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What Are the Truths of Time and Space

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[Abstract]
Space and Time are continuous absolute quantities. They don't change with anything at all. However, the dimension and duration of an object or event can change with the local gravitational field and aging of the universe. This is because that Wu's Unit Length (diameter) and Wu's Unit Time (period) of Wu's Pairs (building blocks of the universe) in an object or event can be affected by the bombardment of gravitons complying with gravitational field in accordance to Graviton Radiation and Contact Interaction Theory, and also the shrinkage of Wu's Pairs due to aging of the universe in compliance with Cosmic Microwave Background Radiation (CMB). According to Wu's Spacetime Shrinkage Theory and intrinsic atomic and subatomic structures, a linear relationship is proposed between the quantities of the property of a corresponding identical object or event and the gravitational field and aging of the universe. In addition, under Thermodynamic Equilibrium and local Subatomic Equilibrium, three fundamental principles: Principle of Equilibrium, Principle of Parallelism and Principle of Correspondence are derived, such that the correlations of the quantities of the properties between two objects or events at the same location and time (same gravitational field and aging of the universe) can be established. Furthermore, based on Wu's Spacetime Equation $t_{yy} = \gamma l_{yy}^{3/2}$, Wu's Unit Length and Wu's Unit Time of Wu's Pair are correlated to each other. As a result, the correlations of the simple properties such as dimension and duration, or the composite properties such as velocity and acceleration of an object or event, with respect to the gravitational field and aging of the universe, or further to Wu's Unit Length of a reference corresponding identical subatomic particle at the same location and time (same gravitational field and aging of the universe) can be established. This can be used successfully to interpret many important physical phenomena, such as Deflection of Light, Perihelion Precession of Mercury, Cosmological Redshift, Gravitational Redshift, Hubble's Law, Einstein's General Relativity, Spacetime and Field Equations.

[Keywords]
Space, Time, Spacetime, Special Relativity, General Relativity, Velocity Time Dilation, Gravitational Time Dilation, Wu's Spacetime Equation, Wu's Spacetime Shrinkage Theory, Cosmological Redshift, Gravitational Redshift, Subatomic Equilibrium, Corresponding Identical Object, Principle of Equilibrium, Principle of Correspondence, Principle of Parallelism, Yangton and Yington, Wu's Pairs, Graviton Radiation and Contact Interaction,

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I. Introduction

What is "Time"? What is "Space"? And what is "Spacetime"? Nobody really knows. Not Newton, not Einstein, definitely not Stephen Hawking. It was Einstein first found out that space and time are somehow correlated to each other, but he didn't know that both space and time are absolute quantities and they don't change with anything at all. Einstein proposed that space and time can change with velocity and acceleration. It is false or at least partially false. In fact, instead of space and time, it is the dimension and duration of an object or event composed of Wu's Pairs that are correlated to each other and can change under the influence of local gravitational field and aging of the universe. In this paper, a detailed study based on Yangton and Yington Theory will be discussed and reviewed.

II. What is Space?

According to Yangton and Yington Theory [1], it is proposed that "Space" and "Energy" ("Matter" is a cluster of energy) are cogenerated simultaneously from "None" (nothing – no space, time, energy, or matter) at Singularity in Big Bang 13.8 billion years ago. They can coexist in the universe for long time until the recombination and cancellation of each other with matter and time all together at the Singularities in the black holes under massive gravitational force or in Wu's Pairs [2] after trillion years aging of the universe, such that they could eventually go back to None [3].

Space is a continuous absolute nature quantity. It doesn't change with anything at all. Space is continuous except at the Singularities where there is nothing, no space, energy, matter and time at all. Space provides room to place and distribute energy and matter (a cluster of energy). An object composed of matter occupies certain amount of space known as "Dimension" (Length in one dimension and Volume in three dimensions) and takes a defined position in space known as "Location". The space between two objects or points is called "Distance". A three dimensional Cartesian system with three perpendicular axes scaled by a unit length at a reference point is used to coordinate the positions of objects (or points) in space.

Furthermore, dimension is a property of an object or event, which can change with the local gravitational field and aging of the universe [4]. Also, subject to the unit length used for the measurement, the amounts of unit length measured for the dimension of the object or event can be different.

III. What is Time?

Once "Space" and "Energy" (and "Matter") are generated from "None", "Time" is automatically formed to reflect the sequence of changes of the distribution of energy and motion of matter in space. Time is also a continuous absolute nature quantity based on the continuous circulation of Wu's Pairs (the building blocks of the universe). It doesn't change with anything at all. Time is continuous because that the circulation of Wu's Pairs is continuous. The continuous process changing the distribution of a group of objects is called "Event". The period of time proceeded with an event between two stages is called "Duration".

Similar to dimension, duration is a property of an object or event, which can change with the local gravitational field and aging of the universe [4]. Also, subject to the unit time used for the measurement, the amounts of unit time measured for the duration of the object or event can be different.

IV. Gravity and Aging Effects on Dimension and Duration

The biggest mystery of modern physics is that "Dimension" and "Duration" of an object or event (not "Space" and "Time" themself) can change with the local gravitational field and aging of the universe [4]. This is because of the bombardment of gravitons complying with gravitational field in accordance to Graviton Radiation and Contact Interaction Theory [5], and also the shrinkage of Wu's Pairs due to aging of the universe in compliance with CMB [6].

Most people don't know the differences of "Space" and "Time" from "Dimension" and "Duration". Even Einstein was confused of space and time with dimension and duration. It is why Special Relativity [7] is based on a wrong postulation that light speed is constant. Also, General Relativity [8] is derived from a wrong theory that space and time are driven by acceleration instead of gravitational field. In addition, Einstein created a magic word "Spacetime" trying to correlate space and time together, which is actually nothing but a property (such as potential energy) of the object or event reflecting its local gravitational field and aging of the universe.

