$$V_3 \times 1.6 \times 10^{-35} = 5.9 \times 10^{-54} \times 8.8 \times 10^{26}$$

$$V_3 = 3 \times 10^8$$

This means that if an isotropic, spherical mass is rotating even at slowest velocity possible in universe, all the particles inside the mass or inside its gravitational field, will be forced towards its poles and eventually leave it at speed of light when they reach at Planck length of its poles. Above example demonstrates that if our universe that is an isotropic mass, rotates at physically slowest possible rate, the galaxies will eventually leave it for another gravitational field. The faster the mass rotates, the larger the r_3 would be, that is point C will be located at larger distance from the pole. Point C is the point at which, particles reach linear velocity equal to speed of light in order to conserve their angular momentum. This is why I have nominated point C, the Exit Point. Obviously, the Exit Point of an isotropic, spherical, spinning mass will always be adjacent to the poles relative to the axis of rotation.



Considering the fact that such perfect spherical mass has minimum entropy, I am going to denominate it as Avalanche Force, F_A . In other words, the gradient created by the conservation of momentum in the rotating isotropic mass, is virtually the accumulated potential energy created by critically reduced entropy that is released at its first possible opportunity. When a mass is created from aggregation of gravitationally attracted particles, it will have the least probability to be in a perfect, isotropic, symmetric form. According to the equation for entropy of a system, to maximize the entropy, the system needs to homogenize its structure:

$$H(\chi) = - \sum_{i=1}^n P(\chi_i) \log_b P(\chi_i)$$

$$= - \sum_{i=1}^2 \frac{1}{2} \log_2 \frac{1}{2}$$

$$= - \sum_{i=1}^2 \frac{1}{2} \cdot (-1) = 1$$

A good analogy for this situation is tossing a coin. The entropy of the unknown result of the tossing of the coin is maximized if the coin is fair and the probability of heads and tails is equal $\frac{1}{2}$. If the coin is not fair and the probability of heads or tails are p and q , where $p \neq q$ then uncertainty will be reduced, that is entropy decreased. If the entire mass in universe is divided in two forms of matter and antimatter, the maximum entropy would be when there is equal amount of each and even distribution of them. In other words, to maximize the *total* entropy, the *local* entropy must reduce towards symmetry and isotropy. To achieve this Fair State, there needs to be a force. Due to the infinite range of the gravitational force, there is a minimum force of gravity applied to any mass side the universe. The force applied on an asymmetric, anisotropic mass will always cause rotation in it. According to Newtonian physics:

$$\frac{\Delta d}{(\Delta T)^2} m = F$$

This equation demonstrates that in the presence of a mass and space, force will always be created if there is enough time (ΔT). According to General Relativity also the only parameter to produce force is time:

$$\Delta T \times \Delta E = \hbar$$

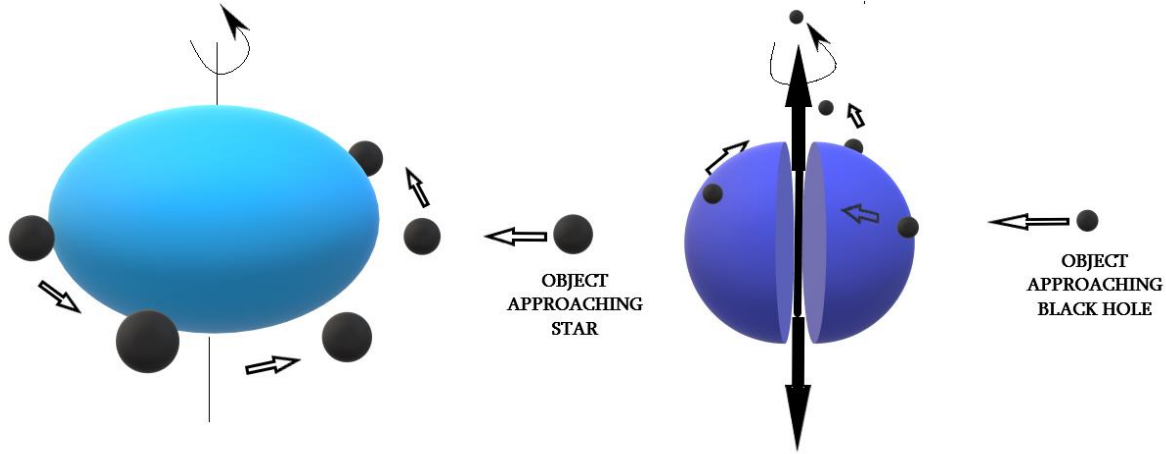
Above equation is in fact the Heisenberg's Uncertainty Principle, rewritten. It demonstrates that if there is enough time, force will be produced. The equation also shows that the total amount of borrowed energy from vacuum will be returned to vacuum in a time inversely proportional to the amount of energy. To return the energy back to the vacuum, the mass that is affected by it will have to return to its original state. This change from one state to a new state and return to the original state is what is known as revolution in physics, and we know it as rotation. In order to calculate the probability of rotation of a mass, we can use the equation for the rotational diffusion of mass around a single axis in response to an external torque Γ_θ :

$$\Omega_d = \frac{\Gamma_\theta}{f_r}$$

Ω_d : angular drift velocity

Γ_θ : external torque

f_r : frictional drag coefficient



How objects are behaving near star and near black hole

The relationship between the rotational diffusion coefficient and the rotational frictional drag coefficient is given by the Einstein relation:

$$D_r = \frac{K_B T}{f_r}$$

D_r : rotational diffusion coefficient

K_B : Boltzmann constant

T : absolute temperature

f_r : frictional drag coefficient

The rotational frictional drag coefficient for a sphere with radius of R is:

$$f_r = 8\pi\eta R^3$$

η : dynamic viscosity

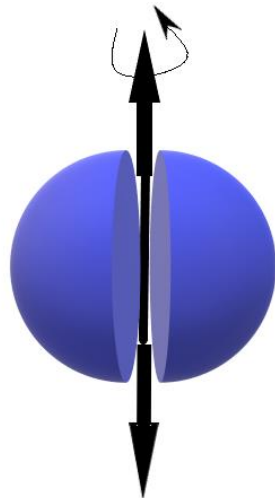
Therefore, we arrive at:

$$D_r = \frac{K_B T}{8\pi\eta R^3}$$

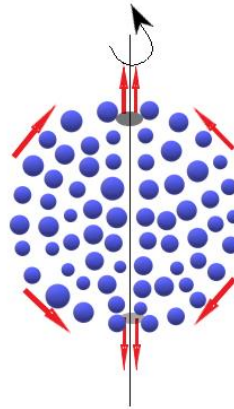
We can also use the rotational version of Fick's law of diffusion to find the probability density distribution for the orientation of n at time t :

$$\frac{1}{D_{rot}} \frac{\delta f}{\delta t} = \nabla^2 f$$

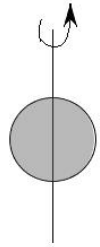
As we can clearly see, in presence of enough time (δt), there is always finite probability for a mass to repeat its state (rotate), and the probability is inversely proportional to the radius of the mass (R).



PERFECT SPHERE



ALL PARTICLES EXIT AT SPEED OF
LIGHT THROUGH POLAR GATES

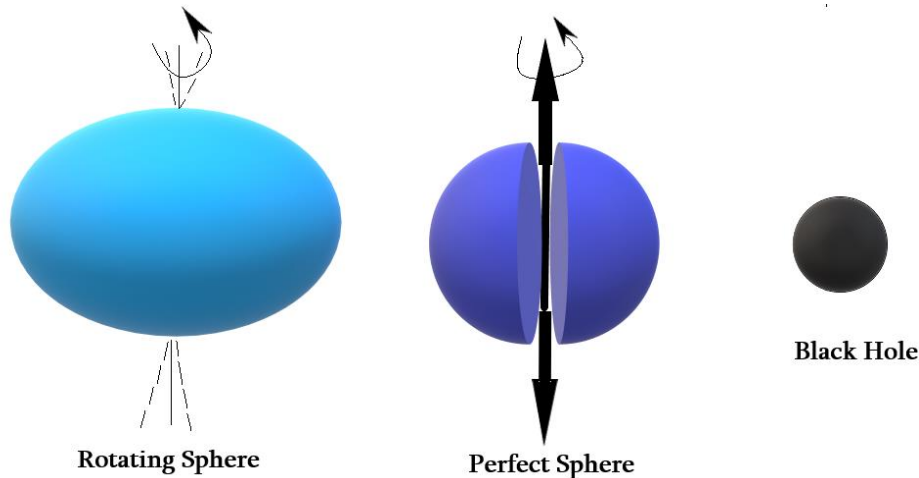


BLACK HOLE FORMED
(NO MASS)

In other words, the larger the mass, the slower the rotation rate will be and the slowest rotation rate is for the universe itself as the largest, single isotropic mass. This conclusion tells us that any non-isotropic mass will have to rotate to maximize its entropy and as it rotates, the entropy reduces slowly due to the redistribution of particles to conserve the angular momentum. This redistribution eventually converts the mass into an isotropic mass. As soon as the mass becomes an isotropic rotating mass, it will lose all its particles from its Exit Points at its two poles. This explains why everything in universe rotates, becomes spherical and eventually explodes. This also explains that every rotational orbit, either stationary (eg. Earth's spin) or revolutionary (eg. Earth's rotation around the sun) has to be in an imperfect circular form because if it follows a perfect circle it will have to approach the poles of the axis of rotation (as I explained before) and when it reaches the exit points of the mass it is rotating around, it will turn into photons at that point and leave the field. This means, no particle or celestial body can spin or revolve in a perfectly circular orbit, unless at its final moment when it reaches the maximum isotropy at which it will explode and lose all its mass through its exit points. This explains why earth's spin has a wobble and all planets rotate in an elliptical orbit. Now, we conclude an extremely crucial principle of universe: Every mass has to rotate in both spin around its own axis as well as revolving around a center, and both these are always in a imperfectly circular path to increase the mass's entropy and when it finally reaches the isotropy and perfect circular orbit and maximum general entropy, it will explode into photons because its local entropy has reaches maximum and needs to leave the state. The crucial product of this finding is as following:

The universe is rotating with slowest possible velocity.

This means the entire universe has to rotate too. Such is the life of any mass in the universe, from quarks to stars and also for the whole universe too. As I showed in previous paragraph, the entire universe is rotating, with at least the slowest linear velocity possible in universe.



Progress of every mass towards the final perfect sphere and black hole

According to equation when a spherical mass rotates, even at slowest possible velocity, M' will be driven by the Kick Force towards the axis of rotation and it will always have a chance to leave the mass at speed of light. This is how eternal rotation is developed in universe and every mass revolves around an axis by force of gravity in order to reach the Fair State and enhance the entropy. The time that takes for a mass to reach the final state of absolute isotropy and symmetry depends only on the mass. Once the rotating mass reaches its ultimate isotropic symmetry, the Kick Force will activate to take M' from its current position to the exit point. The Portal is a point at a position critically close to the axis of rotation at which the rotating mass M' reaches the speed of light and escapes the mass.

For a collection of bodies rotating around the same axis of rotation, the total angular momentum of each body is the sum of angular momentum and moment of inertia. The following equation demonstrates the moment of inertia in a rotating mass:

$$I = r^2 m$$

I: moment of inertia

r: radius, distance of body from axis of rotation

m: mass of the body

To preserve the conservation of angular momentum, the greater the radius of a mass, the slower the linear velocity of the particles at its external surface will be, because such particles will have the maximum distance (r) from the axis of rotation. This is provided the axis of rotation has central configuration and we know that angular momentum will be at its minimum when the axis of rotation passes through the center of the mass. The larger the radius of the mass, the slower its rotation will be. As I shown earlier, the entire universe has to rotate too and it is rotating with a minimum velocity of $5.9 \times 10^{-54} m/s$. This is the linear velocity of outer edge of the universe, where the radius is at its maximum. Therefore, as we approach the central axis of rotation in universe the linear velocity will increase. If we somehow find the point of maximum linear velocity of galaxies movement, we would know the central axis of the universe and we could locate the Portals on its poles.

Once a mass is developed, the probability for it to be an isometric, symmetric mass is the least. Therefore, as the mass rotates it will have multiple axis of its rotation because the center of

mass varies at various points of its vertical axis. This creates a wobble that even increases the moment of inertia by enhancing the radius of rotation (look at the previous equation). Due to the laws of thermodynamic, in order for the mass to reach an energy equilibrium, it has to reduce its angular momentum and moment of inertia to its least possible level. To do this, it has to reposition the axis of rotation to the center of the mass but this is only possible if the mass possesses a center of symmetry. Therefore, by rotation, the centrifugal force will arrange the particles in the mass according to their mass at various distances (r) from the axis of rotation and at the same time eventually in δT it will reach its maximum symmetry and isometry and finds its central axis of rotation. This is the reason why every mass needs to rotate, since rotation is the most effective approach to evenly distribute the mass. When mass reaches this equilibrium, it will only need one more rotation to activate the Kick Force. The Kick Force is in fact the ultimate centripetal force that transfers the particle towards the axis of rotation to locate it at the Portal or Exit Point. Once the particle is at the Portal, it will leave the mass at speed of light. The following equation demonstrates the value of Kick Force for every particle in the spinning mass:

$$F_k = mf^2r$$

F_k : Kick Force

m : mass of the particle

f : frequency of the particle rotation (revolution per second)

r : distance of the particle from the axis of rotation

By definition, in an isometric, symmetric mass that is spinning around its central axis, when it reaches the energy equilibrium, all the particles must have the same total energy. The total energy is the sum of kinetic and potential energy, equivalent of angular momentum and moment of inertia:

$$L_1 + I_1 = L_2 + I_2$$

To establish this state, the Kick Force will vary accordingly based on the mass of each particle (m) and its distance from the axis of rotation (r). According to conservation of angular momentum, and as we can see in my equation for the Kick Force, in the final state, the more massive the particle, the shorter its distance from the axis of rotation and the faster its rotation will be to have the same energy and angular momentum as lighter particles at greater radius that rotate slower. Therefore, the value of Kick Force to transfer the heavier particle that is closer to axis will be higher than the Kick Force that transfers the lighter particle that is located at far point of mass.

$$F = ma$$

$$F_{k1} = m_1 \frac{V_2 - V_1}{\nabla t}$$

$$F_{k2} = m_2 \frac{V'_2 - V'_1}{\nabla t'}$$

$$V_2 = V'_2 = c$$

$$V_1 > V'_1$$

$$(C - V_1) < (C - V_2)$$

$$m_1 > m_2$$

$$E_1 = E_2 \Rightarrow F_{k1}\nabla t = F_{k2}\nabla t'$$

$$\nabla t = \nabla t'$$

The result means that once Kick Force is activated, all the particles constituent in the mass will reach the Portal at the same time. In other words, when the mass is converting to massless photons, there will be no privileged particle exiting through the Portal gate (exit point) before others. This clearly violates the laws of thermodynamics and also the General relativity. For example, if m_1 is located at two Planck length from the Portal it will travel to the Portal at speed of light, so all other particles that are located at further distances from the Portal must travel faster than speed of light to reach at the same time. The only solution to this is for speed of light to be slower once a rotating mass reaches its ultimate isotropy and symmetry. But how could this be possible?

So far, we have found that if any mass reaches the state of isotropy and symmetry and rotates around its central axis, all the particles constituent in it will convert to massless photons along its axis of rotation and leave at two points on upper and lower poles of the mass, and the conversion of all particles will be simultaneous and localized in a line parallel to the axis of rotation at Planck length distance from it. Therefore, the conversion will be complete, simultaneous and localized. In this statement, mass could be as small as an elementary particle or as large as the entire universe. Also note that rotation only needs to be one full circle 2π , regardless of its velocity and frequency. A good example of such isotropic, symmetric, revolving mass is the black hole. According to the Schwarzschild metric and Reissner-Nordstrom metric, a non-rotating black hole has perfect spherical symmetry even if it is electrically charged. A rotating black hole has a flattened ergosphere but according to Boyer-Lindquist coordinates, its event horizon has a symmetrical, constant radial coordinates. Besides, since the entire mass in rotating black hole is located in the ring singularity that is a perfectly symmetric shape, the mass in all types of black hole is always in perfectly symmetrical distribution in all directions, even if absorption of external mass or merging with another black hole, temporarily alters the shape of the event horizon, the mass distribution in ring singularity will always stay in perfect symmetry. At least, once a black hole is formed, by definition, it is in perfect spherical, isotropic symmetry until a new mass is attracted to its event horizon. Based on the current standard model in cosmology, when a star turns into a black hole, a third of its mass explodes into energy and the resting $2/3$ of the mass that is in the core of the star becomes so compact and creates a black hole. But I showed that once the black hole is formed, the mass is infinitely compacted under its own gravity and its size has reduced to Schwarzschild radius. In this state, the mass is transformed into a perfect, isotropic, symmetric sphere with an axis of rotation that goes through its poles. Therefore, with the first rotation of the black hole, Kick Force is triggered and in Planck time, the entire mass is converted to massless photons along the axis of rotation and this massive energy will leave through the exit points that are located close to the poles. This is exactly what we observe in gamma bursts and some supernovae. For decades the intensity and localization of gamma bursts have been puzzling the scientists because these explosions are simply the most powerful and the most localized ray of energy that can be produced in space but no theory has been able to successfully explain the mechanism of such concentrated, tremendous amount of energy. However, Perfect Sphere Solution describes the mechanism in its most perfect possible way. The solution tells us that because the gravitational collapse of the star at its final stage converts the star to a perfect sphere, once it rotates for 360 degrees, its entire mass must convert to photons. According to $E = mc^2$ the amount of produced energy will

be gigantic and as it is described in the mechanism, the entire conversion takes place at Planck length distance from the axis of rotation and the produced photons will leave at the Portal Points that are located at the poles. Therefore, the entire energy exits the star at its poles that perfectly matches the observation of gamma bursts. No other mechanism of conversion can explain this localized and simultaneous conversion of matter to energy. This also explains why any particle approaching the black hole will turn into photons and exit from its poles as Relativistic Jets. Once we accept this mechanism, we will face an extremely important dilemma in this phenomenon that differentiates it from any other matter-energy transformation in the universe: the entire matter in the newly formed black hole must convert to photons at exactly the same time and at along a line parallel to the axis of rotation at the center of the star and all the photons must leave at two Portal Points on poles. As I demonstrated before, the conversion is independent of mass and location of the particles in the black hole, therefore all of them will reach the Portal gates in Planck time and all of them reach near speed of light at the same moment. This is a clear violation of first and second laws of thermodynamics, because if all the particles reach the Portal in Planck time, the particles located at far side of the black hole must have traveled faster than speed of light. There is only one convincing answer to this, and only one possible answer: The speed of light inside the black hole must be faster than speed of light in our universe.

To find the speed of light inside a black hole we can use equation for acceleration:

$$a = \frac{\nabla V}{T}$$

a: acceleration

T: time

∇V : change of velocity

As I showed before, the gravitational constant is in fact the acceleration of speed of light (which we perceive as deceleration because as time accelerates, light will seem decelerating):

$$G = \frac{C_2 - C_1}{10T}$$

$$C_2 = TGC_1$$

$$G = \frac{C(TG - 1)}{T}$$

$$TG = 6.67 \times 10^{-11} \times 4.3 \times 10^{17} = 2.9 \times 10^7$$

$$TG = 0.1C$$

$$G = \frac{C}{10T}$$

As I explained in details in other chapters, once speed of time accelerates, passage of time slows down with the same ratio, so the final speed of time for observer would be square of passage of time. Therefore, to find the ratio we need to use the find the square of the coefficient (10) that we found for speed of light:

$$G = \frac{V_{T2} - V_{T1}}{\nabla T}$$

$$\Delta T = (10)^2 T$$

$$G = \frac{V_T}{100T} \times GF$$

G : gravitational constant

V_T : speed of time

GF : Growth Factor

T : duration of time

In above equation, GF is what I am calling the Growth Factor. The definition of Growth Factor is the following: Growth factor is the ratio of universe mass that has already developed that is equal to the ratio of universe that is passed so far. I already calculated that universe is going to last for 14.4 billion years and it is now 13.8 billion years old. Therefore, we can easily find the GF:

$$GF = \frac{13.8}{14.4} = 0.95$$

This means the GF at present is 0.95 and this is why most calculations in Origami Model need to be multiply by 0.95 to give us the accurate result. For example, when we are calculating G :

$$G = \frac{C}{10T} \times 0.95$$

We can now drive a new equation:

$$\frac{\sqrt{C}}{\sqrt{C'}} = \frac{G'}{G}$$

This means inside the black hole speed of light (C') can be calculated and the value of G will be also different inside the black hole and so is the speed of time:

$$\frac{C'}{T} = \frac{C}{T'}$$

$$R = \frac{\pi}{\alpha} CT$$

$$4.39 \times 10^{26} = \frac{3.14}{\alpha} \times 3 \times 10^8 \times 4.35 \times 10^{17}$$

$$\alpha = 0.95 = GF$$

$$\frac{\pi}{0.95} = 3.3$$

$$R = 3.3CT$$

$$R' = 3.3 C'T'$$

$$\frac{C'}{T} = \frac{C}{T'}$$

$$C'T' = CT$$

$$R = R'$$

$$R' = 4.3 \times 10^{26}m$$

R' : radius of black hole

R : radius of universe

This gives us an extraordinary result. The last equation is actually demonstrating that the speed of light and the value of gravitational constant are different inside a black hole and their variation is in a format that keeps the radius of the black hole equal to the radius of the mother black hole= universe. This means all the black holes in universe, including the naked and the shelled

ones, are all in fact various extensions of the mother hole and they are all connected to the mother hole and so all black holes are connected to each other. As I showed in another chapter that the black hole (gravity) is in fact the order and the direction of time, the consciousness is nothing but the black hole (gravity) in our body that is in every particle of our body. This means our consciousness is connected to everybody else and to every particle and finally to the mother black hole of the universe.

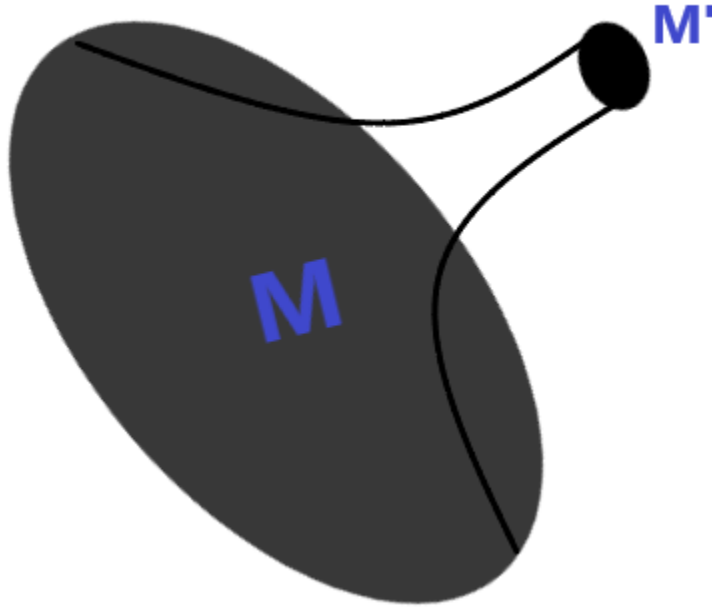


Figure 3. Mother black hole (M) and its extension black hole (M')

$$\frac{C'}{4.3 \times 10^{17}} = \frac{3 \times 10^8}{T'}$$

$$C'T' = CT = 1.3 \times 10^{26}$$

$$\frac{\sqrt{G'}}{\sqrt{G}} = \frac{C'}{C}$$

When star contracts to a black hole, the rate of its contraction depends on its mass and speed of light:

$$\frac{R_s}{R} = \frac{2MG}{C^2} : 2CT : (GF)^2$$

$$F_G = 0.95$$

$$R = R_s C' G' \times 1.8$$

Now, based on this new equation we can find out the speed of light in any black hole in our universe. For the smallest possible black hole with mass of $7.6 \times 10^{30} kg$, we will arrive at:

$$4.3 \times 10^{26} = 1.12 \times 10^4 \times 2.3 \times C' G'$$

$$C' G' = 9 \times 10^{22}$$

$$C' = \frac{8.9 \times 10^{22}}{G'}$$

When we plug this in previous equation we will have:

$$G' \sqrt{G'} = \frac{8.9 \times 10^{22} \times 8.1 \times 10^{-6}}{3 \times 10^8}$$

$$G' = 1.3 \times 10^6$$

This can give us the speed of light in the smallest black hole:

$$C' G' = 8.9 \times 10^{22}$$

$$C' = 8.9 \times 10^{16}$$

Now we can find the life span of the star:

$$C' = 10 G' T'$$

$$T' = \frac{9 \times 10^{16}}{10^5}$$

$$T = 9 \times 10^9 s$$

As we see, the smaller the radius of the black hole, the larger the value of G' in that black hole and therefore, the faster the speed of light in that black hole will be, and therefore the universe inside the black hole (miniverse) will explode as supernova earlier and the naked black hole will appear earlier than bigger black holes. This means as time progresses, larger and larger black holes will appear and the first black hole appearing in universe was the smallest ones. In other words, the T' which is the time from the birth of star till the moment it burst into a black hole will be shorter. Therefore, because smallest naked black hole has a mass of almost four solar masses ($7.6 \times 10^{30} kg$) as we calculated speed of light in this black hole is equal to the square of our speed of light and universe cannot have any naked black hole smaller than this because in that case speed of light in the black hole will be above the square of speed of light in our universe which means *the effects will happen before the cause*, the world inside such black hole will travel to its past. This tells us another crucial fact about our universe:

“Time travel is possible only by entering a black hole and it will take us to future, with no return to present because time traveling to past is not possible.

This means that traveling to past is not possible in our universe, but travel to future is possible, and once we travel to future, we will not be able to come back. This means if we go inside a black hole or to the polar gate of a perfect sphere, we will be taken to future and we will never be seen again until the time reaches the point in future that we are in.

As I calculated Growth Factor before to be 95%, it clearly means that our universe has reached to 95% of its growth, in other word there is only 700 million years left for our universe to end. At that point our universe will be expanded enough to reach the event horizon of its mother black hole and it will exit to a new universe. This exit as I have shown in star and white hole mechanism, will be as photons because by the time we reach the event horizon we will be accelerated to near speed of light. Every single photon then will carry the information from our universe to the new one. Our exit from this mother black hole to the new one will be like a time travel to future, and once we are developed eventually in the new universe will have our current time as our memory of past in our consciousness. According to my calculations, our universe is

the second one and there are another five universes to go before the photons (Origamons) start to decay and we reach our final growth. This explains why we have memory of our past and in ancient times some people had incredible knowledge about the cosmos and universe without having any advanced technology, because they were somehow able to remember.

To finish this chapter, I would like to extract one last equation. I showed that gravitational constant is in fact the acceleration of speed of light:

$$G = \frac{C}{10T}$$

We can easily rewrite the equation as the following:

$$6.67 \times 10^{-11} \times 10 \times 4.3 \times 10^{17} = C$$

$$6.667 \times 10^{-10} \times T = C$$

$$T = 5C^2$$

This means the life of our universe is five times speed of light squared. Note that this equation is only correct for our universe and if we want to find the duration of life for the universes inside the black holes we have to use : $T = \frac{C}{10G}$ for the black hole and C and G and T in that black hole will be all different.

Once we put the speed of light in the new equation, it gives us 14.4 billion years which again means in 700 million years our current universe will reach the end of its journey and it enters the new mother black hole that is much larger. Over there, based on my previous equations, speed of light will be faster (note that speed of light will seem slower to observers inside the universe), therefore the life of the next universe will be shorter but the radius of it will be larger because the radius of its mother black hole is larger.

According to these equations, as the mother black hole of next universe is bigger, therefore the value of gravitational constant in that universe will be lower so the speed of light will be faster and the black holes in it will be larger. This means the number of black holes compared to the older universe will be less but their radius will be larger and the speed of light in them will be slower. This means each time that universe ends and enters the new mother black hole, the number of black holes reduces by a factor of 10^4 (I have already calculated this), and in 7th cycle, the total number of black holes will reach only 12 black holes. As each black hole contains a universe, this means during each transfer to new mother black hole, the universes merge into larger ones until at the final universe there will be only 12 universes emerging from 12 super black holes.

Stars and White Holes

In the chapter about the Course of Universe I explained and calculated that in each universe there are increasing number of black holes that will eventually reach its maximum that is equal to the CQC (cosmic quantization constant) of that universe. I also mentioned that with exactly the same mechanism that our universe is growing inside its Mother Black Hole, there is a miniverse growing inside each naked black hole of our universe. I also demonstrated mathematically that smaller the naked black hole, smaller gravitational constant in it and so shorter the life of the miniverse inside the black hole. This is how we found that first smallest black hole emptied its contents (miniverse) at a billion years from the Big Bang and this is how we found the answer to the source of energy at the beginning of universe to produce stars and galaxies. According to Origami Theory, black holes are the only source of energy and gravity in universe. They first appear as a star that produces energy for millions of years and then they finish by a gamma burst or supernova that spues the last large part of their miniverse and then stay as the naked black hole, continuing to convert mass of neutrino matrix to energy. In my theory, the e same mechanism produces the Ignition, Big Bang, stars and gamma bursts/supernovae: These are all white holes by definition. Every star in universe is a white hole.

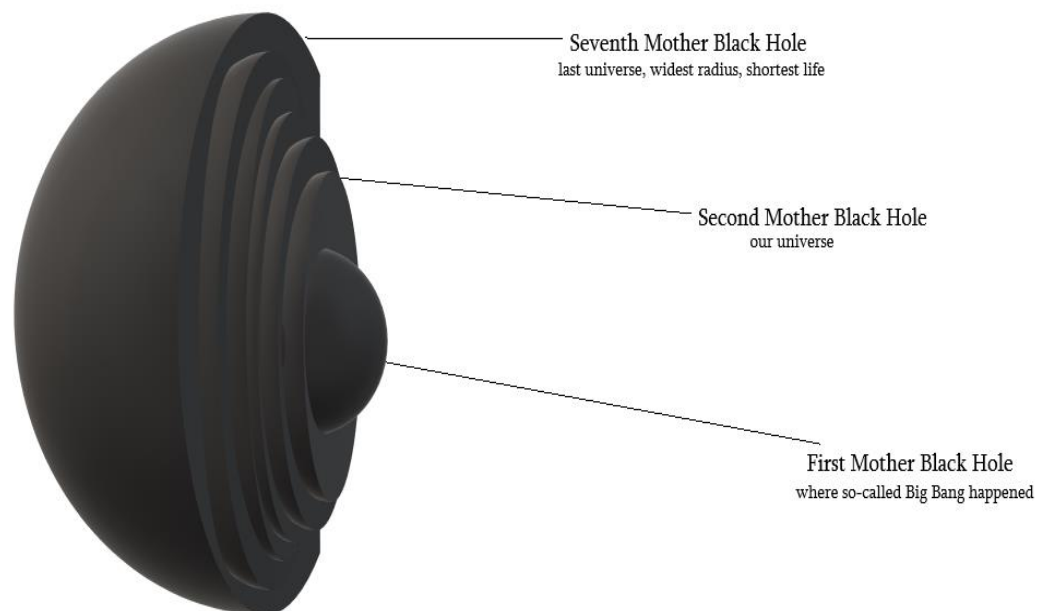


Figure 1. The seven mother black holes, inside each one a universe develops

In previous chapter I showed that number of black holes reduce in each universe compared to the previous one:

CQC in first universe = final number of black holes: 10.3×10^{27}

CQC in second universe (our universe) = final number of black holes: 6×10^{23}

CQC in third universe = final number of black holes: 2.7×10^{19}

CQC in fourth universe = final number of black holes: 1×10^{15}

CQC in fifth universe = final number of black holes: 2.8×10^{10}

CQC in sixth universe = final number of black holes: 6.5×10^5

CQC in seventh universe = final number of black holes: 12

This means the number of stars produced in next universe will drop too because every black hole in this universe, will produce a star in the next universe. Our entire universe will produce the Big Bang of the next universe. This means there was 10.3×10^{27} black holes in first universe but there will be only finally 6×10^{23} black holes in our universe. Therefore, the rest of the black holes that have arrived from the first universe will stay as stars ($10.4 \times 10^{27} - 6 \times 10^{23} = 10^{26}$ stars) and they will never reach to the critical radius to explode and drop their mass and leave behind their central black hole. This means we can predict the total number of stars in our universe when it reaches its maximum size in 700 million years will be around 10^{26} , and considering the rate of growth of universe, this means at present there must be close to 10^{25} stars in our universe. Now, let's see how this transition from black hole to star and vice versa occurs.

As I described, in our universe the exosphere which is the outmost layer of our universe is almost purely made of antineutrinos that are repelled by black holes to furthest part of our universe. This is why we hardly find any antimatter around us. According to my calculations in previous chapters, this layer has already reached the radius of the Mother Black Hole and it has started exiting the Mother Black Hole. The exit of antimatter layer will take millions of years and during this time, the Mother Black Hole will manifest as the Big Bang of the third universe. Technically there is absolutely no difference between the Big Bang and a star other than their size. When the antimatter layer eventually finishes, the matter layer of our universe will start exiting the mother black hole. However, the exit of the matter layer will happen so violently and it takes place in only few seconds to hours and it will be observed as a massive short gamma burst or supernova in the third universe. Now, let's analyze the exit of the antimatter layer first. Every single antineutrino when enters the new universe, will annihilate a neutrino in neutrino matrix of the new universe, therefore in exactly a mechanism opposite of what I showed at Big Bang, a hole of vacuum will be created in the fabric of neutrino matrix which will keep expanding for million od years. Below Pictures demonstrate this process.

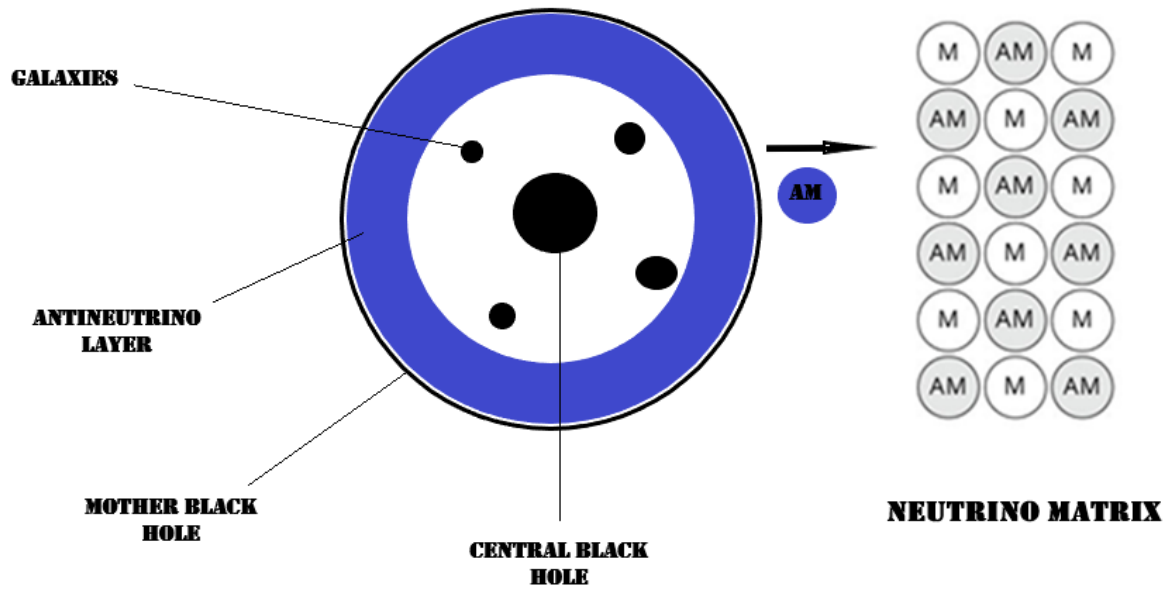


Figure 2. The exit of antineutrinos from our Exosphere to the third universe

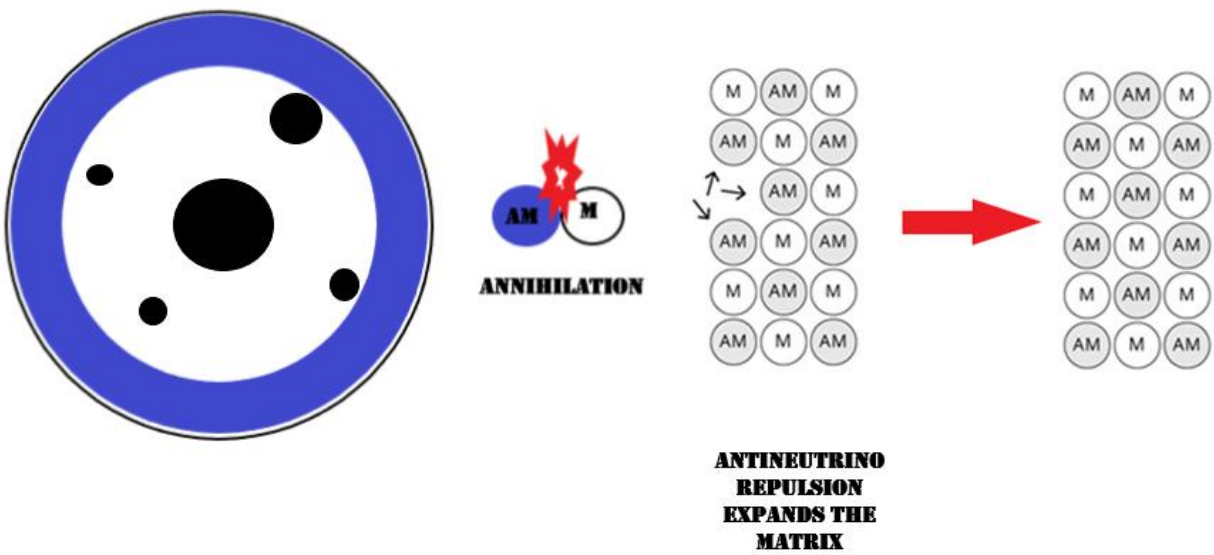


Figure 3. Annihilation of neutrino-antineutrino and creation of a black hole in third universe

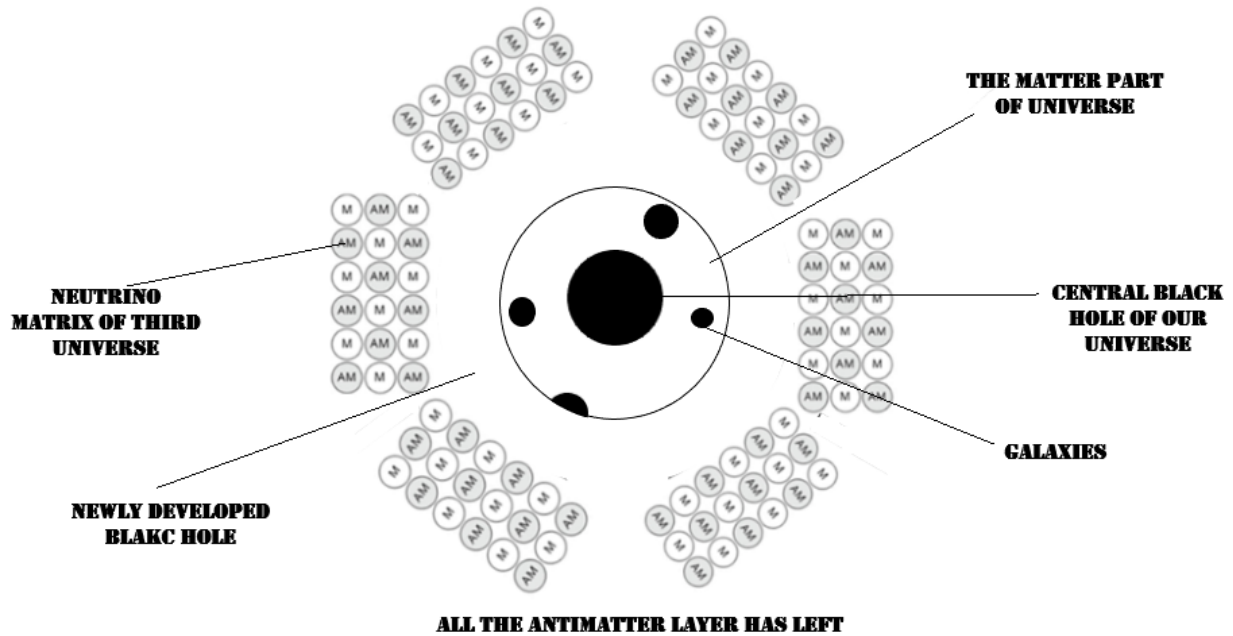


Figure 4. The antimatter layer is finished and now the matter layer (galaxies) start to exit

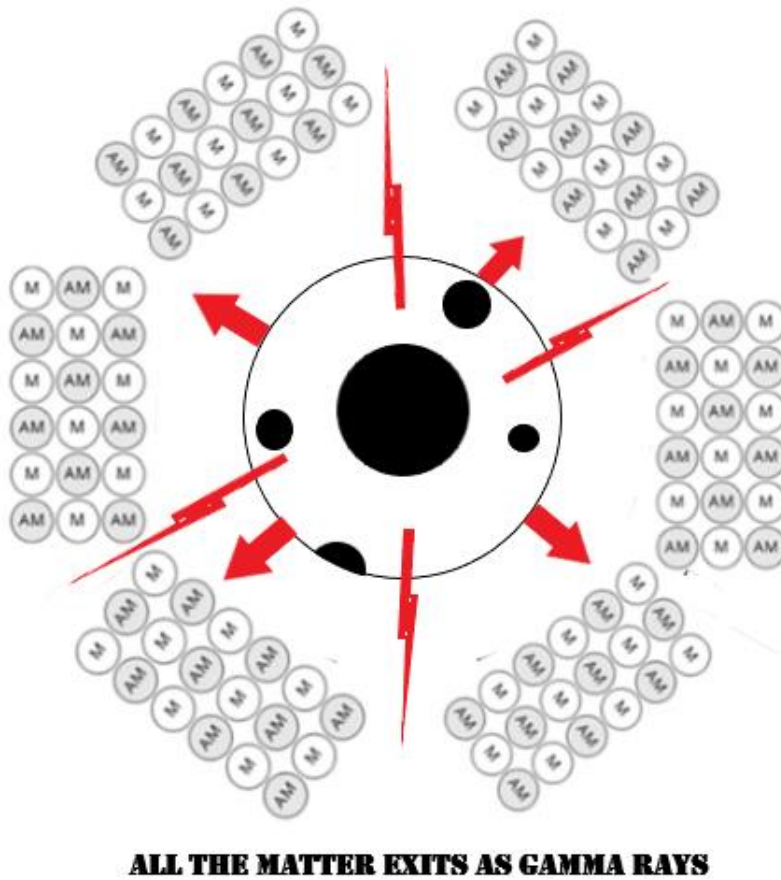
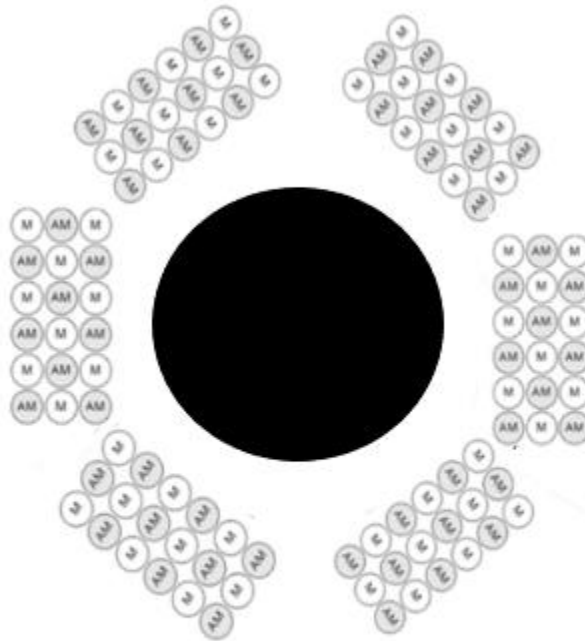


Figure 5. Exit of matter layer as a gigantic gamma burst/supernova



CENTRAL BLACK HOLE WILL BE LEFT

Figure 6. The central black hole is left as naked black hole in new universe

Before going to the details of this process I would like to mention the definition of white holes. “In general relativity, a white hole is a hypothetical region of space-time and singularity which cannot be entered from the outside, although energy-matter and light can escape from it.” . There is still inconclusive evidence about the existence of the white holes but at least one gamma burst in 2006 has been the most mysterious event in sky that most scientists agree that it could be truly a white hole. This was the gamma burst 2006 GRB 060614 that has been documented as the first observance of a white hole.

