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Wu's Spacetime Field Equation Based On Yangton And Yington Theory

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Abstract: *Wu's Spacetime Field Equation is derived from Yangton and Yington Theory based on Wu's Unit Length l_{yy} (the diameter of Yangton and Yington Circulating Pairs) and Wu's Unit Time t_{yy} (the period of Yangton and Yington Circulating Pairs). Wu's Unit Length and Wu's Unit Time are correlated to each other by Wu's Spacetime Theory. They are also dependent on the gravitational field and the aging of the universe. Furthermore, instead of being a constant, the speed of light C is a function of Wu's Unit Length l_{yy}, which can increase the acceleration (the curvature of Spacetime) to form a deep continuum in Spacetime along the edge of a spherical mass (or black hole). As a result, the existence of black hole can be interpreted by Wu's Spacetime Field Equation. Also, the expansion of the universe can be explained by Wu's Spacetime Shrinkage Theory and Wu's Spacetime Reverse Expansion Theory without the modification of Wu's Spacetime Field Equation with Einstein's Cosmological Constant and dark energy.*
Keywords: *General Relativity. Einstein's Field Equations, Yangton and Yington, Wu's Pairs, Spacetime, Spacetime Shrinkage, Universe Expansion, Redshift, Black Hole, Dark Energy, Cosmological Constant.*

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I. Definition Of Time

"Time" is the duration of an event which can be measured by a "Unit Time" at the same location, to have a value equals to the amount of the Unit Time multiplied by the Unit Time. This Unit Time is the period of a specific repeating process such as the electronic transition in an atomic clock at the same location. Time doesn't change, but the amount of the Unit Time could be different subject to the duration of the Unit Time [1] [2].

II. Principle Of Time

Based on the Yangton and Yington theory that Wu's Pairs are the building blocks of all matter, each corresponding identical event occurred to a corresponding identical object takes exactly the same amount of the cycles, named "Relative Time", of the corresponding identical Unit Time, no matter where the event takes place and how the corresponding Unit Time is different from one location to the other. This theory is named "Principle 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 (longer period) than that on earth, due to Saturn's large gravity [1][2].

III. Definition Of Length

Similarly, "Length" is the size of an object which can be measured by a "Unit Length" at the same location, to have a value equals to the amount of the Unit Length multiplied by the Unit Length. This Unit Length is the end to end distance of a specific object such as human's foot at the same location. Distance doesn't change, but the amount of the Unit Length could be different subject to the size of the Unit Length [1] [2].

IV. Principle Of Length

Based on the Yangton and Yington theory that Wu's Pairs are the building blocks of all matter, each corresponding identical object has exactly the same amount of multiplication, named "Relative Length", of the corresponding identical Unit Length, no matter where the object is and how the corresponding Unit Length is different from one location to the other. This theory is named "Principle of Length". For example, a six foot tall man on Saturn can have the same six foot height but actually be taller than his twin on earth, because one foot on Saturn is longer than that on earth due to Saturn's large gravity [1] [2].

Space is a three dimensional system in the universe, in which objects have relative positions and directions. A three dimensional Cartesian System is commonly used to define the positions and directions of the objects in space. This contains three perpendicular axes, each of them linearly scaled by the numbers of the Unit Length of the reference point.

V. Wu's Time And Normal Time

5.1 Wu's Time

Since Wu's Pairs are proposed as the building blocks of all matter [1], the duration of an event called "Wu's Time" (t_w) can be measured by "Wu's Unit Time" (t_{yy}), the circulation period of a Wu's Pair at the same location, to have a value equals to the amount of Wu's Unit Time multiplied by Wu's Unit Time [1] [2].

According to the Principle of Time, Wu's Time (t_{w1}) the duration of an event at location 1 measured by Wu's Unit Time (t_{yy1}) at location 1 should have an equal value as Wu's Time (t_{w2}) of the corresponding identical event at location 2 measured by the corresponding Wu's Unit Time (t_{yy2}) at location 2, no matter the gravitational field and the aging of the universe. Therefore, for corresponding identical events at different locations,

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

Where "a" is a constant named "Relative Wu's Time".

