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A Collection of Novel Theories in the Field of Cosmology
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Originator: Mohammad Ali Taheri

Space, Gravity-Time

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Special Issue

T-Consciousness Cosmology

Space, Gravity-Time

Important Point: A documentary concerning the topics addressed in this issue, titled:

"Space, Gravity-Time"

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The YouTube channel of Mohammad Ali Taheri(Part 1)

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Preface

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Introduction

Unveiling the Cosmos

The vast expanse of the cosmos, a celestial ocean teeming with constellations and swirling galaxies, has ignited an unquenchable spark of curiosity within humanity since the dawn of time. This eagerness to understand the universe in which we live has continually driven humankind to uncover the secrets of the cosmos. This endeavor is evident in ancient civilizations that charted constellations, as well as in modern astronomers who peer into the farthest reaches of space. Throughout history, pioneering astronomers like Galileo and Copernicus paved the way for a more tangible understanding of the universe. Eventually, modern cosmology, equipped with powerful telescopes and advanced detectors, has revolutionized our understanding of the universe as a whole, offering a framework for the origin, evolution, and ultimate fate of the universe.

From Philosophy to Physics Theories and Observations

The mysterious enigma of the cosmos has been and continues to be a pretense for the clash of ideas, inspiration, and countless arguments throughout human history. For tens of thousands of years, the configuration of stars in the sky has captivated our attention and inspired the creation of constellations from which myths and fictional stories were born, followed by philosophical inquiries essentially defining the philosophy of nature. Subsequently, the introduction of mathematics to simplify these philosophical concepts has opened up the world of physics to humanity. Persistent efforts and the accumulation of unanswered questions have not only compelled humans to observe and monitor the cosmos on larger scales with the advancement of technology but also aimed to interpret and analyze its components. This has been achieved through the processing of numerous mathematical models and the formulation of various theories, which sometimes align and sometimes contradict.

However, despite technical and technological advancements, the definition of the cosmos has been obscured in countless equations, calculations, models, and physics theories, with no clear and powerful unified interpretation provided thus far. Humanity remains at a loss in answering the questions: What is the cosmos? Why does it exist, and where is it headed? This is where the power of intuition and perception from a holistic viewpoint becomes essential for understanding and grasping the philosophy of the why and how of the cosmos. From this perspective, T-Consciousness Cosmology has attempted to unravel the complexities of conventional cosmology and provide a complete, clear, and unified interpretation of the cosmos through new theories. Additionally, this viewpoint addresses all concepts and the nature of what transpires in the cosmos, including Cosmic Information, Cosmic Mind, Cosmic T-Consciousness, and also various forms of Cosmic Life. These topics, however, do not entirely conform to the limited framework of currently accepted theories in physics and cosmology.

The Conventional Cosmological Perspective and Common Theories

Big Bang: The universe originated from an ultra-dense and hot point.

With the advancement of scientific research, the Big Bang theory was eventually established as the dominant cosmological model for the origin of the universe. This theory posits that the cosmos began nearly 13.8 billion years ago from an infinitesimal point with incredibly high density and temperature, known as the singularity. This singularity rapidly expanded and cooled in a fraction of a second, initiating the process of element formation and subsequently the formation of celestial bodies, ultimately leading to the cosmos we observe today.

From the perspective of cosmologists, the Big Bang theory is strongly supported by several key observations. One such observation is the discovery of the Cosmic Microwave Background (CMB). This radiation is considered a faint echo of the early universe, permeating the entire cosmos. In other words, its uniformity across the sky aligns with the predictions of a hot, dense origin of the universe. Additionally, the observed abundance of light elements such as hydrogen and helium in the universe also corresponds with the nuclear synthesis predicted to have occurred following the Big Bang.

Standard Model of Cosmology: A Framework for Cosmic Evolution

Building on the Big Bang theory, the standard model of cosmology (Lambda-CDM) provides another perspective on the universe's initial moments and its evolution, from the formation of fundamental particles to the creation of large structures like galaxies and galaxy clusters. This model incorporates the theory of inflation, a period of rapid exponential expansion believed to have occurred shortly after the Big Bang. The theory addresses the observed uniformity in the large-scale universe and theoretically resolves some of the problems with the Big Bang model. Additionally, the model relies on the existence of dark matter and dark energy, which are considered enigmatic components of the universe. Although invisible, dark matter influences the motion of galaxies and clusters through its gravitational pull. On the other hand, dark energy is believed to be responsible for the currently accelerated expansion of the universe.

Unanswered Questions and Ongoing Explorations

Despite the successes achieved in cosmology, the Big Bang theory and the standard model still face challenges. Questions about how the universe was born, the process of its evolution to its current form, the nature and geometric shape of the cosmos, its ultimate fate, the characteristics of dark matter and dark energy, and the possibility of other universes – along with countless unanswered questions – continue to drive ongoing research. Furthermore, alternative cosmological models such as the steady-state model, etc., are being examined to ensure a comprehensive understanding of the origin and evolution of the universe.

T-Consciousness Cosmology: A New Perspective on the Universe

Through its novel approach, T-Consciousness Cosmology comprises a collection of theories that examine and analyze topics such as the origin of the universe, its nature, the manner of its evolution, its fate, and hundreds of other theories.

As the name suggests, this viewpoint introduces a unique consciousness known as T-Consciousness. It posits that the universe, in addition to matter and energy, contains another element called T-Consciousness, which differs from definitions previously offered in the history of science or philosophy. From this perspective, it is argued that both matter and energy themselves arise from T-Consciousness.

Furthermore, T-Consciousness Cosmology articulates that the cosmos generally consists of two parts: frequency-based (~) and non-frequency-based (-):

The frequency-based part of the cosmos describes behavior that is periodic and non-linear, characterized by amplitude and wavelength, such that it has a non-continuous effect on the cosmos (i.e. all known types of waves and ordinary matter).

In contrast, the non-frequency-based part of the cosmos describes non-periodic and linear behavior, where the amplitude and wavelength are zero, and its effects in the cosmos are linear and continuous.

In this regard, for example, it can be said that space, gravity, and time themselves do not have a frequency effect and have a sustained effect on everything. Even if, for a moment, one of these, like gravity, were to exhibit a periodic effect, the entire cosmos would disintegrate. However, it is worth noting that the result of this influence is the emergence of particles (ordinary matter), which exhibit periodic and frequency-based behaviors. Similarly, if time itself were to have a periodic effect, the cosmos would likewise collapse in the same way, despite the fact that we have a periodic method of measurement for time (tick tock of a clock). Therefore, from this perspective, for the most part, the known physical aspect of the cosmos is periodic and frequency-based.

An important point to note is that the linearity of the impact of space, gravity, time, dark matter, and dark energy refers to the inherent influence of these factors in the universe, not the outcome of their effects.

Consequently, the frequency-based part (~) of the cosmos includes matter and energy, and the non-frequency, non-pulsing part (-) of the cosmos consists of two sections:

A- A section that in conventional cosmology is referred to with different definitions, such as spacetime, dark energy, and dark matter.

B- T-Consciousness, information, mind, life, dark life energy, etc., are parts that do not have specific definitions and are not mentioned in conventional cosmology. While from the viewpoint of T-Consciousness Cosmology, they constitute the main part of the cosmos.

Important Note: In T-Consciousness Cosmology, instead of the concept of "space-time," the term "space, gravity-time" is used, in which gravity and time are always proportionally intertwined and inseparable. In fact, the effect of gravity-time is considered as two sides of the same coin. Moreover, considering that if space did not exist, the cosmos would certainly not exist either. Therefore, from this perspective, space is considered a fundamental element of the cosmos, while it is neither matter nor energy. This means the nature of space, as one of the main components of the cosmos, is non-pulsing. This concept also applies to dark energy and dark matter, which this perspective identifies as functions of space itself.

Therefore, T-Consciousness Cosmology states that the structure of the components of the cosmos, such as dark energy and dark matter, is not composed of particles. Additionally, because of its non-pulsing nature, gravity is inherently a non-frequency element. Thus, generally, gravity is also not composed of particles (such as the hypothetical graviton particles in conventional science).

Regarding the non-pulsing nature of gravity or space, it can be noted that physics calculations show that celestial bodies with significant mass or acceleration can disturb spacetime in such a way that it appears as if gravitational waves propagate in all directions. In other words, conventional cosmology predicts that although they differ from each other, gravitational waves resulting from the spinning of neutron stars, the collision of black holes, and supernova explosions can be analyzed. However, T-Consciousness Cosmology defines what is commonly referred to as gravitational waves in physics simply as the squeezing and stretching of space due to the changing behavior of massive bodies in proximity to one another. Therefore, the changes in gravitational behavior caused by massive bodies only lead to the contraction and expansion of space. In simpler terms, gravity has a linear impact on the structure of space, not a wave-like one.

Like gravity, time exerts its influence in a linear fashion on the cosmos and its components, in tandem with gravity. If gravity were zero, time would also be zero. Conversely, if gravity approached infinity, time would similarly become infinite. It is also essential to mention that the type of timekeeping invented by humans (i.e. the ticking of a clock) is completely arbitrary, as time does not have a frequency or pulsing nature.

Consequently, T-Consciousness Cosmology uses "space, gravity-time" instead of the well-known term "spacetime."

The Origin and Fate of the Universe

Existing models in conventional cosmology have not yet provided a widely accepted theory about what existed before the Big Bang or how the various forms of matter and energy known today came into being at the initial moment of the explosion. This issue remains shrouded in ambiguity for cosmologists. In this context, T-Consciousness Cosmology, by introducing a new model named the ‘Spherical Cosmos Model,’ not only addresses the origin or how the initial seed of the cosmos came into existence, but also acknowledges the expansion of the cosmos and introduces a shell made of TAM (Taheri Absolute Matter), that isolates the cosmos. This model proposes a different foundational mechanism compared to conventional inflationary models and introduces a new concept called ‘Space Rebound’ to explain the increase in the volume of the cosmos. In fact, the theories of this viewpoint support each other in the understanding of the structure of the universe as a whole system, making simple predictions about the behavior of the cosmos. Moreover, T-Consciousness Cosmology, by addressing the nature of dark matter and dark energy and their functions, determines the cause of the cosmic expansion and its ultimate fate. Additionally, in line with the Spherical Cosmos Model (SCM), a new theory about another stage of the lifecycle of the cosmos, referred to as its ‘Reversion,’ is also proposed.

The Nature of the Building Blocks of the Cosmos

T-Consciousness Cosmology, in addition to addressing the general behavior of the cosmos, also explores the formation and function of its components, introducing new types of matter. According to the Spherical Cosmos Model, there is no contradiction between the formation mechanism of fundamental particles and the initial point of the cosmos (Big Bang). However, in the standard model of cosmology, which includes the theory of inflation and is based on general relativity and the standard model of fundamental particles, there is a clear contradiction known as the singularity at the birth of the universe and the formation of matter. Specifically, the singularity, a consequence of general relativity, is an obstacle that is inconsistent with the formation of fundamental particles in the initial moments of the cosmos's birth.

Overall, it can be stated that T-Consciousness Cosmology offers a unique view of the cosmos by altering the perspective of the observer. From this shifted viewpoint, the cosmos is perceived as a grand system endowed with distinct identity, personality, and behavior. This system not only follows a specific trajectory to fulfill a special purpose but also demonstrates a high level of intelligence.

The Multiverse from a New Perspective

T-Consciousness Cosmology asserts that the cosmos in which we currently live follows a sequential principle (Consecutive Cosmos) and has its own lifecycle. It is one of countless homogeneous or heterogeneous universes, each with its own unique characteristics and behaviors (laws of physics).

Additionally, from this viewpoint, the fundamental constants of physics change according to different cosmic epochs and locations. For example, gravity-time will range from infinity at the beginning of the cosmic lifecycle to zero at the terminal edge of the cosmos (the ultimate stage of space rebound).

and…

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Space, Gravity-Time

Abstract

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Space and time, from Newton's point of view, were considered as two separate and absolute concepts, and gravity was also defined as a force that varies according to the mass of two objects and their distance from each other. However, Hermann Minkowski, using Einstein's theory of relativity, offered a geometric interpretation of special relativity, integrating time and the three dimensions of space into a unified four-dimensional model now known as Minkowski space. In the theory of general relativity, gravity is also defined as a geometric function and a consequence of the curvature of spacetime, which itself arises from the uneven distribution of mass and energy.

One of the key outcomes of the theory of general relativity is that the motion of celestial bodies orbiting around other bodies in curved paths is not driven by a force known as gravity. Instead, bodies are actually following the closest objects to them through curved spacetime, a bending that gravity is a result of. This movement happens along the shortest path, known as a geodesic. In contrast to Newton's view, the theory of relativity has shown that the speed at which gravity acts is limited to the speed of light. Modern physics proposes that this transmission of gravity might be carried out by hypothetical particles called gravitons. Another prediction of this theory is the concept of a gravitational potential well, which explains why the frequency of light increases or decreases as it falls into or escapes from this well, due to the curvature of spacetime caused by a massive object. Time dilation near a massive object is also a phenomenon that occurs due to the strong gravitational field of that object.

In this regard, Einstein's theory of special relativity explains how the laws of physics are the same for all observers moving at the same velocity and how the speed of light is constant in a vacuum. One of the consequences of this theory is that mass and energy are considered equivalent and interchangeable according to the famous $E=mc^2$ equation. However, in the theories of T-Consciousness Cosmology, space is conceptualized independently and as a principle, in the form of a mesh, and time is described as an entropic force that acts opposite to gravity to break down objects that cause space to contract. In other words, the entropic force of time is introduced as a force that arises from mass to release space from stress, not as a fourth dimension perpendicular to the dimensions of space.

Furthermore, this perspective considers varying viscosities for the space surrounding celestial objects. It introduces gravity as a force that is equivalent to the viscosity of space, rather than as a consequence of curved geometry, as typically presented in relativity. Gravity functions in accordance with the structure of space mesh. Consequently, phenomena such as gravitational redshift or blueshift are interpreted as outcomes of the viscosity of space. This perspective states that as light enters black holes, the mass-energy equivalence principle is violated because of the energetic resonance of the wave during its gravitational blackshift, implying that black holes are matter production factories. Furthermore, the mass-energy equivalence principle and the law of conservation of matter and energy do not hold true in the Cosmic Black Hole, which is the beginning of the cosmos, or after the final stage of space Rebound.

Keywords: Entropic Time Force, Space Viscosity, Space Stress, Structure of space mesh, Energy Resonance of a Wave, Gravitational Blackshift, Matter Generation Factory, Cosmic Black Hole, Ultimate Space Rebound

Space, Gravity-Time

Spacetime, from Classical Mechanics to the Theory of Relativity

Aristotle and Newton both believed in absolute space and time. This means that space and time are two non-reliant and independent concepts, and it is possible to measure the temporal or spatial distance between two events independent of the observer. Although this perspective works correctly in calculations related to ordinary speeds, it is not effective at speeds close to the speed of light.[1] In general, classical physics states that time flows independently of any external factor that is independent of space, and different observers have an equal measure of time, regardless of their position (Figure 1).[2]

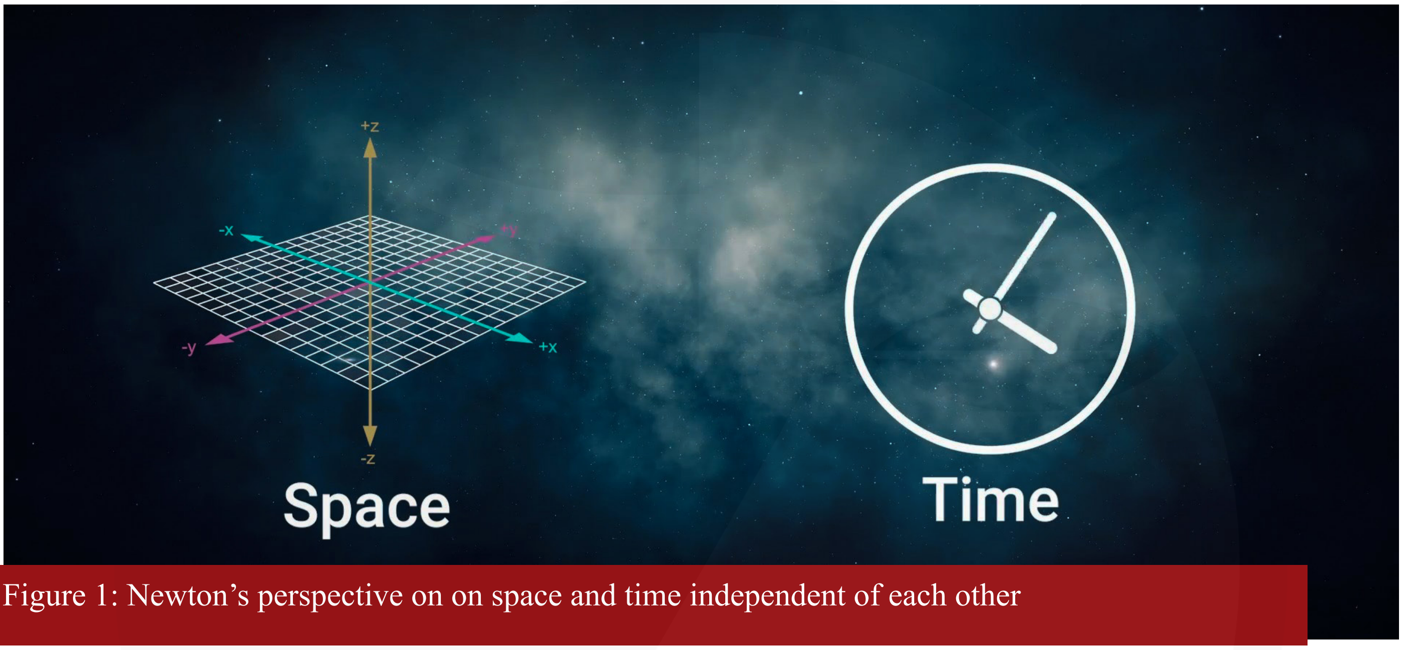

Figure 1: Newton's perspective on on space and time independent of each other

Newton, in addition to defining space and time, described gravity as a force proportional to the mass of two objects and the distance between them.[2] According to this view, two masses exert gravitational force on each other that has no effect on space and time, and whenever one of these objects is moved, the magnitude of the force exerted on the other object changes instantly. In other words, gravitational effects are applied at an infinite speed, which is faster than the speed of light.[3] Simply put, according to this theory, if the sun disappeared at this very moment, the Earth would be immediately released from its gravitational pull and drift in space.

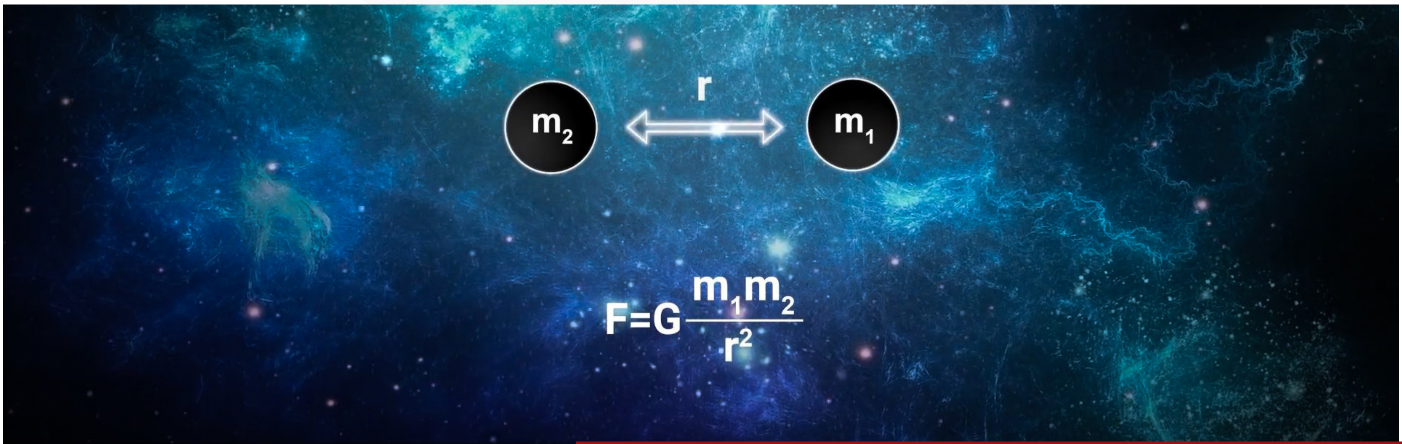

Figure 2: Gravity from the perspective of classical physics.

However, in his theory of relativity, Einstein refuted the concept of absolute space and time.[4,5] In this theory, which is a cornerstone of modern physics, time is not only considered a dimension but is also measured differently by different observers, depending on their speed of movement. For instance, at speeds close to the speed of light, time passes very slowly and at the speed of light itself, time stops.[6] Nevertheless, as stated, in Newton's theory, the passage of time is constant for all observers and has no relation to the position and speed of the observer.

In other words, the theory of relativity states that if we consider time as absolute in the equation $c = \frac{r}{t}$ (where c is the speed of light, r is the displacement of light in (x,y,z) from a hypothetical origin zero, and t is the time of light's displacement from the same origin), then observers in different reference frames should measure different speeds for light.[7,8] However, the speed of light is constant,[1,6,9,10] and it is space and time that are relative and cannot be considered absolute (Figure 3).

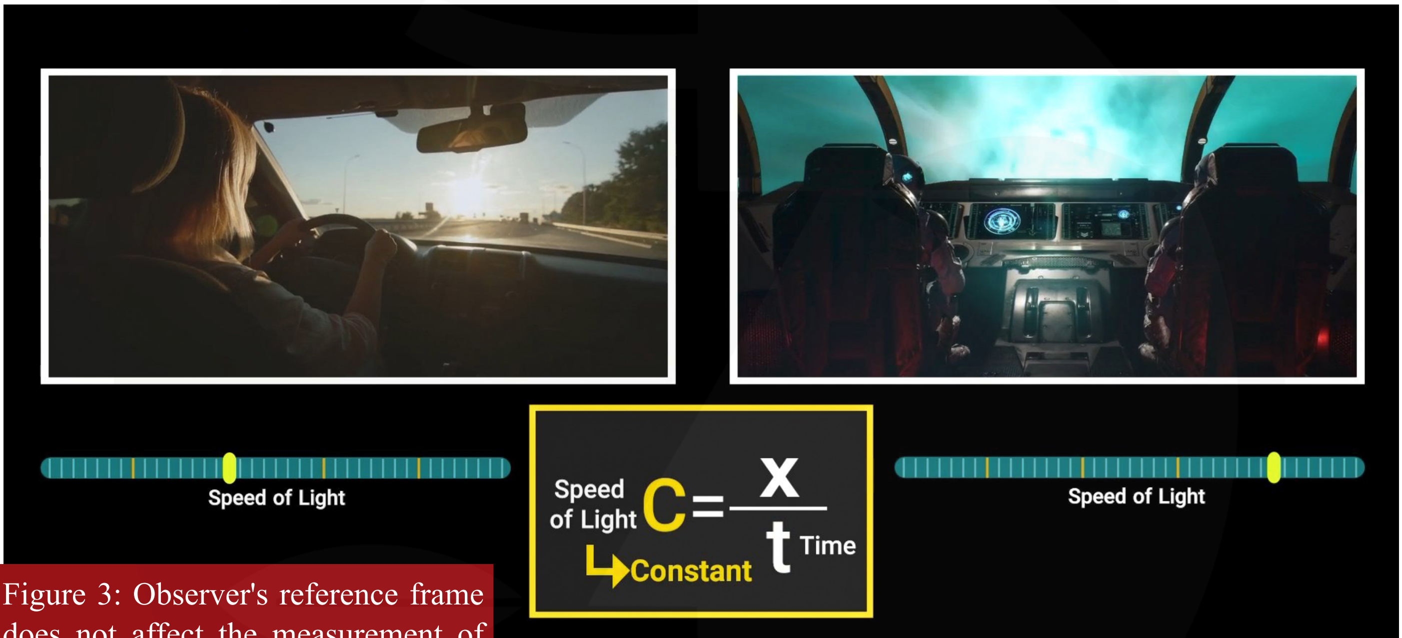

Figure 3: Observer's reference frame does not affect the measurement of the speed of light in the theory of relativity.