This definition tells us that a white hole is in fact the opposite form of a black hole. Most modern physicists still deny the existence of white holes but more and more scientists have been mentioning them and considering that white hole must exist, at least to resolve the information paradox caused by Hawking Radiation: According to Hawking everything that crosses the event horizon of a black hole will be eventually annihilated which obviously violates the law of conservation of information, so if we believe there is a white hole that spue all the matter and energy out back to the universe the problem will be solved. But there is another conflict here: White holes if exist, in modern cosmological model, they will be violating the laws of thermodynamics because they are not connected to the black holes and they are a certain point in space that appears and produces large amount of mass and energy and then disappears, which is clearly the violation of thermodynamics laws. However, Origami Model resolves both

issues effortlessly because in this theory, star is in fact a white hole and what is coming out of it, is the export of the previous universe into the new universe and if we consider the laws of thermodynamics in one universe, it will violate them but as I explained in a separate chapter about the laws of thermodynamics, we need to consider the entire cosmos (all seven universes). The laws of thermodynamics are for a closed system but Origami Model shows clearly that there are seven universes that are interconnected and information (mass and energy) is transferred from previous ones to next ones, and also inside every universe there are millions of miniverses which will act the same way. Based on this explanation every star in universe is a white hole that acts like a portal through which mass and energy from previous universe enters the current universe and when eventually it bursts as a supernova or gamma burst, it will end its export and shut its portal and leaves a small black hole in its place which is the black hole remaining from the previous universe. Origami Model believes that Big Bang and every star are white holes which is formed when a black hole exports its constituent galaxy and antimatter into new space before it appears as a naked black hole again in the new space. This means at the center of every star there is a black hole and star is in fact a worm hole, where black hole and white hole meet. According to the modern cosmology a worm hole can not exist unless there is large amount of antimatter present and this is exactly what Origami Model demonstrates. A star exists as long as the antimatter layer of the miniverse is exiting the black hole and then when the matter layer starts exiting, it manifests itself as a gamma burst or supernova and then at last the central black hole of that miniverse will appear as the new naked black hole. As I explained in previous chapters for a nucleus of atom or a star with central black hole, it must reach a critical radius to explode, shed its shell and become a naked black hole, and we will see now this is why some stars in our universe will never explode into a naked black hole and this is why the total number of naked black holes in our universe will be always less than the previous universe.

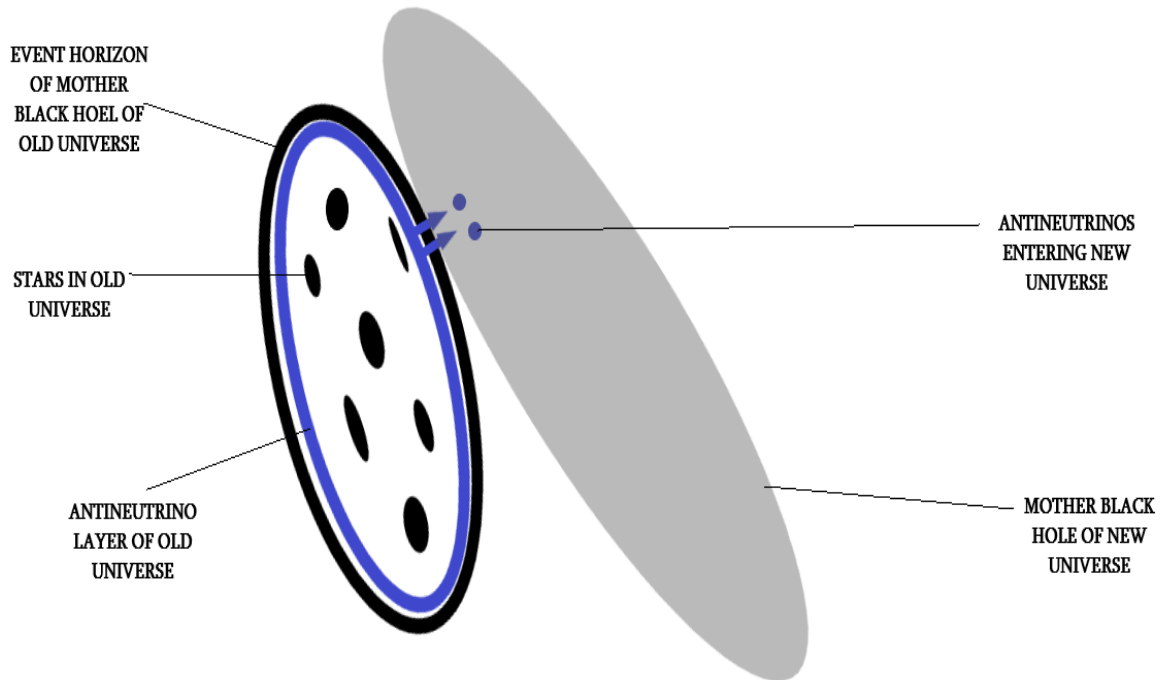


Figure 7. How antimatter of older universe enters the new universe, producing new black holes, which become the cores of new stars

This reduction of black holes reduces the total gravity and because gravity is deceleration of time, this causes the acceleration of time (G =gravitational constant) of the next universe to increase. This is again what we perceive as increasing entropy.

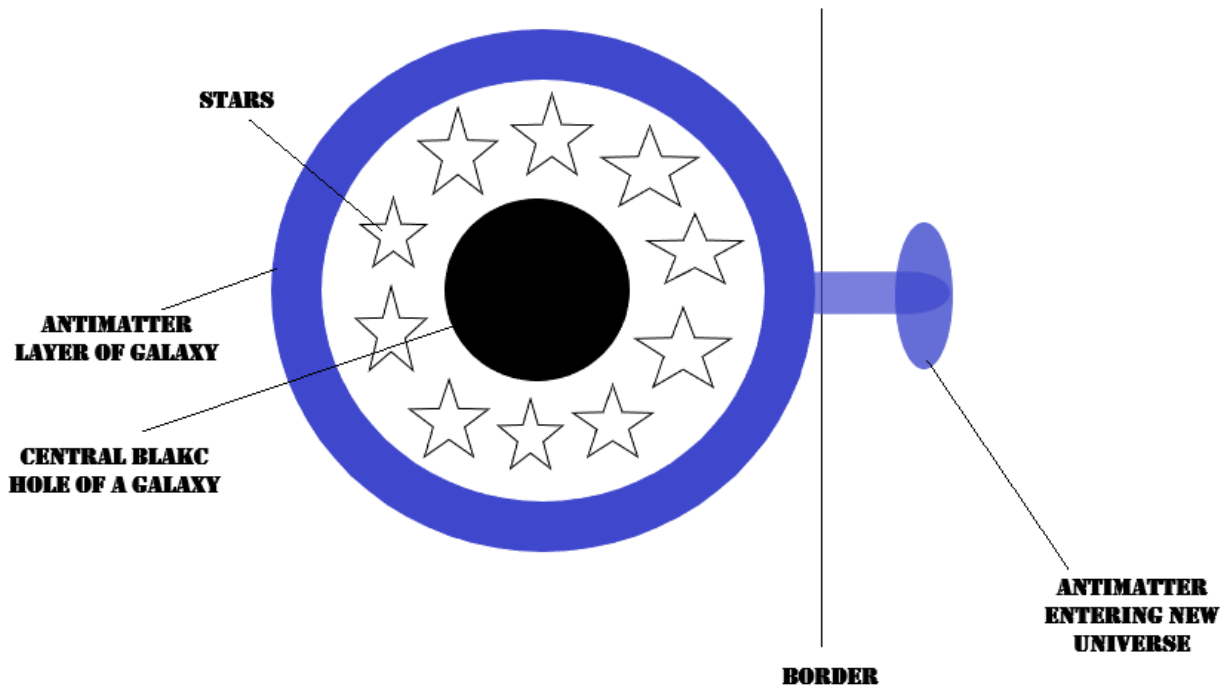


Figure 8. How a galaxy and its central black hole enter a new universe as a star

In above picture, the border between the two universes is the event horizon of the mother black hole of the first universe. As I explained earlier in dark energy chapter, the central black hole of a galaxy pushes the antimatter towards the outmost part of the galaxy and therefore, surrounding every galaxy there is a layer of antineutrinos and surrounding the entire universe there is a massive layer of antineutrinos.

We can easily calculate that half of the total antimatter of our universe would be in outer layer of universe (exosphere) and the other half of it would be around the individual galaxies. Obviously, the total amount of antimatter is equal to the total mass of matter: $9 \times 10^{53} kg$. This means the total mass of antimatter around each galaxy would be equal to the equivalent mass of its central black hole and the other half of it would join the exosphere of the universe.

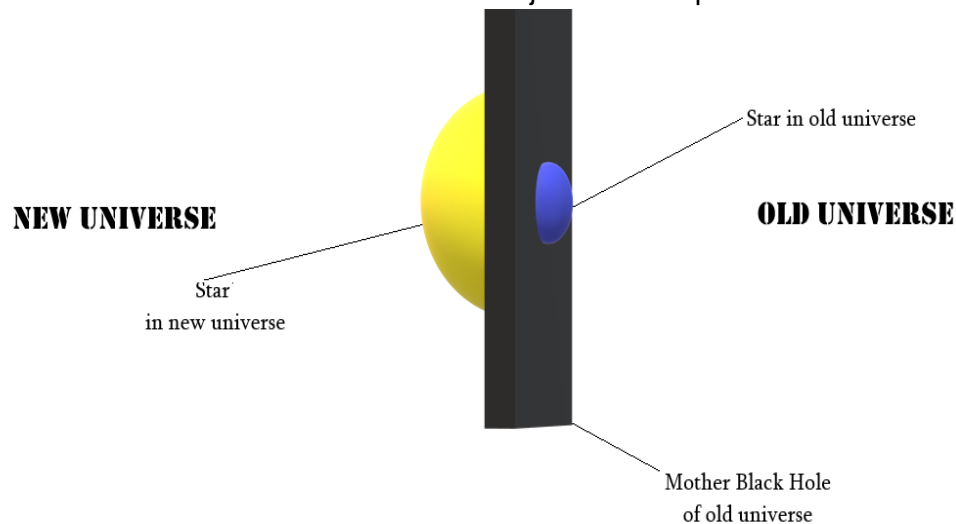


Figure 9. How matter (stars) in older universe come through the new universe as photons, creating stars in new universe

In my model of our universe we can see that while total layer of antimatter exits the Mother Black Hole, it will be observed as the Big Bang (technically a tsar) in the next (third) universe and when the matter layer of our universe (galaxies) reaches the event horizon of the Mother Black Hole, they will reach the speed of light and enter the new universe with extreme velocity as powerful photons with their maximum quantum entrapment (maximum frequency).

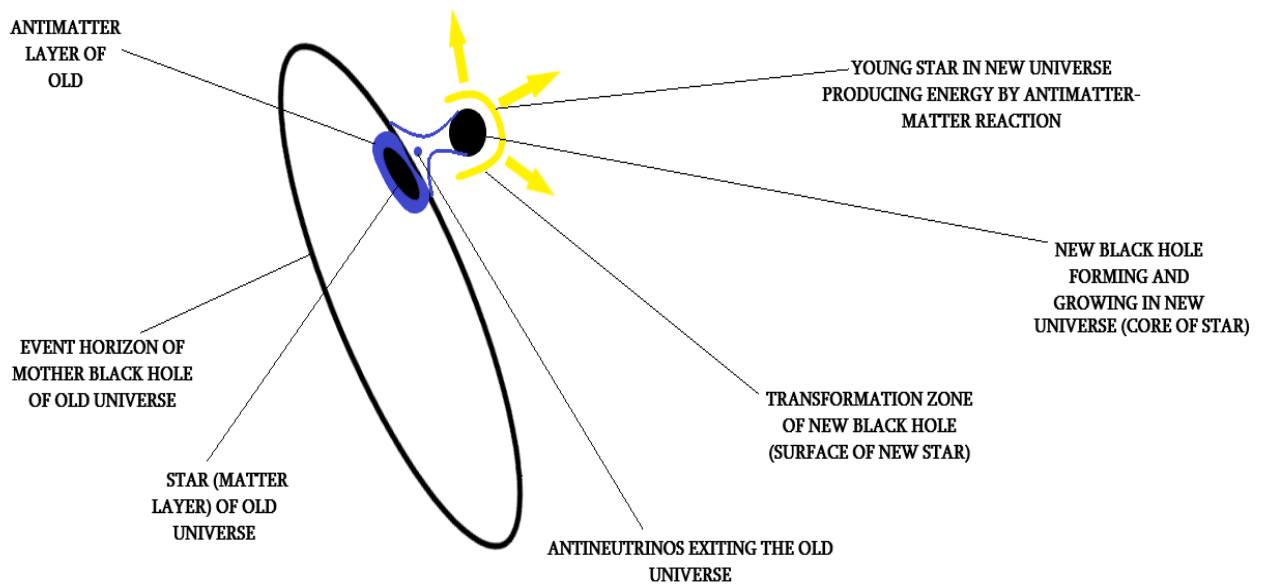


Figure 7. antimatter exiting our universe into new universe creating a new star

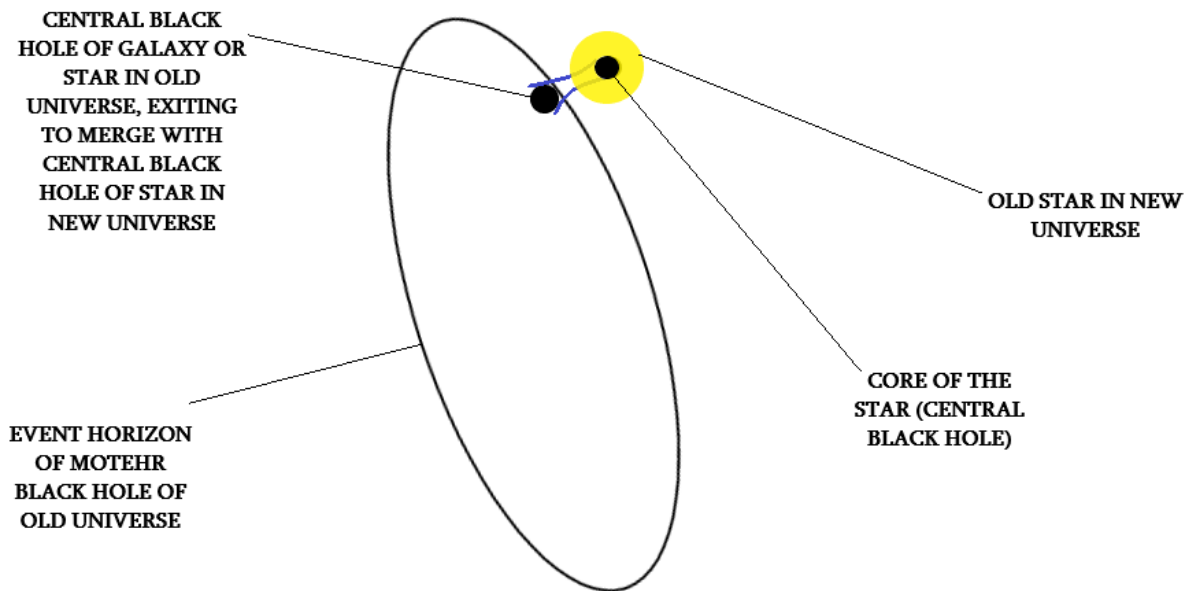


Figure 8. Central black hole of previous universe entering the new universe

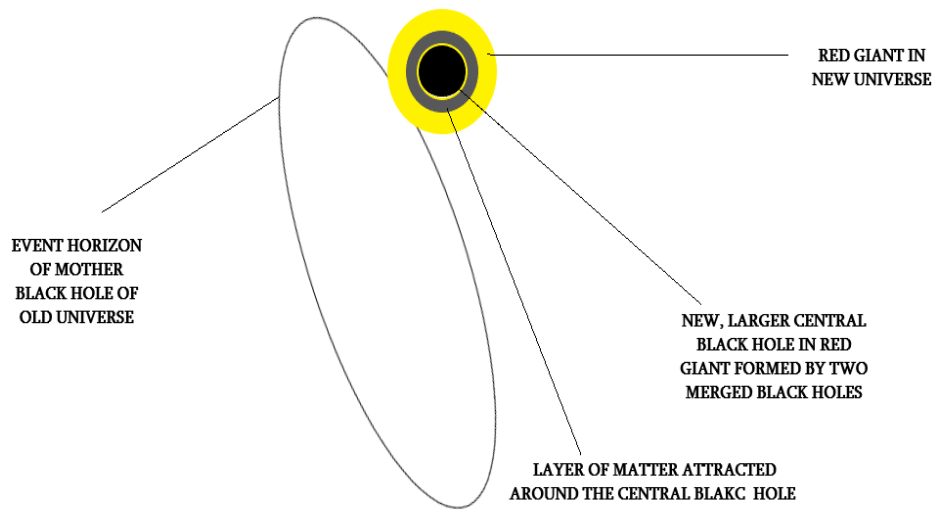


Figure 9. The old star now has central black hole that is too big

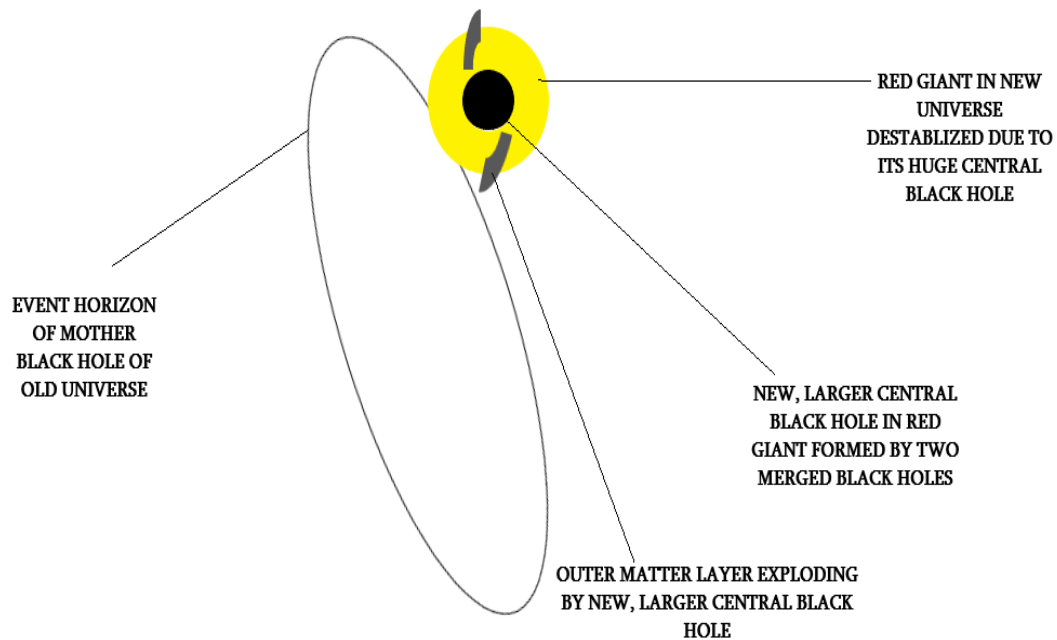


Figure 10. The red giant is going to explode as supernova/gamma burst

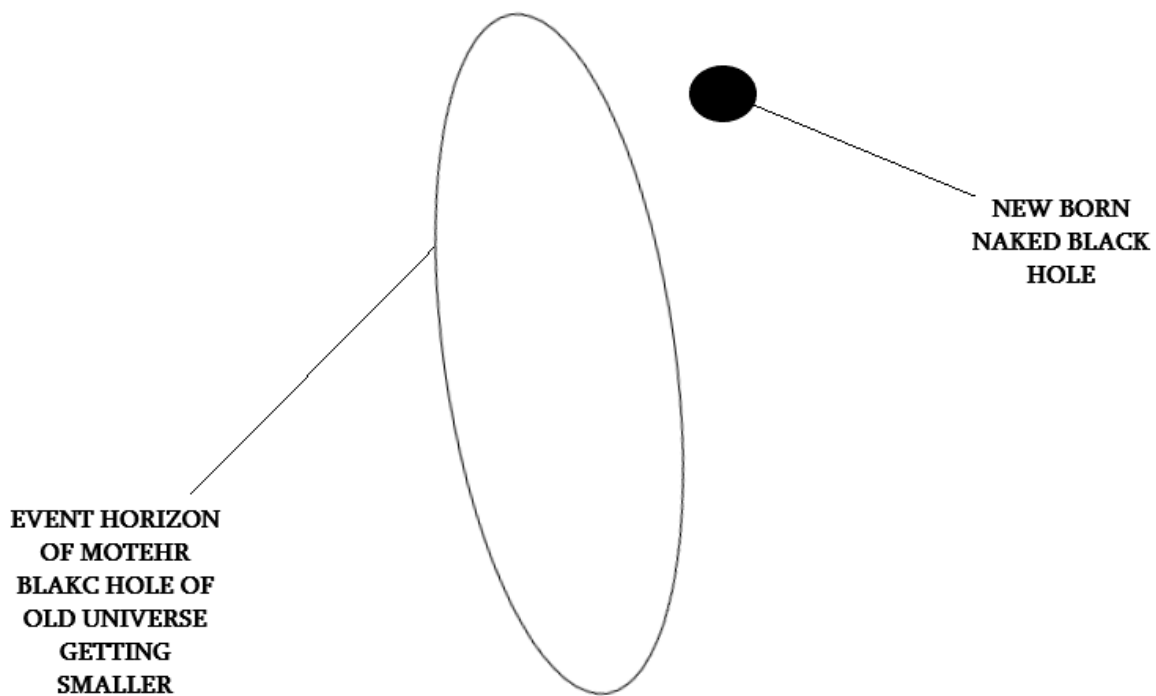


Figure 11. The central black hole of star is left behind from the star explosion

This maximum frequency as I explained in previous chapters, is equal to the Cosmic Quantization Coefficient of the new universe and it will continue to reduce constantly, keeping entropy increasing. This is exactly what happened to our own universe at Big Bang. In Origami Model , Big Bang is nothing but the largest white hole of our own universe, the portal of the first universe through which mass and energy entered our own universe. When the last part of mass enters the new universe, the central black hole of previous universe will finally reach the newly developed black hole in the new universe and fills it, so the central black hole of our universe will become the central black hole of the new universe, but much larger, due to a phenomenon that I am going to explain.

This mechanism takes place for all the stars in our universe, they are white holes importing the mass and energy from previous universe and when they finish with a gamma burst or supernova, they will leave a black hole which is slightly larger than the central black hole of the galaxy that had exited in the previous universe into our universe. Now we can calculate the size of mother black holes and central black holes of all seven universes. We already found the size of the mother black hole and central black hole of our own universe.

According to Origami Model every star is a white hole.

Based on the Standard Model of Sun, nuclear fusion is the source of energy in our sun. Based on this model: The gravity creates so much pressure in the core of the sun that reaches its temperature to almost 15 million centigrade degrees. But for nuclear fusion to happen we need

100 million degrees of heat or more. So, to solve the problem in this model the scientists have used the quantum tunneling phenomenon.

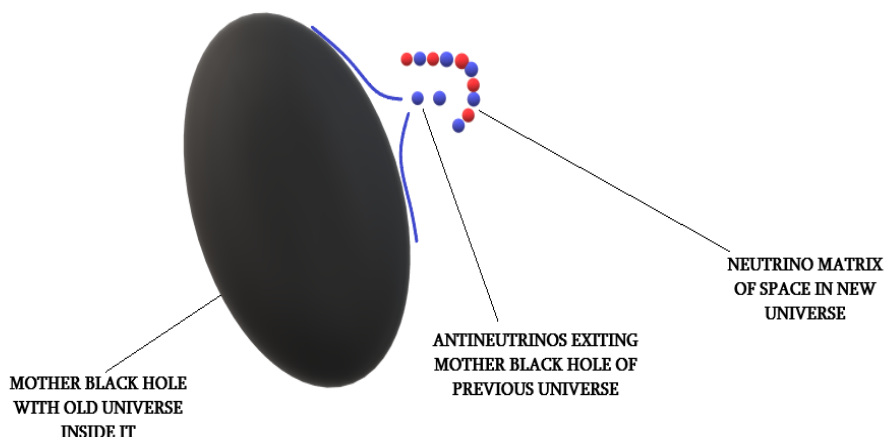


Figure 12. New black hole shaping in new universe

According to the current model of cosmology, the definition of star is a celestial body that has nuclear fusion happening in its core. This fusion in smaller stars is usually converting hydrogen to helium (P-P fusion) but in larger stars heavier atoms are used in Carbon Nitrogen cycle (CNO fusion) to produce the energy. We know that for our sun to produce the energy that it is producing, there must be 10^{38} fusion reactions taking place every second. Between every two protons there is 50 pounds of force that is separating them apart due to their positive electrical charge that repel each other. This is a gigantic amount of force at these nuclear distances. This is why when we try to experiment nuclear fusion between protons on earth, we have to produce hundreds of millions of degrees heat to create a chance for two protons to bump into each other and cause fusion. Such temperature does not exist in the core of the sun at all. Therefore, the current model has convinced the world that sun does the nuclear fusion by using the probabilities in quantum mechanics. By mass, sun is 71% hydrogen, 27% helium and 2% other elements. By particle count though, sun is 91% hydrogen, 8% helium and less than 1% other elements. This gives it around 10^{57} protons in the sun, however only the protons in the core can fuse. The core of the sun has around 12% of the total sun's protons which means almost 10^{56} protons. Their calculations say that chance of two protons to quantum tunnel in the core of the sun at temperature of 15 million degrees is 10^{28} and due to the huge number of protons present in the core, there is enough chance for fusion reactions to occur at rate of 10^{38} reactions per second, only based on the accidental quantum tunneling of some protons that will cause them to bump into each other and get so close that strong nuclear force will take hold and fuse them together.

In this modern cosmology model, they believe when a star explodes, its core condenses as a black hole. But as I explained in previous chapters, there are numerous fundamental conflicts in this model. One obvious paradox is that if you calculate the density of a black hole based on its

mass divided by its volume, in smallest black holes that have a mass of only few solar masses, the density of matter will become meaningless: A small black hole with mass of slightly higher than 3 solar masses will have a Schwarzschild radius of 9 kilometer so its density will be $2 \times 10^{15} \text{ g/cm}^3$, and this means the distance between the particles has to be near $2.5 \times 10^{-40} \text{ m}$. This distance is much less than Planck Length! This means technically all the atoms inside the mass have broken down to their elementary particles and they got packed next to each other at a length that is even shorter than the Planck Length! This is not only impossible; it also means that technically there is no particles in the black hole, which is my theory. On the other hand, in very large black holes with masses billions of solar masses, the density of matter will be close to 10^{-22} g/cm^3 which is equal to the density of interstellar gas, basically billion billion times less than the density of earth atmosphere! We know that in current model, core of star has to reach its maximum density to turn into a black hole, so this means the core of star must have had a density of much less than 10^{-25} g/cm^3 in first place. This is in fact what Origami Model is saying: the core of star is an empty black hole that is massless.

As I shown already, there is a black hole at the center of every star, just like the central black hole of elementary particles. When star reaches the critical radius (when the ratio of R to CGR becomes less than 1.6×10^{-7}), star explodes and leaves its central black hole behind which has no mass inside it, again exactly the same way that a particle decays. Origami Model states that the gamma burst or supernova that occurs at the end of the life of a star is the last part of the mass inside the previous universe that leaves the mother black hole and enters the new universe. The explosion leaves the central black hole behind.

Current Model of Star Formation

In current astrophysics, the accepted model of star formation is based on *pressure equilibrium*. This means a cloud of gas in space starts to compress under its own gravitational force, and as it compresses more and more, its central temperature rises. The heating of the gas at the center of this cloud, increases the pressure of the gas at its center until central pressure becomes equal to gravitational compression and this is when star becomes stable. When such equilibrium is established, the temperature of the core of the star is so high that it triggers the nuclear fusion via quantum tunneling.

Now let's check the mathematical explanation of this model. The gravitational force in the self-compacting gas is calculated as this: we divide the star (compacting gas) into two equal masses, one inside the other one:

$$\text{Total gravity inside star} = \frac{GM_1M_2}{r^2}$$

$M_1 = M_2$: halves of the star mass

$$G_F = \frac{GM^2}{r^2}$$

G_F : gravitational force inside the star

Pressure inside the star is equal to the force per area. $P_F = \frac{F}{A}$

$$A = R^2$$

If pressure force is equal to gravitational force so:

$$\frac{GM^2}{R^2} = P_F \times R^2$$

$$P_F = \frac{GM^2}{R^4}$$

Now we use the *Ideal Gas Law* and its equation for temperature-pressure:

$$P_F = nKT$$

n : density of ideal gas

K : Boltzmann constant

T : temperature

However, this equation is only designed for an ideal gas, while sun is far from an ideal gas, nevertheless it has been used because it gives us satisfactory results! We know that density is mass per volume:

$$n = \frac{M/m}{V}$$

$$V = R^3$$

M : mass of star

m : mass of every atom in star

R : radius of star

So, we arrive at:

$$T = \frac{GMm}{KR}$$

For “ m ” in this equation they use the mass of hydrogen nucleus, most abundant atom in sun, so m is equal to mass of a proton. “ M ” is mass of star, K is Boltzmann constant, R is radius of star and T is temperature of core of star in Kelvin. This is the current astrophysical model of stars which tells us there must be a huge temperature in the core of stars. But there are terrible, multiple major flaws in this model:

- 1- Stars are not ideal gasses, so we cannot use the equation for temperature-Boltzmann for stars.
- 2- Mass of sun cannot be divided into two masses applying gravity on each other because if that is the case, every mass can do the same and just collapse into itself and create huge temperature in its core. This means any mass will create an extraordinarily hot core at its center just due to the gravity, without any force or energy being applied to it! This is very obviously violating the laws of thermodynamics.
- 3- The other major problem is pressure: stars are gas, so there is no surface (A) in them to have pressure. The equation for pressure is only working in a *closed system* when there is gas pressing on a *surface*. However, star is an open system and has no real surface. If there is surface then it is not a gas.
- 4- Sun and all stars have a tremendous magnetic field that no theory so far has been successful to explain how this is produced because according to this model there is millions of degrees temperature in the core and there is convection currents so no

proper current and dynamo mechanism would work in this environment to produce such magnetic moment.

- 5- Why is corona 10 million degree hot but temperature of the photosphere is only around 4 to 5 degrees? What makes corona so hot? Coming from the core to the surface the temperature must go from hot to cold, but it is not.
- 6- What makes the glitches in stars' rotational velocity? Why are their rotational velocity reducing in unpredictable step format instead of steady format?
- 7- Why is maximum light in photosphere but maximum heat of star comes from its corona?
- 8- Why is star cycle related to the minimum star activity? For example, when suns magnetic poles rotate, its activity reduces to its minimum, why? In the current model there is no connection between the heat and luminosity of star and its magnetism.
- 9- If the current model is correct and a cloud of gas becomes more and more compact under its own gravitational force until its core temperature reaches million of degrees to trigger nuclear fusion, why Brown Dwarfs fail? What stops their contraction at some stage?
- 10- What causes star's mysterious, powerful magnetic field to reverse every few years, with such precise evolution?
- 11- What is the origin of the stellar mass spectrum? That is, why do astronauts observe the same distribution of stellar masses (the initial mass function) apparently regardless of the initial conditions?
- 12- Helioseismology shows that below the convection zone, sun rotates exactly like a solid body, such as a bowling ball. But how is this possible if sun is gas?
- 13- There is no direct evidence that core of sun is 15 million degree hot or nuclear fusion is really taking place in it. We create this temperature to establish the pressure equilibrium so sun doesn't collapse under its own gravitational force and to somehow trigger nuclear fusion by quantum tunneling because 15 million degree is still very lower than what is needed for nuclear fusion to take place. In every experiment on earth, the temperature has to be above 100 million degrees to trigger nuclear fusion and we have no evidence that quantum tunneling is really happening in the core of the stars and making nuclear fusion possible for them.
- 14- Based on this model, a mass of gas contracts under its own gravitational force until it heats up its core so much that the pressure in its core becomes equal to the gravitational collapse force and equilibrium is established. This is open violation of thermodynamic laws because it means any mass eventually produces heat at its center without any external force. This is obviously against laws of entropy too because in this model, the entire universe is evolving towards more compaction and more density. All the evidence

demonstrates that universe is continuously evolving towards lower mass density and lower energy density. In this model, star formation is evolution towards higher mass density and higher energy density. This will only be possible if there is external force from another universe.

- 15- A major conflict in the current model is its use of *Ideal Gas Law* and applying it to explain the high temperature of the core of star. An ideal gas by definition is an isotropic gas that does not change temperature during compression or expansion. If we are to consider heating of the gaseous core of a star, we have to apply the Joule-Thompson Effect that explains the heating of a *real gas* when it is compressed. However, Joule-Thompson effect is only correct if no heat is exchanged with the environment, while star is not an isolated system, and it constantly loses heat to space.
- 16- In the current model the final equation that is extracted from ideal gas law is supposed to give us the temperature of the gas throughout its volume, not just at its center, while star has nonuniform distribution of temperature because its density and nature is varying in each layer. Therefore, even though this model provides a high temperature that might make nuclear fusion feasible, but it is not just for the core of the star, but the entire volume of it.
- 17- There is no direct evidence that such tremendous number of protons (eg. 10^{56} *protons in the core of our sun*) exist in the core of stars to make nuclear fusion possible by quantum tunneling probabilities.
- 18- Even if we accept that such large number of protons exist in the core of stars how have they come to existence in first place? What force has produced such huge number of nuclei stripped of their total electrons available in the core of stars? If such force is there, we won't need to develop a mechanism to explain the source of energy for stars anymore.

Origami Model of Stars

The obvious flaws in the standard model of star formation in current cosmology is so disappointing that every rational mind that is even not an expert in physics will see the awful problems in it. If you leave a cloud of gas in space, it will never become a hot star that fuses billions of protons every second to produce such tremendous amount of heat and light for billions of years, automatically, just due to the gravitational attraction inside its mass! A cloud of gas in space, will definitely just scatter and become less dense, because it will evolve according to the laws of entropy. The only way for such mass to get more and more dense to such critical level that its core reaches tens of millions of degrees hot, would be applying a huge force from outside. Outside here is obviously a source from another universe.

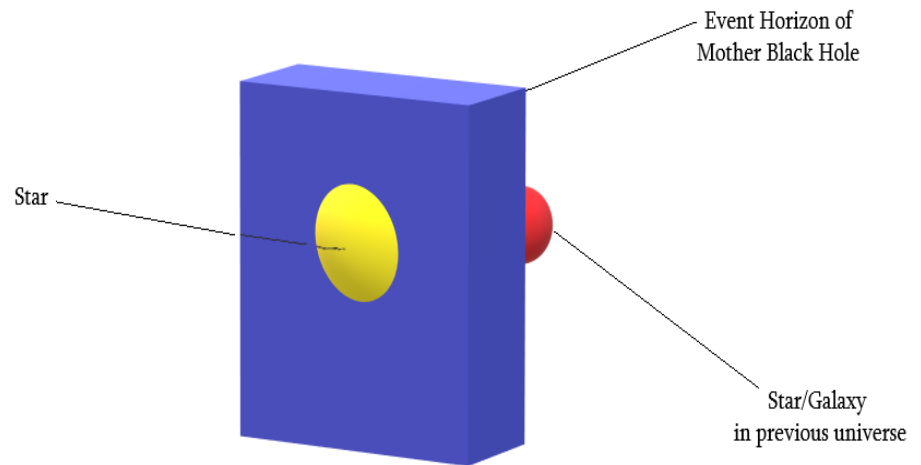


Figure 13. How star in old universe transits through the mother black hole into the new universe, creating new star

Unlike the current model of stars that contains several obvious violations of fundamental laws of physics, and it severely struggles to somehow explain the existence of stars, Origami Model presents a model of universe in which the existence of stars is inevitable. In my model, when a universe exits its mother black hole, it produces stars in the new universe, simple as that. Star is the transit point (portal) between the two universes. As I shown before, the older universe is always smaller and speed of light in it is lower than the speed of light in the new universe and the quantum entrapment (frequency of light) in the new universe is always less than the older universe. This means the kinetic energy of light in the new universe is lower than the old universe, this is why entropy moves the light to transfer from the old universe into the new universe.

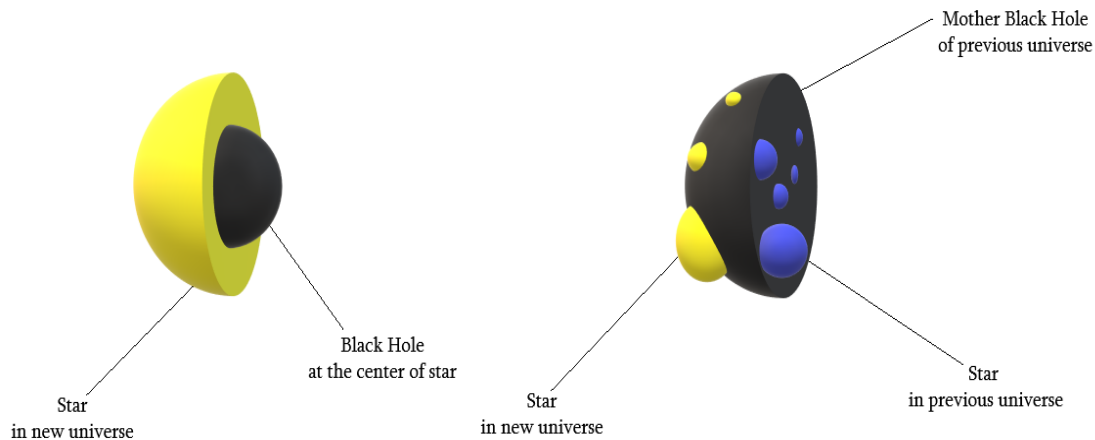


Figure 14. There is a black hole at the center of each star which is in fact the extension of the mother black hole of the previous universe through which antimatter transfers to the new universe producing energy by annihilating with matter, manifesting as star in new universe

So, based on Origami Model a star is born when the first antineutrinos enter our universe from the previous universe. The border between our universe and the previous one is the event horizon of the mother black hole of the previous universe. The border between our universe and the next universe is the event horizon of our own mother black hole. As more and more antineutrinos come into our space from the first universe, they annihilate neutrinos in the neutrino matrix of our space and produce a vacuum space, a tiny black hole that keeps growing. This central black hole attracts gas and dust in space around itself and rotates them as it spins. As the central black hole grows, more mass will accumulate around it and creates a growing star. This will take millions of years during which the central black hole and the entire star will grow and glow. As I calculated before, once a black hole reaches the critical equivalent mass of $7.6 \times 10^{30} kg$ or roughly four solar masses, it can exist as a naked black hole. I also showed that for mass to implode it needs to reach the critical ratio of $\frac{R}{CGR} \leq 1.6 \times 10^{-7}$. The mass could be atom, elementary particle, star, galaxy or entire universe, they will all follow the same rule. It will start losing its mass and implode because its central black hole is too strong for its mass. Therefore, according to Origami Theory, when the central black hole of a star equivalent to 4 solar masses or more, becomes too powerful for its small radius, the star will have to shed its shell and leave the central black hole as a naked black hole in space. As you see, during this process in fact the black hole of a universe transfers itself into the next universe and moves so much energy with it to the new universe. This simply means a star is a white hole that contains a black hole at its center and only stars that are big enough will explode as supernova and release their central black holes. The rest of stars will survive and their central black holes never gets exposed. This is how the number of black holes keeps reducing in the next universe. This model tells us that stars and galaxies and the entire universe are exactly acting like particles, and laws of physics are universal. This explains why the equations I developed earlier for unstable particles work for stars too. This model can explain all the problems that exist in the

current model as well as predicting the future of stars and also calculating the number of stars and black holes in our universe.