5.2 Normal Time

The duration of an event called "Normal Time" (t_n) can be measured by a specific "Normal Unit Time" (t_s) at the same location, to have a value equals to the amount of the Normal Unit Time multiplied by the Normal Unit Time [1] [2].

Similarly, according to the Principle of Time, Normal Time (t_{n1}) the duration of an event at location 1 measured by a Normal Unit Time (t_{s1}) at location 1 should have an equal value as Normal Time (t_{n2}) of the corresponding identical event at location 2 measured by the corresponding Normal Unit Time (t_{s2}) at location 2, no matter the gravitational field and the aging of the universe.

Because,

$t_{n1} = bt_{yy1}$ and $t_{n2} = bt_{yy2}$

$t_{s1} = ct_{yy1}$ and $t_{s2} = ct_{yy2}$

$t_{n1} = (b/c)\ t_{s1}$ and $t_{n2} = (b/c)\ t_{s2}$

Where b and c are constants.

Given $d = b/c$

Therefore, for corresponding identical events at different locations,

$$t_n = dt_s$$

Where "d" is a constant named "Relative Normal Time".

For any event, the Normal Time (t_n) of the event measured by a Normal Unit Time (t_s) at the same location, will always have a constant value, no matter the gravitational field and the aging of the universe. For example, a Cesium oscillator has an oscillation period 1/9,192,631,770 seconds on earth. The corresponding identical oscillator on Mars will have the same oscillation period of 1/9,192,631,770 seconds. However the second on Mars is a Mars second instead of an earth second.

VI. Wu's Length And Normal Length

6.1 Wu's Length

Since Wu's Pairs are proposed as the building blocks of all matter [1], the length of an object called "Wu's Length" (l_w) can be measured by "Wu's Unit Length" (l_{yy}), the size of the circulation orbit of a Wu's Pair at the same location, to have a value equals to the amount of Wu's Unit Length multiplied by Wu's Unit Length [1] [2].

According to Principle of Length, Wu's Length (l_{w1}) of an object at location 1 measured by Wu's Unit Length (l_{yy1}) at location 1 should have an equal value as Wu's Length (l_{w2}) of the corresponding identical object at location 2 measured by the corresponding Wu's Unit Length (l_{yy2}) at location 2, no matter the gravitational field and the aging of the universe. Therefore, for corresponding identical objects at different locations,

$$l_w = el_{yy}$$

Where "e" is a constant named "Relative Wu's Length".

6.2 Normal Length

The length of an object called "Normal Length" (l_n) can be measured by a specific "Normal Unit Length" (l_s) at the same location, to have a value equals to the amount of the Normal Unit Length multiplied by the Normal Unit Length [1] [2].

Similarly, according to Principle of Length, Normal Length (l_{n1}) of an object at location 1 measured by a Normal Unit Length (l_{s1}) at location 1 should have an equal value as Normal Length (l_{n2}) of the corresponding identical object at location 2 measured by the corresponding Normal Unit Length (l_{s2}) at location 2, no matter the gravitational field and the aging of the universe.
Because,
$l_{n1} = ml_{yy1}$ and $l_{n2} = ml_{yy2}$
$l_{s1} = nl_{yy1}$ and $l_{s2} = nl_{yy2}$
$l_{n1} = (m/n)\ l_{s1}$ and $l_{n2} = (m/n)\ l_{s2}$
Where m and n are constants.
Given $p = m/n$
Therefore, for corresponding identical objects at different locations,

$$l_n = pl_s$$

Where "p" is a constant named "Relative Normal Length".
For any object, the Normal Length (l_n) of the object measured by a Normal Unit Length (l_s) at the same location will always have a constant value, no matter the gravitational field and the aging of the universe. For example, a one foot ruler has a length on earth of 30.48 cm. The corresponding identical ruler on Mars will have the same 30.48 cm length. However, the centimeter on Mars is a Mars centimeter not that of an earth centimeter.

