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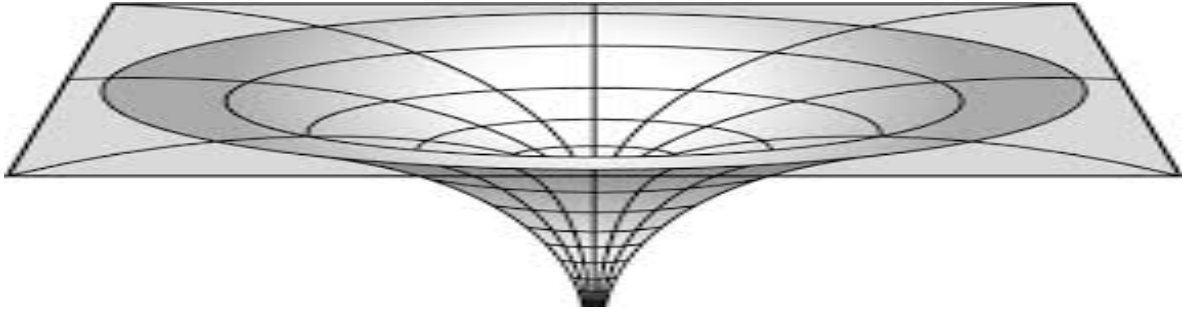
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Fayaz Quantum-Relativity Conception and Resolution

(FQCR)

(fayaz ahmed siyal) (1st year/XI)

Abstract: Contemporary physics of this century have measured many problems regarding the behaviour of gravity, black hole evolution and its information paradox. Our physicists have struggled to resolve these problems but they again and again failed. *The reason of their failure has been resolved by author.* The general relativity narrates the behaviour of masses and their gravitational fields on the basis of their space time curvatures. The reason scientist failed to measure the relation of mass and space time curvature because, *always they made their calculations in inertial frame of reference for space time curvature* but the galaxies, stars, sun, earth, etc are continued in acceleration or moving in accelerating frame of reference so, their *space time curvature must be in acceleration.* Then space time curvature should behave like variable accelerating wave (these are same waves which have been discovered by LIGO gravitational waves) and by *author* with mathematical proof it is estimated that *space time curvature is the classical property of matter or mass depending upon alternation in the quantum energy of mass or matter.* Then the Schrödinger, Hamilton operator H and time evolution operator are applicable for the calculation of space time geometry and its energy. From the author *creational research black hole problems are easily solved.* Even the *unification of general relativity and quantum mechanics can be done.*



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In general theory of relativity, Albert Einstein emphasized that gravity is not a force it is itself property of space time curvature. Galaxies, stars, and other astronomical are in relative speed all astronomical bodies are in accelerating frame then it point out there space time curvature must be in acceleration and should behave like variable accelerating wave. Only the space time curvature is not accelerating but also constantly its geometry is changing because curvature of space is the property of mass like stars, galaxies these giant masses have quite huge temperature, ionized plasma, jiggling motions these properties of mass are constantly altering and in stars matter, anti matter and dark matter influence each other. Also according to the quantum mechanics accelerating and rotating bodies must create quantum particles and for balance emits particles. So these above discussed facts indicate accelerating mass should vary with respective to time then its curvature will also vary with respective to change in quantum energy of a mass.

In consequence, space time fabric is a variable accelerating wave changing with in changing quantum energy of mass. Our entire history and contemporary physicist take the calculation of space time fabric in inertial frame of reference this is the biggest flaw which behave as inertia for the unification of general relativity and quantum mechanics. Space time curvature is the special property because it behave as it work on two aspects one curvature is responsible for gravity of classical bodies and classical body's quantum energy change influence the curvature. Space time permit for the unification of two big twigs general relativity and quantum mechanics.