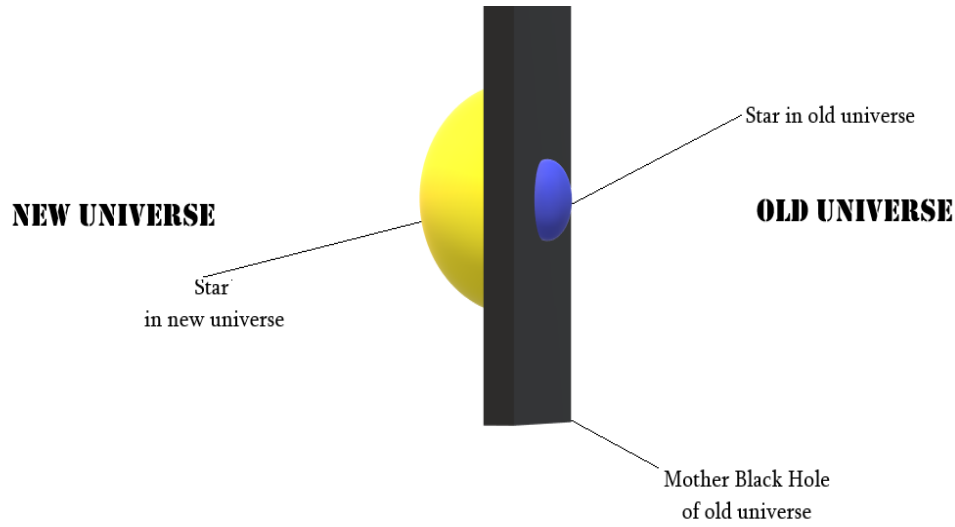


Figure 15. Mass is transferred from old universe to new universe as photons

In the chapter “Course of Universe” I calculated the detailed features of all seven universes. I showed that every universe gets larger and more massive but shorter in duration. Here I mention some important values of the first and second (our) universes:
Speed of light in first universe and second (our) universe can be calculated based on this equation:

$$C_n = \varphi^n 1.17 \times 10^8$$

C_n : speed of light in universe number n

1.17×10^8 : original speed of light in first universe

n : number of the universe (1 to 7)

φ : 1.6

Therefore, speed of light (c) at the end of the first universe = $1.8 \times 10^8 \text{ m/s}$. We know that speed of light, right now, in our universe is $2.9 \times 10^8 \text{ m/s}$, and my calculation shows that speed of light at the end of our universe will be exactly $3 \times 10^8 \text{ m/s}$.

Frequency of light at the beginning of the first universe = CQC = final number of black holes:

$$10.3 \times 10^{27}$$

Frequency of light at the beginning of the second universe = CQC = final number of black holes:

$$6 \times 10^{23}$$

As we see clearly the number of black holes reduces by a factor of 10^4 . Based on this we can easily find out how many stars will develop in our universe, how many of them will turn eventually to black holes and how many will never implode as supernovae.

I have also derived an equation that tells us the mass of a universe which is equal to the mass of mother black hole of that universe:

$$M_u = M_{MBH} = \frac{1}{\varphi^{(7-n)}} \times 10^{55}$$

M_u : mass of a universe

M_{MBH} : equivalent mass of the mother black hole of that universe

φ : 1.6

N : number of that universe from 1 to 7 (in our universe $n=2$)

To calculate the life span of a universe we will only need its mass:

$$M_u = \frac{168 T^3}{\varphi^{(7-n)}}$$

M_u : mass of a universe

T^3 : life duration of that universe

φ : 1.6

n : universe number

To find the gravitational constant of a universe and its life span we can use the following equation:

$$C_n = \frac{G_n T_n}{\varphi^{(7-n)}}$$

C_n : speed of light in universe number n ($n = 1$ to 7)

G_n : gravitational constant in universe number n

T_n : age of the universe number n

n : number of that universe, in our universe $n=2$

Because universe grows inside its Mother Black Hole, the final radius of a universe is simply equal to the Schwarzschild Radius of Mother Black Hole:

$$R_u = \frac{G_n M_n}{C_n^2}$$

R_u : final radius of a universe

G_n : gravitational constant in the universe number n

C_n : final speed of light in the universe number n

M_n : final mass of the universe number n

I calculated that there are 10.39×10^{27} black holes in first universe (equal to CQC) but in second universe (our universe) there will be only 6×10^{23} black holes and in the next universe there will be only 2.7×10^{19} black holes. I also demonstrated that based on my calculations, when a universe reaches its end of expansion, it will be transferred to the next universe that is larger and more massive but shorter, because of acceleration of time. In dark energy chapter I calculated that central black hole of each galaxy repels the antimatter to the periphery of the galaxy, causing the expansion of intergalactic space. When a galaxy in one universe reaches the event horizon of the mother black hole, it will transfer to the new universe as powerful photons because the new universe always has larger gravitational constant (acceleration of time), and I calculated the gravitational constant for each universe.

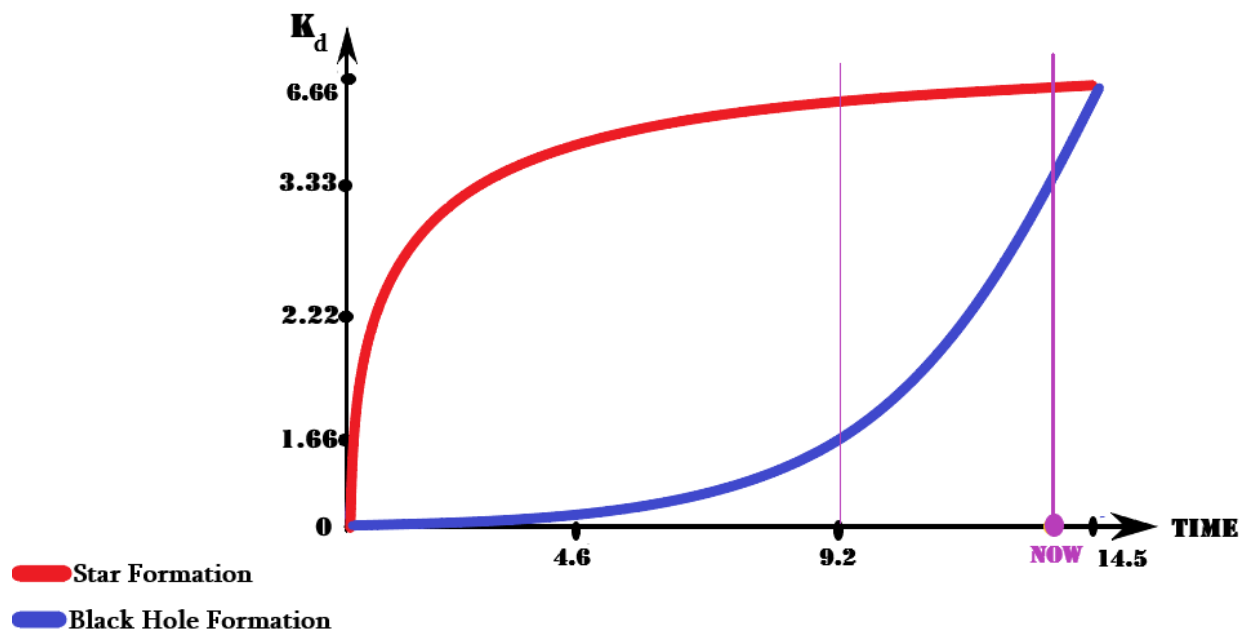
This means when a galaxy is transferred to a new universe, it appears as a star in that universe. Out of 10.3×10^{23} black holes of the first universe a square root of them are intergalactic and another square root are interstellar (inside galaxies) and the total number of galaxies is equal to total number of interstellar black holes. This means at the end of a universe's life when it reaches its maximum radius, we must have the following condition:

Number of galaxies = Number of stars per galaxy = Number of black holes per galaxy

I call this Cosmic Equilibrium and it is obvious from what I have been calculating so far based on acceleration of time in each universe. This means a universe will start with small number of stars, then stars will increase to a maximum and then star formation slows down and star destruction and black hole formation accelerates until the total number of stars and black holes in the galaxy become equal. This way we can calculate the total number of black holes, stars and galaxies in our universe, considering we are at 95% of life of our universe (13.7 billion years out of 14.4 billion years has passed). I calculated before that Devil's Coefficient of 666 is the rate by which frequency of light reduces from Big Bang till the end of universe. This is a coefficient not a constant, which means it changes through time. The rate of change of Devil's Coefficient can be calculated here:

$$K_d = \sqrt[3]{\frac{\text{age of universe} \times \text{acceleration of time}}{\left(\frac{\text{speed of time}}{\text{speed of light}}\right)^{(7-n)}}$$

In above equation n is number of the universe which would be from 1 to 7 and because our universe is the second universe so $n = 2$. the acceleration of time is equal to gravitational constant. The equation demonstrates how slow Devil's Coefficient will increase during the first third of universe life until universe is at 4.8×10^{17} seconds old. Then it accelerates rapidly after that, increasing the number of black holes so much to keep the dark energy density constant. From this point Devil's Constant increases exponentially through the life of the universe. This is obvious because as universe expands, the intensity of light that covers it reduces proportional to square root of speed of expansion because light has to cover the surface: $A = R^2$. At the beginning of universe when it is so small a supernova would be enough to expand it but when it gets so it will need hundreds of supernovae and gamma bursts each time to keep expanding it. Each supernova or gamma burst is a black hole formation, this means rate of black hole formation needs to go up rapidly. The chart below demonstrates this:

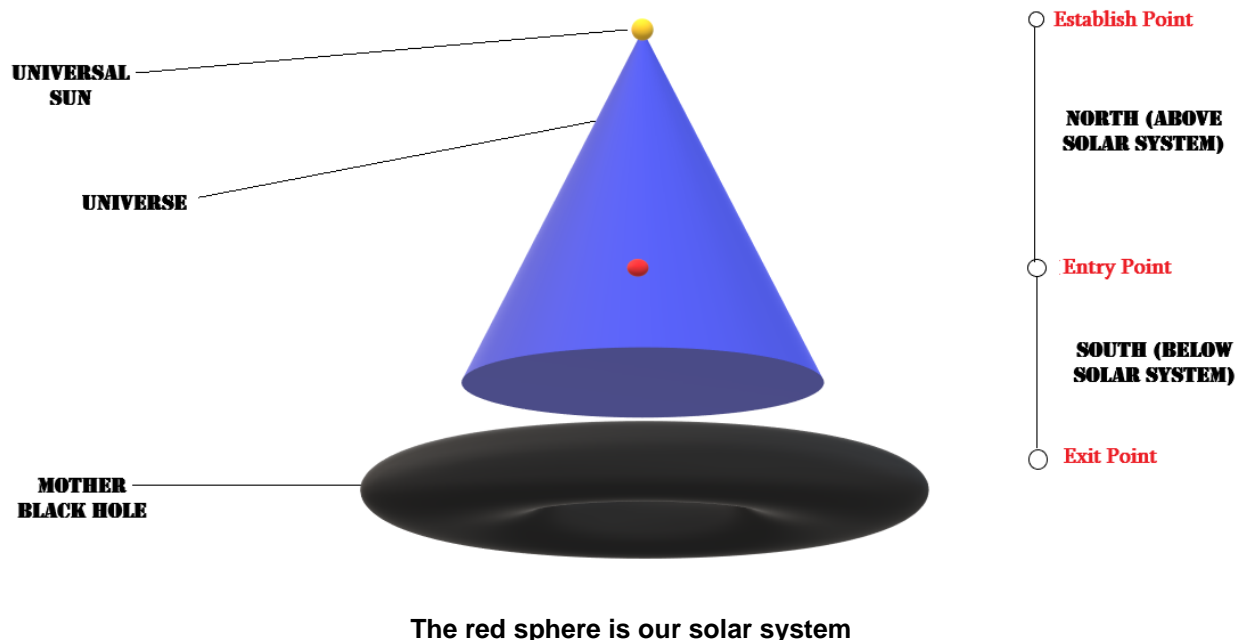


How Devil's Coefficient changes through time

In above diagram, time is the age of universe in billion years, vertical axis is the Devil's Coefficient growth and the horizontal axis is the age of universe in billion years. I showed that our universe is going to have close to 14.5 billion years life (700 million years from now), which is 4.4×10^{17} seconds. If we measure the two third of the age of the universe, it will be 9.2 billion years from the Big Bang:

$$2/3 \times 4.4 \times 10^{17} : 3.15 \times 10^7 = 9.2 \text{ billion years}$$

This is the point on the diagram that is a crucial point because at this point black hole formation starts to rapidly increase and star formation reaches its plateau. I am going to call this special point the Entry Point of our universe. Every universe will have an Establish Point at which the first star (Universal Star) appears that we know as the Big Bang of the universe, then an Entry Point that is the balance point of the universe, when it reaches the half of its total size, and then an Exit Point at which it will transfer to the next mother black hole. Note that at Exit Point, speed of black hole formation becomes equal to star formation rate and the final equilibrium is established. At this point the Universal Star located at the beginning point of the universe will explode and leaves behind the central black hole. This explosion is the most powerful supernova of the universe, pushing the entire universe out to the next universe. As I calculated before, the black hole that will be left over will be the largest black hole of our universe that is the central black hole of our universe with an equivalent mass of $3 \times 10^{48} kg$. This means at current time there must be the largest star with mass of $30\% \times 3.1 \times 10^{48} = 4.2 \times 10^{48} kg$ at the heart of our universe, which would be at the center of the north pole on CMB map. Below picture demonstrates these features.



There are a few wonderful features in this diagram. The most important point is that Entry Point is exactly 4.6 billion years ago. Interestingly, at exactly this crucial point, our sun was born. We know that based on several findings our sun is 4.6 billion years old. This tells us that our solar system was born at exactly the central point of our universe, because due to the acceleration of time, the last third of universe is the same size as the first two third of it. This means our solar system is very unique and its location is at the turning point of our universe. Anything after this point will have more black hole formations which means more supernova/gamma burst events, that is more energy pumped into the universe. Therefore, after this point, universe will be slightly hotter. Matching the CMB map on Origami Model, everything after the Entry Point will be the south hemisphere of the universe, the half that is located below the solar system on CMB, and anything before this point, will be the north hemisphere of universe in CMB map, above the solar system. This explains why the south part is hotter than north part on CMB map. The reason I call it the Entry Point is obvious now: We came to the show at exactly this point.

Now, based on what I have calculated so far in various chapters, we can find some characteristics of our universe. I showed that the number of black holes increase in our universe from the Big Bang till the end of its life. At present, the $K_d = 6.66$, (almost) which means the current size of universe and also the current maximum frequency of light and also the current number of black holes are equal to the total number of black holes divided by 6.66:

CQC in our universe = total number of black holes at the end = 6×10^{23}

Current number of black holes in our universe= current maximum frequency of light:

$$6 \times 10^{23} : 6.66 = 9 \times 10^{22}$$

Half of the total number of black holes are interstellar (inside galaxies) and other half are intergalactic (between galaxies): 4.5×10^{22}

Current number of black holes in each galaxy: $\sqrt{4 \times 10^{22}} = 2.12 \times 10^{11}$

Total number of black holes in each galaxy in 700 million years: square root of total black holes:
 $\sqrt{6 \times 10^{23}} = 7.7 \times 10^{11}$

Current number of galaxies in our universe: $\sqrt{4 \times 10^{22}} = 2 \times 10^{11}$

Total number of galaxies in our universe in 700 million years: $\sqrt{6 \times 10^{23}} = 7.7 \times 10^{11}$

Current number of stars in each galaxy: $\sqrt{4 \times 10^{22}} = 2 \times 10^{11}$

Total number of stars in each galaxy in 700 million years: $\sqrt{6 \times 10^{23}} = 7.7 \times 10^{11}$

Mass of the largest star in our universe= Universal Sun in north hemisphere: $4.2 \times 10^{48} kg$

This is amazing result, which shows that number of black holes in each galaxy will be equal to number of stars. We know that some of these are naked black holes that are visible for us and some are shelled black holes in the center of stars. I believe planets are formed with similar mechanism as stars because without a central gravity, primordial galactic dust and gas won't be able to contract and form a solid planet. This means at the center of our earth there is a central black hole. I will discuss this in more details in a separate chapter for "Earth". Now we can summarize the results:

Current number of stars in our universe: 4×10^{22}

Current number of planets in our universe: 2×10^{22}

Current number of naked black holes in our universe: 3×10^{22}

Current number of shelled black holes inside celestial bodies in our universe: 6×10^{22}

Note that based on the total age of our universe that is 14.4 billion years compared to the current age that is 13.7 billion years, we conclude that so far 95% of life of our universe is already passed. This number 95% is crucial in our calculations and that's why most of our findings need to be multiplied by 95% to give the correct answer. With the same logic, the total number of stars that already exist is $95\% \times 95\% \times 6 \times 10^{23} = 5.7 \times 10^{23}$ stars. This means also at present there must be close to 10^{22} black holes already developed in our universe. Also this tells us that a total of approximately $5\% \times 6 \times 10^{23} = 3 \times 10^{22}$ supernovae are still going to take place and 3×10^{22} more black holes will be developed in the next 700 million years. As I calculated total number of black holes in the first universe must have been 10.39×10^{27} so out of these, 6×10^{23} stars will eventually implode and leave their naked black holes in our sky. As I explained earlier, Big Bang in Origami Model is a continuous process and it is in fact the largest White Hole in our universe that is still continuing, importing more mass and energy to our universe and this is why our universe is still growing and that's why the number of stars and black holes is increasing for the next 700 million years. Now, the question is why some stars implode and some don't. I explained this earlier with the mechanism that I explained about the gravitational attraction of the black hole and the angular moment of particles attracted to it. I calculated that the distance of particles from the center of the black hole is crucial and if the radius of the mass/star divided by the CGR of its central black hole is less than 6×10^{-7} , the star will become unstable because the central black hole will be too strong for the particles around it and they won't stay there anymore. I also demonstrated that when central black hole is too small for a mass, it will have to combine itself with the central black hole of other masses to reach stability and that's why we observe color confinement in particles (quarks) and galaxy combinations and collision and binary stars fusing in space. Now, let's finalize our definition of star:

Star is a celestial body that has a central black hole producing energy by annihilating matter-antimatter.

In 2005 some cosmologists were studying Cosmic Microwave Background (CMB). The CMB is the leftover light from the early universe that is 13.7 billion years old creating the earliest picture of the universe. This picture has incredible cosmological information. The cosmologists surprisingly spotted something very strange. If you look at the CMB as a whole, it looks much the same regardless of which angle you are observing it at. In fact, it is perfectly uniform up to one part in ten thousand. In one part in ten thousand, any patch of the CMB looks like any other patch. This means the universe is isotropic. However, if you start looking at those one in ten thousand differences, you will find some fluctuations: some spots slightly hotter, some spots slightly cooler, but these spots are also uniform, meaning you will find similar spots in a symmetrical pattern. For example, if one spot is cooler than its surrounding background, there will be an ipsilateral spot (similar spot on the opposite side of CMB map) that will match it. So, the CMB is isotropic even considering its variation spots. But, to decide that universe is absolutely isotropic, it has to pass a final test that is called Multipole Analysis. In this process, you look at the CMB map in different dissections, starting by looking at it as a whole (monopole), then looking at it as a map is divided into two hemispheres (dipole), then looking at it again divided into four sections (quadrupoles) and then divided into eight parts and check them against each other (octupoles) and so on. The cosmologists have checked the CMB map

up to 4000 poles, such a tedious work. The results showed that CMB was uniform and isotropic except in one point: Solar system! Let me explain this: When the scientists checked the Dipole version, they realized that the top part of the universe was slightly cooler than the bottom part of it. Then when they checked the Quadrupoles, they found two spots that didn't completely match. The when check the map in Octupoles, the same spots again did not match. The strangest finding is that the plane that divides the cooler top part of the universe from the hotter bottom half is perfectly matched on the plane that divides the solar system into the top and bottom halves! The possibility of this to be a random accident is much less than winning the grand lotto three times on the row. These three findings that all together point at our solar system to be the center of the universe is called Axis of Evil, which has nothing to do with the similar phrase used by George W. Bush in 2002 in a political concept. The cosmological axis of evil is so strange that most scientists have been deliberately avoiding it, because it causes anxiety for them to even imagine among billions and billions of galaxies and stars, our solar system is a Special One and it is located at the very center of the universe. So, this was found in WMAP project that found and analyzed the CMB in last decade. Since then there have been at least three different approaches to somehow dismiss this finding as a random feature or even an error but all of them have been ruled out. In a new multimillion-dollar mission called Planck Satellite cosmologists started mapping and analyzing the CMB using completely different technology and entirely different data processing system, but strangely enough, they confirmed the existence of Axis of Evil too. There has been no explanation so far for this mind-blowing discovery in modern cosmology. There should be absolutely no relationship between the CMB and our solar system. Our Milky Way galaxy was not even around when CMB was formed in 300 thousand years after the Big Bang, so how could the universe know about our solar system back then? How could a random universe be aimed from the beginning to produce our solar system? And for what purpose?

Laurence Krauss, the American cosmologist and the previous lecturer at Arizona State University wrote in his article in 2006, "That's crazy. We're looking out at the whole universe. There's no way there should be a correlation of structure with our motion of earth around sun- the plane of the earth around the sun- the ecliptic. That would say we are truly the center of the universe."

According to Origami Model the universe is predetermined and because time is 10 times faster than light, existence is much ahead of reality. This means that universe is following a purpose. In Origami Theory, unlike the current model used in physics, the entire cosmos is meaningful and operating for a purpose. As I explained before, the notion of random universe is fundamentally defying basics of physics as well as the logic. We will find so many such strong evidences that prove to us that universe has been always on a mission. This is no surprise in Origami Model that solar system and earth specifically have been the purpose of this universe. I explained earlier that we are here for a mission which is developing intelligence to eventually in the seventh universe reach our ultimate form that is 10^{69} times bigger, faster and smarter, and then we join the Designer whom I call Sheva (Seven). This means the Designer certainly needs us, the Designer hasn't made us complete because as I explained the quantization will never reach zero to become completely analog and continuous, so there will be always a degree of interruption which means the accuracy/entropy will increase 10^{69} times but it will never be infinite. Therefore, when we eventually join the Designer, we will be able to help the Designer. A

good analogy to this would be us making robots. We will make our robots smarter and faster and more natural until one day our robots will have exactly the same feelings and perception that we have. That day you will meet a handsome guy in a bar, you'll go to a night club with him and drink and dance and you will take him home after midnight and have the best sex of your life with him and in the morning when you wake up, you will find that he is gone. Then you will sit there wondering, "Was he a real man or a robot?" This will become the new problem of our lives in few decades. We will reach a point that no experiment will be able to differentiate a robot from a natural human. This is when robots join us, and they will help, save and feed us, but they will also change us. All the change will be towards the more intelligence, because intelligence is the power.

I will finish this chapter by reviewing the value of Fine Structure Constant, Alpha. Professor Richard Fynman was almost obsessed with this value and he always said that if alpha changes even for slightest value, the entire universe will shatter. But with exactly the same mechanism that I explained for speed of time and speed of light, the value of alpha is constantly changing too. The current equation to calculate fine structure constant is as following:

$$\alpha = \frac{K_e e^2}{\hbar c}$$

- e is the elementary charge ($:= 1.602176634 \times 10^{-19} \text{ C}$);
- $\hbar = h/2\pi$ is the reduced Planck constant ($:= 6.62607015 \times 10^{-34} \text{ J}\cdot\text{s}$);
- c is the speed of light in vacuum ($= 299792458 \text{ m/s}$);
- k_e is the Coulomb constant;

The Supernovae Type I, have been used as standard Candle to assess the expansion of universe. Since 1990s cosmologists have been studying type I Supernovae to find the exact value of Hubble Constant to the finest precision. The greatest study was Supernova Hubble Constant for Equation State (SHOES) project led by renown cosmologist Adam Reece, who first discovered that expansion of universe is accelerating. This study finally found that Hubble Constant must be $73.5 \pm 1.7 \text{ Km/s/Mpc}$. This study was done for galaxies up to 2 billion lightyears away, which makes it precise only for the Hubble Constant for the most recent time of the universe. But to find the expansion rate of universe at the beginning of the universe, the Planck Team studied the CMB created by Planck Satellite. The Planck Power Spectrum, after a long-time study of CMB found that Hubble Constant at early universe has been $66.9 \pm 0.6 \text{ km/s/Mpc}$ and their result is based on extremely accurate measurement that is founded on the size of the variations in CMB. This has created the biggest crisis in cosmology that has ever existed because it means that current model of universe is not correct. The difference between the two values is 3.7 Sigma, which means they are not reconcilable. In other words, the difference cannot be due to random errors.

Since 2016 that these two values emerged, so many more independent researches and measurements have been used but they all have shown the same difference between the Hubel constant in early and recent universe. In other words, the results prove that Dark Energy might not be constant! However, the result is in fact **the best evidence that Origami Model is correct**. Unlike all the various equations that are in fact all extracted from the one equation in

the standard model for calculation of fine structure constant, Origami Model calculates the value of alpha from speed of light and that's why it constantly changes parallel to the speed of light. My equation for alpha is very simple:

$$\alpha = \sqrt[4]{C} : \frac{\text{life of universe} = 14.4}{\text{age of universe} = 13.7}$$

$$\alpha = 1.37 \times 10^2$$

Now, age of universe = 13.7

$$\alpha = \sqrt[4]{2.99 \times 10^4} : \frac{14.4}{13.7} = 137$$

In other words, the fourth root of speed of light times 95% gives us the alpha. I already explained the 95% as the ratio of the universe life that has been fulfilled. This means, when universe was only 1 billion year old (when first stars were born: age = 1)

$$\alpha = \sqrt[4]{1.14 \times 10^2} : \frac{14.4}{1} = 150$$

So alpha keeps decreasing as speed of light decreases. Now the relationship between Hubble Constant (H_0) and Alpha would be like this:

$$H_0 = \frac{1}{\alpha} \times 10^4$$

So now: $H_0 = \frac{1}{137} \times 10^4 = 72.9$

At one billion years old universe: $H_0 = \frac{1}{150} \times 10^4 = 66.6$

Therefore, I can summarize this chapter as the following results:

From the beginning of our universe till now, The Devil's Coefficient is constantly going up, The Alpha is continuously going down, the Hubble Constant is unceasingly going up and all these are simply due to the entropy increasing.

Subatomic Particles

In this part of the article, we will try to find out what the real structure of subatomic particle is. Unlike the Standard Model that has been unable to solve major problems such as Spin Problem and Color Confinement, Origami Model produces a comprehensive, convincing model of subatomic particles that resolves previous problems and it is also able to predict what other particles could exist in our universe. We will start by dissecting the central black holes inside the subatomic particles.

1. Subatomic Black Holes

As we discussed, Origami Model believes that every mass, including the subatomic particles contain a central black hole. These black holes may be called the Shelled Black Holes or Subatomic Black Holes, that virtually create the various elementary particles. Now we might wonder what would be the radius of the black hole in the center of smallest particle, neutrino? To find out, we need to calculate the Schwarzschild Radius of a neutrino:

$$R_s = \frac{2 GM}{c^2}$$

$$R_s = 2 \times 6.67 \times 10^{-11} \times 1.7 \times 10^{-36} \div 9 \times 10^{16}$$

$$R_s = 1.48 \times 10^{-63} m$$

But as we explained before, the Schwarzschild Radius of any particle cannot be smaller than Planck Length. This is similar to the conflict that Hawking faced when doing the mathematics of black hole radiation.

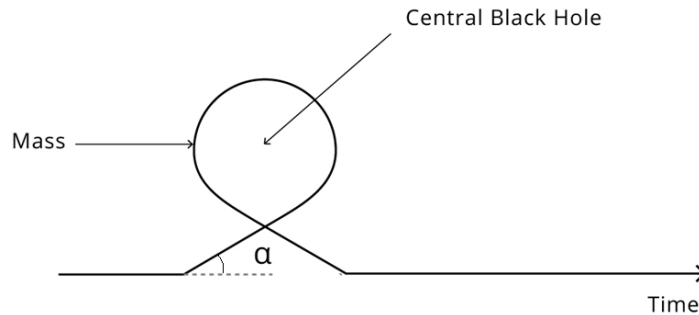


Figure 39- Central blackhole of subatomic particles

Solving this conflict is by considering the real Planck Length at proper angulation of time, in other words we have to multiply the Planck Time by tangent of time angulation (8.99×10^{52}). In other words, because time was much slower in the past, the Planck length was much smaller than its current value. This also means that based on Origami Theory, these baryons must have been produced at the beginning of Big Bang, when time was extremely slow and they cannot be produced or annihilated at present, which is consistent with Big Bang theory that believes only during the period of Baryogenesis these were created. However, we argue that in Origami Theory, any particle can decay due to quantum tunneling. Therefore, because the central black holes of these particles are smaller than current Planck Length, we won't be able to observe them.

Now, as we discussed earlier, according to the theory of general relativity as particles and objects are attracted to a black hole, they accelerate and their mass increases and their time reduces, which are all explained in Origami Model by one single fact: angulation(deceleration) of time. This acceleration of the attracted particles eventually makes them reach the speed of light and turn into energy at a certain distance before reaching the event horizon of the black hole. We can calculate this distance by inserting C (speed of light) for g in gravitation equation:

$$C = \frac{GM}{r^2}$$

So, we arrive at:

$$R_t = \sqrt{\frac{GM}{C}}$$

$$R_t = \text{Transformation Radius}$$

This R is the distance of the particle from the black hole. We can denominate this distance as Transformation Zone, where mass transforms to energy prior to reaching the surface of the black hole. Therefore, we conclude that there must exist a large area of electromagnetic (gamma and x rays) radiations around each black hole, in its ergosphere. In other words, according to Origami Theory, black hole converts mass to energy due to accelerating it to speed of light. Therefore, I predict that there must be a peripheral zone of powerful energy around each naked black hole in space. This is consistent with the bright zone in accretion disc found around black holes which scientists have been currently trying to explain by the extreme friction between the particles falling into the black hole. Origami Model suggests that the high energy zone in accretion disc is in fact the Transformation Zone where particles convert to energy and reflect out from the black hole, not changing the black hole's mass.

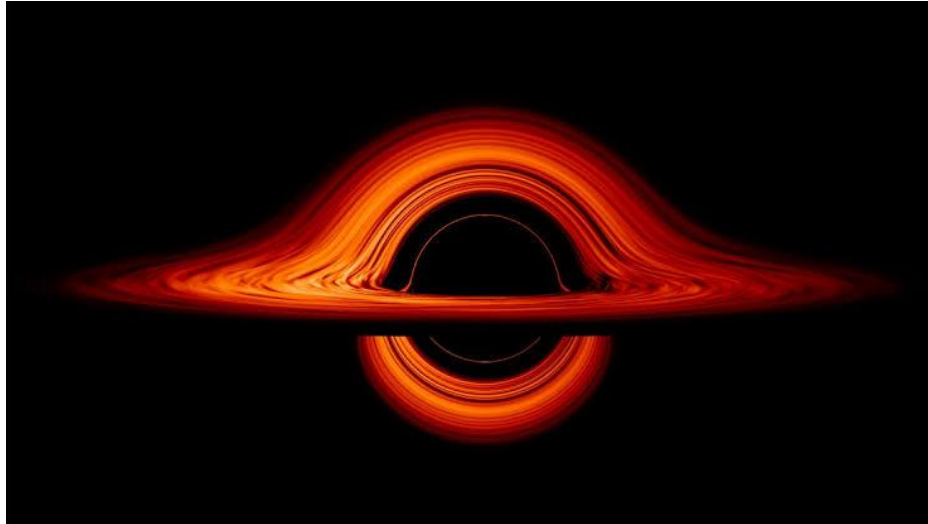


Figure 40 - Black hole in space, with large amount of electromagnetic energy around it, as Origami Model predicts

Current view suggests that the strong ring of energy surrounding the black hole must be created by the friction of particles accelerating into the black hole, but even if that is true, how would the energy created from friction leave the black hole and enter the space? This tremendous amount of energy could not be simply due to the friction of the particles accelerating towards the black hole for two reasons: first, there won't be so much material constantly falling into a black hole otherwise the mass of each black hole would exponentially increase until it swallows the entire galaxy in a relatively short time. Second, even in lonely black holes in void space where there is no virtual mass around the black hole, there is still the bright accretion disc full of energy surrounding the black hole, which can only be explained by Origami Model suggesting that the Transformation Radius is always full of energy due to accelerating particles (constant flow of neutrinos that appear in vacuum due to quantum fluctuation and they are pulled to the black hole) attracted to the black hole while antineutrinos being repelled beyond the Critical Gravitational Radius. Origami Model believes that when mass converts to energy due to acceleration near the black hole, it cannot enter the black hole because time does not enter the black hole. As time rotates around the black hole, energy follows its path and leaves the black hole, returning to space.

We already concluded that there must exist a black hole inside every mass, because according to gravitation equation at the center of every mass where R becomes almost zero, the gravitational force reaches its maximum. In other words, we conclude that because of 360 degree angulation of time in the center of each mass, a micro black hole is produced that contains the gravitation that comes from the mass. But on the other hand, we know that black holes pull masses into themselves, so how could there be mass arranged around a central black hole but not falling into it? The answer is in angular momentum. With a very similar reason why electron does not spiral into the nucleus of an atom, the particles won't fall into the central black hole, instead they form a shell around its inlet and build a mass. Before a particle reaches the Transformation Radius of a black hole, it starts rotating around the black hole, because black hole rotates with an incredible speed, usually close to speed of light. This gives

the falling particle a powerful angular momentum that depends on its angular velocity, its mass and the radius of its rotation. For the mass to not fall into the black hole, the angular momentum must be equal to the gravitational force of the black hole. Therefore, we can arrive at the following equation:

$$g = \frac{GM}{r^2}$$

$$L = I \cdot \omega$$

$$L = VM'R$$

where L is angular momentum, V is linear velocity of the particle, M' is the mass of the extremely small particle that rotates around the central black hole of the object, R is the distance of the particle from the center of the black hole, and M is the mass of the black hole(the object).

$$\frac{MM'G}{r^2} = VM'R$$

This means for a particle to stay around the black hole instead of falling into it, the particle must have the linear velocity of:

$$V = \frac{MG}{R'r^2}$$

Basically, R is equal to r so:

$$V = \frac{MG}{r^3}$$

We can use this equation only for Naked Black Holes in space.

2. Radius of Origamon

Origamons are the only and the most important building blocks of the universe. Unlike the Standard Model that contains so many elementary particles, Origami Model only recognizes Origamon as its only elementary particle that produces all other subatomic particles and masses in our universe. Free Origamon is the same as photon, but it has a mass. In fact, time (data) combines with gravity at Big Bang and produces the first mass that is the Origamon. Then the Origamons combine and form elementary particles, boson, and all subatomic particles smaller than Planck Mass, and then these particles combine to produce larger objects. Therefore, if we

dissect any mass in our universe, we will eventually reach the Origamons and this is exactly why every mass can be converted to energy (photons=Origamons).

Origamons are the only particles that their radius is equal to their Schwarzschild Radius. In other words, Origamon is the smallest naked black hole in the universe. The Schwarzschild Radius of Origamon which is the same as its radius is:

$$R_s = \frac{2GM}{c^2} = \frac{2 \times 6.67 \times 10^{-11} \times 1.3 \times 10^{-70}}{9 \times 10^{16}} = 1.92 \times 10^{-97} m$$

This is the Real radius of Origamon. But practically, Origamons, like any other black hole, create a boundary around themselves inside their Critical Gravitational Radius.

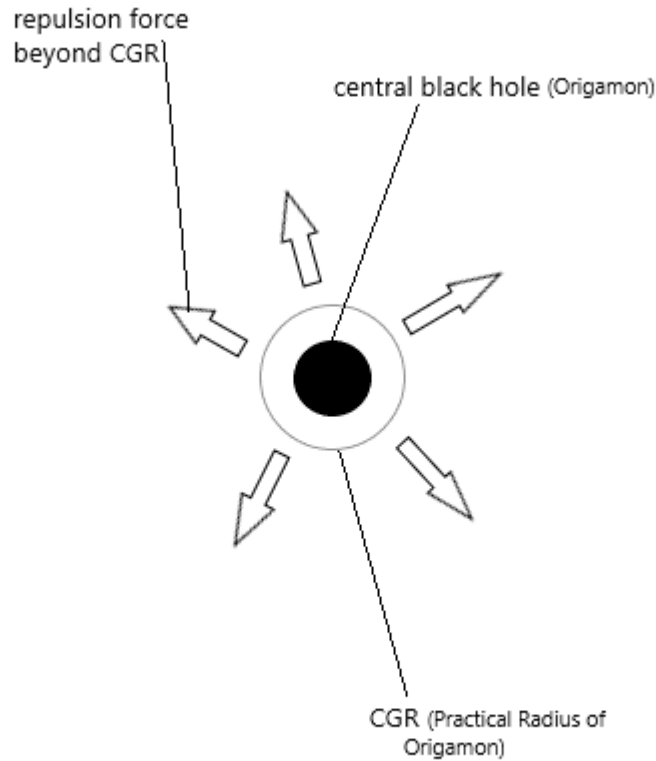


Figure 42- Origamon and its Real and Practical Radii

As I explained before, every black hole repels space beyond its CGR, therefore when two Origamons are near each other, they will stay at the CGR of distance from each other unless a force pushes them towards each other. Therefore, the Practical radius of Origamon is its CGR.

$$CGR = \sqrt{\frac{M}{2}} = \sqrt{\frac{1.3 \times 10^{-70}}{2}} = 8 \times 10^{-36} m$$

Therefore, in all my calculations we will use the CGR of Origamon as its Practical Radius, except only in one case, which is in analyzing the gravitational equilibrium inside subatomic particles, where millions of Origamons virtually fuse into one large particle and to calculate the gravitational attraction between these Origamons we use the Real Radius or Origamon which the Schwarzschild Radius of Origamon and it is much smaller than the Planck Length. As the Real Radius of Origamon is far smaller than the Planck length, in current time we can won't be able to observe or measure it and we only observe the gravitational effects of the Origamon at its Critical Gravitational Radius which is half of Planck Length. From what I say we can conclude that the building block of mass and gravity is a particle that is in fact an extremely small black hole with no tangible mass inside or around it. This unit of mass/energy applies certain amount of gravitational force on its surrounding, just what we observe in gravitational lensing. To summarize this chapter, we conclude that Origamon has two types of radii: Real radius: $1.92 \times 10^{-97}m$, and Practical radius: $8 \times 10^{-36}m$. Figure 43 is a schematic demonstration of this.