General Relativity

Relativity itself is divided into two theories: general relativity and special relativity. In general relativity,[9] space and time are merged into a four-dimensional model known as spacetime,[10] and it is demonstrated that these two dimensions are by no means absolute. In fact, space and time create a four-dimensional fabric, and the motion of objects takes place within this fabric. In other words, the motion of an object is determined by the geometry of the spacetime in which it is situated (Figure 4).[11,12]

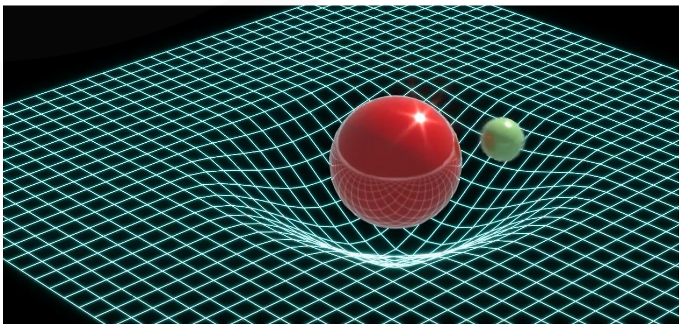

Figure 4: From the perspective of General Relativity, gravity is a geometrical property and a function of the curvature of spacetime due to the uneven distribution of mass and energy.

Generally speaking, general relativity encompasses the notion that the force of gravity is not like other forces, but is instead considered a geometric function and a consequence of the curvature of spacetime.[13,14] This curvature of spacetime is, in turn, a result of the uneven distribution of mass and energy.[13,14] Prior to the introduction of this theory, space and time were considered to be flat.[13,15] In other words, one of the significant implications of general relativity in conventional cosmology is that what causes celestial bodies to orbit in curved paths is not a force called gravity per se, but rather that these bodies follow the nearest mass in a curved spacetime where gravity is a consequence of this curvature,[16,18] and this movement takes place on a direct path known as a geodesic.[12,14,16,19] A geodesic generalizes the concept of a straight line in three-dimensional space to curved spacetime and, according to the definition, is the shortest or longest path between two adjacent points.[16,17,19] (Figure 5)

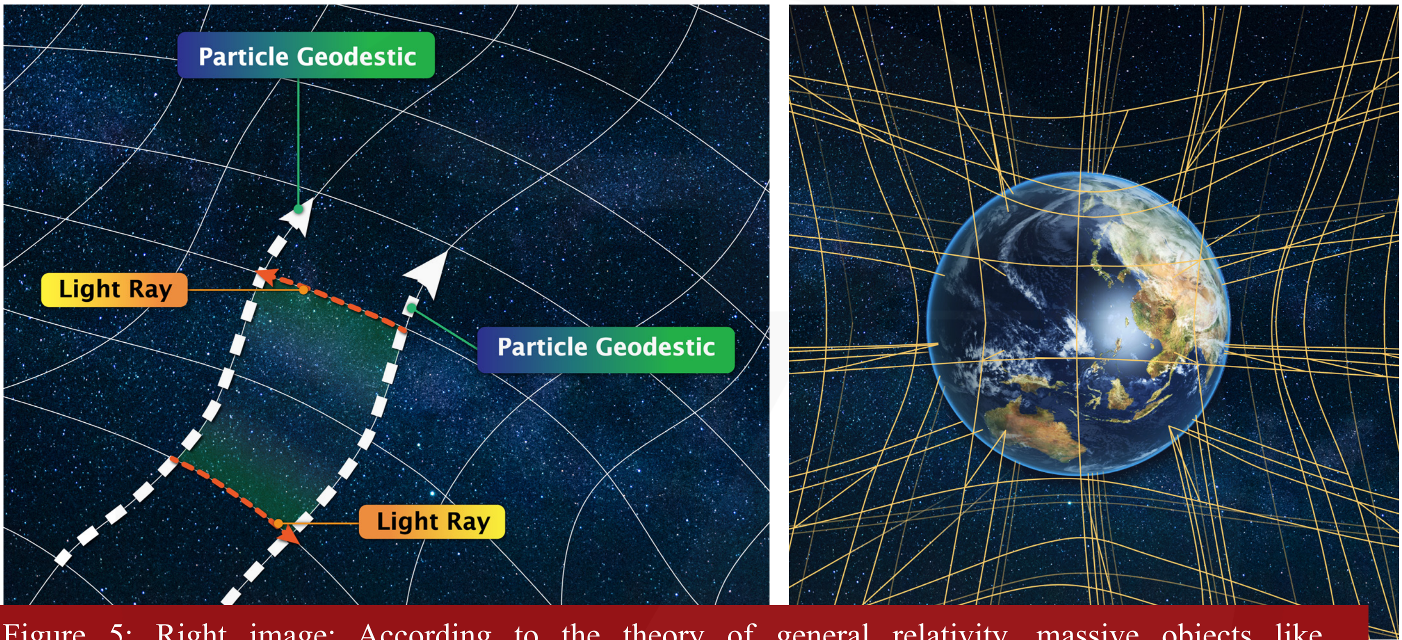

Figure 5: Right image: According to the theory of general relativity, massive objects like a planet, act as a source of spacetime curvature and create an effect known as gravity. Left image: Gravity is not the cause of light bending; rather, light simply travels along the curved paths of spacetime, appearing bent to an observer.

To put it more simply, general relativity shows that objects in four-dimensional spacetime always follow straight lines or geodesics, but in the three-dimensional space perceptible to humans, it appears as if their motion is along a curved path. To further elaborate on this concept, one can refer to the motion of planets in the solar system.

In the solar system, it appears that the Earth revolves around the Sun in a circular orbit within three-dimensional space. However, according to general relativity, the Sun causes a curvature in four-dimensional spacetime,[14,20] which makes the Earth follow straight lines, or geodesics, within this curved space, making its path of motion appear curved. With this description, light also follows geodesic paths in spacetime,[16, 20] bending slightly[22,23] as it passes near the Sun.

In the theory of relativity, contrary to Newton's view, it is shown that the speed of gravitational transmission is limited and is equivalent to the speed of light.[24] Modern physics suggests that this transmission is possible through hypothetical particles called gravitons, which are limited to the speed of light. For instance, if hypothetically the Sun were to disappear from the solar system at this moment, it would take approximately eight minutes and thirty seconds[25] for the Earth to realize the absence of the Sun (Figure 6).[26,27,28,29]

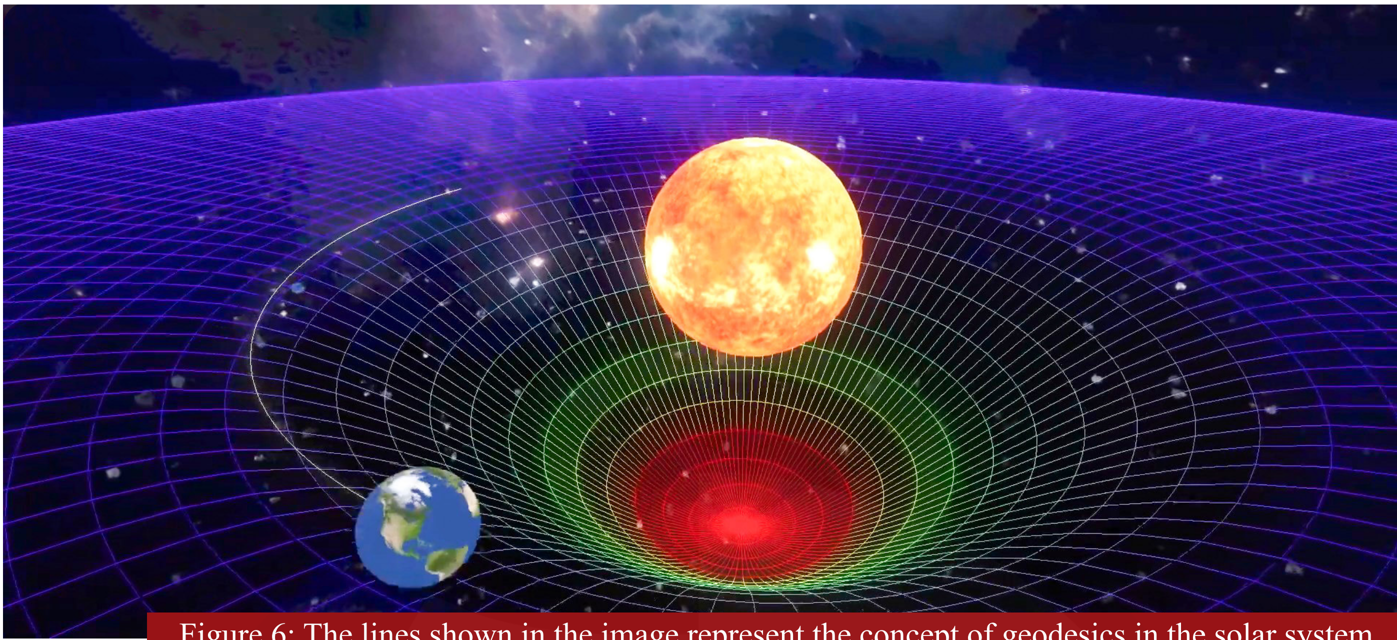

Figure 6: The lines shown in the image represent the concept of geodesics in the solar system.

As a result, general relativity introduces gravity as a geometric feature of spacetime rather than a force. This theory can be summarized in a few words as follows: "Spacetime tells matter how to move, and matter tells spacetime how to curve." (Figure 7)

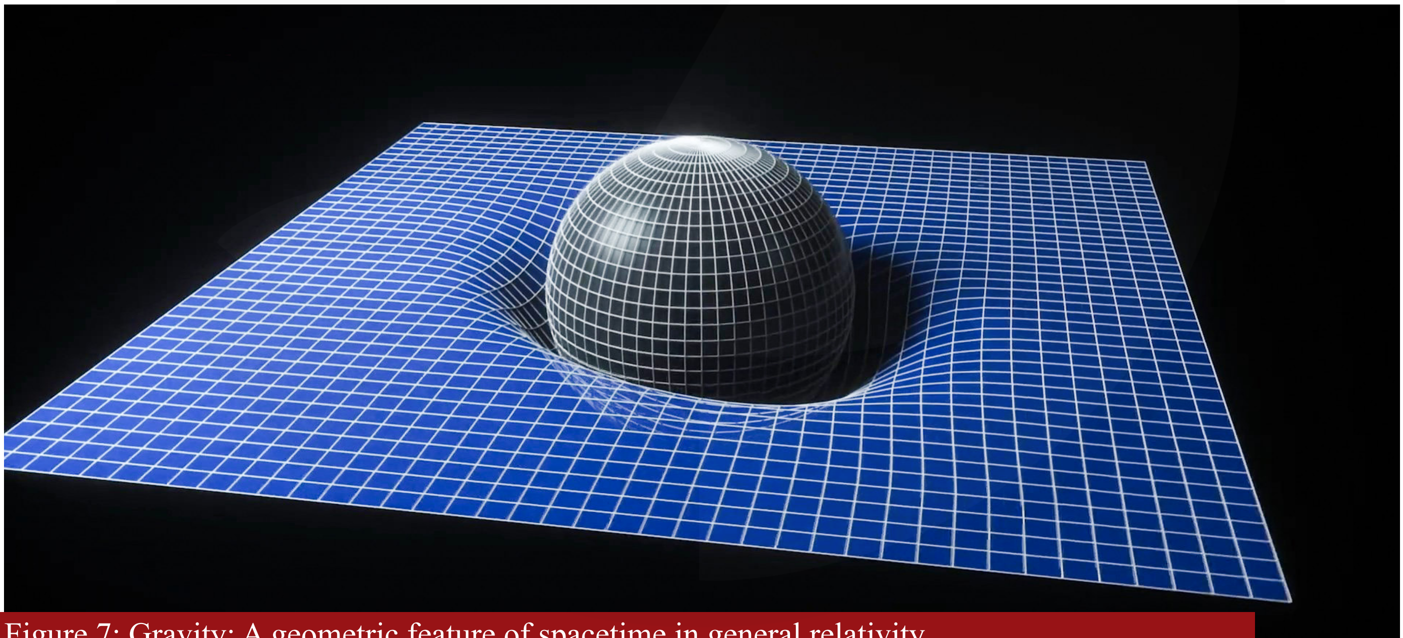

Figure 7: Gravity: A geometric feature of spacetime in general relativity.

Special Relativity

Einstein's theory of special relativity[4] also explains how the laws of physics are the same for all observers, in uniform motion,[16] and how the speed of light in a vacuum is constant.[1,6]

One of the consequences of special relativity is that mass and energy are considered equivalent and interchangeable, and can be converted into each other according to the famous equation $E=mc^2$. In this equation, E is the total relativistic energy of the object, m is the relativistic mass of the object, and c is the speed of light. In other words, if the energy of an object increases by an amount E, its mass changes by an amount m.[1]

Another implication of this theory is that the relativistic mass of an object increases as it moves at speeds close to the speed of light. Relativistic mass is the mass that depends on the motion of that object, meaning the speed which itself is dependent on the observer, and is obtained through the equation $m = \frac{m_0}{1-\sqrt{\frac{v^2}{c^2}}}$. In this equation, m_0 is the rest mass and v is the velocity of the object. The rest mass of an object is the mass measured when that object is at rest. That is, the relativistic mass of an object at rest v=0 is equal to its rest mass, and it increases with speed. When the velocity of an object approaches the speed of light $v \rightarrow c$, its mass also becomes infinitely large. However, this can never happen in reality. To put it more clearly, an object with non-zero rest mass can never reach the speed of light, as according to the mass-energy equivalence relation mentioned earlier, the realization of such speeds requires an infinite amount of energy. Also, it is worth mentioning that the speed of light in the theory of relativity is a constant value. This means that this speed is the same for all observers, regardless of their state of motion.[1,6,8,19]

Another significant consequence of special relativity, one can refer to time dilation and length contraction as well.[10,19] According to this theory, in addition to the mass of an object, the passage of time and subsequently the length of an object are considered relativistic quantities, and they depend on the speed of the object, which itself depends on the observer. This means that if an observer, at rest, looks at an object moving at a high speed, they will notice that time passes more slowly for the moving object compared to themselves. On the other hand, time dilation causes the stationary observer to measure the moving object as being shorter. This phenomenon is known as length contraction (Figure 8).[1,8]

Figure 8: Time in Special Relativity

The Speed of Light Near a Black Hole from the Perspective of the Theory of Relativity

The bending of light in a gravitational field is another consequence of Einstein's Theory of Relativity.[16,19] According to this perspective, light waves are composed of discrete packets of energy called photons,[30] moving at a speed of 299,792,458 meters per second. When these waves fall into the gravitational field of a black hole, they are subjected to a force. As a result of this force, the waves should accelerate and their speed should increase. However, from the standpoint of relativity, the speed of light in a vacuum is a constant value and its magnitude does not change as it passes near a black hole. In other words, light only accelerates as it falls towards the center of a black hole.[31] Acceleration, by definition, is the change in the velocity vector over a period of time, which includes changes in direction, magnitude of speed, or both. Therefore, since the speed of light in a vacuum is constant, an increase in acceleration near a black hole leads to a change in the direction of the light. In other words, when light passes near a black hole, its speed does not increase, but its path curves.[16,21,22,31,32] Astronomers have directly observed this bending of light around massive objects in space[16,21] or in a phenomenon known as gravitational lensing.[21,32,33,34]

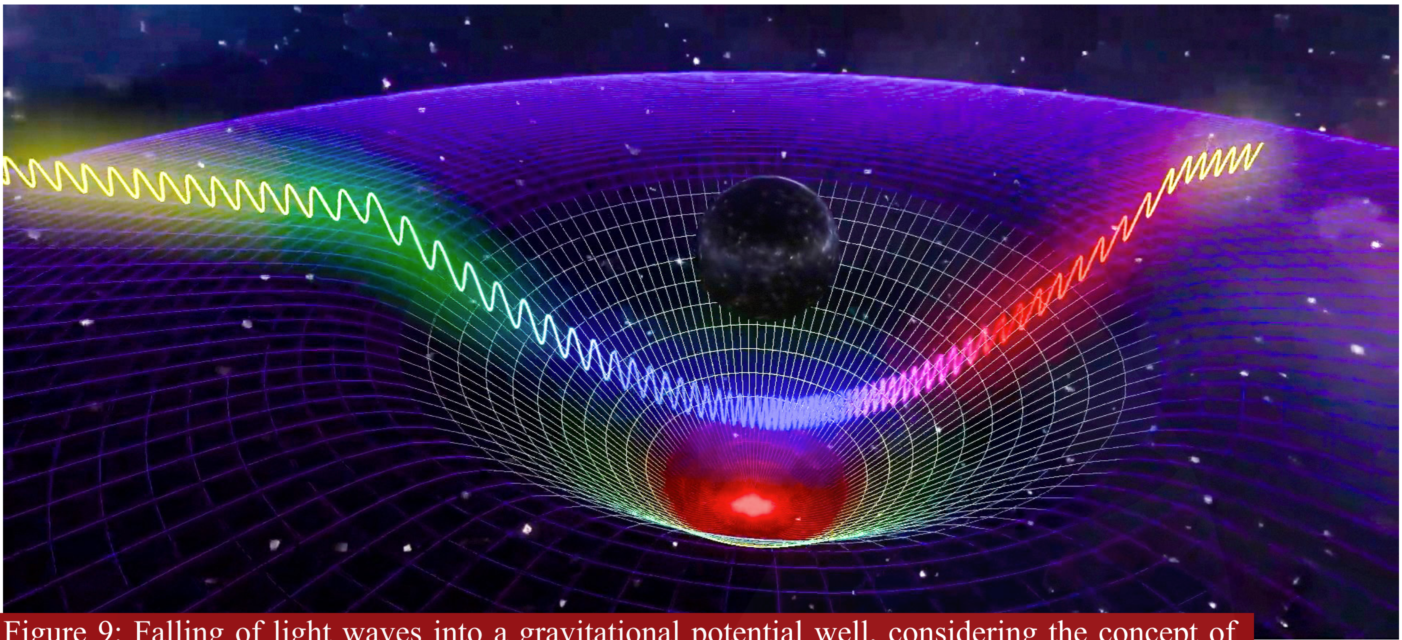

Figure 9: Falling of light waves into a gravitational potential well, considering the concept of acceleration in changing the direction of light.

Gravitational Redshift and Blueshift from the Perspective of the Theory of Relativity

Einstein's theory of general relativity predicts that the wavelength of electromagnetic radiation increases as it escapes from a gravitational potential well from the perspective of an observer located at an infinite distance from a black hole.[9] A gravitational potential well is a strong gravitational field created by the curvature of spacetime around massive objects due to their mass,[35,36] and photons trapped in such a field need to expend energy to escape from it.[16]

To further explain this topic, it first needs to be understood that the motion of electromagnetic waves, like any other motion, has a defined speed, direction, and frequency. As mentioned earlier, the theory of relativity states that if a beam of light falls into the gravitational field of a black hole, the gravitational force exerted increases its energy and acceleration.[31] This increase in acceleration should naturally result in an increase in the speed of light. However, if we consider the speed of light in a vacuum to be constant, such a thing cannot happen. Therefore, it is concluded that the increase in acceleration leads to a change in direction and frequency of light.[16,21,22,31,32] On this basis, as a beam of light escapes from the gravitational field of a black hole, it expends energy, and its acceleration decreases. Since the speed of light in a vacuum is considered constant, this reduction in energy leads to a change in the frequency of that beam of light. In other words, with the decrease in energy, the frequency of light decreases according to Planck's equation,[37] which is accompanied by an increase in the wavelength of the photons, or what is known as a shift to the red end of the electromagnetic spectrum. For this reason, this phenomenon is called "Gravitational Redshift."[13,16,21,31] The opposite of this phenomenon is also true, in such a way that the wavelengths of photons falling towards the center of a gravitational potential well decrease with an increase in energy and frequency, resulting in a "Gravitational Blueshift."[21,22] (Figure 10)

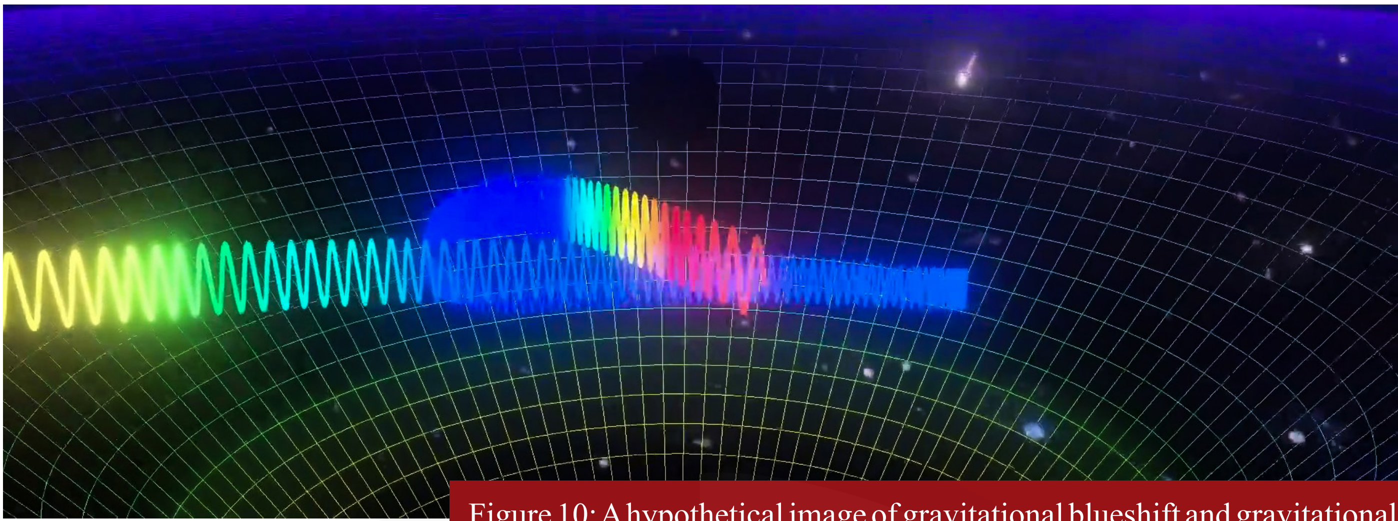

Figure 10: A hypothetical image of gravitational blueshift and gravitational red shift accompanied by changes in wavelength.

