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The Mystery of Gravity & The phantom of Dark Energy are Explained by a Hidden Dimension of Time & Undiscovered Fundamental Force in Nature

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Abstract

The Standard Model of physics explains three of the four fundamental forces that govern the universe: electromagnetism, strong force, and weak force, but it lacks the fourth fundamental force which is gravity. The rapid acceleration of the expansion of the universe indicates that our understanding of gravity as a force between two masses or as a result of the curvature of spacetime caused by a mass is incomplete. Some theorists suggest that a particle called graviton is the carrier for the force of gravity. Unlike the carriers for the other three fundamental forces in nature, the graviton, has never been found experimentally at the large hydron collider in CERN laboratory, which raise the question is gravity a real fundamental force in nature, or it could be a force that result from the interaction between two fundamental forces in nature & one of them has not been discovered yet. Here, we show that we live in a universe with more than one dimension of time where the universe generates a linear time dimension from an energy that results from subatomic particles interactions. This novel interaction at subatomic particles also generates undiscovered fundamental force that interacts with electromagnetism to generate gravity. This undiscovered fundamental force along with a hidden dimension of time in the universe explains the rapid acceleration of the expansion of the universe, or what is known as dark energy.

Keywords: Linear time dimension; collapse of wave function; primary visual cortex of human brain; heart sounds; neutrino; oscillatory force; the constant of all constants; dark energy.

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1. Introduction

The Standard Model of physics explains three of the four fundamental forces that govern the universe: electromagnetism, the strong force, and the weak force. Electromagnetism is carried by photons and involves the interaction of electric fields and magnetic fields. The strong force, which is carried by gluons, binds together atomic nuclei to make them stable. The weak force, carried by W and Z bosons, causes nuclear reactions that have powered our sun and other stars for billions of years. The fourth fundamental force is gravity, which is not explained by the standard model of physics. Despite its the success at explaining the universe, it does have limits. Physicists understand that about 95 percent of the universe is not made of ordinary matter as we know it. Instead, much of the universe consists of dark matter & dark energy that do not fit into the standard mode of physics. The existence of dark energy[1,2] has been proposed to explain the variation in the recession velocity of more distant galaxies. The recession velocity of galaxies was expected to follow Hubble's law where the recession velocity of a distant object is proportional to its distance. The recession velocity of a distant galaxy is calculated by measuring the red shift of the light coming from the galaxy. For observations of the more distant galaxies, it was found that the recession velocity for a given distance was less than expected under Hubble's law[3,4]. This measurement was made possible by using distant supernovae to give an accurate estimate of distance using the luminosity of the supernova event. The conclusion taken from this unexpected recession velocity was that the expansion of the universe must have been slower in the past and that the expansion of the universe must be accelerating. The cause of this accelerated expansion was named dark energy, and remains a mystery until now.

1.1The hidden dimension of time

We live in a universe that has more than one dimension of time. The cyclic time dimension in space-time model for Albert Einstein is the only dimension of time that we know. In Ramzi and his colleagues paper, the human generates a separate time dimension that pulls the cyclic time dimension in one forward direction. This dimension of time "called linear time dimension" is generated in primary visual cortex of the brain. The maximum value for this dimension is 6.62s and the minimum value is 2.7s during wakeful state for every one second of cyclic time, and it runs below 0.00005s during sleep for every one second of cyclic time. The variation in the linear time dimension among individuals is responsible for the relativity of simultaneity, where past & future are present in the same moment in the present[5]. The point of connection between the cyclic time dimension and the linear time dimension generated by primary visual cortex of the brain is the numeric value of the fine structure constant 0.00729s, in which the primary visual cortex has the ability to generate the fine structure constant through the following equation

$$\alpha = \frac{\nabla E_{\gamma}}{\nabla E_{\alpha}} \times \delta \qquad (1)$$

∇E_{γ} is the minimum gamma brain wave energy 1.875J

∇E_{α} is the minimum alpha brain wave energy 400J

δ is the cardiac cycle constant 1.5564s

This linear time dimension in primary visual cortex of human brain is generated through sounds energy (heart sounds) & light energy (photon) for a given cyclic time governs by the cardiac cycle in human (figure 1).