All above passages could explain in mathematical equations,

As gravitational field have been effected by quantum energy for it author has derived below equation 1 which narrates g is the entire gravitational field of body, a is the acceleration of particle under the influence gravitational field, E is the change in the quantum energy of mass, g' is the gravitational field of body or mass before change in quantum energy of mass. This equation has narration that gravitational field and acceleration due to gravitational field of particles will increase as the change in quantum energy increase or the gravity and acceleration of particle is directly proportion increased gravitational field by quantum energy E .

$$ga = E (g' + 1)... 1$$

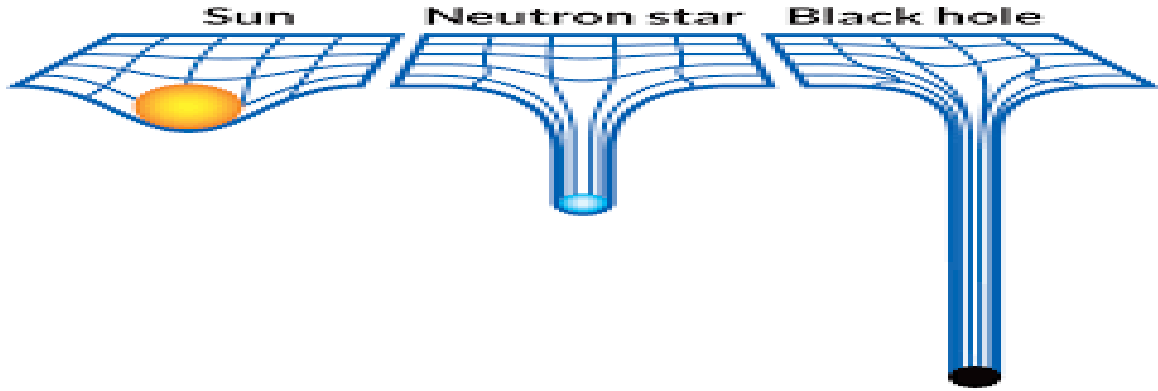
Albert Einstein represent the space time curvature with Einstein field equation (EFE) which is $G = 8\pi Gt/c^4$ replacing the g' in equation 1 with Einstein field equation' then we get below equation 2 narrates space time curvature is increased by change in quantum energy of mass.

$$ga = E (8\pi GT + 1)... 2$$

Schrödinger equations are applicable for space time curvature because accelerating mass should constantly originate variable accelerating wave of space time curvature. Quantum energy and space time curvature could be explain on the basis of Schrödinger equation as below equation 3 narrates wave function of gravitational

field and gravitational acceleration in three or four dimension, this equation also describe quantum energy increases the potential and decreases the kinetic energy of space time curvature. The potential energy provides space time curvature to attract the particles toward space time curvature and distort the space time curvature under its potential energy. This equation also narrates how star get collapse under own gravitational field (potential energy).

$$\varphi(x, y, z \dots) ga = -\frac{\hbar^2}{2} \sum_{n=1}^N \frac{1}{m_n} \nabla^2 \varphi + V\varphi(8\Pi GT + 1) \dots 3$$



This equation 3 has deep application for black hole, when the star loses its energy in the form of radiation like our star is constantly emitting energy, then the gravitational field will increase in which the star collapses and leads to the formation of a black hole. Whether a black hole emits radiation or not? This question is still a mystery but according to the author's concept, a black hole is evaporating its mass constantly; it means black holes emit Hawking radiation. It could be defined in mathematical expression, the gravitational field of a black hole and the gravitational acceleration of black hole particles is equal to the inverse mass ($ga = 1/M$) of the black hole. Equation 4 explains that a black hole is evaporating its mass in the dimensions in the form of a wave function (in the form of Hawking radiation which behaves like a wave, so it is possible to take the wave function of evaporating mass of a black hole). This equation also narrates when the Hawking radiation emits, the space-time curvature potential energy increases which distorts more space-time. This distortion of space-time curvature due to potential energy will increase the gravitational field of the black hole.

$$\varphi(x, y, z \dots) \left(\frac{1}{M}\right) = -\frac{\hbar^2}{2} \sum_{n=1}^N \frac{1}{m_n} \nabla^2 \varphi + V\varphi(8\Pi GT + 1) \dots 4$$

The information paradox of the black hole is the most outstanding problem. It is stated that fallen mass in a black hole or leaving mass or particle information is destroyed but according to quantum mechanics, information of a particle must be conserved in a system at the quantum level. The black hole information paradox could be solved by applying the time evolution operator Z to check the information of a system in the future and past and the Hamilton operator $H = -\frac{\hbar^2}{2} \sum_{n=1}^N \frac{1}{m_n} \nabla^2 \varphi + V\varphi$ on for the energy of the system at a given time. A massive star ends its life in a black hole stage, considering the energy of a massive star before conversion into a black hole at initial time t^0 , this initial time is zero for a black hole because yet the star is not converted into a black hole. And the continuous time t for the energy of a newly black hole to a singularity.