V. Subatomic Equilibrium

As all Wu's Pairs in an environment have fixed quantum energy states with fixed Wu's Unit Lengths (diameters of Wu's Pairs) and Wu's Unit Times (circulation periods of Wu's Pairs) at a location and time with fixed gravitational field and aging of the universe, it is called "Subatomic Equilibrium" [9]. On the other hand, in comparison, as all atoms and subatomic particles in an environment attain fixed structures at a fixed temperature and pressure, it is called "Thermodynamic Equilibrium".

A subatomic particle moves to a location and time with fixed gravitational field and aging of the universe, it undergoes the bombardment of gravitons complying with gravitational field in accordance to Graviton Radiation and Contact Interaction Theory, and also the shrinkage of Wu's Pairs due to aging of the universe in compliance with CMB. Wu's Pairs of the subatomic particle will come to a fixed quantum energy states with fixed diameters (Wu's Unit Lengths) and circulation periods (Wu's Unit Times) such that Subatomic Equilibrium can be achieved.

VI. Principle of Equilibrium

As an object or event under thermodynamic equilibrium at a fixed temperature and pressure comes further to subatomic equilibrium at a location and time with fixed gravitational field and aging of the universe, not only all the atoms and subatomic particles in the object or event have fixed structures, but also all Wu's Pairs of the subatomic particles in the object or event have fixed Wu's Unit Lengths, Wu's Unit Times and quantum energy states. Since the properties of an object or event are dependent on atomic and subatomic structures, and also Wu's Unit Lengths and Wu's Unit Times of Wu's Pairs in the subatomic particles, therefore, under thermodynamic equilibrium and subatomic equilibrium at a location and time with a fixed temperature, pressure, gravitational field and aging of the universe, all the properties of the object or event should attain fixed quantities. This is named "Principle of Equilibrium" [10].

VII. Corresponding Identical Object or Event

Under thermodynamic equilibrium, an object or event moves from one location and time to the other location and time, or two identical objects or events take place at two different locations and times, while each object or event is in subatomic equilibrium with its local gravitational field and aging of universe, the intrinsic atomic and subatomic structures of the object or event remain unchanged except Wu's Unit Lengths and Wu's Unit Times (or quantum energy states), no matter the location and time (or local gravitational field and aging of the universe). This is called "Corresponding Identical Transformation" (Fig. 1) and these objects or events are called "Corresponding Identical Object or Event" (Fig. 1) [10]. Because of the unchanging intrinsic atomic and subatomic structures, the properties of a corresponding identical object or event are dependent on Wu's Unit Lengths and Wu's Unit Times of the subatomic particles in the object or event.

Corresponding identical object likes a stretched rope of rubber bands. Each rubber band has a unit length. The total amount (intrinsic structure) of rubber bands doesn't change, but the length of each rubber band and the total length of the rope can be different subject to the stretching force. Corresponding identical object also likes the giant in "Jack and the Beanstalk" and the dwarfs in "Snow White". They have the same features as that of a normal man except in different sizes.

Corresponding identical event on the other hand likes a movie, where each picture runs by a unit time, the total amount (intrinsic structure) of pictures doesn't change, but the duration of each picture and the total playing time can be different subject to the running speed of the movie. Corresponding identical event also likes the Mickey Mouse cartoon pictures, the entire show can be completed by different time durations subject to the rolling speed of the pictures.

When a photon (free Wu's Pairs) intrudes in earth at an extremely high speed from a far distance star or a massive star, it carries Wu's Unit Length and Wu's Unit Time of its original light source (for example H_α) in the star, which is different from that of the photon generated from the same light source (H_α) on the present earth. In other words, the intruded photon is quenched from its original quantum energy state which is not in subatomic equilibrium with that on the present earth and thus it is not a corresponding identical object or event. This "quenching effect" is the reason that causes Cosmological Redshift [11] and Gravitational Redshift [12].

A corresponding identical object or event can be the photon emitted from electron in the covalent bond of a compound or the photon emitted from electron in the conduction band of a semiconductor. A typical example can be found in H_2 absorption spectrum where each characteristic line in the spectrum represents the wavelength of a photon emitted from a specific light source such as H_α. The wavelength is the property of the photon and the photon emitted from H_α is the corresponding identical object or event.

VIII. Wu's Spacetime Shrinkage Theory

An object or event at a location and time with large gravitational field and early aging of the universe has larger Wu's Unit Lengths (diameters of Wu's Pairs) and Wu's Unit Times (periods of Wu's Pairs) of Wu's Pairs, also renders larger dimension and duration than that of the corresponding identical object or event on the present earth. This is called "Wu's Spacetime Shrinkage Theory" [4]. Large Wu's Unit Lengths are caused by heavy bombardment of gravitons complying with large gravitational field in accordance to Graviton Radiation and Contact Interaction Theory, also resulted from early stage of aging of the universe in compliance with Cosmic Microwave Background Radiation (CMB). This can cause the slowdown of Yangton and Yington circulation and decrease the revolution frequency. Because of these reasons, large gravitational field can increase Wu's Unit Lengths (diameters) and Wu's Unit Times (periods) of Wu's Pairs in the corresponding identical object or event. Furthermore, because of the intrinsic atomic and subatomic structures, the dimension (space) and the duration (time) of the corresponding identical object or event can be increased at large gravitational field.

Furthermore, it is assumed that there is a linear relationship between Wu's Unit Lengths of Wu's Pairs in the corresponding identical object or event and the gravitational field and aging of the universe. In addition, according to Corresponding Identical Transformation, the quantities of the property of the corresponding identical object or event should also have a linear relationship with respect to gravitational field and aging of the universe. Therefore,

$$l_{yy} = k_1G + k_2T + l_{yy0}$$

$$P = K_1G + K_2T + P_0$$

Where l_{yy} is Wu's Unit Length, P is the quantity of the property, G is gravitational field, T is aging of the universe, k_1, k_2, K_1 and K_2 are constants, l_{yy0} is a constant Wu's Unit Length and P_0 is a constant quantity.