It is worth mentioning that scientists have so far not been able to directly track these effects in any black hole due to the very vast distances; however, by observing the massive gravitational fields around heavy objects, they have been able to detect gravitational redshift and blueshift. For example, one can refer to the study of waves from probes transmitted from the orbits of the planets in the solar system towards Earth. The detection of these waves while passing through the vicinity of the Sun demonstrates the effects of gravitational redshift.[38,39] Additionally, this phenomenon can be observed in a white dwarf named Sirius B,[40,41,42,43] with a gravitational field several thousand times stronger than Earth's.[42] Although Sirius B's gravitational field may seem large, it is relatively weak when compared to the gravitational fields of other heavier objects, such as black holes.[42] (Figure 11)

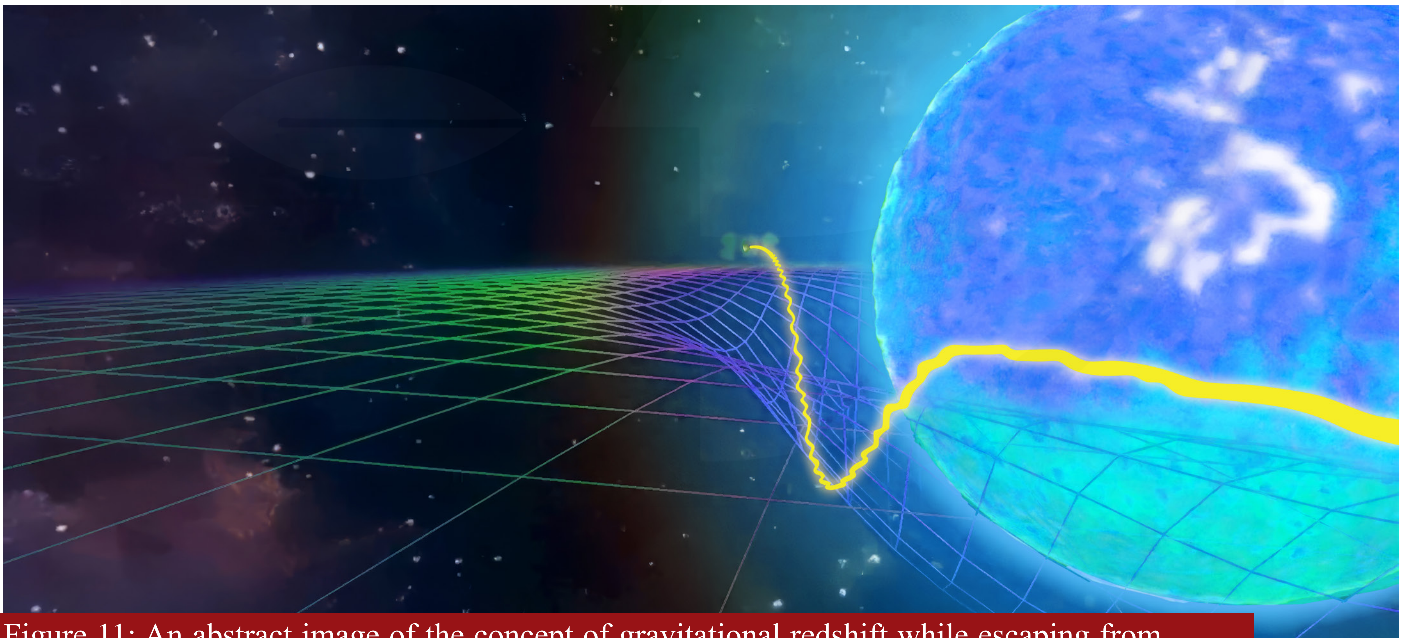

Figure 11: An abstract image of the concept of gravitational redshift while escaping from the gravitational potential well created by Sirius B.

Astrophysicists approximate the gravitational redshift with the equation $z \backsim \frac{GM}{rc^2}$.[16]

In this equation, z represents the gravitational redshift, G is Newton's gravitational constant which is approximately equal to 6.674×10^{-11} m^3 kg^{-1} s^{-2}, M is the mass of the object, and r is the distance of the photon from the mass M. Furthermore, for the electromagnetic radiation emitted from a strong gravitational field such as the surface of a neutron star, or regions close to the event horizon of a black hole, the gravitational redshift can be much larger, which in such cases can be calculated by the equation

$$1 + z = \frac{1}{\sqrt{1 - \frac{2GM}{rc^2}}}.$$ [16,31] (Figure 12)

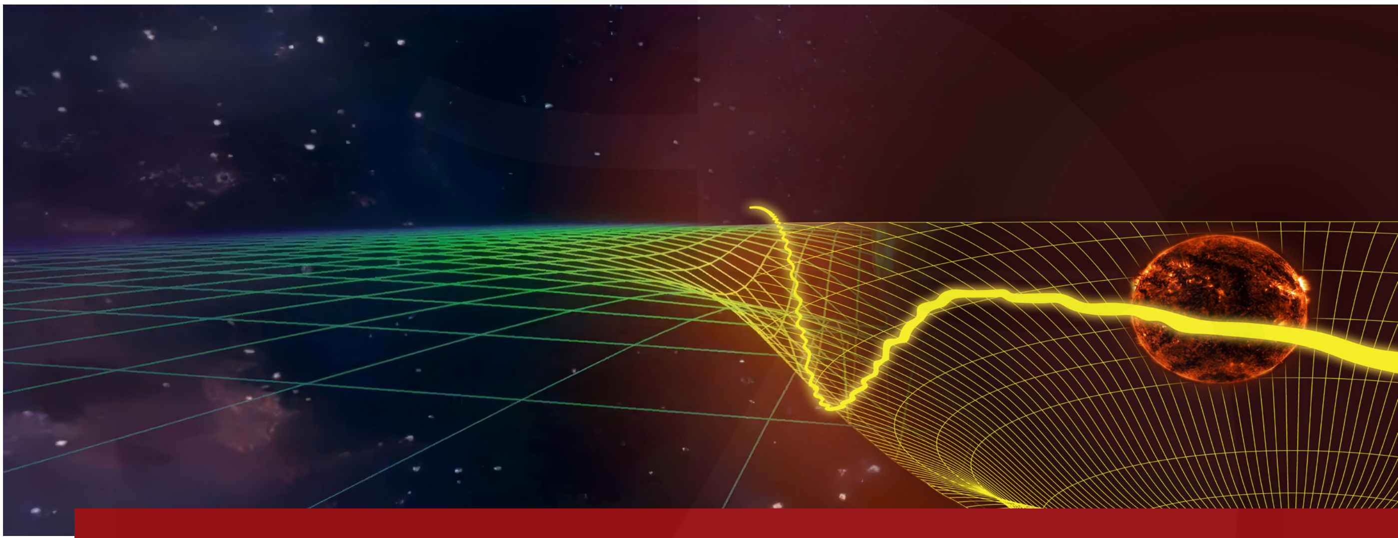

Figure 12: An illustration of the gravitational redshift of light while escaping from the gravitational potential well created by a neutron star (the scale of spacetime curvature in this image is hypothetical).

For instance, if an observer were to orbit around a black hole within a certain radius,[32] they would observe electromagnetic waves moving towards the black hole with shorter wavelengths than usual. This is because, as explained earlier, the motion of a light beam near a black hole is associated with increased energy, frequency, and acceleration. Moreover, if the observer were to fall towards the center of the black hole,[32] looking backward, they would observe a redshift in the passing waves, and looking forward in the direction of the fall, a blueshift in the passing waves. In other words, photons emitted towards the black hole and pass through the event horizon towards the center of mass, would experience an infinite blueshift.[32] This means that the energy of the photons increases to infinity.[32] It is worth mentioning that the event horizon is a specific radius around a black hole relative to its center of mass, such that no photon can escape or be traced beyond this distance.[16,21,31,32]

To understand the behavior of light beams around a black hole, one can use the movement of a satellite in Earth's orbit as an analogy. In fact, it can be stated that a light beam can move in an orbit around a black hole, much like a satellite orbiting the Earth. The difference, however, is that while a satellite can change its speed to orbit at various distances from the Earth, light can only move stably at a specific distance from a black hole and away from its event horizon. This is because if it crosses the event horizon, it will fall into the black hole's center.[32] On the other hand, as mentioned earlier, the path of light bends due to the intense gravity of the black hole. It is important to note that the speed of a satellite orbiting the Earth differs from the speed of light orbiting a black hole. A satellite accelerates as it falls into the Earth's atmosphere, since its potential gravitational energy is converted into kinetic energy. However, from the perspective of relativity, the light falls towards the center of a black hole at a constant speed c.[1,6,10,32]

Time in Relativity

From the perspective of relativity, time dilation near a black hole is a phenomenon that occurs due to its strong gravitational field.[16,22] One way to understand this concept is through the notion of spacetime as a four-dimensional geometry. As mentioned in previous sections, spacetime around massive objects gets curved, such that the distance between points and their direction changes. This curvature affects the measurement of time and space near the black hole. For example, if we consider two synchronized clocks placed at different radial distances within a very strong gravitational field, and suppose an observer at a very far distance is monitoring these two, they would notice that the clock closer to the center of mass of the gravitational field ticks slower than the clock further from the center of mass.[21] This is because spacetime, from the perspective of relativity, is more curved at distances closer to the center of the gravitational field than at farther distances. [33,35]

The degree of time dilation near a black hole depends on the size and properties such as mass, charge, and spin of that black hole. Also, the calculation of time dilation for a non-rotating, spherical symmetric black hole, known as the Schwarzschild black hole,[16,21,31] is performed through the equation $T = t\sqrt{1-\frac{R_s}{r}}$.[16,22]

In this equation, T is the time measured by an observer far away from the black hole, t is the time measured by an observer near the black hole, Rs is the Schwarzschild radius of the black hole, and finally, r is the distance of the observer from the center of the black hole. The Schwarzschild radius for this type of black hole is determined by the equation $R_S = \frac{2GM}{c^2}$.[16,22,31]

According to the above relations, as r approaches Rs, which is also referred to as the event horizon of a black hole, T approaches infinity. This means that an observer situated at a very distant point from the black hole will never be able to see any light ray or particle that has crossed the event horizon and is moving towards the center of the black hole,[22] because such an observation would require an infinite amount of time. However, an observer who is falling into a black hole, from their own perspective, will cross the event horizon within a finite amount of time and will not notice any sudden change in the clock.[22] Overall, from the perspective of the theory of relativity, this demonstrates that time dilation is a relative concept that depends on the reference frame. (Figure 13)

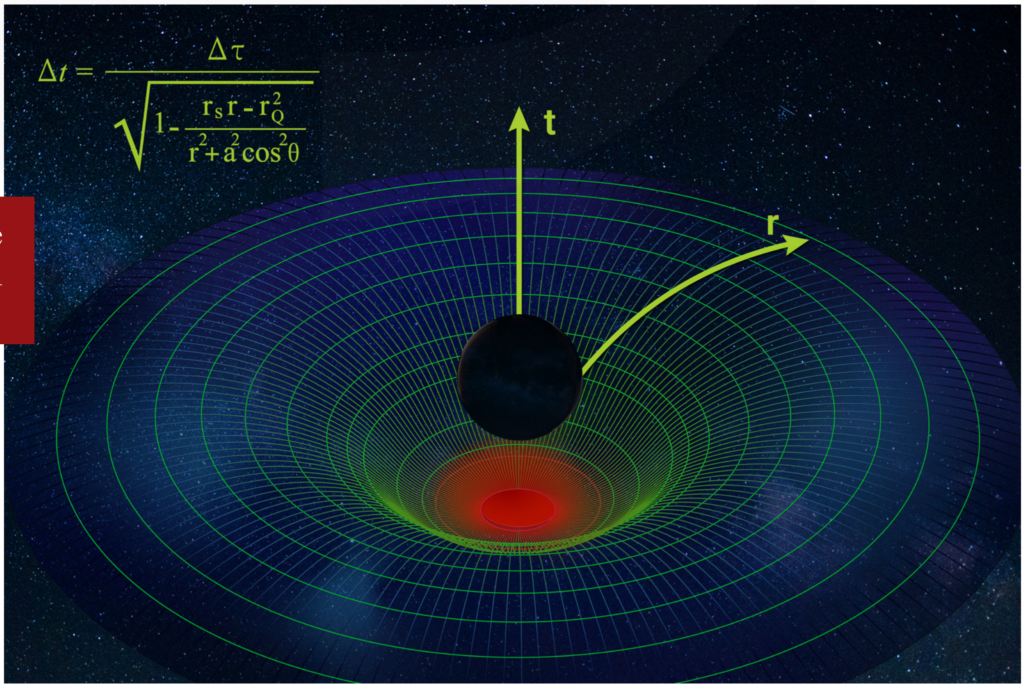

Figure 13: The concept of time dilation near a hypothetical black hole.

Space, Time, and Gravity from the Perspective of T-Consciousness Cosmology

Space and Gravitational Field

According to the perspective of T-Consciousness Cosmology, the primary principles in the universe include *Longitudinal Motion*, *Space*, *Longitudinal Time*, and *Wave*. They are considered primary because they never reach zero. *Transverse Motion*, *Transverse Gravity-Time*, and *Temperature* are considered secondary, as they fluctuate with the expansion of the cosmos and reach zero at the final stage of *Space Rebound*.

As stated above, space is defined not only as a principle, but a bedrock where all cosmic events occur, but it also has a viscosity. Different values of this viscosity lead to the formation of dark matter and dark energy within the cosmos, meaning space acts like a fluid and has different viscosities.

The difference between the viscosity of space and the viscosity of other fluids lies in its structure. The viscosity of space is not brought about by ordinary matter or fundamental particles but rather, space has a mesh-like structure with expansion and contraction properties and can be entangled. On the other hand, the increase in the viscosity of space is directly related to the mass of ordinary matter that is formed within this interconnected mesh. During the formation of mass, space around it contracts, and the viscosity of the space mesh increases, compared to its normal state that is free of any tension or stress. Therefore, the viscosity of space around the smallest fundamental particles to the largest structures in the universe, like a vast cosmic network, varies from low to high.

Given this description, the other source of dark matter and energy, besides the cosmic shell which was previously mentioned in a separate theory, is from the celestial objects within the cosmos that exert stress and tension on space. Furthermore, this perspective recognizes the nature of dark energy as a lower viscosity of space, and the dark matter known in conventional cosmology is seen as high space viscosity, not the hypothetical particles proposed in theoretical physics. The viscosity of space itself is directly related to the magnitude of the generated gravitational field.

Therefore, from the T-Consciousness Cosmology perspective, gravity is considered a field that arises from the contraction of space mesh, which becomes stressed or strained by the mass of ordinary or baryonic matter. In other words, wherever a mass is observed, or when two non-dense waves collide and lead to the formation of particles, dark matter or dark energy with different viscosities are created in a 360-degree manner around that mass. The result is a gravitational field whose radius starts from the center of the ordinary matter's mass and extends to the boundary between the contracted space and the normal space, which is without tension or stress. Consequently, the origin of gravity is ordinary or baryonic matter, which in turn creates a gravitational field by inducing viscosity in space. This means that the strength of the gravitational force is directly related to the amount of dark matter or dark energy surrounding the mass of ordinary or visible matter. Furthermore, T-Consciousness Cosmology suggests that dark matter and dark energy have mass equivalence in comparison to ordinary matter's mass (Figure 14). (The formation of fundamental particles from the collision of non-dense waves is among the newer hypotheses of T-Consciousness Cosmology, which will be discussed in a separate section.)

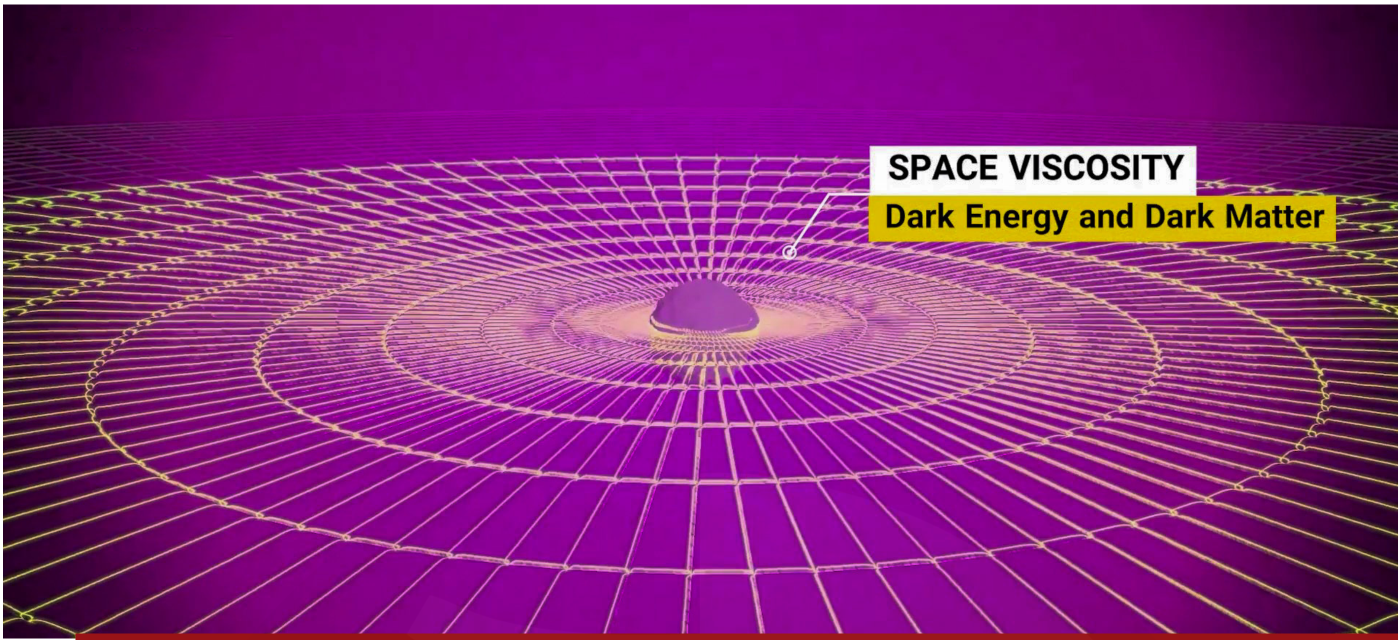

Figure 14: Dark Matter and Dark Energy (different levels of space viscosity) near massive objects.

The Relationship Between Space Viscosity and the Motion of Celestial Bodies

The force of gravity, which is created by the contraction of space, also causes the alteration or stabilization of the paths of celestial bodies. This means that the space mesh in a system, which has a central supermassive object with several bodies orbiting around it, behaves similarly to train tracks on a curved path that resist the force opposite to the centrifugal force while moving, thus keeping the train on its path. This is due to the contraction caused by the gravity of the central supermassive object, forming dark energy and dark matter. Each type of this dark matter and dark energy, which are different viscosities of space, in turn, stabilizes the motion of celestial bodies. In other words, the viscosity of space has a structure that governs the motion of celestial bodies. (Figure 15)

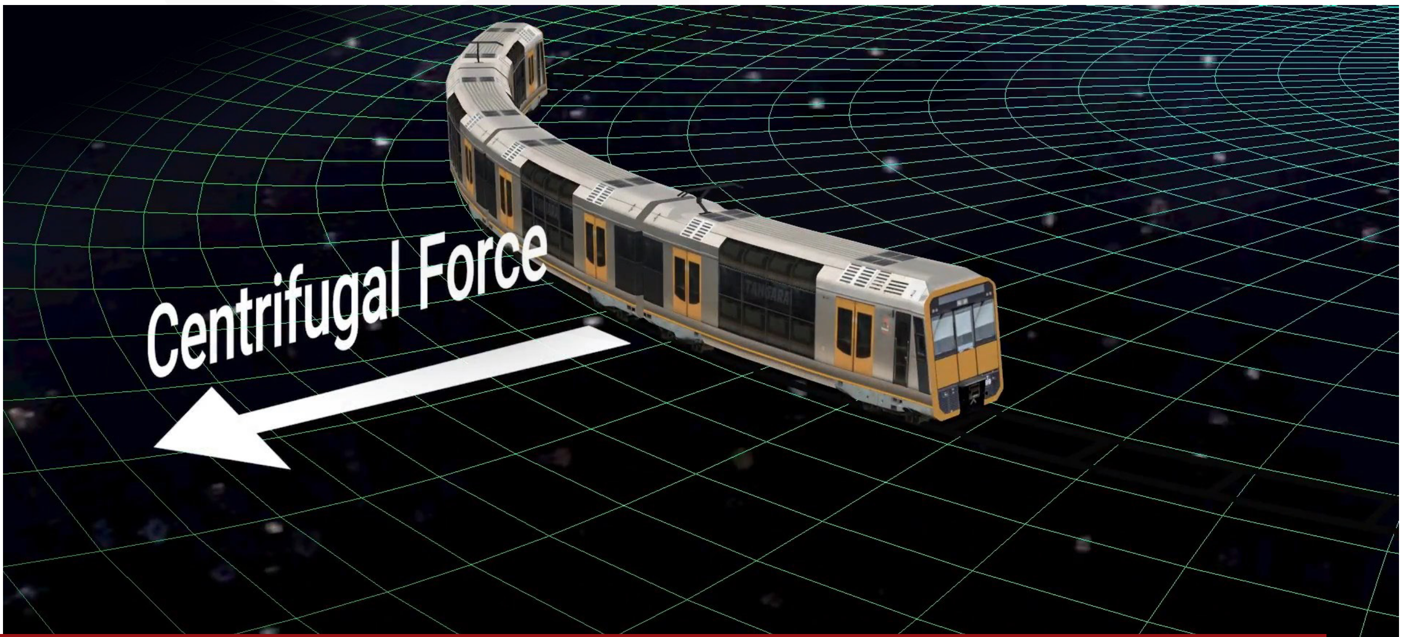

Figure 15: A hypothetical representation of the orbits of low-mass objects around a high-mass object, illustrated with the example of a train curving on tracks and overcoming the centripetal force.