Above equation 3 could be rearrange by applying Hamilton operator H and also applying the time evolution operator for star energy at initial time, where for black hole time is zero(this energy of star is future energy of the black hole) and black hole energy at time.

As physics have concluded that a massive star when converts into black hole energy, gravitational field, gravitational field of particles and mass of black hole increase and increase with respect to time even comes in the form of singularity. It means the energy of black hole at time will more than its energy at time zero (massive star energy before conversion into black hole) Above passages could be explain in mathematical equation 4. This equation narrates time operator function for time and initial time $Z(t, t_0)$ for the state of $[\varphi(x, y, z \dots) ga]$ and the energy $H > E$ at initial time for black hole is less than the energy at time continues for black hole and the time continue energy of black hole is $(8\pi GT + 1)H$ by applying evolution time operator we get equation 4.

$$Z(t, t_0) [\varphi(x, y, z \dots) ga] = \partial(t, t_0)(8\pi GT + 1)H \cdot H > E$$

$$Z(t, t_0) [\varphi(x, y, z \dots) ga] = \partial(t, t_0)(8\pi GT + 1) H^2 > E \dots 4$$

Equation 4 could be rearranged as given equation 5 below by reopening the Hamilton operator $H = -\frac{\hbar^2}{2} \sum_{n=1}^N \frac{1}{m_n} \nabla^2 \varphi + V\varphi$.

$$Z[\varphi(x, y, z \dots) ga] = \partial(t, t_0)(8\pi GT + 1) \left[-\frac{\hbar^2}{2} \sum_{n=1}^N \frac{1}{m_n} \nabla^2 \varphi + V\varphi \right]^2 > E \dots 5$$

In above equation 5 E is the energy of massive star before the conversion in to black hole, if this energy remain constant star will never goes to black hole because to become in black hole star must changes its energy as it is explained by equation $ga = E(8\pi GT + 1) \dots 2$. As every star does evaporates its energy or consume its fuel before the conversion into B.H, so E is the energy evaporated or consumed by star must be inversely proportion to the geometry and energy of space time fabric. Then we get

$$Z[\varphi(x, y, z \dots) ga] = \partial(t, t_0)(8\pi GT + 1) \left[-\frac{\hbar^2}{2} \sum_{n=1}^N \frac{1}{m_n} \nabla^2 \varphi + V\varphi \right]^2 \propto > \frac{1}{E} \dots 6$$

Energy of any system could be define could be define as Hamilton operator H . So the energy evaporated of massive star could be represent by the value Hamilton operator $H = -\frac{\hbar^2}{2} \sum_{n=1}^N \frac{1}{m_n} \nabla^2 \varphi + V\varphi = 1/E$, by this equation 6 could be improved as given below.

$$Z[\varphi(x, y, z \dots) ga] = \partial(t, t_0)(8\pi GT + 1) \left[-\frac{\hbar^2}{2} \sum_{n=1}^N \frac{1}{m_n} \nabla^2 \varphi + V\varphi \right]^2 \propto > \frac{1}{-\frac{\hbar^2}{2} \sum_{n=1}^N \frac{1}{m_n} \nabla^2 \varphi + V\varphi}$$

$$\varphi(x, y, z \dots) ga = -\frac{\hbar^2}{2} \sum_{n=1}^N \frac{1}{m_n} \nabla^2 \varphi + V\varphi (8\pi GT + 1) \propto > 1 \dots 2$$

In result we get equation 2 this explains that when star loses or evaporates its energy or changes in the quantum energy of star then their space time curvature and its energy increases.

Singularity existence has been accepted by physics. The singularity born when black hole shrinks into a point, where space time curvature warped tightly into a solo point where energy is more than black hole. The future energy of singularity is black hole evaporated energy $-\frac{\hbar^2}{2} \sum_{n=1}^N \frac{1}{m_n} \nabla^2 \varphi + V\varphi(8\pi GT + 1) \propto > 1$ and this

energy is less than the singularity energy. Singularity relation could be explaining as given below with the help of evolution time operator.

