Calculating the cosmological constant using quantum field fluctuations within (93.5%) accuracy from the average experimental results by using a vertical variation of the Michelson-Morley experiment

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Contents

1. Abstract

This work proves the effect of the gravitational blueshift of a moving gravity well on the electric permittivity of free space through both mathematical derivation and experimental evidence from a vertical variation of the Michelson-Morley experiment and shows the right way to calculate the cosmological constant from the quantum field fluctuations with an accuracy of (93.5%) from the average accepted experimental results i.e. theoretical calculations $(\Lambda \cong -1.4028 \times 10^{-9}\ \mathrm{J.m^{-3}})$ and the correct way to solve the vacuum catastrophe.

2. Introduction

According to Einstein, in his scientific research paper entitled 'On the influence of gravity on the propagation of light' published in Annalen of Physiks (Volume 35) in June 1911, for a photon traveling from the Sun to the Earth, equation $\boxed{3}$ in that research states:

$$c = c'\left(1+\frac{\Phi}{c^2}\right); \Phi = -\frac{MG}{r} \therefore\Rightarrow c = c'\left(1-\frac{MG}{r\,c^2}\right)$$

$$\therefore\Rightarrow c' = \frac{c}{\left(1-\frac{MG}{r\,c^2}\right)} \quad \therefore\Rightarrow c' = \frac{1}{\left(1-\frac{MG}{r\,c^2}\right)\sqrt{\varepsilon_{\circ}\mu_{\circ}}}$$

$$; c = \text{speed of light}; c = \frac{1}{\sqrt{\varepsilon_{\circ}\mu_{\circ}}}$$

$$; c' \equiv \text{the speed of light near a large gravity well as measured by observer at infinity,}$$

$$G \equiv \text{gravitational constant}, r \equiv \text{radius of the gravity well}$$

Einstein is saying that the speed of light is faster near a gravity well as measured by observer at infinity; the speed of light in a vacuum is influenced by gravity.

This is one of Einstein's best pieces of work. In fact, in this paper, Einstein predicted and calculated gravitational lensing. However, Einstein's calculations missed some factors, as Schwarzschild showed with his metric.

3. Gravitational blueshift and the electric permittivity of the free-space $(\boldsymbol{\varepsilon}_{\circ})$

Let's consider a photon with a wavelength equal to $(\lambda_{\circ} = r - r_s)$ falling from infinity towards a black hole or any gravity well, then for an observer at infinty the photon should have a gravitational blueshift as follow.

$$\therefore \lambda_{\text{blueshift}} = \lambda_{\circ}\left(1-\frac{r_s}{r}\right)^{\frac{1}{2}}$$

$$\because (\lambda_{\circ} = r - r_s = R_{\circ}), \because (\lambda_{\text{blueshift}}) = r' - r_s = R \therefore \Delta\lambda = r - r' \text{and,}$$

$$\because\ r, r', r_s, \text{all are fixed points in space}$$

$$\therefore\Rightarrow \left(R = R_{\circ}\left(1-\frac{r_s}{r}\right)^{\frac{1}{2}}\right); R, R_{\circ} \text{ are real distances in space}$$

Then this means the wavelength itself is shortened due to change in distances of the space because of the gravity effect on space-time itself.

In simple words the gravity will shorten space itself, that's mean gravity has affected space-time and this will change the basic properties of empty space itself near this gravity well. Then this means both electric and magnetic fields will change since both have a geometric characterization due to the shortness in the length happening to the real distances in the space$\left(R \;\&\; R_{\circ} \right)$.

Thus, both will be affected by this phenomenon exerted by a black hole or any gravity well in the same way it changes the wavelength. Since the electric flux is an area description and not in one dimension, then we should use: $\left(R^2 = R_{\circ}^{\,2}\left(1-\frac{r_s}{r}\right)\right)$because for one dimension we use $\left(R = R_{\circ}\left(1-\frac{r_s}{r}\right)^{\frac{1}{2}}\right)$ then for two dimensions, we use the above formula.

$$\because (\Phi_E) = E4\pi R^2 \;\;\therefore\!\Rightarrow \Phi_E{}' = \frac{E4\pi R_{\circ}^{\,2}}{\left(1-\frac{r_s}{r}\right)}$$

Then electric flux efected by gravitaty and since the electric charge is conserved, this will affect the electric permittivity of the free space $\left(\varepsilon_{\circ}\right)$:

$$\because \;\varepsilon_{\circ} = \frac{q}{\Phi_E} = \frac{q}{E4\pi R^2}$$

$$\therefore \text{ under gravity} \Rightarrow \;\varepsilon' = \frac{q}{E\dfrac{4\pi R_{\circ}^{\,2}}{\left(1-\frac{r_s}{r}\right)}} \;\Rightarrow \varepsilon' = \;\varepsilon_{\circ}\left(1-\frac{r_s}{r}\right)$$

$$\because r_s < r \;\therefore\!\Rightarrow \varepsilon' < \;\varepsilon_{\circ}$$

This does not apply to the magnetic permeability of the free space since it is a fully geometrically characterized entity.

$$\because \;\;\mu_{\circ} = \frac{B}{H} \;\therefore H = \frac{B}{\mu_{\circ}} \;\;\therefore\!\Longrightarrow H = \frac{\left(\dfrac{B}{\left(1-\frac{r_s}{r}\right)}\right)}{\mu_{\circ}} \;\;\therefore\!\Longrightarrow \;\mu_{\circ}{}' = \frac{\left(\dfrac{B}{\left(1-\frac{r_s}{r}\right)}\right)}{\dfrac{\left(\dfrac{B}{\left(1-\frac{r_s}{r}\right)}\right)}{\mu_{\circ}}} \;\therefore\!\Longrightarrow \mu_{\circ}{}' = \mu_{\circ}$$

The speed of light is not a vector quantity; it is a scalar quantity that is independent of the direction of the moving source and the observer; it is only dependent on the nature of the empty space itself:

$$\because \mathrm{c} = \frac{1}{\sqrt{\mu_{\circ}\varepsilon_{\circ}}} \therefore\Rightarrow \mathrm{c}' = \frac{1}{\sqrt{\mu_{\circ}\varepsilon_{\circ}\left(1-\frac{\mathrm{r_s}}{\mathrm{r}}\right)}} \therefore\Rightarrow \mathrm{c}' = \mathrm{c}\left(1-\frac{\mathrm{r_s}}{\mathrm{r}}\right)^{-1/2} \therefore \text{under gravity} \Rightarrow \mathrm{c}' > \mathrm{c}$$

Since electric flux effected by gravity and since the electric charge is conserved, then this will change the electric permittivity of the empty space itself $(\varepsilon_{\circ})$ so that a photon will keep falling towards the black hole and the event horizon will always keep running away until it reaches the singularity:

$$\therefore \text{at event horizon and at singularity } \left(\mathrm{r_s} < \mathrm{r} \Rightarrow \frac{\mathrm{r_s}}{\mathrm{r}} < 1\right)$$

Thus, the Schwarzschild metric will always be valid all the way to the singularity, so that the event horizon itself is the singularity at the center of the black hole:

$$\because \mathrm{c}' = \mathrm{c}\left(1-\frac{\mathrm{r_s}}{\mathrm{r}}\right)^{-\frac{1}{2}}$$

Now

The Schwarzschild metric for a non-rotating black hole is as follows:

$$\therefore \mathrm{ds}^2 = \left(1-\frac{\mathrm{r_s}'}{\mathrm{r_s}}\right)\mathrm{c}^2\mathrm{dt}^2 + \frac{\mathrm{dr_s}^2}{\left(1-\frac{\mathrm{r_s}'}{\mathrm{r_s}}\right)}$$

$$\because \text{at the event horizon as well at singularity } \mathrm{r_s} = \mathrm{r_s}' \therefore\Longrightarrow \left(1-\frac{\mathrm{r_s}'}{\mathrm{r_s}}\right) \to 0 \therefore\Longrightarrow \mathrm{ds}^2 = \frac{\mathrm{dr_s}^2}{\left(1-\frac{\mathrm{r_s}'}{\mathrm{r_s}}\right)}$$

Since the space-time anomaly at the event horizon is restricted to the event horizon area with zero time (because of the gravitational time dilation goes to infinity at the event horizon):

$$\therefore\Longrightarrow \mathrm{ds}^2 = \frac{\mathrm{dr_s}^2}{\left(1-\frac{\mathrm{r_s}'}{\mathrm{r_s}}\right)} = 4\pi\, \mathrm{r_s}'^2$$

$$\because\ \left(dr_s{}^2\right) = dr_s.dr_s\ \therefore\Longrightarrow \frac{dr_s.dr_s}{\left(1-\frac{r_s{}'}{r_s}\right)} = 4\pi\, r_s{}'^2\ \ \therefore\Longrightarrow \frac{dr_s.dr_s}{\left(1-\frac{r_s{}'}{r_s}\right)4\pi\, r_s{}'^2} = 1$$

$$\therefore\Longrightarrow \frac{dr_s}{2\sqrt{\pi}\, r_s{}'\sqrt{\left(1-\frac{r_s{}'}{r_s}\right)}} = 1$$

By integration $\Longrightarrow \frac{\ln\left(\sqrt{\left(1-\frac{r_s{}'}{r_s}\right)}+1\right)+2r_s\left(\sqrt{\left(1-\frac{r_s{}'}{r_s}\right)}\right)-\ln\left(\left|\sqrt{\left(1-\frac{r_s{}'}{r_s}\right)}-1\right|\right)}{4\sqrt{\pi}} + C = r_s + D$

