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Perihelion Precession of Mercury and Deflection of Light Interpreted by Yangton and Yington Theory

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[Abstract]: *According to Yangton and Yington Theory, a moving corresponding identical object and event has velocity related to Wu's Unit Length by $V \propto l_{yy}^{-1/2}$. In addition, l_{yy} increases when gravitational force becomes bigger based on Wu's Spacetime Shrinkage Theory. Therefore, a moving corresponding identical object and event, its velocity decreases with the increase of gravitational force. Furthermore, like the light refraction on the surface of a transparent substance, the decreasing speed of the object and event can make its traveling path bent towards the massive mass. As a result, instead of the cured Spacetime proposed by Einstein's general relativity, deflection of light and Perihelion Precession of Mercury can be interpreted by Yangton and Yington Theory.*
[Keywords]: *Wu's Pairs, Yangton and Yington, Wu's Spacetime, Wu's Spacetime Theory, Wu's Spacetime Shrinkage Theory, Principle of Correspondence, General Relativity, Einstein's Spacetime, Cosmological Redshift, Gravitational Redshift, Expansion of Universe, Deflection of Light, Perihelion Precession of Mercury.*

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I. Wu's Pairs

Yangton and Yington Theory [1] is a hypothetical theory based on a pair of super fine Antimatter particles "Yangton and Yington" with an inter-attractive force "Force of Creation" forming a permanent circulating particle pair named "Wu's Pair" [1] that is proposed as the fundamental building blocks of the universe. The theory explains the formation of all the substances in the universe and the correlations between space, time, energy and matter.

II. Wu's Spacetime

Wu's Spacetime [x, y, z, t](l_{yy}, t_{yy}) is a special four dimensional system that is defined by the Wu's Unit Length l_{yy} (the diameter of Wu's Pairs) and Wu's Unit Time t_{yy} (the period of Wu's Pairs) at the reference point. In which [x, y, z] are the position coordinates representing the amounts of Wu's Unit Length (l_{yy}) on three perpendicular axes measured at the reference point (Cartesian coordinate system) and [t] is the time coordinate representing the amount of Wu's Unit Time (t_{yy}) measured at the reference point.

III. Wu's Spacetime Theory

Fig. 1 is the schematic diagram of a Wu's Pair – a Yangton and Yington circulating Antimatter particle pair. The central acceleration (a_c) can be derived as follows:

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

Therefore,

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

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

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

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

Wher k is Coulomb's Constant and q_{yy} is the charge of a Yangton particle or a Yington particle.

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 named Wu Constant.

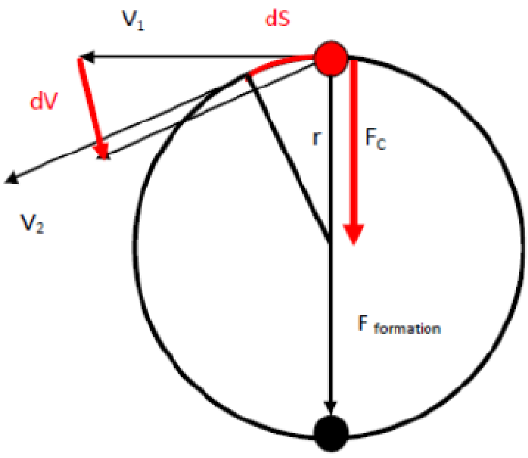

Fig. 1 Schematic diagram of a Wu's Pair.

The period (t_{yy}) and the size (l_{yy}) of the circulation orbit of Wu's Pairs (Fig.1) are correlated to each other as follows:

Because

$V^2r = K$

$T = 2\pi r/V$

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

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

Given

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

Therefore,

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

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

Both Wu's Unit Length and Wu's Unit Time are dependent on the gravitational field and aging of the universe at the reference point.

IV. Wu's Spacetime Shrinkage Theory

According to the Five Principles of the Universe [3] in Yangton and Yington Theory, through the aging of the universe, Wu's Pair is getting smaller and eventually Yangton will recombine with Yington to destroy each other such that everything will go back to Nothing.