VII. Normal Velocity And Wu's Velocity

7.1 Normal Velocity
The velocity of a motion called "Normal Velocity" (V_n) can be measured by a specific "Normal Unit Length" (l_s) over "Normal Unit Time" (t_s) at the same location, to have a value equals to the amount of the Normal Unit Velocity multiplied by the Normal Unit Velocity [1] [2].
According to Principle of Time and Principle of Length, Normal Velocity (V_{n1}) of a motion at location 1 measured by Normal Unit Length (l_{s1}) over Normal Unit Time (t_{s1}) at location 1, should have an equal value as the Normal Velocity (V_{n2}) of the corresponding identical process at location 2 measured by the corresponding Normal Unit Length (l_{s2}) over Normal Unit Time (t_{s2}) at location 2, no matter the gravitational field and the aging of the universe.
Because,
$t_{n1} = x\ t_{s1}$ and $t_{n1}' = x'\ t_{s1}$ and $t_{n1}'' = x''\ t_{s1}$
$l_{n1} = y\ l_{s1}$ and $l_{n1}' = y'\ l_{s1}$ and $l_{n1}'' = y''\ l_{s1}$
$V_{n1} = (l_{n1}'-l_{n1}) / (t_{n1}'-t_{n1}) = ((y'-y) / (x'-x))\ l_{s1}/t_{s1}$
$V_{n1}' = (l_{n1}''-l_{n1}') / (t_{n1}''-t_{n1}'') = ((y''-y') / (x''-x'))\ l_{s1}/t_{s1}$
Also,
$t_{n2} = x\ t_{s2}$ and $t_{n2}' = x'\ t_{s2}$
$l_{n2} = y\ l_{s2}$ and $l_{n2}' = y'\ l_{s2}$
$V_{n2} = (l_{n2}'-l_{n2}) / (t_{n2}'-t_{n2}) = ((y'-y) / (x'-x))\ (l_{s2}/t_{s2})$
Given $v = (y'-y) / (x'-x)$
Therefore, for corresponding identical motions at different locations,

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

Where "v" is a constant named "Relative Normal Velocity".

7.2 Wu's Velocity
Similar to Normal Velocity, the velocity of a motion called "Wu's Velocity" (V_w) can be measured by "Wu's Unit Length" (l_{yy}) over "Wu's Unit Time" (t_{yy}) at the same location, to have a value equals to the amount of Wu's Unit Velocity multiplied by Wu's Unit Velocity [1] [2].
Also, for corresponding identical motions at different locations, no matter the gravitational field and the aging of the universe,

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

Where "w" is a constant named "Relative Wu's Velocity".