When C=D

$$\therefore \ln\left(\sqrt{\left(1-\frac{r_s{}'}{r_s}\right)}+1\right)-\ln\left(\left|\sqrt{\left(1-\frac{r_s{}'}{r_s}\right)}-1\right|\right) = 4\sqrt{\pi}\, r_s - 2r_s\left(\sqrt{\left(1-\frac{r_s{}'}{r_s}\right)}\right)$$

$$\frac{\left(\sqrt{1-\frac{r_s{}'}{r_s}}+1\right)}{\left(\left|\sqrt{\left(1-\frac{r_s{}'}{r_s}\right)}-1\right|\right)} = e^{\left(4\sqrt{\pi}\, r_s-2r_s\left(\sqrt{\left(1-\frac{r_s{}'}{r_s}\right)}\right)\right)}$$

$$\frac{\left(\sqrt{1-\frac{r_s{}'}{r_s}}+1\right)}{\pm\left(\sqrt{\left(1-\frac{r_s{}'}{r_s}\right)}-1\right)} = e^{\left(4\sqrt{\pi}\, r_s-2r_s\left(\sqrt{\left(1-\frac{r_s{}'}{r_s}\right)}\right)\right)}$$

At the singularity:

Each time a photon reaching the event horizon the speed of light itself get increased as I proved before in my formula$\left(c' = c\ \left(1-\frac{r_s}{r}\right)^{-\frac{1}{2}}\right)$ so we have here a step counter r_s& $r_s{}'$ so when the photons reach $(r_s{}')$ it's become the new (r_s) until the collapsing steps reach the singularity

$$(r_s{}' = 0)\ \therefore\Longrightarrow \left(c' = c\ \left(1-\frac{0}{r}\right)^{-\frac{1}{2}}\right) \therefore\Longrightarrow c' = c$$

$$\therefore \text{ At the singularity } \because c' = c \Longrightarrow r_s = r_s{}' \Longrightarrow \frac{r_s{}'}{r_s} = 1 \therefore\Longrightarrow \left(1-\frac{r_s{}'}{r_s}\right) = 0$$

$$\therefore\Longrightarrow \pm 1 = e^{\left(4\sqrt{\pi}\, r_s\right)}\begin{cases} 1 \therefore\Rightarrow e^{2i\pi} = e^{4\left(\sqrt{\pi}\right)r_s}\ \because\ 1 = e^{2i\pi} \text{ i.e. Euler's identity } \therefore\Longrightarrow r_s = i\frac{\sqrt{\pi}}{2} \\ \qquad\qquad \text{or} \\ -1 \therefore\Rightarrow e^{i\pi} = e^{4\left(\sqrt{\pi}\right)r_s}\ \because -1 = e^{i\pi} \text{ i.e. Euler's identity } \therefore\Longrightarrow r_s = i\frac{\sqrt{\pi}}{4} \end{cases}$$

$$\because\ r_s > r_s' \therefore\Longrightarrow r_s = i\frac{\sqrt{\pi}}{2}\ ,,,r_s' = i\frac{\sqrt{\pi}}{4}\ ;\ i\frac{\sqrt{\pi}}{2}\&i\frac{\sqrt{\pi}}{4} \equiv \text{ratio radii i.e. line element,}$$

I will refer to the short ratio radius as $\left(r_T = i\frac{\sqrt{\pi}}{4}\right)$;T stands for At-Tariq since the event horizon is hammering towards the singularity and At-Tariq in Arabic means the hammerer

$$;r_T \equiv \text{length element at singularity}$$

$$\because\ r_s > r_s' \therefore\Longrightarrow r_s = i\frac{\sqrt{\pi}}{2}\ ,,,r_s' = i\frac{\sqrt{\pi}}{4} \therefore\Longrightarrow \frac{r_s'}{r_s} = \frac{i\frac{\sqrt{\pi}}{4}}{i\frac{\sqrt{\pi}}{2}} = \frac{1}{2}$$

$$\text{at } r_s' \to 0\ \because c' = \frac{c}{\sqrt{\left(1-\frac{r_s'}{r_s}\right)}} = \frac{c}{\sqrt{\left(1-\frac{0}{r}\right)}} = c \therefore c_s' = c; r_s \text{ is minimum}$$

$$\therefore \text{line element is the radius here } \therefore dr_s{}^2 = r_s'.r_s'$$

Since the photon geodesic is a null curve:

$$\therefore\Longrightarrow ds^2 = -\left(1-\frac{r_s'}{r_s}\right)c^2dt^2 + \frac{\left(i\frac{\sqrt{\pi}}{4}\right)^2}{\left(1-\frac{r_s'}{r_s}\right)} = 0$$

$$\therefore\Longrightarrow \left(1-\frac{1}{2}\right)\ dt_s{}^2 = \frac{\left(i\frac{\sqrt{\pi}}{4}\right)^2}{c^2\left(1-\frac{1}{2}\right)}\ \therefore\Longrightarrow \left(\frac{1}{2}\right)\ dt_s{}^2 = \frac{\left(i\frac{\sqrt{\pi}}{4}\right)^2}{c^2\left(\frac{1}{2}\right)}$$

$$\therefore\Longrightarrow dt_s{}^2 = \frac{\left(i\frac{\sqrt{\pi}}{4}\right)^2}{c^2\left(\frac{1}{2}\right)^2} = \frac{4\left(i\frac{\sqrt{\pi}}{4}\right)^2}{c^2} = -\frac{\pi}{c^2 4}$$

$$\therefore\Longrightarrow ds^2 = -\left(\frac{1}{2}\right)c^2\left(-\frac{\pi}{c^2 4}\right) + \frac{\left(i\frac{\sqrt{\pi}}{4}\right)^2}{\left(\frac{1}{2}\right)} \therefore\Longrightarrow ds^2 = \left(\frac{\pi}{8}\right) - \left(\frac{\pi}{8}\right) = 0$$

$$\therefore \text{at singularity } \Longrightarrow ds^2 = 0 \equiv \text{the real space} - \text{time interval at singularity}$$

$$\text{since } r > r_s' > 0 \therefore\Longrightarrow r_s - r_s' \neq 0 \therefore\Longrightarrow \Delta r_s \neq 0$$

$$\because c' = \frac{c}{\sqrt{\left(1-\frac{r_s'}{r_s}\right)}} \therefore r > r_s'$$

i.e.(r_s) always will be bigger than ($r_s{}'$) it's indeed a hammering effect from the event horizon all the way to the singularity

$$\because 0 < \frac{r_s}{r} < 1 \therefore\Longrightarrow \text{chaing in position } \neq 0 \therefore\Longrightarrow r - r_s{}' \neq 0 \equiv \text{uncertainty in position}$$

Since we have mass with an uncertain position between zero and one $\left(0 < \frac{r_s}{r} < 1\right)$, this only happens under the Heisenberg uncertainty principle:

$$\therefore\Longrightarrow \triangle\, r_s \triangle\, P_s \geq \frac{\hbar}{2}$$

This is reasonable since we are reaching such a tiny scale:

$$\text{at singularity } \left(r_s = r_T = i\frac{\sqrt{\pi}}{4}\right) \therefore i\frac{\sqrt{\pi}}{4} = \frac{2MG}{c^2}$$

$$\therefore\Longrightarrow M = ic^2\frac{\sqrt{\pi}}{8G} \text{ ; for a observer at singularity } c' = c$$

$$\text{when } r_s{}' \to 0 \therefore\Longrightarrow i\frac{\sqrt{\pi}}{4}.ic^2\frac{\sqrt{\pi}}{8G}c \geq \frac{\hbar}{2} \text{ ; } \left(r_s Mc = n\frac{\hbar}{2}\right)$$

$$\therefore\Longrightarrow i\frac{\sqrt{\pi}}{4}.ic^2\frac{\sqrt{\pi}}{8G}c = n\frac{\hbar}{2}$$

$$\therefore\Longrightarrow \frac{c^3}{\hbar G}i\frac{\sqrt{\pi}}{4}.i\frac{\sqrt{\pi}}{4} = n$$

; n is the number of Schwarzschild radii steps of event horizon due to the effect of gravity on empty space

$$\text{at } n = 1 \therefore\Longrightarrow \frac{c^3}{\hbar G}\left(i\frac{\sqrt{\pi}}{4}\right)^2 = 1$$

$$\therefore\Longrightarrow \frac{\left(i\frac{\sqrt{\pi}}{4}\right)^2}{l_p{}^2} = 1 \therefore\Longrightarrow i\frac{\sqrt{\pi}}{4} = l_p$$

$$\therefore\Longrightarrow n = \frac{r_s}{l_p} \text{at } n = 1 \therefore\Longrightarrow \frac{r_s}{l_p} = 1 \therefore\Longrightarrow \frac{2GM}{c^2 l_p} = 1$$

$$\frac{2GM}{c^2 l_p} = 1 \therefore M = \frac{c^2}{2G}\sqrt{\frac{G\hbar}{c^3}} = \frac{1}{2}\sqrt{\frac{c\hbar}{G}} \therefore\Longrightarrow M = \frac{m_p}{2}$$

$$\therefore\Longrightarrow \frac{m_p}{2} \text{ is the least required mass to form a black hole}$$

$$\therefore\Longrightarrow \frac{m_p}{2} \text{ is the least required mass considered as a gravity well}$$

$$\text{since energy is quantized}$$

$$\therefore\Longrightarrow M = n\frac{m_p}{2} \ \ ; n = 1,2,3 \dots ;$$

This is the mass condition required to form a black hole, which I will name it At-Tariq condition (T).