IX. Principle of Parallelism

Because of the linear relationships based on Corresponding Identical Transformation between the quantities of the property of a corresponding identical object or event and gravitational field and aging of the universe, the ratio between the quantities of the same property of two corresponding identical objects or events can be derived as follows:

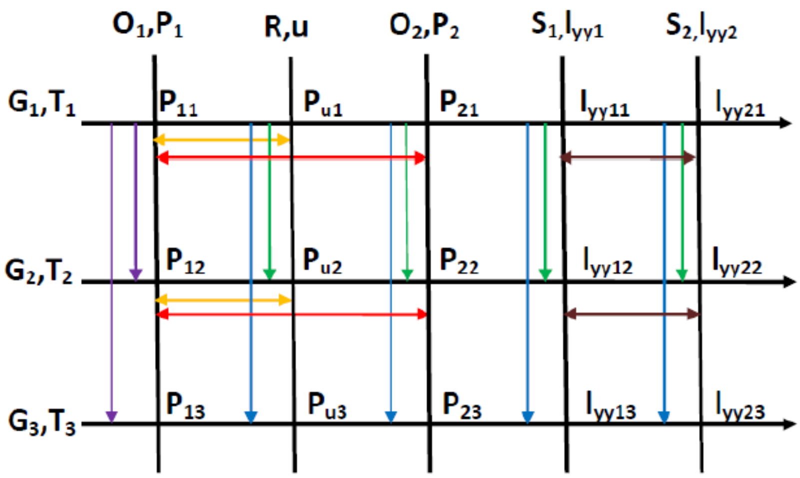

Fig. 1 The effects of gravitational field and aging of the universe on objects and events under thermodynamic equilibrium and subatomic equilibrium. Principle of Equilibrium (P_{ij}, l_{yyij}), Corresponding Identical Transformation (Green, Blue), Principle of Correspondence (Yellow), Principle of Parallelism (Red, Yellow, Brown), Wu's Spacetime Shrinkage (Purple, Green, Blue) (G = gravitational field, T = aging of the universe, O = object or event, R = reference, S = subatomic particle, P = property and l_{yy} = Wu's Unit Length).

As illustrated in Fig. 1, the quantities of the same property of object O_1 at three different locations G_1T_1, G_2T_2 and G_3T_3 can be represented by the following linear equations:

$P_{11} = K_1G_1 + K_2T_1 + P_0$

$P_{12} = K_1G_2 + K_2T_2 + P_0$

$P_{13} = K_1G_3 + K_2T_3 + P_0$

$P_{12} – P_{11} = K_1(G_2 – G_1) + K_2 (T_2 – T_1)$

$P_{13} – P_{11} = K_1(G_3 – G_1) + K_2 (T_3 – T_1)$

Therefore,

$(P_{12} – P_{11})/(P_{13} – P_{11}) = (K_1(G_2 – G_1) + K_2 (T_2 – T_1))/(K_1(G_3 – G_1) + K_2 (T_3 – T_1))$

A similarly result can be obtained for object O_2:

$(P_{22} – P_{21})/(P_{23} – P_{31}) = (K_1'(G_2 – G_1) + K_2' (T_2 – T_1))/ (K_1'(G_3 – G_1) + K_2' (T_3 – T_1))$

A. Case 1

When $G_2 > G_1$, $G_3 > G_1$ and $T_1 \approx T_2 \approx T_3$

$(P_{12} – P_{11})/(P_{13} – P_{11}) = K_1(G_2 – G_1)/K_1(G_3 – G_1) = (G_2 – G_1)/(G_3 – G_1)$

$(P_{22} – P_{21})/(P_{23} – P_{21}) = K_1'(G_2 – G_1)/K_1'(G_3 – G_1) = (G_2 – G_1)/(G_3 – G_1)$

Thus,

$(P_{12} – P_{11})/(P_{13} – P_{11}) = (P_{22} – P_{21})/(P_{23} – P_{21})$

B. Case 2

When $G_1 \approx G_2 \approx G_3$ and $T_2 > T_1$, $T_3 > T_1$

$(P_{12} – P_{11})/(P_{13} – P_{11}) = K_2(T_2 – T_1)/K_2(T_3 – T_1) = (T_2 – T_1)/(T_3 – T_1)$

$(P_{22} – P_{21})/(P_{23} – P_{21}) = K_2'(T_2 – T_1)/K_2'(T_3 – T_1) = (T_2 – T_1)/(T_3 – T_1)$

Thus,

$(P_{12} – P_{11})/(P_{13} – P_{11}) = (P_{22} – P_{21})/(P_{23} – P_{21})$

Therefore, for both cases there is one simple solution:

$P_{21} = K P_{11}$

$P_{22} = K P_{12}$

$P_{23} = K P_{13}$

Therefore,

$$P_1 = K P_2$$

Where P_1 and P_2 are two quantities of the same property of two corresponding identical objects or events and l_{yy} are Wu's Unit Lengths of a subatomic particle, K_1 and K_2 are constants associated with Object 1 or

Event 1, K_1' and K_2' are constants associated with Object 2 or Event 2, K is a constant associated with both objects or events.

As a result, the ratio between two quantities of the same property of two corresponding identical objects or events at the same gravitational field and aging of the universe is constant no matter gravitational field and aging of the universe. This is named "Principle of Parallelism" [13].

Because of Principle of Parallelism, same redshift can be found across the H_2 absorption spectrum from a far distance star. In addition, Principle of Parallelism works not only for simple properties such as length (meter) and time (second), but also for compound properties such as velocity (m/s) and acceleration (m/s^2). Furthermore, Principle of Parallelism works, only if Wu's Pairs is the building blocks of the universe and also law of conservation of mass is true.