$$Z\varphi (x, y, z \dots) ga] = -\frac{\hbar^2}{2} \sum_{n=1}^N \frac{1}{m_n} \nabla^2 \varphi + V\varphi \cdot H \propto > \frac{1}{-\frac{\hbar^2}{2} \sum_{n=1}^N \frac{1}{m_n} \nabla^2 \varphi + V\varphi (8\Pi GT+1) \propto > 1} \dots$$

$$Z\varphi (x, y, z \dots) ga] = H \propto > \frac{1}{(8\Pi GT+1) \propto > 1} \dots$$

$$Z\varphi (x, y, z \dots) ga] = \frac{H}{(8\Pi GT+1)} \dots 7$$

$$Z\varphi (x, y, z \dots) 1/M] = \frac{H}{(8\Pi GT+1)} \dots 7$$

$$Z\varphi (x, y, z \dots) = \frac{MH}{(8\Pi GT+1)} \dots 7$$

Thus equation 7 explain well the formation of singularity that black hole in strong gravitational field even its own space time curvature has got quizzed and warped into a single a point. Thus, we called it singularity.

When the space time curvature becomes so warped and equal to zero of its geometry then the value $8\Pi GT = 0$ then there will be dimensions $Z\varphi (x, y, z \dots)$ with mass and Hamilton operator for a singularity. This could be written in equation 8 as given below

$$Z\varphi (x, y, z \dots) = \frac{MH}{(0+1)}$$

$$Z\varphi (x, y, z \dots) = MH \dots 8$$

Where in equation 8 M is mass and H is the Hamilton operator or the energy of system, according Einstein energy relation mass $E=MC^2$ then $MH = 1/c^2$ then equation 8 can be rearrange as given below

$$Z\varphi (x, y, z \dots) = 1/c^2 \dots 8$$

Jean baptise Rond Albert discovered wave equation $\frac{\partial^2 u}{\partial t^2} = c^2 \frac{\partial^2 u}{\partial x^2}$ then the equation 8 must be rearrange in wave equation as given below

$$Z\varphi (x, y, z \dots) \frac{\partial^2 u}{\partial t^2} = c^2 \frac{\partial^2 u}{\partial x^2} \dots 9$$

This equation 9 narrates where v is the [phase velocity](#) of the wave and u represents the variable which is changing as the [wave passes](#) when the singularity curvature approaches to zero then mass and energy will liberate in the form of waves from dimensions with the speed of light and the information is conserved it will also be release with mass energy in the form of waves. By analogy, there should be a wave equation governing the evolution of the mysterious "matter waves", whatever they may be, over time. Its solution would be a wave function Ψ (but resist thinking of it as describing an actual wave) which tells you all there is to know about your quantum system — for example a single particle moving around in a box — at any time t . It was the Austrian physicist Erwin Schrödinger who came up with this equation in 1926. For a single particle moving around in three dimensions the equation can be written as

$$\frac{i\hbar}{2\pi} \frac{\partial \Psi}{\partial t} = -\frac{\hbar^2}{8\pi^2 m} \left(\frac{\partial^2 \Psi}{\partial x^2} + \frac{\partial^2 \Psi}{\partial y^2} + \frac{\partial^2 \Psi}{\partial z^2} \right) + V\Psi.$$

Here V is the potential energy of the particle (a function of x, y, z and t), $i = \sqrt{-1}$, m is the mass of the particle and h is Planck's constant. The solution to this equation is the wave function $\Psi(x, y, z, t)$.

In some situations the potential energy does not depend on time t . In this case we can often solve the problem by considering the simpler *time-independent* version of the Schrödinger equation for a function ψ depending only on space, i.e. $\psi = \psi(x, y, z)$:

$$\frac{\partial^2 \psi}{\partial x^2} + \frac{\partial^2 \psi}{\partial y^2} + \frac{\partial^2 \psi}{\partial z^2} + \frac{8\pi^2 m}{h^2} (E - V) \psi = 0, \quad \dots 10$$

where E is the total energy of the particle. The solution Ψ to the full equation is then

$$\Psi = \psi e^{-(2\pi i E/h)t}, \quad \dots 11$$

These equations apply to one particle moving in three dimensions, but they have counterparts describing a system with any number of particles. And rather than formulating the wave function as a function of position and time, you can also formulate it as a function of momentum and time.

Thus, the information paradox is resolved the information of particle exist in wave function or in quantum state from the birth of star – black hole to singularity particle did not loses its information. The information from black hole will be evaporating when space time curvature shrink into the value of zero due to its own gravitational. The evaporated information would carried by the wave function which is the complete code of information for a particle.

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