Using At-Tariq Condition to Construct Newton Universal Law of Gravity from the Schrödinger Equation and to Calculate the Cosmological Constant

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1. Abstract

At-Tariq condition is a non-constant ratio I drive it from Schwarzschild metric it represents the ratio mass of a gravity well to the Planck mass and I use it to construct Newton universal law of gravity from the Schrödinger equation and then use it 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 ($\Lambda \cong -1.4028 \times 10^{-9}$ $(\mathrm{J.m^{-3}})$ with a proper solution to the vacuum catastrophe, in fact, this work proves the effect of the gravitational blue shift of a moving gravity well, on the electric permittivity of free space ($\varepsilon_\circ$)through both mathematical derivation and experimental evidence using a vertical variation of the Michelson-Morley experiment.

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 [3] in that research states:

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

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

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

$$; c' \equiv the\ speed\ of\ light\ near\ a\ large\ gravity\ well\ as\ measured\ by\ observer\ at\ infinity,$$
$$G \equiv gravitational\ constant, r \equiv radius\ of\ the\ gravity\ well$$

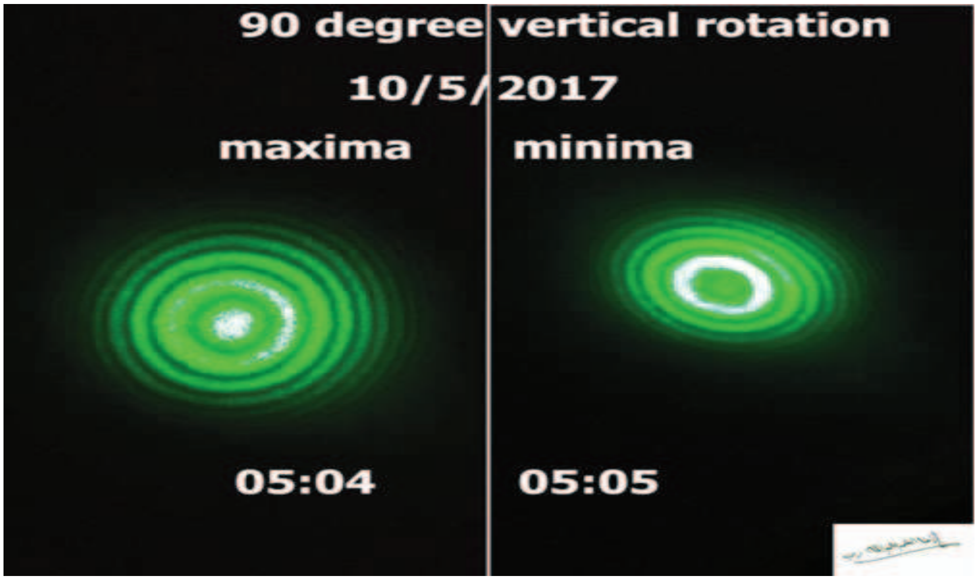
Einstein suggested that the speed of light is faster in curved space-time if measured by an observer at infinity “i.e. observer in a flat space-time” in simple words the speed of light in a vacuum is influenced by difference due to gravity between flat space-time and curved space-time such that this difference will increase with a deeper curve in compear to more flat curve if measured between these two regions.

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

As I will show in this paper both mathematically and experimentally that Einstein approach is almost true but it needs some factor correction to be quite true, actually the speed of light for a local observer nearby gravity well is always constant but for an observer at infinity its differs by a factor of $\left[\left(1-\frac{r_s}{r}\right)^{-1/2}\right]$ as long as the measuring is for photon approaching the gravity well but it will differs by a factor of $\left[\left(1-\frac{r_s}{r}\right)\right]$ as long as the measuring is for aphoton distancing away from the gravity well as long as both measurements are taken by an observer at infinity

In short words speed of light is not constant between two regions of space as long these regions have a difference in space-time curvature actually its gravitational blue shift and gravitational red shift phenomenon but since the time for the photon is zero then the gravitational time dilation will not compensate to keep the speed of light constant as for other mass particles and I will prove this mathematically also.

Since the original Michelson-Morley experiment does not change the distance between the interferometer and the nearby gravity well (i.e. The Earth) then there is no change in the space-time curvature so nothing will happen until we conduct a vertical variation of the Michelson-Morley experiment then we will get different results as I did and get in the experimental part.



This is not a new thing it has ben observed expermentaly in 1953 by Pound and Rebka experiment on gravitational red-shift in nuclear resonance

Then I will use these results to calculate the cosmological constant using the quantum field fluctuations within an accuracy of [93.5%] from the average current experimental results i.e. ($\Lambda \cong -1.4028 \times 10^{-9}\ (J.m^{-3})$).

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

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 infinity, the photon should have a gravitational blueshift as follow.

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

$$\because (\lambda_{\circ} = r - r_s = R_{\circ}), \because (\lambda_{blueshift}) = r' - r_s = R \therefore \Delta\lambda = r - r'\ and,$$
$$\because\ r, r', r_s, all\ are\ fixed\ points\ in\ space$$

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

Then this means the wavelength itself is shortened due to change in distances of the space itself 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(R & $R_\circ$).

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.

The electric flux is an area description and not in one dimension and since 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 $\left(R^2 = {R_\circ}^2\left(1-\frac{r_s}{r}\right)\right)$.

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

Then electric flux affected by gravity and since the electric charge is conserved, this will affect the electric permittivity of the free space ($\varepsilon_\circ$):

$$\because \; \varepsilon_\circ = \frac{q}{\Phi_E} = \frac{q}{E4\pi R^2} \therefore under\ gravity \Rightarrow \varepsilon' = \frac{q}{E\frac{4\pi {R_\circ}^2}{\left(1-\frac{r_s}{r}\right)}} \Rightarrow \varepsilon' = \varepsilon_\circ\left(1-\frac{r_s}{r}\right) \because r_s < r \therefore\Rightarrow \varepsilon' < \varepsilon_\circ$$

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

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

Since the speed of light is not a vector quantity and it is a scalar quantity that is independent on the direction of the moving source nor the observer and it is only dependent on the nature of the empty space itself:

$$\because c = \frac{1}{\sqrt{\varepsilon_\circ\mu_\circ}}$$

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

$$\therefore\Rightarrow c' = c\left(1-\frac{r_s}{r}\right)^{-1/2} \therefore under\ gravity\ for\ observer\ at\ infinity\ i.e.\ in\ flat\ space\ time\ c' > c$$

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

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

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:

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

Now

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

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

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

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):

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

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

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

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

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

$$At\ the\ singularity\ for\ local\ observer\ (r_s{}'=0)\ \therefore\Longrightarrow\left(c'=c\,\left(1-\frac{0}{r}\right)^{-\frac{1}{2}}\right)\therefore\Longrightarrow c'=c$$