As a result, Spacetime [x, y, z, t](l_{yy}, t_{yy}) shrinks because the diameter of Wu's Pair l_{yy} (Wu's Unit Length) becomes smaller due to the aging of the universe. The period of the circulation of Wu's Pair t_{yy} (Wu's Unit Time) also shrinks due to Wu's Spacetime Theory ($t_{yy} = \gamma l_{yy}^{3/2}$). This is called "Wu's Spacetime Shrinkage Theory" [2] which is the reason for Cosmological Redshift [4] and Universe Expansion [5].

Spacetime [x, y, z, t](l_{yy}, t_{yy}) also shrinks with small gravitational field which causes Gravitational Redshift [6]. This opposes Einstein's General Relativity [7] that is based on the curvature (acceleration) of an interwoven space-time continuum.

V. Time & Length

"Time" is the duration of an event. It is a "Nature Quantity" and has an absolute value. Time can be measured by a "Unit Time" and represented by the "Amount of Unit Time" multiplied by the "Unit Time" which is known as "Measured Quantity". Unit Time is also a nature quantity which is the period of a specific repeating process such as the circulation period of Wu's Pairs (Wu's Unit Time) and electronic transition in an atomic clock. The time duration of an event doesn't change, but with different measurements, the amount of unit time could be different subject to the duration of the Unit Time. For the corresponding identical objects and events, the Amount of Corresponding Identical Unit Time keeps the same, but the Corresponding Identical Unit Time could be different subject to the gravitational field and aging of the universe.

Similarly, “Length” is the size of an object. It is a nature quantity and has an absolute value. Length can be measured by a “Unit Length”, and represented by the “Amount of Unit Length” multiplied by the “Unit Length” as the measured quantity. Unit Length is also a nature quantity which is the length of a specific object such as the diameter of Wu’s Pairs (Wu’s Unit Length) and human’s foot. The length of an object doesn’t change, but with different measurements, the amount of Unit Length could be different subject to the size of the Unit Length. For the Corresponding Identical Objects and Events, the Amount of Corresponding Identical Unit Length keeps the same, but the Corresponding Identical Unit Length could be different subject to the gravitational field and aging of the universe.

Since Wu’s Pairs are the building blocks of all matter, a Wu’s Pair (Wu’s Unit Mass m_{yy}) can be used as the basic unit mass. Also, the circulation period of Wu’s Pair (Wu’s Unit Time t_{yy}) and the diameter of Wu’s Pair (Wu’s Unit Length l_{yy}) can be used as the basic unit time and basic unit length for the measurements of the objects and events at the same location with the same gravitational field and aging of the universe [8].

Because of the Conservation of Mass, Wu’s Unit Mass m_{yy}, the mass of a single Wu’s Pair, stays unchanged at all time. However, according to Wu’s Spacetime Theory that Wu’s Unit Time depends on Wu’s Unit Length ($t_{yy} = \gamma\ l_{yy}^{3/2}$), also basing on Wu’s Spacetime Shrinkage Theory [9] that Wu’s Unit Length increases with the gravitational field and decreases with the aging of the universe, Wu’s Unit Time and Wu’s Unit Length could be different from one location to the other location subject to the gravitational field and aging of the universe at the reference point.

VI. Principle of Correspondence

When an object or event takes place or moves to a different location under an equilibrium condition, it keeps all of its properties in a corresponding state while maintaining still the same mass. In other words, it keeps all of its properties with the same “Amounts of Quantities”, no matter the changes of “Unit Quantities” caused by the gravitational field and aging of the universe. This object is called “Corresponding Identical Object” and event is called “Corresponding Identical Event”.

Corresponding identical object likes a stretched rope of rubber bands. Each rubber band has a unit length. The total amount of rubber bands doesn’t change, but the length of each rubber band (corresponding identical unit length) and the total length of the rope could be different subject to the stretching force. Corresponding identical object also likes the giant in “Jack and the Beanstalk”, and the dwarf 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 motion pictures, where each picture runs by a unit time, the total amount of pictures doesn’t change, but the duration of each picture (corresponding identical unit time) and the total playing time could be different subject to the moving speed. 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.

For a corresponding identical object and event, its physical property can be measured by the corresponding identical unit of the property. The amount of corresponding identical unit of the property always maintains the same no matter of the gravitational field and aging of the universe. This phenomenon is known as “Principle of Correspondence” [10].