Now the speed of light at singularity for observer at infinty is:

$$\therefore \ c.(T) = \frac{c}{\left(\sqrt{1-\frac{1}{2}}\right)^{\frac{2M}{m_p}}} = \frac{c}{\left(\frac{1}{\sqrt{2}}\right)^{\frac{2M}{m_p}}} \ ; (T) = \left(\sqrt{2}\right)^{\frac{2M}{m_p}} \ \therefore\Longrightarrow c_T = c\left(\sqrt{2}\right)^{\frac{2M}{m_p}}$$

$\therefore\Longrightarrow$a black hole is any mass that will increase the speed of light by at least a factor of $\left(\sqrt{2}\right)$ or more

4. Black hole thermodynamics and the entropy of the vacuum.

Entropy is a measure of the number of ways in which a system might be arranged in microscopic configurations that are consistent with the macroscopic quantities that characterize the system. So, in this sense, the entropy is the number of microstates or the natural logarithm of the multiplicity of these microstates multiplied by Boltzmann constant. So, for a single test particle with a single microstate reaching event horizon, then acording to boltzman entropy law the entropy for multiplicity of one is zero:

$$S = k_B \ln \Omega = k_B \ln 1 = 0$$

Since this test particle falling towards a black hole then its speed of light will be increased by a factor of $\left(\sqrt{2}\right)$ and since the speed of light is the speed of causality as Minkowski diagram showed us then the multiplicity should be increased by a factor of $\left(\sqrt{2}\right)$

But as long as nothing could ever cross the event horizon, then it is safe to claim that what is located behind event horizon is nothing but empty space, even when it is not and this mathematical formula is representing the vacuum entropy.

$$S_V = k_B \ln\sqrt{2}\,\Omega = k_B\left(\ln\sqrt{2} \ \ln 1\right) \therefore S_V = k_B \ln\sqrt{2}$$

We could generalize it for black hole as follow:

$$\therefore S_T = k_B \ln\left(\Omega\left(\sqrt{2}\right)^{\frac{2M}{m_p}}\right) = k_B\left(\ln\Omega + \ln\left(\sqrt{2}\right)^{\frac{2M}{m_p}}\right)$$

$$\therefore S_T = k_B \frac{2M}{m_p} \ln\sqrt{2} + k_B \ln\Omega$$

$$\text{since nothing could cross the event horizon} \therefore\Rightarrow \Omega = 1 \therefore S_T = k_B \frac{2M}{m_p} \ln\sqrt{2}$$

$$\text{at } \frac{2M}{m_p} = 1 \therefore \text{vacuum entropy } S_V = S_T = k_B \ln\sqrt{2}$$

$$\therefore\Rightarrow U = k_B K \ln\sqrt{2} \therefore \text{at } K = 1 \therefore U_V = k_B \ln\sqrt{2}$$

$\therefore$ Landauer's principle should be corrected.

Then, even when we have no entropy, we will have this entropy for nothing just due to space-time nature

That is happens since nothing can cross the event horizon:

$$\text{since } S_T = \frac{\Delta U}{K} \therefore K = \frac{\Delta U}{S_T} = \frac{M(c_T)^2}{k_B \frac{2M}{m_p} \ln\sqrt{2}} = \frac{m_p c^2 \left(\sqrt{2}^{\frac{2M}{m_p}}\right)^2}{2\, k_B \ln\sqrt{2}}$$

$$\text{at } 2M = m_p \therefore\Rightarrow K_T = \frac{m_p c^2}{k_B \ln\sqrt{2}}$$

$$\therefore K_T = \frac{K_p}{\ln\sqrt{2}}; K_T \equiv \text{event horizon temperature}$$

$$K_T = \frac{1.416785 \times 10^{32}}{\ln\sqrt{2}} = 4.0879 \times 10^{32} \text{ Kelvin}$$

The surface temperature of a black hole is unrelated to its mass; it is always constant and this is very reasonable since nothing could ever cross the event horizon. This is because, for anything going towards the event horizon, the speed of light is always increasing$\left(c_T = c\sqrt{2}\right)$, so that the event horizon will always run away from whatever is approaching; like chasing an elusive mirage.

5. The Schwarzschild metric and Lorentz transformation of a moving gravity well and its effect on the electric permittivity of the free-space $(\boldsymbol{\varepsilon}_{\circ})$:

For electric charge moving with a velocity v, the Lorentz transformation of the field is as follows:

$$E_{\parallel}' = E_{\parallel} \quad , \quad B_{\parallel}' = B_{\parallel}$$

$$E_{\perp}' = \frac{(E + v \times B)_{\perp}}{\sqrt{1 - v^2/c^2}} \quad , \quad B_{\perp}' = \frac{\left(B - \frac{v \times E}{c^2}\right)_{\perp}}{\sqrt{1 - v^2/c^2}}$$

$$E_{\perp}' = \frac{(E + |v||B| \sin\theta)_{\perp}}{\sqrt{1 - v^2/c^2}} \quad , \quad B_{\perp}' = \frac{\left(B - \frac{|v||E| \sin\theta}{c^2}\right)_{\perp}}{\sqrt{1 - v^2/c^2}}$$

$$\because \gamma = \frac{1}{\sqrt{1 - v^2/c^2}} \therefore E_{\perp}' = \gamma(E + |v||B| \sin\theta)_{\perp} \;,\quad B_{\perp}' = \gamma\left(B - \frac{|v||E| \sin\theta}{c^2}\right)_{\perp}$$

$$\because E \perp B \therefore B \parallel v \therefore \sin\theta = 0 \therefore\Longrightarrow E_{\perp}' = \gamma E_{\perp} \;,\quad B_{\perp}' = \gamma B_{\perp}$$

$$\because \mu_{\circ} = \frac{B}{H} \therefore H = \frac{B}{\mu_{\circ}} \therefore\Longrightarrow H_{\perp}' = \frac{\gamma B_{\perp}}{\mu_{\circ}} \therefore\Longrightarrow \mu_{\circ}' = \frac{\gamma B_{\perp}}{\frac{\gamma B_{\perp}}{\mu_{\circ}}} \therefore\Longrightarrow \mu_{\circ}' = \mu_{\circ}$$

Where ∥ and ⊥ are relative to the direction of the velocity (V). Since, in this example, $B_{\parallel} = 0$ and $B_{\perp} = V \times E_{\perp}$ in the laboratory frame, the magmatic field in the frame of the moving charge vanishes, in which is consistent with our intuition. The static Maxwell's equations are satisfied in both frames:

$$\varepsilon_{\circ} = \frac{q}{\Phi_E} = \frac{q}{E 4\pi r^2}\hat{r} \;\because E = (E_{\perp} + E_{\parallel}),,,, \because E_{\perp} = E_x + E_y ,,,, \because E_{\parallel} = E_z \;\therefore E = \left(\frac{2}{3}E_{\perp} + \frac{1}{3}E_{\parallel}\right)$$

$$\therefore\Longrightarrow \varepsilon_{\circ}' = \frac{q}{\left(\gamma\frac{2E_{\perp}}{3} + \frac{E_{\parallel}}{3}\right)4\pi r^2}$$

$$\because \varepsilon_{\circ}' = \frac{q}{\frac{(2\gamma + 1)}{3} E 4\pi r^2}\hat{r} \therefore\Longrightarrow \varepsilon_{\circ}' = \frac{3q}{(2\gamma + 1) E 4\pi r^2} \therefore\Longrightarrow \varepsilon_{\circ}' = \varepsilon_{\circ}\frac{3}{(2\gamma + 1)}$$

$$\because c = \frac{1}{\sqrt{\varepsilon_{\circ}\mu_{\circ}}} \therefore\Longrightarrow c' = \frac{1}{\sqrt{\varepsilon_{\circ}'\mu_{\circ}}} = \frac{1}{\sqrt{\frac{3\varepsilon_{\circ}\mu_{\circ}}{(2\gamma + 1)}}} \therefore c' = c\sqrt{\frac{1}{\frac{3}{(2\gamma + 1)}}}$$

$$\therefore c' = c\sqrt{\frac{(2\gamma + 1)}{3}}$$

This is unrecognizable in the Michelson and Morley experiment since it is direction-dependent, while the speed of light by formula definition is a scalar quantity because it is dependent on the electric permittivity of the empty space

Speed of light is not a vector quantity: it is a scalar quantity that is independent of the direction of the moving source and the observer; it is only dependent on the nature of the empty space itself [i.e. $(\varepsilon_{\circ})$the electric permittivity of the empty space & $(\mu_{\circ})$ the magnetic permeability of the empty space]: $c = \frac{1}{\sqrt{\varepsilon_{\circ}\mu_{\circ}}}$; $\varepsilon_{\circ} = \frac{q}{\Phi_E} = \frac{q}{E4\pi r^2}\hat{r}$; $\mu_{\circ} = \frac{B}{H}$

Now, let's consider a moving gravity well. At its surface, the electromagnetic fields are under Lorentz transformation and Schwarzschild metric. In this case, the direction of velocity of the gravity well will be effective due to the collaboration between Lorentz transformations and Schwarzchield metric because we have a runaway gravity well, and this will change the nature of empty space, and ultimately, the speed of light.

So, when a moving inertial mass satisfy the (T) condition , it will drag space-time with it just a little extra due to the movement of the mass; this resembles a ball tangled with the fabric of space-time, so the gravitational tidal elongation due to Schwarzschild metric will sometimes be increased and sometimes be decreased, depending on the angle of direction between the moving mass and its velocity.

Of course, we need to achieve hugely concentrated amounts of mass in front of or behind the space-time to drag it or to push it; to see this effect, we would need to set the Michelson interferometer vertically to achieve a warped space-time.

And since space-time bend in respect to difference in energy concentration distribution then we should count here for the relativistic mass

Because the increase on relativistic mass will change the total concentration distribution of energy in a certain place depending on direction and velocity of the moving mass as long the original inertial mass satisfy the (At-Tariq) condition.