X. Principle of Correspondence

According to Principle of Parallelism, as the property of a corresponding identical object or event measured by the unit quantity of the same property of a reference corresponding identical object or event at the same location and time (same gravitational field and aging of the universe), the amount of the unit quantity remain unchanged no matter the location and time (gravitational field and aging of the universe). This is named "Principle of Correspondence" [14]. In fact, Principle of Correspondence is a special case of Principle of Parallelism.

XI. Correspondence of Time

Based on Principle of Correspondence, the duration (a property) of a corresponding identical event measured by the unit time of a reference corresponding identical event at the same location and time (same gravitational field and aging of the universe) should have a constant "Amount of Unit Time" no matter the location and time (gravitational field and aging of the universe). This phenomenon is named "Correspondence of Time".

For example, a 3000 cycles pendulum swing event on Saturn takes the same amount of cycles but more slowly than that on earth because the pendulum swing on Saturn is slower with longer period (Saturn second) than that on earth (Earth second), due to Saturn's large gravity.

XII. Correspondence of Length

Similarly, based on Principle of Correspondence, the length (a property) of a corresponding identical object measured by the unit length of a reference corresponding identical object at the same location and time (same gravitational field and aging of the universe) should have a constant "Amount of Unit Length" no matter the location and time (gravitational field and aging of the universe). This phenomenon is named "Correspondence of Length".

For example, a man on Saturn can have the same six foot height but actually be taller than his twin on earth, because one foot on Saturn (Saturn foot) is longer than that on earth (Earth foot) due to Saturn's large gravity.

XIII. Duration of Event

"Duration" is a period of time proceeded between two stages of an event, which has a fixed quantity based on Principle of Equilibrium. Duration is dependent on the local gravitational field and aging of the universe according to Wu's Spacetime Shrinkage Theory. "Unit Time" is the duration of a specific reference event such as the vibration period of a quartz resonator or the period of electronic transition of an atomic clock at a specific gravitational field and aging of universe.

Based on Principle of Correspondence, the Amount of Unit Time remain unchanged as the duration of a corresponding identical event measured by the Unit Time of a reference corresponding identical event, no matter the location and time (gravitational field and aging of the universe.

Duration of an event can be measured by the Unit Time of a specific reference event at the same location and time. It can also be measured by the Unit Time of a specific reference event at different location and time. Duration of an event can be represented by the Amount of Unit Time multiplied by the Unit Time. For different measurement methods, the Amount of Unit Time can be different based on the quantity of the Unit Time.

XIV. Dimension of Object

Similarly, "Dimension" (or "Length") is the size of an object, which has a fixed quantity based on Principle of Equilibrium. Length is dependent on the local gravitational field and aging of the universe according to Wu's Spacetime Shrinkage Theory. "Unit Length" is the size of a specific reference object such as the diameter of Wu's Pairs (Wu's Unit Length) of a reference subatomic particle or the length of a human foot at a specific gravitational field and aging of universe.

Based on Principle of Correspondence, the Amount of Unit Length remain unchanged as the length of a corresponding identical object measured by the Unit Length of a reference corresponding identical object, no matter the location and time (gravitational field and aging of the universe.

Length of an object can be measured by the Unit Length of a specific reference object at the same location and time. It can also be measured by the Unit Length of a specific reference object at different location and time. Length of an object can be represented by the Amount of Unit Length multiplied by the Unit Length. For different measurement methods, the Amount of Unit Length can be different based on the quantity of the Unit Length.

Distance between two objects such as the distance between a star and earth really means the distance between two points. It is independent to the objects. Therefore it is not a function of gravitational field and aging of the universe.

XV. Wu's Unit Quantities

Since Wu's Pairs are the building blocks of all matters, therefore, for the measurements of the properties of an object or event, the following Wu's Unit Quantities of a reference subatomic particle at a reference location and time (or gravitational field and aging of the universe, either at the same or different locations and times as that of the object or event), can be used as the basic unit mass, basic unit time and basic unit length [4].

(1) Wu's Unit Mass (m_{yy}) – the mass of a single Wu's Pair
(2) Wu's Unit Time (t_{yy}) – the circulation period of Wu's Pair
(3) Wu's Unit Length (l_{yy}) – the diameter of Wu's Pair

XVI. Reference Object or Event and Reference Subatomic Particle

According to Principle of Equilibrium, under thermodynamic equilibrium at the same temperature and pressure, and subatomic equilibrium at the same local gravitational field and aging of the universe, all the quantities of the properties including length, time, velocity and acceleration of an object or event are dependent on the same local gravitational field and aging of the universe. In addition, the Normal Unit Length (centimeter) and Normal Unit Time (second) of a reference object or event, as well as Wu's Unit Length and Wu's Unit Time of a reference subatomic particle are also dependent on the same local gravitational field and aging of the universe. Because all of these quantities are one to one correspondence, therefore, all the quantities of the properties of an object or event are dependent on the Normal Unit Length (centimeter) and Normal Unit Time (second) of a reference object or event, and also dependent on Wu's Unit Length and Wu's Unit Time of a reference subatomic particle at the same location and time (same gravitational field and aging of the universe) [9].

The correlation between the quantity of the property of a corresponding identical object or event and the unit quantity of the same property of a reference corresponding identical object or event at the same gravitational field and aging of the universe, also the correlations between the quantities of the same property of two corresponding identical objects or events at the same gravitational field and aging of the universe can be derived from Principle of Equilibrium, Principle of Correspondence, Principle of Parallelism and Wu's Spacetime Equation. These correlations are used successfully in the explanation of many important physical phenomena, such as Deflection of Light [80][15], Perihelion Precession of Mercury [15], Cosmological Redshift [4], Hubble's Law [16], Einstein's General Relativity [8], Spacetime [17] and Field Equations [17], etc.