VII. Velocity and Spacetime

Because of “Wu’s Spacetime Theory”,

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

Therefore,

$$l_{yy}/t_{yy} = \gamma^{-1}\, l_{yy}^{-1/2}$$

For a moving object,

$V = v\ (l_s/t_s)$

$l_s = ml_{yy}$

$t_s = nt_{yy}$

$V = v\ (m/n)(\ l_{yy}/t_{yy})$

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 constant of Normal Unit Length, n is the constant of Normal Unit Time and l_{yy} is Wu’s Unit Length.

For a corresponding identical motion, the Amount of Normal Unit Velocity “v” is a constant, therefore the velocity V is proportional to $l_{yy}^{-1/2}$.

Since the emission of photon from a substance is a process of corresponding identical event, the Amount of Absolute Light Speed 3×10^8 maintains a constant, therefore the Absolute Light Speed C is proportional to $l_{yy}^{-1/2}$ [11].

$$C = c\ m\ n^{-1}\ \gamma^{-1}\ l_{yy}^{-1/2}$$
$$c = 3 \times 10^{8}$$
$$C \propto l_{yy}^{-1/2}$$

As a result, for photon emission at high gravitational field or in ancient universe, because the size of Wu's Pair l_{yy} is bigger and the Amount of Absolute Light Speed "c" is a constant (3 x 10^8), therefore the Absolute Light Speed C is slower.

However, for photon emission from the same light source, no matter of the frequency, the Absolute Light Speed "C" always maintains constant 3 x 10^8 cm/s observed at the light source (where cm/s is a Normal Unit Velocity on the light source).

VIII. Photon and Spacetime

For a photon moving in space,
$\nu = 1/t_{yy}$
Because of "Wu's Spacetime Theory",
$t_{yy} = \gamma l_{yy}^{3/2}$
Therefore,

$$\nu \propto l_{yy}^{-3/2}$$

Because,

$$C \propto l_{yy}^{-1/2}$$

$\lambda = C/\nu$
Therefore,

$$\lambda \propto l_{yy}$$

When the universe grows older, the circulation orbit (2r) of the Wu's Pair becomes smaller. Since V^2r is always a constant ($V^2r = k$) for an inter-attractive circulating pair such as a Wu's Pair (Fig. 21), the circulation speed (V) of a Wu's Pair becomes faster. Also, the circulation period ($T = 2\pi r/V$) of the Wu's Pair gets shorter. In other words, Wu's Unit Time ($t_{yy} = T$) and Wu's Unit Length ($l_{yy} = 2r$) both become smaller. As a result, when the universe grows older, the frequency ($\nu = 1/T$) of a photon becomes bigger, the light speed ($C \propto l_{yy}^{-1/2}$) becomes faster, and the wavelength ($\lambda \propto l_{yy}$) becomes smaller.

For a high gravitational field, the circulation speed (V) of a Wu's Pair becomes slower. Since V^2r is always a constant ($V^2r = k$) for an inter-attractive circulating pair such as a Wu's Pair, the size of circulation orbit (2r) of Wu's Pair becomes larger. Also, the circulation period ($T = 2\pi r/V$) of Wu's Pair gets longer. In other words, Wu's Unit Time ($t_{yy} = T$) and Wu's Unit Length ($l_{yy} = 2r$) both become bigger. As a result, for a low gravitational field, the frequency ($\nu = 1/T$) of a photon becomes smaller, the light speed ($C \propto l_{yy}^{-1/2}$) becomes slower, and the wavelength ($\lambda \propto l_{yy}$) becomes larger.

Furthermore, both Wu's Unit Length l_{yy} and Wu's Unit Time t_{yy} can be represented by Absolute Light Speed C as follows:
Because

$$C \propto l_{yy}^{-1/2}$$
$$t_{yy} \propto l_{yy}^{3/2}$$

Therefore,

$$l_{yy} \propto 1/C^2$$
$$t_{yy} \propto 1/C^3$$

As a result, photon can be considered as a marker of the Spacetime at the original light source. The photon's frequency ($\nu = 1/t_{yy}$), Absolute Light Speed ($C \propto l_{yy}^{-1/2}$) and wavelength ($\lambda \propto l_{yy}$) can carry the information of l_{yy} and t_{yy} of the Spacetime at the original light source deep into the universe. In other words, photon bears the DNA of the original light source.