∴ For collaboration between the Schwarzschild metric and Lorentz transformation, the speed of light is as follows:

$$\therefore c = c_{B_r} = c\,.\,B_r\,;\,B_r\ = \left(1 - \frac{6Gm\gamma\cos(t)}{r(2\gamma\cos(t)+1)c^2}\right)^{-\frac{1}{2}}$$

; B_r Stands for Al-Buraq in which means in Arabic emits lightning

$$;\gamma = \frac{1}{\sqrt{1 - {v^2}/{c^2}}}\,;\,r_s = \frac{2GM}{c^2}\,;\,0 \le t \le \pi;\,M = m\gamma\cos(t)$$

As I show before for a black hole $\left(\frac{r_s}{r} = \frac{1}{2}\right)$:

$$\therefore c_{B_r} = c\,.\,B_r = c\left(1 - \frac{3\gamma\cos(t)}{(2)(2\gamma\cos(t)+1)}\right)^{-\frac{1}{2}}\,;\,\gamma = \frac{1}{\sqrt{1 - {v^2}/{c^2}}}\,;\,0 \le t \le \pi$$

$$\text{for surface gravit} \Rightarrow g = \frac{MG}{(r_{Br})^2} = \frac{MG}{\left(\frac{2GM}{{c_{B_r}}^2}\right)^2} = \frac{\left(c_{B_r}\right)^4}{4MG} = \frac{c^4\,{B_r}^4}{4MG}$$

$$\therefore\Rightarrow g = \frac{F_p}{4M}{B_r}^4;\,B_r = \left(1 - \frac{3\gamma\cos(t)}{(2)(2\gamma\cos(t)+1)}\right)^{-\frac{1}{2}}$$

$$\text{at } t = 0\ \ \therefore\Rightarrow g = \frac{F_p}{4M}{B_r}^4$$

$$;\,\text{escape velocity} = c_{B_r} = \frac{c}{\left(1 - \left[\left(\frac{3}{2}\right)\frac{\gamma}{(2\gamma+1)}\right]\right)^{\frac{1}{2}}}$$

$$\text{at } t = \frac{\pi}{2} \therefore\Rightarrow B_r = 1 \therefore\Rightarrow c_{B_r} = c \therefore\Rightarrow\ g = \frac{F_p}{4M};\,\text{escape velocity} = c$$

Since the escape velocity at the poles of a black hole is the speed of light then energy could escape from the black hole poles since the speed of light on the surface of the black hole is $\left(c\sqrt{2}\right)$ so this is an excellent candidate solution for the relativistic jets.

Since we know the black hole temperatuer from

$$\therefore K_T = \frac{K_p}{\ln\sqrt{2}}\,;\,K_T \equiv \text{event horizon temperature}$$

$$K_T = \frac{1.416785 \times 10^{32}}{\ln\sqrt{2}} = 4.0879 \times 10^{32}\ \text{Kelvin}$$

By using Wien's displacement law

$$\lambda_T = \frac{b}{K_T} = \frac{2.8977 \times 10^{-3}}{4.0879 \times 10^{32}} = 0.7088 \times 10^{-35}\text{m}$$

We should count for gravitational redshift

$$\lambda_\infty = \frac{\lambda_T}{\sqrt{2}} = 2.04510.7088 \times 10^{-35}\text{m} \; ; \lambda_\infty \equiv \text{wave length observed at very large distance}$$

We should observe this em radiation from any moving black hole poles

$$\text{at } t = \pi; \text{escape velocity } c_{B_r} = \frac{c}{\sqrt{\left(1 + \frac{\gamma}{1-2\gamma}\right)}}; \gamma \neq \frac{1}{2}$$

$$\because \text{surface gravity} \Rightarrow g = \frac{MG}{(r_s')^2} = \frac{MG}{\left(\frac{2GM}{\left(c\sqrt{2}\right)^2}\right)^2} \therefore\Rightarrow g_T = \frac{MG}{\left(\frac{GM}{c^2}\right)^2}$$

$$\therefore\Rightarrow g = \frac{c^4}{MG} = \frac{F_p}{M} \; \therefore\Rightarrow \text{at } g = \sqrt{2} \; , (T) \text{ spontaneous emission point}$$

$$g = \frac{MG}{(r_s)^2}$$

$$g_{TB_r} = \frac{MG}{\left(\frac{2GM}{{c_{B_r}}^2}\right)^2}; c_{B_r} = c.B_r; B_r = \frac{1}{\sqrt{1 - \frac{6GM\gamma\cos(t)}{r(2\gamma\cos(t)+1)c^2}}}; \gamma = \frac{1}{\sqrt{1 - v^2/c^2}}; 0 \leq t \leq \pi$$

For ordinary gravity well we have : $g = \frac{MG}{(r_s+h)^2}$

$$g_{B_r} = \frac{MG}{\left(\frac{2GM}{{c_{B_r}}^2} + h\right)^2}; c_{B_r} = c.B_r; B_r = \frac{1}{\sqrt{1 - \frac{6GM\gamma\cos(t)}{r(2\gamma\cos(t)+1)c^2}}}; \gamma = \frac{1}{\sqrt{1 - v^2/c^2}}; 0 \leq t \leq \pi$$

$(g_{TB_r})\&(g_{B_r})$ is an excellent candidate solution for the dark-matter.

6. Fine-structure constant and the graviton effects

The fine-structure constant does not affect by gravitational blue-shift since it's considered a local observer, $\because c' = c\left(1 - \frac{r_s}{r}\right)^{-1/2}$; c'as measured by an observer at infinity

7. Calculating the cosmological constant from the quantum field in [93.5%] accuracy from the average experimental results plus the solution for the vacuum catastrophe.

The expansion of the universe is an anti-gravitational act and as I show before space-time can only be affected gravitationally by wave functions of masses equal or larger than half Planck mass i.e. At-Tariq condition and since gravity and anti-gravity in general relativity are both described in Einstein field equation as the same but with different signs then they are obeying the same conditions to

So we should only consider quantum fluctuation with frequencies that's agree with At-Tariq condition, the most suitable convenient name in Arabic for such quantum field is the word (Eyde) in which means in Arabic the mighty firmness, where the Eyde quantum field is responsible for the universe expansion and very suitable for cosmic inflation as I will show.

If we take virtual particles in time-energy uncertainty principle with energies obeying At-Tariq condition, then the event occurs in three dimensions one spatial dimension and two time dimensions disguised as space dimensions as I will show.

We take one dimension for the space between two points representing the creating point and annihilation point of the Eyde virtual particles since virtual particles oscillate between existence and nonexistence that's mean we could exclude any inner path because we could safely presume that it didn't happened in the first place so that will left us with only one space dimension and that's between the creating point and annihilation point of the Eyde virtual particles.

That left us with two remaining dimensions, in fact, these two dimensions are time dimensions disguised as space dimensions since space-time interval has a term for time disguised as space dimension by multiplying the time term by the speed of light.

$$ds^2 = -\left(1 - \frac{r_s}{r}\right) dt^2 c^2 + \left(1 - \frac{r_s}{r}\right)^{-1} dr^2$$

Its two time dimensions disguised as space dimensions because the first disguised time dimension is due to the accelerated frame of reference of the Eyde virtual particles where the speed of light in this frame will be unchanged ; $(\acute{c} = c)$ in respect to the Eyde virtual particles and another time dimension related to the non-accelerated frame of reference of the observer such that the speed of light of the Eyde virtual particles in respect to the observer frame of reference will be changed in a factor of the square root of two$\left(; \acute{c} = c\sqrt{2}\right)$.

That's mean the Eyde virtual particles will have two speeds of light one in its own frame of reference and the other speed of light in the observer frame of reference and that will give the Eyde virtual particles in this conditions two time dimensions disguised as space dimensions.

$$\text{since photon geodesic is a null geodesic} \therefore\Rightarrow \; ds^2 = 0$$

$$\therefore\Rightarrow 0 = -\left(1-\frac{{r_s}'}{r_s}\right)dt^2c^2 + \left(1-\frac{{r_s}'}{r_s}\right)^{-1} dr^2$$

at $\frac{2M}{m_p} = 1 \Rightarrow {r_s}' = 0$, I already proved this mathematically before with At − Tariq ratio radius

$$\therefore\Rightarrow \left(1-\frac{r_s}{r}\right) = 1;\ dr = i\frac{\sqrt{\pi}}{4}$$

this is the line element of the Eyde virtual particles in the observer frame of reference

$$ds^2 = 0 \therefore\Rightarrow dt^2c^2 = dr^2 \Rightarrow dt^2c^2 = dr^2 \therefore\Rightarrow dt^2 = \frac{dr^2}{c^2}$$

$$dt^2 = \frac{dr^2}{c^2} \Rightarrow dt = \frac{dr}{c} \Rightarrow dt = \frac{i\sqrt{\pi}}{4c} \therefore\Rightarrow \text{the first disguised time dimension} = \frac{i\sqrt{\pi}}{4}$$

at $\left(1-\frac{r_s}{r}\right) = \frac{1}{2} \Rightarrow {r_s}' = i\frac{\sqrt{\pi}}{4}$; $dr = i\frac{\sqrt{\pi}}{2}$ line elementin in the observer frame of reference

since photon geodesic is a null geodesic $\therefore\Rightarrow ds^2 = 0$

$$\therefore\Rightarrow \left(\frac{1}{2}\right)dt^2c^2 = \left(\frac{1}{2}\right)^{-1} dr^2 \therefore\Rightarrow \left(\frac{dt^2c^2}{2}\right) = 2dr^2 \therefore\Rightarrow dt^2 = 4\frac{dr^2}{c^2}$$

$$dt^2 = \frac{4dr^2}{c^2} \Rightarrow dt = \frac{2}{c}dr \Rightarrow dt = \frac{2}{c}i\frac{\sqrt{\pi}}{2} = i\frac{\sqrt{\pi}}{c}$$

$$\therefore\Rightarrow dt = i\frac{\sqrt{\pi}}{c} \therefore\Rightarrow \text{the second disguised time dimension} = i\sqrt{\pi}$$

$$\text{At} - \text{Tariq condition} \equiv \frac{2M}{m_p} = 1 \therefore\Rightarrow M = \frac{m_p}{2} \therefore\Rightarrow r_s = \frac{2G\frac{m_p}{2}}{c^2} = \frac{Gm_p}{c^2}$$

$$= \frac{6.6743 \times 10^{-11} \times 2.176435 \times 10^{-8}}{(299792458)^2}$$

$$= \frac{14.5261801205 \times 10^{-19}}{(89875517873681764)} = 1.616 \times 10^{-35} \equiv l_p$$