XVII. Dimension and Duration Measured By Different Unit Quantities

As an object or event moving under thermodynamic equilibrium and local subatomic equilibrium ("Corresponding Identical Object or Event"), its dimension and duration are dependent on the local gravitational field and aging of the universe. On the other hand, for the "Same Object or Event" which is in stationary at the same location and time (same gravitational field and aging of the universe), its dimension and duration don't change, however, while measured by different methods with different unit quantities, the amounts of the unit quantity can be different subject to the unit quantities of the measurement methods.

1. Wu's Time and Normal Time

A. Wu's Time

Since Wu's Pairs are proposed as the building blocks of all matters, the duration of an event called "Wu's Time" (T_w) can be measured by Wu's Unit Time (t_{yy}) of a reference subatomic event, and to be represented by the Amount of Wu's Unit Time (a) multiplied by Wu's Unit Time [4].

$$T_w = a\ t_{yy}$$

According to Correspondence of Time, as the time of a corresponding identical event is measured by Wu's Unit Time of a reference corresponding identical subatomic event at the same location and time (gravitational field and aging of the universe), the amount of Wu's Unit Time "a" should be a constant no matter the location and time (gravitational field and aging of the universe).

B. Normal Time

The duration of an event called "Normal Time" (T_n) can be measured by a "Normal Unit Time" (t_s) such as "second" of a reference normal event, and to be represented by the amount of normal unit time (t) multiplied by the normal unit time [4].

$$T_n = t\, t_s$$

According to Correspondence of Time, as the time of a corresponding identical event is measured by the normal unit time of a reference corresponding identical normal event at the same location and time (gravitational field and aging of the universe), the amount of normal unit time "t" should be a constant no matter the location and time (gravitational field and aging of the universe). For example, a Cesium oscillator has an oscillation period 1/9,192,631,770 Earth Seconds. The corresponding identical oscillator on Mars will also have an oscillation period of 1/9,192,631,770 Mars Seconds. However the second on Mars is Mars Second instead of an Earth Second.

2. Wu's Length and Normal Length

A. Wu's Length

Since Wu's Pairs are proposed as the building blocks of all matters, the length of an object called "Wu's Length" (L_w) can be measured by Wu's Unit Length (l_{yy}) of a reference subatomic object, and to be represented by the Amount of Wu's Unit Length (e) multiplied by Wu's Unit Length [4].

$$L_w = e l_{yy}$$

According to Correspondence of Length, as the length of a corresponding identical object is measured by Wu's Unit Length of a reference corresponding identical subatomic object at the same location and time (gravitational field and aging of the universe), the amount of Wu's Unit Length "e" should be a constant no matter the location and time (gravitational field and aging of the universe).

B. Normal Length

The length of an object called "Normal Length" (L_n) can be measured by a "Normal Unit Length" (l_s) such as "meter" of a reference normal length, and to be represented by the amount of normal unit length (l) multiplied by the normal unit length [4].

$$L_n = l\, l_s$$

According to Correspondence of Length, as the length of a corresponding identical object is measured by the normal unit length of a reference corresponding identical normal object at the same location and time (gravitational field and aging of the universe), the amount of normal unit length "l" should be a constant, no matter the location and time (gravitational field and aging of the universe). For example, a one foot ruler has a length on earth of 30.48 Earth Centimeters. The corresponding identical ruler on Mars will also have a length of 30.48 Mars Centimeters. However, the centimeter on Mars is Mars Centimeter instead of an Earth Centimeter.

3. Velocity, Normal Velocity and Wu's Velocity

Velocity is a quantity related to the change of the position of an object with respect to time. Velocity is defined by infinitesimal traveling length divided by infinitesimal traveling time.

$$V = \Delta L/\Delta T$$

Where V is velocity, $\Delta L = (L' - L)$ is infinitesimal traveling length and $\Delta T = (T' - T)$ is infinitesimal traveling time.

A. Normal Velocity

The velocity of a motion called "Normal Velocity" (V_n) can be measured by a "Normal Unit Velocity" (l_s/t_s) such as "meter/second" of a reference normal object or event, and to be represented by the amount of normal unit velocity (v) multiplied by the normal unit velocity (l_s/t_s) [4].

$$V_n = v\,(l_s/t_s)$$

Because,

$T_n = x\, t_s$ and $T_n' = x'\, t_s$

$L_n = y\, l_s$ and $L_n' = y'\, l_s$

$V_n = (L_n'-L_n) / (T_n'-T_n) = ((y'-y) / (x'-x))\, l_s/t_s$

Given

$v = (y'-y) / (x'-x)$

Therefore,

$$V_n = v\,(l_s/t_s)$$

Where V_n is Normal Velocity, v is amount of normal unit velocity and l_s/t_s is normal unit velocity.

According to the Principle of Correspondence, as the velocity of a corresponding identical object or event is measured by the normal unit velocity of a reference corresponding identical normal object or event at the same location and time (gravitational field and aging of the universe), the amount of normal unit velocity “v” should be a constant no matter the location and time (gravitational field and aging of the universe).

B. Wu’s Velocity

Similarly, the velocity of a motion called “Wu’s Velocity” (V_w) can be measured by Wu’s Unit Velocity (l_{yy}/ t_{yy}) of a reference subatomic particle, and expressed by the Amount of Wu’s Unit Velocity (w) multiplied by Wu’s Unit Velocity (l_{yy}/ t_{yy}) [4].

$$V_w = w\,(l_{yy}/t_{yy})$$

Where V_w is Wu’s Velocity, w is Amount of Wu’s Unit Velocity and l_{yy}/t_{yy} is Wu’s Unit Velocity.