VIII. Normal Acceleration and Wu's Acceleration

8.1 Normal Acceleration

The acceleration of a motion called "Normal Acceleration" (a_n) can be measured by a specific "Normal Unit Length" (l_s) over "Normal Unit Time" (t_s) at the same location, to have a value equals to the amount of the Normal Unit Acceleration multiplied by the Normal Unit Acceleration.
According to Principle of Time and Principle of Length, Normal Acceleration (a_{n1}) of a motion at location 1 measured by Normal Unit Length (l_{s1}) over Normal Unit Time (t_{s1}) at location 1, should have an equal value as the Normal Acceleration (a_{n2}) of the corresponding identical process at location 2 measured by the corresponding Normal Unit Length (l_{s2}) over Normal Unit Time (t_{s2}) at location 2, no matter the gravitational field and the aging of the universe.
Because,
$t_{n1} = x\, t_{s1}$ and $t_{n1}' = x'\, t_{s1}$ and $t_{n1}'' = x''\, t_{s1}$
$l_{n1} = y\, l_{s1}$ and $l_{n1}' = y'\, l_{s1}$ and $l_{n1}'' = y''\, l_{s1}$
$V_{n1} = (l_{n1}'-l_{n1}) / (t_{n1}'-t_{n1}) = ((y'-y) / (x'-x))\, l_{s1}/t_{s1}$
$V_{n1}' = (l_{n1}''-l_{n1}') / (t_{n1}''-t_{n1}') = ((y''-y') / (x''-x'))\, l_{s1}/t_{s1}$
$a_{n1} = (V_{n1}' - V_{n1})/(t_{n1}'' - t_{n1}')$
$= [(y''-y') / (x''-x') - (y'-y) / (x'-x)]\, (l_{s1}/t_{s1})/(x'' - x')t_{s1}$
$= \{[(y''-y') / (x''-x') - (y'-y) / (x'-x)] /(x'' - x')\}\, (l_{s1}/t_{s1})/t_{s1}$
Also,
$t_{n2} = x\, t_{s2}$ and $t_{n2}' = x'\, t_{s2}$ and $t_{n2}'' = x''\, t_{s2}$
$l_{n2} = y\, l_{s2}$ and $l_{n2}' = y'\, l_{s2}$ and $l_{n2}'' = y''\, l_{s2}$
$V_{n2} = (l_{n2}'-l_{n2}) / (t_{n2}'-t_{n2}) = ((y'-y) / (x'-x))\, (l_{s2}/t_{s2})$
$V_{n2}' = (l_{n2}''-l_{n2}') / (t_{n2}''-t_{n2}') = ((y''-y') / (x''-x'))\, l_{s2}/t_{s2}$
$a_{n2} = (V_{n2}' - V_{n2})/(t_{n2}'' - t_{n2}')$
$= [(y''-y') / (x''-x') - (y'-y) / (x'-x)]\, (l_{s2}/t_{s2})/(x'' - x')t_{s2}$
$= \{[(y''-y') / (x''-x') - (y'-y) / (x'-x)] /(x'' - x')\}\, (l_{s2}/t_{s2})/t_{s2}$
Given $a = [(y''-y') / (x''-x') - (y'-y) / (x'-x)] /(x'' - x')$
Therefore, for corresponding identical motions at different locations,

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

Where "a" is a constant named "Relative Normal Acceleration".

8.2 Wu's Acceleration
Similar to Normal Acceleration, the acceleration of a motion called "Wu's Acceleration" (a_w) can be measured by "Wu's Unit Length" (l_{yy}) over "Wu's Unit Time" (t_{yy}) at the same location, to have a value equals to the amount of Wu's Unit Acceleration multiplied by Wu's Unit Acceleration.
Also, for corresponding identical motions at different locations, no matter the gravitational field and the aging of the universe,

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

Where "b" is a constant named "Relative Wu's Acceleration".

IX. Definition Of Wu's Spacetime

In the universe, the position of an object is normally defined by a four dimensional system [x, y, z, t] at a reference point, in which [x, y, z] are the coordinates of three perpendicular axes in space measured by a unit length and [t] is the duration measured by a unit time. In MKS system, a Normal Unit Length such as "meter" and a Normal Unit Time such as "second" are used for the measurements. These units are independent on each other. "Wu's Spacetime" [x, y, z, t] (t_{yy}, l_{yy}) [3] is a special four dimensional system that is defined by Wu's Unit Length (l_{yy} – the size of Wu's Pairs) and Wu's Unit Time (t_{yy} – the period of Wu's Pairs) which are correlated to each other by Wu's Spacetime Theory. Wu's Unit Length and Wu's Unit Time are both dependent on the gravitational field and the aging of the universe. In contrast, the Unit Time and Unit Length in Einstein's Spacetime are constants and independent to each other. On the other hand, the Relative Time and Relative Length in Einstein's Spacetime are related to each other by general relativity. They are both dependent on the gravitational force. In contrast, the Wu's Relative Time and Wu's Relative Length in Wu's Spacetime are always remained unchanged.