We should use an upgrade to Lorentz factor it's appropriate to name it At-Tariq factor (γ_T) For the Eyde virtual particles in the reference frame of the observer, this At-Tariq factor will affect the length and time dimension in this reference frame

$$;\gamma = \frac{1}{\sqrt{1-\left(\frac{v}{c}\right)^2}} \;\&\; \gamma_T = \frac{1}{\sqrt{1-\left(\frac{v}{c\sqrt{2}}\right)^2}}$$

Expansion of the universe is an increment in entropy so we could represent it mathematically with entropy law for empty space that I derived before; $\left[E = k_B K \ln(\sqrt{2})\right]$ then to obtain the energy density in which represent the cosmological constant we should divide it on the space-time volume in which I derived above

$$\therefore\Rightarrow \Lambda = \frac{\mathrm{k_B K}\ \ln\left(\sqrt{2}\,\Omega\right)}{\frac{4}{3}\pi\left(\left(\mathrm{i}\sqrt{\pi}\,\gamma_T\right)\left(\mathrm{i}\frac{\sqrt{\pi}}{4}\gamma\right)\left(\frac{\mathrm{l_p}}{\gamma_T}\right)\right)}$$

$$\therefore\Rightarrow \Lambda = \frac{-3\ \mathrm{k_B K}\ \ln\left(\Omega\sqrt{2}\right)}{\pi^2 \mathrm{l_p}}\left(\frac{1}{\gamma}\right)$$

$$\therefore\Rightarrow \Lambda = \frac{-3(1.38\times10^{-23})(2.7)[(0.346)+\ln(\Omega)]}{(9.869)(1.616\times10^{-35})}\left(\frac{1}{\gamma}\right)$$

By taking the appropriate relative velocity for Lorentz factor and the appropriate multiplicity(Ω) we will get energy density exactly equal to the experimental value of the cosmological constant For example if we take the multiplicity$\{\Omega = 4\}$ and the relative velocity very close to the speed of light with 34 digits after the comma to be compatible with Planck length in Eyde equation as follow

$$\mathrm{v} = 299{,}792{,}457.999{,}999{,}999{,}999{,}999{,}999{,}999{,}999{,}999{,}999{,}999{,}8\ {}^{\mathrm{m}}/_{\mathrm{s}}$$

$$\therefore\Rightarrow \left(\frac{\mathrm{v}}{\mathrm{c}} = 99.999999999999999999999999999999999999999933287181\%\right)$$

$$\therefore\Rightarrow \frac{1}{\gamma} = 1.1551001605\times10^{-21}$$

$$\therefore\Rightarrow \Lambda = -1.4028\times10^{-9}\ \ (\mathrm{J.m^{-1}.s^{-2}.c^{-2}} \equiv \mathrm{J.m^{-3}})$$

This value is in (93.5%) from the average experimental accepted value

8-Tabarak formula:

If we generalize the Eyde formula for quantum field fluctuations frequencies corresponding to energies of At-Tariq condition more than one i.e. $\left(\frac{2\mathrm{M}}{\mathrm{m_p}} \geq 1\right)$ then for each higher frequency we will get an extra disguised time dimension in the dominator with an extra Lorentz factor and this combination will drain out the infinite energy frequencies fluctuations of the quantum field and this will prevent the vacuum catastrophe

$$\therefore\ \mathrm{Tabarak} = \frac{3\ \mathrm{k_B K}\left[\ln\sqrt{2} + \ln\Omega\right]}{4\pi\left(\left(\mathrm{i}\sqrt{\pi}\right)\mathrm{l_p}\right)}\left(\left(i\sqrt{\pi}\,\gamma_T\right)\left(\mathrm{i}\frac{\sqrt{\pi}}{4}\gamma\right)\right)^{-\frac{2\mathrm{M}}{\mathrm{m_p}}}\left(\mathrm{J.m^{-1}.s^{\frac{-2M}{m_p}}.c^{\frac{-2M}{m_p}}}\right);\left(\frac{2M}{m_p}\rightarrow\infty\right)$$

Tabarak in Arabic means blessed there is no physical entity fit Tabarak since it has infinite time disguised dimensions in the dominator.

In simple words it seems that there is an infinite energy from the quantum field fluctuations fighting against infinite time dimensions and infinite Lorentz factors and this will bring the quantum field into balance

Without this balance everything will explode to oblivion and we will have nothing but black holes or impossibly rapid fast expansion due to the infinite energies of the quantum field's fluctuations it's indeed a mighty firmness.

The implication of this equation is huge

Since Eyde equation is temperature dependent then the expansion of the universe was bigger in the past due to the early universe high temperatures so it could help us to solve cosmic inflation problem for example if we input Planck temperature to see how the cosmological constant act in the first moment of the big-bang then we will have really a different expansion by a factor of(10^{32}) if we took my previse result as an estimation reference point then:

$$\therefore\Rightarrow \Lambda_p = -0.7361 \times 10^{23} \ \ (\mathrm{J.m^{-1}.s^{-2}.c^{-2}} \equiv \mathrm{J.m^{-3}})$$

Since the temperature effect the expansion then the universe will never stop expansion since the absolute zero is impossible basically the big bang is not a repeatable event.

9. Finding the equation for the big bang singularity at (t=0) and driving the gravitational constant from it.

If we inflect Tabarak formula on Planck era we could easily rolls out the temperature from the equation as follows

$$\therefore\Rightarrow \Lambda_p = \frac{k_B K_p \ \ln\left(\sqrt{2}\,\Omega\right)}{\frac{4}{3}\pi\left(\left(i\sqrt{\pi}\,\gamma_T\right)\left(i\frac{\sqrt{\pi}}{4}\gamma\right)\left(\frac{l_p}{\gamma_T}\right)\right)} = \frac{3\,k_B\frac{m_p c^2}{k_B}\ \ln\left(\sqrt{2}\,\Omega\right)}{\pi^2\left(l_p\right)}\frac{1}{\gamma}$$

$$\therefore\Rightarrow \Lambda_p = \frac{3\,k_B\frac{m_p c^2}{k_B}\ \ln\left(\sqrt{2}\,\Omega\right)}{\pi^2\left(l_p\right)}\frac{1}{\gamma} = \frac{3 m_p c^2\ \ln\left(\sqrt{2}\,\Omega\right)}{\pi^2\left(l_p\right)}\frac{1}{\gamma} = \frac{3\,c^4\ \ln\left(\sqrt{2}\,\Omega\right)}{\pi^2\,G}\frac{1}{\gamma}$$

$$\therefore\Rightarrow \Lambda_p = -\frac{3\sqrt{\frac{\hbar c}{G}}c^2\ \ln\left(\sqrt{2}\,\Omega\right)}{\pi^2\ \sqrt{\frac{\hbar G}{c^3}}}\frac{1}{\gamma} = -\frac{3c^4\ \ln\left(\sqrt{2}\,\Omega\right)}{\pi^2\,G\,\gamma}$$

$$\therefore\Rightarrow G = \frac{3c^4\ \ln\left(\sqrt{2}\,\Omega\right)}{\pi^2\ 0.7361 \times 10^{23}}\frac{1}{\gamma}$$

at $\Omega = 4$ & at $v = 299792457.999,999,999,999,999,999,999,999,999,999,999,8$ m/s

$$\therefore\Rightarrow \frac{v}{c} = 99.9999999999999999999999999999999999999999933287181\%$$

$$\frac{1}{\gamma} = 1.1551 \times 10^{-21}$$

$$\therefore\Rightarrow G = 6.6947 \times 10^{-11}\left(\frac{m^3}{kg.\,s^2}\right)$$

At (t= 0) there is nothing moving there is no prior causality i.e. there is no Lorentz factor and there is nothing to have any multiplicity that's mean the temperature is exactly the absolute zero then we will have two things a flat smooth space-time

Plane space time i.e. there is no energy equal to At-Tariq condition and smooth space time means the temperature is exactly the absolute zero

There is nothing except the initial conditions of the universe before the rupture in the space-time that's we name it the big bang

From Planck era cosmological constant we will get

$$\because \Lambda_p = -\frac{3c^4\ \ln\left(\sqrt{2}\,\Omega\right)}{\pi^2\ G\,\gamma} \therefore\Rightarrow \Lambda_R = -\frac{3\ c^4\ \ln\left(\sqrt{2}\,\right)}{\pi^2\ G}$$

$$\therefore\Rightarrow \Lambda_R = -1274.9 \times 10^{40}(J.\,m^{-3})$$

For cosmic inflation, we have a combination of two expansions one for the space-time rupture (Λ_R) named wrongfully as the big bang and cosmological constant for the Planck era

$$\therefore\Rightarrow \Lambda_R = -1274.9 \times 10^{40}\ (J.\,m^{-3})\ \&\ \Lambda_p = -0.7361 \times 10^{23}\ \ (J.\,m^{-1}.\,s^{-2}.\,c^{-2} \equiv J.\,m^{-3})$$

$$\therefore\Rightarrow \Lambda_R = -\frac{3\ \ln\left(\sqrt{2}\,\right)}{\varepsilon_\circ{}^2\mu_\circ{}^2\pi^2\ G}$$

$$\therefore\Rightarrow G = \frac{3\ \ln\left(\sqrt{2}\,\right)}{\varepsilon_\circ{}^2\mu_\circ{}^2\pi^2\ \Lambda_R}$$

This is the original equation to derive the gravitational constant.

