Quantum Space-Time bend of special relativity in Riemann multidimensional space Theory

Space is Quantic, ranging from the tiny dimension of the particle to the vastness of the Local Universe. According to Einstein, gravity is due to the curvature of space my guess is gravity exists due to the interaction on the microparticle level (ν) within a multidimensional framework encompassing mass, torsion field, space (μ), electric charge, heat, and sound… Mass gives gravity and gravity bends space and the two of them are materialized through the μ (muon) neutrinos particles and Higgs Boson gives the particle mass. The equation of quantic space is: $\frac{R_S}{r}\Delta f(r,t) = \frac{1}{c^2}\frac{\partial^2 f(r,t)}{\partial t^2}$ (1)

As initial condition $f(2R_S) = 0$, $f'(0)=R$ and the speed of interaction is the velocity of light c the same as electronic neutrino so gravity and space are two aspects of reality… Where f is the Quantic EOWF of space from the smallest to the wide expanse of space…

Initial condition $f(2R_{S,}\,0) = 0$ & $f(2R,0) = 0$ where Rs = is a constant distance.

Hence the value $2\cdot Rs = R\cdot$dimension nucleon/dim quark thus is $2\cdot 3.9228\cdot 0.841419/0.43\cdot 10^{25}$ m$=15.5329\cdot 10^{25}$ m = 16.418 billion Light Years.

Thus $2\cdot Rs \sim 16.41866$ billion Light-years

A) [$f(r,t) = 0$ for $r=2\cdot R_S$ for any t] that can be replaced with $g\,(2\cdot R_S) = 0$;

B) $f(2Rs,0) = 0$ for $t = 0$;

C) And that verifies the condition that the speed of interaction is the velocity of light c.

The above 3 conditions imposed onto the Muon Neutrino Effective Onduscular Wave Function f(r,t) uniquely determine the basis of separated solutions.

Thus space is the wave and the particle is elastic and can be bent and torched as a piece of rubber. Also the other quantum coordinates (space), time, mass, electric charge magnetic field, and temperature, gravity, light (phonon), all thus have a similar equation according to onduscular theory.

The particle in the motion is one-time quant a microparticle and one-time quant a wave of probability and between it executes an instant quantum jump from the successive position in space. At the transformation of the microparticle into a wave of probability, it emits a muon neutrino which gives the matrix repartition of the mass. That mince space is the wave and particle are elastic and can be bent and torched as a piece of rubber. Also, the other quantum coordinates in multidimensional space, gravity, time, phonon, electric charge, magnetic field temperature, light, and magnetism, and all thus have a similar equation, according to onduscular theory & mass (mass is peculiar).

The other physical quantities are derived from the basic of these 5 coordinates meaning that they are the combination of basic 9 (11 coordinates if we consider the space 3D).

Generalized (special) relativity can be applied below, all of these coordinates in the sense that each coordinate bends the so-called space-time curvature in Riemann's multidimensional space. These cords are with **spherical symmetry Gravity(ν)**, **Phonon, 3D space*(μ)***, *Time**(τ)***, Electric Charge (electron), Heat (Thermal Part), & *Mass coordinate* with the Bottom Quark and Higgs Boson as in Chromodynamics all of that bends space-time. With cylindrical symmetry magnetic field (mag) & torsion field (P_{To}) & light bends the space.

The similarity between muon neutrino (μ space) and electronic neutrino (ν graviton) equation and boundary condition was the reason that in general relativity the gravity field and space are the same things to Einstein: "Matter tells space how to curve, and curved space tells matter how to move" but those two are not the same thing.

$$\frac{R}{r}\Delta f(r,t) = \frac{1}{c^2}\frac{\partial^2 f(r,t)}{\partial t^2} \qquad (3)$$

The ratio between Rs and R, Rs/R=1979.8, implies that there is a transformation between the two equations indicating that the Effective Onduscular Wave Function is proportional but not equal. By substituting r = r/1979.8, Equations (3) and (1) become equivalent. Consequently, the curvature of space is approximately ~1980 times smaller than the curvature caused by the gravitational field. Although space and the gravitational field are highly similar, and the curvature of space exhibits similarities, they differ in terms of structure and coverage. ν governs gravity, while μ governs space, which is completely distinct in terms of structure and values of the field. Link: http://www.michaelvio.byethost8.com/GravBend.pdf