IX. Deflection of light

The first observation of light deflection was performed by Arthur Eddington and his collaborators during the total solar eclipse of May 29, 1919 [12] when the stars near the Sun (at that time in the constellation Taurus) could be observed. Starlight that passes close to the sun before reaching us gets deflected (Fig. 2). This starlight will thus reach us from a slightly different direction than when the sun is in some different region of the sky. Accordingly, the star's position in the night sky is shifted slightly.

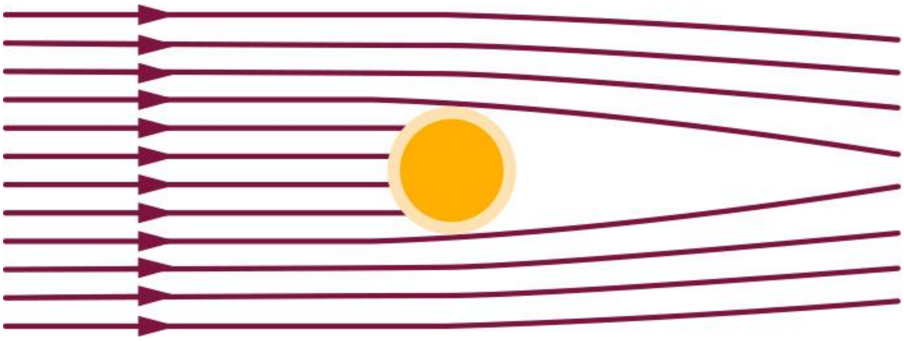

Fig. 2 Light deflection in the gravitational field of the sun.

In the early 20th century, Einstein successfully explained this phenomenon by his general relativity theory. He claimed that because space-time is highly curved around heavy mass, light rays can thus be deflected when passing by.

One important application of the light deflection effect is “Gravitational Lensing”, in which two or more images of one far-away object can be observed (Fig. 3).

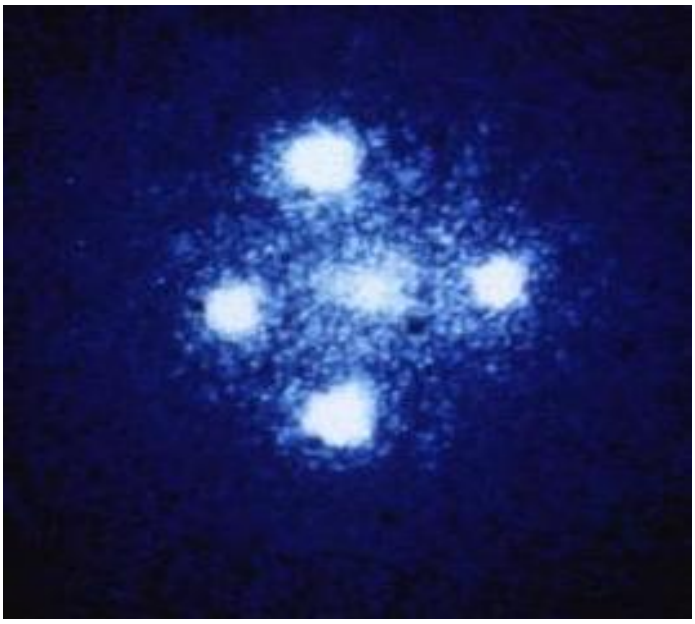

Fig. 3 Gravitational lenses generate an Einstein cross, image of the Hubble Space Telescope © NASA/ESA/STScI.

Masses acting as gravitational lenses have now become a standard tool of astronomy. They allow astronomers to infer the masses of cosmic objects, and the structure and size scale of the universe (with some caveats). Through their magnifying effect, gravitational lenses have also been used to observe the properties of very distant galaxies and quasars, as well as to search for planets around distant stars.

Light deflection can also be explained by Yangton and Yington Theory. Since the motion of photon is considered as a process of corresponding identical event, the Amount of Absolute Light Speed 3 x 10^8 maintains a constant, therefore the Absolute Light Speed C is proportional to $l_{yy}^{-1/2}$.

$$C = c\, m\, n^{-1}\, \gamma^{-1}\, l_{yy}^{-1/2}$$

$$c = 3 \times 10^8$$

$$C \propto l_{yy}^{-1/2}$$

When a photon moves close to a heavy mass, gravitational field becomes extremely large which makes l_{yy} bigger and C smaller. As a result, like light refraction in the transparent object, light rays are bent towards the heavy mass due to the decreasing speed of photon. This is called “Deflection of Light”.