$$t_h = \alpha^2 \left(\delta^2 - \frac{60}{HR}\right) + \sqrt[4]{\frac{E_\alpha}{E_\gamma}} \qquad (2)$$

t_h is human linear time,

δ is cardiac cycle constant 1.5564s

HR is the heart rate

Eγ is gamma brain wave energy

Eα is alpha brain wave energy

α is the fine structure constant

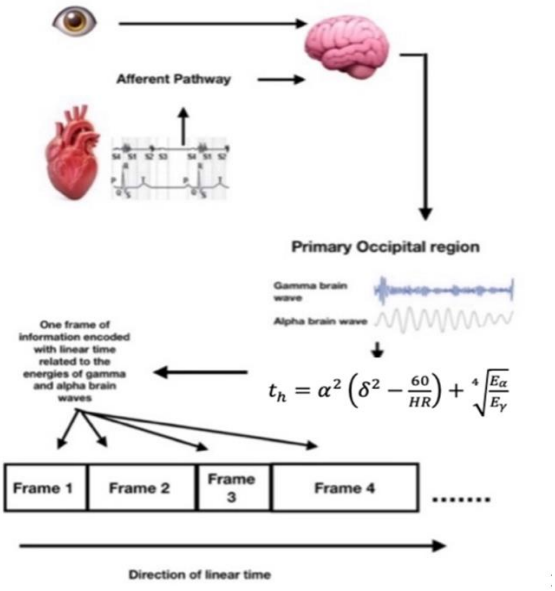

Figure 1: The diagram represents the process of interaction between the heart sounds transmitted via the afferent pathway to generate resonant gamma brain waves with alpha brain waves in primary visual cortex of the brain to generate forward frames of linear time dimension for human. Note that each frame of visual information has different time ranging between 2.7s to 6.62s in wakeful state depending on the energies of alpha and gamma brain waves[(5)]

The universe also has a linear time dimension that pulls the cyclic time dimension in one forward direction only. Like in human, this dimension of time in the universe (is called linear time dimension of the universe) is generated through the interaction between sounds energy and light energy at subatomic particles[5]. The first particle is a photon since it produces light energy. The second particle must produce variable values of sound energy (through oscillations) in order to generate relativity in linear time dimension. Like the heart in human which produces "involuntary" sound with specific frequency, which is eventually converted into an energy through neuronal oscillations in primary visual cortex, the second particle in physics or universe that interacts with the photon to generate linear time dimension responsible for relativity must possess the following criteria:

1- The particle does not carry charge; therefore, it cannot be accelerated by electric field.
2- The particle does not interact with Higgs field, therefor, Higgs field has no influences on the particle's energy status
3- The particle must have variable form of oscillation, hence, variable energy (in order to generate relativity in time).

The only particle in the standard model of particles that fulfills these criteria to generates liner time dimension in the universe is neutrino[5]. Neutrino is an elementary particle with spin of 1 /2 that interacts via the weak interaction [6]. It was postulated first by Wolfgang Pauli in 1930 to explain how beta decay could conserve energy, momentum, and angular momentum (spin). Weak interactions create neutrinos in one of three leptonic flavors: electron neutrinos (νe), muon neutrinos (νμ), or tau neutrinos (ντ), associated with the corresponding charged leptons, the electron (e−), muon (μ−), and tau (τ−), respectively [7] . Neutrino comes in three masses; each neutrino flavor state is a linear combination of the three discrete mass eigenstates [8]. Neutrino flavor eigenstates (creation and annihilation combinations) are not the same as the neutrino mass eigenstates. Neutrinos oscillate between different flavors, for example, an electron neutrino produced in a beta decay reaction may interact in a distant detector as a muon or tau neutrino, as defined by the flavor of the charged lepton produced in the detector. This oscillation occurs because the three mass state components of the produced flavor travel at slightly different speeds, so that their quantum mechanical wave packets develop relative phase shifts that change how they combine to produce a varying superposition of three flavors. Each flavor component thereby oscillates as the neutrino travels, with the flavors varying in relative strengths. The relative flavor proportions when the neutrino interacts represent the relative probabilities for that flavor of interaction to produce the corresponding flavor of charged lepton [9,10] These are a great property of neutrino that makes it suitable for interaction with photon's energy to generate linear time dimension and relativistic effect in relation to cyclic time dimension. Neutrino and photon (like the heart and the brain in human) generate the value of fine structure constant[5] which is the point of connection between the linear time dimension and the cyclic time dimension.