X. Wu's Spacetime Theory

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

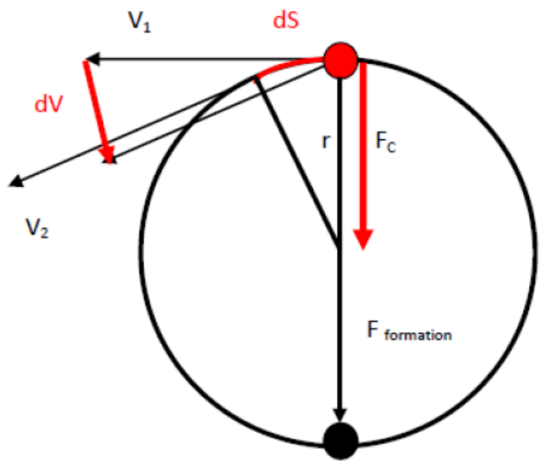

Fig. 1 Schematic diagram of Wu's Pair.

Because,

$$V^2r = \text{constant}$$

And,
$T = 2\pi r/V$
$T^2 = 4\pi^2r^2/V^2 = 4\pi^2r^3/V^2r = 4k_1\pi^2r^3$
$T = k_2r^{3/2}$
Where k_1 and k_2 are constants.
"Wu's Spacetime Theory" [2] is represented as follows:

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

Where 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) of Wu's Pairs called "Wu's Unit Length", and γ is Wu's Spacetime constant.

XI. Velocity and Spacetime

Because of "Wu's Spacetime Theory",
$t_{yy} = \gamma l_{yy}^{3/2}$
Therefore,
$l_{yy}/t_{yy} \propto l_{yy}^{-1/2}$
For a corresponding identical motion (or process) at different locations,
$V_n = v\,(l_s/t_s) = v\,(m/n)(l_{yy}/t_{yy})$ and $V_w = w\,(l_{yy}/t_{yy})$
Where v, m, n and w are constants.
Therefore,

$$V_n \propto l_{yy}^{-1/2} \quad \text{and} \quad V_w \propto l_{yy}^{-1/2}$$

For a motion (or a process) at a high gravitational field, or in an ancient universe, the size (l_{yy}) of a Wu's Pair is bigger, but both the Normal Velocity (V_n) and Wu's Velocity (V_W) of the motion (or a process) is slower. As a consequence, light speed (C) is also slower.

XII. Photon and Spacetime

For a photon moving in space,
$\nu = 1/t_{yy}$
Also,
$t_{yy} = \gamma l_{yy}^{3/2}$
Therefore,

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

Because,

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

$$\lambda = C/\nu$$

Therefore,

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

Where ν is frequency, C is light speed, λ is wavelength.
When the universe grows older, the circulation speed (V) of a Wu's Pair becomes faster. 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 size of the circulation orbit (2r) of the Wu's Pair becomes smaller. Also, the circulation period ($T = 2\pi r/V$) of the Wu's Pair gets smaller. 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 (ν) of a photon becomes bigger, the light speed (C) becomes faster, and the wavelength (λ) becomes smaller.
For a low gravitational field, the circulation speed (V) of a Wu's Pair becomes faster. 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 the circulation orbit (2r) of the Wu's Pair becomes smaller. Also, the circulation period ($T = 2\pi r/V$) of the Wu's Pair gets smaller. In other words, Wu's Unit Time ($t_{yy} = T$) and Wu's Unit Length ($l_{yy} = 2r$) both become smaller. As a result, for a low gravitational field, the frequency (ν) of a photon becomes bigger, the light speed (C) becomes faster, and the wavelength (λ) becomes smaller.
A photon can be considered a marker of the Spacetime of the light source. The photon's frequency (ν), light speed (C) and wavelength (λ) carry the information of l_{yy} and t_{yy} of the Spacetime of the light source deep into the universe. In other words, the photon bears the DNA of the light source.