X. Perihelion precession of Mercury

A long-standing problem in the study of the Solar System was that the orbit of Mercury did not behave as required by Newton's equations. In fact, it is found that the point of closest approach (Perihelion) of Mercury to the sun does not always occur at the same place but that it slowly moves around the sun (Fig. 4). This rotation of the orbit is called a "Perihelion precession" [13].

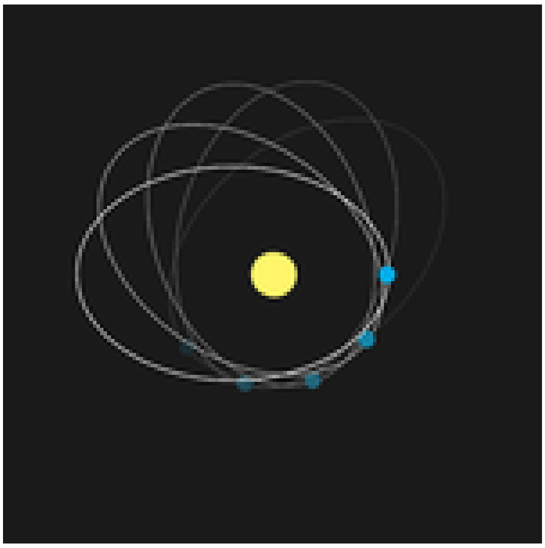

Fig. 4 Artist's version of the precession of Mercury's orbit.

As seen from Earth the precession of Mercury's orbit is measured to be 5600 seconds of arc per century (one second of arc=1/3600 degrees). Newton's equations, taking into account all the effects from the other planets (as well as a very slight deformation of the sun due to its rotation) and the fact that the Earth is not an inertial frame of reference, predicts a precession of 5557 seconds of arc per century. There is a discrepancy of 43 seconds of arc per century.

This discrepancy cannot be accounted for using Newton's formalism. Many ad-hoc fixes were devised (such as assuming there was a certain amount of dust between the Sun and Mercury) but none were consistent with other observations. In contrast, Einstein was able to predict, without any adjustments whatsoever, that the orbit of Mercury should precess by an extra 43 seconds of arc per century.

In a curved spacetime a planet does not orbit the Sun in a static elliptical orbit, as in Newton's theory. Rather, the orbit is obliged to precess because of the curvature of spacetime. When Einstein calculated the magnitude of this effect for Mercury he got precisely the previously unexplained 43". He correctly took the view that this was an important confirmation of his general relativity theory.

Perihelion Precession of Mercury can also be interpreted by Yangton and Yington Theory as follows:

Because

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

Where V is the velocity, "v" is the Amount of Normal Unit Velocity, γ is the Wu's Spacetime constant, m is the constant of Normal Unit Length, n is the constant of Normal Unit Time and l_{yy} is Wu's Unit Length.

For a corresponding identical motion as that Mercury circulating around the sun, the Amount of Normal Unit Velocity "v" is a constant, and the velocity "V" is proportional to $l_{yy}^{-1/2}$. When Mercury moves close to the sun, gravitational field becomes extremely large which makes l_{yy} bigger and V smaller. As a result, like light refraction in the transparent object, Mercury is deflected towards the sun due to the decreasing speed in each cycle caused by the extremely high gravitational field and thus Perihelion precession of Mercury can be observed.

XI. Conclusion

According to Yangton and Yington Theory, a moving corresponding identical object and event has velocity related to Wu's Unit Length by $V \propto l_{yy}^{-1/2}$. In addition, l_{yy} increases when gravitational force becomes bigger based on Wu's Spacetime Shrinkage Theory. Therefore, a moving corresponding identical object and event, its velocity decreases with the increase of gravitational force. Furthermore, like the light refraction on the surface of a transparent substance, the decreasing speed of the object and event can make its traveling path bent towards the massive mass. As a result, instead of the cured Spacetime proposed by Einstein's general relativity, deflection of light and Perihelion Precession of Mercury can be interpreted by Yangton and Yington Theory.

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