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

$$The\ singularity\ for\ nonlocal\ observer\ (r_s=r_s{}')\ \therefore\Rightarrow\left(1-\frac{r_s{}'}{r_s}\right)=0$$

$$\therefore\Longrightarrow\pm1=e^{\left(4\sqrt{\pi}\,r_s\right)}\ (for\ non-local\ observer)\begin{cases}\because\ 1=e^{2i\pi}\ \therefore\Rightarrow e^{2i\pi}=e^{4\left(\sqrt{\pi}\right)r_s}\ \therefore\Longrightarrow r_s=i\frac{\sqrt{\pi}}{2}\\ or\\ \because -1=e^{i\pi}\ \therefore\Rightarrow e^{i\pi}=e^{4\left(\sqrt{\pi}\right)r_s}\ \therefore\Longrightarrow r_s=i\frac{\sqrt{\pi}}{4}\end{cases}$$

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

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

$$;r_T\equiv length\ element\ at\ the\ singularity$$

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

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

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

Since the photon geodesic is a null curve:

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

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

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

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

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

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

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

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

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

Since we have mass with an uncertain position between zero and one $\left(0 < \frac{r_s}{r} < 1\right)$, then this is a normalized wave function this is only happening 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:

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

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

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

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

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

$$; n\ is\ the\ number\ of\ Schwarzschild\ radii\ steps\ of\ the\ event\ horizon$$

$$due\ to\ the\ effect\ of\ gravity\ on\ empty\ space$$

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

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

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

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

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

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

$$since\ energy\ is\ quantized$$

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

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 an observer at infinity is:

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

$$\Longrightarrow A\ black\ hole\ is\ any\ mass\ that\ will\ \ increase\ the\ speed\ of\ light\ on\ its\ surface\ by\ at\ least\ a\ factor\ of\ (\sqrt{2})$$

A gravity well is any mass is equal or biger than half Planck mass.

4. Space-time curvature and Schwarzschild radii from multi-perspective:

A black hole of mass (M) will have multiple different Schwarzschild radii depending on the observers such that we have here two observers each one will report a different Schwarzschild radius.

The first observer is the particles that falling in the event horizon and I will denote the Schwarzschild radius in this perspective as $\left(r_{sf}\right)$.

The second observer is an observer at infinity i.e. observer in flat space-time and in this perspective, the black hole will have the ordinary Schwarzschild radius in which we all know and love $\left(r_s = \frac{2GM}{c^2}\right)$.

The first observer is the falling particle in the event horizon the speed of light at this region will be increased by a factor of $\left(\sqrt{2}\right)$ in compare with the speed of light in flat space-time then the Schwarzschild radius will shrink in the same ratio so the mass of the black hole in the particle perspective will be decreased in the same ratio as follows

$$\therefore\Longrightarrow\ r_{sf} = \frac{2Gm_T}{c^2};\ m_T = \frac{M}{\left(\sqrt{2}\right)^{\left(\frac{2M}{m_p}\right)}}$$

$$; M\ is\ the\ mass\ of\ the\ black\ hole\ as\ observed\ from\ flat\ space\text{–}time$$

This is very reasonable since when the particle reaches event horizon will have a space-time curvature behind it start from infinity caused by the black hole itself then the speed of the fall will be increased by a factor of $\left(\sqrt{2}\right)$ but the curvature will be less by the same factor and as the particle will fall towards the black hole at each step it will leave behind it more curved space-time and this curvature behind the particle will decrease the total curvature of the space-time of the black hole itself in the falling particle perspective.

This is nothing but changing of energy from potential to kinetic energy in simple words when you fall from a one-story building is really different from when you fall from a ten-story building

5.Using At-Tariq condition to construct Newton universal law of gravity from the Schrödinger equation.

From At-Tariq equations we know that the least mass to create curvature in space-time is half Planck mass and this curvature in space-time is happening due to the energy density difference created by wave function of half Planck mass and this energy density difference is due to uncertainty principle of the half Planck masses i.e. At-Tariq condition.

Now I will use this knowledge to construct Newton universal law of gravity from the Schrödinger equation

Since mass have a certain space to exist in then we could describe it with Schrodinger equation for infinite square well then we magnify it by At-Tariq condition

$$-\frac{\hbar^2}{2m}\frac{\partial^2}{\partial x^2}\psi + V\psi = E\psi$$

$$we\ use\ half\ Planck\ mass\ from\ At-Tariq\ condition\ \therefore\Rightarrow -\frac{\hbar^2}{m_P}\frac{\partial^2}{\partial x^2}\psi + V\psi = E\psi$$

We know that the wave function for infinite square well is

$$\psi_n(x) = \sqrt{\frac{2}{a}}sin\left(n\frac{\pi}{a}x\right)$$

Since the mass will act gravitationally the same way near absolute zero and near nuclear fusion temperature then energy levels is neglect able and our wave function will be as follows

$$\because\ n = 1 \Rightarrow \psi_n(x) = \sqrt{\frac{2}{a}}sin\left(\frac{\pi}{a}x\right) \Rightarrow \frac{\partial^2}{\partial x^2}\psi = -\frac{\sqrt{2}(\pi)^2\, sin\left(\frac{\pi x}{a}\right)}{a^2\sqrt{a}}$$

$$a = l\begin{cases} ;l = 2x \Rightarrow \psi_n(x) = \sqrt{\frac{2}{l}} \Rightarrow \frac{\partial^2}{\partial x^2}\psi = -\frac{\sqrt{2}(\pi)^2}{l^2\sqrt{l}} \ldots\ldots\boxed{1} \\ ;l = 4x \Rightarrow \psi_n(x) = \sqrt{\frac{1}{l}} \Rightarrow \frac{\partial^2}{\partial x^2}\psi = -\frac{(\pi)^2}{l^2\sqrt{l}} \ldots\ldots\boxed{2} \end{cases}$$

Where (l) is the distance separating the half Planck masses from each other then it's not a real distance it's just a way to describe the total distribution of mass in corresponding to At-Tariq condition and the total density of the body.

Since (m_P) is fixed then density will change with the distance separating the half Planck masses from each other and since gravity is an act in 4d space-time we need to express density through 4d surface volume to make the 3d Newton gravity compatible with the 4d general relativity

$$\Rightarrow \frac{m_P}{4\pi^2 l dl} = 3M\frac{1}{4\pi r^3} \Rightarrow \frac{4\pi^2 l^3 dl}{m_P} = \frac{4\pi r^3}{3M} \Rightarrow l = r\left(\frac{2}{3\pi n dl}\right)^{\frac{1}{3}} ; n = \frac{2M}{m_P}$$

$For\, l = 2x$

$$\frac{\hbar^2}{m_P}\frac{\sqrt{2}(\pi)^2}{l^2\sqrt{l}} = E\sqrt{\frac{2}{l}} \Rightarrow E = \frac{\hbar^2}{m_P}\frac{(\pi)^2}{l^2}; l = r\left(\frac{2}{3\pi ndl}\right)^{\frac{1}{3}}; n = \frac{2M}{m_P}$$