10. Nature of time and the higher dimensions.

Black hole is an increasing in speed of light by a factor of $\left(\sqrt{2}\right)^{\left(\frac{2M}{m_p}\right)}$ and as I show that the Eyde virtual particles increasing the speed of light in only one spatial dimension by a factor of $\left(\sqrt{2}\right)$ that's mean one thing

Each pair of Eyde virtual particles is nothing but a virtual line black hole i.e. a black hole in one space dimension despairs with the inhalation of the Eyde virtual particles appears and disappears again due to its virtual nature and since it's in one spatial dimension act.

If we took my previse calculations for the cosmological constant as a reference estimation point then in the Planck level due to the effects of the Eyde quantum field there are roughly(449,792) virtual linear black holes in every cubic centimeter of vacuum distorting space-time in a factor of $(\sqrt{2})$ exclusively in Planck level and that will let other virtual particles to move faster than the speed of light in respect to us but in there frame of reference they move less than there speed of light and they follow At-Tariq factor (γ_T) and At-Tariq transformations its exactly as Lorentz transformations but with At-Tariq factor (γ_T)

$$; \gamma_T = \frac{1}{\sqrt{1-\left(\frac{v}{c(\sqrt{2})^{\left(\frac{2M}{m_p}\right)}}\right)^2}} ; \frac{2M}{m_p} \geq 1$$

We should note that for At-Tariq condition higher than one there are extra disguised time dimensions for each step.

We saw that high energies do not reveal higher space dimensions rather than extra time dimension and that's all about measuring the speed of light differently between two frames of reference one of them accelerated in relative to the other one that's mean there is no extra higher space dimension and any theory relying on extra higher space dimension should be excluded and should be considered as nothing but unnecessary mathematical fantasy

The amount of time determent by the speed of light and the different between two differently accelerated frames of reference

The direction of time is determent by the entropy

That's mean time didn't come from the big bang since there is no enough high energy that will generate more space-time without original space-time we observed that both in black hole singularity and in Eyde quantum field.

11-Experimental results

Since the speed of light is independent of the direction of the moving source and the observer, it is only dependent on the nature of the empty space itself:

$$c = \frac{1}{\sqrt{\varepsilon_{\circ}\,\mu_{\circ}}}\ ;\ \varepsilon_{\circ} = \frac{q}{\Phi_E} = \frac{q}{E4\pi r^2}\hat{r}\ ;\ \ \mu_{\circ} = \frac{B}{H}$$

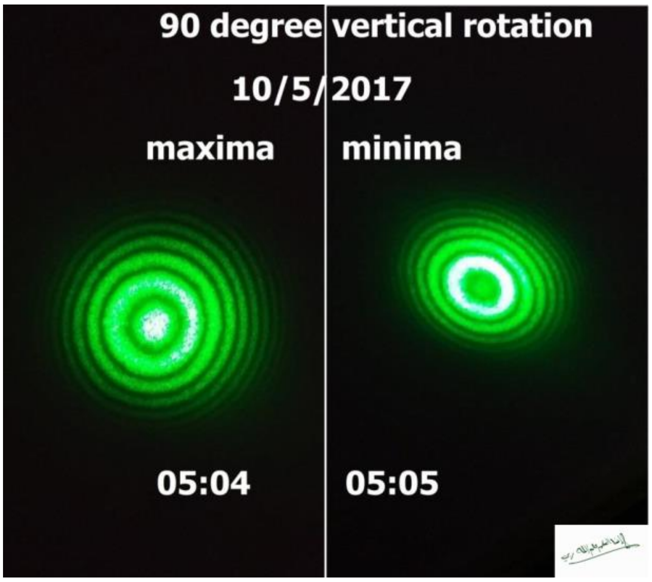
Then, changing the distance from a large gravity well will change the nature of the empty space itself due to gravitational redshift and blueshift. Thus, we should detect a notable interference pattern.

We could detect this by setting up a vertical Michelson and Morley experiment relative to the Earth (and not parallel to the Earth or horizontally). In this way, when we rotate the Michelson's interferometer 90 degrees; we should get a significant change due to gravitational redshift and blueshift, which responds to the change in the speed of light as follows:

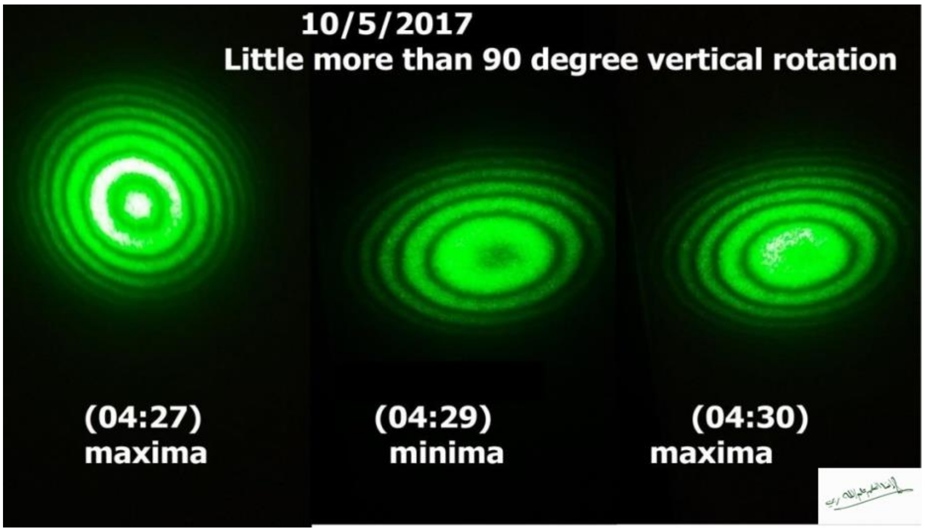
$$c' = \frac{1}{\sqrt{\varepsilon_{\circ}\mu_{\circ}\left(1 - \frac{r_s}{r}\right)}} \therefore\Rightarrow c' = c\left(1 - \frac{r_s}{r}\right)^{-1/2}$$

This is not a new thing it's made before in pound rebka experiment and in laser gravimeter as in field absolute ballistic laser gravimeter.

For the 90°rotation, I have a confirmed positive change in the central interference pattern from maxima to minima as follows.



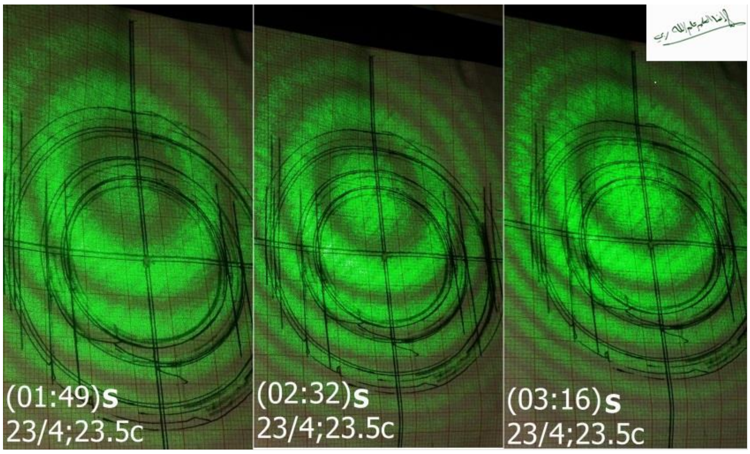
For more than 90° rotation, I have a confirmed positive change in the central interference pattern from maxima to minima to maxima in the central interference pattern as follows.

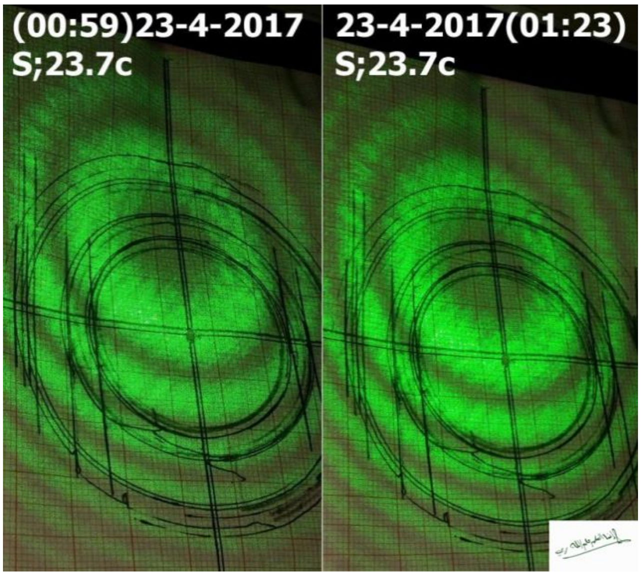


However, detecting the collaboration effect (B_r) is much harder since it depends on the movement of the gravity well itself in our case it's the Earth, so a vertical non-rotating interferometer in which its horizontal arm is oriented to the north or south (to eliminate the Sagnac effect) should be sufficient it took me 4 months of continuous working day and night to complete this task of hard labor experimental work.

I get a lot of results considering the same temperature and the minimum time elapsed to remove anyside effects on the interferometer.

Some of these results are presented below:





I am keen to redo the experiment for the (B_r) effect with a laser gravimeter, as this will be the only way to allow us to make highly precise measurements. Or, we could make an ordinary horizontal Michelson-Morley experiment, but next to a large mountain-chain, so that the mass of the mountain-chain will act as a runaway gravity well.