Interaction of neutrino with photon result in three important outcomes:

1- Quantum initiation of linear time dimension QILTD
2- Collapse of the wave function
3- New fundamental force, it was proposed in Ramzi and his colleagues [5], and named oscillatory force, which explains the magnetic moment anomalies of Muon subatomic particle that was discovered at

Fermilab. And he also proposed that the carrier for this force is neutrino

Based on these three outcomes the universe was born. As stated in Ramzi and his colleagues, the universe was originated from a quantum field with high potential energy, neutrino was added to the quantum filed triggering quantum initiation of linear time dimension QILTD. The value of fine structure constant was 1/127 at the birth of the universe [(11)] meaning that the maximum linear time "allowed" in the universe was 127 seconds. while the value of linear time was 85 seconds (proton decay must not exceed 1/85 in order for life to exist) [(12)] at the moment of the birth of the universe, all the constant in physics were set at from these two numbers (125 and 85) 125s is the maximum linear time "allowed" at the birth of the universe, and 85s is the actual linear time at the birth of the universe. These two numbers give rise to the constant of all constants R

$$\mathcal{R} = \frac{t_{\vec{u}} \vee}{\wedge^{\leftarrow} t_u} \qquad (3)$$

$t_{\vec{u}} \vee$ is the maximum linear time "allowed" at the birth of the universe 127s

$\wedge^{\leftarrow} t_u$ is the maximum linear time at the birth of the universe 85s

$$\mathcal{R} = \frac{127}{85} = 1.49411765s$$

The constant of all constants (R) gives rise to all constant in physics and also in human body like the cardiac cycle constant together with heart sounds timing constant as stated in Ramzi and his colleagues paper[(5)].

The neutrino which interacted with photon that is bonded in the electromagnetic force of the quantum field at the birth of the universe lead to collapse of the wave function in which the status of the particle has changed from probabilistic to deterministic and it is now governed by two time dimensions

$$[i\hbar \frac{\partial}{\partial t}\psi(x,t)]^2 = \psi(x,t)[-\frac{m_e}{2(\hbar\epsilon_0)^2}\frac{e^2}{\frac{\vee E_v}{\vee E_p}}\frac{1}{8\pi\mathcal{R}}]^2 \qquad (4)$$

ϵ_0 is electric constant, ψ is wave function, m_e is electron mass

$\hbar$ is reduced planck constant, e is elementry charge

$\vee E_v$ is minimum energy of neutrino 0.1 KeV

$\vee E_p$ is minimum energy of photon 511 KeV

R is the constant of all constants 1.49411765s

Once collapse of wave function occurs, the particle has changed its status from probabilistic to deterministic because it is governed now by two dimensions of time and can not travel faster than the speed of light, unlike in quantum state, where the particle is in probabilistic state and there is no linear time dimension, thus, the particle

can travel with no speed limit. This fact explains the phenomena of quantum entanglement.

The primary visual cortex of the brain is also capable of converting the particle from quantum status (probabilistic) to classical status (deterministic), which results in collapse of the wave function. This fact explains the mystery behind the famous double slit interferometer experiment (the most bizarre experiments in modern physics) by Thomas Young in 18th century.

$$[i\hbar\frac{\partial}{\partial t}\psi(x,t)]^2 = \psi(x,t)[-\frac{m_e}{2(\hbar\epsilon_0)^2}\frac{e^2}{\frac{\vee E_v}{\vee E_p}}\frac{1}{8\pi\sqrt{\frac{\wedge t_h}{\vee t_h}-\beta}}]^2 \qquad (5)$$

$\wedge t_h$ is the maximum human linear time in wakeful state 6.62s

$\vee t_h$ si the minimum human linear time in wakeful state 2.7s

β is the heart sound timing constant 0.2s

ϵ_0 is electric constant, ψ is wave function, m_e is electron mass

$\hbar$ is reduced planck constant, e is elementry charge

Or

$$[i\hbar\frac{\partial}{\partial t}\psi(x,t)]^2 = \psi(x,t)[-\frac{m_e}{2(\hbar\epsilon_0)^2}\frac{e^2}{\left(\frac{\nabla E_\gamma}{\nabla E_\alpha}\times\delta\right)}]^2 \qquad (6)$$