XIII. Acceleration and Spacetime

Because of "Wu's Spacetime Theory",
$t_{yy} = \gamma l_{yy}^{3/2}$
Therefore,
$l_{yy}/t_{yy}^2 = \gamma^{-2} l_{yy}^{-2}$
For a corresponding identical motion at different locations,
$a_n = a (l_s/t_s^2) = a (m/n^2)(l_{yy}/t_{yy}^2)$
Therefore,

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

Where a is the Relative Normal Acceleration (a constant), γ is the Wu's Spacetime constant, m is the constant of a Normal Unit Length, n is the constant of a Normal Unit Time and l_{yy} is Wu's Unit Length.
For a corresponding identical motion (or a process) at a high gravitational field, or in an ancient universe, the size (l_{yy}) of a Wu's Pair is bigger, but the Normal Acceleration (a_n) of the motion (or a process) is slower.

XIV. Einstein's Field Equations

The Einstein field equations (EFE) may be written in the form:

$$R_{\mu\nu} - \frac{1}{2} R\, g_{\mu\nu} + \Lambda\, g_{\mu\nu} = \frac{8\pi G}{c^4} T_{\mu\nu}$$

where Rμν is the Ricci curvature tensor, R is the scalar curvature, gμν is the metric tensor, Λ is the cosmological constant, G is Newton's gravitational constant, c is the speed of light in vacuum (a constant), and Tμν is the stress–energy tensor.
The Einstein field equations comprise the set of 10 equations in Albert Einstein's general theory of relativity that describe the fundamental interaction of gravitation as a result of Spacetime being curved by mass and energy. First published by Einstein [4] in 1915 as a tensor equation, the EFE relate local Spacetime curvature (expressed by the Einstein tensor) with the local energy and momentum within that Spacetime (expressed by the stress–energy tensor).

To avoid the universe from collapsing, Einstein added the cosmological constant into the formula to balance the attraction force caused by the gravity. However, after Hubble showed us that the universe is expanding, this term was not longer necessary, because the universe is not static. Einstein later felt that the inclusion of this term was the biggest blunder of his career.

Similar to the way that electromagnetic fields are determined using charges and currents via Maxwell's equations, the EFE are used to determine the Spacetime geometry resulting from the presence of mass–energy and linear momentum, that is, they determine the metric tensor of Spacetime for a given arrangement of stress–energy in the Spacetime. The relationship between the metric tensor and the Einstein tensor allows the EFE to be written as a set of non-linear partial differential equations when used in this way. The solutions of the EFE are the components of the metric tensor. The inertial trajectories of particles and radiation (geodesics) in the resulting geometry are then calculated using the geodesic equation.

As well as obeying local energy–momentum conservation, the EFE reduce to Newton's law of gravitation where the gravitational field is weak and velocities are much less than the speed of light [5].

Exact solutions for the EFE can only be found under simplifying assumptions such as symmetry. Special classes of exact solutions are most often studied as they model many gravitational phenomena, such as rotating black holes [6] and the expanding universe [7]. Further simplification is achieved in approximating the actual Spacetime as flat Spacetime with a small deviation, leading to the linearized EFE. These equations are used to study phenomena such as gravitational waves [8].

XV. Wu's Spacetime Field Equation

Wu's Spacetime Field Equation can be derived as follows:

For a corresponding identical motion at different locations,

Because

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

$F = M_0\ a_n$

$C = k_1\ l_{yy}^{-1/2}$

Therefore,

$F = M_0\ a\ m\ n^{-2}\ \gamma^{-2}\ l_{yy}^{-2} = k_2\ \gamma^{-2}\ M_0\ a\ C^4$

Also,

$F = G\ M_0\ \Sigma(M/r^2)$

Therefore,

$$a = -\ \sigma\ \gamma^2\ G\ C^{-4}\ \Sigma(M/r^2)$$

This is named "Wu's Spacetime Field Equation". Where a is the relative normal acceleration, σ is a constant, γ is Wu's Spacetime constant, G is the gravitational constant and C is the speed of light which is a function of Wu's Unit Length l_{yy} (diameter of Wu's Pair) dependent on the gravitational field and the aging of the universe. The negative sign shows that the acceleration is toward the center of the spherical mass (or black hole).