12. Conclusions

1. The electric flux gets stretched and constricted due to the gravitational effect as in the gravitational blueshift and redshift, and since the electric charge is conserved, then this will affect the electric permittivity of the free-space $(\varepsilon_\circ)$ and, as a consequence, the speed of light itself, in a way such that it updated as follows:

;for any usual gravity well $\left[c' = c\left(1 - \frac{r_s}{r}\right)^{-1/2}\right]$ in respect to an observer at infinity; for a black hole we have $\left[c_T = c\left(\sqrt{2}\right)^{\frac{2M}{m_p}}\right]$ in respect to an observer at infinity.

2. For a black hole we will always have($r_s < r$) due to the change in the speed of light because of the gravitational blue-shift, and since we will have ($ds^2 = 0$) at the singularity, then space-time is continuous and not discrete.

This is because, when $\left[r_s = l_p \therefore\Rightarrow r_s' = \frac{l_p}{2}\right]$ and despite of Zeno paradox, we will get a zero space-time interval [$ds^2 = 0$] in the center of the black hole and not an undefined singularity that will leave us with only one result: space-time is continuous and not discrete; it is a continuous physical entity, which I call it Al-Hubok, from the Arabic word for fabric.

3. From At-Tariq condition & Al-Buraq effect of the collaboration between Schwarzschild metric and Lorentz transformation, the only conclusion is that the gravity is some sort of reflection of the uncertainty principle through the fabric of space-time only for masses eqal or bigger than half Planck mass $\left(M = \frac{m_p}{2}\right)$ and does not need a messenger particle at all i.e. gravity is not a force its reflection to the other forces throgh the fabric of space-time thats mean we nedd to change the four forces of natuer to be only three.

Basically, the probability distribution to energy and mater in space-time fabric contribute to the whole energy density distribution, and this is what the Einstein field equations originally state (gravity is an acceleration due to curvature in space-time due to the difference in energy density distribution through this fabric) and this is only for masses equal or bigger than half Planck mass $\left(M = \frac{m_p}{2}\right)$.

4. Elementary particles dose not satisfy At-Tariq condition so it cannot effect space-time until space-time effected by a mass scale bigger than or equal to half Planck mass$\left(M = \frac{m_p}{2}\right)$ that's mean a molecule with half Planck mass will bend space-time but the atoms and the elementary particles that make this molecule will not.

5. Al-Buraq effect (B_r) (i.e., collaboration between the Schwarzschild metric and Lorentz transformation) is a good candidate solution for the dark matter problem since the speed of light is affected by the velocity and direction of the gravity well itself; then, the gravity itself will change,(in respect to observer in infinty) it even changes the gravitational lensing due to the movement angle (t) of the gravity well as inAl-Buraq factor (B_r), so we will have some gravitational lensing dependent on the direction angle (t) and velocity of moving gravity well; I call this Al-Buraq refraction.;the surface gravity in relativ to a local observer is un changed but in relative to a distance observer its changed with Al-Buraq factor as folow For ablack hole we have

$$g_{TB_r} = \frac{2MG}{(r_s')^2} = \frac{MG}{\left(\frac{2GM}{{c_{B_r}}^2}\right)^2}; c_{B_r} = c.B_r; B_r = \frac{1}{\sqrt{1 - \frac{6GM\gamma\cos(t)}{r(2\gamma\cos(t)+1)c^2}}}$$

$$;\gamma = \frac{1}{\sqrt{1 - {v^2}/{c^2}}}; 0 \le t \le \pi$$

For ordinary gravity well we have :

$$\because g = \frac{MG}{(r_s'+h)^2} \therefore\Longrightarrow g_{B_r} = \frac{MG}{\left(\frac{2GM}{{c_{B_r}}^2}+h\right)^2}; c_{B_r} = c.B_r$$

$$;B_r = \frac{1}{\sqrt{1 - \frac{6GM\gamma\cos(t)}{r(2\gamma\cos(t)+1)c^2}}}; \gamma = \frac{1}{\sqrt{1 - {v^2}/{c^2}}}$$

$; 0 \le t \le \pi (g_{TB_r}) \& (g_{B_r})$ is an excellent candidate solution for the dark-matter.

6. Al-Buraq effect is a strong candidate solution for the relativistic jets, and it is our way to make antigravity & space-time warp drive; we only need to accelerate a molecules with the mass equal or bigger than half Planck mass to satisfy At-Tariq condition, and when we accelerate such a beam then it will creat antigravity & warp space-time itself as follows

$$\left[(B_r) = \left(1 - \frac{6GM\gamma\cos(t)}{r(2\gamma\cos(t)+1)c^2}\right)^{-\frac{1}{2}}; \gamma = \frac{1}{\sqrt{1 - {v^2}/{c^2}}}; 0 \le t \le \frac{\pi}{2}\right]$$

This is a very good way to prove experimentally the effects of gravity on the microstate level.

7. The cosmological constant is calculated with Eyd formula as folow

$$\Lambda = \frac{-3\, k_B K\, \ln(\Omega\sqrt{2})}{\pi^2 l_p}\left(\frac{1}{\gamma}\right)$$

By taking the appropriate relative velocity for Lorentz factor and the appropriate multiplicity(Ω) we will get energy density exactly equal to the experimental value of the cosmological constant For example if we take the multiplicity$\{\Omega = 4\}$ and the relative velocity very close to the speed of light with 34 digits after the comma to be compatible with Planck length in Eyde equation as follow

$$(V = 299{,}792.457{,}999{,}999{,}999{,}999{,}999{,}999{,}999{,}999{,}999{,}999{,}999{,}8\ {m}/{s})$$

$$\therefore\Rightarrow \left(\frac{v}{c} = 99.999999999999999999999999999999999999999933287181\%\right)$$

$$\therefore\Rightarrow \Lambda = -1.4028 \times 10^{-9} \ \ (\mathrm{J.m^{-1}.s^{-2}.c^{-2}} \equiv \mathrm{J.m^{-3}})$$

This value is in (93.5%) from the average experimental accepted value

8. Generalizing the Eyde formula to Tabarak formula to include higher energies This will prevent the vacuum catastrophe since the infinite quantum filed fluctuations will fight aginst infinite time disguised dimensions plus infinite Lorentz factors.

$$\therefore\Rightarrow \mathrm{Tabarak} = \frac{3\,k_B K\left[\ln\sqrt{2} + \ln\Omega\right]}{4\pi\left(\left(i\sqrt{\pi}\right) l_p\right)}\left(i\frac{\sqrt{\pi}}{4}\gamma\right)^{-\frac{2M}{m_p}}\left(\mathrm{J.m^{-1}.s^{\frac{-2M}{m_p}}.c^{\frac{-2M}{m_p}}}\right)$$

9. Since the Eyde formula is temperature dependent then the expansion of the universe was bigger in the past due to the early universe high temperatures so it could help us to solve cosmic inflation problem for example if we input Planck temperature to see how the cosmological constant act in the Planck era then we will have really a different expansion by a factor of(10^{32}) if we took my previse result as an estimation reference point then:

$$\therefore\Rightarrow \Lambda_p = -0.7361 \times 10^{23} \ \ (\mathrm{J.m^{-1}.s^{-2}.c^{-2}} \equiv \mathrm{J.m^{-3}})$$

Since the temperature effect the expansion then the universe will never stop expanding since the absolute zero is impossible basically the big bang is not a repeatable event at any way.

10. As we saw in Tabarak formula adding enormous energy will not reveal higher space dimensions instead of this it will only change the measure of the speed of light between a different accelerated frame of reference and this will be translated mathematically into disguised time dimensions and not a higher space dimensions this should be the end for strings theories and every theory depends on higher space dimensions.

11. The big bang singularity is not a singularity at all and its well defined as follows

$$\Lambda_R = -\frac{3\,c^4\ \ln\left(\sqrt{2}\right)}{\pi^2\ G}\ \therefore\Rightarrow \Lambda_R = -1274.9 \times 10^{40}(\mathrm{J.m^{-3}})$$

; Λ_R is the cosmological constant at exactly (t=0);R stands for rupture in space-time in the dawn of the universe

12. I already proved the physicality of space-time through the successful vertical variation of Michelson-Morley experiment and as we saw in the black hole singularity and in the cosmological constant its' clear that in both cases involving extreme energy like no other and in both cases there are no signs to create a new space-time but in fact, just expanding space-time to infinity and

constrict it to zero, and as we saw both in the universe expansion and in gravity mechanism space-time is not a product of the events rather than the stage for it.