$\nabla E_\gamma$is the minimum gamma brain wave energy 1.875J

$\nabla E_\alpha$is the minimum alpha brain wave energy 400J

δ is the cardiac cycle constant 1.5564s

The port of entry to the linear time dimension generated in the universe at subatomic particle is the numeric value of the fine structure constant that is calculated by the minimum energy of neutrino & the minimum energy of the photon at beta and gamma decays that is governed by the constant of all constant R (equation 7). Similarly, the post of entry to the linear time dimension in human generated by the primary visual cortex of the brain is the numeric value of the fine structure constant, that is calculated by the minimum energy of gamma brain wave (heart sounds) & the minimum energy of alpha brain waves (photon or light energy), which is governed by the cardiac cycle constant (equation 1) or governed by the constant of all constant R in relation to heart sounds timing constant (equation 8)

$$\alpha = \frac{\vee E_v}{\vee E_p}\times 8\pi\mathcal{R} \qquad (7)$$

$\vee E_v$ is minimum energy of neutrino 0.1KeV

$\vee E_p$ is minimum energy of photon 511KeV

R is the constant of all constants

Equation (1) can also be written to include the constant of all constant R

$$\alpha = \frac{\nabla E_\gamma}{\nabla E_\alpha}\sqrt{\mathcal{R}^2 + \beta} \qquad (8)$$

β is the heart sound timing constant 0,2s

The interaction of neutrino with photon at the quantum field at the birth of the universe leads to formation of oscillatory force. However, since the energy of neutrino at the birth of the universe was too low, oscillatory force was able to generate a magnetic moment only in the field in which the velocity of the particle was perpendicular to the magnetic force in the field, thus, the field moves in a circular trajectory motion only, and everything in the field at the beginning was massless because Higgs field had zero potential. As the temperature of the universe started to decrease, Higgs field gained non zero potential, and when the fundamental particles interacted with Higgs field, they gained masses, leading to slow inflation of two space dimensional field. With slow inflation of the universe, the temperature started to decrease, and the energy of the neutrino started to increase, the oscillatory force increases, and when the universe reached to the stage of cosmic microwave background, the oscillatory force was able to generate an angular momentum creating a third space dimension. At this point the energy of neutrino was enough to convert the photon into a visible light. This explains why the cosmic microwave background is flat or 2 space dimensional field and we can not see any lights behind it. With formation of an angular momentum & 3 dimensions, the entire field moved in helical forward movement completing 4 circles (figure 2) and all the matter are gathered inside that helical shape forming 7 layers or level of galaxies and stars.

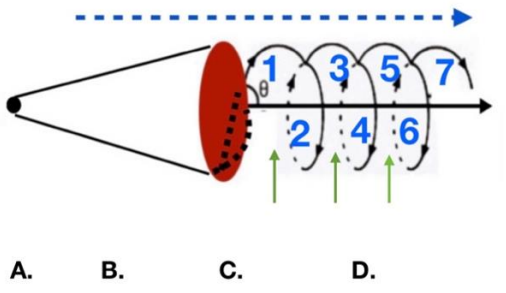

Figure 2: Stages of the formation of the universe. Stage A: The universe arises from quantum field. Stage B: Slow inflation of the universe. Stage C: Cosmic microwave background. Stage D: Three space dimensions universe rotating around the axis of magnetic force completing 4 circles resulting in galaxies and stars clustered in 7 levels. The green arrows represent empty space.[(5)]

The linear time of the universe can be calculated by several ways since it depends on the variabilities of the energy of neutrino in relation to the energy of the photon, one way is to formulate the same equation that calculate linear time in human by the primary visual cortex of the brain (equation 2), however, there is another way that depends on understanding the fact that as the energy of neutrino has been increasing since the birth of the universe, which means, the linear time of the universe decreases and the oscillatory force increases. Since the linear time of the universe started at 85s and it has been decreasing ever since due to increase in the energy of the neutrino, and the increase in the energy of the neutrino means decreases in the value of the fine structure constant . This concept allows us to calculate the linear time of the universe through an easier mathematical equation that depends on the change of fine structure constant

$$t_u = \frac{\Lambda \leftarrow t_u}{\sqrt[8]{\mathcal{R}} + (\alpha^{-1} - t_u \rightarrow V)} \qquad (9)$$

t_u is the linear time of the universe

$\Lambda \leftarrow t_u$ Is the maximum linear time at the birth of the universe 85s