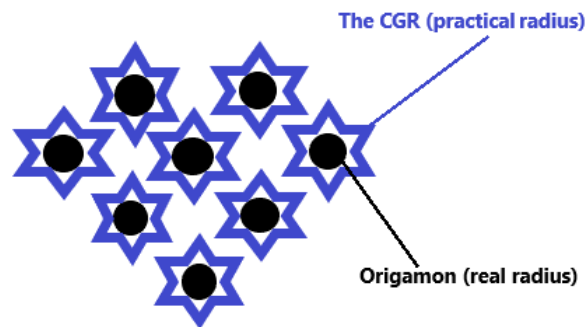


Figure 43 – Origamons staying in a distance from each other due to their practical radius

2. Fusion Distance and Separation Distance

We explained that every subatomic particle has a central black hole and every black hole has a Critical Gravitational Radius. We saw that inside the CGR, the black hole attracts everything and but beyond its CGR, the black hole repels antimatter which causes an outward force in space. This means that practically, around each black hole there is an attraction force, and after the CGR, there is a repulsion force. When two particle are near each other, the outmost part of them, which would be the outmost Origamons building each particle, would interact and as far as they are out of each others' CGR zone, they would slightly repel each other with an

extremely trivial force, but as soon as they get closer than their CGR, the powerful attraction of each Origamon will attract the other one and the particles will *Collide*. This is the mechanism of friction between the particles. After the particles collide, they get closer until their Origamons fuse to produce one single new particle. However, as long as they are not inside each other's CGR zone, they would slightly repel and avoid each other, so there would be no collision, no friction between them. In other words, Origamons are quite territorial and repel other Origamons approaching them, unless they have enough energy to break the CGR barrier and fuse themselves into the hosting Origamon. This is exactly the reason there is no friction in subatomic world, because the Origamons wouldn't get into each other's CGR zone and collide, unless a particular force guide two of them directly toward each other, in which case they will collide and form a bigger particle or shatter into smaller ones. But in macroscopic world (anything bigger than Planck Mass) there would be no central black hole for the object and there are millions of particles set next to each other to produce the object, so the entire object can collide completely or partially with another object and that's what we call friction. Based on this mechanism we can calculate the distance at which the repulsion between Origamons of a particle and another particle turn to attraction, causing the collision, which I call Fusion Distance. Basically, whenever the distance between two Origamons is shorter than the Fusion distance, they will fuse into one new particle. Therefore, the Fusion Distance (CD) would be equal to the CGR of Origamon multiply by 2:

$$FD = 2 \times CGR$$

We know that CGR for Origamon can be calculated by the equation that we have for naked black hole, because as we said previously, Origamon has no mass around its central black hole:

$$CGR = \sqrt{M} \times 1.68 \times \frac{\pi}{4}$$

$$CGR = 8.05 \times 10^{-36}m$$

$$FD = 2 \times 8.05 \times 10^{-36} = 1.61 \times 10^{-35}m$$

$$FD = 1.61 \times 10^{-35}m$$

This is a crucial value, which means the Fusion Distance in our universe is $1.61 \times 10^{-35}m$. But this is a very well-known value! This is what is called Planck Length in Standard Model, a constant that its origin has never been explained. Now based on Origami Model we have just discovered another extremely important constant and we understand why it is so crucial in formation of particles. This means whenever two or more Origamons are closer than Planck Length to each other they will fuse into a new particle. So, we can write it simply as:

$$FD = l_p$$

$$\text{Fusion Distance} = 1.61 \times 10^{-35}m$$

This clearly explains why Planck length is the shortest length in our universe because once any two points are closer than this length, they will fuse into one bigger distance. One more time we have cracked one of the most important constants in physics. This means Planck Length is actually the Fusion Distance in universe, when two particles combine into one. Therefore, the real definition of Planck length is this: *Planck Length is the shortest possible distance between two particles.*

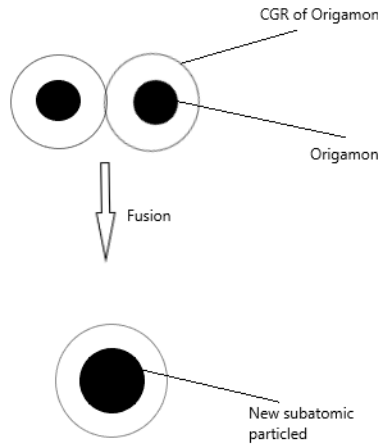


Figure 44- Origamons at Fusion Distance, fusing to create one heavier particle

On the other hand, if the distance between two Origamons is too far, the repulsive effect of the mass beyond its CGR will repel the other mass. In other words, at certain distance, two Origamons would repel each other because every Origamon repels space beyond its CGR and at certain distance from the center of the Origamon, the gravitational repulsive force between the two Origamons will overcome the gravitational attractive force and they run away from each other. To find this distance we need to multiply the Fusion Distance by Origami Coefficient:

$$K_o \times 1.61 \times 10^{-35} = 1.68 \times 10^2 \times 1.61 \times 10^{-35} = 2.7 \times 10^{-33}m$$

$$SD = K_o l_p$$

$$\text{Separation Distance} = 2.7 \times 10^{-33}m$$

So, the upper limit of the distance between two Origamons in any subatomic particle, which I would denominate as Separation Distance, is $2.7 \times 10^{-33}m$. Figure 45 shows this.

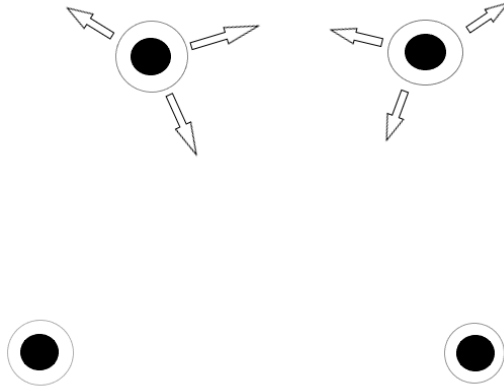


Figure 45- Origamons repelling each other at Separation Distance

This means any time two subatomic particle get closer than Planck Length to each other they will fuse into one new particle, and anytime two subatomic particles are further away from each other than $2.7 \times 10^{-33}m$ they will repel each other. The distance between the Fusion Distance(lower limit) and Separation Distance(upper limit), is called Aggregation Distance(AD), because at this distance, Origamons neither attract nor repel each other, so as long as no direct force is applied to them, they will stay at Aggregation Distance from each other, and this is how Bosons are created.

$$AD = \text{from } 1.61 \times 10^{-35}m \text{ to } 2.7 \times 10^{-33}m = 2.68 \times 10^{-33}m$$

$$AD = 2.68 \times 10^{-33}m$$

Because all subatomic particles are produced by collection of Origamons, the values of Fusion Distance, Separation Distance and Aggregation Distance apply to all subatomic particles, not only Origamns. Figure 46 demonstrates how Aggregation Distance works between the Origamons.

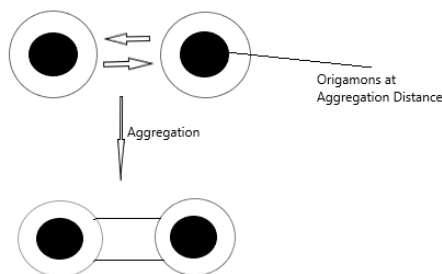


Figure 46- Origamons at Aggregation Distance, creating a boson

To finish this chapter I mention that in any subatomic particle other than bosons, Origamons fuse to each other and create one single central black hole and Origamons at first shell would sit at closest distance possible to each other which is equal to Fusion Distance, and the Origamons at the last shell sit at the largest possible distance relative to each other which is equal to Separation Distance. Therefore, to find out the average distance between the Origamons in any subatomic particle, for measuring the gravitational force purposes, we can use the Real radius of the Origamon to find the real distance between the Origamons. As I mentioned before, when Origamons fuse, there would be no real distance between them but to calculate the total gravitational force that hold the particle together we will need to use a practical distance for the equation. We can call this practical distance, the Conventional Distance, because it's not really a physical distance. Therefore, we can find the Conventional Distance (CD) by the following equation:

$$\text{Average distance between Origamons in any subatomic particle} = \sqrt{\frac{n}{2}} \times \frac{\text{separation distance}}{2}$$

n: shell number

$$CD = \sqrt{\frac{n}{2}} \times 1.35 \times 10^{-33} m$$

We will see in subsequent chapters that subatomic particles are consisted of several shells around a central black hole and in each shell, there are millions of Origamons. This equation would apply to any subatomic particle, such as quark, electron, proton, Pronon, Nucleoton(nucleus), etc. For example, the conventional distance between the Origamons in the third shell of the down quark would be:

$$CD = \sqrt{\frac{4}{2}} \times 1.35 \times 10^{-33} = 1.89 \times 10^{-33} m$$

And if a particle has eight shells, the distance between the Origamons in the eight shell of the particle would be:

$$CD = \sqrt{\frac{8}{2}} \times 1.35 \times 10^{-33} = 2.7 \times 10^{-33} m$$

But this is equal to Separation Distance! So, this means no subatomic particle can have more than seven shells. We will explain how subatomic particles are produced and we will see that the smallest has only one shell and the largest has seven shells.

3. Lack of Friction in Quantum World

One of the major problems in Standard Model is lack of ability to explain why there is no friction in quantum world. Scientists have been deeply perplexed for decades to see that friction does not really exist between subatomic particles. There has been no successful explanation why particles smaller than Planck Mass are not resisted by friction between them. Origami Model not only explains this clearly, it also predicts it.

We already explained that when Origamons are at Separation Distance, they will repel each other. In other words, Origamons are very territorial particles and they don't allow other Origamons get to close, yet alone collide with them. Because all subatomic particles are created by Origamons, the outmost layer of every particle is consisted of Origamons, therefore the particles do not get closer than Separation Distance, they virtually keep a distance between each other, unless a direct force moves a particle towards another particle which would only happen when very small number are particles are aimed at each other in Hadron Colliders. Figure 47 shows this *preserved corridor* between the particles/Origamons.

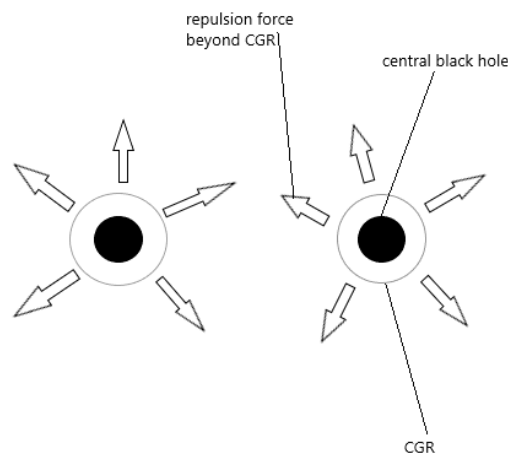


Figure 47- The repulsion between Origamons or any subatomic particles that stops them from collision and friction

However, in macroscopic world, large objects collide all the time which manifests itself as friction. This is why we do not observe friction in quantum world, because there is no collisions between particles unless they fuse to one, new particle.

4. Antigravity

As I explained in Dark Energy chapter, where there is a black hole, at CGR distance from the center of the black hole, we will have repulsion of space. This means if we manage to manufacture a naked black hole, and locate it inside a vehicle, at CGR radius from the black hole, the vehicle will have no contact with the Neutrino Matrix of space and it will act like a subatomic particle and it can travel at speed close to speed of light with virtually no friction. Also, as the naked black hole convert the neutrinos inside the CGR distance to photons, it will produce enormous amount of electromagnetic energy constantly. Such vehicle would travel almost as fast as speed of light and can maneuver in an incredibly complex ways due to lack of friction.

The problem so far in producing a black hole is the current impression that the scientists wrongfully suppose that black hole is an extraordinarily compact mass, while I showed that to make a black hole, we must do the opposite: annihilate all the mass to create an absolute vacuum. This will not be an easy job as the entire universe is saturated with neutrino matrix and as soon as the smallest vacuum is produced after a matter-antimatter explosion, the Origamons and neutrinos will rush to the gravitational force that is created in the vacuum space.

At present, there are multiple ideas to produce a super-fast spaceship in order to travel in interstellar space, but none of them has the features of what Origami Model can provide. The age of rockets and propelling technology is past. Even the idea of converting a human memory and information into laser light and projecting it to far points of universe, is not helpful because human consciousness is not the information, but the analog gravity inside the entire black holes in a human body. The consciousness is not in the nervous system, but inside all the Origamons that are in a person's physical body, from head to toe, every single particle and these are all connected to the entire gravitational pool of the universe, and so to all the black holes. By projecting someone's memory to moon, that person will be on the moon! What is inside the central nervous system is the memory, not the consciousness. Memory is the collection of information and it is quantized. Consciousness is the gravity inside the black holes and it is continuous.

5. Structure of Subatomic Particles

We already explained the mechanism by which masses above the Planck Mass are produced with a mathematical central black hole. But the mechanism by which subatomic particles are structured is completely different and that's why the behavior and features of particles in quantum world are slightly different from macroscopic world. If we imagine a central black hole inside a subatomic particle with Origamons arranged around it, for the Origamons not to fall into the central black hole their angular momentum must be equal or more than the gravitational pull of the central black hole:

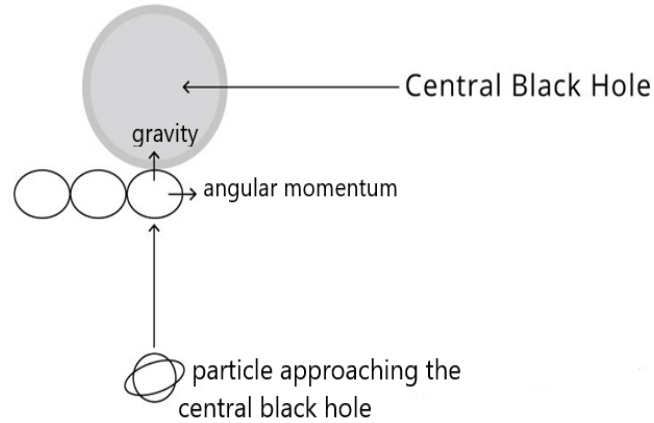


Figure 48- Formation of subatomic particles

$$V = \frac{GM}{r^3}$$

Where V is the rotation velocity of Origamons inside the Planck Mass around its central black hole:

G : *gravitational constant*

r = Rs : *Schwarzschild Radius of Planck Mass* = $3.2 \times 10^{-35}m$

$$V = \frac{6.67 \times 10^{-11} \times 2.18 \times 10^{-8}}{(3.2 \times 10^{-35})^3}$$

$$V = 4.44 \times 10^{85}m/s$$

As we can see this velocity is ridiculously high, simply impossible. This means when it comes to subatomic particles, angular momentum, even in very high velocities won't be strong enough to neutralize the gravitational force of the central black hole because the radius is extremely small and therefore the gravitational force is incredibly strong. So, there must be a different mechanism responsible for holding the shell around the central black hole and creating the subatomic particle.

If we look closer, very similar effect based on the same fundamental mechanism of time angulation creating gravity/mass, can be found in subatomic particles. In particles lighter than Planck Mass, instead of angular momentum, a slightly different force will neutralize the gravitational force of the central black hole and allow the Origamons to accumulate around the black hole and create the particle. Surrounding the event horizon of the black hole, ultra- small Origamons have a statistical chance of appearing all at the same time, interacting with each other due to the gravitational force between them, and form a sphere that instead of falling into

the central black hole, it will create the shell required for formation of the final subatomic particle. For this shell formation to take place, the gravitational force between Origamons needs to be equal or more than the gravitational force of the central black hole.

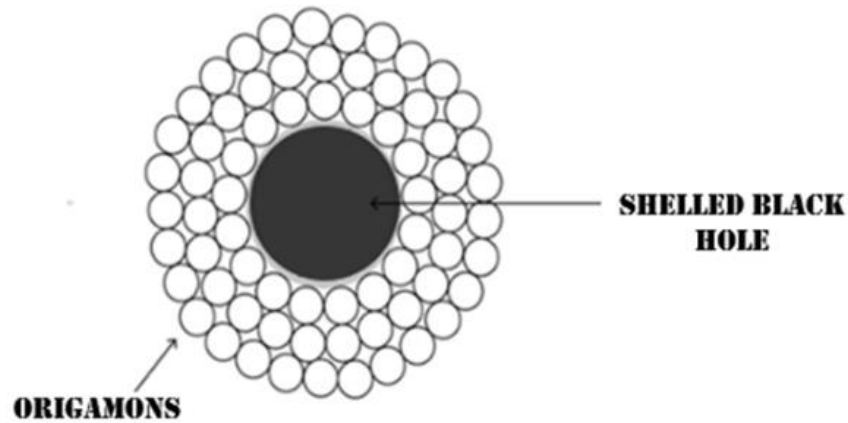


Figure 49- structure of subatomic particles

Let's see if this would work. If we try the logic for Planck Particle, which has a mass of 2.18×10^{-8} and Schwarzschild Radius of 3.2×10^{-35} we will need to know the distance between the Origamons. This distance must be the smallest possible distance between the centers of two adjacent Origamons to maximize the gravitational force between the two Origamons and neutralize the attraction force of the central black hole, therefore it would be equal to the Real Radius of Origamon multiply by 2 which would be equal to $3.8 \times 10^{-97}m$. Now if we use this smallest possible distance, the gravitational force between the two Origamons will be incredibly huge:

$$g = \frac{Gmm'}{r^2}$$

g: gravitational force between two Origamons apart by their real radius

G: gravitational constant

m: mass of the Origamon

m': mass of Origamon=*m*

r: distance between two Origamons = 2 x radius of Origamon = $3.8 \times 10^{-97}m$

$$g = \frac{1.3 \times 10^{-70}}{(3.8 \times 10^{-97})^2}$$

$$g = 9 \times 10^{124}$$

This massive force is not only enough to prevent Origamons from falling into the central black hole, also it will virtually fuse the Origamons into one single particle with one central black hole. In other words, what occurs in subatomic particles is exactly the same as what happens when two naked black holes merge in space and produce one slightly bigger black hole. We explained this fusion in previous chapter when we calculated Fusion Distance and Separation Distance. This is why particles in quantum world are slightly different from objects in macroscopic world. *Basically, whenever two Origamons are closer than Planck Length they will fuse into one.* When certain number of Origamons fuse to produce the particle, their gravitational status in relation to the each other and to the central black hole is called Gravitational Equilibrium. Therefore, the production mechanism of particles smaller than Planck Mass is via fusion of Origamons to reach Gravitational Equilibrium, while the mechanism of producing objects larger than Planck Mass, is by angular momentum of Origamons which prevents them from falling to the central black hole. This explains why fundamental particles have spin(solving Spin Problem in Standard Model), because when Origamons which have their own spin (due to rotation of time) fuse into one final particle, the spin will be preserved, while if Origamons set next to each other to produce a particle, the final particle won't have spin. This also means that fundamental particles are consisted of much smaller particles (Origamons) and that explains many conflicts that are unresolved in Standard Model, which we will explain in further pages.

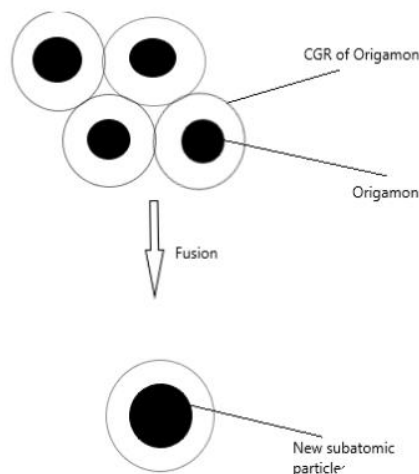


Figure 50- Fusion of Origamons into one new particle with one central black hole

In technical terms, the Gravitational Equilibrium means the central black hole in the center of particles is covered by shells of Origamons hold in place by their inter-Origamon gravitational force (for masses less than Planck Mass) or by their angular momentum (for masses bigger than Planck Mass). If you notice in my previous argument about the angulation of time, we can see that value of Planck Mass is so crucial. As we showed, time angulates almost 90 degrees and creates the biggest mass which is the universe, then it angulates at closest angel to zero

and creates the most trivial mass, which is Origamon, but right in the middle, at exactly 45 degree angulation, it creates Planck Mass. My equation for time-mass demonstrates this perfectly:

$$M = \frac{t_g \alpha \times m_p}{2}$$

$$\alpha = 45^\circ$$

$$t_g 45 = 1$$

$$M = \frac{1}{2} m_p$$

As we explained before, the coefficient of $\frac{1}{2}$ in the equation is to deduct the mass of the antimatter, because when any mass/particle is produced an equivalent antimatter mass is produced too and the equation is showing the total mass of the matter + antimatter so we will have to divide the result by 2 to find the mass of the matter. But Planck Mass is an imaginary particle with no antiparticle, so when using the equation for Planck Mass, we have to disregard the $\frac{1}{2}$. We will see later that Planck Mass simply cannot exist because its radius is equal to its Schwarzschild Radius, which makes the particle, a black hole. Figure 51 demonstrates the microstructure of subatomic particles, which all are consisted of one single central black hole and millions of Origamons in shells arranged around it.

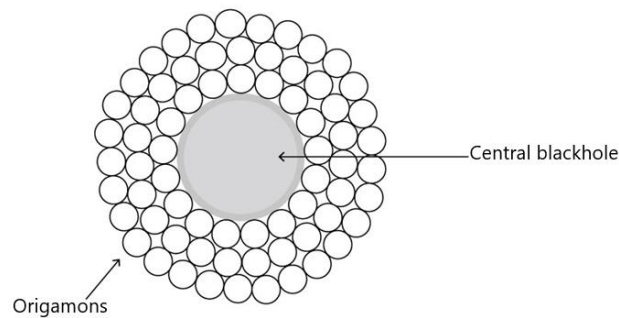


Figure 51- structure of subatomic particles in Origami Theory

6. Baryons in Origami Model

When Big Bang started, the first particles to appear must be the smallest ones, the Origamons . Then the Origamons accumulate and create the first neutrinos which are the product of large number of Origamons stuck together by gravity and creating the most stable and most neutral

particle. Every elementary particle consists of one central black hole and millions of Origamons arranged around it in shells. As we explained previously, the Origamons producing a particle, virtually fuse into one, but to make the calculations and conception easier, we will show Origamons as individual particles arranged around the central black hole forming the particle. Higgs Boson is the only exception that we will explain it in a separate chapter.

So far, we concluded that there are two types of black holes: Shelled Black Holes in the center of all the subatomic particles, Naked Black Holes in space with masses above 4 solar mass. We created an equation for Critical Gravitational Radius for Shelled Black Holes:

$$CGR = \sqrt{M} \times 0.037$$

And a slightly different equation for Critical Gravitational Radius in Naked Black Holes:

$$CGR = \sqrt{M} \times 1.68$$

We already reached the conclusion that the smallest mass produced by slightest angulation of time would be Origamon with a mass of $1.3 \times 10^{-70} kg$. This is incredibly small particle, septillion times lighter than Electron Neutrino. Origamons are highly attractive to each other because their radius is so small, leaving their central black hole exposed to attract other Origamons. We discussed before that the Origamons forming the subatomic particles, actually fuse into one single particle with one central black hole, but for calculation and comprehension purposes, we consider that Origamons set next to each other by a Gravitational Equilibrium around the central black hole of a particle, creating the first layer of the shell for that particle. Each layer of shell, depending on the circumference of the central black hole, would accommodate certain number of Origamons, very similar to the structure of atom, and structure of galaxy. To see how Origamons set in layers of shell around the central black hole of a particle, we start from the second smallest particle after the Origamon, which is electron neutrino with mass of $1.9 \times 10^{-37} kg$. Considering the mass of each Origamon to be $1.3 \times 10^{-70} kg$, we can see how many Origamons would be used to create one electron neutrino:

$$\frac{\text{mass of electron neutrino}}{\text{mass of Origamon}} = \text{number of Origamons in an electron neutrino}$$

$$\frac{1.96 \times 10^{-37}}{1.3 \times 10^{-70}} = 1.5 \times 10^{33}$$





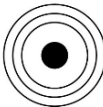
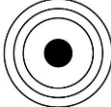
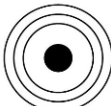
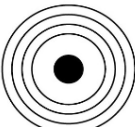
This would be consistent with the first shell capacity. In other words, 1.5×10^{33} Origamons are placed in the first shell around the central black hole to create one electron neutrino with mass of $1.9 \times 10^{-37} kg$. But as we mentioned before, when two Origamons are closer than Planck Length, they fuse to each other, just like two black holes merging. In this merge, depending how close the shell is to the central black hole, between 0.30 percent (at first shell) to 0.003 (in last

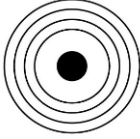
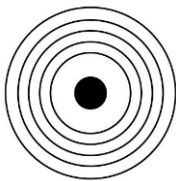
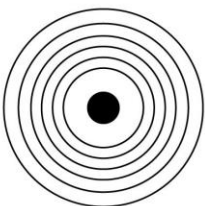
or eighth shell) of the mass of Origamons turn into energy. This is exactly similar to when two naked black holes in space collide, they lose some mass and merge into a just slightly bigger black hole. Therefore, in first shell, the only shell, in electron neutrino, there will be 2×10^{33} Origamons fused to produce the mass. This makes the capacity of the first shell complete, and so the electron neutrino is a stable, complete particle.

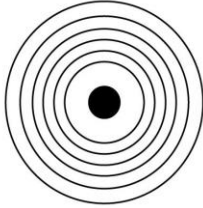
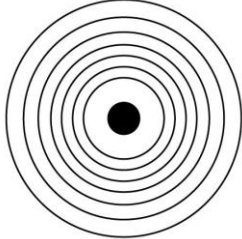
Now we can see how the next elementary particle can be formed. The first shell will be complete by 5×10^{33} Origamons arranged around the central black hole. Therefore, electron neutrino will have only 2×10^{33} Origamons, which wouldn't complete the first shell. When the first shell become complete with enough Origamons, then to add anymore Origamons, they will have to be placed in the next layer above the first shell, second shell. Now the radius has increased so the surface of the next shell would be larger. We can calculate this area by finding the new radius, which is the sum of $R_s + R$. Here R is the diameter of one Origamon, which is equal to the diameter of the first shell. By finding the surface of the second shell we can see that interestingly in every particle, the mass of all the Origamons before the last two shells will be converted to energy so the rest can fuse to form the new particle. This 0.3 to 0.003 percent loss that turns to energy is exactly the same energy that is released when nuclear fusion happens and we call it strong nuclear force and we will explain it in deep details in last chapter. The released energy will be in electromagnetic form, photons, that we will see it's in fact exactly the same as what we call Origamon. Therefore we can calculate that the second shell would fit a maximum of 8×10^{39} Origamons. Then the next shell, would fit 13×10^{40} Origamons and the forth shell would have the capacity of 21×10^{41} Origamons and the fifth shell would accommodate 34×10^{42} Origamons. The sixth shell would have capacity of 55×10^{43} Origamons. The seventh shell would be able to accommodate 89×10^{44} Origamons and there would not be any more shells because we don't have any particle bigger than this. So, the total number of shells is seven. We can calculate that the eighth shell would be too far from the central black hole, locating beyond the CGR, so it won't be able to stay around the central black hole. Now we can create an Elementary Periodic Table for fermions and bosons showing the shells and the number of Origamons creating each particle:

Table 1- Periodic table of subatomic particles

Particle	Number of Shells	Structure	Mass	Origamon Number	Arrangement

Origamon (photon)	0	.	$1.3 \times 10^{-70} kg$	1	1
Jannon*	1		$5 \times 10^{-46} kg$	6×10^{23}	1×10^{33}
Electron Neutrino	1		$1.96 \times 10^{-37} kg$	1.5×10^{33}	2×10^{33}
Muon Neutrino	2		$3 \times 10^{-31} kg$	2.3×10^{39}	3×10^{33} 3×10^{39}
Electron	2		$9.1 \times 10^{-31} kg$	7×10^{39}	5×10^{33} 7×10^{39}
Up Quark	3		$3.5 \times 10^{-30} kg$	2.6×10^{40}	5×10^{33} 8×10^{39} 2×10^{40}
Down Quark	3		$7.3 \times 10^{-30} kg$	5.6×10^{40}	5×10^{33} 8×10^{39} 5×10^{40}
Tau Neutrino	3		$3 \times 10^{-29} kg$	2.3×10^{41}	5×10^{33} 8×10^{39} 13×10^{40}
Strange Quark	4		$1.8 \times 10^{-28} kg$	1.38×10^{42}	5×10^{33} 8×10^{39}

					13×10^{40} 12×10^{41}
Muon	4		$2.3 \times 10^{-28} kg$	1.77×10^{42}	5×10^{33} 8×10^{39} 13×10^{40} 16×10^{41}
Tau	5		$3.2 \times 10^{-27} kg$	2.4×10^{43}	5×10^{33} 8×10^{39} 13×10^{40} 21×10^{41} 22×10^{42}
Charm Quark	6		$2.2 \times 10^{-27} kg$	1.69×10^{43}	5×10^{33} 8×10^{39} 13×10^{40} 21×10^{41} 5×10^{42} 1×10^{43}

Bottom Quark	6		$7.2 \times 10^{-27} kg$	5.5×10^{43}	5×10^{33} 8×10^{39} 13×10^{40} 21×10^{41} 34×10^{42} 2×10^{43}
Top Quark	7		$3.2 \times 10^{-25} kg$	2.46×10^{45}	5×10^{33} 8×10^{39} 13×10^{40} 21×10^{41} 34×10^{42} 55×10^{43} 20×10^{44}

7. Stability of Mass

As you can see, all the elementary particles fill one shell completely before going to the next shell, but quarks don't follow this pattern and before completing the last shell, they have Origamons placed into the next outer shell. This expands the radius of the particle and creates an unstable shell in outmost layer of the particle. We can calculate easily and see when the number of Origamons in a shell is less than half of the capacity for that shell, the particle would be unstable, and if the number of Origamons in the shell is exactly equal to the capacity of the shell, the particle would be the most stable one, and the least likely to decay.

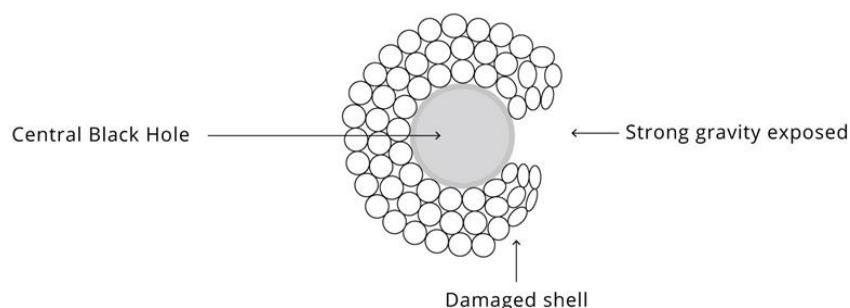


Figure 52 Unstable particle (quark)

Therefore, we can see that Origamon itself, and electron would be the most stable particles, while all the quarks are the most unstable. Also, Higgs boson and Z boson are unstable too but not to the level of quarks, which is exactly consistent with the findings of experiments. The mechanism of this instability can be explained by ratio of $\frac{R}{CGR}$ in the particle. This is the ratio of radius of particle to the CGR of the central black hole of the particle. As I explained so far, inside the CGR distance, the central black hole of the particle has enough strength to hold the Origamons and beyond the CGR, the Origamons would be susceptible to escape. This means when the ratio of $\frac{R}{CGR}$ is bigger than 1, the gravitational force of the central black hole would be weaker than the sufficient level to hold the outer shell. My equation shows that if $\frac{R}{CGR}$ in any mass, regardless of subatomic particle or celestial star, is equal or bigger than 1, that mass will be unstable because its radius is far too big for its central black hole gravity. Therefore, quarks are very unstable fermions and that's why they need to always bind/fuse with another similar particle, lose some mass, become smaller and reach stability. This instability is what quantum mechanics calls Color Confinement. In other words, when two outer shells are incomplete, making the ratio of $\frac{R}{CGR}$ equal or bigger than 1, the particle will have insufficient gravity from its central black hole to hold the entire Origamons in their shells, so it will need to find another nearby similar particle and lose the Origamons of the outer shell(turn to energy) and share its outer shell with the other quark to reach stability. Also, as we see, a particle can only share the similar shell with another particle because each shell has certain distance from the central black hole, so it has certain energy. That is why an up quark would only combine with another up quark or down quark, both of which have 3 shells. With the same reason, a bottom quark can easily combine with top quark or charm quark, sharing their incomplete 6th shells (figure 53).

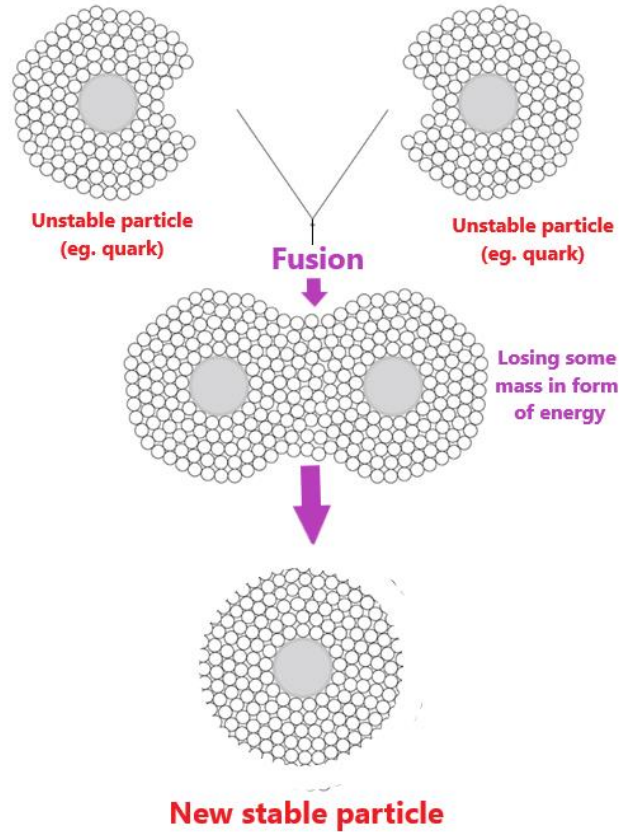


Figure 53- Fusion of subatomic particles to produce bigger, single, stable particle

Therefore, if the ratio $\frac{R}{CGR} \geq 1$ the particle would need to bind with another particle to become stable. Therefore, I call the $\frac{R}{CGR} \geq 1$, the *Confinement Edge*. On the other hand, if the radius of the particle is too small, the gravitational force of the central black hole would be too much and it makes the shell vulnerable to collapse into the central black hole and convert completely to energy. We can find out the lower ratio for $\frac{R}{CGR}$ that can make the particle fragile. The implosion takes place when the gravitational force of the central black hole in a particle is higher than the total gravitational force between the Origamons inside the shells.

Implosion Threshold: $g > g'$

g: the gravitational force of the central black

g': the gravitational force of the Origamon

$$g = \frac{GMm}{r^2}$$

$$g' = \frac{Gmm}{r'^2}$$

For implosion to happen we must have: $g > g'$

$$\frac{GMm}{r^2} > \frac{Gmm}{r'^2} \Rightarrow \frac{M}{r^2} > \frac{m}{r'^2}$$

M : mass of the particle

m : mass of Origamon = $1.3 \times 10^{-70} kg$

r : radius of the particle

r' : distance between two Origamons = $2.3 \times 10^{-27} m$ (the largest distance between the Origamons in outmost shells)

$$\text{In other words: } \frac{M}{R^2} > \frac{1.3 \times 10^{-70}}{(2.3 \times 10^{-27})^2} \Rightarrow \frac{R^2}{M} < 2.36 \times 10^{-17} \Rightarrow \sqrt{\frac{R^2}{M \times 1.4 \times 10^{-3}}} < \sqrt{\frac{2.36 \times 10^{-17}}{1.4 \times 10^{-3}}}$$

We know that $CGR = \sqrt{GM \times 2.18 \times 10^7}$

Therefore:

$$\frac{R}{CGR} < \sqrt{\frac{2.36 \times 10^{-17}}{1.4 \times 10^{-3}}} \Rightarrow \frac{R}{CGR} < \sqrt{1.69 \times 10^{-14}}$$

$$\frac{R}{CGR} < 1.3 \times 10^{-7}$$

This means if the ratio of $\frac{R}{CGR} < 1.3 \times 10^{-7}$ the particle's or atom's or star's central black hole will overpower its shell and therefore the shell will collapse into the central black hole. This will apply to every mass, including subatomic particles to gigantic stars in space. In all these masses, the implosion happens with exactly the same mechanism and the same equation works on all of these masses. If this happens in a star, the star will explode as a supernova, all its mass will turn into energy and the central black hole will remain as a naked black hole in space. If before the implosion, the star or particle meets another star or particle and join together to attract its mass and strengthen its shell, it might reach stability. In other words, when the central black hole of star or particle is too strong for its small shells before it loses more mass and reaches the critical ratio, it will try to combine with other stars or particles to increase its radius and reach stability. Examples of this critical ratio can be found in unstable stars, such as white dwarfs. In classical white dwarf, mass is around $1.3 \times 10^{30} kg$ and the radius is $7000 km$, therefore we can calculate the ratio:

$$CGR = \sqrt{M} \times 3.7 \times 10^{-2} = \sqrt{1.3 \times 10^{30}} \times 3.7 \times 10^{-2} = 4.21 \times 10^{13}$$

$$R = 7 \times 10^6 m$$

$$\frac{R}{CGR} = \frac{7 \times 10^6}{4.21 \times 10^{13}} = 1.6 \times 10^{-7}$$

At this point, the ratio is very close to the 1.3×10^{-7} and if the white dwarf loses just another 0.1 percent of its radius it will explode into a black hole. This is very consistent with our observations of stars and especially white dwarfs that are very susceptible to explode as supernovae and turn into black holes. This equation shows that reduction of the radius of a star

is the key point to convert the star into a black hole through an explosion that we call supernova. The supernova is nothing but collapsing the entire star shell (mass) into the central black hole, converting matter to energy and releasing it into space.

Therefore, we have three crucial ratios that are so important in entire universe to predict the behavior of subatomic particles and celestial stars and galaxies and even the entire universe:

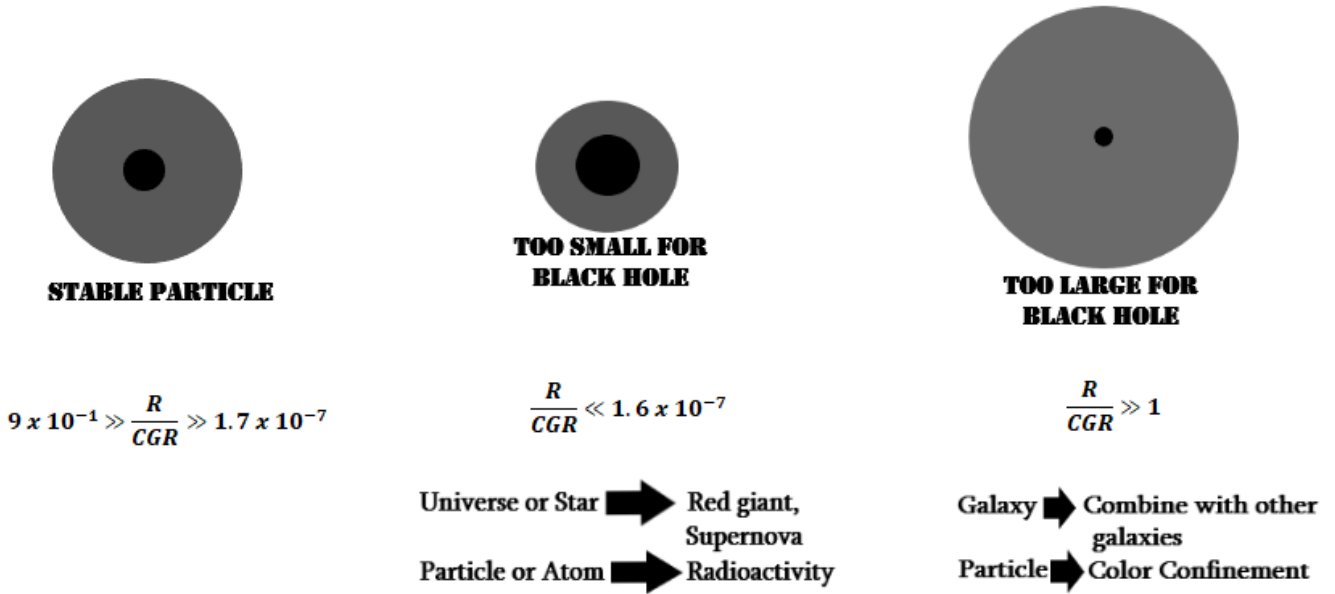
$$\textbf{Breakpoint Edge} : \frac{R}{CGR} \ll 1.6 \times 10^{-7}$$

$$\textbf{Implosion Edge} : \frac{R}{CGR} \ll 1.3 \times 10^{-7}$$

$$\textbf{Confinement Edge} : \frac{R}{CGR} \gg 1$$

$$\textbf{Stable Particle} : 9 \times 10^{-1} \gg \frac{R}{CGR} \gg 1.7 \times 10^{-7}$$

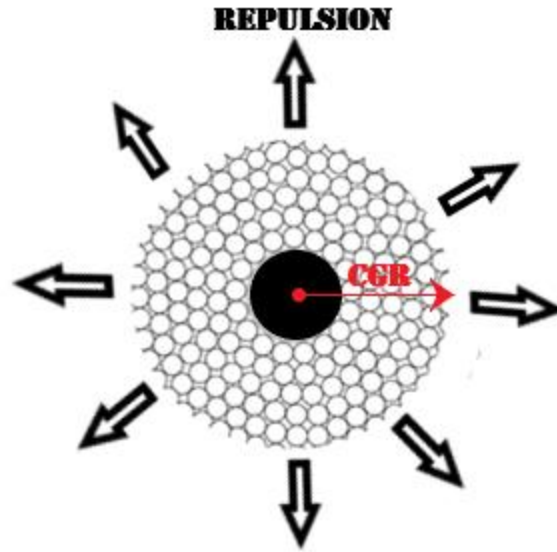
When the ratio reaches the *Breakpoint Edge* the particle or star or galaxy or universe, starts losing its mass as energy (free Origamons, radioactive). When particle or star or galaxy reaches the *Implosion Edge*, its central black hole is too powerful and so it will collapse the entire mass and lose it all as energy (free Origamons). We will see later that our entire universe is also a particle and it has already reached the Breakpoint Edge and it is losing mass to the next universe and in 700 million years as its CGR keeps enlarging, it will reach the Implosion Edge and turns into a supernova, exploding into the next universe. If a mass (subatomic particle or celestial star or galaxy) has a $\frac{R}{CGR}$ ratio of 1 or more (its radius is too big for its central black hole), it has reached its *Confinement Edge*, which means the mass has to lose some of its matter by combining to another similar mass to reach stability.



Three different types of mass based on their radius to their black hole radius

Note that only subatomic particles contain a central black hole and the rest of the mass lacks such feature, however, large stars and also galaxies and the universe have a central black hole too. The reason for this is that as I will explain in the next chapter, when a universe ends, all enters to the next universe as a red giant exploding to a supernova. This means the central black hole of the exiting universe is already there and when it sheds its mass, the black hole will appear. Also, stars contain a central black hole because there are in fact the black holes with a universe developing inside them and when finally, the universe emerges, the naked black hole will be left behind, exactly the same way the entire universe acts at the end of its life. The galaxies contain a central black hole too in order to hold their stars, just like an atom. All these masses with central black hole behave exactly the same way and based on the above ratios. I will show that Origami Model predicts the existence of the most massive black hole at the center of the universe.