In this example, the form and manner of dark matter absorption around celestial bodies is of great importance. This is because the form of space contraction is one of the factors that contributes to the preservation of the rotation of low-mass bodies in the orbit of high-mass bodies and prevents them from escaping. While the theory of relativity attributes this to the curvature of spacetime, from the perspective of T-Consciousness Cosmology, not only is the curvature of space or the gravitational potential well not the factor in preserving this type of motion, but rather the way in which space mesh condense and form into various orbits around massive bodies becomes the factor that preserves and moves low-mass bodies on those orbits, which is also in accordance with the transformation of space mesh into dark matter around high-mass bodies or dark energy in low-mass bodies. (Figure 16)

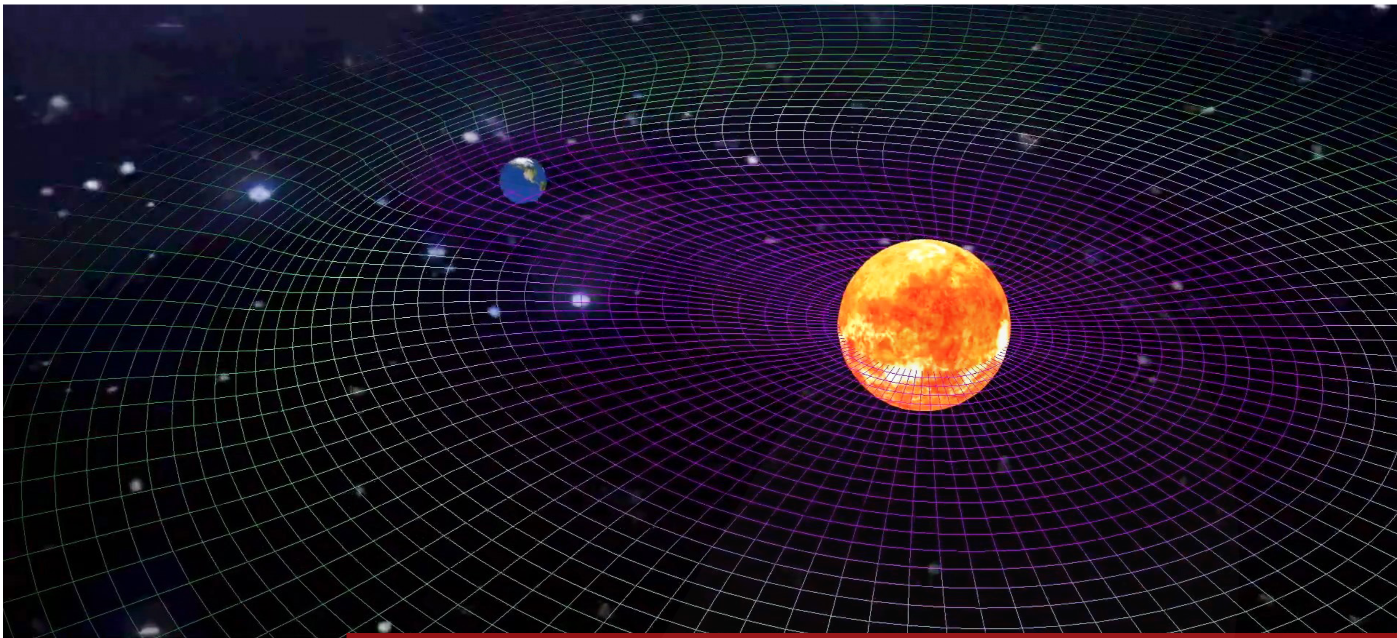

Figure 16: Contraction of space mesh (formation of dark matter as a function of the mass of ordinary matter) - the driving force of Earth's orbit around the Sun.

The Standard Model of Particle Physics

From the perspective of the Standard Model of Particle Physics, all particles in nature can be classified into two categories, based on their spin under quantum mechanical conditions, which may be clockwise or counterclockwise: bosons, which are force carriers with integer spin values (0, 1, 2, ...), and fermions, which are mass carriers with half-odd integer spin values ($\frac{1}{2},\frac{3}{2},\frac{5}{2},\ldots$) [44] (Figure 17). From the viewpoint of physicists, some force carriers like the photon and the gluon have zero rest mass and transmit one of the force fields at the speed of light.[45,46] However, from the standpoint of T-Consciousness Cosmology, if something is named a particle, it certainly has mass, and particles with mass cannot move at the speed of light. Therefore, force fields are transmitted by waves, not particles. In other words, the gravitational waves commonly discussed in science are not wave-like from the perspective of T-Consciousness Cosmology (having zero frequency). They are transmitted non-frequentially, or rather linearly, from the central mass due to the compression it causes in the space mesh to the surrounding mass, maintaining it in an orbital rotation. This force is not carried by hypothetical particles (such as a graviton). Essentially, the space mesh and gravity themselves are part of the non-frequency aspects of the cosmos, which will be examined in a separate discussion.

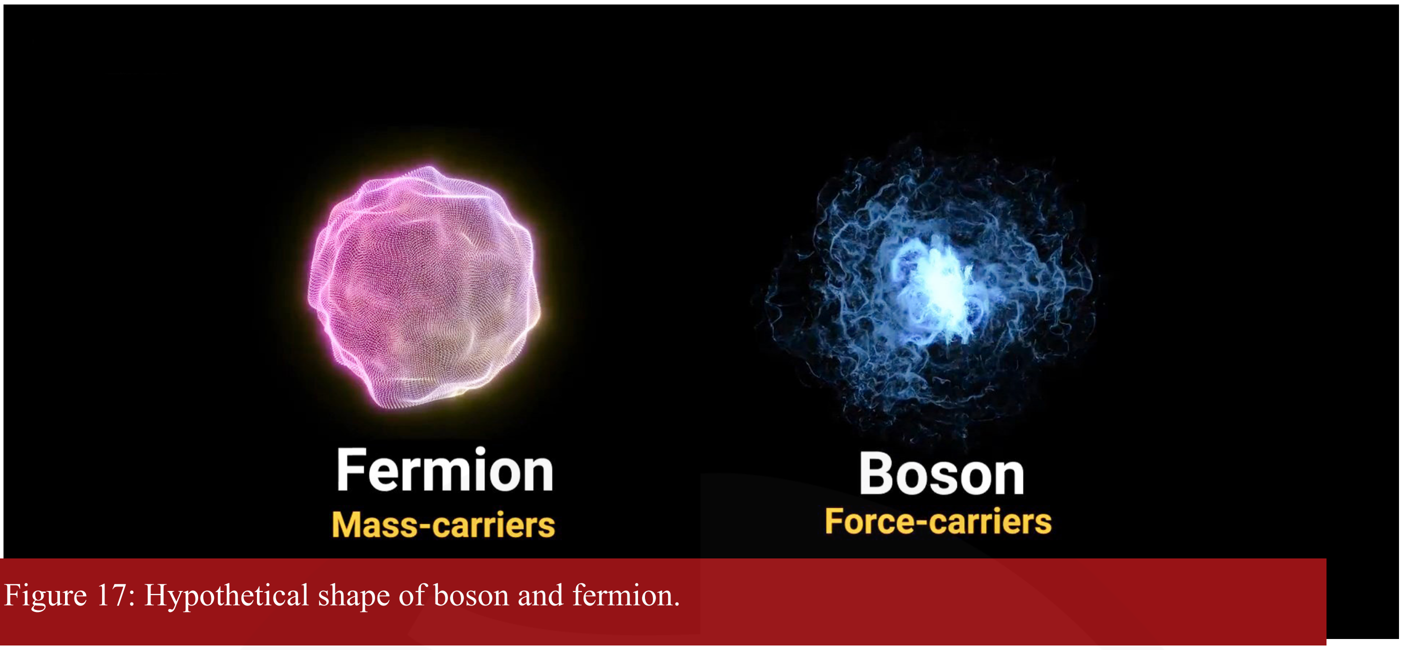

Figure 17: Hypothetical shape of boson and fermion.

Dark Energy and the Expansion of the Universe

Cosmologists, based on the standard model of cosmology, do not consider a shell for the universe, stating that the universe is isotropic and expanding, and on the other hand, they consider dark energy[47] as the opposing force to gravity. Isotropy suggests that if any observer were to observe distant galaxies, they would find that galaxies are moving away from each other at an average speed proportional to their distance relative to the observer.[48,49] This phenomenon is known as Hubble's Law.[47] Also, the universe does not have a preferred direction or center.[50] The reason for using the term dark energy in conventional cosmology is because it creates a negative pressure that leads to the accelerated expansion of the universe.[47,51] Its darkness is also due to the unknown nature of its constituent particles, as scientists are still researching and investigating this area. (Figure 18)

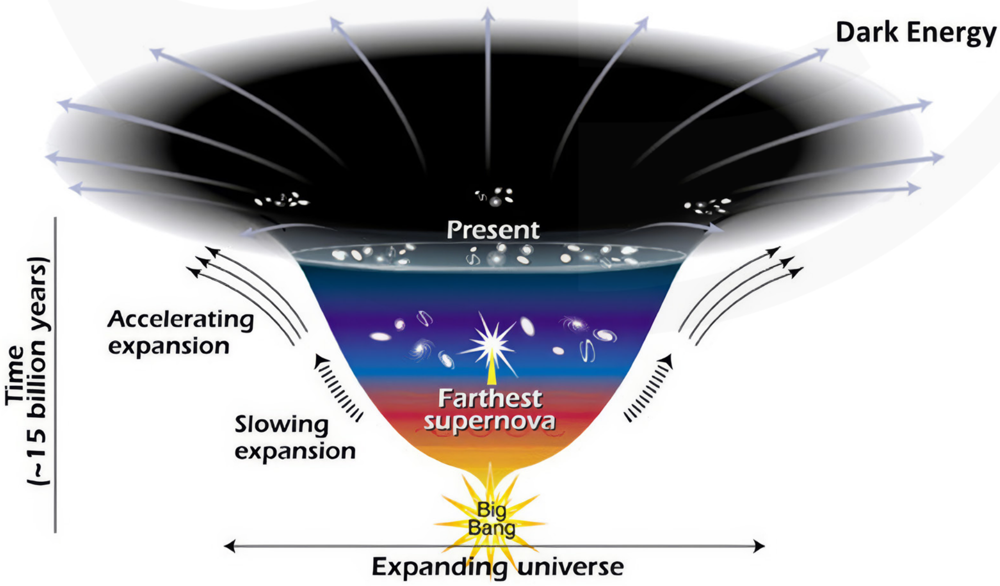

Figure 18: The accelerated expansion of the universe in its current era, driven by dark energy, depicted using gray vectors. Credits: Anne Field, public domain

However, in T-Consciousness Cosmology, the nature of dark energy is introduced primarily as the contraction of space mesh, which possesses a lower viscosity compared to dark matter. Therefore, wherever dark energy is observed, the footprint of the mass generating it (ordinary matter) should also be sought. With this definition, even the smallest fundamental particles are surrounded by dark energy. Additionally, around black holes, which are considered the most massive objects in the cosmos, dark energy exists beyond a certain radius encompassed by dark matter. On the other hand, the cosmic model introduced in T-Consciousness Cosmology is an isolated spherical cosmos with a shell. The shell of the cosmos constantly injects dark energy into the isolated cosmos through the process of dark-dark matter decomposition and release of space mesh. As the shell releases dark energy into the cosmos, it becomes thinner, and a thinner elastic shell offers less resistance to the positive energy that is created by the dark energy from within the cosmos, causing it to expand beyond the speed of light. Therefore, dark energy does not have negative pressure; rather, by creating positive pressure in the spherical cosmos with a shell, it acts as one of the factors for volume increase and acceleration in this process. (Figure 19)

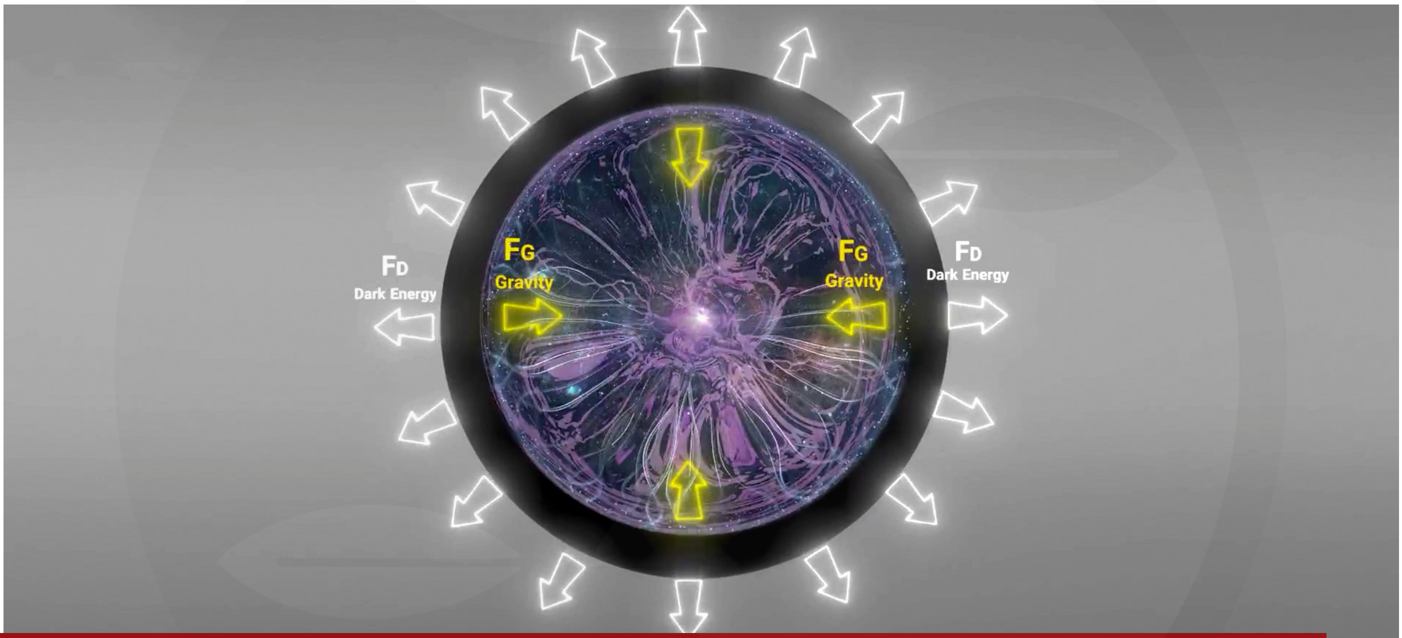

Figure 19: The positive pressure of dark energy versus gravitational force, one of the factors in the increasing volume of cosmos in the Spherical Cosmos Model.

Time and its Types

The T-Consciousness Cosmology perspective on the concept of time is different from the viewpoints of classical physics and theory of relativity. Time, according to this viewpoint, is not only not considered as a dimension, but is also divided into two general types of Longitudinal Time and Transverse Time.

1- Longitudinal Time: This refers to the time period extending from one Big Shock (Big Bang) at the moment of the birth of the cosmos, to the next Big Shock, which includes a complete or final Rebound of space and subsequent Reversion, leading to the formation of a new Cosmic Black Hole at a new point. This type of time always ranges between zero to infinity, with the emphasis that it neither becomes zero nor infinity. Longitudinal time is not only unaffected by events and objects within the cosmos but is also completely different from the concept of time dilation as described in the theory of relativity. It is expressed using standard time measurement such as the tick-tock of a clock with units like seconds, milliseconds, etc. Essentially, longitudinal time is solely a specific time span that describes the lifecycle of the cosmos from one Big Shock to the formation of a new cosmic black hole. (Figure 20)

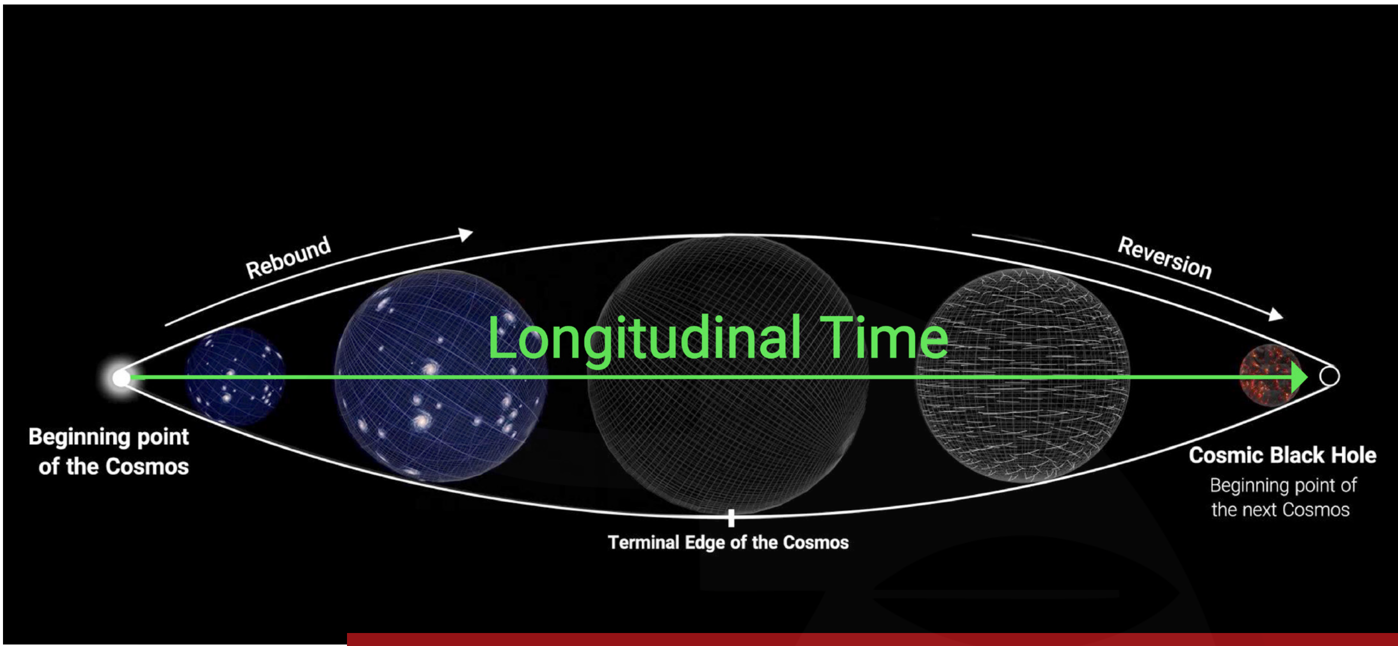

Figure 20: The concept of Longitudinal Time through the Rebound, according to the Spherical Cosmos Model.

2. Transverse Time: This type of time is relative and exhibits different functions regarding components or events. It is categorized into Special Entropic Time Force, General Entropic Time Force, and the Current Cosmic Rebound Time.

Special Entropic Time Force

In a general definition of this type of time, it can be stated that it acts as a force for the disintegration of mass and the release of space from any tension or stress caused by that mass and the gravity resulting from it. In other words, when a mass forms, gravitational force is created, which, in parallel, gives rise to an entropic time force that acts against gravity within the mass. Such that gravity tends to preserve mass, and entropic time force tends to disintegrate it. To better explain this concept, we can use the example of a spring being compressed. As the spring compresses, elastic energy or mechanical potential energy is simultaneously stored in it, and with the release of the spring, this energy is converted into kinetic energy.[52] Based on these explanations, entropic time, accompanying the formation of mass, acts as a force in the opposite direction of gravity. It pushes outward from the center of mass, working to disintegrate it and thus release space from tension. (Figure 21)

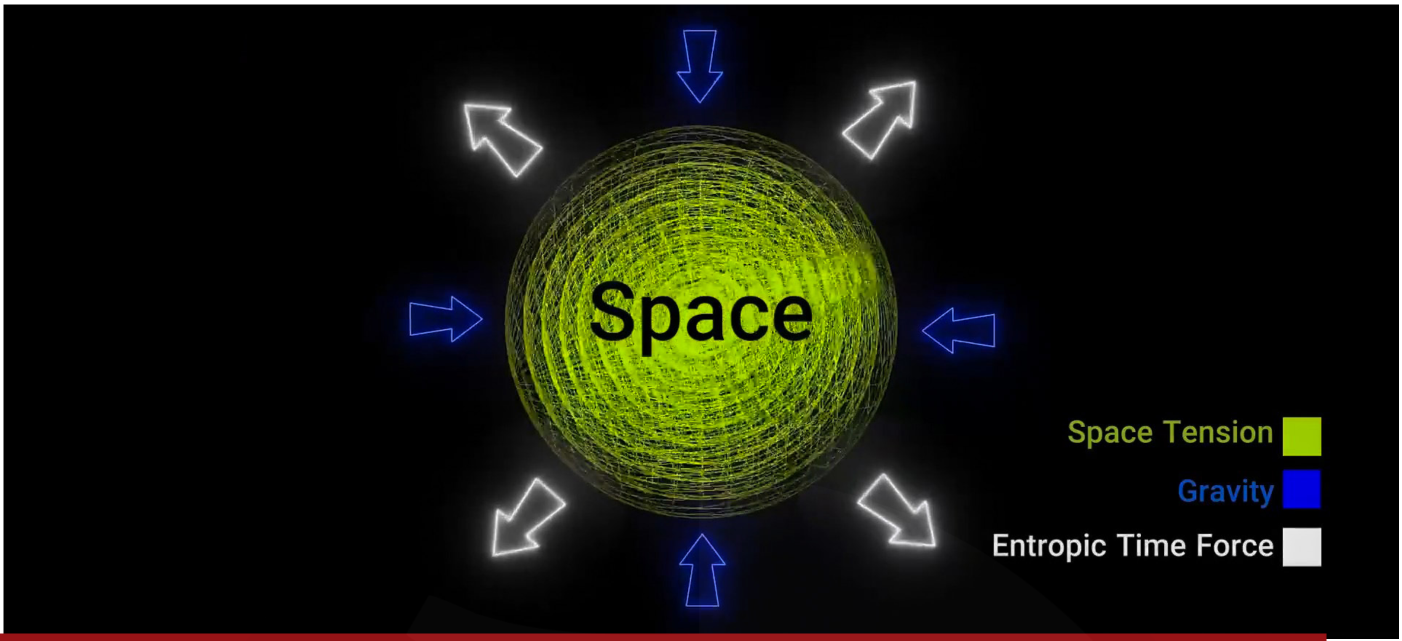

Figure 21: Entropic time force as an agent for releasing space from tension.

Therefore, this type of time is specific to each mass, encompassing everything from the smallest fundamental particles to the largest celestial bodies, and its effect on electromagnetic waves, which have no mass, is zero. The entropic time force is like a vector with direction and magnitude. Therefore, its quantities vary depending on the amount of gravitational force and mass, and it is applied in all directions from the center of mass outward in the direction of its disintegration. As this force is greater in massive objects and lesser in objects with less mass, it can be concluded that it has a direct relationship with the amount of mass. Thus, the entropic time force vector can be individually drawn for any mass in the cosmos, from the most fundamental particles to massive objects. (Figure 22)

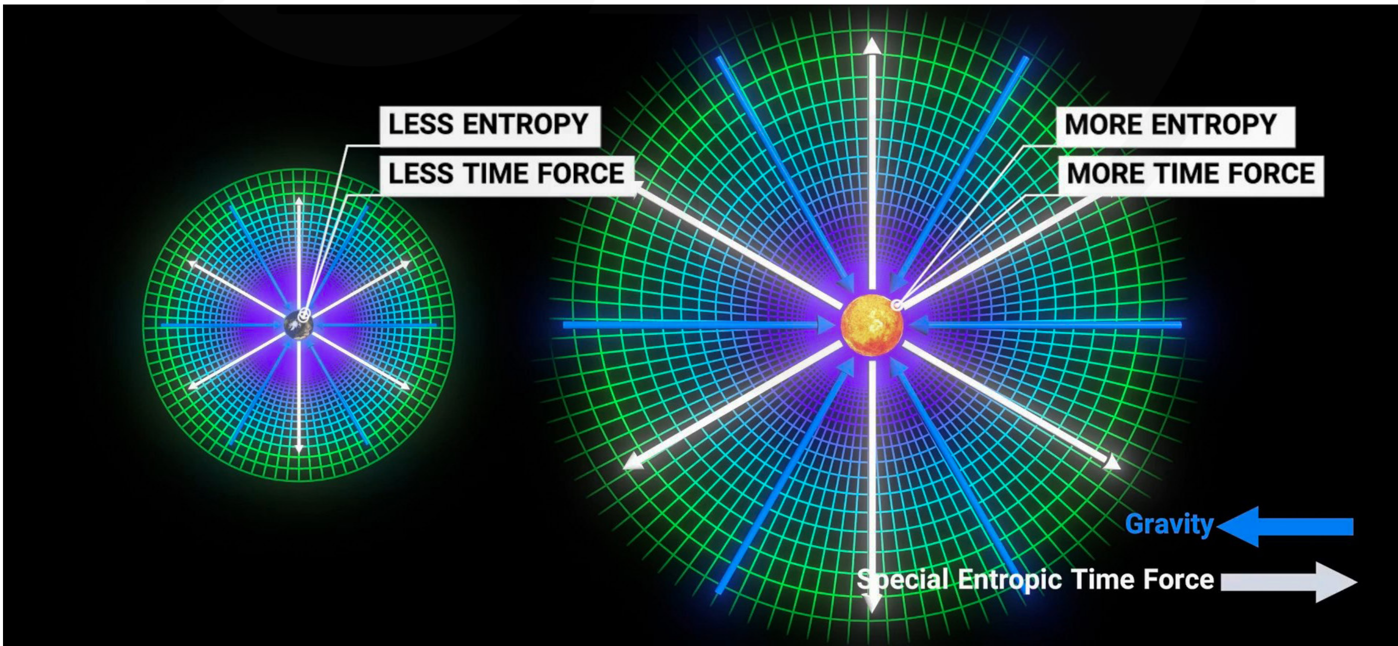

Figure 22: The relationship between entropic time force, gravity, and mass.