According to the Principle of Correspondence, as the velocity of a corresponding identical object or event is measured by Wu’s Unit Velocity of a reference corresponding identical subatomic particle at the same location and time (gravitational field and aging of the universe), the amount of Wu’s Unit Velocity “w” should be a constant no matter the location and time (gravitational field and aging of the universe).

4. Acceleration, Normal Acceleration and Wu’s Acceleration

Acceleration is a quantity related to the change of the velocity of an object. Acceleration is defined by the infinitesimal divided by infinitesimal traveling time.

$$A = \Delta V/\Delta T$$

Where A is acceleration, $\Delta V = (V' - V)$ is infinitesimal velocity and $\Delta T = (T' - T)$ is infinitesimal traveling time.

A. Normal Acceleration

The acceleration of a motion called “Normal Acceleration” (A_n) can be measured by a “Normal Unit Acceleration” (l_s/t_s^2) such as “meter/second^2” of a reference normal object or event, and to be represented by the amount of normal unit acceleration (a) multiplied by the normal unit acceleration (l_s/t_s^2) [4].

$$A_n = a\,(l_s/t_s^2)$$

Because,

$T_n = x\,t_s$ and $T_n' = x'\,t_s$ and $T_n'' = x''\,t_s$

$L_n = y\,l_s$ and $L_n' = y'\,l_s$ and $L_n'' = y''\,l_s$

$V_n = (L_n'-L_n) / (T_n'-T_n) = ((y'-y) / (x'-x))\, l_s/t_s$

$V_n' = (L_n''-L_n') / (T_n''-T_n') = ((y''-y') / (x''-x'))\, l_s/t_s$

$A_n = (V_n' - V_n) /(T_n'' - T_n')$

$= [(y''-y') / (x''-x') - (y'-y) / (x'-x)]\, (l_s/t_s) /(x'' - x')t_s$

$= \{[(y''-y') / (x''-x') - (y'-y) / (x'-x)] / (x'' - x')\}\, (l_s/t_s)/t_s$

Given

$a = [(y''-y') / (x''-x') - (y'-y) / (x'-x)] / (x'' - x')$

Therefore,

$$A_n = a\,(l_s/t_s^2)$$

Where A_n is Normal Acceleration, “a” is amount of normal unit acceleration and l_s/t_s^2 is normal unit acceleration.

According to the Principle of Correspondence, as the acceleration of a corresponding identical object or event is measured by the normal unit acceleration of a reference corresponding identical normal object or event at the same location and time (gravitational field and aging of the universe), the amount of normal unit acceleration “a” should be a constant no matter the location and time (gravitational field and aging of the universe).

B. Wu’s Acceleration

Similarly, the acceleration of a motion called “Wu’s Acceleration” (A_w) can be measured by Wu’s Unit Acceleration (l_{yy}/ t_{yy}^2) of a reference subatomic particle, and expressed by the Amount of Wu’s Unit Acceleration (b) multiplied by Wu’s Unit Acceleration (l_{yy}/ t_{yy}^2) [4].

$$A_w = b\,(l_{yy}/t_{yy}^2)$$

Where A_w is Wu’s Acceleration, b is Amount of Wu’s Unit Acceleration and l_{yy}/t_{yy}^2 is Wu’s Unit Acceleration.

According to the Principle of Correspondence, as the acceleration of a corresponding identical object or event is measured by Wu’s Unit Acceleration of a reference corresponding identical subatomic particle at the same location and time (gravitational field and aging of the universe), the amount of Wu’s Unit Acceleration “b” should be a constant no matter the location and time (gravitational field and aging of the universe).

5. Same Object or Event versus Corresponding Identical Object or Event

As the “Same Object or Event” measured by different methods, the quantities of the property maintain the same, no matter of the measurement methods. For examples, Wu’s Time (T_w) and Normal Time (T_n) are the same time (T). Also, Wu’s Velocity (V_w) and Normal Velocity (V_n) are the same velocity (V). On the other hand, as the “Corresponding Identical Object or Event” measured by the reference corresponding identical project or event at the same location and time (gravitational field and aging of the universe), the amount of unit quantity remains unchanged, no matter the location and time (gravitational field and aging of the universe).

XVIII. Wu's Spacetime Equation

The circulation of Yangton and Yington Antimatter particles in Wu's Pairs is a revolution of Yangton and Yington particles around the normal axis of the circulation orbit. Fig. 2 is a schematic diagram of the circulation.

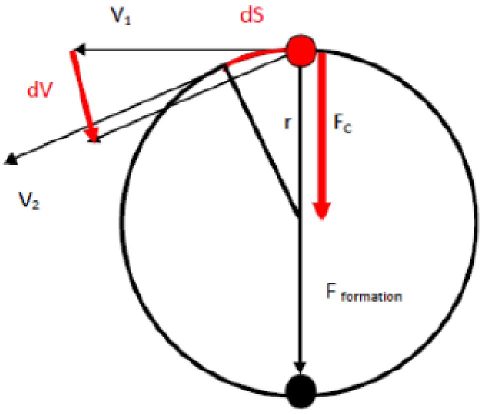

Fig. 2 Schematic diagram of a Wu's Pair.

Because of the circulation, the central acceleration (a_c) can be derived as follows:

$a_c = dV/dt = (VdS/r)/dt = V(dS/dt)/r = V^2/r$

And the center face can be represented as follows:

$F_c = ½\, m_{yy}\, a_c = ½\, m_{yy}\, V^2/r$

Where m_{yy} is the mass of a single Wu's Pair.

Also, because of Coulomb's Law of Electrical Force,

$F_{attraction} = k\, q_{yy}{}^2/(2r)^2$

Where k is Coulomb's Constant and q_{yy} is the charge of either a Yangton particle or a Yington particle (same but opposite charges).