This is how Origami Model acts like an excellent Unifying Theory with equations and rules that apply to entire universe regardless of the mass or radius of the object. The following picture shows the central black hole of an elementary particle and how the Origamons are always placed inside its CGR to produce the particle, exactly the same way stars locate inside CGR of the central black hole of a galaxy:



Schematic figure showing a subatomic particle with its central black hole in the center and the Origamons around it.

As I explained, when radius of a particle or star or galaxy is equal or more than its CGR, the particle or star or galaxy will be too large for its central black hole and it will become unstable and will need to combine with another mass. To test the equation in particles I need to provide the equation for CGR of the shelled black holes. I have already extracted the equation for the CGR of the naked black holes in space. The shelled black holes have a smaller CGR because their gravitational attraction point starts virtually from their event horizon, so the equation is modified to:

$$CGR_e = \sqrt{M} \times 1.68 \times 10^2 : 2\sqrt{C}$$

$$CGR_s = \sqrt{M} \times 3.8 \times 10^{-2}$$

In above equation CGR_s is the CGR of any shelled black hole, M is equivalent mass of the black hole and C is speed of light. Now let's try to find the CGR of electron:

Mass of electron = mass of its central black hole: $9.1 \times 10^{-31} kg$

Radius of electron: 3.6×10^{-18}

$$CGR_e = \sqrt{9.1 \times 10^{-31}} \times 3.8 \times 10^{-2}$$

$$CGR_e = 3.6 \times 10^{-17} m$$

$$\frac{R}{CGR} = \frac{3.6 \times 10^{-18}}{3.6 \times 10^{-17}} = 0.1$$

As we see, in electron R is exactly ten times smaller than CGR, which makes electron the second most stable particle after the Origamon.

Now we can try the equation for massive objects, such as our Milky Way Galaxy or extremely small particle such as quarks. The mass of the central black hole at the center of Milky Way Galaxy, Sagittarius A is $8.6 \times 10^{36} kg$, and it is a naked black hole. The radius of our galaxy is $4.9 \times 10^{20} m$. let's see what the ratio is for our galaxy:

$$\begin{aligned} CGR &= \sqrt{M} \times 1.68 \times 10^2 \\ CGR &= \sqrt{8.6 \times 10^{36}} \times 168 = 4.9 \times 10^{20} m \\ \frac{R}{CGR} &= \frac{4.9 \times 10^{20}}{4.9 \times 10^{20}} = 1 \end{aligned}$$

This is wonderful result because shows that our Milky Way galaxy is exactly at Confinement Edge. This means our galaxy would love to meet and collide and combine with another galaxy and it is going to happen soon. In fact, recent observations have proved that Milky Way Galaxy is going to definitely collide with Andromeda Galaxy in 4.5 billion years. Our equation shows why the galaxy is on its way to make this happen.

The ratio for Andromeda Galaxy is $\frac{11.35 \times 10^{20}}{12.5 \times 10^{20}} < 1$. Let's see the results for quarks now. Up quark has a mass of $4.6 \times 10^{-30} kg$, so its CGR would be:

$$\begin{aligned} CGR_s &= \sqrt{4.6 \times 10^{-30}} \times 3.8 \times 10^{-2} \\ CGR_s &= 8.15 \times 10^{-17} m \end{aligned}$$

But radius of up quark is 3×10^{-16} therefore in up quark $\frac{R}{CGR} = \frac{3 \times 10^{-16}}{8.17 \times 10^{-17}} = 3.6$. This means in up quark is definitely at its Confinement Edge. In other words, the radius of the quark is so much larger than what it should be and it stretches beyond the CGR, so its central black hole cannot provide enough gravity to hold all its Origamons in place so it needs to immediately combine with another quark to stabilize itself. This is the mechanism of what we know as Color Confinement in quantum mechanics. If we calculate the ratio for down quark with mass of $8.56 \times 10^{-30} kg$ we will have:

$$\begin{aligned} CGR &= \sqrt{8.56 \times 10^{-30}} \times 3.8 \times 10^{-2} \\ CGR &= 1.1 \times 10^{-16} \end{aligned}$$

The radius of down quark is 3.3×10^{-16} so again in down quark the $\frac{R}{CGR} = 3$ which means down quark is at its Confinement Edge too. These results are consistent with observations of color confinement in quarks that makes them extremely elusive as they are hardly ever found in free space and they are always bound to each other inside a composite particle such as a proton or a neutron. If we try the equation for Charm quark with mass of $2.29 \times 10^{-27} kg$ we will have:

$$CGR = \sqrt{2.1 \times 10^{-27}} \times 3.8 \times 10^{-2}$$

$$CGR = 1.73 \times 10^{-15}$$

We know that Charm Quark has a radius of $2.3 \times 10^{-15}m$ therefore $\frac{R}{CGR} = 1.35$ which is again at Confinement Edge. This is why charm quark is also very fragile and has color confinement feature. We can try this for Top Quark that has a mass of $3.09 \times 10^{-25}kg$:

$$CGR = \sqrt{3.09 \times 10^{-25}} \times 3.8 \times 10^{-2}$$

$$CGR = 2.09 \times 10^{-14}m$$

The radius of top quark based on various measurements is between 2.5×10^{-7} to $10^{-5}m$, so $\frac{R}{CGR} = 10^7$ which explains again why top quark has color confinement.

The other crucial conclusion based on my equation for CGR is related to the Dark Energy. As we know, almost entire gravitational attraction in our universe is provided by black holes and the entire gravitational repulsive force is also provided by the black holes. Surface of the black hole is at its event horizon so the surface area of the black hole is:

$$A_a = R_s^2 \times \pi$$

This is the surface that attracts matter and antimatter. But the size of the repulsive area that is at CGR radius from the center of the black hole is:

$$A_r = CGR^2 \times \pi$$

This is the surface area that repulses the antimatter and causes the expansion of our universe. Because CGR is much larger than the radius of the black hole, therefore the repulsive area is much bigger. Referring to the average mass of the black holes and average radius of them, I will calculate in next chapters that the ratio of $\frac{R}{CGR}$ is always (in stars and particles) equal or bigger than $\frac{1}{1.7}$, in other words, CGR is at least 1.7 times larger than R. Considering the surface area being proportional to the square of radius, this means the repulsive area (A_r) of black holes is $1.7^2 = 3$ times (at least) bigger than the attractive area (A_a) of the black holes. This is exactly why Dark Energy in our universe is slightly more than three times the gravitational force and constitute to 75% of the force in universe.

If we consider the mass and radius of elementary particles, we have to notice that based on what we said so far, every elementary particle is formed by a central black hole with shells of Origamons set around it and the more Origamons used in the structure of the particle, the smaller the distance between the Origamons in first shells and bigger distance in outer shells.

Therefore, the radius of elementary particles stays very close to each other. To estimate the radius of elementary particles, we look at the gravity inside the particle again: the central black hole attracts the Origamons and the gravity between the Origamons stops them from falling into the central black hole. Therefore, we will have:

$$g = g'$$

g : the gravitational attraction between the central black hole and the Origamon

g' : the gravitational attraction between two Origamons

$$\frac{GMm}{r^2} = \frac{Gmm}{r'^2}$$

G : gravitational constant = 6.67×10^{-11}

M : mass of the particle

m : mass of Origamon = $1.3 \times 10^{-70} \text{ kg}$

r : radius of the particle

r' : distance between two Origamons

The distance between the Origamons could be the sum of two Origamons' radius ($2 \times 8 \times 10^{-36} = 1.6 \times 10^{-35} = \text{Planck Length}$). Therefore, we will arrive at:

$$r = \sqrt{\frac{M}{2}}$$

$$r = \sqrt{\frac{1.3 \times 10^{-70}}{2}} = 8 \times 10^{-36} \text{ m}$$

This is exactly the radius of Origamon, which is half of Planck Length. Based on this explanation, in a particle, the distance between the Origamons producing the particle varies based on the mass of the particle and the bigger the mass, the smaller the distance would be. Based on Origami Model when two particles are closer than Planck Length, they will fuse into one. Therefore, during baryogenesis, Origamons virtually fused to create fermions and therefore the distance between them is much smaller than Planck Length. We explained that Planck Length at the beginning of the universe was millions of time smaller than current Planck length and that is why Origamons are not observable anymore. Therefore when Origamons with radius of half a Planck length fused to make fermions, the actual distance between them would be Planck Length multiply by the ratio of the electron neutrino mass to the particle mass, because the distance between the Origamons is the largest in smallest mass which electron neutrino, and it is equal to Planck Length. Therefore, we will arrive at:

$$r = \sqrt{\frac{M}{2}} = \sqrt{\frac{1.9 \times 10^{-37}}{2}}$$

$$\mathbf{r = 3 \times 10^{-19}m}$$

This result is extremely close to the measured radius of elementary particles that have been confirmed by experiments in various studies. Also based on what we explained about the distance between the Origamons that shrinks to much less than Planck Length as the mass of the particle increases, so the final radius of the particle stays more or less the same. This is due to the fusion of Origamons to produce the elementary particles. In last part of the article we will see that exactly the same mechanism explains why the radius of nucleus of atom also stays always around $10^{-15}m$ despite accumulating several protons and neutrons in it. This tells us that the radius of all elementary particles would be around $10^{-19}m$ because as we explained previously, as the particle's mass grows, the distance between the Origamons inside its first shells shrinks to keep the radius in a close range.

The last incredible thing is another feature that is clearly visible in our elementary particle periodic table, is the number of Origamons in each shell. If you return to the table and note the number of Origamons from the first to the last particle you will find something extraordinary: a special sequence that has been seen by most of the scientists in everything in nature and universe but there has been no convincing explanation for it: Fibonacci Sequence.

In the periodic table of elementary particles, under the arrangement column, from the Origamon and Jannon to Top Quark, the number of Origamons in the seven shells, starts from 1, and ends at 55. This is the Golden Sequence or Sacred Sequence. I also explained in "Time Chapter" that Data can only recombine with itself and reuse its 1 and 0 codes and therefore the only possible pattern for it to progress would be a Fibonacci Sequence. In other words, Data uses its previous Digits to produce new sequences.

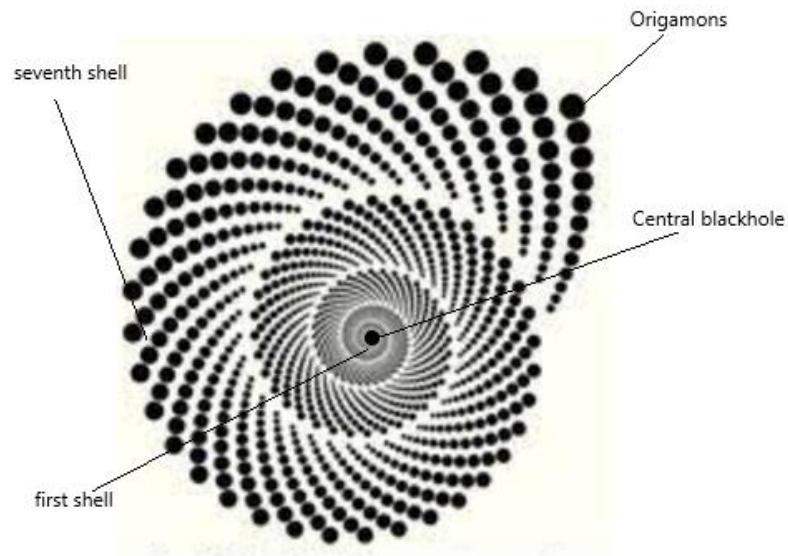


Figure 54- Seven shells with their Origamons around the central black hole in subatomic particles

Fibonacci sequence is based on adding the first two numbers to find the next number, and it always creates a perfect spiral. This means the shells around the central black hole in particles are in fact, fused Origamons arranged in a spiral pattern around the central black hole. This is basically because the time in our universe travels in spiral path, creating the spiral pattern in everything, from smallest subatomic particles, to the entire universe. As we said before, the universe is developing and expanding in a spiral that expands as it goes forward, creating a cone shape in sagittal view (when looking from the side). Imagine looking at a sea shell in sagittal profile. The reason for the spiral advance of universe is spiral progression of data (time) following the Fibonacci sequence because this is the only way possible to recombine data with its own previous values.

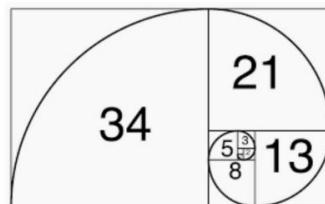


Figure 55- Fibonacci Spiral

Figures 54 and 56 demonstrate the seven shells that accommodate Origamons around the central black hole in a spiral structure.

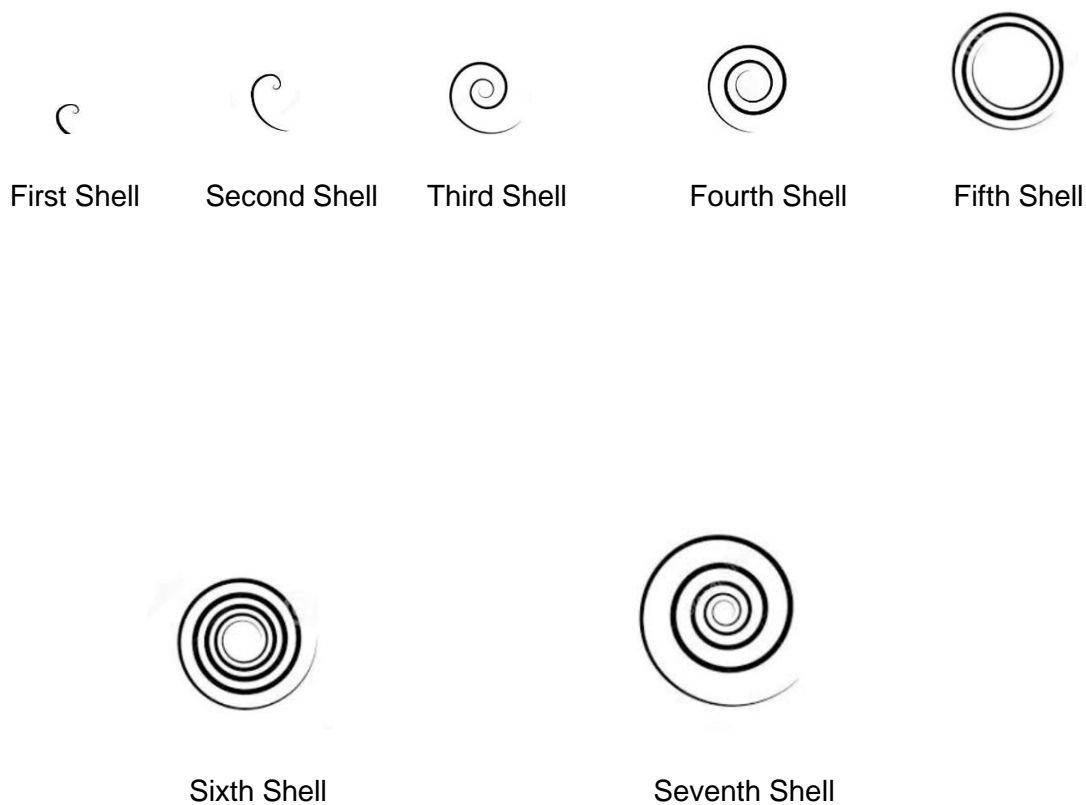


Figure 56- Seven shells around central blackhole in subatomic particles that create a spiral

*Jannon is a subatomic particle that Origami Model predicts its existence. This particle is consisted of Avogadro Number of Origamons: 6×10^{23} , so it's mass would be Avogadro Number multiplied by mass of Origamon minus 35% (mass loss in every fusion): $5 \times 10^{-47} kg$. Therefore, Jannon is a billion times lighter than electron neutrino and it would be located immediately under the Origamon in my periodic table. This means based on my equation, the radius of Jannon must be around $3.33 \times 10^{-24} m$, which is larger than the Planck Length, so it is not a ghost particle.

8. Antimatter

We saw that the entire universe is created by recombination of digits and producing new data. Let's imagine there are just six numbers in a Shot and they are randomly setting until they create the following sequence:

1-2-3-5-8-13-21

At the same time, the same digits would produce the opposite version of the sequence too, because they are forming all random sequences:

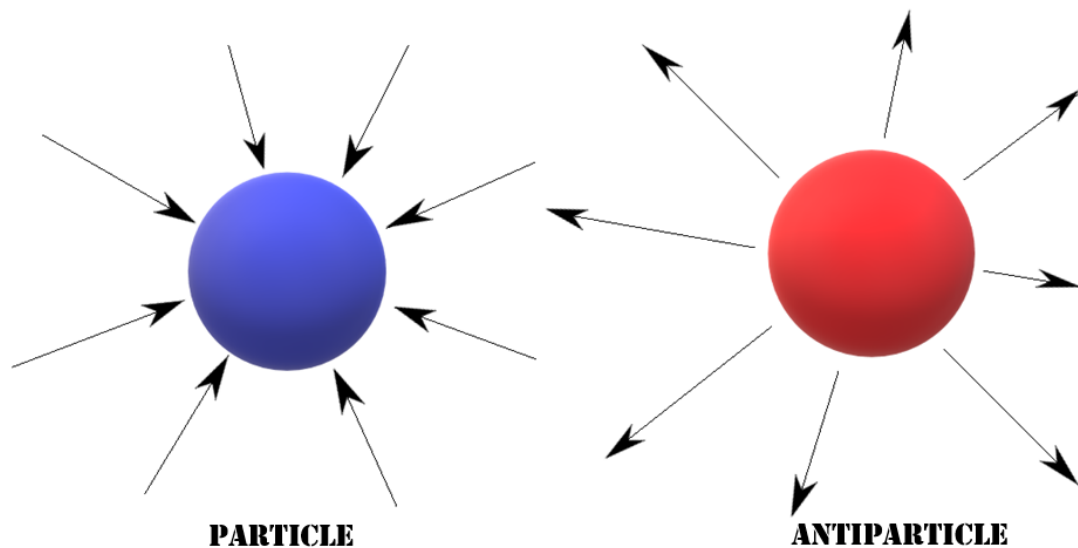
21-13-8-5-3-2-1

If the first sequence is translated to a neutrino, the second one, that is the mirror image of the first one is antineutrino. Therefore, the antimatter is the reverse sequence of data that produces matter and both matter and antimatter are formed by collections of Origamons, but in different structures. This means everything about the matter, including mass, spin, speed, force etc. would be the same for antimatter except one thing:

The direction of gravitational force in antimatter is towards the center of the antimatter.

The direction of gravitational force in matter is from the center of the matter.

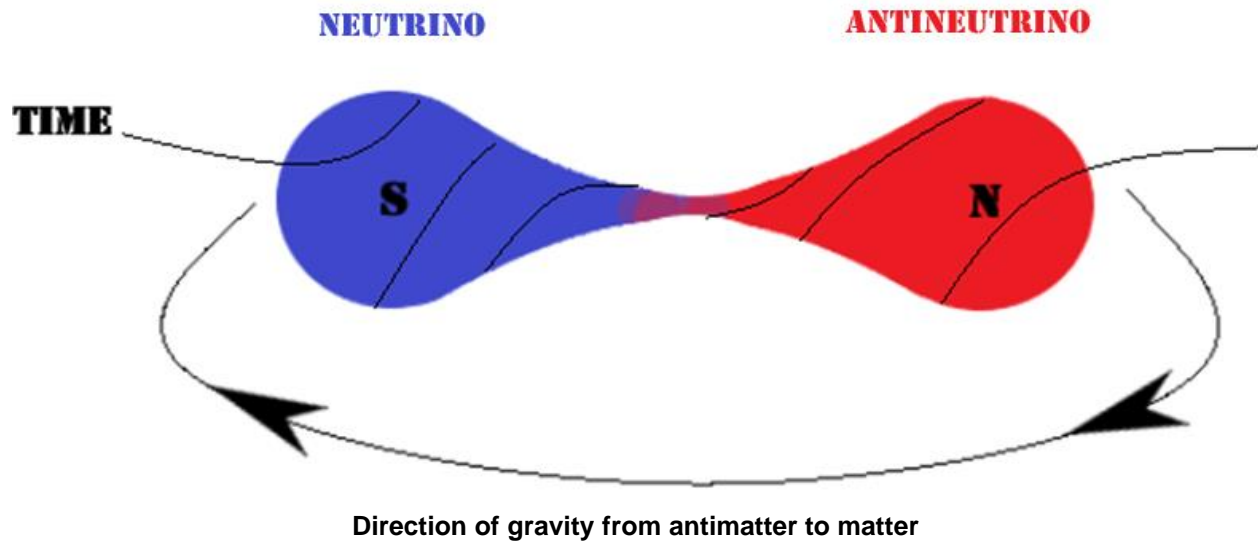
Below picture demonstrates these vectors:



Direction of gravity in matter and antimatter

As we can see, the gravitational force in matter particles pulls the matter towards the center of the mass, but gravitational force in antimatter particles pushes the antimatter away from the mass. This means two antimatter repel each other, two matter attract each other, and matter

and antimatter attract each other. If we combine time and gravity in a matter (neutrino) and an antimatter (antineutrino) will have something like the following picture:

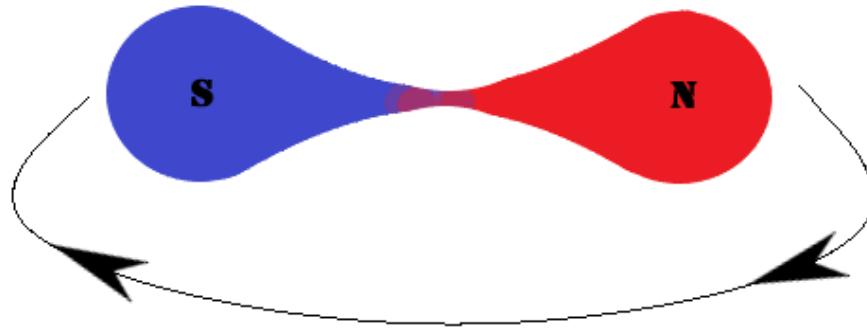


When matter meets antimatter, the entire mass will be converted to Origamons (photons). This is why Origamon (photons) in fact have no antimatter. The smallest real anti particle is our universe is antineutrino, because if Origamon had an antiparticle they would have destroyed each other at Big Bang and nothing would have been created. Unlike the Standard Model that believe photons (Origamons) only exist in free form, Origami Model shows that photons are the building block of universe simply because they are the smallest particle and also any matter in universe when receives energy, releases photons. This means obviously photons (Origamons) are part of the structure of all other subatomic particles. So, at the Big Bang, Origamons fused to produce neutrinos and antineutrinos and from that moment, expansion started due to the gravitational attraction and repulsion with the mechanism that I explained in previous chapters. But how could Origamon (photon) have no antiparticle. The answer is very clear: Origamon is the first and simplest Data, so it is symmetric and it is not able to produce the antiparticle for itself. I showed before that antimatter has only one structural difference with the matter and that is the order of its data (time). When the sequence is reversed, the antimatter is created and that's why every particle automatically has an antiparticle. But Origamon has a symmetric data such as this:

1-2-3-2-1

This symmetric data cannot have a reversed form. In other words, Origamons are consisted of the very first data: 1. The one Digit is not capable of having reversed form. But anything that is created with more data based on Fibonacci Sequence, will be asymmetric and capable of having antimatter counterpart. For example Neutrino is 1-2 , then the antineutrino would be 2-1 and so on.

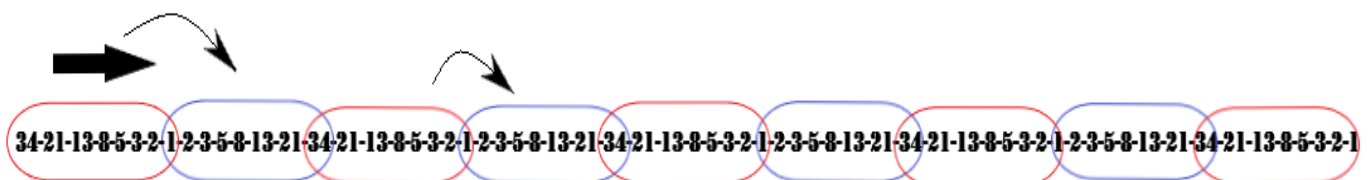
As we can see in the pictures, the gravity begins in the center of antimatter and ends in the center of matter. This means we can imagine gravity as a dipolar force and if we call the gravity pole in the center of antimatter N, the gravity pole in the center of matter will be S and gravity will always flow from N to S, just like a magnet:



GRAVITATIONAL FORCE VECTOR FROM N TO S

Picturing gravity as a dipolar force from antimatter (N) to matter (S)

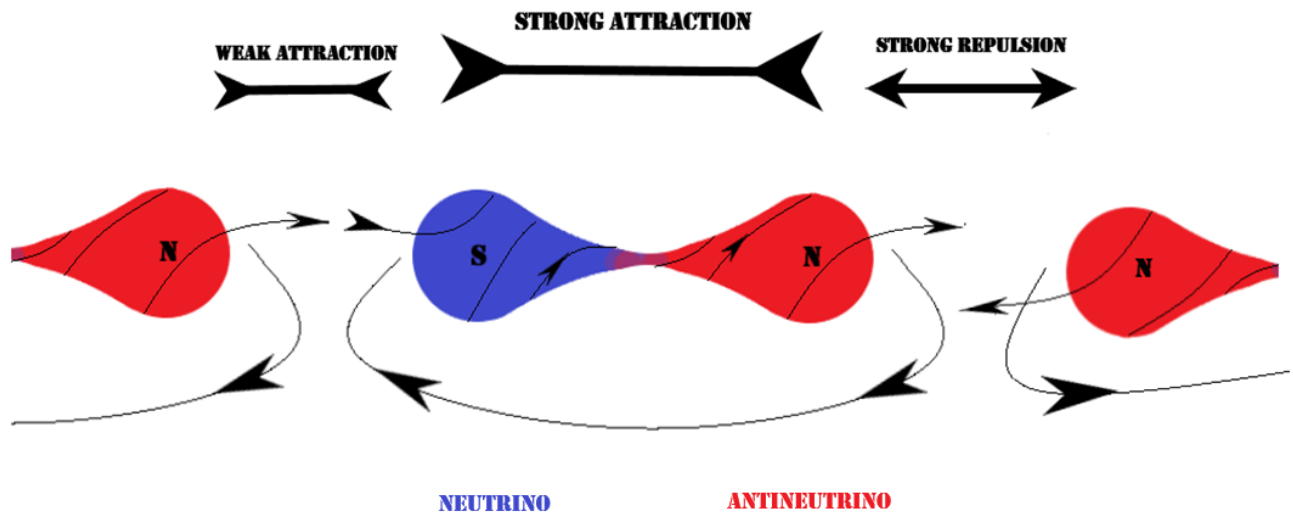
But what makes gravity to have such direction? The answer is in fact in time. If we imagine that a neutrino is only a sequence of five Digit of 1-2-3-5-8-13-21-34, then the reversed sequence will be the antineutrino: 34-21-13-8-5-3-2-1. Let's demonstrate this:



Imaginary sequence of data that produces neutrino and antineutrino

Now we can see two important points in above diagram:

First, the direction of Digits is from antineutrino to neutrino and this is why the direction of gravity is from antineutrino to neutrino, below picture demonstrates the interaction between the matter and antimatter and how gravity can act as a repulsive force as well as attractive force.



Repulsion and attraction caused by gravity

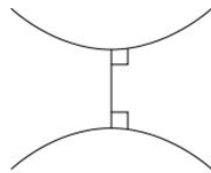
Second, there is a common point or shared Data between every neutrino and antineutrino. When two series of data are reversed picture of each other, they will have at least one point of connection, the end point of one will be the beginning point of the other one. Therefore, our entire universe is interconnected. This means that although time is quantized but it does not disrupt at any point between the matter and antimatter. In other words, the entire universe is connected through time. However, we will not be able to time travel to the past because past is annihilated and we will not be able to travel to future because it requires us to travel as fast as horizontal speed of time which is 10 times faster than light. This is why despite the quantum tunneling occurs with speed of time (much faster than speed of light) but it does not violate the causality because particle always arrives at a certain point in *future*. I will show later that the only way to time travel would be through gravity and using the black holes because they are timeless.

To see the structure of Origamons in antimatter, we must consider the direction of gravity. But before that, we need to note that every subatomic particle can have an antiparticle except the Origamons. Because Origamon is the first mass, its data is only one Digit: 1. Therefore, it cannot have a reversed form. Even if it has more than one Digit in its structure, there is a symmetry in its data, because it is the plain particle. After the Origamon, all other masses are produced by collections of more than one Origamon therefore, they lack symmetry of data which enables them to have an antiparticle. By symmetric data I mean a sequence of Digits that is the same if reversed. Such as:

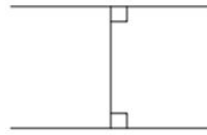
1-2-3-2-1

If Origamon is consisted of such sequence, its antiparticle will be the same as the particle. In other words, Origamon has no antiparticle. This is why photons have no antiphotons. This explains why at the Big Bang, matter and antimatter did not annihilate each other because first matter that was produced was Origamons and they have no antiparticle to annihilate them. I showed that the structure of Origamon and all the particles is in a spiral form that follows Fibonacci Sequence. On the other hand, the structure of antimatter is in an opposite form

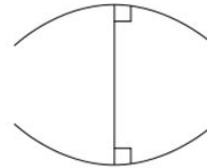
because the direction of gravity is from the center outwards. We know that the geometry of space is not Euclidean geometry, which means the reality of lines in our universe can be in Elliptic direction or Hyperbolic direction. In matter, shells of Origamons are arranged in Elliptic direction, creating a spiral form. In antimatter, shells are arranged in Hyperbolic direction, creating a stag form. The following picture demonstrates the difference:



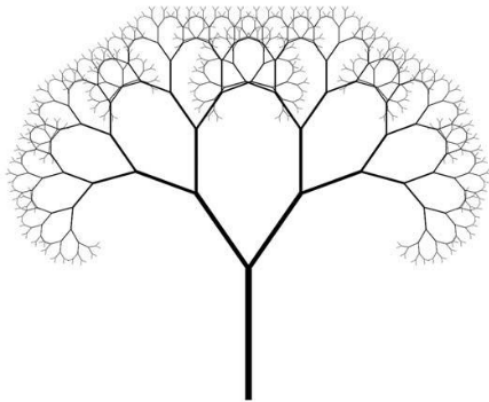
Hyperbolic



Euclidean



Elliptic



STAG PATTERN

ANIMATTER

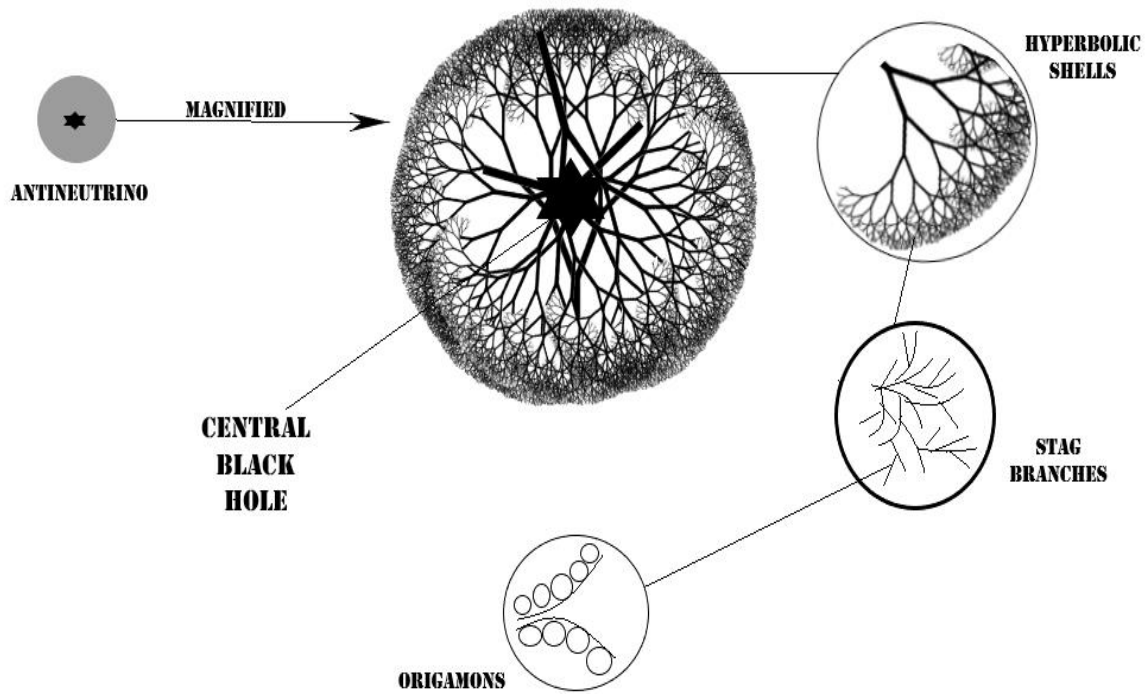


SPIRAL PATTERN

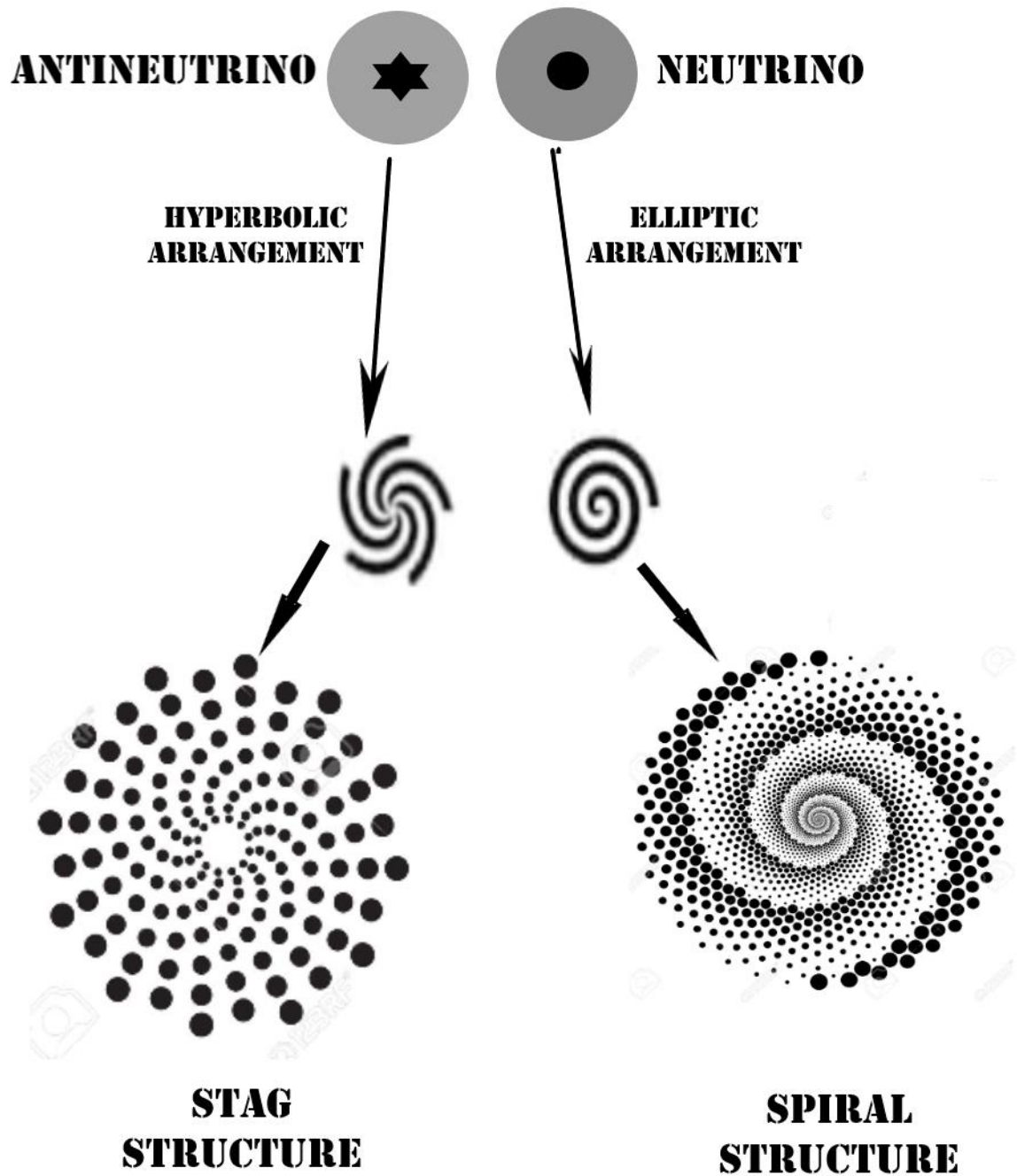
MATTER

As we can see, when shells are in Stag arrangement, they produce a *branching out* structure. We see this transpire in all various things in universe, such as trees. When shells are in Spiral arrangement, they produce a *closing in* structure.

Now, with this in mind we can understand the deference between the structure of a particle and an antiparticle. Below picture demonstrates the structure of an antiparticle, such as an antineutrino and how Origamons arrange in its stag shells:



This structure explains why when antiparticle meets particle, the radiating shells of antiparticle which are consisted of Origamons will virtually penetrate between the shells of particle, attaching to the Origamons in its shells and separating them from the central black hole, so that eventually all the Origamons in the particle and antiparticle will break free. That's how the entire mass converts to free Origamons, energy. Also due to the direction of gravity in antimatter, the shape of its central black hole will be radiating instead of spherical.



The structure of shells and central black holes in matter and antimatter

To end this chapter, I just summarize the discussion. Our definition of gravity in antimatter would be still the same: Gravity is deceleration of time or expansion of Shots of data. Mass of the antimatter is also the same: Mass is combination of time (data) and gravity. Spin, the directional revolution of antiparticle would be opposite of particle because the sequence of data is reversed. The force of gravity between the neutrinos (matters) tend to attract neutrinos towards

each other, and eventually work in direction of reducing the radius of universe, but force of gravity between the Antineutrinos (antimatter) tend to repel the Antineutrinos away from each other, and eventually expand the radius of universe.

Unlike the gravity that has direction, we see that Data (time) is chiral, which means it is asymmetric and random. As we can see in Fibonacci sequence, nothing repeats itself. However, when data combines with gravity, it gets ordered and sequence and this is how it produces the spin. Gravity is the reason of universe.

Missing Particle

As I explained so far, based on Origami Model there is only one elementary particle that is the Origamon. Origamon in its free form is what we know as the photon with a difference that photons are considered massless while Origami Model believe that photons have a mass of square root of Neutrino mass: $1.3 \times 10^{-70} kg$. All other particles are developed by various collections of Origamons, therefore there must be any particles that we haven't discovered yet and some of them must have turned to ghost particles already. This is exactly why mass converts to energy and vice versa, because energy is free Origamons (photons) and all particles are produced by Origamons. In other words, all particles are produced by various collections of photons and that is simply why when a mass is broken down, it turns to photons.

When a collection of Origamons produce a particle, as I demonstrated before, they arrange in spiral form so we will have an almost sphere of Origamons that produce a mass. The number of Origamons in this sphere defines the mass of the particle. Because when Origamons combine to produce the particle, there will be around 33% loss, the final mass of the particle is 33% less than sum of all Origamons masses used in its structure. This means the volume of this sphere (almost sphere) is proportional to the mass of the particle. The formula for volume of sphere is:

$$\text{Volume of sphere: } \frac{4}{3}\pi r^3$$

Because our sphere is spiral, its volume is 33% or 1.6 times bigger than a perfect sphere. We know that 1.6 is called ϕ :

$$\text{Volume of particle} = \phi \frac{4}{3}\pi r^3$$

Now to see how many Origamons fit into the volume we can rewrite the equation as the following:

$$\text{Number of Origamons in a volume of particle} = \phi \frac{4}{3}\pi \frac{1}{r^3}$$

I explained before that mass of a particle is proportional to the volume that time produces around the gravity:

$$M = 1/2 t_g \alpha \times m_p$$

α here is the angle at which time bends to produce the mass and m_p is the Planck Mass. This means that in a typical mass, the radius of the sphere that time produces is proportional to Planck Mass:

$$r \propto m_p$$

therefore, in our previous equation we can replace the radius with Planck Mass to find the number of Origamons in a typical particle:

$$\text{Number of Origamons in a particle } (O_i) = \varphi \frac{4}{3} \pi \frac{1}{m_p^3}$$

O_i is Origamon Index or the number of Origamons used to produce a particle. Now considering Planck Mass is 2.18×10^{-8} , we can find the number of Origamons in a particle:

$$O_i = 1.6 \times \frac{4}{3} \times 3.14 \times \frac{1}{(2.18 \times 10^{-8})^3}$$

$$O_i = 6 \times 10^{23}$$

We all know this number: Avogadro Constant. This means that the first, or lightest elementary particle will have the smallest integer (1) multiple of Avogadro number of Origamons used in its structure. Therefore, the mass of every elementary particle must be a multiple (N) of Origamon mass times Avogadro Constant:

$$P_m = O_i m_o N$$

P_m : elementary particle mass

N : an integer number of Fibonacci Sequence

m_o : mass of Origamon = $1.3 \times 10^{-70} \text{ kg}$

O_i : Origamon index = Avogadro Constant = $6.02214076 \times 10^{23}$

As I explained before due to the spiral/stag arrangement of shells around the central black holes of the particles, the number of Origamons used is always a multiple of Fibonacci Sequence so N is always an integer number in Fibonacci Sequence. The first, lightest elementary particle that was produced after the Origamons were developed at Big Bang, N would be equal to 1. So, to find the mass of this lightest elementary particle we only need to multiply the Origamon Index by mass of Origamon by 1.3 (to cover the loss):

$$P_m = 1.3 \times 1.3 \times 10^{-70} \times 6.02214 \times 10^{23}$$

$$P_m = 1 \times 10^{-46} \text{ kg}$$

This is the lightest elementary particle that is produced after Origamons were created at Big Bang. I call this archaic particle Jannon. If I use my previous equation for mass-radius of particle, we can estimate the radius of Jannon:

$$M = r^2$$

$$1 \times 10^{-46} = r^2$$

$$r = 1 \times 10^{-23} \text{ m}$$

This means the radius of Jannon is larger than the current Planck length so it is not a ghost particle, which means we must be able to discover this particle one day. There is possibility that Jannon be the particle for Dark Matter, but I definitely believe that Dark Matter is composed of electron neutrinos that are favoured by the gravitational attraction of black holes in neutrino matrix of space, acting as a quasi-particle that I have called Deutrino and it is in fact what

particle physicists call solar Axion. This approach means that technically all elementary particles must have a mass that is a multiple of Planck Mass. Let's see if it's correct. Mass of electron is 9.1×10^{-31} , which is simply a multiple square of Planck Mass:

$$(m_p)^4 \times 4 = 9.1 \times 10^{-31}$$

Electron neutrino has a mass of $1.96 \times 10^{-37} kg$, again a multiple square of Planck Mass:

$$(m_p)^5 \times 4 \times 10 = 1.96 \times 10^{-37}$$

Jannon has a mass of $1.07 \times 10^{-46} kg$, again a multiple square of Planck Mass:

$$(m_p)^6 = 1.07 \times 10^{-46}$$

Deutrino has a mass of $4.2 \times 10^{-42} kg$, again a multiple square of Planck Mass:

$$(m_p)^6 \times 4 \times 10^4 = 4.2 \times 10^{-42}$$

Origamon too is a square multiple of Planck Mass with slight difference:

$$(m_p)^9 \times 0.1 = 1.3 \times 10^{-70}$$

This proves the concept of Origami Model about the Origamon and its mass and its role in composing all other elementary particles and it also proves that what we know as elementary particles are actually composite particles produced by various collections of Origamons.