Due to the fact that gravity governs the entire cosmos and causes tension in space, as a result, the special entropic time force is also reciprocally present throughout the universe, varying from zero for electromagnetic waves to infinity in black holes. (Figure 23)

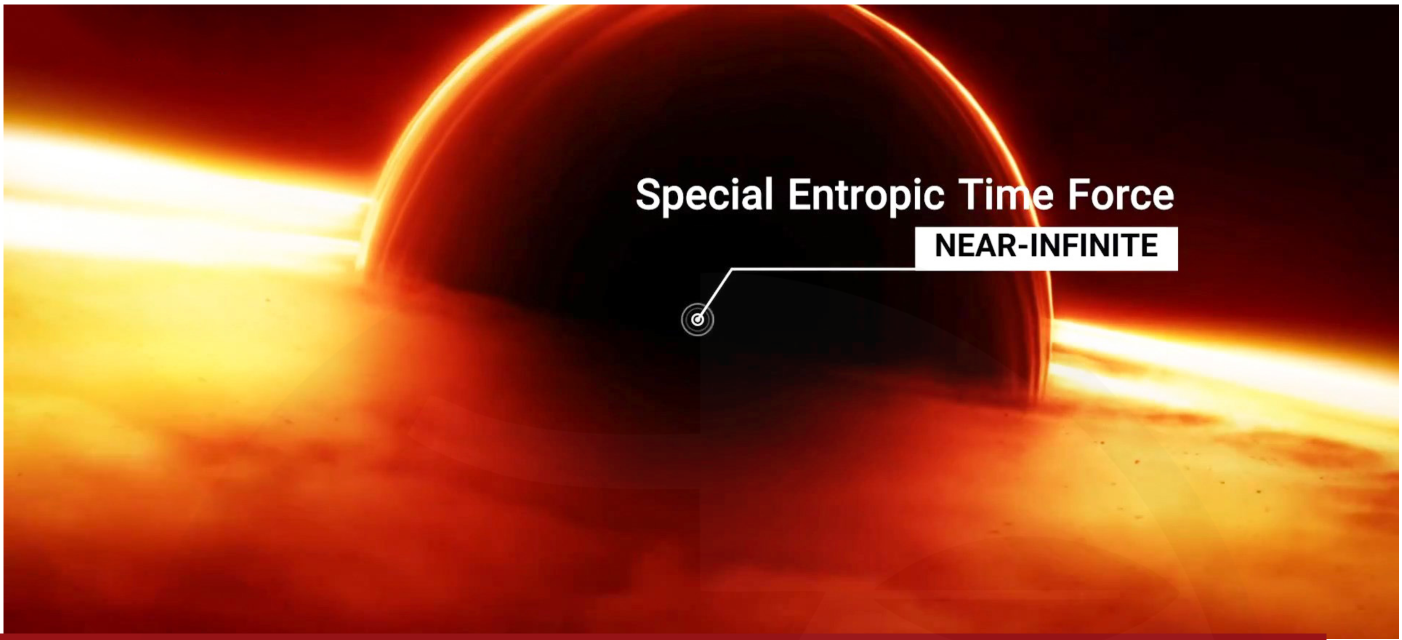

Figure 23: The extremely high amount of entropic time force at the center of mass of a black hole

General Entropic Time Force

In defining the general entropic time force, it can be said that this type of time is the cumulative amount of specific entropic time force vectors applied to each object within the cosmos at every moment, constantly changing from infinity to zero throughout the cosmic Rebound. Gravity was near-infinite at the inception of the cosmos within the cosmic black hole, causing both specific and general entropic time forces to be near-infinite as well. These forces will diminish to zero following the complete rebound of space. In other words, at the terminal edge of the cosmos, as the rebound of space concludes, objects have completely disintegrated into waves with infinite wavelengths. Consequently, the overall stress in space caused by these objects, or by the incomplete rebound of the cosmos, dissipates. On the other hand, due to the disappearance of the viscosity of space, the speed of the waves resulting from the disintegration of bodies will exceed the speed of light. (Figure 24)

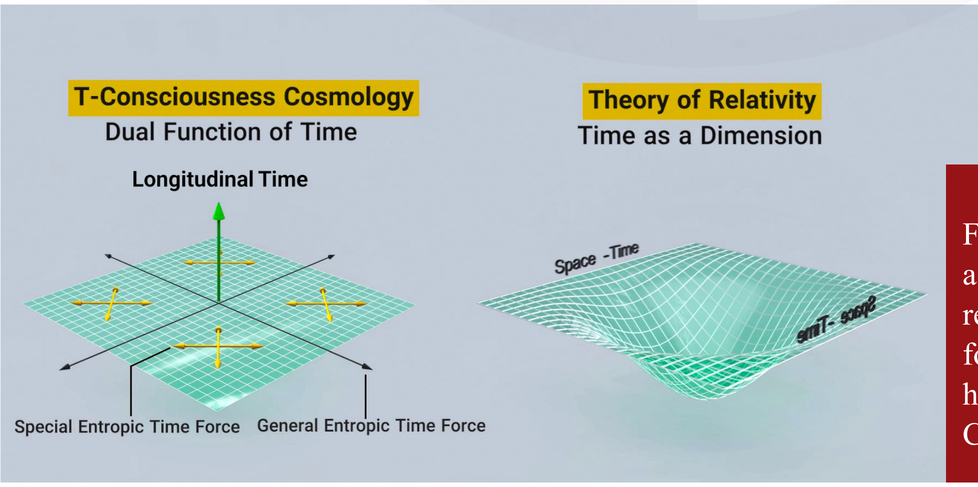

Figure 24: Right image: Time as a dimension in the theory of relativity. Left image: Time as a force in the Space Gravity-Time hypothesis of T-Consciousness Cosmology.

Time as a Force or Time as a Dimension?

In general, by stating the definitions of entropic time force, T-Consciousness Cosmology offers a different perspective on the dilation of time around black holes (massive objects), or time reaching zero when approaching the speed of light. It does so in such a way that primarily, around such objects, time as a dimension does not dilate, but rather the entropic time force comes into play, and the magnitude of this force is proportional to the amount of mass, which is variable. Second, since mass cannot travel at the speed of light, the absence of mass, which could cause stress and tension in space, results in this force having a value of zero for waves. The entropic time force, both general and specific, does not directly affect space itself or dark matter and dark energy. This is because this type of matter and energy have equivalent mass and their existence is dependent on the amount of ordinary matter and the resulting gravity from that mass. Essentially, both the specific and general entropic time forces transform ordinary matter into non-compressed waves, thereby eliminating the surrounding dark matter and dark energy. This process, facilitated indirectly by the rebound of space, gradually reduces the total mass of the cosmos to zero. Therefore, instead of the "spacetime" concept used in the theory of relativity, T-Consciousness Cosmology introduces the principle of "Space, Gravity-Time".

Current Cosmic Rebound Time

In defining the Current Cosmic Rebound Time, it can be stated that it has taken 13.8 billion years for the cosmic microwave background (CMB) to reach us in the form of microwave wavelength. This number is the latest consensus in cosmology regarding the age of the universe from the occurrence of the Big Bang to the present. Now, if we consider the reverse of this process, for example, transmitting gamma rays from Earth into the depths of the cosmos, it would take 13.8 billion years for these waves to transform into the microwave wavelengths we receive today. T-Consciousness Cosmology posits that there is a defined terminal edge marking the fate of the cosmos, and that waves become absolute at the final stage of space Rebound within this boundary. If we were to emit gamma waves from the Earth toward the CMB, the Current Cosmic Rebound Time is the total time it takes for the transformation of the gamma waves to microwaves (13.8 billion years), and the time it takes for the microwaves to be reduced to absolute waves (with zero frequency) at the terminal edge of the cosmos. This type of time is termed "current", because it is measurable under the current conditions of the cosmos and will change with variations such as volumetric expansion, and the instantaneous change in the wavelength of electromagnetic waves over time. (Figure 25)

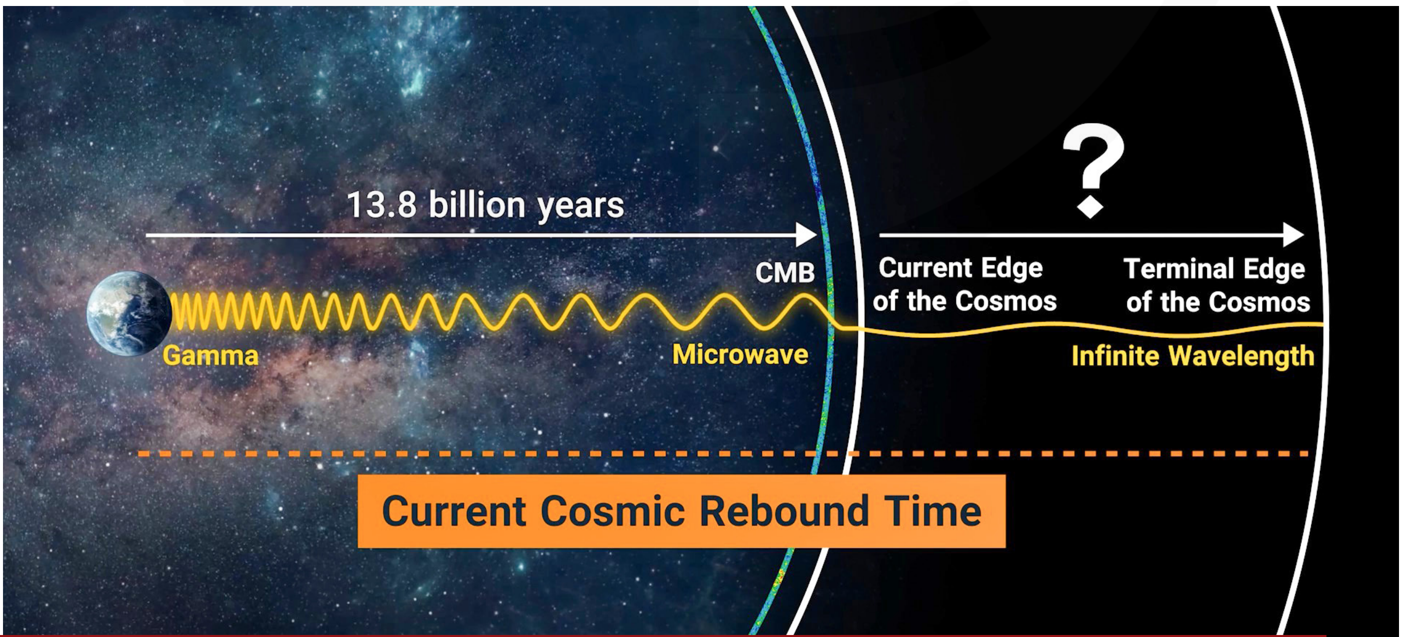

Figure 25: Concept of Current Cosmic Rebound Time in the Space Gravity-Time Hypothesis.

Conventional cosmology infers information about the universe's past from the cosmic microwave background. This means, if we were to travel further back in time beyond this point, we would reach the Big Bang, which no longer exists in the present. However, from the perspective of T-Consciousness Cosmology, as mentioned in the discussion on the cosmic shell, the CMB is not related to the past of the universe. In fact, the current information of this radiation is telling of the reactions in the shell of the cosmos, and also the events along the path it took to reach us. Also, the source of this radiation is currently moving towards the terminal edge of the cosmos. In other words, the CMB is information from the future that reaches us with a delay. (Figure 26)

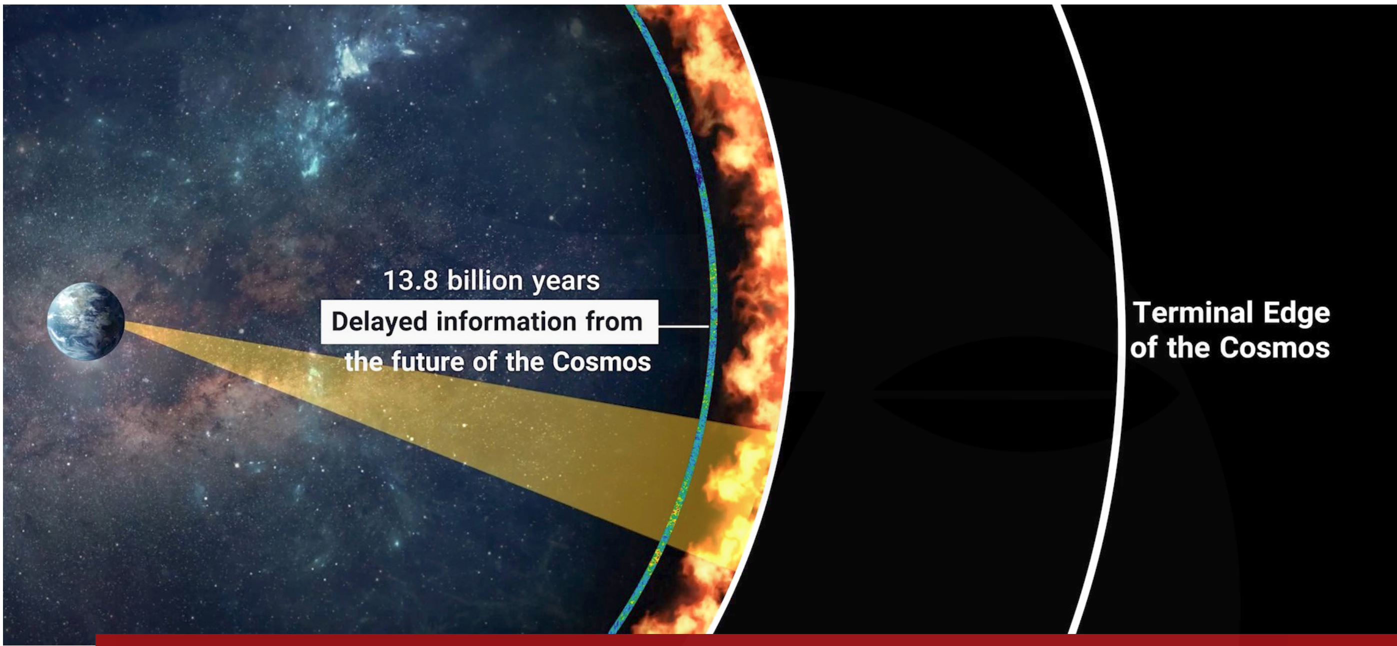

Figure 26: According to the Spherical Cosmos Model, CMB is information from the future that reaches us with a 13.8 billion-year delay.

In addition to the mentioned types of time, T-Consciousness Cosmology also refers to two other types of time named Observer at Lightspeed and Observer of Lightspeed, which are conceptually aligned with the theory of relativity.

Observer at Lightspeed

In this type of scenario, if an observer were to move at the speed of light, time would be zero for that observer. T-Consciousness Cosmology posits that this is because electromagnetic waves are not affected by the entropic time force, since mass cannot exist at the speed of light which would cause tension or stress in space, the entropic time force for disintegration of mass will be zero.

Observer of Lightspeed

In this type of time, the observer measures the duration of the passing light event according to their own standard time criteria, which can be the same as other observers who share a common reference frame. It's worth noting that the theory of relativity also offers such a definition for an observer at the speed of light.

The Variability of the Speed of Light

As previously discussed in the topic of space viscosity and fundamental constants, the speed of light varies depending on the amount of density in the cosmos. In other words, the vacuum defined in conventional science, when viewed through the lens of T-Consciousness Cosmology, is equivalent to the space viscosity we deal with in the vicinity of the Solar System or the Milky Way Galaxy, and experiments to determine the speed of light, etc., are conducted in this environment. Consequently, the viscosity of the vacuum in intergalactic space or throughout the universe varies depending on the amount of matter present and will undoubtedly have a direct impact on the measurement of constants. (Figure 27)

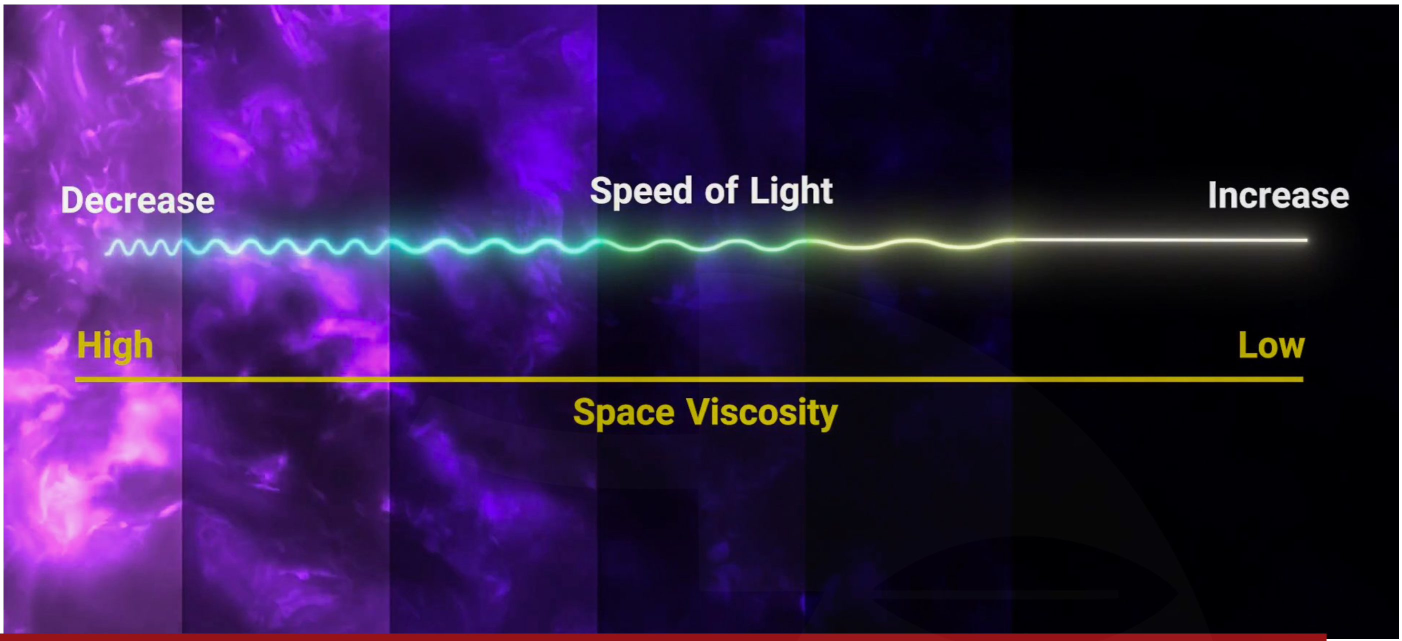

Figure 27: The viscosity of space and its relationship with the speed of light according to the Space Gravity-Time Hypothesis.

With this description, a unique characteristic defined for light is that it becomes compressed near a black hole or any other massive object (depending on the amount of their mass) in space, while at the same time remaining unaffected by the force of time. In other words, electromagnetic waves, upon encountering the high viscosity surrounding black holes, undergo a decrease in speed and a shortening of wavelength, resulting in an increase in frequency. It's as if something in their path causes a slowdown in their movement, causing the peaks and troughs of the waves to merge. In other words, wherever there is a mass, the gravity of that mass contracts the surrounding space. Thus, light or any electromagnetic wave, upon passing through and colliding with the contracted space, experiences a reduction in speed and changes in frequency and wavelength. Therefore, the speed of light varies depending on the viscosity of space. For this reason, from the perspective of T-Consciousness Cosmology, the speed of light cannot be constant. Also, as light travels, when approaching a massive object, depending on the angle of incidence with the dark matter surrounding that mass, it experiences refraction and deviation.

In other words, the viscosity of dark matter, which encompasses heavy objects in the form of a sphere due to their mass and induces gravity, is the factor of bending of light. (Figure 28)

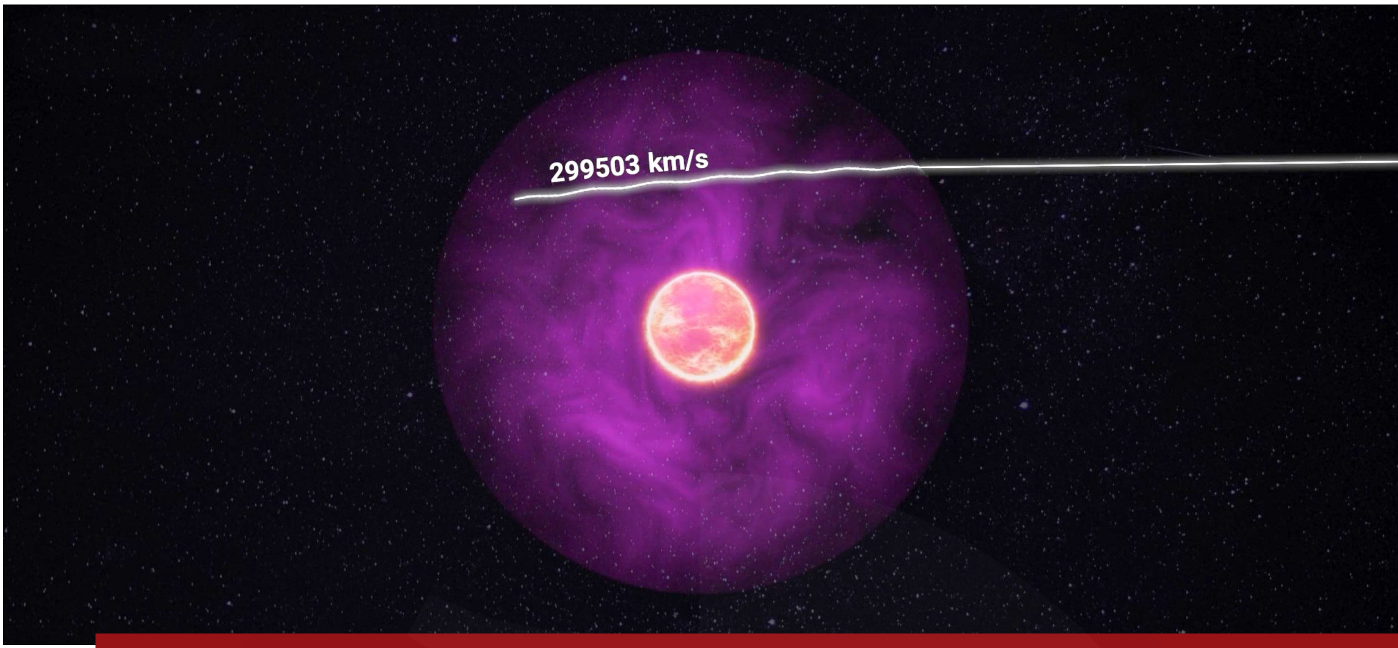

Figure 28: The effect of high viscosity of the surrounding space on massive objects in reducing the speed of light according to the Space Gravity-Time Hypothesis.