Because the speed of light C is a function of l_{yy}, Wu's Spacetime Field Equation represents a group of contours in Spacetime having curvatures associated with the relative normal acceleration a, which not only reflects the distribution of energy and momentum of matter but also depends on Wu's Unit Length l_{yy}, the diameter of Wu's Pairs.

When an object moves toward the center of the spherical mass (or black hole), gravitational field F_g is getting bigger, so as the Wu's Unit Length l_{yy} (diameter of Wu's Pair). Meantime the speed of light C is getting smaller ($C \propto l_{yy}^{-1/2}$) and C^{-4} is getting bigger which can enhance the acceleration and enlarge the curvature ($a \propto C^{-4}/r^2$), so that a deep Spacetime continuum can be formed (Fig. 2). In other words, the existence of black hole can also be interpreted by Wu's Spacetime Field Equation.

As to the expansion of the universe, it can be explained by Wu's Spacetime Shrinkage Theory [2] and Wu's Spacetime Reverse Expansion Theory [9] without the modification of Wu's Spacetime Field Equation with Einstein's Cosmological Constant [4] and dark energy [10].

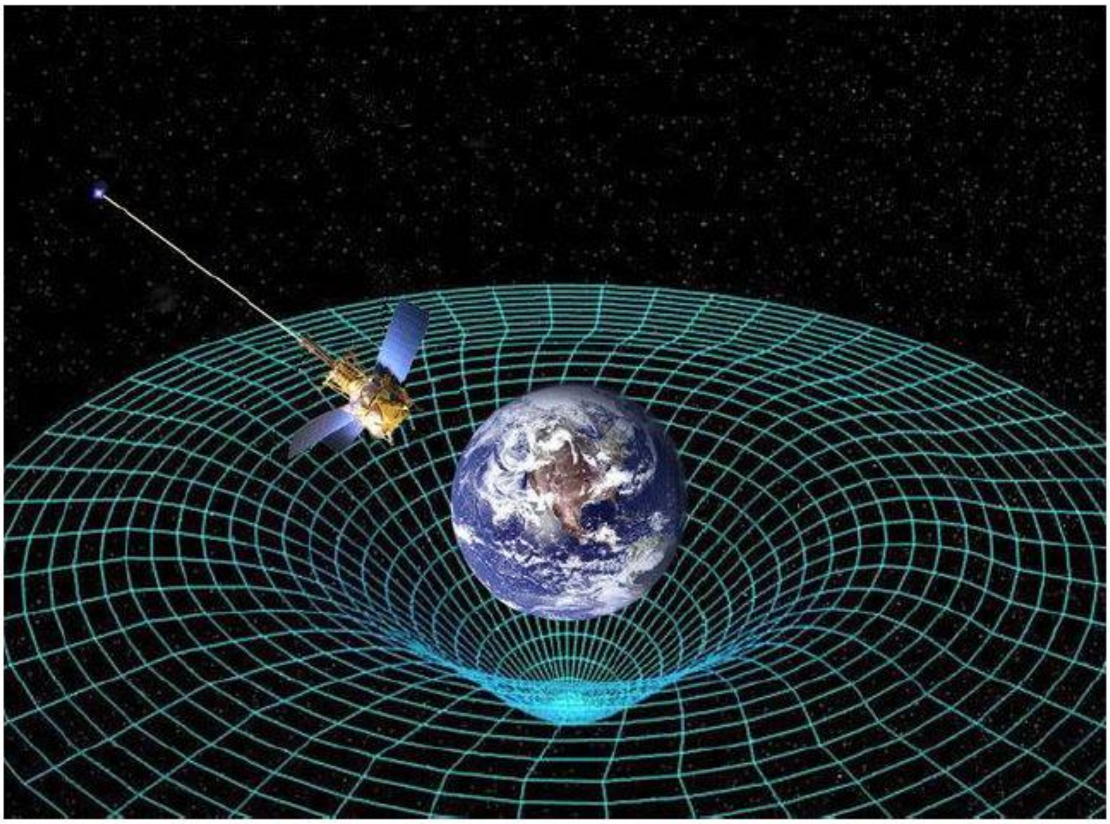

Fig. 2. Earth and Its Spacetime Continuum

XVI. Spacetime And Concentration Of Higgs Bosons

According to Wu's Yangton and Yington Theory, both Wu's Unit Time (t_{yy}) and Wu's Unit Length (l_{yy}) are functions of the gravitational field (F_g). Because the gravitational field is a function of the concentration of Higgs Bosons (C_{Higgs}), therefore, Spacetime [x, y, z, t] (t_{yy}, l_{yy}) is a four dimensional system of both gravitational field ($t_{yy}(F_g)$, $l_{yy}(F_g)$) and concentration of Higgs Bosons ($t_{yy}(C_{Higgs})$, $l_{yy}(C_{Higgs})$) at a reference point in the universe.

Similar to Wu's Spacetime Field Equation, A Spacetime Higg's Boson Concentration Equation can be obtained as follows:

Because

$\Sigma(M/r^2) = (C_{Higgs})$

Therefore,

$$a = - \sigma G C^{-4} (C_{Higgs})$$

This is named "Spacetime Higg's Boson Concentration Equation". Where σ is a constant and C_{Higgs} is the concentration of Higgs Bosons.

XVII. Spacetime And Aging Of The Universe – Cosmological Redshift