To summarize this discussion, I can write the arguable particles that Origami Predicts their existence in four types:

Ghost Particle: Origamon with mass of $1.3 \times 10^{-70} kg$ and radius of $8 \times 10^{-36} m$

Archaic Particle: Jannon with mass of $1.07 \times 10^{-46} kg$ and radius of $1.07 \times 10^{-23} m$

Dark Matter particle: Deutrino quasi-particle (Axion) with mass of $4.2 \times 10^{-42} kg$ and radius of $2 \times 10^{-21} m$

Polariton: The photon quasiparticle that I believe transfers the energy of photon (free Origamon) through the neutrino matrix of space.

Mass of Deutrino

Because Deutrino is a quasi-particle of electron neutrino its mass would vary depending on its location. As I explained, a quasi-particle is an excitation of energy level which in this case depending on the distance from the black hole, the mass effect produced of kinetic energy level of Deurino would vary, closer to the event horizon, lower the mass.

This means to calculate an average mass for Deutrino (or solar Axion in particle physics), we need to find the average number of Deutrinis across the final radius of universe. We know that our universe has a radius of $4.4 \times 10^{26}m$ and if the entire space is saturated with neutrino matrix, then every neutrino would occupy a distance that can be calculated based on the formula for volume of sphere:

$$volume\ of\ sphere = 4/3\pi r^3$$

Also, as I showed before the mass of particle is proportional to the square of its radius. This means the reverse cube root of radius of universe can tell us the estimate of average mass reduction across the length of universe radius. I calculated before that final radius of universe in 700 million years would be $4.59 \times 10^{26}m$. Therefore, we have:

$$mass\ reduction = \frac{1}{\varphi^6 \sqrt[3]{r}}$$

$$Mass\ reduction = 2.14 \times 10^{-5}$$

Now we can multiply this by the mass of electron neutrino to find the mass of Deutrino:

$$2.14 \times 10^{-5} \times 1.96 \times 10^{-37} = 4.2 \times 10^{-42}kg$$

So, I believe this should be the average mass of Dark Matter Quasi-particle that I call Deutrino and particle physicists call solar axion. The further the particle from the central black hole $10^{-37}kg$ at the very edge of the universe and close to $10^{-70}kg$ near the event horizon of the black holes.

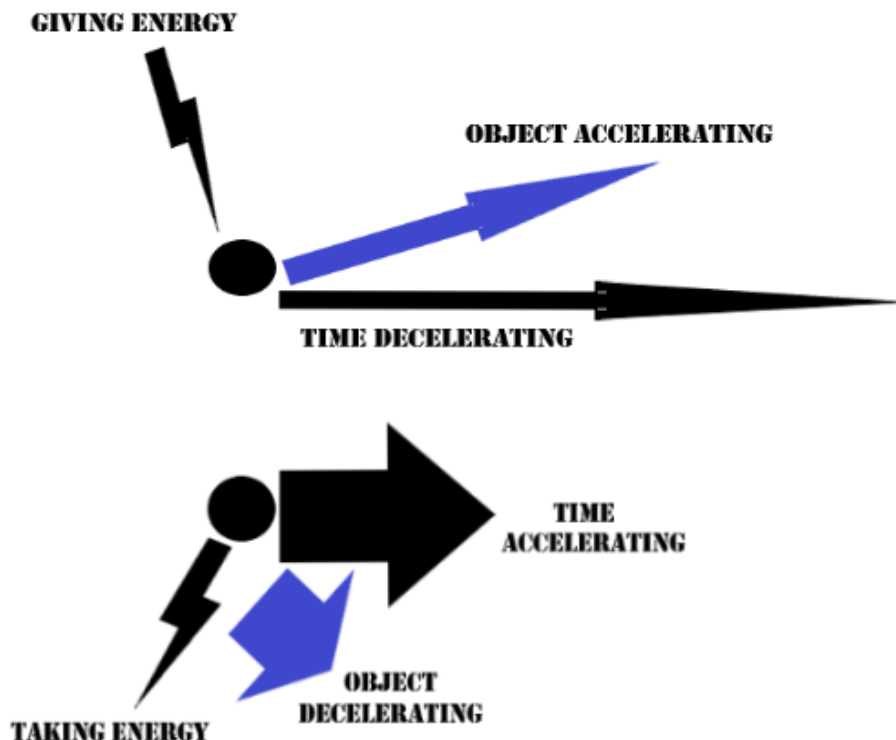
Also, I will show in Subatomic Particles Chapter that because all elementary particles are made out of Origamons, every particle's mass is a multiple square of Planck Mass and we can easily find the mass of Deutrino based on this approach too:

$$(m_p)^6 \times 4 \times 10^4 = 4.2 \times 10^{-42}kg$$

Force and Movement

We know that when we apply force on an object, the object moves. In other words, force causes acceleration. But how? We still don't really know what force is, and how it causes movements or acceleration.

But based on what I explained so far, we know that mass is time with a central gravity in it. I also explained that space and locality are not real dimensions, but manifestations of time. This means, the only force is gravity and what we know as movement, is in fact change of time. We saw in previous chapters that gravity is in fact deceleration of time and when time slows down, everything seems faster to us. Deceleration of time in fact means that frames of time that we call Shots or Planck Time (shortest observable time for us) get wider. Acceleration of time means shrinkage of Shots. What we found about gravity is true about any force, because we will see in last chapter that the only force is gravity and other forces are various forms of gravity. This means when we apply force on a mass, we decelerate time, so object seems accelerating. This is exactly the same mechanism by which universe started and continues to accelerate. The following picture shows this effect:

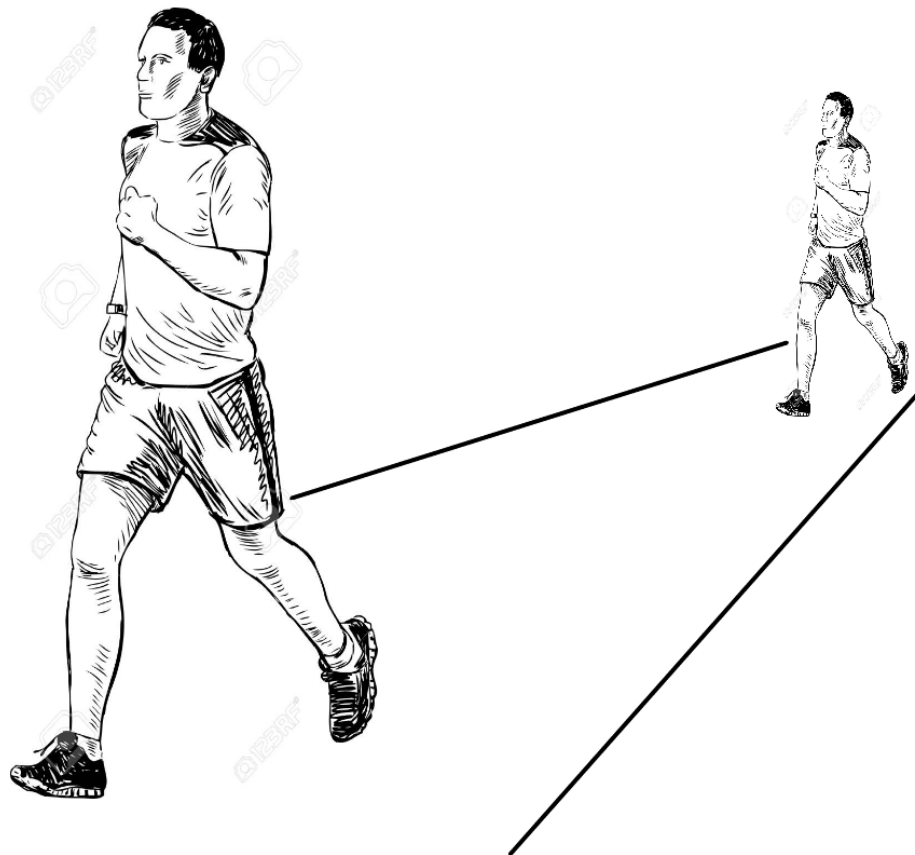


How force causes movement

I show you that we know as space is in fact the vertical progression of time, or the Repetition of Data. This means our universe is just an Origami of time. Any intervention in universe, only changes the data (time), and by changing the data, it can obviously change the mass and location because they are products of time. Einstein showed that when object accelerates, its mass increases. This was an extraordinary finding but no one could comprehend how and why. However, based on what we know so far, understanding the change of mass and locality and acceleration of object is so obvious.

Movement

As I explained before, space is produced by Repetition of data and time is produced by Recycling of data. In other words, space is a manifestation of data (time). When a character on your screen walks towards you, he seems to be walking in a three-dimensional space, while you know that screen is only a 2D plane and by changing the data on your computer you make the character walk in a various direction. When an object moves and changes locality in our world, exactly the same thing occurs: data (time) changes and the objects seems moving in 3D space. Speed and locality and space are all effects produced by change of data (time). Force, enlarges the time Shots, decelerating the time, so the object seems accelerating.



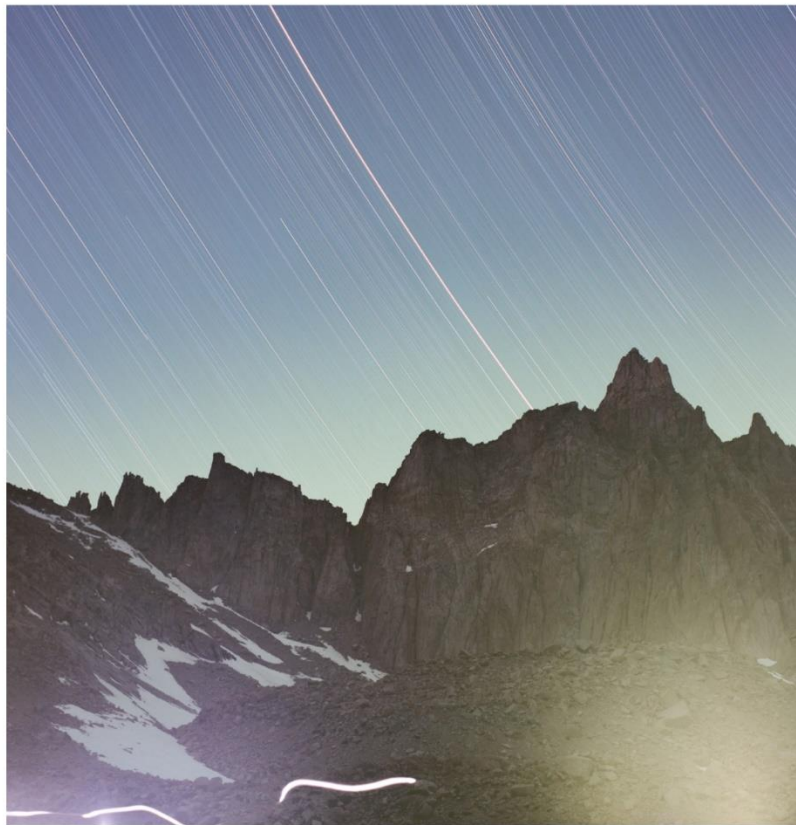
3D effect produced by change of data on 2D screen

Object Permanence

In ancient Greece the great philosophers asked themselves, “Does things exist when we are not looking at them?” their conclusion was yes. You might find this a silly question but it is in fact one of the most profound questions of our intelligence. Some phenomena in quantum mechanics actually created doubt about object permanence.

As I explained so far, our world is simply made of data or time. Time progresses horizontally by recombining its data and this is what we perceive as the progression of time. Also, time expands itself vertically by repeating its data and the repetition of data is what we perceive as space.

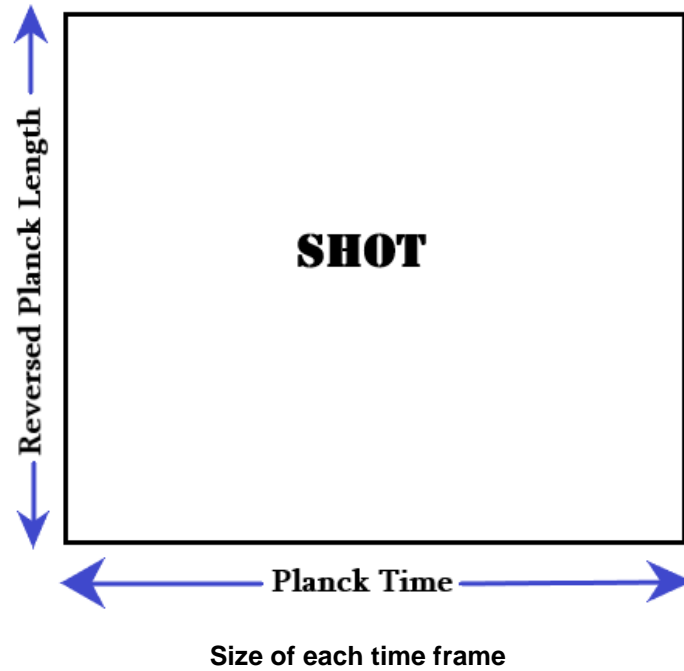
When you take a picture of something, the diaphragm of the camera opens and shuts in a fraction of second. But if you get one of those old mechanical cameras, such as Lubitel 2 made in 1977, and set it towards the sky at night and instead of taking a normal picture, leave its diaphragm open for few hours, then process the film and look at the picture you will something like this:



Night photo with diaphragm constantly open

As you see, stars will appear as lines instead of dots, because the camera is taking a continuous picture as star moves. This is exactly what object permanence is in our universe. Vertical speed of time is so fast that it goes from the center to the edge and returns back in such a short time that we think the entire universe exists at the same time. This means for universe to expand, time needs to accelerate, and this exactly what I am trying to prove. No two particles

exist at the same time. In fact, our universe is like a light that flashes so rapidly that we think its constantly on. In fact, the light in your room is 50 (in USA and 60 in Australia) times turning on and off, but you think its constantly on, because the effect in your consciousness is an analog effect. I will explain in memory and consciousness chapter that consciousness which is in fact the gravity is analog, but the memory that is information stored about the universe is quantized. If one day we invent a camera that works based on quantum tunneling and is able to take photos faster than Planck Time, it will show us something very scary, because we will see that our universe going in and out of existence very rapidly. I explained already that each Shot or frame of time has a length equal to Planck Time and a width equal to reversed Planck Length:



This means length of time frame is 5.39×10^{-44} seconds and width of time frame is 6.2×10^{34} seconds. this we can easily find the current vertical speed of time:

$$speed = \frac{distance}{time}$$

$$V_t^v = \frac{2R_u}{T_p}$$

V_t^v : vertical speed of time

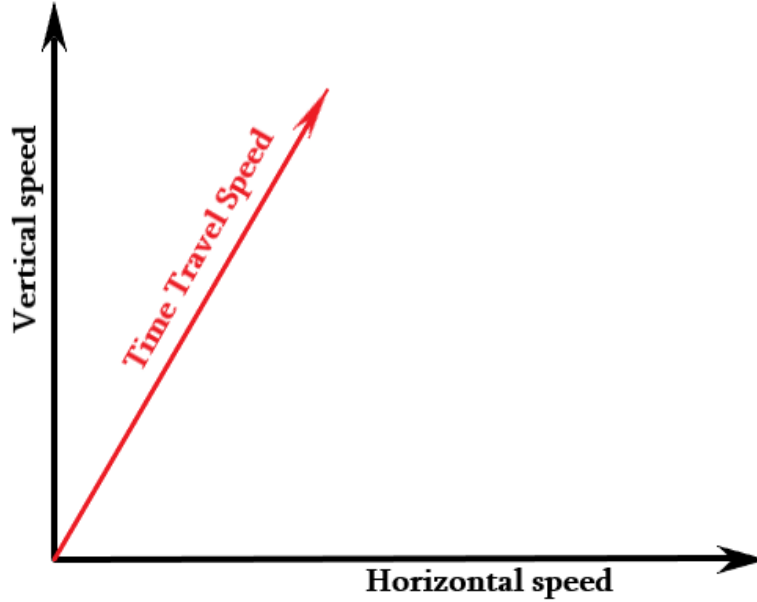
R_u : radius of universe = $4.4 \times 10^{26}m$

T_p : Planck Time = $5.39 \times 10^{-44}s$

$$V_t^v = \frac{2 \times 4.4 \times 10^{26}}{5.39 \times 10^{-44}}$$

$$V_t^v = 1.6 \times 10^{70}m/s$$

Now the average between these two speeds can be calculated based on the square root of the vertical speed divided by 2.



The result would be a third speed that I am going to call it Time Traveling Speed, because this is in fact the speed by which particle jumps ahead of horizontal progression of time:

$$V_{tt} = \frac{\sqrt{V_t^v}}{2} = \frac{\sqrt{1.6 \times 10^{70}}}{2}$$

$$V_{tt} = 6.2 \times 10^{34} \text{ m/s}$$

This is Time Traveling Speed in our universe. The other easier way to find this speed is reversing the Planck Length:

$$V_{tt} = \frac{1}{1.61 \times 10^{-35}} = 6.2 \times 10^{34} \text{ m/s}$$

Now to see how far the particle can time travel per Planck Time we can easily multiply the speed by the Planck Time:

$$5.39 \times 10^{-44} \times 6.2 \times 10^{34} = 3.3 \times 10^{-9} \text{ m}$$

This means every Planck Time, a particle can Time Travel for 3.3 nanometer. In later chapter we will see that we have already discovered this phenomenon in quantum mechanics: Quantum Tunneling. We have actually found why quantum tunneling happens and how.

Energy from Vacuum

Based on what I have been saying so far, the most powerful thing in our universe is actually the vacuum. Where there is nothing. Modern physics tells us that antimatter is the most expensive

thing in the world because you can use it for nuclear fusion and produce so much energy from it. That's why one gram of antimatter is 62.5 trillion dollars. But I am claiming that the most expensive thing in universe is Nothing. We saw that black holes, which hold all the energy in universe and I will show later that they are in fact the consciousness of universe, are pure Nothing. It will be extremely costly to create a small area of absolute vacuum, because the entire universe, except the black holes, is saturated with particle-antiparticle pairs. If one day we succeed to manufacture a black hole, we will have infinite amount of energy forever, and we will also have antigravity by placing the black hole inside a spaceship.

Now, what happens if you take two mirrors and put them inside a box of vacuum, so that they are facing each other in that empty space? Your immediate answer might be "nothing at all". But the reality is that both mirrors will be mutually attracted to each other. The force that does this comes from vacuum. This was first discovered by Dutch physicist Hendrik Casimir in 1948 and as usual like all the great discoveries was completely ignored until Richard Feynman used it to prove his theory and received the Nobel prize of 1965 in physics.

In above experiment the vacuum that we used was just a partial vacuum, and based on Origami Model if we achieve to have the absolute vacuum, the force will be tremendous. We all know that Heisenberg found a great equation that shows we can never be certain about the momentum and locality of a particle. This is called Uncertainty Principle:

$$\delta X \times \delta P \geq \frac{h}{4\pi}$$

δX : error in location

δP : error in momentum

h : Planck Constant

This simply means if we try to find the speed of a particle, we will lose its exact location, so the most accurate measurement is when we have equal amount of error in location of a particle and in its speed. Heisenberg basically showed that we will always suffer a degree of error in our observations. This is an extremely important equation in physics and I have used it a lot in Origami Theory. The other way to rewrite the equation is even more amazing:

$$\delta E \times \delta T \geq \frac{h}{4\pi}$$

δE : amount of borrowed energy from vacuum

δT : duration of time allowed to keep the borrowed energy

h : Planck Constant

This wonderful equation tells us that we can borrow energy from vacuum (from an unknown place in universe) but we can only keep it for an extremely short amount of time and the more we borrow the less we can keep it, before we give it back to vacuum. Richard Feynman, one of the greatest geniuses in quantum physics, used this equation to prove how energy comes from vacuum and how particles interact and force is transferred. The equation simply tells us that we can borrow energy (E) from the vacuum for an incredibly short period of time (T), before it returns back to vacuum. And because $E = MC^2$ then we can rewrite the equation again:

$$T = \frac{h}{4\pi mc^2}$$

Now, look carefully at above equation, please. This equation clearly shows that certain seconds of time is equal to certain kilograms of mass. As we know, the shortest period of time is Planck Time: 5.39×10^{-44} . But we said that time was much slower at Big Bang, so let's see how much time would be equal to Planck Time at Big Bang. Considering the acceleration of time being 6.67×10^{-11} , we can see what the speed of time was at Planck Time after the Big Bang:

$$T_r = \frac{V_t \times T}{V_{t_0} \times 9.87}$$

$$V_t = 10GT$$

$$V_t = 10 \times 6.67 \times 10^{-11} \times 5.39 \times 10^{-44}$$

$$V = 3.6 \times 10^{-53}$$

Therefore the speed of time at Planck Time from Big Bang moment (the first virtual moment of beginning), was 3.6×10^{-53} , which means speed of light was $3.6 \times 10^{-54} m/s$ because speed of time in our universe is always 10 times bigger than speed of light (I have explained this before). Now we can find out what the duration of Planck Time was at that moment:

$$T = \frac{5.39 \times 10^{-44} \times 2.9 \times 10^8}{3.6 \times 10^{-53} \times 9.87} = 4.5 \times 10^{17} \text{ sec}$$

This is an incredible result! Because as we know the age of universe is only $4.3 \times 10^{17} s$ so, the value that we have found is in fact equal to 14.4 billion years, in other words, 700 million years from now! This means one Planck Time at Big Bang was actually taking the entire life of our universe. This is mathematically demonstrating that our universe will reach the end of its expansion in 0.7 billion years from now. This means *we have borrowed the energy at Big Bang only a Planck Time but the universe has accelerated time so it can drag it on for entire life of the universe! This means in fact for observer outside the universe (the Designer), our entire universe from Big Bang to the end of its life takes only a Planck Time.* We have always asked ourselves how universe started at Big Bang? How the energy suddenly appeared at the Big Bang from nothing? This is the answer: The universe borrowed a tremendous amount of energy to build itself at Big Bang, so it had only a Planck time to keep the energy before returning back to vacuum, so to keep the energy longer, the universe changed the time. This is exactly like borrowing money from John for 24 hours, but every 24 hours, wind you clock back for 10 hours, that was you will be able to keep the money for such a long time. However, you can not hold the money forever, you can only delay it, eventually the time will come that you have to pay the

money back. If we calculate the rate of acceleration of time,, we will see that exactly in 14.4 billion years from Big Bang (0.7 billion years from now), the original Planck Time that we were given will be up and that shows again, why our universe will have to end in 700 million years. At that time, we will turn into photons (because our speed will reach speed of light) and we will all enter a new universe as light that carries the information that we have collected here. This is why we have to go to a new universe, in order to pay the energy back.

Now we see how a phenomenon like Big Bang could physically happen out of nothing. Based on the equation, we can calculate how much energy was borrowed during first $5.39 \times 10^{-44} \text{sec}$ of Big Bang. We calculated that Planck Time at Big Bang is actually $4.5 \times 10^{18} \text{s}$, therefore we arrive at:

$$T = \frac{h}{4\pi E}$$

$$4.6 \times 10^{18} = \frac{6.62 \times 10^{-34}}{4 \times 3.14 \times E}$$

$$E = 1.12 \times 10^{-53} \text{J}$$

This result shows that only an incredibly trivial amount of energy was borrowed and now we have to see if this would be sufficient to produce our universe. This is in fact what Standard Model calls the Super-force, the force that later created other four forces. To see how much mass could be produced by this energy we can use Einstein's equation:

$$E = MC^2$$

I showed that speed of time at Big Bang was so slow. To find the speed of time then we do the following:

$$\text{speed of light} = \text{Gravitational constant} \times \text{time}$$

$$C_0 = GT$$

$$C_0 = 10 \times 6.67 \times 10^{-11} \times 5.39 \times 10^{-44}$$

$$C_0 = 3.59 \times 10^{-54}$$

So, the speed of light at that moment was only 3.6×10^{-54} . Now we plug this in Einstein's equation:

$$E = MC^2$$

$$1.12 \times 10^{-53} = M \times (3.59 \times 10^{-54})^2$$

$$M = 8.75 \times 10^{53} \text{kg}$$

Isn't this incredible? The mass we found is exactly the total mass of our universe. This simply means that at Big Bang we were allowed to borrow the energy equivalent of the total current mass the universe and hold it just for a Planck Time, but after we got it, our universe dragged the Planck time by accelerating the time so it can return the energy back in 14.4 billion years ! This is why time is accelerating. Time has no choice. This confirms our theory again: When we take energy, time accelerates, when we give energy, time decelerates. What we perceive as movement of an object or acceleration or deceleration, are only various speeds of time. As I explained before, acceleration of time creates our universe and causes it expansion. Now we know the mechanism by which, force causes movement: by decelerating time. This is why objects accelerate near a mass that we know as the gravity: Force of gravity, decelerates time and so we perceive the objects movement faster. What Einstein called curvature or bending of the fabric of space-time fabric, is actually just deceleration of time.

Probability of Intelligence

This part of Origami Model is slightly different from the rest of the paper and it is dealing more with statistics and biology. Due to the crucial importance of intelligence as the true meaning of Time, I find it irresistible to review the probability of intelligence to appear in our universe and then discussing the role of intelligence and its final destination.

1. Intelligent Evolution

The development of life represents the coming together of various molecules to form more organized and complex forms. That is the development of life requires moving from less order to more order. When it comes to calculate the likelihood of a phenomenon to happen, we need to first consider the second law of thermodynamic, the law of entropy. Mathematics holds an opposite view to the movement of matter toward the higher order. Mathematics says that if the probability of a phenomenon happening is less than 10^{-50} that event has virtually no chance of occurring. That is because the value of 10^{-50} is much smaller than the number of planets in the entire universe. In that we can refer to the statement from Dr. Jean Morton, "The odds that a single large protein molecule can develop by chance is 10^{-113} ." It goes on to say that the chance of a natural development of 25000 enzymes that make up the human body is $10^{-285000}$! As Einstein once said, "God does not play dice." This means considering the age of the universe, development of human intelligence would be simply mathematically impossible. But the universe has solved this problem by multiplying the cycles of universal life by Avogadro number, as we discussed. This is in fact the real origin of Avogadro number. We showed before that seven cycles of universe, each one must go through Avogadro number of universes and this is because only this number of universes will create sufficient chance for life and subsequent intelligence to be developed.

Based on what we said so far, each cycle of the seven cycles of the universe takes $\cos \propto$ shorter than previous one, so the first cycle would take and the last cycle would take , the average duration of time would be $3.6 \times 10^{64} \div 7 = 5.14 \times 10^{63}$ s. Now if we convert that to corrected time: $T_c = 100 \times 5.14 \times 10^{63} = 5.14 \times 10^{65}$ s.

According to the latest data the total number of inhabitable planets in the universe is close to 6×10^{23} . For life to become possible, the most fundamental molecule is amino acid which produces the protein, and then protein produces the enzyme which makes the DNA replication and also cognition feasible. Then beneficial mutations will enhance the adaptation capacity and intelligence and survival rate of the species. Therefore, by multiplying the probability of all these factors we can find the chances for life and then human being to be created and his intelligence to be increased by beneficial mutations. We know that there are 7×10^4 enzymes in live cells, there are 8.7 million species in nature and average similarity of enzymes between species is close to thirty percent. The total biomass of earth (all living beings) is 75 billion ton and average

mass of a cell on earth is close to 10^{-15} kg, and the total number of habitable planets is 6×10^{23} , so we can calculate how many living cells could exist in the universe:

$$8.7 \times 10^6 \times 7.5 \times 10^{13} \div 1 \times 10^{-15} = 6.52 \times 10^{35}$$

The average number of atoms in enzymes is 200 Therefore the probability of an enzyme to be produced randomly is:

$$\frac{7 \times 10^4 \times 6 \times 10^{23} \times 0.7 \times 8.7 \times 10^6 \times 6.52 \times 10^{35}}{20^{200}} = \frac{1.6 \times 10^{71}}{1.6 \times 10^{260}} = 1 \times 10^{-190}$$

We know that average life span of earth size planets is around 7.5 billion years. So we have to multiply my result by 7.5:

$$7.5 \times 1 \times 10^{-190} = 7.5 \times 10^{-190}$$

To find out the number of atoms in earth we can divide the mass of earth by the average mass of an atom:

$$\frac{5.972 \times 10^{24}}{3.7 \times 10^{-27}} = 1.6 \times 10^{51}$$

Therefore, the total number of atoms in habitable planets in universe would be:

$$1.6 \times 10^{51} \times 6 \times 10^{23} = 9.6 \times 10^{74}$$

If all these atoms are actively interacting to produce various molecules, the probability of a protein molecule can be calculated, since the average number of amino acids in a protein is 20 and the average number of atoms in an amino acid is 20. So, the probability of a protein to be randomly produced in entire number of habitable planets would be:

$$\text{probability of a protein to be produced} = \frac{\text{number of atoms in habitable planets}}{\text{number of atoms per enzyme}} = \frac{1.9 \times 10^{75}}{20 \times 20} = 4.75 \times 10^{71}$$

The average number of genes per live cell is 2.5×10^3 and the average number of sperms per ejaculation is 1.44×10^5 . The rate of beneficial mutations is from the minimum of one in every 10 years to 100 in every 7 years, which would be equal to $1 \div 10 \times 3.1534 \times 10^7 = 3.17 \times 10^{-9}$. Therefore, the probability of beneficial mutations would be:

$$\text{probability of a beneficial mutation be concived} = 2.5 \times 10^3 \times 30 \times 1.44 \times 10^5 \times 3.17 \times 10^{-9} = 34.3$$

$$T = \frac{1}{P}$$

T: time that takes for event to occur

P: probability of the event = product of all the probabilities of all the consequential events

$$P = 4.75 \times 10^{71} \times 34.3 \times 10^1 \times 9.6 \times 10^{74} \times 7.5 \times 10^{-190} = 1.17 \times 10^{-41}$$

Now due to the

$$T = \frac{1}{1.17 \times 10^{-41}} = 8.53 \times 10^{41} s$$

This means it would take 8.53×10^{41} seconds for an enzyme to be produced randomly in one of these planets and then an organism to evolve and have beneficial mutations that can enhance his intelligence. As we can see, if we consider the age of the universe as the current age of $4.3 \times 10^{17} s$ there would be absolutely no chance for intelligent life to evolve, but when I plug the real amount of time that is used in the entire universe through its first cycle and the time in 6×10^{23} black holes, then there is significant chance for smart humans to be developed. Now if we divide the age of the universe by the time required for intelligent beings to appear randomly, we will have:

$$\frac{5.14 \times 10^{65}}{8.53 \times 10^{41}} = 6.02 \times 10^{23}$$

This is again a wonderful result! This means there has been Avogadro number of chances for intelligent beings to appear in entire universe, and if in every universe only one intelligent being survives, there must be 6×10^{23} intelligent civilizations in entire cosmos. This result confirms that there are definitely intelligent beings in the world but almost certainly originating from the black holes in our universe, where other universes are placed. In fact, these results show that not only there is intelligent beings other than us in the universe, but our universe is in fact a crowded place! The reason for us to having no confirmed official report of any foreign visitors is our very limited access to the history of our planet which is restricted to a very trivial part of the recent history and also lack of access to all the existing data due to political restrictions. My probability results show that we live in a universe that because it's in the second cycle of its life and contains 6×10^{23} potential universes inside it, possess so many intelligent civilizations that even considering very long distances between us, we must certainly have been visited by more than one of them. Also considering the technology required to travel from one part of universe to another, the intelligent beings that visit us will definitely be much more advanced compared to us. Violence and aggression is triggered by need and fear and as intelligence increases, more sources of energy are discovered because universe has unlimited energy for its beings and keeps producing mass/energy as it expands:

$$M = r^2$$

This equation proves that as time progresses, it produces more mass and energy and space, so universe never runs short of energy for its residents. Therefore, need and fear are both delusions produced by lack of knowledge about the real features of universe. On the other hand, I just showed that considering the time of the universe, probability of intelligence to be produced is definite. Therefore, as time passes, intelligence increases and as intelligence increases, fear and need reduces. Therefore, time reduces violence.

In terms of risk of harm from these intelligent visitors, the risk would be almost zero because the intelligent is reversely proportional to violence and as they are much more advanced than us, they would possess no danger for us, and in fact it would be us who carry the risk of harm for them. In fact, it would be a wonderful opportunity to meet these other beings because they would happily share their advanced science and knowledge with us and teach us so much about the universe and create a technological leap for our universe worth of hundreds of years study and experience. Despite so many scientific fictions and movies depicting aliens as dangerous pieces that come to earth to eliminate human beings and take over our planet for their energy and material requirements, I strongly believe the advanced visitors who will find us, would have passed the stage of energy starvation and pollution that we are struggling with, because the universe has almost unlimited amount of energy provided for everyone and we are going to find the right way of harnessing energy in near future and for the future generations of human beings, the only concern will be the concept of happiness, not energy or food. In terms of their phenotype, due to the universal pattern of time that we assessed in this paper, the visitors, no matter how advanced they are, would definitely look very much fundamentally like us. I see no physical cause to create humanoids in other parts of the universe who would look like an octopus or a unicorn!

During each cycle of the universe, according to the conservation of information, all the data from the previous universe will transfer to the next. Therefore, all the information that is simply preserved in time, as its angulation and its rotation, will be passed on to the new universe. When it comes to the live matter, the information eventually manifests itself as encrypted code in the DNA and therefore the new generation of human beings will be much more intelligent. The multiple cycles of universes increase the chance of intelligence to develop and thus, the Avogadro number is in fact the crucial number of universes to raise the probability of human evolution to a viable threshold. Then we go through the cycles of universe which we calculated to be seven. Each cycle would be slightly longer due to the increase of beta angle is increasing in each cycle for 8.5 degree, and we gather more and more information and our collective consciousness expands, exactly in parallel to the acceleration of light, because by acceleration of time and therefore increasing velocity of light, the events take place faster and so the efficiency of our nervous system and data exchange will enhance. Until we reach the seventh universe, the final stage. At this final universe, speed of time would be:

$$V_t = \omega C \div \cos\theta, \omega = 1, \theta = 0.1^\circ$$

$$V_t = C$$

This will be paradigm shift in human's life. As we said, by this time speed of light will be billions of billions of times faster than current speed of light, which means the final universe will be 10^{64} times bigger, faster and more complex. The human beings in that universe will be at the same rate more intelligent. But the most important fact is that human beings reaching that stage, will be the first generation that live at *present* time, so unlike all the six previous universes where we live always in the past (because time was much faster than light), these human beings will live truly at present and they will be the first ones who will witness the raw reality of cosmos and they will be the first ones to be able to decide, and to execute their decisions and manage the universe and form their lives the way they wish. If I denominate the human being in the seventh cycle, *Origaman*, we know that Origaman will be 10^{64} times taller, faster and smarter. This is in fact an Avatar. His precision and accuracy will be 10^{64} times larger and he will give birth to the eighth generation, who will be *ahead* of time, so they will be the ones who will design the universe, program it, and run it as they wish. They are going to be what we consider our Gods! And they will create us!

As I explained in previous chapters, time spirals inside a black hole and creates the universe. But as time travels inside the black hole, there will always be some space left that time hasn't traveled through, some empty parts, the black holes. Existence of black holes is inevitable because time won't be able to cover the entire space as it rotates and spirals outwards. I showed that the gravity produced from the empty spaces, the black holes, accelerates time. In fact, time has its maximum speed inside the black hole and as it fills up the universe, there will eventually be no empty space left, no black hole to accelerate time. This is when time stops. The end point of cosmos. This means, when all the black holes are saturated with time, cosmos will end. We already calculated this to be 3.6×10^{64} seconds. At that moment, there will be no black hole left in universe. Time will have no place to go. We will see in the next chapter that time and consciousness are the same thing. Therefore, at the end of the world, consciousness will have to find a new home, or it will truly die. The intelligence by then will reach the level to exit the cosmos. The characters of the computer game, become so intelligent that they recreate themselves and come out of the computer screen and live outside.



Figure 75- Ultimate liberty

2. What is time?

The entire Origami Model is necessarily revolving around the subject of time and the foundation of it is the fact that our universe is formed by only one dimension: time. But do we know what time is?

The answer is yes. If we pay enough attention to the mathematical evaluation of our universe so far, we can understand that everything is a manifestation of time. Therefore, time is the most versatile commodity in the universe. I explained so far that space, length, mass and energy are all produced by time. In other words, everywhere we look we see time, and anything we touch or smell or taste, we are sensing time. To see what time is, you can just feel your skin, touch the tree, smell the flower. Time is all of those. Anything that exists, is time in its various forms.

Based on what I explained so far, the entire cosmos is one string of time, so everything in the past and future are all connected by time. This includes us too. So, we are connected to the rest of cosmos. So, we are able to communicate to everything, in past or future. Anything that we imagine, exists. In other words, **time is imagination**. This means, consciousness, which so far hasn't had any definition, is in fact time. The entire cosmos exists inside a super intelligent being's imagination. As time passes, more intelligence is developed. Anyone who is more intelligent, lives in future compared to the less intelligent. The massive black hole that our universe is expanding inside it, is in fact a more intelligent being. We can say that we are all in someone's imagination. Whatever this intelligent being imagines, will happen in our universe. The goal of our existence is to develop more accumulative intelligence so we will eventually imagine, and time will follow our imagination. That's how we will become faster than time. So, we will become the creator. This is how time traveling will be possible too, because our imagination can take us to past or future. We are connected to the past and future by the same string of time, it only needs concentration to connect to past or future and observe or change it. Based on origami theory, there is absolutely no difference between what we know as the real world, and what we call imaginary world. "Emperor of China woke up one day and asked his courtiers: I had a dream last night. I dreamed that I had become a butterfly. Now tell me, am I the emperor of China who dreamed that he had become a butterfly, or a butterfly who dreams that he is the emperor of China?" And till today nobody has been able to answer the question. The answer is our choice. We decide which one to be: emperor or butterfly. It is our imagination that decides what we are. The more intelligent decides for the less intelligent what they are. Without intelligence, there is no existence. Intelligence is the sum of all the information in one's physical mass. In other words, consciousness is in fact total information that has produced a mass. According to conservation of information, information does not annihilate so everyone of us, is eternal. What in various schools of belief or thought is classified as soul, intelligence, consciousness or mind, is in fact, the total sum of information that produces a mass. The mass, could be a rock, a planet or a human being.

I showed that entire life of universe in fact takes a Planck Time that is stretched for 14.4 billion years. Therefore, everything in universe is created in a Planck Time and whatever exists now has already existed. In mathematical language, once Origamon is produced at the beginning of Big Bang, it took a Planck Time to produce all the possible combinations of Origamons, including elementary particles, bosons and hadrons. Therefore, anything that comes to existence, has already lived, including intelligence. We know today that human intelligence that

differentiates us from apes is mainly due to the chromosome number 2, which exists in apes in form of two separated chromosomes but in humans these two small chromosomes bind to produce one big chromosome that we call chromosome number 2. That's why apes have one pair of chromosomes more than us. This clearly shows that all the genes responsible for human intelligence already exist in apes, but they are not active. During evolution, we experience various combinations of particles, not any new particle. We live to observe all the possible combinations of particles so we can collect the maximum intelligence that time can produce and become Origamon, an entity unrecognizable from the creator.