And

$F_c = F_{attraction}$

Therefore,

$½\, m_{yy}\, V^2/r = k\, q_{yy}{}^2/(2r)^2$

$V^2 r = ½\, k\, (q_{yy}{}^2/m_{yy})$

Given

$$K = ½\, k\, (q_{yy}{}^2/m_{yy})$$

Therefore,

$$V^2 r = K$$

Where K is Wu Constant, V is the speed of circulation and r is the radius of the circulation orbit. This equation is named "Equation of Wu's Pair".

Furthermore,

$T = 2\pi r/V$

$T^2 = 4\pi^2 r^2/V^2 = 4\pi^2 r^3/V^2 r = 4\pi^2 r^3/K$

$T = 2\pi\, K^{-1/2}\, r^{3/2} = \pi\, (2K)^{-1/2}\, d^{3/2}$

Given

$\gamma = \pi\, (2K)^{-1/2}$

Because

$T = t_{yy}$

$d = l_{yy}$

Therefore,

$$t_{yy} = \gamma l_{yy}{}^{3/2}$$

Where K is Wu constant, t_{yy} is the circulation period (T) of Wu's Pairs, named "Wu's Unit Time", l_{yy} is the size of the circulation orbit (2r = d) of Wu's Pairs, named "Wu's Unit Length", and γ is Wu's Spacetime constant. This equation is named "Wu's Spacetime Equation" [4].

Wu's Spacetime Equation gives the correlation between Wu's Unit Time and Wu's Unit Length in a Wu's Pair. As a result, based on Principle of Parallelism and Wu's Spacetime Equation, all the quantities of the properties of an object or event such as velocity and acceleration can be correlated to Wu's Unit Length of a reference corresponding identical subatomic particle at the same location and time (gravitational field and aging of the universe) which can be used to explain many important physical phenomena including Deflection of Light, Perihelion Precession of Mercury and Einstein's Field Equations, etc.

XIX. Velocity and Spacetime

The velocity of an object or event measured by normal unit length and normal unit time of a normal object or event can be represented as follows:

$$V = v\ (l_s/t_s)$$

Where V is the velocity, "v" is the amount of normal unit velocity, I_s is normal unit length and t_s is normal unit time.
Because
$l_s = m\ l_{yy}$
$t_s = n\ t_{yy}$
$V = v\ (m/n)(l_{yy}/t_{yy})$
Also, because of Wu's Spacetime Equation,
$t_{yy} = \gamma l_{yy}^{3/2}$
$l_{yy}/t_{yy} = \gamma^{-1}\ l_{yy}^{-1/2}$
Therefore,

$$V = v\ m\ n^{-1}\ \gamma^{-1}\ l_{yy}^{-1/2}$$

Where V is the velocity, "v" is the amount of normal unit velocity, γ is the Wu's Spacetime constant, m is the ratio between the normal unit length of a reference normal object or event and Wu's Unit Length of a reference subatomic particle, n is the ratio between the normal unit time of the reference normal object or event and Wu's Unit Time of the reference subatomic particle. l_{yy} is Wu's Unit Length of the reference subatomic particle.
According to Principle of Correspondence and Principle of Parallelism, for a corresponding identical object or event moving from one location to another location or taking place in two locations under thermodynamic equilibrium and local subatomic equilibrium, v is a constant, m and n are reference-dependent constants. Therefore, the velocity of the corresponding identical object or event is proportional to the inverse square root of Wu's Unit Length ($l_{yy}^{-1/2}$) of the reference corresponding identical subatomic particle at the same location and time (gravitational field and aging of the universe).

$$V \infty\ l_{yy}^{-1/2}$$

As a result, for a corresponding identical object or event at high gravitational field or in ancient universe, because the size (l_{yy}) of Wu's Pair of the reference corresponding identical subatomic particle is bigger, therefore the velocity of the corresponding identical object or event is slower. This correlation can be used to interpret "Perihelion Precession of Mercury" [15]. The precession is caused by the reduction of the speed of Mercury which is due to the big Wu's Unit Length of the reference corresponding identical subatomic particle resulting from heavy graviton bombardment complying with the large gravitational field of the sun based on Graviton Radiation and Contact Interaction Theory [5].

XX. Acceleration and Spacetime

As the acceleration of an object or event is measured by Wu's Unit Length and Wu's Unit Time of a reference subatomic particle,

$$A = a\ (l_s/t_s^2)$$

$l_s = ml_{yy}$
$t_s = nt_{yy}$
$A = a\ (m/n^2)(l_{yy}/t_{yy}^2)$
Because of Wu's Spacetime Equation,
$t_{yy} = \gamma l_{yy}^{3/2}$
$l_{yy}/t_{yy}^2 = \gamma^{-2}\ l_{yy}^{-2}$
Therefore,

$$A = a\ m\ n^{-2}\ \gamma^{-2}\ l_{yy}^{-2}$$

Where A is the acceleration, a is the amount of normal unit acceleration, γ is the Wu's Spacetime constant, m is the ratio between normal unit length and Wu's Unit Length of the reference subatomic particle, n is the ratio between normal unit time and Wu's Unit Length of the reference subatomic particle, l_{yy} is Wu's Unit Length of the reference corresponding identical subatomic particle.
For the acceleration of a corresponding identical object or event, the amount of normal unit acceleration "a" is a constant, both m and n are reference-dependent constants. Therefore, the acceleration of the corresponding identical object or event is proportional to the inverse square of Wu's Unit Length (l_{yy}^{-2}) of the reference corresponding identical subatomic particle at the same location and time (gravitational field and aging of the universe).

$$A \infty\ l_{yy}^{-2}$$

As a result, for the acceleration of a corresponding identical object or event at high gravitational field or in ancient universe, because the size (l_{yy}) of Wu's Pair of the reference corresponding identical subatomic particle is bigger, therefore the acceleration is slower.