$For\, l = 4x$

$$\frac{\hbar^2}{m_P}\frac{(\pi)^2}{l^2\sqrt{l}} = E\sqrt{\frac{1}{l}} \Rightarrow E = \frac{\hbar^2}{m_P}\frac{(\pi)^2}{l^2}; l = r\left(\frac{2}{3\pi ndl}\right)^{\frac{1}{3}}; n = \frac{2M}{m_P}$$

As we know the gravitational potential is as follows

$$E = \frac{GM^2}{r} \therefore\Rightarrow \frac{GM^2}{r} = n\frac{\hbar^2}{m_P}\frac{(\pi)^2}{l^2}; l = r\left(\frac{2}{3\pi ndl}\right)^{\frac{1}{3}}; n = \frac{2M}{m_P}$$

$$\therefore\Rightarrow E = \frac{GM^2}{r} = n\frac{\hbar^2}{m_P}\frac{(\pi)^2}{r^2\left(\frac{2}{3\pi ndl}\right)^{\frac{2}{3}}}; n = \frac{2M}{m_P}$$

$$\therefore\Rightarrow \frac{2}{3\pi ndl} = \left(\frac{2}{GM}\frac{\hbar^2}{(m_P)^2}\frac{(\pi)^2}{r}\right)^{\frac{3}{2}}; n = \frac{2M}{m_P}$$

$$\therefore\Rightarrow dl = \left(\frac{2}{3\pi\frac{2M}{m_P}\left(\frac{2}{GM}\frac{\hbar^2}{(m_P)^2}\frac{(\pi)^2}{r}\right)^{\frac{3}{2}}}\right)$$

$$\therefore\Rightarrow E = n\frac{\hbar^2}{m_P}\frac{(\pi)^2}{r^2\left(\frac{2}{3\pi n\left(\frac{2}{3\pi n\left(\frac{2}{GM}\frac{\hbar^2}{(m_P)^2}\frac{(\pi)^2}{r}\right)^{\frac{3}{2}}}\right)}\right)^{\frac{2}{3}}};\; n = \frac{2M}{m_P}$$

$$\therefore\Rightarrow E = \frac{GM^2}{r} \dots Q.E.D$$

6. Black hole thermodynamics and the entropy of the vacuum (i.e. At-Tariq thermodynamics and Al-Hubok entropy).

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 in which the system is made of them in a short words its a measure for the dispersion of energy in the system.

So, for a single test particle with a single microstate reaching event horizon of a black hole, then according to Boltzmann entropy law, the entropy for such particle or system 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 $(\sqrt{2})$ and since the speed of light is the speed of causality as Minkowski & Penrose diagrams showed us then the multiplicity should be increased by a factor of $(\sqrt{2})$

But as long as nothing could ever cross the event horizon as we saw with At-Tariq equations, then it is safe to claim that what is located behind event horizon is nothing but empty space, even when it is not

So such a mathematical formula will represent the vacuum entropy as follows.

$$\therefore S = k_B \, ln\sqrt{2} \, \Omega$$

$$at \; \Omega = 0 \; \therefore\Rightarrow S_H = k_B \, ln \sqrt{2}$$

; S_H stands for Al-Hubok or Hubok entropy since Al-Hubok in Arabic means fabric

We could generalize it for black holes as follow:

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

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

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

$$at \; \frac{2M}{m_p} = 1 \; \therefore \; vacuum \; entropy \; (Al - Hubok \; entropy) \; S_H = \; S_T = \; k_B \, ln \sqrt{2}$$

$$\therefore\Rightarrow U = \; k_B K \, ln \sqrt{2} \; \therefore \; at \; K = 1 \; \therefore \; U_H = \; k_B \, ln \sqrt{2}$$

∴ 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 (I name it Al-Hubok entropy instead of vacuum entropy, from the Arabic word for fabric.)

This happened since nothing could cross the event horizon:

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

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

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

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

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; it's like chasing an elusive mirage and the Schwarzschild radius in the falling perspective will be described by the following law.

$$r_{sf} = \frac{2GM}{c^2}\frac{1}{\sqrt{2}}$$

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

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

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

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

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

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

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

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

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 magnetic field in the frame of the moving charge vanishes, which is consistent with our intuition? The static Maxwell's equations are satisfied in both frames:

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

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

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

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

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

Since space has no directions unless it was addressed in relation to an accelerated frame of reference then Lorentz transformation of the field can not act here alone it should be related to an accelerated frame of reference then it will be considered only in that course of relation

In a short word Lorentz transformation of the field can not act on the speed of light unless it was related to Schwarzschild metric.

Now, let's consider a moving gravity well. We will have on its surface electromagnetic fields under both Lorentz transformation and the Schwarzschild metric. In this case, the direction of the 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 and this will bring out the effects of Lorentz transformations.

So, when a moving inertial mass satisfies the (T) condition, it will change space-time nearby and due to the movement of the mass this wil add extra factor, so the gravitational blue shift and red shift 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 a hugely concentrated amount 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 significantly warped space-time.

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

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

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

$$\therefore c = c_{B_r} = c\,.B_r\,;B_r = \left(1 - \frac{r_s}{r}\frac{3\gamma\,cos(t)}{(2\gamma\,cos(t)+1)}\right)^{-\frac{1}{2}} \therefore B_r = \left(1 - \frac{6Gm_\circ\gamma\,cos(t)}{r(2\gamma\,cos(t)+1)c^2}\right)^{-\frac{1}{2}};r_s = \frac{2Gm_\circ}{c^2}$$

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

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

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

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

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

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

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

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

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

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

Since we know the black hole temperature from

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

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

By using Wien's displacement law

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

We should consider for the gravitational redshift

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

We should observe this high energy radiation from moving black hole poles and it should agree with these calculations to validate it or it's a real disprove.

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

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

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

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

Then the surface gravity $\left(g_{TB_r}\right)$ for a moving black hole is as flow:

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

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 since it's only manifested for an outside observer but for a local observer, there is no extra gravity.

This is unrecognizable in the original Michelson and Morley experiment since there is no enough sufficient amount of mass in front of the interferometer to change nature of the space-time such to make effect like dragging it but in fact it's not actually it just changing the nature of space-time itself with the gravitational effect of the moving gravity well.