You are what you think

3. Precision Threshold of Cosmos

One crucial point throughout this article is that our universe is quantized because time is quantized. This basically means the intelligent designer of the cosmos is not perfect! The Jumps in quantum mechanics that are produced by the quantized, and therefore limited values of mass and energy demonstrate clearly that our universe is built by certain blocks. We showed in Origami Model that these building blocks are in fact, frames of time. The quantized nature of our universe makes it possible for us to perceive it mathematically. The existence of numbers is owed to the imperfect nature of the designer of the cosmos and his restricted precision and so the quantized structure of his product. This logically means there must be an upper and lower limit to cosmos precision. Cosmos is not limitless.

Two numbers have always confused us in the entire life of intelligence in the universe: 0 and ∞ . We know that both these numbers are not tangible values. Zero means absolutely nothing which means no mass, no energy, no time, and this does not exist in the cosmos because anything that we imagine, once it's imagined, it exists. I showed that inside black holes there is absolutely nothing but black holes are the only source of gravity for the universe, so their value is not zero, also they have various sizes, so they are not of zero quantity. Also, the upper limit of value that we simply call infinite is an ambiguous quantity that basically could have any value above zero, depending on the scale of the concept. Therefore, zero is in fact the smallest value possible in the universe and infinite is the largest value possible in the universe. But what is the quality of this value? Is it length? Is it mass? Is it energy?

The answer is time. Because time produces everything, then infinite is in fact the largest possible quantity of time and zero is the smallest possible quantity of time. The smallest possible quantity of time is Planck Time and I showed that as time accelerates, Planck Time shrinks. Therefore, the smallest length of Planck Time is at the end of the cosmos. I showed that we are on the second cycle of the universe and we have finished 95% of the universe's life ($13.78 : 14.4 = 0.95$, then $2.6 \times 0.95 = 2.47$) now, so we have passed $\frac{2.47}{7}$ of the total age of the cosmos, therefore there is $\frac{5.09}{7}$ of the age of the cosmos still left. This means the original value of Planck Time (T_p^a) was:

$$5.39 \times 10^{-44} \times \frac{2.47}{7} \times 3.6 \times 10^{64} = 6.8 \times 10^{20}$$

$$T_p^a = 6.8 \times 10^{20} s$$

T_p^a : Archaic Planck Time

We can calculate how much of the life of the cosmos is still left:

$$\frac{4.53}{7} \times 3.6 \times 10^{64} = 2.32 \times 10^{64} s$$

This is how much is left for cosmos to live in its next five cycles. During this time Planck Time will keep shrinking and its final value which would be the smallest possible time can be calculated:

$$\frac{5.39 \times 10^{-44}}{2.32 \times 10^{64}} = 2.32 \times 10^{-108} s$$

This is in fact the eventual value of Planck Time (T_p^e):

$$T_p^e = 2.32 \times 10^{-108} s$$

T_p^e : Eeventual Planck Time

Therefore, zero in our cosmos means the smallest possible amount of time:

$$0 = 2.32 \times 10^{-108}$$

This is extremely important because this means the precision of the intelligence that has created the cosmos is down to 108 decimal points and this is the limit that we will eventually be able to achieve. In our cosmos there is no zero, and anytime we have zero in any equation, we can plug the value to get the real result. For example, there will be no zero moment. Cosmos started at $2.32 \times 10^{-108} s$, not from zero second. This is why it was never at zero mass/energy. This is what in Higgs Field is called the Mexican Hat, the dent in the deepest point of the curve that does not reach the zero-level energy. We won't be able to find anything smaller than equivalent of $2.32 \times 10^{-108} s$. For example, if we convert this to mass:

$$M = 10T_m^3$$

$$M = 10 \times (2.32 \times 10^{-108})^3 = 1.24 \times 10^{-323} kg$$

This means we would never find a mass in universe at any stage or any of the universes that is $1.24 \times 10^{-323} kg$. We would never find a moment at any stage, even the very first Big Bang at the very first moment of cosmos, that is shorter than 2.32×10^{-108} seconds. The first moment that cosmos originated, it was already 2.32×10^{-108} seconds old.

On the other hand, the highest value of time would be the total life of the cosmos in corrected time. I showed that corrected time is much more than apparent/measured time:

$$T_c = 2T_m^2$$

Therefore, the corrected total life of the cosmos would be:

$$T_c = 2 \times (3.6 \times 10^{64})^2 = 2.6 \times 10^{129}$$

So, the real value of infinite is 2.6×10^{129} :

$$\infty = 2.6 \times 10^{129}$$

This means we can never find a moment 2.6×10^{129} seconds in future. The cosmos at its very end of life, will be 2.6×10^{129} seconds old. We will never find a mass that would be equivalent of 2.6×10^{129} seconds, which is:

$$M = 10 \times (2.6 \times 10^{129})^3 = 1.75 \times 10^{389} kg$$

This means, there will never be a mass as big as $1.7 \times 10^{389} kg$. Even the total mass of all multiverse together will be:

$$Multiverse\ mass = 10 \times (3.6 \times 10^{64})^3$$

$$\mathbf{M_m = 4.6 \times 10^{194} kg}$$

M_m : total mass of multiverse

This means to find unknown values in my calculations, we can practically replace zero time by 2.32×10^{-108} second, and ∞ time by 2.6×10^{129} seconds, or equivalent of mass or energy or length of these values.

Particle Decay

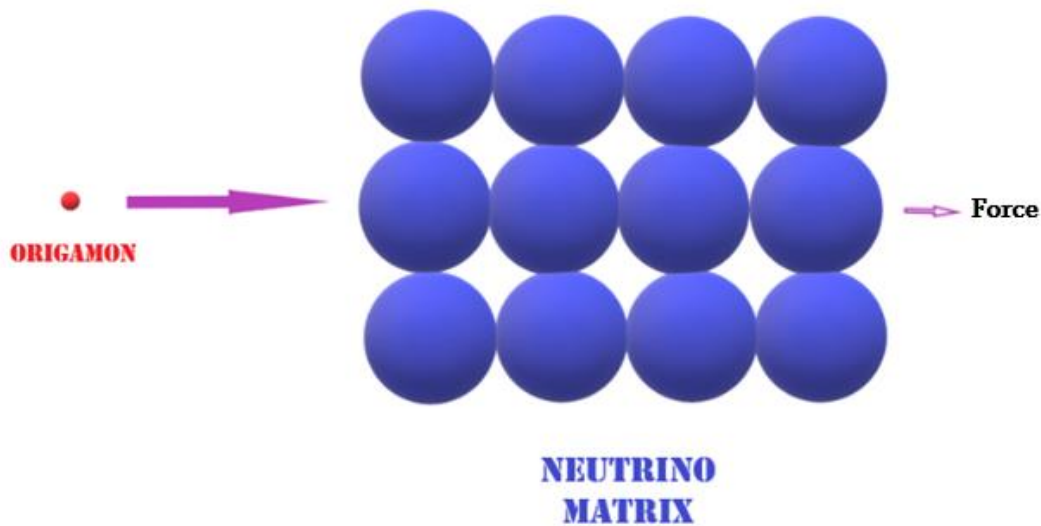
No subject in quantum mechanics has been more controversial than the phenomenon of particle decay. The reality of proton decay has been under profound scrutiny until in 1980s when it was eventually accepted as a real process but the exact duration of time that takes for protons to transform into a neutral pion and a positron, and also the actual mechanism of it has not been agreed on. This is purely due to our lack of knowledge about the real nature of particles and their mysterious interactions. Proton is a stable baryon in Standard Model which is not to decay into any lighter baryons but again, as another paradox confronting this model, Proton Decay that was first suggested in 1967 by Andrei Sakharov, turned out to be true. However, based on the new picture that Origami Model creates of elementary particles we can easily find out the cause, mechanism and the duration of decay for any particle. Unlike the Standard Model that believes subatomic particles are elementary and fundamental, and so they cannot be broken into smaller fermions, Origami Model proposes that all the particles except Origamons are produced by collections of Origamons combined by the gravity of the central black hole and therefore, even the smallest Neutrino has a probability of decaying into lighter fermions. In this part of Origami Theory, we will dissect the mechanism and duration of proton decay. We start the chapter by reviewing the nature of what we know as the kinetic energy based on the model that Origami Model offers. Then we will explain the structure of atoms and the nucleus in Origami Model and finally explain how Proton Decay can take place.

1. Kinetic Energy in Origami Theory

At the Big Bang, the first particles were Origamons to be produced. Then Origamons fuse to produce bigger particles that we call elementary particles. In other words. If we measure the angle of time to produce Origamon and compare it to the angle of time to produce the next bigger mass, which is electron neutrino, we will find a big *jump*. This is obviously because of the big difference between the mass of Origamon and mass of electron neutrino. This jump is in fact the basis for the quantization of matter and energy. But how much was this increase in angulation of time? In other words, how big was the time *jump*? The value of this jump would be actually extremely important, because as we explained, the smallest particle, Origamon, disappeared due to the acceleration of time and became the unit of energy, therefore the value of time jump would be in fact the coefficient of energy. To find the value of this jump, we can find the angle of time to produce the mass of Origamon and divided by the angle of time to produce the mass of neutrino, and because the angles are in linear proportion to the mass we can simply divide the mass of Origamon by the mass of electron neutrino:

$$K = \frac{\text{mass of Origamon}}{\text{mass of electron neutrino}} = \frac{1.3 \times 10^{-70}}{1.96191 \times 10^{-37}} = 6.6261 \times 10^{-34}$$

Again, we discover a well-known constant! This is what we call Planck Constant and it appears in almost every equation in quantum mechanics. During our journey to find this coefficient, I showed how angulation of time produces the mass and we saw that mass is a product of angulation and tangent, in other words, mass(and energy) are proportional to π , and the biggest mass is produced when the angle of time is $\frac{\pi}{2}$. Therefore, every phenomenon and so every equation we produce will be related to the angulation of time and that is why π keeps reappearing in my equations, including Planck Constant. We realize now that the Planck Constant is in fact the time jump, the reason for quantization of the energy and this is exactly how quantum mechanics describes this constant, but nobody knew where it came from. Based on what I explained so far, we can say that the difference between the time angulation to produce Origamons and the time angulation to produce smallest mass is the value of this coefficient. Therefore, in origami Theory, Planck Constant is defined as the coefficient of time angulation between energy and mass. This is why every equation that deals with mass and energy and time interaction, consist of Planck Constant. From the practical point of view the ratio of Origamon mass to neutrino mass is a critical index in our universe because as we know the entire empty space of universe is filled by Neutrino Matrix and any Origamon (photon) will collide a neutrino to transfer its kinetic force (following picture), therefore the kinetic force of the particle needs to be multiplied by this ratio that is in fact what we know as the Planck Constant. In fact Planck Constant is the Matrix Index of our universe:



$$E \cdot T = \frac{h}{2\pi}$$

$$E = fh$$

$$\lambda = \frac{h}{p}$$

As we explained before, the mass of Origamon is defined as the smallest possible mass and the first and the most important particle in universe and based on Origami Model all other fermions are produced by collections of Origamons and extracting the exact value of Planck Constant here means the proposed mass of Origamon (photon) has to be correct. Also, this means the value of Planck Constant would stay the same during the life of universe because mass of Origamon and mass of neutrino do not change.

2. Frequency

According to Origami Theory, time progresses in two mechanisms: Horizontal that produces the passes of time and has a speed of 3×10^9 and Vertical that produces the space and has a speed of 3.7×10^{44} . As I explained in previous chapters, as time accelerates constantly, the Planck Time which is the Shots of time reduce. Because each particle is consisted of certain amount of data (time), then the number of particles that can be produced by one Shot (or can fit in one Planck Time) is constantly reducing due to the reduction of Shot capacity. I have denominated the total number of identical particles coexisting in the same Planck Time (same Shot) Quantum Entrapment. This means as time progresses quantum entrapment reduces and this is what we perceive as the increasing of the entropy in our universe.

We know that mass of the particle is related to the tangent of alpha, when alpha is the angulation of time to produce the mass. We produced an equation to relate alpha with the mass:

$$M = \frac{t_g \propto x m_p}{2}$$

We can convert the mass of a particle to the equivalent amount of time that has produced the particle. The time equivalent of a mass would be a virtual sphere that time produces by rotating around the gravity to create the mass:

$$T_e = \frac{4}{3} x \pi x r^3$$

In above equation, T_e is the time equivalent for a mass and r is the radius of the mass produced by rotation of time. Therefore, r is equal to $t_g \alpha$, so we arrive at:

$$T_e = \frac{4}{3} x \pi x t_g \alpha$$

$$t_g \alpha = r^3$$

$$r = \sqrt[3]{t_g \alpha}$$

Now, if we imagine that mass is a tiny sphere of time that is trying to fit in a Shot of time (equal to Planck Time) then the number of masses that can be produced by (fit into) the same Shot would be simply proportional to the reversed radius of the mass:

$$n = 2 \times \frac{1}{\sqrt[3]{t_g \alpha}}$$

$$n_{max} = \frac{2}{\sqrt[3]{t_g \alpha}}$$

This is a wonderful equation showing how many particles would fit in each Planck Time. This is the maximum quantum entrapment or maximum frequency of a particle, so we can call it n_{max} . To find the $t_g \alpha$ for any mass we need to simply use the equation:

$$t_g \alpha = \frac{2M}{m_p}$$

As we can see, the bigger the mass, the lower the number of particles that can fit in one Shot. For example, for Origamons (photons) with mass of $1.3 \times 10^{-70} kg$ we can see how many Origamons can be produced by one Shot (or how many can fit in one Planck Time):

$$t_g \alpha = \frac{2 \times 1.3 \times 10^{-70}}{2.18 \times 10^{-8}} = 1.19 \times 10^{-62}$$

$$n = \frac{2}{\sqrt[3]{t_g \alpha}} = 9 \times 10^{20}$$

And for Planck mass, we will find an interesting result, because α for Planck Mass is 45 degrees and $t_g 45^\circ = 1$, therefore:

$$n = \frac{2}{\sqrt[3]{1}} = 2$$

This means the actual size of a Shot is equivalent to two Planck Masses. This means that Planck Mass is the upper limit of the size to for quantum entrapment. This means that any particle heavier than the Planck Mass cannot have frequency or wave feature. Quantum Entrapment explains the exact mechanism by which subatomic particles produce a wave feature and interference pattern.

The crucial point is that only identical particles can fit in the same Shot because they have the same Core Data. Therefore, an up quark and a down quark won't be able to place themselves

in one Shot. All the particles that are in one Shot are entrapped, which means they will travel together and there would be no virtual distance between them.

Based on the same calculation we can extract the equation for minimum number of particles that can get entrapped:

$$n_{min} = \frac{2x^3\sqrt[3]{n_{max}}}{\sqrt{c}} = \sqrt[3]{n_{max}} \times 1.15 \times 10^{-4}$$

$$\mathbf{n_{min} = \sqrt[3]{n_{max}} \times 1.15 \times 10^{-4}}$$

As far as particles, including Origamons (photons) are concerned, the higher the kinetic energy, the larger number of entrapped particles, therefore when the particle has its maximum energy, the value of n would be at its highest value $=n_{max}$ and when the particle has the lowest kinetic energy it would be at its lowest value $=n_{min}$. As I explained earlier quantum entrapment is exactly what is wrongfully considered as the frequency of the particle. This means our new equations for n are actually extremely important because they demonstrate the maximum possible frequency of a particle, such as light and also the minimum frequency of it in our universe.

Another crucial point here is as I explained earlier, speed of time has been constantly increasing due to the reduction of the capacity of Shots. As the volume of Shot is directly proportional to the cube of speed of time, we can conclude that the maximum number of particles that could fit in one Shot is inversely proportional to the cube root of speed of light. This means that the number of particles that could fit in one Planck Time, quantum entrapment, is reducing with the progression of time.

$$n_{max} = \frac{2}{\sqrt[3]{t_g \alpha}} \times \sqrt[3]{10xTxG}$$

n_{max} : maximum number of particles that could fit in one chronosphere

T : time in the past (for example for present time, $T=1$, and for Big Bang T =age of universe)

G : Gravitational Constant

This means at the Big Bang when $T = 4.3 \times 10^{17}$, the maximum number of particles that could fit in a Shot was much higher. Now we can calculate the n_{max} for the Origamons at the Big Bang:

$$n_{max} = \frac{2}{\sqrt[3]{1.19 \times 10^{-62}}} \times \sqrt[3]{10 \times 4.3 \times 10^{17} \times 6.67 \times 10^{-11}}$$

$$\mathbf{n_{max} = 6.02214 \times 10^{23}}$$

Now, this is an extremely valuable result! Because what we have just calculated is exactly Avogadro Number with five decimal points. This explains to us where Avogadro number comes from. We will see again in future chapters how important this number is and how our universe is built based on this mysterious number. We will see that the number of black holes in our universe is increasing until at the end (in 700 million years from now) it will reach the Avogadro Number and also the number of universes in our cosmos is exactly Avogadro Number. This is all originating from the fact that original capacity of Shots at Big Bang was equal to Avogadro Number.

Now, with the same mechanism that we found equation to calculate the kinetic energy of Origamon (photon) and Planck Constant, we can find equation to calculate the kinetic energy of any particles, atoms and molecules in a gas. When heat is applied to a gas, electromagnetic wave is penetrating the gas and energy from Origamons (photons) is transferred to the molecules or atoms of the gas. Therefore, the kinetic energy of Origamon is passed on to the gas molecule and the ratio of the energy transferred is equal to the ratio of Origamon Mass to the gas molecule mass, very similar to when we calculated the ratio of Origamon mass to neutrino mass and we found Planck Constant. Therefore, the total kinetic energy transferred to gas molecules is equal to the ratio of Origamon mass to the gas molecule mass multiply by the number of gas molecules:

$$E = \frac{\text{Origamon mass}}{\text{gass molecule mass}} \times \text{number of gas molecules}$$

To reach a standard equation we must choose a typical gas, and in this case, Argon which sits in the middle of period table between all noble gasses with classic features of noble gas, would be the perfect candidate. The atomic mass of Argon is $6.63 \times 10^{-26} \text{ kg}$. Also, we know that in one cube meter of any gas, the number of gas molecules would be equal to Avogadro Number. Therefore, we arrive at:

$$E = \frac{1.3 \times 10^{-70}}{6.63 \times 10^{-26}} \times 6.02 \times 10^{23} = 1.17 \times 10^{-21}$$

This value is in fact a constant that would act exactly like Planck Constant for photons. Here again to find the total amount of energy we will need to multiply this by the number of entrapped particles (frequency). As we discussed before, the number of entrapped particles (identical particles inside the same Planck Time) is what is known as the frequency of the particle and it is directly proportional to the kinetic energy of the particle. Therefore to find the minimum kinetic energy of the gas, we should use the n_{min} . In previous chapter we found an equation for n_{min} :

$$n_{min} = \sqrt[3]{n_{max}} \times 1.15 \times 10^{-4}$$

$$n_{max} = \frac{2}{\sqrt[3]{t_g^\alpha}} = \frac{2}{\sqrt[3]{\frac{2 \times M}{m_p}}} = \frac{2}{\sqrt[3]{\frac{2 \times 6.63 \times 10^{-26}}{2.18 \times 10^{-8}}}} = 1.09 \times 10^6$$

$$n_{min} = \sqrt[3]{1.09 \times 10^6} \times 1.15 \times 10^{-4} = 1.18 \times 10^{-2}$$

This is the minimum frequency of gas molecules at zero kelvin. Now to find the energy of each molecule we simply multiply this number by the constant that we found:

$$E = 1.17 \times 10^{-21} \times 1.18 \times 10^{-2} = \mathbf{1.38 \times 10^{-23}}$$

This is the kinetic energy of each molecule of gas at zero kelvin, which is called Boltzmann Constant (K_B). One more time, just by using our own equation and the mass of Origamon and based on the mechanism presented by Origami Model we discover where the Boltzmann Constant actually come from. If we multiply this value by Avogadro Number to find the total energy of one mole of gas, we will find what is called gas constant:

$$1.38 \times 10^{-23} \times 6.02 \times 10^{23} = \mathbf{8.31}$$

Interesting point is that we calculated Boltzmann constant without directly using the value of temperature, which makes absolute sense because temperature is only a perception of kinetic energy.



Boltzmann's grave in Vienna, with his equations next to it.

2. Atoms in Origami Theory

Origami Model proposes an understanding of the laws of physics and the fundamental structure of the universe that unlike what Standard Model suggests, they are the same for all masses, from subatomic particles to celestial objects and stars. What we discussed so far for elementary particles and fermions, would be true for atoms and stars too.

Based on my principle that gravity is the only fundamental force in universe, we can find the equation to calculate the radius and CGR of the nucleus of every atom. Origami Model suggests that all the elementary particles are in fact consisted of a central black hole surrounded by shells of Origamons. The Theory believes that whenever two particles are as close as near Planck Length, they can fuse into one. During this fusion, each particle loses 0.35% of its Origamons and the final particle will have a mass, slightly less than the sum of the two particles' masses and the radius of the final particle will be only slightly bigger than the radius of one particle, exactly the same phenomenon as when two black holes collide into one in space. The lost

Origamons will release as energy (free photons). Therefore, inside every proton all three quarks are in fact fused into one single particle (proton) and that's why the produced composite particle still has a spin (if a proton has three separated quarks trapped in it, how would proton have spin?), and that's why the mass of proton is slightly smaller than sum of the masses of the three quarks and that's why the radius of proton is smaller than three quarks radii. The same mechanism happens for neutron. Also when neutrons and protons get together to form the nucleus of atom, all these protons and neutrons fuse into one particle (nucleus) which explains why the mass of nucleus is always smaller than sum of the masses of the protons and neutrons creating it and the radius of nucleus is so much smaller than the sum of the radii of all the protons and neutrons inside it. Therefore, Origami Model believes that nucleus of atom is one single heavy particle with a central black hole and shells of Origamons around it, with only a small difference that due to protons and their electric charge, an electromagnetic force would be added to the equation. In further chapters of the paper I will explain how electromagnetic force is produced by gravity.

The gravitational force of the central black hole will pull the Origamons to the center of nucleus, but the tremendous gravitation between the Origamons (due to their extremely small distance from each other) neutralizes this attractive force. On the other hand, the electromagnetic repulsion between charged Origamons would oppose the gravitation force between the Origamons, so for nucleus to be stable we must have:

$$\begin{aligned} &\text{gravitational attraction between Origamons inside nucleus} - \text{electromagnetic repulsion between protons inside nucleus} \\ &= \text{gravitational attraction of the central black hole of nucleus} \end{aligned}$$

$$\text{electric repulsion of the protons inside nucleus} = \frac{qq'k}{r''^2}$$

$$q = q' : \text{charge of proton} = 1.6 \times 10^{-19}c$$

$$r'' : \text{distance of protons from each other} = 2 \times \text{radius of proton} = 1.89 \times 10^{-15}m$$

$$k : \text{Coulomb's Constant} = 9 \times 10^9$$

$$\text{gravitational attraction of the central black hole} = \frac{GMm}{r^2}$$

G : gravitational constant

M : mass of central black hole = mass of atom

m : mass of Origamon

r : radius of nucleus of atom

r' : distance between Origamons inside nucleus = $5 \times 10^{-4} \times \text{radius of Origamon} = 4 \times 10^{-39}m$

$$\frac{GMm}{r^2} = \frac{Gmm}{r'^2} - \frac{qq'k}{r''^2} \Rightarrow r = \sqrt{M} \times 2.8 \times 10^{-3}$$

$$R_n = \sqrt[3]{Z} \times 3.8 \times 10^{-16}$$

R_n : radius of nucleus of atom

G : gravitational constant

Z : atomic number

The distance between the Origamons to produce the particle is much smaller than Planck Length, and that's why they are fused. This equation should be able to predict (at least to a critical accuracy) the radius of any nucleus in any atom. For example, if we try uranium element, that has atomic number of 92 and atomic mass of $3.95 \times 10^{-25} kg$ the radius of uranium nucleus would be:

$$R = \sqrt[3]{92} \times 3.8 \times 10^{-16}$$

$$R = 1.7 \times 10^{-15} m$$

This is precisely consistent with experiments and measurements. Now we need to find out the Critical Gravitational Radius of the nucleus of atom. By definition of CGR, we need to find out for what distance the gravitation of the central black hole of an atom on antineutrinos is equal to the repulsive force between two antineutrinos. We know that the central black hole of an atom is in its nucleus. The space around this black hole would be full of neutrinos and antineutrinos. The same as stars and black holes in space, in atoms up to a certain distance, the central black hole would attract both neutrinos and antineutrinos, but at a critical point, its attraction would be equal to the repulsion between two adjacent antineutrinos, the point of CGR. Therefore:

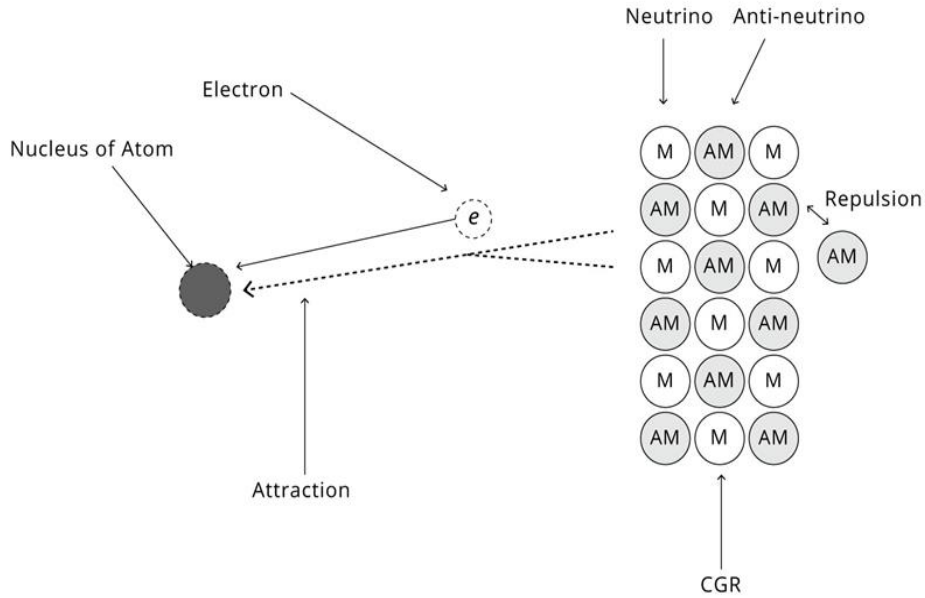


Figure 56- CGR of atom

$$\frac{G(M-m)}{r^2} = \frac{Gmm}{r'^2}$$

G: gravitational constant

M: mass of the central black hole of an atom = mass of atom

m: mass of antineutrino

r: distance of the center of the atom from the antineutrino = CGR

r': distance between two antineutrino centers = diameter of one antineutrino = $3.8 \times 10^{-32}m$

Because m is so small, virtually $M - m = M$

Therefore:

$$r = \sqrt{M} \times r' \div m \Rightarrow r = CGR = \sqrt{M} \times 3.8 \times 10^{-32} \div 1.78 \times 10^{-36}$$

$$CGR = \frac{4\pi}{3} \sqrt{A \times M_p \times M_n}$$

$$CGR = 4.2 \times \sqrt[2]{A \times 1.67 \times 10^{-27} \times 1.67 \times 10^{-27}}$$

$$CGR = \sqrt[2]{A} \times 4.2 \times 1.19 \times 10^{-9}$$

$$CGR_n = \sqrt{A} \times 6.9 \times 10^{-10}$$

This would be my equation for CGR of the nucleus of an atom, when M_p is mass of proton, M_n is mass of neutron and Z is mass number M is the atomic mass of the atom. Now we will calculate in next chapter that once the ratio of $\frac{R}{CGR}$ reaches as low as $\frac{R}{CGR} \leq 1.6 \times 10^{-7}$ (too strong central black hole for the too small radius of atom) the nucleus will become unstable (very close to implosion) and starts to lose some of its mass in form of Origamons (radioactive radiation) and when its $\frac{R}{CGR}$ reaches 1.3×10^{-7} it explodes completely to photons (energy) which we know as nuclear fission. This is what we experience as radioactivity and nuclear decay. Therefore, we should be able to predict radioactivity of various atoms based on my equation. Now let's try the equation for uranium 235, that has atomic mass of $3.95 \times 10^{-25} kg$. I already measured the radius of nucleus of uranium. Let's find its CGR now:

$$CGR = \sqrt{A} \times 6.9 \times 10^{-10} = \sqrt{235} \times 6.9 \times 10^{-10}$$

$$CGR = 1.06 \times 10^{-8} m$$

Therefore, the ration would be:

$$\frac{R}{CGR} = \frac{1.7 \times 10^{-15}}{1.06 \times 10^{-8}} = 1.6 \times 10^{-7}$$

This is the ratio that atom just starts to become radioactive and unstable. The reason is because the shell is about to collapse into the central black hole. This explains why uranium has radioactive quality. Then if we try my equation for Neon with atomic number of 10, that has mass number of 20 and atomic mass of $3.35 \times 10^{-26} kg$ we will find:

$$R = \sqrt[3]{10} \times 3.8 \times 10^{-16} = 8.18 \times 10^{-16} m$$

$$CGR = \sqrt{20} \times 6.9 \times 10^{-10} = 3 \times 10^{-9} m$$

Therefore, the ratio of $\frac{R}{CGR}$ for Neon atom would be:

$$\frac{8.18 \times 10^{-16}}{3 \times 10^{-9}} = 2.7 \times 10^{-7}$$

This ratio will make Neon nucleus far from explosion or losing its shell that can cause any radioactivity. Then if we try Iron atom that has atomic number of 26 and mass number of 56, and atomic mass of $9.2 \times 10^{-26} kg$:

$$R = \sqrt[3]{26} \times 3.8 \times 10^{-16} = 1.12 \times 10^{-15} m$$

$$CGR = \sqrt{56} \times 6.9 \times 10^{-10} = 5.16 \times 10^{-9} m$$

$$\frac{R}{CGR} = \frac{1.12 \times 10^{-15}}{5.16 \times 10^{-9}} = 2.2 \times 10^{-7}$$

As you see the resulted ratio for Iron is also far from what is needed for explosion of nucleus (radioactivity). Also the radius of nucleus that I calculated for Iron is extremely close to the measurements that have been done so far.

3. Critical Mass and Quantum Entanglement

According to Heisenberg's equation the relationship between the amount of borrowed energy from vacuum and the duration of time holding that energy would be as follow:

$$T = \frac{h}{2\pi E}$$

If we replace energy with $E = MC^2$, then we will have:

$$T = \frac{h}{2\pi MC^2}$$

Now, we can see that if we borrow for the shortest time possible, Planck Time, the mass produced will be equal to what is called Planck Mass. Max Planck calculated this mass with a different equation. Surprisingly, unlike Planck Time and Planck Length, the importance of Planck Mass has always been unclear in Standard Model, because it is too large to be considered as the lower limit of anything of importance and it is too small to be considered the upper limit of anything. But in Origami Model this mass is in fact an extremely imperative value. Planck Mass actually implies the upper limit of cosmic ray particle energy because any particle of radiation with energy (almost equal to Planck Energy) would have a wavelength equal to Planck Length and then its gravitational self-energy would equal its energy, in other words:

$\frac{hC}{2\pi\lambda} = \frac{GM^2}{\lambda}$ which is equal to Planck Mass. As we know, the very first and the smallest black hole developed during Big Bang at Planck Era has a mass equal to Planck Mass.

In a simple description, Planck Mass is the *upper limit* of mass for a particle to be a fundamental particle. In other words, Planck Mass is in fact *the border between the General Relativity and Quantum Mechanics*. Any particle with mass less than Planck Mass would exhibit quantum features and any particle with a mass bigger than Planck Mass would be considered a composite object formed by combination of fundamental particles. In Origami Model we saw that every mass lighter than the Planck Mass will be a subatomic particle with a central black hole but masses heavier than the Planck Mass won't have one single central black hole because Origamons in their structure won't fuse. This factual view gives a paramount importance to

Planck Mass in Origami Theory. For a more transparent understand we can use reduced Planck Mass which is the Planck Mass value divided by two and denominate it as Critical Mass.

$$C_m = 1.08 \times 10^{-8} kg$$

The reason for using this terminology is because based on my calculation, Planck Mass is equivalent of smallest unit of time, because it is the mass produced from Planck Time. Therefore, we can consider time being composed of Shots, each of which capable of accommodating maximum amount of Planck Mass. Therefore, if a particle has a mass smaller than Critical Mass (half of Planck Mass), it can have quantum entrapment (frequency) because more than one particle will fit in same Shot of time as long as the sum of their masses do not exceed Planck Mass. Therefore, if two particles each has a mass of equal or less than Critical Mass, they can fit inside one Shot and travel together.

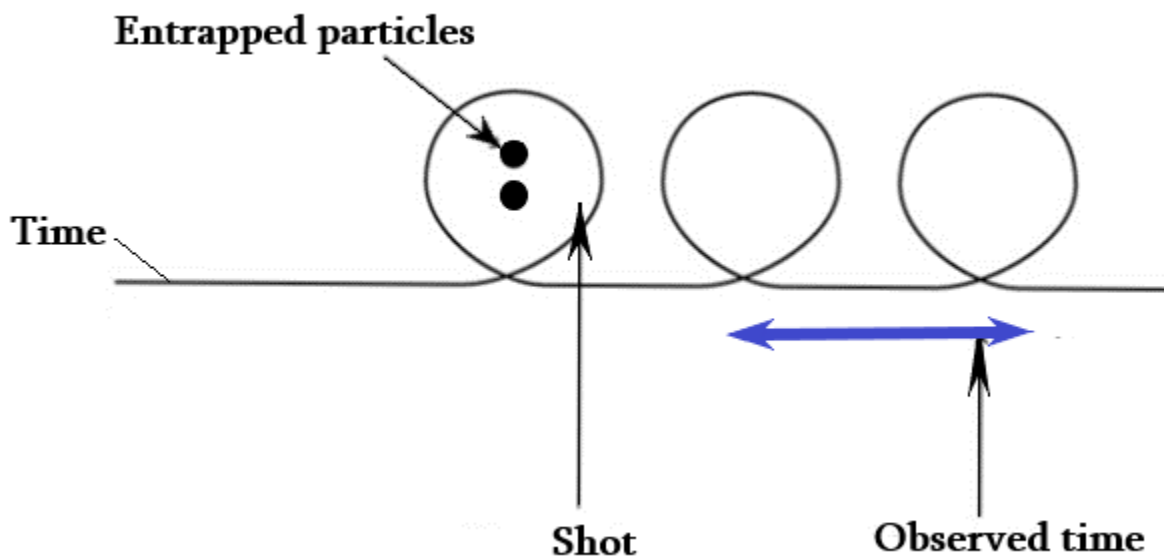


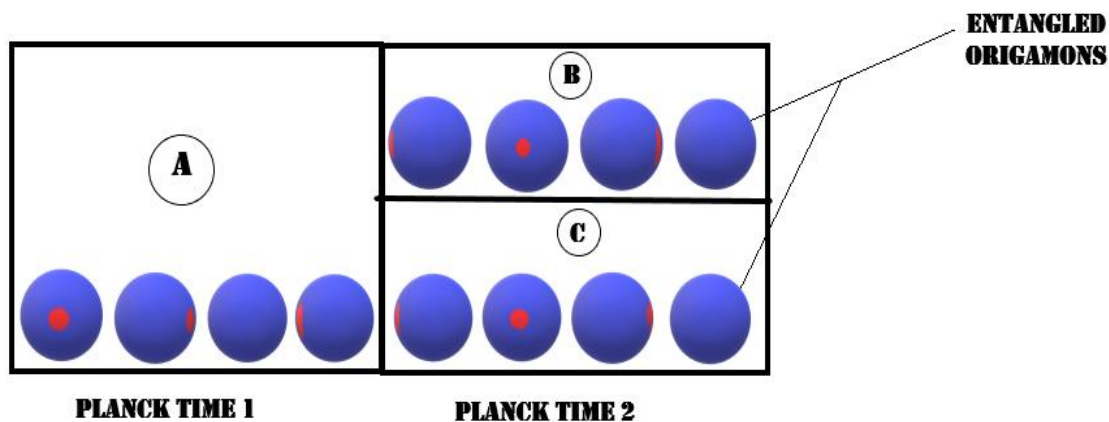
Figure 57- Hypothetical diagram to demonstrate quantum entrapment

Quantum entanglement has been one of the most complex features of subatomic particles that Standard Model hasn't be able to explain. However, Origami Model can easily explain how this effect takes place and in fact, due to the proper explanation of distance and locality that Origami Model proposes, quantum entanglement is a favorite phenomenon for the theory. The major conflict in quantum entanglement is instantaneous communication of the entangled particles which defies the concept of locality and speed of light.

One of the unique features of Origami Model is that it shows that all particles in universe are connected both through time and gravity. The sequence of data (time) that creates Origamons

is never disrupted and all Digits producing data in all the Origamons in entire universe are in connection with each other. Also the Gravity inside all three types of black holes, Shelled Black Holes in the center of Origamons and subatomic particles, Naked Black Holes in space and Mother Black Hole encapsulating the universe are all different extensions of the same pool of gravity and this is why the more progression of time through the universe, the more reduction of density in the total gravity of universe will occur. In fact, by considering the speed of time in Origami Model we can relatively easily explain the phenomenon of entanglement. Gravity is the effect that opposes the acceleration of time, so gravity tends to slow down the recombination of data in the Shots. In other words, gravity pushes more particles back into the Shot, and therefore it increases the frequency. Applying force on Origamons (photons) only increases their frequency and this is what we know as Doppler Effect.

As I explained before, revolution of data along the length of time (horizontal progression) creates the spin of Origamons and copying the same data across the width of the shot, produces the illusion of locality. In other words, the vertical expansion of data produces the radius of universe and the expansion of data horizontally produces the progression of time. Of course, there is no horizontal and vertical dimensions here and the correct term would be *copying* for vertical extension and *recombining* for horizontal progression. Imagine there are four Origamons produced from the raw of data inside a Shot. As it recombines, it produces new *order* of the same four Origamons that gives us the perception of spin. But it has now there are two new Shots and the four Origamons now have a copy of themselves in the second Shot. Each of the four Origamons in the same Shot are different in their Collateral Data otherwise they won't have spin. However, the four Origamons in each Shot are copies of the four Origamons in the other Shot above it (vertical), which means each one of them has a double in the Shot above it. Below picture demonstrates the vertical and horizontal progression of time in a schematic, simplified way:



Origamons in Shot B and Shot C are entangled

These twin Origamons that we can see in the picture above each other in shots B and C are what we know as entangled particles. Now, if you go from Shot A to Shot B or C we are moving along the length of time, so time will pass. But if we move from Shot B to Shot C we are going through the radius of universe, which means we are changing locality but we are at the same time. As I explained before, speed of time across the vertical shots is 3.7×10^{44} , which is incredibly faster than speed of light. I described before that when time moves across the vertical column there is no gravity involved, so it moves much faster, but for light to travel, gravity needs to get combined with time because when light travels it takes the reality/existence with it. This effect makes two entangled particles to get so much away across the radius of universe but still be able to affect each other because they are connected through the same data/time. This means that:

Quantum Entanglement occurs across the vertical repetition of time.

In a simple definition, two entangled particles are the two particles that are produced at the exact same Planck time, they are copies of each other (with different Collateral Data) and they are located across each other in vertical repetition of time. As more Planck Times pass, the two entangled particles get further away because the shots keep breaking and dividing into smaller shots, developing new shots between the two. This is how universe expands. But the two Origamons will be entangled until one of them changes. If a force is applied to one of them, its data will change, and it will be a new Origamon, in a new Shot of time, which cannot be entangled anymore, and this is why any slight force applied to one of the entangled particles, make them decohere. This means the connection between the two entangled particles is not instantaneous but it is so fast that the speed of communication between the two with our current

technology won't be easily measurable. Note that speed of time does not defy the General Relativity because speed of time is only applicable for pre-existing reality. This brings us to two critical conclusions: Firstly, the communication between the entangled particles is much faster than speed of light but it is not instantaneous; Secondly, the two entangled particles are not really just two single particles and because they have frequency so each one has many other nearly identical particles traveling in the same Shot but we only observe one particle until they leave effect on a secondary media and that's when we observe their interference pattern. In reality there could be billions and billions of Origamons in each Planck time (Shot) depending on the frequency of light, and we only see the most distal Origamon that exits the Shot first and that's why our chances to find the other Origamon that is entangled with it is reduced so much. In fact, if the frequency of light is 1000, this means in each shot of light there are 1000 photons and at each Planck Time, there will be 1000 photons disappearing and new 1000 photons appearing. So, when two photons with frequency of 1000 are produced in an experiment instantly, there will be two sets of 1000 photons across each other are copies of each other, placed on the top of each other (metaphorically). So, there are two sets of 1000 photons entangled with each other but every single photon is entangled only with one photon amongst the other set in adjacent Shot. This explains why we can only find entangled photons when we produce two photons at exactly the same time or very close time, because obviously due to constant change of data for each Planck Time, if the two photons are from two different Shots that are along each other, their chances of being copies (entangled) is much reduced, this means the first condition for entanglement is that the two photons are produced at, almost at the same Planck time, which is not easy. This is why the chance of finding the entangled photons are low. This also tells us that chance of finding entangled photons (particles) is related to their frequency. It also tells us an incredibly important point: There are large number of entangled particles all the time but we are not able to locate them. Also, this means all the particles smaller than Planck Mass can have this feature because they all have the Quantum Entrapment feature (sharing same Shot). Based on this data we will be able to calculate the real probability of entanglement in particles based on their frequency and mass. This also means the larger the particle, the larger number of Origamons in its mass, the less chance of finding the entangled particle. Also, a macroscopic object can get entangled with another one provided all their particles are entangled one to one. Basically, because Origami Model of universe connects all the Origamons via time and gravity, it gives any mass the probability of getting entangled with another mass.