The correlations of velocity and acceleration of a corresponding identical object or event with respect to Wu's Unit Length of a reference corresponding identical subatomic particle at the same location and time (gravitational field and aging of the universe) can be used to explain many physical phenomena such as Deflection of Light, Perihelion Precession of Mercury, Cosmological Redshift, Hubble's Law, Einstein's General Relativity, Spacetime and Field Equations.

XXI. Einstein's Special Relativity and Velocity Time Dilation

Einstein's Special Relativity [7] is based on a postulation that the light speed in vacuum is constant no matter the light sources and observers (reference points). As a consequence, time on a moving object runs slower than that is stationary to the observer (reference point). This phenomenon is known as "Velocity Time Dilation" [18].

Einstein's Special Relativity and Velocity Time Dilation conflict to Photon Inertia Transformation [35] that light speed changes with observers (reference points) moving at different speeds and directions with respect to the light sources [19]. More specifically, it against the Equation of Light Speed that the speed of light observed at the reference point is a vector summation of the Absolute Light Speed (speed of photon observed at the light source dependent on local gravitational field, 3×10^8 m/s on earth) and the Inertia Light Speed (speed of light source observed at the reference point) [20]. Therefore, it is believed that Einstein's Special Relativity is false, as is the Velocity Time Dilation.

XXII. Einstein's General Relativity and Gravitational Time Dilation

Based on Einstein's General Relativity [7][8], both space and time can be influenced by acceleration, and acceleration can be affected by the gravitational field, therefore, the dimension of an object can increase with large acceleration or massive gravitational field, and clock runs more quickly at lower gravitational field or smaller acceleration, which is known as "Gravitational Time Dilation" [21]. Furthermore, according to Einstein's Spacetime Theory, light can be bent with the curvature of spacetime induced by the acceleration or gravitational field without changing the light speed.

In contrast, according to Wu's Spacetime Shrinkage Theory, large gravitational field implies heavy bombardment of gravitons which can cause the slowdown of Yangton and Yington circulation and decrease the revolution frequency. In other words, large gravitational field can increase Wu's Unit Length (diameter) and Wu's Unit Time (period) of Wu's Pairs in all subatomic particles of the object or event. Also because of intrinsic atomic and subatomic structures, the dimension (space) of the object could be enlarged and the duration (time) of the event could be slowed down at large gravitational field. This agrees very well with Einstein's General Relativity and Gravitational Time Dilation. However, because acceleration is dependent on the total forces, and gravitational force is only one of the Four Basic Forces, Einstein's general relativity is true only when acceleration is solely caused by the gravitational field. Also, unlike General Relativity, based on Principle of Parallelism and Wu's Spacetime Equation, light speed ($C \propto l_{yy}^{-1/2}$) decreases with increasing Wu's Unit Length caused by large gravitational field, and subsequently direction of light can also be changed.

XXIII. Principle of Correspondence versus General Relativity

In Einstein's General Relativity, both space and time are not absolute quantities. Instead, they can change with local gravitational field and become bigger at massive gravitational field. On the other hand, Einstein's spacetime is a solution of Einstein's Field Equation. Similar to potential energy, spacetime is a function (a property) of an object or event which has fixed quantity dependent on the local gravitational field and aging of universe.

In comparison, according to Principle of Equilibrium based on Yangton and Yington Theory, both dimension and duration are the properties of an object or event. They have fixed quantities dependent on the local gravitational field and aging of the universe. In addition, according to Wu's Spacetime Shrinkage Theory, both dimension and duration of a corresponding identical object or event can become bigger at large gravitational field and early aging of the universe. Therefore, Einstein's space and time are nothing but the dimension and duration of the object or event.

Furthermore, in compliance with Principle of Parallelism, Einstein's Spacetime considered as a property of a corresponding identical object or event, its quantities should be linearly related to the unit length and unit time of a reference corresponding identical object or event at the same gravitational field and aging of the universe. Therefore, the unit length (centimeter) and unit time (second) of the reference corresponding identical object (ruler) or event (clock) can be used to reflect the spacetime of Einstein's General Relativity [22], in the same way as that to reflect the local gravitational field and aging of the universe.

XXIV. Conclusion

Space and Time are continuous absolute quantities. They don't change with anything at all. However, the dimension and duration of an object or event can change with the local gravitational field and aging of the universe. This is because that Wu's Unit Length (diameter) and Wu's Unit Time (period) of Wu's Pairs (building blocks of the universe) in an object or event can be affected by the bombardment of gravitons complying with gravitational field in accordance to Graviton Radiation and Contact Interaction Theory, and also the shrinkage of Wu's Pairs due to aging of the universe in compliance with Cosmic Microwave Background Radiation (CMB). According to Wu's Spacetime Shrinkage Theory and intrinsic atomic and subatomic structures, a linear relationship is proposed between the quantities of the property of a corresponding identical object or event and the gravitational field and aging of the universe. In addition, under Thermodynamic Equilibrium and local Subatomic Equilibrium, three fundamental principles: Principle of Equilibrium, Principle of Parallelism and Principle of Correspondence are derived, such that the correlations of the quantities of the properties between two objects or events at the same location and time (same gravitational field and aging of the universe) can be established. Furthermore, based on Wu's Spacetime Equation $t_{yy} = \gamma l_{yy}^{3/2}$, Wu's Unit Length and Wu's Unit Time of Wu's Pair are correlated to each other. As a result, the correlations of the simple properties such as dimension and duration, or the composite properties such as velocity and acceleration of an object or event, with respect to the gravitational field and aging of the universe, or further to Wu's Unit Length of a reference corresponding identical subatomic particle at the same location and time (same gravitational field and aging of the universe) can be established. This can be used successfully to interpret many important physical phenomena, such as Deflection of Light, Perihelion Precession of Mercury, Cosmological Redshift, Gravitational Redshift, Hubble's Law, Einstein's General Relativity, Spacetime and Field Equations.

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