Then this effect will remain hidden until it collaborated with a sufficient mass that's considered a noticeable effect of a big gravity well.

$$\because c = \frac{1}{\sqrt{\mu_\circ \varepsilon_\circ}}$$

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

8. What was the deficiency in the original Michelson-Morley Experiment?

The original Michelson-Morley Experiment deal with the speed of light as a vector quantity and not a scalar quantity and this does not match with the speed of light in which by definition is a scalar quantity so it depends only on the nature of the empty space itself and have nothing to do with the direction of the emitter not the receiver of the light itself

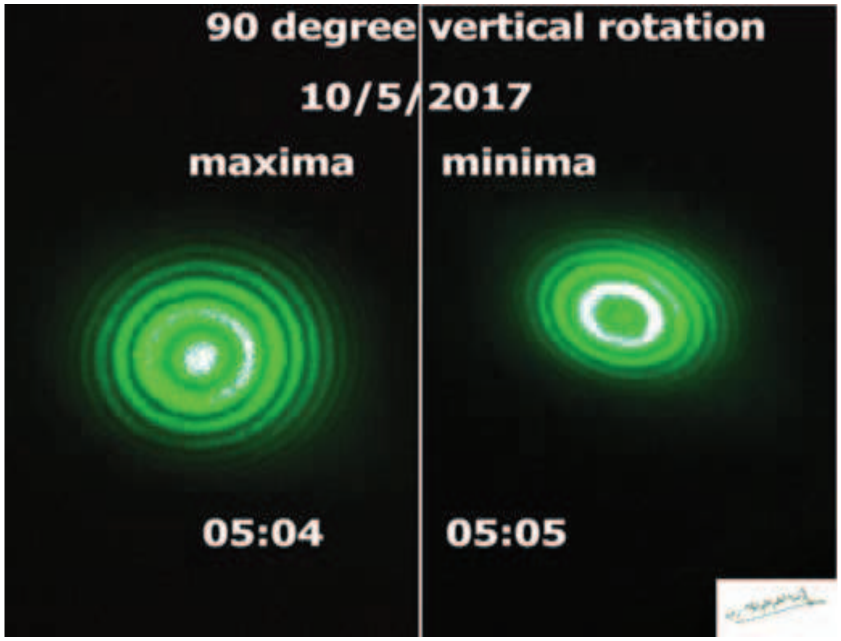
$$c = \frac{1}{\sqrt{\mu_\circ \varepsilon_\circ}};\ \mu_\circ \& \ \varepsilon_\circ\ \ scalar\ quantities$$

And if we took an approximate approach, there is no enough mass in front of the interferometer to drag the space-time to create an interference pattern but in real approach, we have in vertical variation there is the whole Earth in which its gravity will defect space-time and create a detectable interference pattern in which prove both experimentally and mathematically the non-constancy of the speed of light under gravity influence.

In short words, the original Michelson-Morley Experiment looking for non-constancy of the speed of light in a non-accelerated frame of reference while it should consider an accelerated frame of reference to be able to measure any positive interference pattern and since there is no enough sufficient mass or acceleration in the frame of reference of the horizontal direction of the original Michelson-Morley Experiment its grantee to get null results because you don't have an accelerated frame of reference and the relevant way to have an accelerated frame of reference to test the constancy of the speed of light is by the effect of a big gravity well as I proved before mathematically and experimentally in the experimental part

$$\because c = \frac{1}{\sqrt{\mu_\circ \varepsilon_\circ}}$$

$$\therefore\Rightarrow c' = \frac{1}{\sqrt{\mu_{\circ}\varepsilon_{\circ}\left(1-\frac{r_S}{r}\right)}} \therefore\Rightarrow c' = c\left(1-\frac{r_S}{r}\right)^{-1/2} \therefore under\ gravity\ for\ observer\ at\ infinity\ c' > c$$



But since in the original Michelson-Morley Experiment all the objects in front the Michelson interferometer has infinitesimally small Schwarzschild radii that are all approaching zero then

$$at\ (r_s \to 0) \therefore\Rightarrow c' = \frac{1}{\sqrt{\mu_{\circ}\varepsilon_{\circ}\left(1-\frac{0}{r}\right)}} \therefore\Rightarrow c' = c\ for\ all\ observers$$

$$at\ (r_s \to 0) \therefore B_r = \left(1 - \frac{0}{r}\left(\frac{3\gamma\cos(t)}{(2\gamma\cos(t)+1)}\right)\right)^{-\frac{1}{2}} \to B_r = 0$$

In brief words space has no directions unless it was addressed in relation to an accelerated frame of reference then Lorentz transformations of the field can not act alone it should be related to an accelerated frame of reference then it will be considered only in this course of relation.

In a short word Lorentz transformation of the field can not act on the speed of light unless it was related to Schwarzschild metric and that's why there is no Lorentz variance detected in the original Michelson-Morley Experiment but the variance detected in my experiment and in Pound and Rebka gravitational redshift in nuclear resonance experiment .

9. Calculating the cosmological constant using the quantum field fluctuations within an accuracy of [93.5%] from the average current experimental results.

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

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

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

We take one dimension for the space between two points representing the creating point and the 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 just didn't happen in the first place so that will leave 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-disguised dimensions as space dimensions since space-time interval has a term for time-disguised as space dimensions 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 dual-time dimensions disguised as space dimensions because the first time-disguised 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 ;($c' = c$) 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 dual light speed measurements one in its own frame of reference and the other one is in the observer frame of reference and that will give the Eyde virtual particles in these conditions dual time-disguised dimensions as space dimensions.

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

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

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

$$\therefore\Rightarrow\left(1-\frac{r_s{}'}{r_s}\right)=\left(1-\frac{0}{r_s}\right)=1;\ dr=i\frac{\sqrt{\pi}}{4}$$

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

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

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

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

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

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

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

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

For $\left(\frac{2M}{m_p}>1\right)$ for each step we will have a different speed of light i.e. an extra time dimension $\therefore\Rightarrow$ $the\ second\ disguised\ time\ dimension\ in\ the\ observer\ frame\ of\ refrence\ \equiv\left(\frac{2M}{m_p}\right)\ i\sqrt{\pi}$

For the space dimension we have the following

$$At-Tariq\ condition\equiv\ \frac{2M}{m_p}=1\therefore\Rightarrow M=\frac{m_p}{2}\therefore\Rightarrow r_s=\frac{2G\frac{m_p}{2}}{c^2}=\frac{Gm_p}{c^2}$$
$$=\frac{6.6743\times10^{-11}\times2.176435\times10^{-8}}{(299792458)^2}$$

$$=\frac{14.5261801205\times10^{-19}}{(89875517873681764)}=1.616\times10^{-35}\equiv l_p$$

We should use an upgrade to Lorentz factor and 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 frame of reference

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

Expansion of the universe is an increase in entropy so we could represent it mathematically we should use the entropy law for empty space that I derived before; $\left[E=\ k_BK\ \ ln\left(\sqrt{2}\ \right)\right]$ 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 it mathematically above

$$\therefore\Rightarrow \varLambda = \frac{k_B K \;\; ln\left(\sqrt{2}\,\varOmega\right)}{\frac{4}{3}\pi\left(\left(\frac{2M}{m_p}\right)\left(i\sqrt{\pi}\,\gamma_T\right)\left(i\frac{\sqrt{\pi}}{4}\gamma\right)\left(\frac{l_p}{\gamma_T}\right)\right)} \therefore\Rightarrow \varLambda = \frac{k_B K \;\; ln\left(\sqrt{2}\,\varOmega\right)}{\frac{4}{3}\pi\left(\left(\frac{2M}{m_p}\right)i\sqrt{\pi}\left(i\frac{\sqrt{\pi}}{4}\gamma\right)\, l_p\right)}$$

$$at\ \frac{2M}{m_p} = 1 \therefore\Rightarrow \varLambda = \frac{-3\, k_B\, K\, ln\left(\sqrt{2}\,\varOmega\right)}{\pi^2\ \gamma\, l_p}$$

$$\therefore\Rightarrow \varLambda = \frac{-3(1.38\times 10^{-23})(2.7)[(0.346) + ln(\varOmega)]}{(9.869)(1.616\times 10^{-35})}\left(\frac{1}{\gamma}\right)$$

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$\{\varOmega = 4\}$ 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 follows

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

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

$$\therefore\Rightarrow \frac{1}{\gamma} = 1.1551001605\times 10^{-21}$$

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

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

Black hole is an increase in the 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 disappears with the inhalation of the Eyde virtual particles appears and disappears again due to its virtual nature and its linear since it's acting only in one spatial dimension.