The $c = \frac{r}{t}$ Equation in T-Consciousness Cosmology

If we want to study the change in the speed of light in different viscosities of space from another perspective, it can be stated that in the theory of relativity, space and time are not absolute, and in the equation r=(x,y,z) $c = \frac{r}{t}$, [53,54] it's the speed of light which remains constant. But, T-Consciousness Cosmology posits that considering the effect of space viscosity on the speed of light, in the equation $c = \frac{r}{t}$, it is time that remains zero for electromagnetic wave or light, and c is variable. According to this view, as previously mentioned, not only is the time governing objects not a dimension, but it is considered as a force, which T-Consciousness Cosmology refers to as the Entropic Time Force, and this force has no effect on electromagnetic waves or light and is equal to zero. As a result, in this equation, alongside massive objects like intra-cosmic black holes, light is constantly faced with a decrease in speed and an increase in frequency as it is drawn towards them due to the continual increase in viscosity. Therefore, the viscosity of space affects the wave in three ways: **1- Change in direction of movement 2- Change in speed 3- Change in frequency.** (Figure 29)

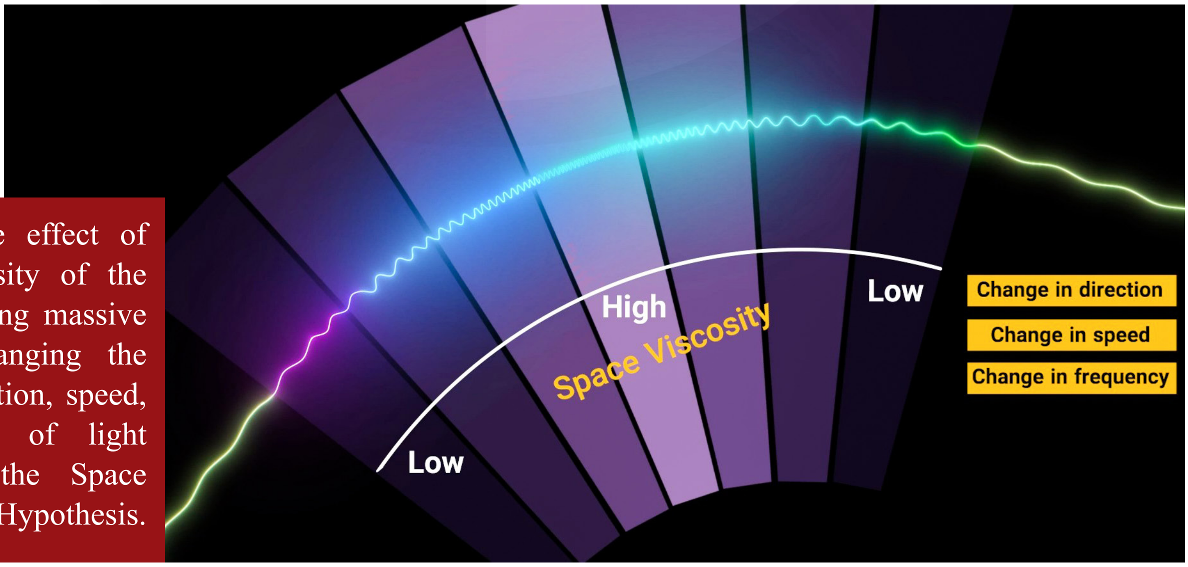

Figure 29: The effect of the high viscosity of the space surrounding massive objects on changing the direction of motion, speed, and frequency of light according to the Space Gravity-Time Hypothesis.

Evidence of Space Viscosity Around the Earth: The Formation of Rainbows and Blue Skies

T-Consciousness Cosmology considers the space viscosity formed around the Earth as another factor in the formation of a rainbow, in addition to the effect of raindrops on light refraction, which bends and disperses them.[55,56] This means that due to the difference in the viscosity of space outside the Earth's atmosphere compared to inside, light undergoes multiple refractions and deviations, resulting in the creation of a rainbow.

This is also true for the blue color seen in the Earth's sky. As we know, the sky appears blue due to a phenomenon called Rayleigh Scattering. The Earth's atmosphere scatters blue light more than other colors received from the sun, because blue light moves with a shorter wavelength. Shorter wavelengths of light, such as violet and blue, are more easily absorbed by air molecules than longer wavelengths like red, orange, and yellow.[57] Additionally, T-Consciousness Cosmology attributes the viscosity of the space surrounding Earth as an effective factor in this phenomenon. That is, when sunlight enters the Earth's atmosphere, it is refracted due to the viscosity around it, emitting frequencies in the blue color range with short wavelengths.

These examples each separately demonstrate the importance of viscosity in the refraction of light. Considering this example, in general it can be said that the dark matter surrounding massive objects plays the role of the viscosity of Earth's atmosphere for electromagnetic waves.

Gravitational Redshift, Blueshift, and Blackshift

Considering the role of space viscosity in changing speed, frequency, and wavelength, the cause of gravitational redshift and blueshift can also be examined from this perspective.

In the vicinity of massive objects such as various types of giant stars, neutron stars, and black holes, there is a region of space with high viscosity known as dark matter. The wavelength of electromagnetic waves decreases upon entering this area, and their frequency increases. The closer these waves move towards the center of mass of these massive bodies due to the presence of a strong gravitational field, their frequency increases further and their wavelength becomes shorter. This phenomenon is referred to as gravitational blueshift. As this process continues, a new gravitational change in electromagnetic waves known as **"Gravitational Blackshift"** is introduced by T-Consciousness Cosmology. According to this definition, as electromagnetic waves move closer to the center of massive bodies, they encounter further compression of wavelength and an increase in frequency that exceeds the frequency of gamma waves, resulting in a *gravitational blackshift*. Conversely when waves escape from the region of high viscosity in space, leading to a decrease in frequency and an increase in the wavelength of electromagnetic waves, known as gravitational redshift.

As indicated by the definitions above, the difference in perspective between T-Consciousness Cosmology and the theory of relativity regarding gravitational redshifts and blueshifts extends beyond the variability of the speed of light to also include the viscosity of space. Specifically, the theory of relativity describes gravitational potential wells surrounding massive objects in terms of the descent of electromagnetic waves, leading to either a gravitational blueshift when falling into such a well or a gravitational redshift when escaping from it. Instead, T-Consciousness Cosmology perceives this process as not the result of a gravitational potential well, but rather as the contraction of space that forms a spherical enclosure around massive objects. Moreover, while the theory of relativity considers the speed of light to be constant and defines the acceleration resulting from the waves falling into such wells in terms of their directional change, T-Consciousness Cosmology views the speed of light as variable and states that as light enters an area with high viscosity, its speed decreases and vice versa. (Figure 30)

Figure 30: The effect of high viscosity of the space surrounding massive objects on the gravitational redshift and blueshift phenomenon according to the Space Gravity-Time Hypothesis.

The Principle of Conservation and Mass-Energy Equivalence

The law of conservation of mass states that in a closed system, matter is neither created nor destroyed by itself. Therefore, the total amount of matter in the universe must be constant.[50] Additionally, the law of conservation of energy states that in a closed system, energy can neither be created nor destroyed - only converted from one form of energy to another,[58,59] so the total amount of energy in the universe also remains constant.[59] From the evolution of these two principles, the law of conservation of mass and energy is derived. This law states that mass and energy can be converted into each other. The implication that the amount of mass is conserved means that in any process within a closed system, the sum of the initial and final mass will be equal. Consequently, the total amount of mass and energy in the universe is constant. (Figure 31)

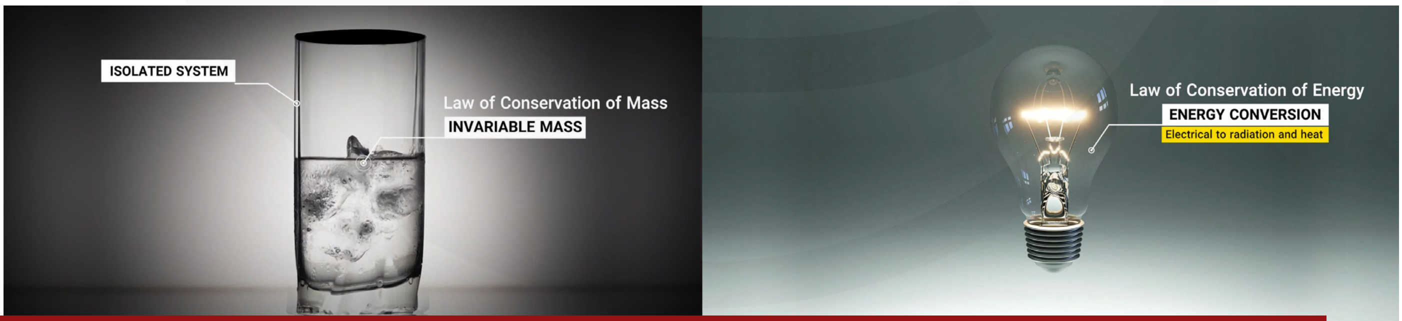

Figure 31: The law of conservation of mass in a closed system

Later in the theory of special relativity, Einstein demonstrated that mass cannot be considered as an ultimate constant quantity. Consequently, the principle of mass-energy equivalence was expressed. According to this principle, mass and energy are equivalent, and they are related through the famous equation *E=mc2*. In effect, this equation states that the rest mass of an object is equivalent to its internal energy. That is, the increase in relativistic mass of an object m in the square of the speed of light c^2 equals the kinetic energy *E* of that object. Therefore, mass and energy are convertible to each other (Figure 32). Also, E is the total relativistic energy of an object, which is derived from the sum of its relativistic kinetic energy (*K*) and its rest energy (m_0c^2). In other words, the above equation can also be expressed as $E=mc2 = K+m_0c^2$. Based on this equation, the rest mass of an object (m_0) is equivalent to its rest energy (internal energy). Furthermore, any increase in the relativistic kinetic energy of that object (K) is equivalent to a change in the relativistic mass of the object (m), since $K = mc^2-m_0c^2$.[1,60]

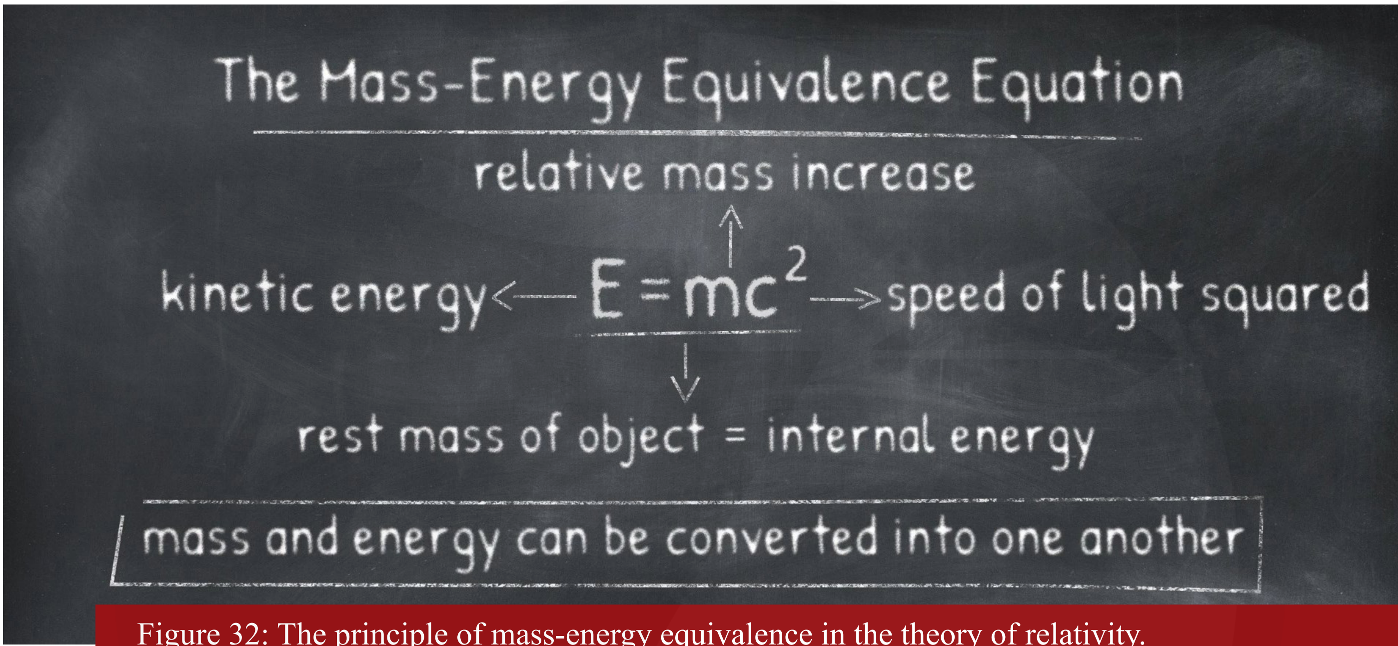

Figure 32: The principle of mass-energy equivalence in the theory of relativity.

It should be mentioned that prior to the presentation of the theory of special relativity, in classical physics theories, mass and energy were considered as two separate entities. Moreover, an arbitrary value was attributed to the rest energy of an object. However, in the theory of special relativity, as mentioned above, the rest energy of an object is determined by the value m_0c^2. Therefore, any object with a rest mass of m0 has a rest energy value of m_0c^2, which is potentially available for conversion into other forms of energy.[1,60] In the event of such a conversion, if energy is released from the object, according to the principle of matter-energy equivalence, the mass of the object decreases. Consequently, mass cannot be considered a conserved quantity on its own. This type of conversion occurs at a small scale in ordinary chemical reactions; however, much larger conversions take place in nuclear reactions.[5] For instance, hydrogen atom nuclei are converted into helium in nuclear fusion reactions. During this process, part of the rest energy of hydrogen atoms transforms into other forms of energy. An example of such reactions can be observed in the sun, where the conversion of hydrogen atoms into helium releases part of the rest energy in the form of light radiation. [61,62,62] (Figure 33)

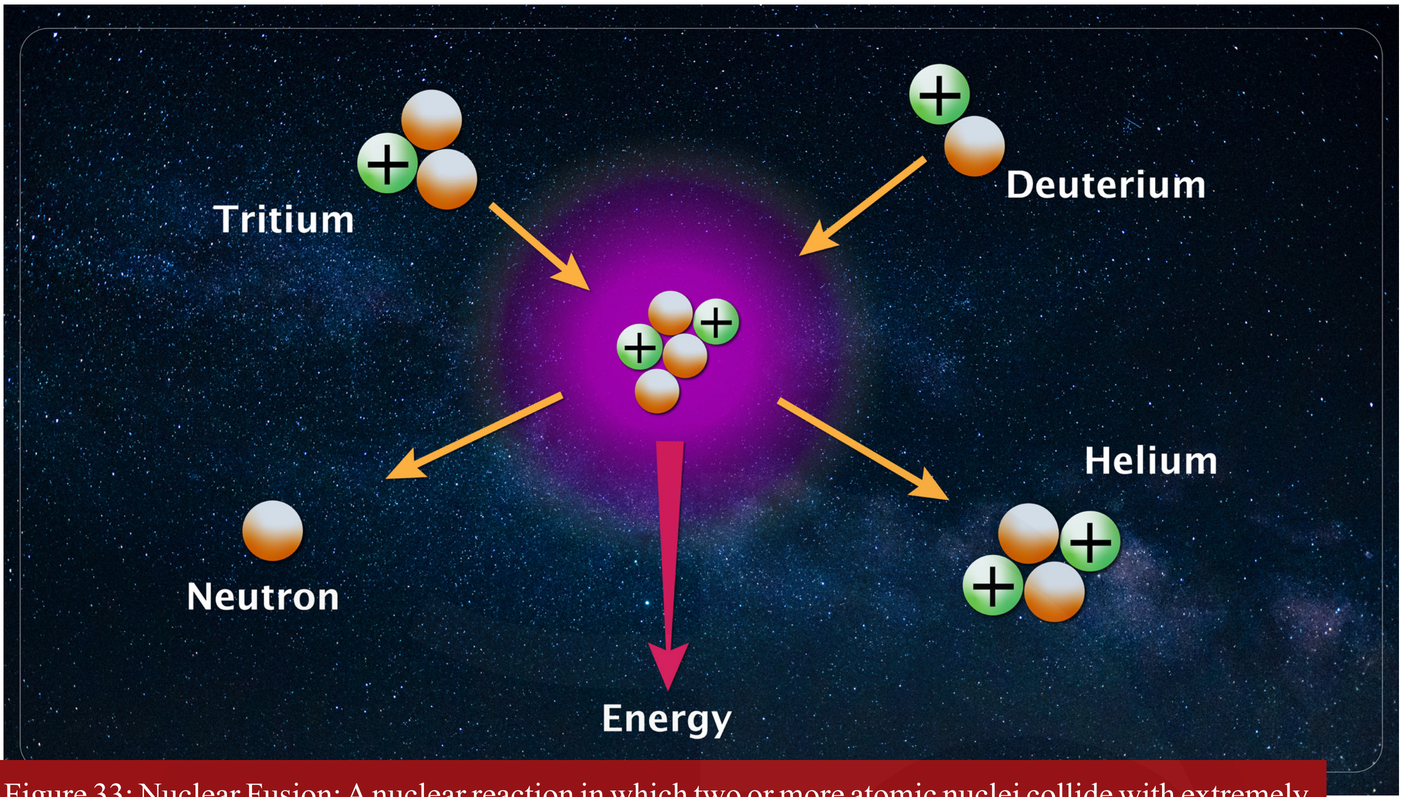

Figure 33: Nuclear Fusion: A nuclear reaction in which two or more atomic nuclei collide with extremely high energy and fuse together.

The matter-energy equivalence in the theory of relativity also led to the evolution of the two principles of conservation of matter and conservation of energy, under the principle of conservation of matter-energy.[1] This law states that matter and energy can be converted into each other, and in any physical or chemical process, the total mass-energy at the beginning will be equal to the total mass-energy at the end.[1,64] It is worth mentioning that since matter itself is another form of energy,[65] this law is known among physicists as the law of conservation of energy.

As a final summary, it can be said that from the perspective of conventional physics and based on the law of "conservation of energy," energy is neither created nor destroyed, but merely converts from one state to another. This means that the total amount of energy in the universe remains constant, but the forms that energy takes can change. Therefore, matter, as a form of energy, does not maintain its original state. In fact, matter can be created or destroyed, and according to the theory of relativity, its final quantity is not necessarily conserved. What is conserved from the perspective of modern physics is the total mass-energy at the beginning and end of a process.

Based on the definitions in conventional science, T-Consciousness Cosmology asks: are Einstein's relativity equations and principles such as the matter-energy equivalence, or the conservation of matter and the conservation of energy always and everywhere true in the cosmos?

Gravitational Lensing - Energy Resonance of Waves

As stated, T-Consciousness Cosmology defines different viscosities for space and determines the amount of this viscosity based on the mass of ordinary matter, whether it is high or low in density, often known as dark matter or dark energy. Additionally, this perspective considers the speed of light to be variable, such that it decreases with an increase in the viscosity of space, and increases with a decrease in viscosity. This concept can be examined through images captured by space telescopes, known as gravitational lensing.

Gravitational lensing is a phenomenon observed around massive objects such as galaxies or galaxy clusters and has various applications for cosmologists in studying the structure and components of the cosmos (Figure 34). This phenomenon is one of the predictions of general relativity, which attributes it to the bending of spacetime around massive objects.

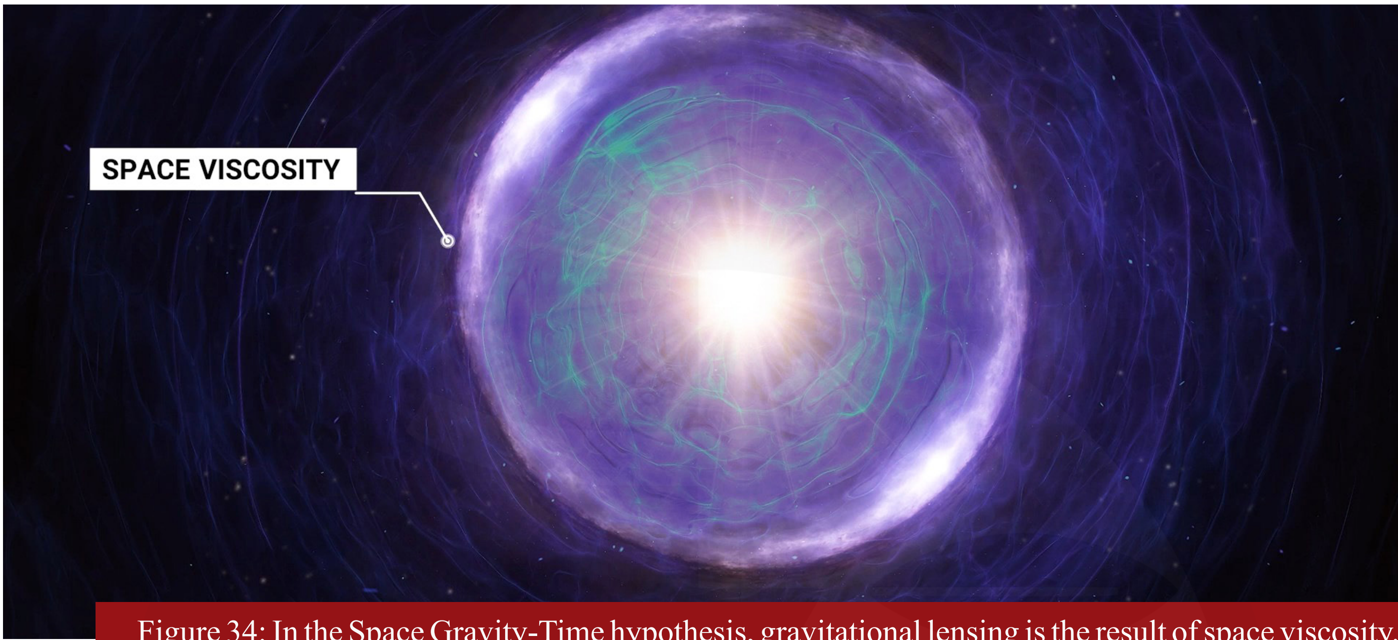

Figure 34: In the Space Gravity-Time hypothesis, gravitational lensing is the result of space viscosity.