Therefore, gravity does not arise from the geometric nature of space, but rather at the quantum level as a result of the change in the electronic neutrino (ν). Einstein's General Relativity is not merely a conjecture but rather a deduction at the quantum level, derived from the Onduscular Torsion Field Equations (1) and (3), and it involves a particle called the graviton (ν) that acts as the mediator of gravity, interacting with all atomic nuclei. It can be assumed that Space-Time curves due to the presence of gravity, mass, time, phonon, and heat, exhibit a spherical symmetry that is first ordered linear and thus allows superposition. Thus, for simplification, we take the Sun supposing that is a sphere with homogeneous density and we study the Riemann curvature due to gravity thus ν, τ, and μ neutrino, and the checking will be Schwarzschild radius as follows. (The expansion is generated by space expansion due to the μ neutrino and rejection of ν for a distance 2R >~ 8.293 mil Light Years ~ $7.8456 \cdot 10^{22}$ m

Einstein's equation: $R_{\mu\nu} - \frac{1}{2} R_C g_{\mu\nu} + \Lambda g_{\mu\nu} = -\frac{8\pi G}{c^4} T_{\mu\nu} = -KT_{\mu\nu}$ (4)

Where $R_{\mu\nu}$ is the Ricci curvature tensor, $g_{\mu\nu}$ is the metric tensor R_c is the Ricci scalar curvature of spacetime and $T_{\mu\nu}$ is the stress-energy tensor the cosmological constant was introduced by Einstein to fix the expansion of the Local Universe.

Each member of (4) has the dim $[L^{-2}]$, G is the Newtonian constant of gravitation and c is the speed of light in the vacuum: 299792458 m/s, G = $6.6743 \cdot 10^{-11} m^3/Kg \cdot s^2$

$K = \frac{8\pi G}{c^4} = 2.076647443 \cdot 10^{-43} N^{-1} [s^2/m \cdot Kg]$;

with cords (x1, x2, x3, x4) => (ct, r, θ, ϕ) in the Schwarzschild simplification with spherical symmetry and the Sun mass m = $M_\odot$ =$1.9885 \cdot 10^{30}$Kg:

$$g_{\mu\nu} = \begin{bmatrix} -\left(1 - \frac{2Gm}{rc^2}\right) & 0 & 0 & 0 \\ 0 & -r^2 & 0 & 0 \\ 0 & 0 & -r^2 sin^2(\theta) & 0 \\ 0 & 0 & 0 & \left(1 - \frac{2Gm}{rc^2}\right)^{-1} \end{bmatrix}$$

The **Schwarzschild metric** solution: $ds^2 = e^{2\phi}(cdt)^2 - r^2 d\theta^2 - r^2 \sin(\theta)^2 d\Phi^2 - e^{2\Lambda} dr^2$;
Where ϕ and Λ are functions of r only that we are going to determine thus according to [1].

$e^{2\phi} = e^{-2\Lambda} = \left(1 - \frac{2Gm}{rc^2}\right) \Leftrightarrow ds^2 = -\frac{rc^2 - 2Gm}{r} dt^2 + r^2 d\theta^2 + r^2 \sin(\theta)^2 d\Phi^2 + \frac{rc^2}{rc^2 - 2Gm} dr^2$ (5)

For P_γ the γ-ray particle, the ½ in equation (4) [$½R_c \cdot g_{\mu\nu}$] is the same as in Einstein's equation.
For tau neutrino metric with a translation of spherical coordinates with the notation R_{Schwar} = R_S and $R_S = \frac{2Gm}{c^2}$ „**TransformCoordinates**" TR: $TR := r = 1 - \frac{2\rho}{Rs} = \frac{mG - \rho c^2}{mG}$ that involves transforming the coordinates of a given tensor or expression from one coordinate system to another. This operation changes the representation of the tensor or expression without altering its underlying mathematical properties. (5.1)

$$ds_{21}{}^2 = -\frac{c^6(mG-rc^2)}{m^2G^2(c^4r-2mGc^2+2m^2G^2)}dr^2 + \frac{(mG-rc^2)^2}{m^2G^2}d\theta^2 + \frac{(mG-rc^2)^2}{m^2G^2}\sin(\theta)^2 d\Phi^2 + \frac{(c^4r-2mGc^2+2m^2G^2)}{(mG-rc^2)}dt^2$$

With $T_{\mu\nu}$ tensor stress - energy = 0 and tensor Ricci = 0 cosmological constant Λ has a null value equation that becomes 0 = 0. (file SchwarAXR.mw with Maple 2021 Physics).
With this Coordinates Transformation, we have Ricci scalar and Λ equal to zero.
After that, we go back to variable changing with the inverse transformation „**change variable**” $\rho = \frac{mG(1-r)}{c^2}$ that change the metric (5.1) and starting from metric as a function only for „r” not all the coordinates we obtain a transformation as in [2] of the metric (6):

$$ds_{22}{}^2 = -\frac{c^6 r}{m^2G^2(2mG-rc^2)}dr^2 + r^2 d\theta^2 + r^2\sin(\theta)^2 d\Phi^2 + \frac{(2mG-rc^2)}{r}dt^2 \qquad (6)$$

For equation $R_{\mu\nu} - \frac{1}{2}R_c g_{\mu\nu} + \Lambda g_{\mu\nu} = -\frac{8\pi G}{c^4}T_{\mu\nu} = -KT_{\mu\nu}$ (7) (This change of variables does not alter the metric tensor itself but allows you to express it in terms of different coordinate systems) Thus for the metric (6), we have Ricci scalar and Λ not null.