If we took my previous 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 these are the source of universe expansion and dark energy.

10- Solving the vacuum catastrophe and the Planck era:

If we generalize the Eyde formula for quantum field fluctuations frequencies corresponding to energies of At-Tariq condition more than one i.e. $\left(\frac{2M}{m_p}\right) > 1; \left(\frac{2M}{m_p}\right) \to \infty$.

Then for each higher frequency we will get two extra disguised time dimensions in the denominator and this will drain out the infinite energy frequencies fluctuations of the quantum field and this will prevent the vacuum catastrophe.

$$\therefore\Rightarrow Tabarak = \frac{-3\, k_B K\ \ ln\left(\sqrt{2}\,\Omega\right)}{\pi^2 \left(\frac{2M}{m_p}\right)(\gamma)\, l_p}; units\left(J.m^{-1}.(s.c)^{-1}\left(\left(\frac{2M}{m_p}\right)(s.c)\right)^{-1}\right); \left(\frac{2M}{m_p} \to \infty\right)$$

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

In simple words, it seems that there is infinite energy from the quantum field fluctuations fighting against infinite time dimensions and this will bring the quantum field into balance and prevent the vacuum catastrophe.

Without this balance, everything will explode into 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 and a bless effects.

Energies resulting from higher frequencies of Tabarak formula are distorting space-time with a factor of $\left(\sqrt{2}^{\left(\frac{2M}{m_p}\right)}\right)$ in Planck level and even lower than that such that it will let other virtual particles to move faster than the speed of light in respect to us but in their frame of reference they move less than there speed of light and they follow At-Tariq factor (γ_T) and At-Tariq transformations it's exactly as Lorentz transformations but with an, increased speed of light because of At-Tariq factor(γ_T).

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

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

We saw that high energy do not reveal higher space dimensions, but reveal extra time dimensions and all that 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 is determined by the speed of light and the difference between two differently accelerated frames of reference.

The direction of time is determent by the entropy.

That means 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 and we observed that both in black hole singularity and in the Eyde quantum field.

11. Finding the equation for the big bang singularity at $(\mathbf{t \leq 0})$ and driving the gravitational constant from it.

If we inflict Tabarak formula upon the Planck era we could easily roll out the temperature from the equation as follows:

$$\because \Lambda = \frac{-3\, k_B\, K\, ln\left(\sqrt{2}\,\Omega\right)}{\pi^2\ \gamma\, l_p} \therefore\Rightarrow \Lambda_P = \frac{-3\, k_B\, K_P\, ln\left(\sqrt{2}\,\Omega\right)}{\pi^2\ \gamma\, l_p}; K_P = Planck\ temperature$$

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

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

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

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

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

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

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

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

From the same formula and the same conditions we have

$$G = \frac{3c^4\ ln\left(\sqrt{2}\,\Omega\right)}{\pi^2\, 0.7361 \times 10^{23}}\frac{1}{\gamma} \therefore\Rightarrow G = 6.6947 \times 10^{-11}\left(\frac{m^3}{kg.s^2}\right)$$

Since we canceled out both the temperature and the Planck length from our consideration by the Planck era trick and by using Al-Hubok entropy then we could easily calculate it for the first rupture i.e. the big bang singularity at $(t \leq 0)$

At ($t \leq 0$)there is nothing there is no prior causality i.e. there is no Lorentz factor or At-Tariq factor and there is nothing to have any multiplicity so we could only use Al-Hubok entropy and of curse that's mean the temperature is exactly the absolute zero then we will have only two things flat & smooth space-time

Flat space-time i.e. there is no energy equal or bigger than At-Tariq condition and smooth space-time means there is no energy at all and 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

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

$$Another \ approach \because \ \Lambda_p = -\frac{3 \ F_P \ ln(\sqrt{2}\,\Omega)}{\pi^2 \ G \ \gamma} \ \therefore\Rightarrow \Lambda_\circ = -\frac{3 \ F_P \ ln\sqrt{2}}{\pi^2}$$

$$\therefore\Rightarrow \Lambda_\circ = -1.2749 \times 10^{43} (J.m^{-3})$$

For cosmic inflation, we have a combination of two expansions one for the flat smooth space-time before and exactly at big bang ($\Lambda_\circ$) and one for the cosmological constant of the Planck era

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

$$\because \Lambda_\circ = -\frac{3 \ c^4 \ ln(\sqrt{2}\,)}{\pi^2 \ G} \therefore\Rightarrow \Lambda_\circ = -\frac{3 \ \ ln(\sqrt{2}\,)}{\varepsilon_\circ{}^2 \mu_\circ{}^2 \pi^2 \ G}$$

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

This is the original equation to derive the gravitational constant.

12-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:

$$c = \frac{1}{\sqrt{\varepsilon_\circ \, \mu_\circ}} \ ; \varepsilon_\circ = \frac{q}{\Phi_E} = \frac{q}{E 4\pi r^2} \hat{r} \ \ ; \ \ \mu_\circ = \frac{B}{H}$$

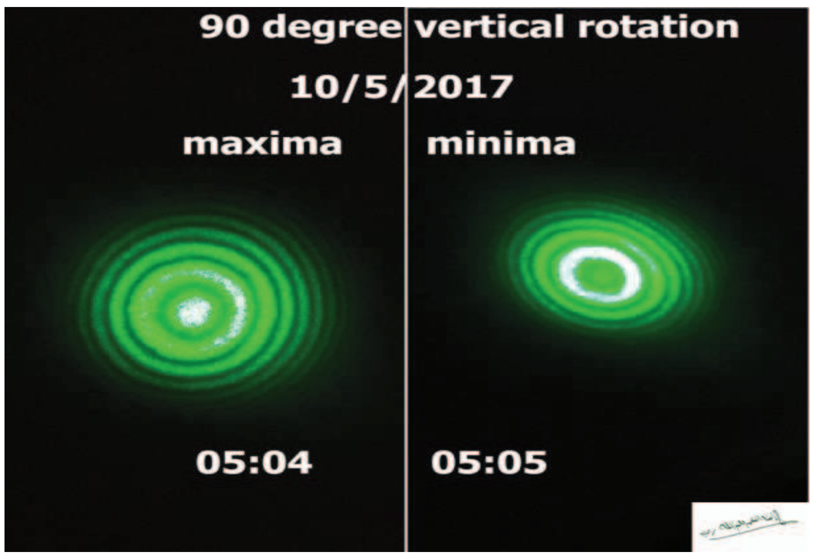
Then, changing the distance from a large gravity well will change the nature of the empty space itself due to gravitational redshift and blueshift, thus, we should detect a notable interference pattern.