However, from the perspective of T-Consciousness Cosmology, the cause of this phenomenon is the high viscosity of the space surrounding these objects. As previously stated, there is a high viscosity of space, or what conventional cosmology calls dark matter, around massive objects such as black holes, galaxies, and galactic clusters. When light enters this compressed or dense space, it faces a reduction in wavelength and an increase in frequency, which leads to a decrease in speed or, in other words, a gravitational blueshift in its spectrum. Since the frequency in electromagnetic waves, according to the equation $E = hf = \frac{hc}{\lambda}$, is directly related to the amount of energy,[66] therefore, the high viscosity of space also causes an increase in the wave's energy. So much so that the energy of the wave entering it increases as the viscosity (dark matter) becomes more dense. T-Consciousness Cosmology introduces this increase in stored wave energy as *"Energy Resonance of a Wave"* (Figure 35).

Figure 35: The energy resonance of a wave phenomenon from the perspective of T-Consciousness Cosmology.

The Violation of the Matter-Energy Equivalence Principle Inside a Black Hole

T-Consciousness Cosmology, using the "Energy Resonance of a Wave" hypothesis, states that the increase in wave energy at the event horizon of a black hole contradicts Einstein's mass-energy equivalence equation, and around the black hole, the equation $E_1 = M_1C^2$ does not hold true.

In explaining this phenomenon, it can be said that if a beam of light from a star or any other light source is moving towards a black hole, then the amount of energy that this light carries comes from the Planck equation $E_1 = hv_1$, in which E represents energy, h is Planck's constant, and v is the frequency of radiation. If the initial energy of this beam when it separates from the star is equal to E_1, according to this equation we will have: $E_1 = hv_1$. The mass equivalent of the energy of this ray is also equal to $E_1 = M_1C^2$.

When this light approaches the black hole, near its event horizon, its frequency increases, leading to an increase in the light's energy near the black hole. If we denote the increase in energy in the light as E_2, then we have $E_2 = hv_2$. (Figure 36)

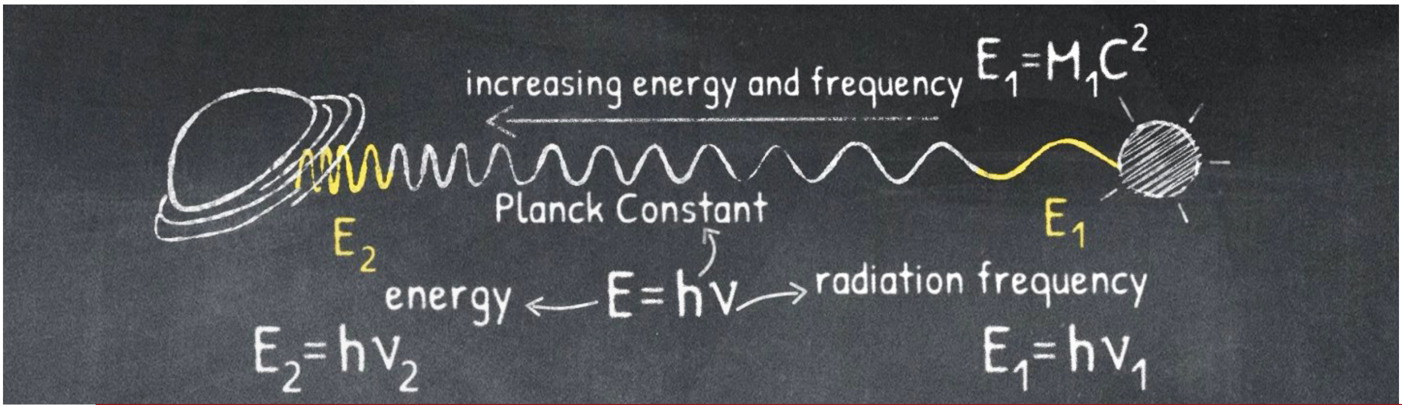

Figure 36: The relationship between energy and frequency in a light beam.

As can be observed in these two equations, the secondary frequency is higher than the primary frequency, i.e., $v_1 < v_2$. Since the secondary frequency is higher, the energy will also be greater in the second relation, meaning $E_1 < E_2$. Overall, the initial energy is less than the energy of that same light near a black hole. Consequently, according to the mass-energy equivalence equation of the theory of relativity for this light, we have $E_2 = M_2C^2$, where M_2 is the mass equivalent of energy.

By comparing the primary energy of light at the source and the secondary energy of the same light at the destination, which is near the event horizon of a black hole, the following relations are obtained: $E_1 < E_2$, therefore, $M_1C^2 < M_2C^2$.

Considering that from the perspective of the theory of relativity, c or the speed of light is constant, we can therefore eliminate it from both sides of the equation, resulting in the relation $M_1 < M_2$. In this relation, we will see that the secondary equivalent mass of this beam is greater than its primary equivalent mass at the origin.

If we consider the mass difference of these two as ΔM, then by comparing these two equations, we can conclude $\Delta M = M_2 - M_1$. Now, by substituting the equivalent mass difference, which is ΔM, into the equation $E=mc2$, we will have $\Delta E = \Delta MC^2$.

In this equation, ΔE represents the energy difference of a light ray from the beginning of its path to the event horizon of the black hole.

Given that the energy of light has increased around a black hole, the mass equivalent of energy also increases. In this comparison, ΔM represents the matter accretion. In other words, the mass equivalent of a light wave increases near a black hole. (Figure 37)

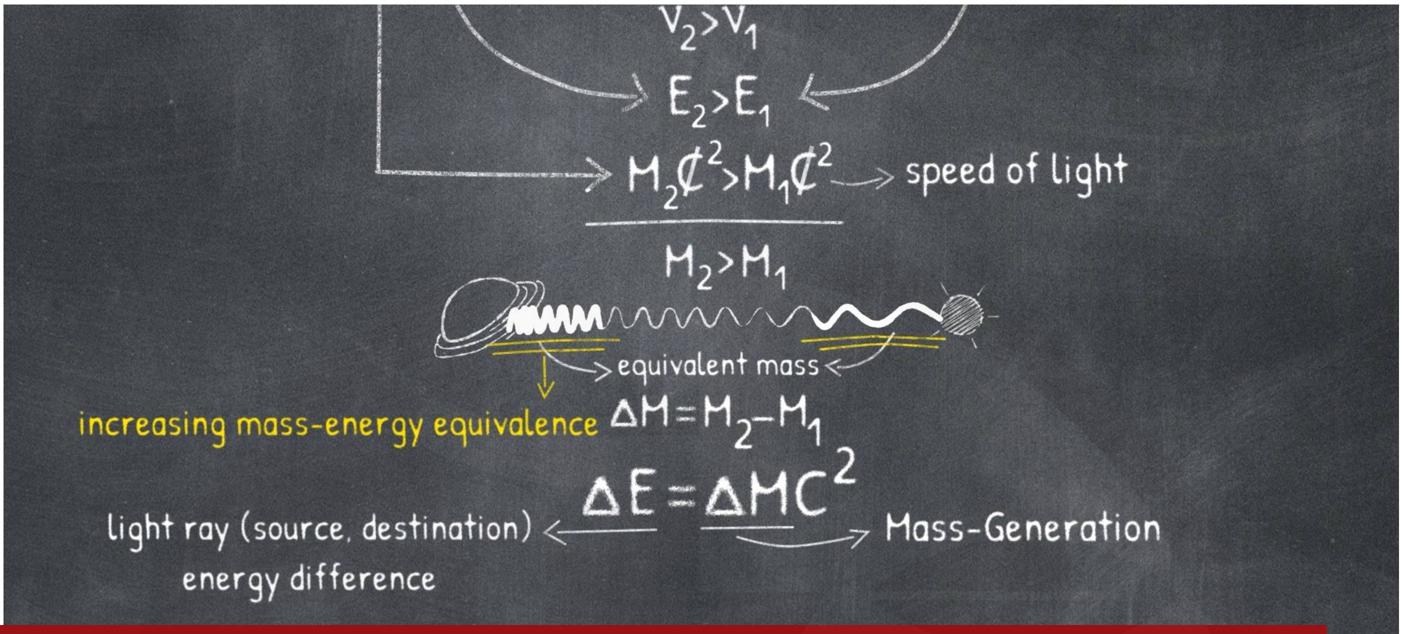

Figure 37: The phenomenon of matter accretion in a black hole according to the T-Consciousness Cosmology theory.

This equation can also be examined from another angle. In that, as gravitational blueshift occurs near a black hole, the frequency of the wave increases, resulting in not only $v_2 > v_1$ but consequently $E_2 > E_1$ as well. Thus, this relation can also be expressed as $M_1C^2 < M_2C^2$, therefore, $\frac{M_2}{M_1} > \frac{C^2_1}{C^2_2}$ and $\frac{M_2}{M_1} > \sqrt{\frac{C_1}{C_2}}$.

Considering the variability of the speed of light relative to the viscosity of space from the perspective of T-Consciousness Cosmology, we have: $c_1 > c_2$.

Therefore, if $\sqrt{\frac{C_1}{C_2}} > 1$, then $\frac{M_2}{M_1} > 1$ will result. In other words, the ratio of the mass equivalent of energy near a heavy object, like a black hole, etc., compared to the mass equivalent of energy of the light source, is always greater than one, which proves the increase of M_2 relative to M_1.

Based on the analyses presented, T-Consciousness Cosmology names the exponential increase in energy (ΔE) as **"Energy Resonance of a Wave"**, which is equivalent to the difference in electromagnetic radiation or light energy from the origin to the vicinity of a black hole's event horizon; furthermore, the equivalent mass of this radiation at the destination is greater than the equivalent mass of the same radiation at the origin.

Given the explanations provided, the energy difference or the energy resonance of a wave and its amount do not correspond with the relativity equations related to this subject near the event horizon of the black hole. This means that in the vicinity of a black hole, the equation $E=mc^2$ does not hold, and we will encounter the phenomenon of the increase in equivalent mass and energy. (Figure 38)

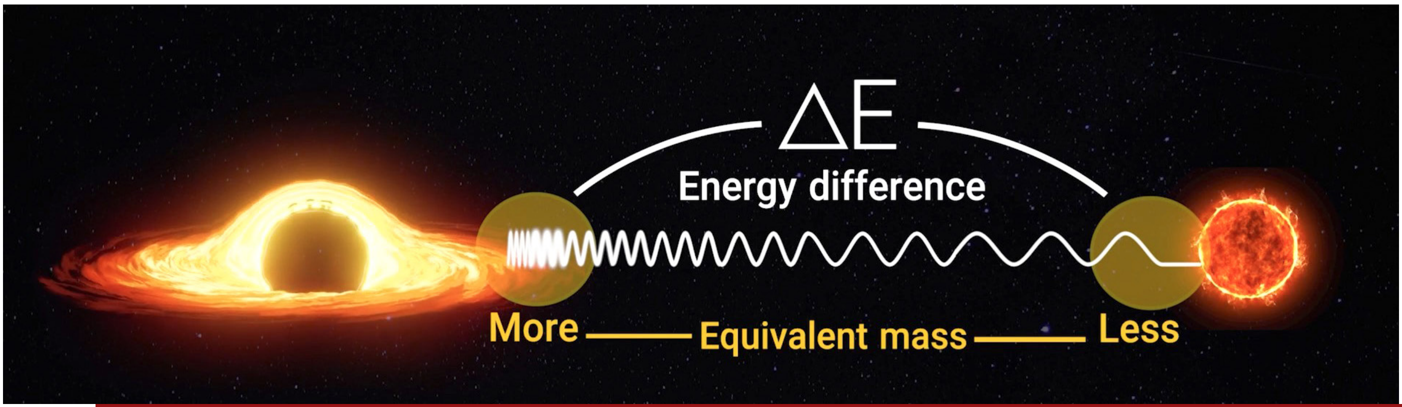

Figure 38: The phenomenon of increased mass equivalence around massive objects relative to the radiation source.

Black Holes as Matter Production Factories

Given the high viscosity of space around a black hole and gravitational blueshift, light waves after crossing the event horizon encounter a higher entanglement of the spherical space mesh. Return from this stage is impossible as this entanglement elevates the Energy Resonance of a Wave and increases its equivalent mass. At this stage, waves after experiencing gravitational blueshift, reaching infinite frequency and energy, enter the phase of gravitational blackshift and turn into black light. (Figure 39)

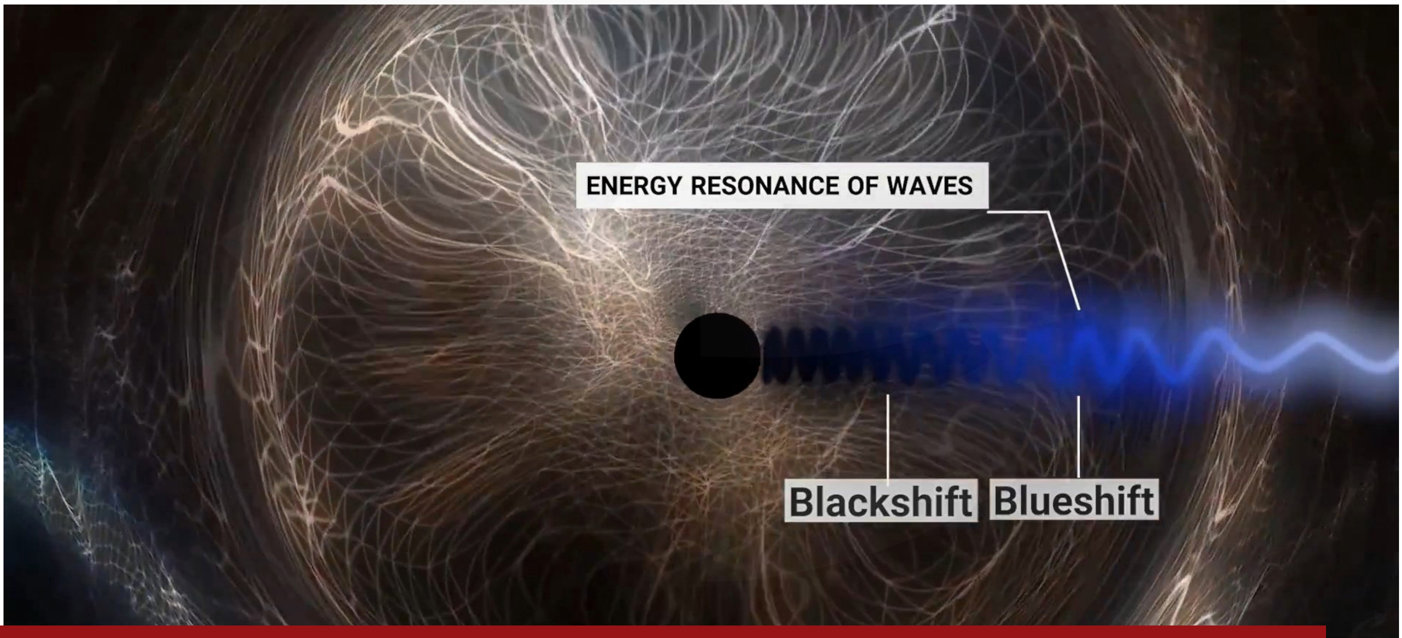

Figure 39: The phenomenon of gravitational blackshift of a light beam that has passed the event horizon of a black hole and is moving towards its center of mass.

The advancement of light towards the center of a black hole's mass leads to the creation of a new form of matter, which cannot form outside of the black hole. This newly formed matter, resulting from the infinite compression of electromagnetic waves, is termed "light-dark matter" in T-Consciousness Cosmology. As stated in the cosmic shell hypothesis, the formation of ordinary or "light" matter is the result of the collision of non-compressed fundamental waves, which transform into compressed waves or fundamental particles; in other words, ordinary matter is essentially compressed wave. Now, if this ordinary matter is being consumed by a black hole and moves towards its center of mass, it first breaks down into uncompressed waves as it orbits around the black hole at the speed of light before crossing the event horizon, then it is pulled into the black hole and, according to the described mechanism, faces an increase in energy and ultimately transforms into light-dark matter. (Figure 40)

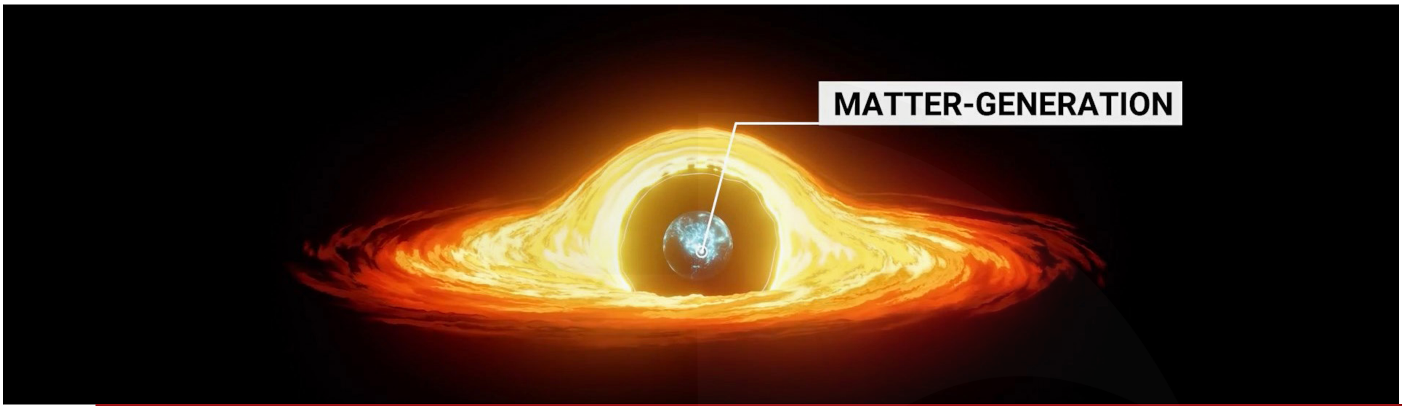

Figure 40: Formation of light-dark matter inside a black hole.

Based on these descriptions, T-Consciousness Cosmology suggests that such an equivalent mass did not exist before light entered the black hole. Therefore, one of the consequences of Energy Resonance of a Wave is the creation of a new type of matter inside the black hole, which carries gravitational resonance with it. Another consequence of this phenomenon is the double contraction of space due to the increase in the black hole's mass, which in turn contributes to the augmentation of dark matter or dark energy around it, which previously did not exist in the static area or the quiet region (negligible gravitational influence) of the black hole. In fact, black holes are matter production factories and show that the principles of matter and energy conservation are not applicable in these entities, given the energy resonance, increase in equivalent mass, and also the accumulation of matter occurring within them.

The Violation of the Matter and Energy Equivalence Principle at the Terminal Edge of the Cosmos (Final Stage of Space Rebound)

One of the implications of the Cosmic Rebound hypothesis is that the principle of conservation of matter and energy is not valid at the terminal edge of the cosmos when the process of space Rebound comes to an end.

In explaining this topic, it can be stated that in the cosmic black hole, considered the initial seed of the cosmos before the beginning of space Rebound, the gravitational resonance of the absolute matter, or TAM, was nearly infinite. Following the Big Shock, TAM begins the process of decomposition, which it continues in the role of the cosmic shell. Ultimately, in the lifespan of the cosmos after the completion of the space Rebound, dark matter and dark energy disappear due to the absolute decompression of space mesh and the release of any tension or stress. In parallel, the light matter or baryonic objects within the cosmos moving towards the shell are transformed into waves that gradually approach an infinite wavelength with a nearly zero frequency around the terminal edge of the cosmos. With the frequency reaching zero, the energy of these waves also tends to zero. T-Consciousness Cosmology refers to these waves as absolute waves.

In general, it can be said that the cosmos, originating from absolute matter (TAM) with an almost infinite mass, began its journey and ultimately, at the end of space rebound, transforms into a cosmos with zero mass and energy, where only absolute waves exist on a bedrock of tension-free space mesh. Under these circumstances, neither the principle of conservation of matter nor the principle of conservation of energy will prevail. (Figure 41) It is also worth mentioning that space itself, at this stage, transforms into absolute space, a topic that will be addressed in future discussions.

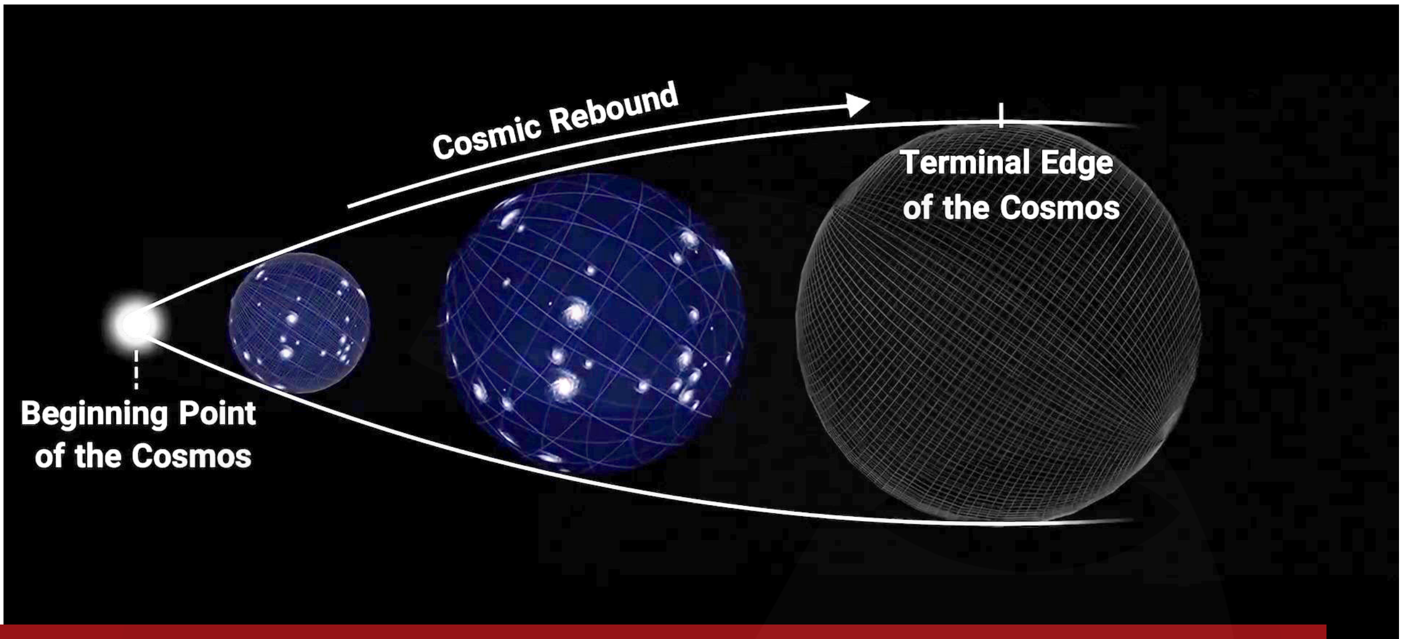

Figure 41: The violation of the conservation of matter and energy equivalence principle at the terminal edge of the cosmos (final stage of space Rebound).

Therefore, by stating these reasons, T-Consciousness Cosmology asserts that not only in different periods of time, but also currently in the black holes of the cosmos, the matter-energy conservation principle and the mass-energy equivalence equation are not maintained. In fact, this viewpoint declares that the law of change is always dominant in the cosmos, and even fundamental constants are not exempt from this rule.