$\mathcal{R}$ is the constant of all constants 1.49411765s

α is the fine structure constant 1/137, or α^{-1} is the current maximum linear time "allowed in the universe 137s

$t_u \rightarrow V$ is the maximum linear time "allowed" at the birth of the universe 127s

It means that, the linear time of the universe today is approximately 7.7s. It should be noted that collapse of linear time dimension for human occurs when the heart stops beating, (no heart sounds) and for the star when it runs out of neutrino it collapses into a quantum field with high electromagnetic force due to the absence of oscillatory force. This high electromagnetic force traps the photon; thus, the photon can not escape. Therefore, a black hole is just a quantum field with no linear time dimension and high electromagnetic force where photon is trapped in electromagnetic bond. This photon will only be released if neutrino is added to the field, and the interaction of neutrino with photon leads to QILTD and oscillatory force. These two outcomes result in three important phenomena:

1- Gravitational momentum, which is govern by the linear time dimension. Gravitational momentum is responsible for the speed of the stars and the galaxies in the universe (dark matter).
2- Gravitational field, which is due the interaction between the electromagnetic force and the oscillatory force. Gravitational field is responsible for the curvature of space dimensions (gravity)
3- Gravitational dynamic, that is governs by both linear time dimension and the magnitude of the oscillatory force, which is responsible for the expansion & the shape of the universe (dark energy).

1.2Gravitational dynamic & dark energy

The linear time dimension and the oscillatory force are changing over time. Since the energy of neutrino in the universe is increasing, the linear time dimension of the universe is decreasing, and the oscillatory force is

increasing. The universe in figure [2] changes over time, and the dynamic change in the size & shape of the universe over time depends on the dynamic of the axis of magnetic force which corresponds the speed of light that is related to the change of the numeric value of the function derived from the change in the linear time dimension and the maximum linear time "allowed" in the universe. It can be written as follows

$$\frac{\partial}{\partial t} d = 8\pi \frac{\partial}{\partial t} c^{[\mathcal{R} - (\alpha^{-1}/t_u + \Lambda^{\leftarrow} t_u)]} \qquad (10)$$

$\frac{\partial}{\partial t} d$ is the dynamic change in the geometry of the universe over time

α is the fine structure constant 1/137, or α^{-1} is the current maximum linear time "allowed in the universe 137s

C is the speed of light

R is the constant of all constants 1.4911765s

$\Lambda^{\leftarrow} t_u$ is linear time at the birth of the universe 85s

t_u is the current linear time of the universe 7.7s

At the beginning of the universe the function derived from the linear time was zero because the linear time of the universe equal to 85s & the fine structure constant was equal to 1/127. This fact in equation 10 dictates two things:

1- the speed of light is constant in vacuum.
2- nothing can travel faster than the speed of light when it is governed by linear time dimension.

From equation [9], as the linear time of the universe gradually decreases due to increase in the energy of the neutrino, the rate of the forward movement of magnetic axis slows down & the oscillatory force increases, this will result in two important things [Figure 3-A, 3-B] :

1- The radius of each level in the seven levels where matters are gathered is increasing. When the radius of each level increases, (for example level 6), it causes galaxies within that level to move away from each other (red shifted galaxies).
2- The distance between two adjacent parallel levels decreases (for example levels 4 & 6), this causes galaxies in two adjacent parallel orbits move close to each other (blue shifted galaxies) Figure [3-A, 3-B].

And that explains the mystery behind dark energy.

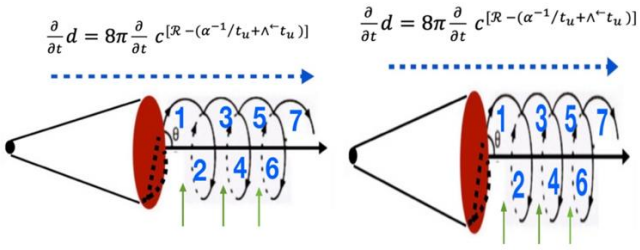

Figure 3-A. Figure 3-B

Figure 3: A-B represents the dynamic changes in the axis of the magnetic force of the universe in relation to the changes in the linear time dimension & the oscillatory force which explains the red and blue shifted galaxies in the seven levels.