We could detect this by setting up a vertical Michelson-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:

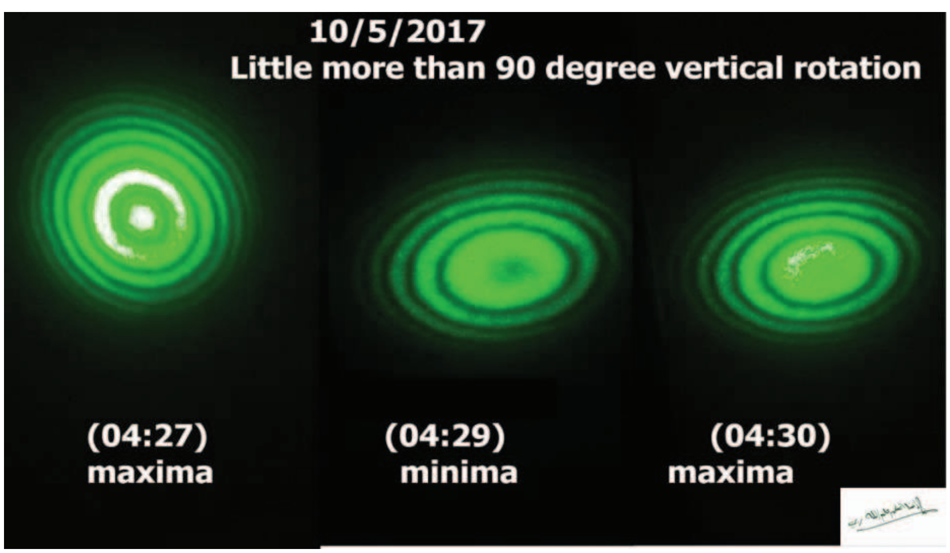
$$c' = \frac{1}{\sqrt{\varepsilon_\circ\, \mu_\circ \left(1 - \frac{r_s}{r}\right)}} \therefore\Rightarrow c' = c\left(1 - \frac{r_s}{r}\right)^{-1/2}$$

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.



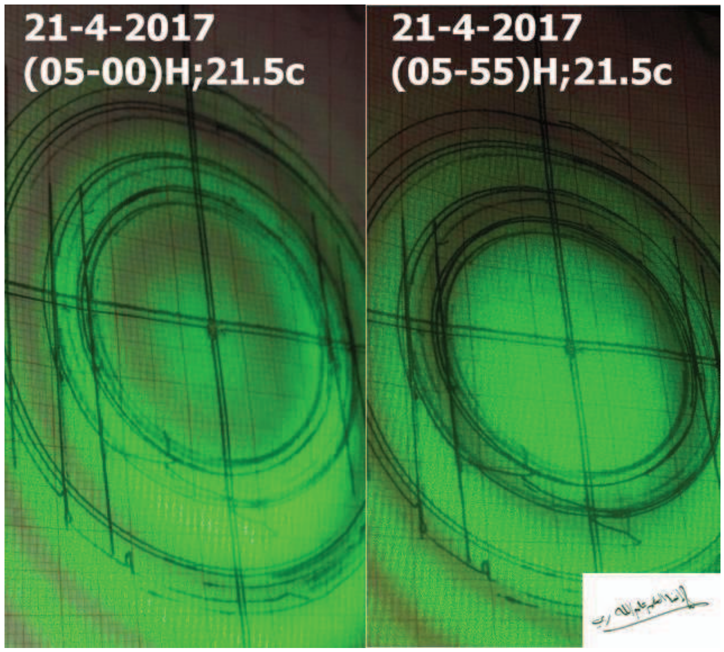
For a little more than 90° rotation, I have a confirmed positive change in the central interference pattern from maxima to minima to maxima in the central interference pattern as follows.

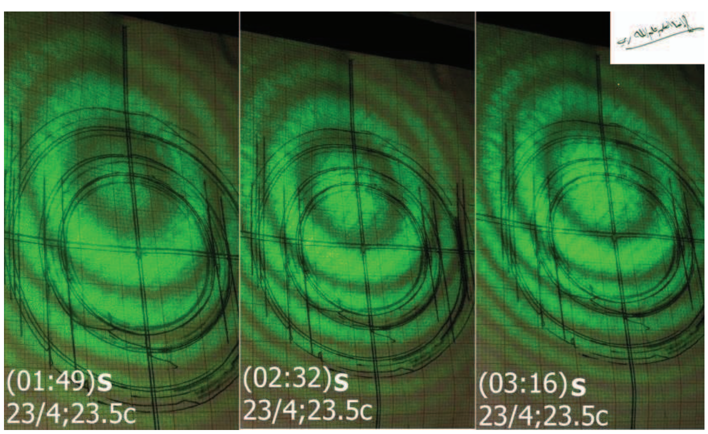


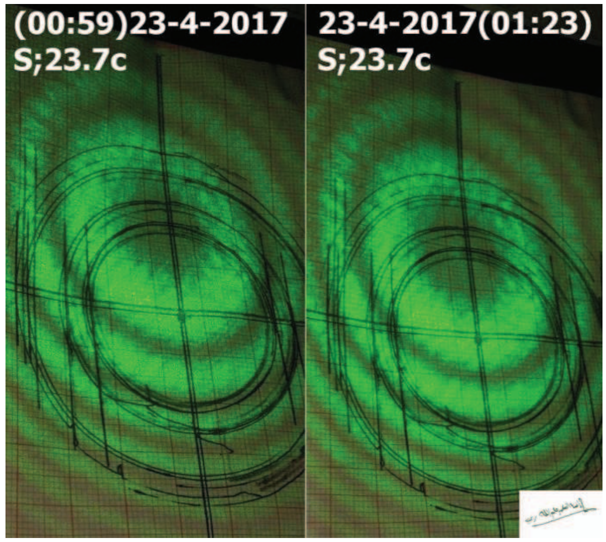
However, detecting the collaboration effect (B_r) is much harder since it depends on the movement of the gravity well itself in our case it's the Earth, so a vertical non-rotating interferometer in which its horizontal arm is oriented to the north or south (to eliminate the Sagnac effect) should be sufficient 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 any side effects on the interferometer.

Some of these results are presented below:







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 like a runaway gravity well and we will still get a positive change in the interference pattern.