Differences Between the Cosmological Perspective and Conventional Physics with T-Consciousness Cosmology

1- Classical mechanics considers space as an absolute coordinate system. While general relativity combines space and time into a four-dimensional model known as spacetime demonstrating that they are by no means absolute. In fact, according to this theory, space and time create a four-dimensional fabric through which objects move. However, from the perspective of T-Consciousness Cosmology, the lattices of space are introduced as fundamental and a bedrock of the cosmos, and their contraction causes the creation of dark matter and dark energy. While dark energy is also injected into the cosmos through its shell. (Figure 42)

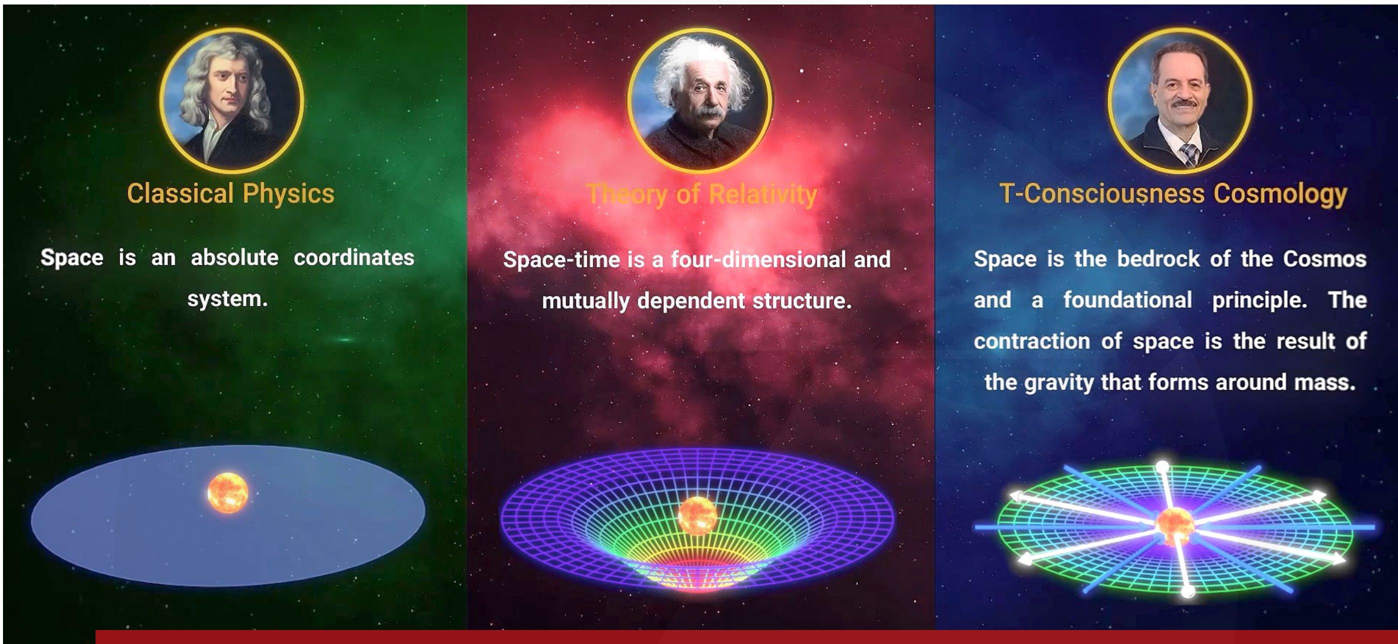

Figure 42: The distinct definition of space from the perspective of T-Consciousness Cosmology compared to other views.

2- The Newtonian perspective asserts that time is linear and independent of space, and different observers, regardless of their reference frame, measure time the same way. However, the theory of relativity considers time as a dimension that is measured differently by different observers based on their speed of motion. In other words, a different reference frame results in different time measurements. For example, for an observer moving at speeds close to the speed of light, time passes very slowly and stops at the speed of light itself. Meanwhile, T-Consciousness Cosmology introduces longitudinal time and various types of transverse time, stating that longitudinal time is always constant and independent of events within the cosmos from one Big Shock to the next. However, in transverse time, specific and general entropic times are introduced as force vectors with direction and magnitude, playing a fundamental role in increasing entropy. These two types of time force cause the disintegration of matter, which act against gravity and releases space from stress and tension. In this approach, the special and general entropic time forces are zero and constant for electromagnetic waves under all conditions. In addition to the mentioned types of time, this perspective also introduces the *Current Cosmic Rebound Time*. (Figure 43)

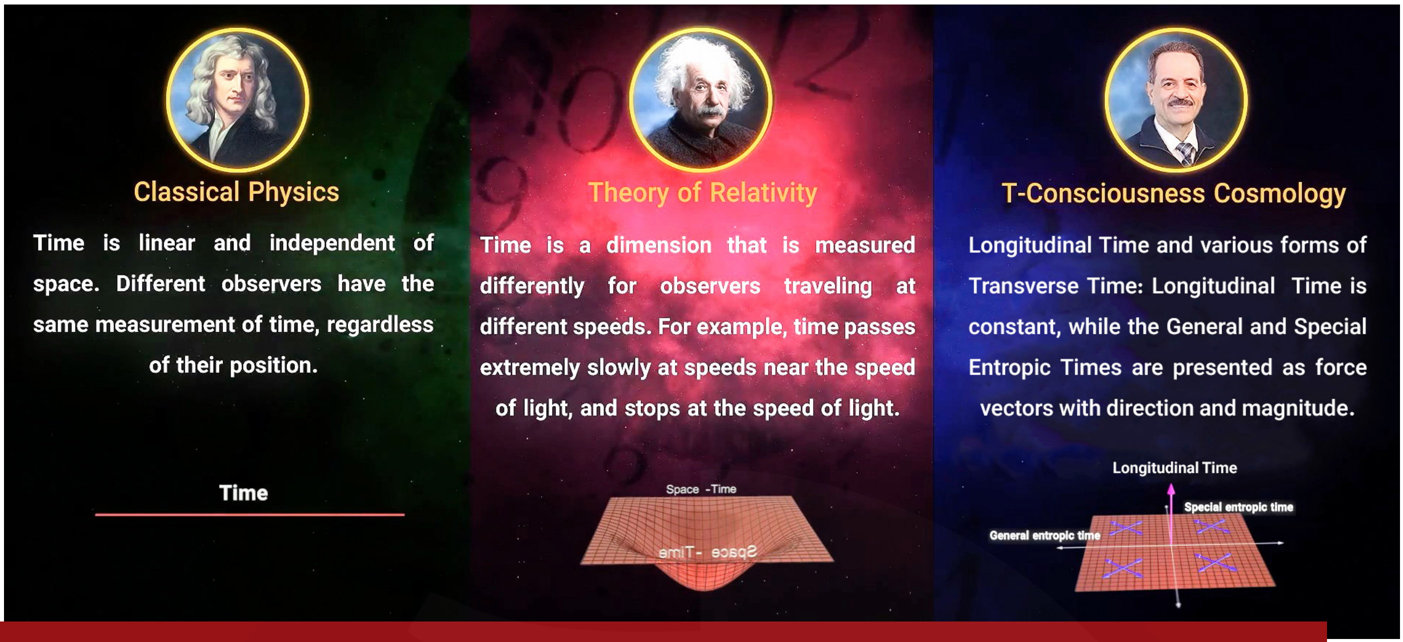

Figure 43: Types of time from the perspective of T-Consciousness Cosmology.

3- Despite scientists' efforts to show that the speed of light is limited and not infinite, the theories of the classical physics era did not yield any tangible discussions in this field. However, in the theory of relativity, the speed of light in a vacuum is considered constant and has since been used as a principle in equations. But T-Consciousness Cosmology regards the speed of light as variable depending on the space it moves through, attributing the different viscosities of space as the cause of the change in the speed of electromagnetic waves. In other words, the viscosity of dark matter and dark energy causes the speed of light to change. (Figure 44)

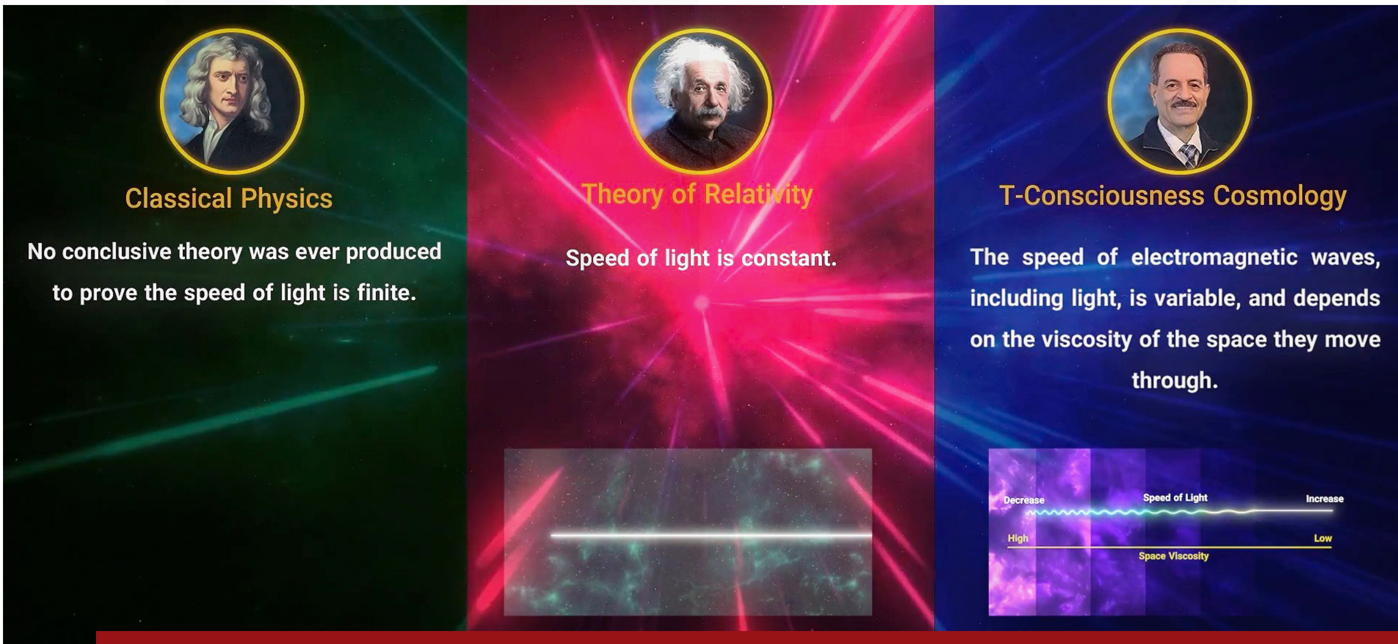

Figure 44: The variability of the speed of light from the perspective of T-Consciousness Cosmology.

4- Classical physics states that gravitational force, independent of time, exists in absolute space between two objects. In contrast, the theory of relativity considers the gravitational field as a feature of the geometric spacetime curvature. However, the view of T-Consciousness Cosmology is such that the surrounding space contracts in conjunction with the formation of mass. This contraction results in an increase in the viscosity of space, leading to the formation of dark energy and dark matter. In fact, the contraction of space mesh or what is known as dark matter and dark energy, represents the gravitational field resulting from the mass of light (ordinary) matter. (Figure 45)

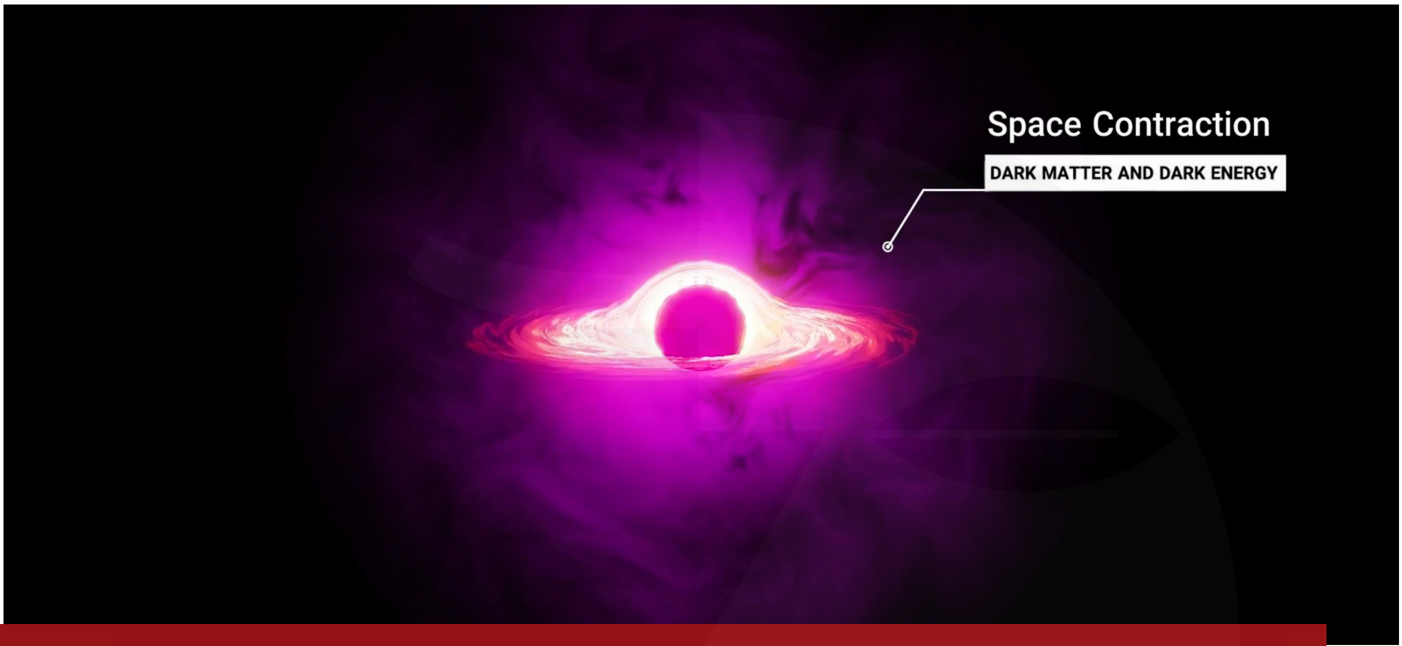

Figure 45: Dark Matter and Dark Energy: Results from the viscosity of space that is caused by the gravitational field of light matter.

5- Classical physics states that the gravitational force is transmitted instantaneously across the cosmos. The theory of relativity considers the speed of gravitational field transmission to be equal to the speed of light, which in modern physics is mediated by hypothetical particles called gravitons. However, T-Consciousness Cosmology defines the speed of gravitational field propagation as equal to the speed of movement of space mesh during compression (squeezing) or stretching due to the presence of celestial bodies, which is recognized neither as a wave nor as a particle. It is worth mentioning that the functioning of gravitational force in this perspective is non-frequency or linear, which will be discussed separately. (Figure 46)

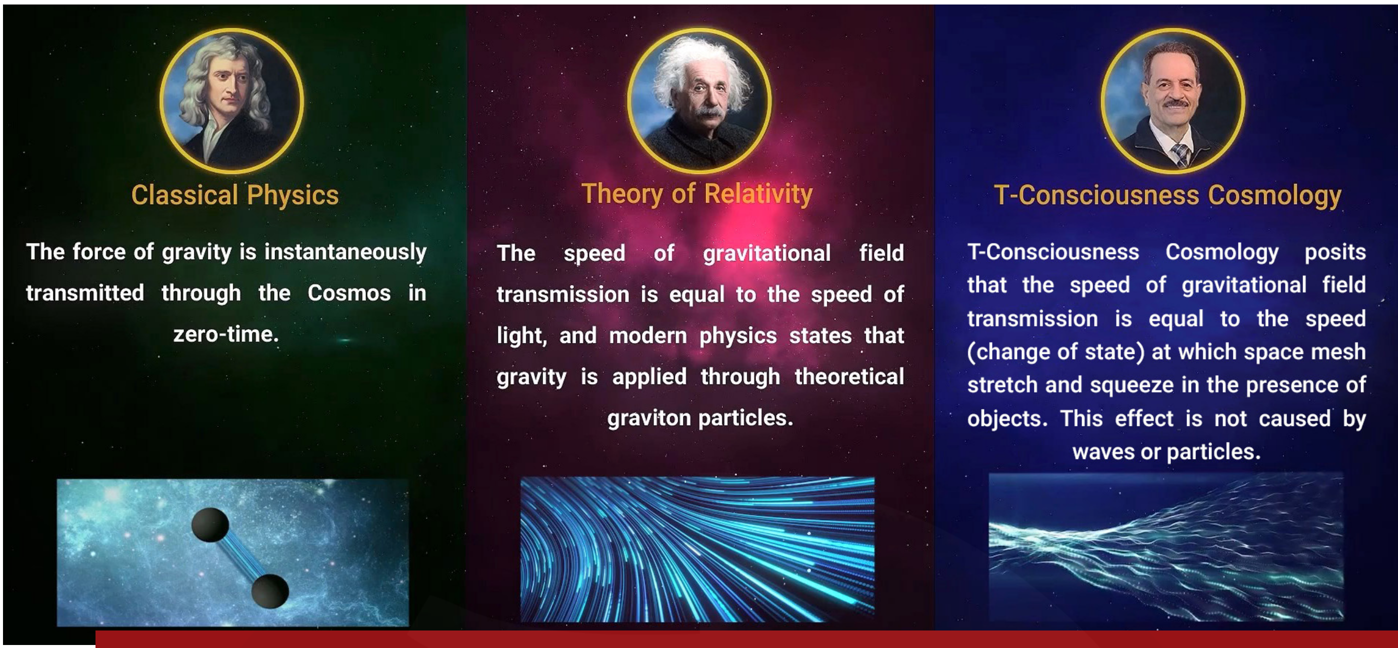

Figure 46: Transmission of gravitational force through space waves in the theory of T-Consciousness Cosmology.

In fact, modern physics states that hypothetical particles called gravitons exist that have the ability to transmit gravity at the speed of light. It is worth mentioning that these hypothetical particles have not been observed so far.

While T-Consciousness Cosmology asserts that the force of gravity cannot be mediated by graviton particles because if something is called a particle, it must have mass, and since mass cannot travel at the speed of light, and only massless waves can do so, these particles cannot be responsible for the transmission of gravity.

6- The theory of relativity considers gravitational blueshift and redshift to result from the fall and escape of electromagnetic waves from a gravitational potential well. While T-Consciousness Cosmology asserts that the speed of light is not constant; gravitational blueshift and redshift are the consequences of light passing through different viscosities of space, causing changes in speed, frequency, and bending.

Furthermore, this viewpoint states that as these waves approach the center of mass of a black hole, a phenomenon known as gravitational blackshift occurs. The result is the creation of light-dark matter within the black hole. It is worth mentioning that dark-dark matter is also produced within the black hole. Therefore, from the perspective of T-Consciousness Cosmology, the black hole is essentially a matter production factory. (Figure 47)

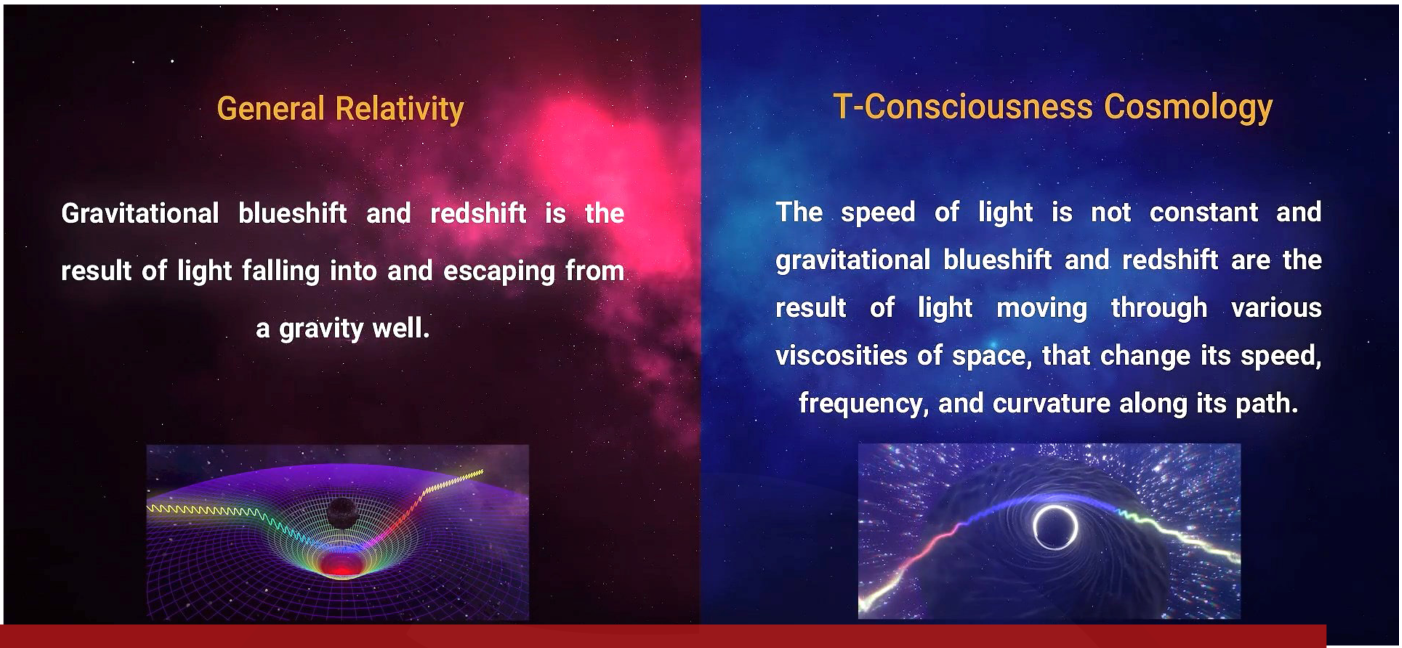

Figure 47: Gravitational redshift and blueshift from the perspective of T-Consciousness Cosmology.

7- The Theory of Relativity states that mass-energy equivalence is consistent under all conditions and everywhere in the Cosmos. While T-Consciousness Cosmology asserts that the law of mass-energy equivalence does not apply in the vicinity of intra-cosmic black holes due to the mass-generation that takes place inside them. Mass-energy equivalence also does not apply during the process of the Big Shock and at the Terminal Edge of the Cosmos.

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Space, Gravity-Time

From Newton's perspective, space and time were considered as two separate and absolute concepts, and gravity was defined as a force that changes proportionally with the mass of two objects and their distance from each other. However, in the theory of general relativity, gravity is introduced as a geometric function and a consequence of the curvature of space-time, which arises from the uneven distribution of mass and energy. However, in T-Consciousness Cosmology, instead of the concept of 'space-time,' the term 'space, gravity-time' is used, in which gravity and time are always proportionally intertwined and inseparable. In fact, the effect of gravity-time is considered as two sides of the same coin. In this view, time is categorized into Longitudinal and Transverse Time. Likewise, the time that is considered a dimension in the theory of relativity, is also introduced as an entropic force that facilitates the decay of mass to relieve space from tension and stress.

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