The conclusion is inescapable space-time is prior to the big bang itself and the big bang is nothing but a rupture to space-time in the dawn of creation

In a short word since I proved that the vacuum has entropy higher than zero with law of hubok entropy then space-time is prior to the big bang itself.

$$\text{hubok entropy: } S_V = k_B \ln\left(\sqrt{2}\right)$$

13. For cosmic inflation, we have a combination of two expansions one for the space-time rupture (Λ_R) named wrongfully as the big bang and cosmological constant for the Planck era

$$\therefore\Rightarrow \Lambda_R = -1274.9 \times 10^{40}\ (\mathrm{J.m^{-3}})\ \&\ \Lambda_p = -0.7361 \times 10^{23}\ \ (\mathrm{J.m^{-1}.s^{-2}.c^{-2}} \equiv \mathrm{J.m^{-3}})$$

14. We could drive gravitational constant from the rupture constant (Λ_R) since it's the most basic elementary equation in physics it's the only equation in which act on a plane and smooth space-time and without prior physical causality there is no other equation do this and there is no wonder about this we are talking about the first act of physics and the beginning of creation itself

$$\therefore\Rightarrow \Lambda_R = -\frac{3\ \ln\left(\sqrt{2}\right)}{\varepsilon_\circ{}^2\mu_\circ{}^2\pi^2\ G}\ \therefore\Rightarrow G = \frac{3\ \ln\left(\sqrt{2}\right)}{\varepsilon_\circ{}^2\mu_\circ{}^2\pi^2\ \Lambda_R}$$

If we use a less precise approach as Planck era expansion and we use my previous estimation as a reference point then

$$\therefore\Rightarrow \Lambda_p = -\frac{3\sqrt{\frac{\hbar c}{G}}c^2\ \ln\left(\sqrt{2}\,\Omega\right)}{\pi^2\ \sqrt{\frac{\hbar G}{c^3}}}\frac{1}{\gamma} = -\frac{3c^4\ \ln\left(\sqrt{2}\,\Omega\right)}{\pi^2\ G\,\gamma}$$

$$\therefore\Rightarrow G = \frac{3c^4\ \ln\left(\sqrt{2}\,\Omega\right)}{\pi^2\ 0.7361 \times 10^{23}}\frac{1}{\gamma}$$

$$\text{at } \Omega = 4\ \&\ \text{at } v = 299792457.999,999,999,999,999,999,999,999,999,999,999,999,8\ \mathrm{m/s}$$

$$\therefore\Rightarrow \frac{v}{c} = 99.999999999999999999999999999999999999999933287181\%$$

$$\frac{1}{\gamma} = 1.1551 \times 10^{-21}$$

$$\therefore\Rightarrow G \cong 6.6947 \times 10^{-11}\left(\frac{\mathrm{m^3}}{\mathrm{kg.s^2}}\right)$$

15. Time is nothing else than a relative directional scale of changing where its amount decided by the speed of light and the relative speed of light in which decided by At-Tariq factor and At-

Tariq condition and its direction decided by the law of hubok entropy $\left[S_V = k_B \ln\left(\sqrt{2}\Omega\right)\right]$ so an accelerated frame of reference that creating a variance in the speed of light will create a time disguised dimension in relative to an observer in fixed frame of reference and since the speed of light in vacuum is decided by Maxwell law $\left[c = \frac{1}{\sqrt{\mu_\circ \epsilon_\circ}}\right]$ and since the vacuum has an entropy $\left[S_V = k_B \ln\left(\sqrt{2}\right)\right]$ then time is before the big bang itself and time cannot be zero nor reversed even when entropy get lucky and arrange the system to be less random then the system will get more random due to vacuum entropy.

16. For the expermental part this is not new it allways cared out with laser gravimeter but no body notice it (except a german physics enthusiastic his name was Mr. Martin Grusenick and his work should be noticed but he couldn't figure it out and his work used by pseudoscience on internet a lot) in fact we could make a successful ordinary horizontal Michelson-Morley experiment but next to a large mountain-chain so that the mass of the mountain-chain will act like a runaway gravity well and have a positive result, unlike what we have in the original experiments, which failed.

17. Since the vacuum entropy $\left[\, S_V = k_B \ln\left(\sqrt{2}(\Omega)\right); \text{in vacuum } \Omega = 1\right]$, so both Boltzman entropy law and Landauer's principle should be revision.

18. The surface temperature of the black hole has nothing to do with its mass; it is always constant for a local observer, $K_T = \frac{K_p}{\ln\sqrt{2}}$; $K_T \equiv$ the singularity temperature, and it is the same temperature of the singularity, and this is very reasonable since nothing could ever cross the event horizon (because for anything going towards event horizon speed of light will always increase $\left[c_T = c\sqrt{2}\right]$ so that the event horizon will always run away from it, like chasing an elusive mirage).

19. Since the event horizon is unreachable, this means that the black hole cannot evaporate; the black hole feeds on nothing but quantum foam will leak out the quantum foam from its poles due to Al-Buraq effect and this is a useful approach to study quantum foam.

20. Relativistic mass differs from gravitational mass and from the inertial mass by At-Tariq condition such that every mass does not meet At-Tariq condition is not a gravitational effect

21. Black hole entropy is vacuum entropy multiplied by the Al-Tariq condition of that black hole $\left[S_T = k_B \frac{2M}{m_p} \ln \sqrt{2}\right]$.

22. The Eyde virtual particles are bending space-time at Planck level and elevating the speed of light by a factor of $(\sqrt{2})$ for an outside observer and that will let other virtual particles to move faster than the speed of light in respect to us but in there frame of reference they move less than there speed of light and they follow At-Tariq factor (γ_T) and At-Tariq transformations its exactly as Lorentz transformations but with At-Tariq factor (γ_T); $\gamma_T = \frac{1}{\sqrt{1-\left(\frac{v}{c(\sqrt{2})^{\left(\frac{2M}{m_p}\right)}}\right)^2}}; \frac{2M}{m_p} \geq 1$

23. Space-time is not aether because aether is a medium filling the vacuum and dragged by any mass moving through it while space-time is a physical fabric with special properties it could expand to infinity and constrict to zero in response to an exclusive wave function of mass that follows At-Tariq condition and unlike aether, it can't be affected with masses it affected exclusively by the wave function of masses equal or more than half Planck mass and I proved that when I calculate the speed of light changing due to At-Tariq condition

$$\therefore\ c.(T) = \frac{c}{\left(\sqrt{1-\frac{1}{2}}\right)^{\frac{2M}{m_p}}} = \frac{c}{\left(\frac{1}{\sqrt{2}}\right)^{\frac{2M}{m_p}}}\ ; (T) = (\sqrt{2})^{\frac{2M}{m_p}}\ \therefore\!\Longrightarrow c_T = c(\sqrt{2})^{\frac{2M}{m_p}}$$

$$M = \frac{m_p}{2}; M \equiv \text{ wave function I drive it from the uncertinty principl}$$

24. Space-time interval at the exact center of any black hole is not a singularity its well define to be exactly zero.

$$ds^2 = -\left(\frac{1}{2}\right)c^2\left(-\frac{\pi}{c^2 4}\right) + \frac{\left(i\frac{\sqrt{\pi}}{4}\right)^2}{\left(\frac{1}{2}\right)} \therefore\!\Longrightarrow ds^2 = \left(\frac{\pi}{8}\right) - \left(\frac{\pi}{8}\right) = 0$$

25. The fine-structure constant does not affect by gravitational blue-shift or by the Eyde quantum field since it's considered a local observer,

$\because c' = c\left(1-\frac{r_s}{r}\right)^{-1/2}$; (c')as measured by an observer at infinity since elementary particles do not satisfy Al-Tariq condition so the space-time nearby an elementary particle is completely flat and it does not bend until it reaches a mass scale bigger or equal to half Planck mass $\left(M = \frac{m_p}{2}\right)$

$$\text{since } r_s \text{ is the smallest possible value at } \frac{2M}{m_p} = 1 \therefore\Rightarrow \text{ at } \frac{2M}{m_p} < 1 \Rightarrow r_s = 0$$

$$\therefore \Rightarrow \mathrm{Al-Tariq\ condition} = 0, (\mathrm{T})\mathrm{factor} = 1, (\mathrm{B_r})\ \mathrm{factor} = 1$$

$\therefore\Rightarrow \alpha$ is constant for elementary particles since they are a local observer.

13. Key features

- $\varepsilon_\circ \equiv$ the electric permittivity of the free − space
- $\mu_\circ \equiv$ magnetic permeability of the free − space
- $\Phi_E \equiv$ electric flux
- $q \equiv$ electric charge
- $E \equiv$ electric field
- $M \equiv$ mass of the gravity well
- $\Phi \equiv$ gravity potential
- $G \equiv$ Gravitational constant
- $r \equiv$ gravity well radius
- $c' \equiv$ updated speed of light due to gravity as measured by the observer at infinity
- $f \equiv$ photon frequency in free − space
- $f_g \equiv$ photon frequency near a gravity well, i.e., blue − shifted
- $\lambda \equiv$ wavelength
- $\lambda_g \equiv$ wavelength near gravity well blue − shifted as measured by the observer at infinity
- $R =$ shrinking length of space − time due to gravitational effects
- $R_\circ = r - r_s =$ ordinary length of space − time free of any effect of gravity
- $\varepsilon' \equiv$ updated electric permittivity of the free − space due to gravity
- $ds^2 \equiv$ space − time interval
- $r_s \equiv$ Schwarzschild radius
- $r_s' \equiv$ updated Schwarzschild radius due to gravity

- $dr_s{}^2$ ≡ line element squared in Schwarzschild metric
- $dt_s{}^2$ ≡ time element squared in Schwarzschild metric
- l_p ≡ Planck length
- m_p ≡ Planck mass
- M ≡ black hole mass
- $\left(T = (\sqrt{2})^{\frac{2M}{m_p}}\right)$ ≡ black hole condition (I name it At-Tariq condition)
- c_T ≡ speed of light at event horizon or singularity calculated by outside observers
- $\left(r_T = i\frac{\sqrt{\pi}}{4}\right)$ ≡ At − Tariq ratio radius or black hole ratio radius
- $\hbar$ ≡ Planck reduced constant $= (h/2\pi)$
- k_B ≡ Boltzmann constant
- S ≡ entropy
- Ω ≡ microstates multiplicity
- K_T ≡ blackhole Surface temperature for a local observer
- S_T ≡ black hole entropy, i.e., free − space entropy
- U ≡ energy in thermodynamic part
- γ ≡ Lorentz factor
- γ_T ≡ At − Tariq factor
- B_r ≡ calibration factor (I name it Al-Buraq factor)
- c_{B_r} ≡ updated speed of light due to Al − Buraq factor
- t ≡ direction angle of movement of the gravity well
- F_p ≡ Planck force
- g ≡ surface gravity
- g_T ≡ blackhole surface gravity
- g_{B_r} ≡ surface gravity due to calibration factor
- α ≡fine-structure constant and the graviton effects
- $\Lambda_R \equiv \mathit{cosmologecal\ constant\ at}\ (t = o)$
- $\Lambda_P \equiv \mathit{cosmologecal\ constant\ at\ Planck\ era}$

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