13. Conclusions

1. Differences in space-time curvature affect the speed of light as follows.

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

$$\because \ \varepsilon_\circ = \frac{q}{\varPhi_E} = \frac{q}{E4\pi R^2} \therefore under\ gravity \Rightarrow \ \varepsilon' = \frac{q}{E\,\frac{4\pi R_\circ{}^2}{\left(1-\frac{r_s}{r}\right)}} \Rightarrow \varepsilon' = \ \varepsilon_\circ\left(1-\frac{r_s}{r}\right) \because r_s < r \therefore\Rightarrow \varepsilon' < \ \varepsilon_\circ$$

for a black hole in respect to an observer at infinity, we have

$$\left[c_T = c\left(\sqrt{2}\right)^{\frac{2M}{m_p}}\right]$$

2. Space-time is a continuous physical entity, which I call it Al-Hubok, from the Arabic word for fabric.

$$\because \left[c_T = c\left(\sqrt{2}\right)^{\frac{2M}{m_p}}\right] \therefore\Rightarrow (\, r_s < r) \therefore\Rightarrow (ds^2 = \ 0)$$

$$\because space - time\ interval\ at\ singularity \equiv ds^2 = -\left(\frac{1}{2}\right)c^2\left(-\frac{\pi}{c^2 4}\right) + \frac{\left(i\frac{\sqrt{\pi}}{4}\right)^2}{\left(\frac{1}{2}\right)} \therefore\Rightarrow ds^2 = \left(\frac{\pi}{8}\right) - \left(\frac{\pi}{8}\right) = 0$$

$$\Rightarrow i.e. space - time\ is\ continuous\ and\ not\ discrete \quad \therefore\Rightarrow\ r_s = l_p \therefore\Rightarrow\ r_s{}' = \frac{l_p}{2}$$

3. Spae-time is not aether because its non-draggable entity it only changes under gravity i.e. differences in space-time curvature due to gravity is what separate space-time from the aether

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

4. From At-Tariq condition and Al-Buraq effect of the collaboration between Schwarzschild metric and Lorentz transformations, the only conclusion is that the gravity is nothing but curvature of space-time created by the probability distribution of the wave function of masses equal or bigger than half Planck mass, i.e. it's not a force its a reaction to the three other forces of nature as long these three forces act with a minimum of half Planck mass $\left(\mathrm{M} = \frac{\mathrm{m_p}}{2}\right)$ is what create curvature in space-time fabric in which we call it gravity,

I already proved this when I constructed Newton universal law of gravity from the Schrödinger equation.

$$\because \frac{GM^2}{r} = n\frac{\hbar^2}{m_P}\frac{(\pi)^2}{r^2\left(\frac{2}{3\pi n dl}\right)^{\frac{2}{3}}};\ dl = \left(\frac{2}{3\pi\frac{2M}{m_P}\left(\frac{2}{GM}\frac{\hbar^2}{(m_P)^2}\frac{(\pi)^2}{r}\right)^{\frac{3}{2}}}\right)$$

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

In principle, gravity is not a weak interaction “gravity is not just a curvature in space-time it's the difference between a curved and flat space-time i.e gravity depends on the difference of curvature and its depth and this diffrence will increase as long you have a two things first a littel difrence between Schwarzschild radius and the dimensions of the mass in question and second the measurement point where it location how much the difference in the flatness of the space-time curvature between the measurement point and observer point and thats why its appear to us in most cases as a weak interaction due to the difference between Schwarzschild radius and the dimensions of the mass in question so when the diffrence between Schwarzschild radius and the dimensions of the mass in question become small the gravity efect become bigger and in dramatic way.

5. Elementary particles do not satisfy At-Tariq condition so it cannot affect space-time until space-time affected by a mass scale bigger than or equal to half Planck mass i.e.$\left(\mathrm{M} = \frac{\mathrm{m_p}}{2}\right)$ or its equivalent of energy and that’s mean a molecule with half Planck mass will curve space-time but the atoms and the elementary particles that make this molecule will not.

In simple words an electron traveling through double slit experiment will not affect space-time but a cluster of molecules with mass equal to or bigger than half Planck mass will bend space time as its traveling through space

6. Al-Buraq effect (B_r) (i.e., the collaboration effect between the Schwarzschild metric and Lorentz transformation) It is a good candidate solution to the dark matter problem because the speed of light is affected by the speed and direction of the moving gravity well itself; then the gravity itself will change,(in respect to an observer in infinity) it even changes the gravitational lensing due to the movement angle (t) of the gravity well as in Al-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 relation to a local observer is unchanged but in relative to a distance observer it is changed with Al-Buraq factor as follow For ablack hole we have

$$g_{TB_r} = \frac{2MG}{(\acute{r_s})^2} = \frac{MG}{\left(\frac{2GM}{{c_{B_r}}^2}\right)^2}; c_{B_r} = c.B_r; B_r = \frac{1}{\sqrt{1 - \frac{6GM\gamma\, cos(t)}{r(2\gamma\, cos(t) + 1)c^2}}}$$

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

For ordinary gravity well we have :

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

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

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

7. 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 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 create an antigravity effect as follows

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

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

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

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

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

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

$$\therefore\Rightarrow \left(\frac{v}{c} = 99.9999999999999999999999999999999999999933287181\%\right)$$

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

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

9. 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.

$$Tabarak = \frac{-3\ k_B K\ \ ln\left(\sqrt{2}\,\Omega\right)}{\pi^2\ \left(\frac{2M}{m_p}\right)(\gamma)\ l_p}; units\ \left(J.m^{-1}.(s.c)^{-1}\left(\left(\frac{2M}{m_p}\right)(s.c)\right)^{-1}\right); \left(\frac{2M}{m_p} \to \infty\right)$$

10. 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 previous result as an estimation reference point then:

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

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

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

$$\therefore\Rightarrow\ \frac{v}{c} = 99.9999999999999999999999999999999999999933287181\%$$

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

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

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 anyway.

11. 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.

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

12. The big bang singularity is not a singularity at all and it's well defined as follows

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

$$;\ \Lambda_\circ\ \equiv the\ cosmological\ constant\ at\ (t\leq 0).$$

i.e. space time expansion is aprperity for both space-time and it caused by space time and by Eyed vertual particles

space-time is prior to the big bang itself and the big bang is nothing but a rupture of energy in space-time in the dawn of creation.