1.3Gravitational field & oscillatory force

Photon is the carrier for electromagnetic force, while neutrino is the carrier for oscillatory force [(5)]. When neutrino interacts with photon, an interaction between two fundamental forces occurs resulting in gravity. Oscillatory force weakens the electromagnetic force. Therefore, gravity is not a fundamental force, it is a product of an interaction between two fundamental forces, electromagnetic & oscillatory forces. Gravity is inversely proportional to oscillatory force, and the oscillatory force depends on the energy of neutrino. The higher energy of neutrino, the stronger oscillatory force and weaker gravity. The constant for the oscillatory force is derived from the relationship between Planck's constant and the speed of light as follow

$$Z = \frac{h}{c} \qquad (11)$$

Z is oscillatory force constant (J/m)= 2.2×10^{-42}

The oscillatory force constant is also set at the time of the birth of the universe & derived from the constant of all constants (R), which is equal to the square of R itself.

And the oscillatory force is equal to

$$O_f = \frac{8\pi Z}{\alpha\,[(\sum_{n=1}^{g} E_v)/E_p]} \qquad (12)$$

O_f is the oscillatory force (J/ms)

g is the sum of neutrino's masses & flavors between the source and the target

α is the fine structure constant

The interactions of electromagnetic force and oscillatory force, together with the rate of forward movement of the universe that is influenced by the linear time of the universe determines the curvature of space dimensions

of the universe. Therefore, mass is not the only factor that determines the curvature of space dimensions in the universe as stated in Einstein theory of general relativity.

The equation to calculate the gravity involves three components, 1-electromagnetic force, 2-oscillatory force, and 3-dynamic change in the universe based on the linear time dimension.

$$R_{ab} - \frac{1}{2}Rg_{ab} = (8\pi T_{mx}G)\left(\frac{8\pi Z}{\alpha\,[(\sum_{n=1}^{g} E_v)/E_p]}\right) + 8\pi\frac{\partial}{\partial t}\,c^{[\Re\,-(\alpha^{-1}/t_u + \wedge^{\leftarrow} t_u)]} \qquad (13)$$

R_{ab} is Ricci curvature tensor, which should contain only three space dimensions without time dimension.

g is metric tensor

T_{mx} is stress energy tensor which contains energy density, momentum energy, shear stress/momentum flux & pressure.

G is gravitational constant

Equation 13 represent how matters and rate of change in. time dimensions change the curvature of space dimension. Therefore, identifying how the space dimensions curve due to mass does not reflect the true amount of gravity, because gravity in the universe is due to the interactions of electromagnetic force with oscillatory force as well the rate of change in linear time dimension. Equation 12 does not have dark matter, but this will be explained in detail in separate article with complete equation that has dark energy, gravity, dark matter, black holes and worm holes.

2. Conclusion

We live in a universe with more than one dimension of time. The primary visual cortex of human brain has the ability to change the status of the particle from probabilistic to deterministic through its ability to generate a linear time dimension. The universe has its own linear time dimension by the interaction of neutrino and photon resulting in formation of linear time dimension and oscillatory force.

The fine structure constant is the gate of entrance to the linear time dimension for both human and the universe. The linear time dimension depends on the sound to light energies at a given cyclic time. Gravity is a product of interaction between two fundamental forces in nature (electromagnetism and oscillatory forces), therefore, gravity is not entirely due the curvature of spacetime only as in Einstein model for gravity.

The reduction in the linear time dimension together with increasing the oscillatory force leads to change in the dynamic movement of the universe, which is responsible the concept of dark energy.

3. Future research

Dark matter will be discussed in detail in separate article through the concept of gravitational momentum that

explains why stars and galaxies maintain the same velocity, which will complete the grand equation for the universe that contains quantum mechanics, collapse of wave function, electromagnetism, oscillatory force, gravity, dark matter, dark energy, black hole, & worm hole. Understanding the interaction between linear time dimension for the human and for the universe is crucial for the concept of human consciousness, through formation of consciousness window and frame.

Both consciousness window and frame are important in understanding some of the mystery in medicine and physics and it gives a valid explanation why human loss consciousness when the heart rate is too slow or too fast, which will be discussed in a separate article. Interestingly, the primary visual cortex of human brain together with heart sounds have the ability to generate the numeric value of Pi π through a mathematical equation which will be outlined in sperate article.

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