When the universe was young, the circulation speed (V) of Wu's Pairs was slower. Since V^2r is always a constant ($V^2r = k$) for an inter-attractive circulating pair such as Wu's Pairs, the circulation orbit (2r) of the Wu's Pairs was bigger. The circulation period ($T = 2\pi r/V$) of the Wu's Pairs was also bigger. When the universe was young, both Wu's Unit Length ($l_{yy} = 2r$) and Wu's Unit Time ($t_{yy} = T$) were bigger, which means the length was longer, time ran slower, and velocity was slower compared to that on earth today. As a result, light coming from a star greater than 5 billion years ago (5 billion light years away), travels at a lower speed with lower frequency and a larger wavelength. This phenomenon is known as "Cosmological Redshift" [11].

Because of the shrinkage of Wu's Spacetime with the aging of the universe, Wu's Spacetime Reverse Expansion Theory [9] can be derived to explain Hubble's Law and the expansion of the universe without the modification of Wu's Spacetime Field Equation with Cosmological Constant and dark energy.

XVIII. Spacetime And Gravitational Redshift

When a gravitational field increases, the attractive force between Higgs Bosons also increases. Thus 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 the circulation orbit (2r) of the Wu's Pair gets bigger. And the circulation period ($T = 2\pi r/V$) of the Wu's Pair also gets bigger. When the gravitational field increases, both Wu's Unit Length ($l_{yy} = 2r$) and Wu's Unit Time ($t_{yy} = T$) become greater, meaning time runs more slowly, length is longer and velocity is slower compared to that on earth. As a result, light comes from a large gravitational field traveling at a lower speed with a lower frequency and a larger wavelength. This phenomenon is known as "Gravitational Redshift" [12].

XIX. Conclusion

Wu's Spacetime Field Equation is derived from Yangton and Yington Theory based on Wu's Unit Length l_{yy} (the diameter of Yangton and Yington Circulating Pairs) and Wu's Unit Time t_{yy} (the period of Yangton and Yington Circulating Pairs). Wu's Unit Length and Wu's Unit Time are correlated to each other by Wu's Spacetime Theory. They are also dependent on the gravitational field and the aging of the universe. Furthermore, instead of being a constant, the speed of light C is a function of Wu's Unit Length l_{yy}, which can increase the acceleration (the curvature of Spacetime) to form a deep continuum in Spacetime along the edge of a spherical mass (or black hole). As a result, the existence of black hole can be interpreted by Wu's Spacetime Field Equation. Also, the expansion of the universe can be explained by Wu's Spacetime Shrinkage Theory and Wu's Spacetime Reverse Expansion Theory without the modification of Wu's Spacetime Field Equation with Einstein's Cosmological Constant and dark energy.

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