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

$$Al - Hubok\ entropy\colon S_H =\ k_B\ ln\left(\sqrt{2}\right)$$

i.e. the universe has a beginning but the time has not

13. For cosmic inflation, we have a combination of two expansions one for the space-time rupture ($\Lambda_\circ$) i.e. the big bang and cosmological constant for the Planck era

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

14. We could drive gravitational constant from the rupture constant ($\Lambda_\circ$) 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

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

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

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

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

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

$$\therefore\Rightarrow\ \frac{v}{c} = 99.9999999999999999999999999999999999999999999933287181\%$$

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

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

15. Time is the scale of causality transmion rate and the dissipation of its sequential order ;where its amount or its "causality transmion rate" decided by the speed of light and the relative speed of light in which decided by At-Tariq factor and At-Tariq condition inwhich decided by the following law

$$\because c' = c\ \left(1 - \frac{r_s}{r}\right)^{-\frac{1}{2}};\ as\ measured\ by\ observer\ at\ infinity$$

$$c_T = c\left(\sqrt{2}\right)^{\frac{2M}{m_p}};\ M = n\frac{m_p}{2}\ \ ;n = 1,2,3\ \ldots.,$$

and its direction decided by my law of entropy & the law of Al-Hubok entropy

i.e. $\left[S_H = k_B\ ln\left(\sqrt{2}\Omega\right)\right]$ & $\left[S_H = k_B\ ln\left(\sqrt{2}\right)\right]$

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 at infinity in another frame of reference and since the speed of light in vacuum is decided by Maxwell law

$\left[c' = \frac{1}{\sqrt{\mu_\circ\epsilon_\circ\left(1 - \frac{r_s}{r}\right)}}\right], \left[c_T = \frac{\left(\sqrt{2}\right)^{\frac{2M}{m_p}}}{\sqrt{\mu_\circ\epsilon_\circ}}\right]$ and since the vacuum has an entropy i.e. Al-Hubok entropy $\left[S_H = k_B\ ln\left(\sqrt{2}\right)\right]$ then time exists 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 even in this case due to vacuum entropy i.e. Al-Hubok entropy the system will get more random.

16. For the experimental part this is not new it always cared out with laser gravimeter but nobody notices it (except a german physics enthusiastic his name is Mr. Martin Grusenick and his work should be noticed but he couldn't figure it out and his work used by pseudoscience on the 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* $\left[S_H = k_B \ln\left(\sqrt{2}(\Omega)\right); \text{in vacuum } \Omega = 1\right]$, then 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, $K_T = \frac{K_p}{\ln\sqrt{2}}; K_T \equiv \text{the singularity temperature}$, 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; that means a 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 mass and every gravitational mass will be increased by Al-Buraq factor with the increasing of its relative mass only for an observer with a space-time curvature difference i.e. observer at infinity..

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

22. The Eyde virtual particles are bending space-time at Planck level and elevating the speed of light by a factor of $\left(\sqrt{2}\right)$ 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 it's exactly as Lorentz transformations but with At-Tariq factor

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

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 I name it Al-Hubok its a fabric with special properties it could expand to infinity and constrict to zero in response to an exclusive wave function of masses that follows At-Tariq condition and unlike aether, it can't be affected with any mass below At-Tariq

condition, in fact, it affected exclusively by the wave function of masses equal or more than half Planck mass and I have proven this previously when I calculated the changing in the speed of light due to At-Tariq condition

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

24. Space-time interval at the exact center of any black hole is not a singularity it's well defined to be exactly zero.

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

$$r_s = \frac{2Gm_T}{c^2};\ m_T = \frac{M}{\left(\sqrt{2}\right)^{\left(\frac{2M}{m_p}\right)}}$$

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

$$\because\ c' = c\left(1-\frac{r_s}{r}\right)^{-1/2};\ (c')\ as\ measured\ by\ an\ observer\ at\ infinity$$

$$since\ elementary\ particles\ are\ local\ observer\ \therefore\Rightarrow c' = c\ \ \therefore\Rightarrow \alpha\ \ constant$$

14. Key features

- $\varepsilon_\circ\ \equiv the\ electric\ permittivity\ of\ the\ free-space$
- $\mu_\circ \equiv magnetic\ permeability\ of\ the\ free-space$
- $\Phi_E \equiv electric\ flux$
- $q \equiv electric\ charge$
- $E \equiv electric\ field$
- $M \equiv mass\ of\ the\ gravity\ well$
- $\Phi \equiv gravity\ potential$
- $G \equiv Gravitational\ constant$
- $r \equiv gravity\ well\ \ radius$

- $c' \equiv updated\ speed\ of\ light\ due\ to\ gravity\ as\ measured\ by\ an\ observer\ at\ infinity$
- $f \equiv photon\ frequency\ in\ free-space$
- $f_g \equiv photon\ frequency\ near\ a\ gravity\ well, i.e., blue-shifted$
- $\lambda \equiv wavelength$
- $\lambda_g \equiv wavelength\ near\ gravity\ well\ blue-shifted\ as\ measured\ by\ the\ observer\ at\ infinity$
- $R =\ shrinking\ length\ of\ space-time\ due\ to\ gravitational\ effects$
- $R_\circ = r - r_s = ordinary\ length\ of\ space-time\ free\ of\ any\ effect\ of\ gravity$
- $\varepsilon' \equiv updated\ electric\ permittivity\ of\ the\ free-space\ due\ to\ gravity$
- $ds^2 \equiv space-time\ interval$
- $r_s \equiv Schwarzschild\ radius$
- $r_s{}' \equiv\ updated\ Schwarzschild\ radius\ due\ to\ gravity$
- $dr_s{}^2 \equiv line\ element\ squared\ in\ Schwarzschild\ metric$
- $dt_s{}^2 \equiv time\ element\ squared\ in\ Schwarzschild\ metric$
- $l_p \equiv Planck\ length$
- $m_p \equiv Planck\ mass$
- $M \equiv black\ hole\ mass$
- $\left(T = \left(\sqrt{2}\right)^{\frac{2M}{m_p}}\right) \equiv black\ hole\ condition$ *(I name it At-Tariq condition)*
- $c_T \equiv speed\ of\ light\ at\ event\ horizon\ or\ singularity\ calculated\ by\ outside\ observers$
- $\left(r_T =\ i\frac{\sqrt{\pi}}{4}\right) \equiv At-Tariq\ ratio\ radius\ or\ black\ hole\ ratio\ radius$
- $\hbar \equiv Planck\ reduced\ constant = (h/2\pi)$
- $k_B \equiv Boltzmann\ constant$
- $S \equiv entropy$
- $S_H \equiv Al-Hubok\ entropy\ (i.e. vacuum\ entropy)$
- $\Omega \equiv microstates\ multiplicity$
- $K_T \equiv blackhole\ Surface\ temperature\ for\ a\ local\ observer$
- $S_T \equiv black\ hole\ entropy$

- $U \equiv energy\ in\ thermodynamic\ part$
- $\gamma \equiv Lorentz\ factor$
- $\gamma_T \equiv At - Tariq\ factor$
- $B_r \equiv\ collaboration\ factor$ *(I name it Al-Buraq factor)*
- $c_{B_r} \equiv updated\ speed\ of\ light\ due\ to\ Al - Buraq\ factor$
- $t \equiv direction\ angle\ of\ movement\ of\ the\ gravity\ well$
- $F_p \equiv Planck\ force$
- $g \equiv surface\ gravity$
- $g_T \equiv blackhole\ surface\ gravity$
- $g_{B_r} \equiv surface\ gravity\ due\ to\ calibration\ factor$
- $\alpha \equiv$ *fine-structure constant and the graviton effects*
- $\Lambda_\circ \equiv cosmologecal\ constant\ at\ (t = o)$
- $\Lambda_P \equiv cosmologecal\ constant\ at\ Planck\ era$

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