4. Delusion of Quantum Superposition

Based on Origami Model time is constantly recombining data that is organized in Shots of Planck Time size. When more than one identical particle is produced by the same Shot of time it means more than one identical particle is traveling at the same Planck Time. This phenomenon is called Quantum Entrapment and it transpires itself as the wave feature of the particle, the frequency of the particle, Aharonov-Bohm Effect, the interference pattern produced by the particle and the superposition phenomenon. The reason we witness an interference pattern in

double slit shot experiment is exactly the quantum entrapment. Origami Model demonstrates that speed of time has been constantly increasing since the beginning of the universe, and as the total amount of time in universe is constant, so the Shots of time constantly reduce. This reduces the quantum entrapment constantly, reducing the granularity and increasing the entropy.

I already extracted equations that can calculate the maximum and minimum quantum entrapment and so the maximum and minimum frequency of particles, including light in our universe. Therefore, Superposition is nothing but two or more particles, sharing same Shot of time. By applying force to Origamons (photons), quantum entrapment increases, increasing what is perceived as the frequency of light. When a source of light is moving towards or away from us, the resulting Doppler effect is exactly created by increasing and decreasing of the quantum entrapment of Origamons. We saw that due to the capacity of Shots, once the particle is bigger than $2.18 \times 10^{-8} kg$ it cannot be produced by the data of one Shot, which means it cannot share the Planck Time with another identical particle. This explains why quantum entrapment only happens to subatomic particles and larger objects have no wave feature. This means wave feature of particles is a complete misconception in Standard Model and every single particle only exists in one certain time. Origami Model rules out confusing terms such as superposition and it demonstrates that such phenomena are simply misconceptions in the Standard Model.

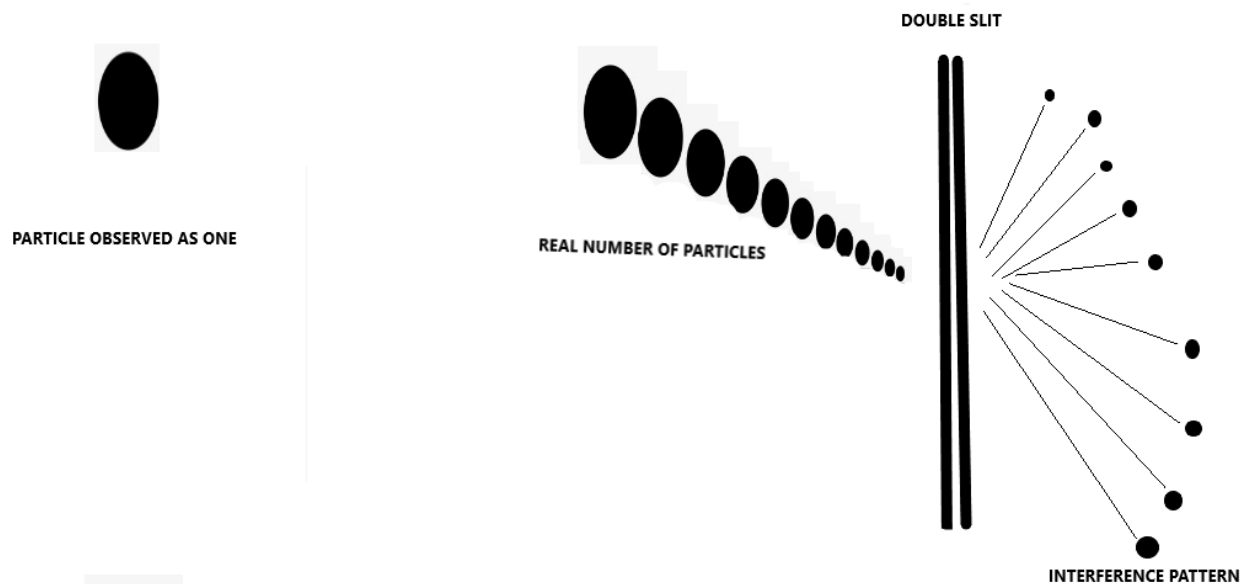


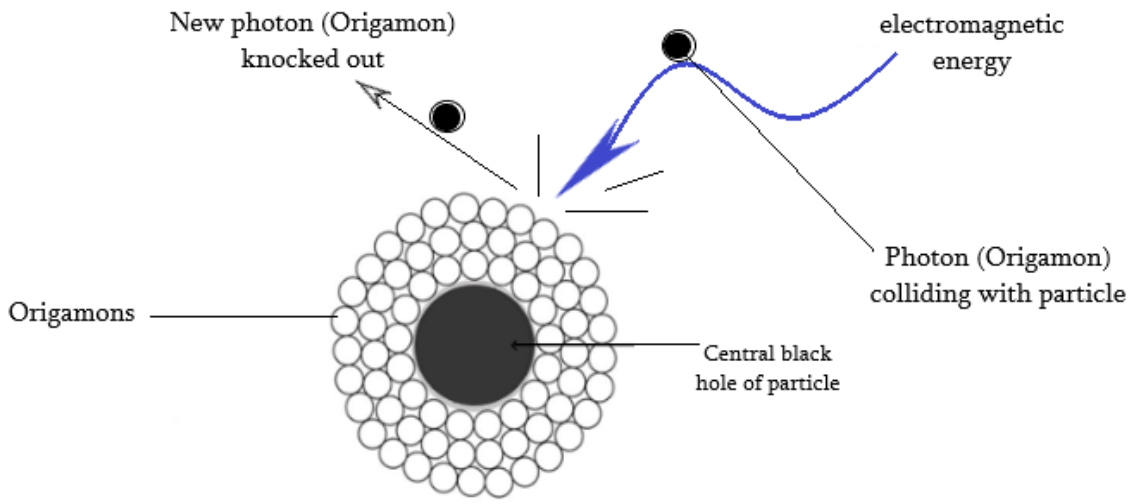
Figure 58- The mechanism of interference pattern created by particle

There is one dead cat and one living cat next to each other in one Shot, at zero distance to each other. We will observe only one of them at the time but they both have effects and they also interact with each other because there *are* two cats.



5. Fermions, Bosons and Quantum Tunneling in Origami Theory

So far, we explained that based on Origami Theory, Big Bang started from a couple of particle-antiparticle pairs, certainly the first and smallest ones, Origamons. Since rotation is the intrinsic property of time, every mass developed by angulation of time has spin. Origamon is the first fermion and it has spin of 1. We also saw that all other particles are produced by collections of Origamons. For producing new, heavier particles, Origamons fuse into each other, lose some mass and produce one final particle which has one central black hole that has a final spin of $\frac{1}{2}$ because when Origamons fuse, they lose some of the spin property. But when producing Higgs Boson, Origamons only gather around each other, bind by gravitational force and that is why bosons are much more unstable and have no spin, as the spins of various Origamons cancel each other out. The other bosons and gluon are in fact nothing but free, Origamons and Graviton in Origami Model does not exist. Therefore, Origami Model believes that photons and gluons are Origamons and because Origamon is now a ghost particle, no tangible volume or mass has been observed for these bosons and we only observe the effect of the energy carried by the particle. In the last chapter we will explain how strong nuclear interaction and weak nuclear interaction are nothing but gravity, so gluons which are the force carriers for strong nuclear interaction, are in fact Origamons moving between fermions and composite particles inside the nucleus and because Origamn has a mass and momentum, it has a kinetic energy. Based on Standard Model, when energy is absorbed by atoms, the electrons inside the atoms get excited and jump to a higher energy shell, and when they return to the original shell, they lose their energy as massless photons. This has never been able to explain how electron's energy convert to photon, why is the energy quantized and how can a real particle have absolutely no mass! But in Origami Theory, energy is Origamons with mass and momentum, therefore when light hits the atoms, the Energetic Origamons (what we call photons) collide with the outmost Origamons in atom and knock it out.



How energized particles release photons

The new arriving Origamon can replace the Origamon in the shell and transfer its energy to the shell Origamon. The freed Origamon will now move with the kinetic energy that it has received from entering Origamon. This is exactly like Newton's Cradle, when a moving ball hits the stationary ball and replace it. This model is much easier to understand and makes absolute sense. The free Origamon has a rotational/spiral movement while it proceeds in space, because time has rotation. This is what we call spin. But how can we calculate the energy in moving Origamon?

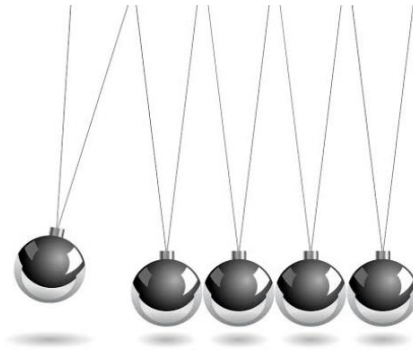


Figure 59- Newton's Cradle, mechanism of force transfer in universe

The properties of a moving Origamon are its mass, its momentum and its rotational frequency. Based on origami Theory, electromagnetic wave, or light, is consisted of moving Origamons and the particle effect of it is due to the particle nature of Origamon, while the wave feature of it is

due to Origamon's entrapment. Also, according to Origami Theory, for Origamons to travel in space, they need to collide to another Origamon and create the Newton's Cradle effect, therefore light needs a media to travel which is the Neutrino Matrix filling the entire space of the universe. The only place with vacuum, is inside the black holes and that's why no light enters any black hole, and light in fact emerges from the black hole. We have seen before that in our universe speed of time is almost ten times bigger than speed of light:

$$\text{speed of time} = 10 \times \text{speed of light}$$

As we explained before, the reason for this is the angle of $\theta = 75^\circ$, between universal time in our universe and the cosmic horizon (the event horizon of the black hole that our universe is in it). We will see in last chapter that after this universe ends in 0.7 billion years from now, a new cycle starts and in the new universe the angle of θ will increase, until in the last cycle (last universe) it reaches 90, when speed of light will become equal to speed of time (in 70 billion years). Therefore, at the outer edge of the universe, time enters the vacuum before light enters it. As we explained before, our universe is completely placed inside a black hole. We have already seen multiple reasons indicating that we are completely inside a black hole, but we can also find out with a simple calculation: If we consider the universe as a mass and try to calculate its Schwarzschild Radius:

$$R_s = \frac{2MG}{c^2} = \frac{2 \times 6.67 \times 10^{-11} \times 8.7 \times 10^{53}}{9 \times 10^{16}} = 1.28 \times 10^{27} m$$

But we know that the radius of universe is only $4.4 \times 10^{26} m$! This means our universe is a mass that its radius is smaller (10 times) than its Schwarzschild Radius, in other words, the universe is a black hole, even more compact than a black hole! That's why the universe has to expand its radius to reach the final radius of $1.28 \times 10^{27} m$, to fill the black hole inside which it is technically free falling. Now we can easily calculate the time left for universe to expand: 0.7 billion years. Now, if our universe is inside a black hole, then it means there is no real distance between the particles and that is what Origami Model believes from the first place: space is an illusion of time. Also, we showed that universe is completely empty, and that's again what Origami Model believes: Black holes are empty. Therefore, light cannot enter the vacuum and the only thing that can enter vacuum is time, and that's how universe expands. Gravity is the property of vacuum and that's how time is accelerated by vacuum and creates the universe. When light hits an atom, the kinetic Origamon collides with the outmost Origamon in outer shells of the atom and releases the Origamon. The more energy in the arriving Origamon (more energy in light), the more number of Origamons will be released from the atom. Each Origamon has a specific amount of energy and spin and that's why energy and spin are both quantized. The released Origamon flies to space. Free traveling Origamon will collide with the neutrino matrix and its energy is transferred to the last neutrino on the other end of the traveling path. One Origamon at the end of path, will be released from the last neutrino, that will carry the same amount of energy that was carried by the arriving Origamon, exactly like the Newton's Cradle model. This transfer of kinetic energy through the Deutrinos (quasi-neutrino) is as fast as speed of light, and regardless of the consistency of the matter, it will always have the same speed because it travels with Newton's Cradle mechanism, and this is why speed of light does not

change in any material, something that Standard Model hasn't been able to explain. The following figure can help comprehend this phenomenon:

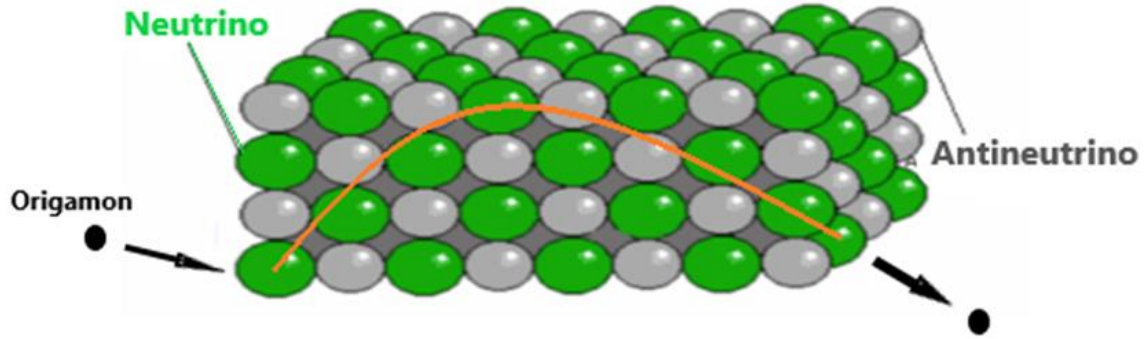


Figure 60- The matrix of space that fills our entire universe

To calculate the kinetic energy of the traveling Origamon we can use the classic equation:

$$K_E = \frac{1}{2}mv^2$$

K_E : kinetic energy

m : mass of the traveling object

v : velocity of the traveling object

When the traveling Origamon collides with the electron neutrino (smallest neutrino consisting the free space), it transfers its kinetic energy to the neutrino and creates energy in neutrino. As we explained in the subject of width of time and superposition, we know that one Origamon has n number of entrapped Origamons with it, all traveling in the same Shot (same Planck Time). All these entrapped Origamons arrange themselves in the wavelength of the Origamon, so in fact, in each unit of time, not one but n number of Origamons will hit the neutrino. The number of entrapped Origamons is equal to the speed of Origamon divided by its wavelength. Therefore, for every single Origamon, n number of them will transfer their kinetic energy to a neutrino.

$$\text{kinetic energy of one Origamon} = \frac{1}{2} \times \text{mass of Origamon} \times n \times v^2$$

$$\text{total energy transferred from one Origamon} = \frac{\text{kinetic energy of one Origamon}}{\text{kinetic energy of one neutrino}}$$

$$\text{Total energy transferred from one Origamon} = \frac{0.5 \times \text{mass of Origamon} \times n \times v^2}{0.5 \times \text{mass of electron neutrino} \times v^2}$$

The speed of Origamon and neutrino is the same and it is in fact the speed of light. Therefore, we will arrive at:

$$\text{total energy transferred by one origamon} = \frac{\text{mass of origamon} \times n}{\text{mass of electron neutrino}}$$

$$\text{total energy transferred by one Origamon} = \frac{1.3 \times 10^{-70} \times n}{1.961 \times 10^{-36}} = 6.6261 \times 10^{-34} \times n$$

Now the number we have calculated is in fact another famous fundamental constant in quantum physics! It is exactly the value of Planck Constant! One more time Origami Model proves to be correct and it has decoded one of the most important constants in physics. As we explained, n is the number of Origamons that hit the neutrino at the same time in each unit of time. In other words, n is the frequency of traveling Origamon. Therefore, we can rewrite my equation:

$$\text{total energy transferred by one Origamon} = h \times f$$

Considering the conservation of energy, the energy transferred by one Origamon is equal to the energy in that Origamon, therefore we can simplify the equation again, and also this would apply to any particle, because as we explained before, all quantum particles smaller than Planck Mass, will have n number of entangled (superpositioned) particles traveling with them at the same time:

$$E = h.f$$

This is exactly what Einstein discovered with a major difference that we only used classical physics equations and considered the wave feature of a particle to be due to its n number of entrapped particles. Here Origami Model demonstrates that wavelength of a particle and wave feature of a particle are both real and purely due to the quantum entrapment, therefore n is always equal to f . In Origami Theory, frequency of light is *the number of Origamons (photons) coexisting at the same Planck Time*.

Frequency in a wave is exactly equivalent of current in electromagnetic force, since current is the number of electrons passing per second, and wavelength is equivalent to voltage, the force of each electron. For exactly the same mechanism of transferring the energy from Origamon to neutrino, light won't be able to penetrate vacuum because there is no neutrino in absolute vacuum (inside black holes) to transfer the kinetic energy of light. Strangely enough, in Standard Model the theoretical value for Planck constant is $6.648982 \times 10^{-34} \text{ Js}$ but the empirical value is $h = 6.626069 \times 10^{-34} \text{ Js}$. Therefore the theoretically derived value for Planck constant has always been a factor 1.003458 times the empirical value. The discrepancy is 0.35%. Isn't this amazing? We showed in Origami Model that when particles fuse, 0.35% of mass will turn to energy and the final particle will have one single central black hole. This is exactly the cause of discrepancy that Standard Model cannot explain again. Scientists claim that formula for Planck constant is merely a numerical approximation and not exact, therefore the formula used is false, so Standard Model has not been able to propose a formula for origin of Planck Constant.

As Origami Model shows clearly, Planck Constant has purely to do with the mass of Origamon which makes absolute sense because when calculating the momentum and kinetic energy of a particle we need to find its mass, while in Standard Model the exact meaning of this constant is obscure and that's why the SI units of Planck constant is also conflicting. Various SI units have been suggested for Planck constant, such as joule-second or same units of angular momentum to rectify the unit problem for kinetic energy equation but as Origami Model shows, Planck Constant has no units. It is produced by dividing the mass of photon (Origamon) by mass of neutrino and that's why it lacks any unit. Planck constant is expressing the share of energy that is transferred per second from each photon (Origamon) to neutrinos. As we showed so far, energy transfers via Newton Cradle's mechanism and there is no real particle movement in free space or inside matter. The carrier of the energy inside a medium is in fact a quasi-particle of Deutrino, not a real particle and that's exactly why speed of light is always the same, regardless of the density of the medium.

We know in Standard Model that light must be carried by a particle that has no observable mass and no real diameter but still it exists and it has a momentum. This is exactly what we call in Ghost Particle in previous chapter. Origamon as a ghost particle, is perfect candidate of light carrier with resting mass of $1.3 \times 10^{-70} kg$, and so it has a momentum. According to Origami Theory, frequency is in fact the number of particles colliding with the medium per second so a DC current will have a frequency of one, not zero. In fact, a ray of particles that has no fluctuation of intensity to produce frequency effect in Standard Model, will still have a number of particles moving per unit of time so its frequency in Origami Model is non-zero. Therefore, a DC ray of particles according to Standard Model would have zero kinetic energy because frequency is zero, which is obviously incorrect. The highest frequency found so far is gamma rays in gamma bursts with frequency of $10^{20} Hertz$ and the lowest frequency found is $10^3 Hertz$, but Standard Model cannot explain why there is upper and lower limits to the frequency of photon. Because theoretically the shortest possible wavelength would be the Planck Length, therefore theoretically based on Standard Model, there must be frequencies up to $10^{43} Hertz$, but no frequency above 10^{20} has ever been observed. On the other hand, Origami Model can clearly demonstrate the limits of frequency: When frequency is the number of particles fit in one Shot, then due to the limited size of the Shot (Planck Time), there will be a lower limit and an upper limit to the number of particles that can be produced by one Shot, or the number of particles that can be entrapped. We developed an equation before to calculate the maximum number of particles for each particle that can be in one Shot:

$$n_{max} = \frac{2}{\sqrt[3]{t_g \alpha}}$$

Therefore, we calculated before that for Origamons we can have up to 9×10^{20} particles in one Shot, which means the maximum frequency for light is $8.7 \times 10^{20} Hertz$. Therefore, based on Origami Model the shortest wavelength possible in our universe would be:

$$3 \times 10^8 \div 8.7 \times 10^{20} = 3.4 \times 10^{-13} m$$

This is a wonderful result! This is why no light with frequency above $8.7 \times 10^{20} \text{Hertz}$ has been discovered, because unlike Standard Model that proposes no true mechanism for the frequency of light, Origami Model predicts the highest and lowest frequency and wavelength possible in our universe. Now based on the equation that we extracted in previous chapter for minimum number of particles that can get entrapped, we can find out the lowest frequency possible for light:

$$n_{min} = \sqrt[3]{n_{max}} \times 1.15 \times 10^{-4}$$

$$n_{min} = \sqrt[3]{8.7 \times 10^{20}} \times 1.15 \times 10^{-4} = 1.09 \times 10^3$$

This means the lowest possible frequency of electromagnetic wave would be $1.09 \times 10^3 \text{Hertz}$, which is absolutely consistent with experimental findings. No electromagnetic wave with frequency less than 1000 Hertz has been found so far! Again, Standard Theory cannot explain why there is a lower limit or an upper limit for the frequency of the electromagnetic wave, while Origami Model predicts precisely that there will be an upper and a lower limit for the frequency of the electromagnetic wave and it precisely calculates them. As the kinetic energy of particle increases, the number of entrapped particles increases until it reaches a maximum which is the maximum size of the Shot, and that's why when we reach the highest frequency, even by applying more energy to the particle, its frequency will not increase, and again Standard Model predicts something different to happen. When we approach zero kelvin, the number of particles getting entrapped reduces until it reaches a lowest level but it would never be less than 1, because there will always be at least one particle in the Shot. In other words, the energy of particle would never be zero, which is consistent with Origami Model but inconsistent with Standard Model predicts.

Another crucial point is the constant reduction of quantum entrapment due to the constant reduction of the Shots (Planck Time reduction). We concluded the proper equation for time-dependent maximum number of particles that can fit in one Shot to be the following:

$$n_{max} = \frac{2}{\sqrt[3]{t_g \alpha}} \times \sqrt[3]{10xTxG}$$

n_{max} : maximum number of particles that could fit in one Shot

T : time in the past (for example for present time, $T=1$, and for Big Bang $T=\text{age of universe}$)

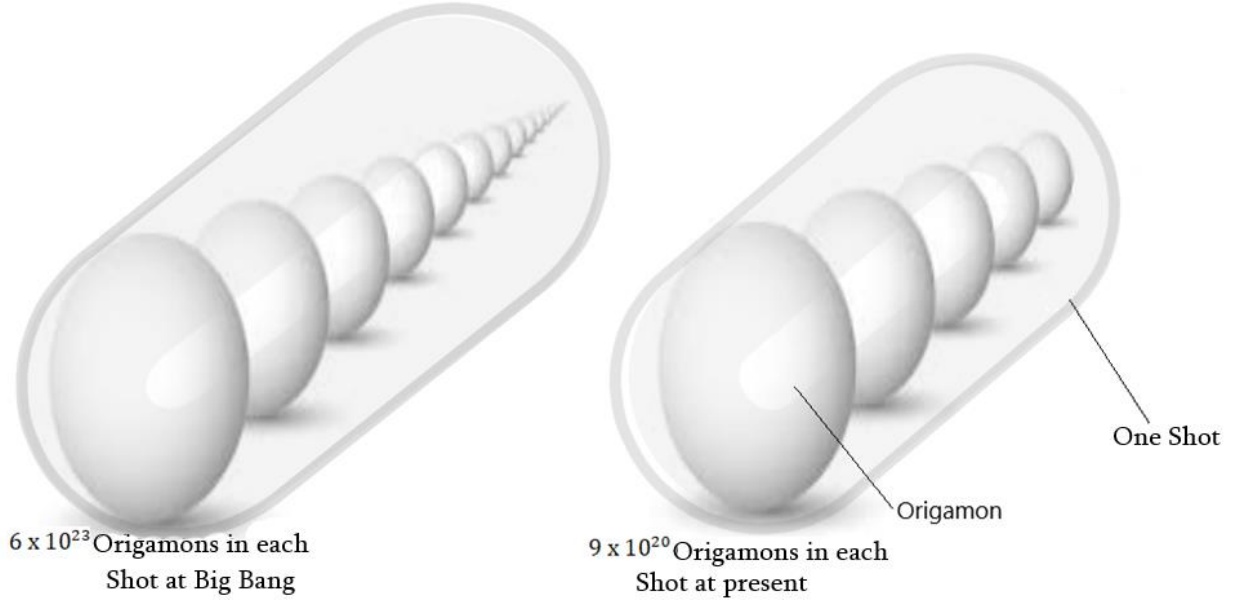
G : Gravitational Constant

This means at the Big Bang when $T = 4.3 \times 10^{17}$, the maximum number of particles that could fit in a Shot was much higher. Now we can calculate the n_{max} for the Origamons at the Big Bang:

$$n_{max} = \frac{2}{\sqrt[3]{1.19 \times 10^{-62}}} x \sqrt[3]{10 \times 4.3 \times 10^{17} \times 6.67 \times 10^{-11}}$$

$$n_{max} = 6.02214 \times 10^{23}$$

This is how we found the origin of Avogadro Number and now we understand that the maximum frequency of light at Big Bang have been much higher, which is again exactly what current data have shown. Origami Model demonstrates clearly that as time progresses, the maximum frequency of light reduces.



Reduction of the size of Shot and the quantum entrapment as time accelerates

This means we can actually calculate the coefficient for the constant reduction of the maximum frequency which is equal to the constant reduction of quantum entrapment and therefore continuous reduction of maximum energy of light in our universe:

$$K_d = \sqrt[3]{10xTxG}$$

K_d : Devil's Coefficient

As we see, at the Big Bang when $T = 4.352 \times 10^{17}s$ the value of K_d is:

$$K_d = \sqrt[3]{10 \times 4.352 \times 10^{17} \times 6.67 \times 10^{-11}} = 666$$

But this is not why I have nominated as Devil's Coefficient. K_d is physically the coefficient opposing the intensity of light in our universe.

The total number of Origamons (photons) that will fit into same Shot to create the frequency of that light, is directly proportional to the momentum of that Origamon. This is true for any particle. Based on my equation for energy of particle, we can easily find out the equation that will tell us how many particles would get entangled:

$$n = \frac{E}{h}$$

n: number of entrapped particles

E: Energy of particle

h: Planck Constant

Therefore, the more energy applied to a particle, the more particles will get entrapped in the same Shot, therefore more energy will be carried per time, and vice versa. This explains exactly how a particle (or light) can carry more or less energy.

Quantum Tunneling

So many sophisticated experiments and so much debate and argument have been happening in the world to see how long it takes for the tunneled photons to cross the barrier. Some have claimed that they travel faster than speed of light inside the barrier, some argue that they actually take no time to cross the barrier, but most scientists agree that tunneling occurs as fast as speed of light. But we know that light slows down in a media and this is why it refracts, so how could these photons cross the solid metal sheet with the same speed and how could they go through the metal sheet when they don't have such kinetic energy to do so? This is another example of why quantum mechanics has been considered contradictory to classic physics. Another perplexing feature of quantum tunneling that physicists have not been able to explain is that the photons cannot tunnel through any barrier that is thicker than $3 \times 10^{-9}m$. If they ignore the barrier and do not obey the kinetic-potential energy equilibrium, why they only do it for such small distance only?

However, based on the model that Origami Model produces for the nature of light, time and speed, we can easily explain and even expect the quantum tunneling to occur all the time. In this model, the laws of physics are the same for all sizes of mass and we have proper equations that are able to process all kinds of object movements, regardless of their radius or mass. The reason for quantum tunneling and quantum entanglement to be so counterintuitive, is due to the wrong current model used in quantum mechanics. Based on what Origami Model proposes, there can be even more complex events and phenomena that we haven't discovered yet because time travels much faster than light and we must see events that seemingly violate our current understanding of locality and momentum. Fundamentally, the mechanism of quantum tunneling is very similar to entanglement. As we saw earlier, due to Quantum Entrapment, Origamons (photons) always travel in packs of thousands and millions, all located in same Shot and the number of Origamons in same Shot is what we know as the frequency of light. I explained before that only one of these photons is observable for us. Now, once the Origamons reach a barrier, there is always a chance that one of them in each Shot, instead of

the Horizontal progression of time, goes through the Vertical pathway. Therefore, this single observable photon will not go through the barrier, but its data travels (without the gravity) in the vertical progression of time. We calculated earlier that vertical speed of time is $3.7 \times 10^{44}m/s$, much faster than speed of light because it doesn't combine with gravity. The data will virtually travel as fast as vertical speed of time to the end of the time which is the end of it, which is the entire radius of universe that is $4.4 \times 10^{26}m$. Then it comes back but when it is back it will be 3.3 nanometer into the thickness of the barrier because it during this time, time would go 3.3 nanometer further with its real speed of $3 \times 10^9m/s$. Let's calculate this:

$$T = \frac{R}{V_t^v}$$

T : the time that takes for data change to travel to the end of universe

R : radius of universe

V_t^v : vertical speed of time

$$T = \frac{4.4 \times 10^{26}}{3.7 \times 10^{44}} = 1.1 \times 10^{-18}$$

This means it takes the data of photon (Origamon) $1.1 \times 10^{-18}seconds$ to travel the radius of universe and return. Now we need to see how far would photon (data with the gravity) progress horizontally in this short duration, so we just multiply the duration by the horizontal speed of time:

$$D = V_t^h \times T$$

$$D = 3 \times 10^9 \times 1.1 \times 10^{-18} = 3.3 \times 10^{-9}m$$

This gives us 3.3 nanometer, which means if the barrier is up to 3.3 nanometer thick/tall, the photon will arrive on its other side, but if it is thicker/taller than this, it will return in the middle of it and it won't be able to tunnel through it. This result gives us a critical conclusion: A fraction of Origamons *always tunnel* through any barrier but we only observe the tunneled Origamons if the thickness/height of the barrier is less than 3.3 nanometer so the tunneled Origamons will appear on the other side of barrier. The result concludes that whenever light reaches a barrier that is equal or less than 3.3 nanometer thick/tall, a number of photons will appear on the other side of the barrier through the tunneling phenomenon. Obviously, the rate of tunneling will be directly proportional to the frequency of light, because the larger number of photons in each Planck Time, the bigger possibility of them to tunnel through the barrier, which is exactly what happens in experiments. This explains how photons tunnel though barriers, and why they cannot tunnel if barrier is thicker than 3.3 nanometer and why tunneling rate is directly proportional to the frequency of light. This tells us two important and unique findings: firstly, the time for photons to tunnel through a barrier is constant and it is independent of the thickness of the barrier and it only depends on the radius of universe and horizontal vs vertical speed of time, secondly, as universe expands constantly, the maximum tunneling diameter will increase constantly above the current value of 3.3 nanometer, because as I explained in previous chapter, the rate of acceleration of time is less than the rate of increasing of the radius of universe, so the end result will slowly go up over the time. By checking the below equation this will be easily understandable. Thirdly, up to 3.3 nanometer the thicker the barrier the faster that tunneling will be observed because while the tunneling time is constant but as we can see in above calculations, the thickness of barrier is directly proportional to the *predicted* spent time per

speed of time, in other words, the thicker the barrier, the more significant the tunneling would be observed. Our calculation can be simplified to produce a new equation for maximum tunneling diameter (D_{max}):

$$D_{max} = \frac{10CR}{3.7 \times 10^{44}}$$

$$D_{max} = CR \cdot 2.6 \times 10^{-44}m$$

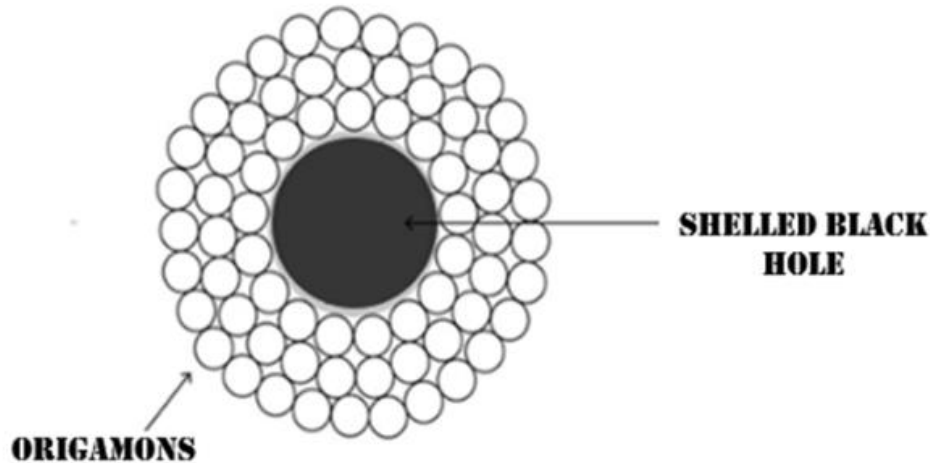
D_{max} : maximum tunneling diameter

C : speed of light

R : radius of universe

6. Particle Decay in Origami Theory

Based on Origami Model all subatomic particles except origamon are made of large number of fused Origamons and therefore, unlike the Standard Model, the elementary particles in Origami Model are divisible and decayable. The following picture is a schematic demonstration of fermions in Origami Theory:



Structure of subatomic particles with a single shelled black hole at their center

Due to quantum tunneling there is always a trivial chance that one of these Origamons escapes its position and leaves the outer shell, causing a disarray in the shell and ending in destruction of the particle. Therefore, every particle, regardless of elementary or composite, has a chance of decay and based on the probability of quantum tunneling for Origamons, we should be able to calculate the chance of decay for that particle.

The general probability equation is as following:

$$T_{(L,E)} = 16 \frac{E}{U_0} \left(1 - \frac{E}{U_0}\right) \times 10^{-2\beta L}$$

$T_{(L,E)}$: transmission coefficient = probability of tunneling

E : Total energy of the particle that is going over the barrier (Origamon that is going to tunnel)

U_0 : barrier's hight = amount of energy opposing the tunneling particle

β : this is the product of this equation: $\beta = \sqrt{\frac{2m}{(\frac{h}{2\pi})^2}} \times (U_0 - E)$

m : mass of the tunneling particle (mass of Origamon)

h : Planck constant

L : Thickness of the barrier in meter

Therefore, E is in fact the angular momentum of the outmost Origamons in the last shell of particle (third shell) that pushes them to escape. This angular momentum is normally overcome by the average force that keeps the Origamon in its shell. The force that holds the Origamon in its shell around the particle is our U_0 here and it would be equal to the force that pulls the Origamon into the central black hole divided by the force that attaches the Origamon to its adjacent origamon and opposes the central black hole's attraction. To calculate the gravitational force between the two adjacent Origamons we need to know the distance between these two Origamons in that particle. If we consider the particle to be proton, then if we divide the mass of proton by the mass of Origamon, we will find out how many Origamons are in a proton. Then based on the radius of proton we can find the volume of proton. If we divide the volume of proton by the number of Origamons used in one proton we will find out what volume is occupied by each Origamon so the cube root of that volume would be the radius occupied by each Origamon or in fact the distance of two Origamons from each other:

$$\frac{\text{mass of proton}}{\text{mass of Origamon}} = \frac{1.67 \times 10^{-27}}{1.3 \times 10^{-70}} = 1.28 \times 10^{43} \text{ this is the number of Origamons used in one proton.}$$

$$\text{volume} = \frac{4}{3}\pi r^3 = \frac{4}{3} \times 3.14 \times (8.8 \times 10^{-16})^3 = 2.8 \times 10^{-45}$$

$$\frac{\text{volume of proton}}{\text{number of Origamons}} = \text{volume occupied by each Origamon} = \frac{2.8 \times 10^{-45}}{1.28 \times 10^{43}} = 2.18 \times 10^{-88}$$

$$\text{volume} = \frac{4}{3}\pi r^3 \Rightarrow 2.18 \times 10^{-88} = 4.1 \times r^3 \Rightarrow r = 3.7 \times 10^{-30}m$$

This is the distance of Origamons at the closest shell to the central black hole. As we discussed before, the distance of Origamons grows as we reach the outer shells by ratio of 6.6×10^9 , and because proton would have three shells, the distance of Origamons in the outmost shell would be $3 \times 6.6 \times 10^9 \times 3.7 \times 10^{-30} = 1.8 \times 10^{-20}m$. The other way of finding the distance between the

Origamons in last shell of Proton is the following equation (I show you how I developed this equation in future chapter):

$$d = \sqrt{\frac{r}{M}} \times 2.53 \times 10^{-26}$$

$$d = \sqrt{\frac{0.84 \times 10^{-15}}{1.67 \times 10^{-27}}} \times 2.53 \times 10^{-26} = 1.8 \times 10^{-20} m$$

$$\text{distance between outmost Origamons in a proton} = r' = 1.8 \times 10^{-20} m$$

Now we can calculate the U_0 for proton:

$$\begin{aligned} U_0 &= \frac{\text{gravitational force between two adjacent Origamons}}{\text{gravitational force from central black hole on Origamon}} = \frac{Gmm}{r'^2} \div \frac{GMm}{r^2} = \frac{mr^2}{Mr'^2} \\ &= \frac{1.3 \times 10^{-70} \times (8.8 \times 10^{-16})^2}{1.67 \times 10^{-27} \times (1.8 \times 10^{-20})^2} \\ U_0 &= 1.86 \times 10^{-35} \end{aligned}$$

Now we need to calculate the angular momentum of outmost Origamons in proton:

$$E = m.r.v = 1.3 \times 10^{-70} \times 3 \times 10^8 \times 8.8 \times 10^{-16} = 3.43 \times 10^{-78}$$

$$\frac{E}{U_0} = \frac{3.43 \times 10^{-78}}{1.68 \times 10^{-35}} = 1.9 \times 10^{-43}$$

$$T_{(L,E)} = 16 \times 1.9 \times 10^{-43} \times (1 - 3.6 \times 10^{-42}) \times 10^{-2\beta L}$$

$$\beta = \frac{\sqrt{\frac{2m}{(\frac{h}{2\pi})^2} \times (U_0 - E)}}{\sqrt{\frac{2 \times 1.3 \times 10^{-70}}{(\frac{6.62 \times 10^{-34}}{2 \times 3.14})^2} \times (1.86 \times 10^{-35} - 3.43 \times 10^{-78})}} = 4.2 \times 10^{-37}$$

$$L = \text{radius of proton} = 8.8 \times 10^{-16} m$$

$$T_{(L,E)} = 3.19 \times 10^{-42} s^{-1}$$

This means the chance of one Origamon inside a proton to tunnel to free space and leave the proton, causing decay is 3.19×10^{-42} per second. To calculate the rate of decay for proton we have to multiply this probability by the number of seconds in one year:

$$\text{years to take for proton to decay} = \frac{1}{\text{probability of decay per second} \times \text{number of seconds in one year}}$$

$$\text{years to decay proton} = \frac{1}{3.19 \times 10^{-42} \times 31.53 \times 10^6} = 1 \times 10^{34}$$

This means based on Origami Theory, it will take 10^{34} years for proton to decay. We know that the latest experiments have calculated the proton decay time to be close to 1.08×10^{34} years, which is much longer than the age of the universe. This is consistent with what Origami Model would predict. Also, this calculation tells us that if mass of a particle is higher, the probability of Origamon tunneling will increase because the higher mass will give the higher angular momentum in outmost shell and also bigger distance between the Origamons in outmost shell. This is completely true for all particles as we know in space, stars with bigger mass have shorter life. We can simplify the calculations that we performed and find the following equation for decay time of any particle in seconds:

$$\sigma = \frac{4\pi^2 r}{Mh} \times 10^{-5}$$

σ : decay time of the particle in years

r : radius of the particle

M : mass of the particle

h : Planck Constant

Therefore, mass of the particle is reversely proportional to its decay time and the radius of a particle is directly related to its decay time. This equation is purely derived from gravitation force only and its quite precise. If we try it for Origamon with its mass of $1.3 \times 10^{-70} \text{ kg}$ and radius of $8 \times 10^{-36} \text{ m}$:

$$\text{decay time} = \frac{3.15 \times 10^{-34}}{6.62 \times 10^{-34} \times 1.3 \times 10^{-70}} \times 10^{-5} = 3.6 \times 10^{64} \text{ s}$$

So, the decay time for Origamon would be the longest, and Origamons which were produced at the start of the Big Bang would last longer than any other particle because their mass is extremely small.

Also based on this equation, if an object has a very high mass and very small radius, it will have the shortest life time. This is exactly consistent with what we see in universe. The more compact

a star is the closer it will be to explosion and converting to a black hole, and that's why White Dwarfs that are super-dense, have the shortest life span, they explode and leave a black hole in their place. The equation also proves that black holes are empty, because if there is a real mass inside this radius, it would instantly decay because black holes have the shortest radius possible and the highest mass possible. Therefore, black holes don't decay because they are already the product of the decay, that's why they have no tangible mass inside them.

Based on the same principle of gravitational force of the central black hole and probability of Origamons tunneling out, we can conclude the equation for stars decay time in years:

$$\sigma = \frac{\pi r}{M} \times 10^{31}$$

σ : decay time of the star in years

r : radius of the star

M : mass of the star

This equation is derived again from exactly the same details and the same factors. Again, we see that mass of the star is reversely proportional to its decay time and radius of star is directly related to its decay, exactly like subatomic particles. For example, if we try the equation for sun:

$$\sigma = \frac{6.8 \times 10^8}{2 \times 10^{30}} \times 3 \times 10^{31} = 1 \times 10^{10} \text{ years}$$

The equation tells us that our sun would end its life in 10 billion years (5 billion years from now because sun is five billion years old), which is precisely the same results that we have found through observations. But Origami Model is using simply only gravitational force and Origamons as its fundamental structure. We can try the equation for earth:

$$\sigma = \frac{6.3 \times 10^6}{5.9 \times 10^{24}} \times 3 \times 10^{31} = 3.2 \times 10^{13} \text{ years}$$

As we can see, earth would live thousand years more than sun, because its mass is much smaller than sun.