$R_{cp} = 2\frac{c^4-G^2m^2}{c^4r^2}$ and cosmological constant $\Lambda_p = \frac{c^4-G^2m^2}{12c^4r^2}$

For this metric (Eq. 6), the Ricci scalar and Λ are **non-zero**:

$$R_{cp} = 2\,\frac{c^4 - G^2m^2}{c^4r^2}$$

$$\Lambda_p = \frac{c^4 - G^2m^2}{12\,c^4r^2}$$

The modified metric tensor $g_{\mu p}$ and the proportional constant take the form:

$$K_p = \frac{G}{c^2} = 7.42616 \times 10^{-28} \text{ [m/kg]}$$

Important distinction: Metric (6) is **not** the standard Schwarzschild vacuum solution. It arises from a specific non-trivial change of variables and produces non-zero Ricci curvature and a non-zero cosmological constant. The condition for $T_{\mu p} = 0$ requires $Gm = c^2$, which for the Sun gives $m = c^2/G \approx 1.35 \times 10^{27}$ kg — ***about 675 times smaller*** than the solar mass $M_\odot = 1.9885 \times 10^{30}$ kg. This is a special algebraic condition imposed to close the system, and the physical interpretation is that the γ-ray & torsion field curvature is ***abut 675 times smaller*** than gravitational field space curvature generated by Sun.
With the substitution $m = 2M/R_S$ (where M is a re-scaled mass parameter), the cosmological constant becomes:

$$\Lambda_\tau = \frac{c^4R_S^2 - 4G^2M^2}{12\,R_S^2\,c^4\,r^2}$$

Thus, with c = light speed G gravitational constant and m the Sun mass:

$$g_{\mu p} = \begin{bmatrix} \frac{rc^6}{G^2m^2(rc^2+2Gm)} & 0 & 0 & 0 \\ 0 & r^2 & 0 & 0 \\ 0 & 0 & r^2\sin(\theta)^2 & 0 \\ 0 & 0 & 0 & \frac{-rc^2-2Gm}{r} \end{bmatrix}$$

and null Tensor Energy $T_{\mu p} = 0$ for $G\cdot m = c^2$. With notation $R_{Schwarzschild} = R_S$ and substitution

$$m = \frac{2M}{R_S} \text{ thus: } \Lambda_\tau = \frac{c^4R_S{}^2 - 4G^2M^2}{12R_S{}^2c^4r^2}\,;\; g_{\mu p} = \begin{bmatrix} \frac{-R_S{}^3c^6r}{4(-rR_Sc^2+4GM)G^2M^2} & 0 & 0 & 0 \\ 0 & r^2 & 0 & 0 \\ 0 & 0 & r^2 sin(\theta)^2 & 0 \\ 0 & 0 & 0 & \frac{-rR_Sc^2+4GM}{rRs} \end{bmatrix}$$

Diagonal [4x4] tensor in spherical symmetry of the Sun only, hypothesis, thus null tensor:

$$T_{\mu p} = \begin{bmatrix} 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix}$$

The eigenvalues of the characteristic polynomial gave the solution $c^2 = mG$ possible if we make a substitution $m = \frac{2M}{R_S}$ where m is the Sun mass thus, we have null Tensor $T_{\mu p}$.

$$K_p = \frac{G}{c^2} = 7.42616 \cdot 10^{-28} \; [m/Kg]$$

For the Spherical symmetric distribution of matter like the Sun and void space outside $T_{\mu p}$ = Diagonal [4x4] tensor in spherical symmetry of the Sun only, hypothesis. We have the tensor stress-energy $T_{\mu p}$ tensor not null according to the radial flux value of the γ ray particle. Thus, the tensor stress energy if we take the approximation based on the template:

For the P_γ we have: $R_{\mu p} - \frac{1}{2} R_{cp} g_{\mu p} + \Lambda g_{\mu p} = -K_p T_{\mu p}$

So the equations are the same boundary conditions as in equation (3) we have f(2R,t) = 0 as for gravity ν neutrino the so P_γ has spherical symmetry:

$R_{\mu p} - \frac{1}{2} R_{cp} g_{\mu p} + \Lambda g_{\mu p} = -K_p T_{\mu p}$ where $K_p = \frac{G}{c^2} = 7.42616 \cdot 10^{-28} \; [m/Kg]$ the proportional constant (7) So, the total amount of space bend is linear of the first degree, thus cumulative with Einstein's equation of the Schwarzschild radius of the Sun with m mass. The two equations are similar but with different Ricci scalar and Ricci curvature tensors, Λ and constants K_p:

$R_{\mu\nu} - \frac{1}{2} R_c g_{\mu\nu} + \Lambda g_{\mu\nu} = -\frac{8\pi G}{c^4} T_{\mu\nu} = -K T_{\mu\nu}$; $R_{\mu p} - \frac{1}{2} R_{cp} g_{\mu p} + \Lambda g_{\mu p} = -K_p T_{\mu p}$;

1) The cumulative phenomenon is known in astronomical circles as anomalies in Venus's trajectory

2) The delay of 3 days at the perihelium of Halley Comet in 1910. The link below: Pr. Ioan N. Popescu book: Gravity [3] Page 184 https://kupdf.net/download/1982-ioan-n-popescu-gravitatia_5a5e726be2b6f5605ccd28b2_pdf

Thus this is the gravitational flux of the Sun which will satisfy Einstein's equation (4) with the same metrics (6) with Λ null and cosmological constant equal to:

$K = \frac{8\pi G}{c^4} = 2.076647 \cdot 10^{-43} N^{-1}$; & $R_{\mu\nu} - \frac{1}{2} R_c g_{\mu\nu} + \Lambda g_{\mu\nu} = -\frac{8\pi G}{c^4} T_{\mu\nu} = -K T_{\mu\nu}$

result in the file: http://www.michaelvio.byethost8.com/SchwarAXR.pdf
http://www.michaelvio.byethost8.com/Sun.pdf

The proportional constant K_p arises from other considerations see the link below.
http://www.michaelvio.byethost8.com/ConstProp.pdf

With constant $K = \frac{8\pi G}{c^4} = 2.076647 \cdot 10^{-43} N^{-1}$;$R_{\mu\nu} - \frac{1}{2} R_c g_{\mu\nu} + \Lambda g_{\mu\nu} = -\frac{8\pi G}{c^4} T_{\mu\nu} = -K T_{\mu\nu}$ and null Tensor Energy $T_{\mu p} = 0$ for $G \cdot m = c^2$. With notation $R_{Schwarzschild} = R_S$ and substitution $m = \frac{2M}{R_S}$ Calculus link: http://www.michaelvio.byethost8.com/TauBend.pdf
http://www.michaelvio.byethost8.com/GFtau.pdf https://vixra.org/pdf/1511.0101v1.pdf

The gamma ray P_γ and the torsion particle are responsible for space expansion? The answer could be yes P_{To} generates attraction of galaxies within 2R=8.3 mil Lightyears and outside 2R and within 16.418 billion Lightyears the forces change sign and result in rejection force between distant galaxies we must go deeper, so both γ-ray and torsion particle could generate expansion of space, see [3] Gravity that explains of Gravitovortex revealed by Pr. Dr. Ioan N. Popescu 40 years ago.

The gamma ray P_γ & the P_{To} are proposed to be **responsible for space expansion**, with an attraction/repulsion transition at a distance scale:

$$2R \approx 8.293 \text{ million Light-Years} \approx 7.846 \times 10^{22} \text{ m}$$

- For $r < 2R$: P_{To} generates **attraction** between galaxies.

- For $2R < r < 2R_S \approx 16.418$ billion Light-Years: P_{To} generates **repulsion** (analogous to dark energy).

Commentary: This is a qualitative model for the role of the cosmological constant / dark energy. The transition from attraction to repulsion at a specific scale is reminiscent of modified gravity theories (e.g., $f(R)$ gravity, scalar-tensor theories). The specific identification of $2R = 7.846 \times 10^{22}$ m as this transition scale is consistent with the TauTimp parameter $R = 3.9228 \times 10^{22}$ m.

The calculuation obeys Einstein's equation so the GR app in Maple is tuned to a set of data, and for each set, we have equality for that Cosmological Constant. In brief, the torsion particle is generated by synchronized precession of an amount of spin particle and the γ-ray field generate space curvature as in the book Gravity [3] Page 378 (The advance Mercury's perihelion 42.6'' +/- 0.9'' per century)

REFERENCES

[1]. MIT Einstein's Field Equation *http://web.mit.edu/klmitch/classes/8.033/Schwarzschild.pdf* page *7-10;*

[2]. GRAVITATION Charles MISNER, Kip THORNE, John WHEELER September 1972 Copyright 1970-1971;

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