



Neoclassical Gravitational Field Theory

Sudeer Punnery 

Independent Scientist, Manama, Kingdom of Bahrain

spunnery@gmail.com

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ABSTRACT

This Neoclassical Gravitational Field Theory offers a potential alternative perspective on the nature of gravity by expanding upon Newton's classical law of gravitation. It seeks to address fundamental questions, such as why gravity functions as it does and why nothing in the universe can escape its influence. This paper explores some of the long-standing mysteries of gravity, including why masses are multiplied in Newton's gravitational formula and why objects accelerate at the same rate in a local gravitational field, regardless of their structure or composition. By presenting a classical framework, this research aims to provoke discussion and encourage further exploration of alternative explanations for gravity, potentially leading to a deeper understanding of both gravity and the universe itself.

Keywords: Neoclassical Gravitational Field Theory; Newton's Law of Gravitation; Gravity Mysteries; Alternative Gravity Theories

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INTRODUCTION

A major breakthrough in gravitational theory occurred between 1589 and 1592, when Italian scientist Galileo Galilei demonstrated that objects of different masses dropped from the same height fall with the same acceleration, with their time of descent being independent of their mass. In 1687, Sir Isaac Newton formulated the law of universal gravitation in his *Philosophiæ Naturalis Principia Mathematica* (Newton, Cohen, & Whitman, 1999). Although Newton's law was later superseded by Albert Einstein's theory of general relativity, the universality of the gravitational constant remains intact, and Newton's law continues to be a highly accurate approximation of gravitational effects in most practical applications. Newton's explanation for the equal acceleration

of all objects is embedded in his formula, $F = G \frac{m_1 m_2}{r^2}$, where the mass of the falling object cancels out due to the equality of inertial and gravitational mass. On the other hand, Einstein described gravity as the result of acceleration caused by the curvature of spacetime. While both theories accurately predict the effects of gravity, neither fully explains the fundamental cause behind it. This paper seeks to explore why mass interacts through gravity and the underlying principles that govern gravitational attraction.

EQUIVALENCE PRINCIPLE & GENERAL RELATIVITY

While the theory of general relativity is widely accepted, the pursuit of alternative theories still requires justification.

The equivalence principle posits that the observed equivalence between gravitational and inertial mass is a fundamental feature of nature (Thorne, Misner, & Wheeler, 2000). The weak form, known for centuries, states that objects of any composition in free fall follow the same trajectories and land at the same time. Einstein extended this principle, requiring that special relativity also holds in free fall and that the weak equivalence principle is valid universally (Hobson, Efstathiou, & Lasenby, 2006).

This extended version was crucial to the development of general relativity. Einstein famously suggested that a person inside a windowless elevator could not distinguish whether the elevator is at rest in a gravitational field or being accelerated upward at a constant rate. From this, he proposed that the laws of physics must be identical in both scenarios.

According to the equivalence principle, locally (in the elevator), the effects of gravity are indistinguishable from those of acceleration in the absence of gravity (Rohrlich, 1963). This idea, when translated into mathematical form, became the foundation of general relativity.

In general relativity, objects in a gravitational field behave similarly to objects within an accelerating frame. For instance, an observer would see a ball fall in the same way inside a rocket accelerating at 9.8 m/s^2 (the acceleration due to gravity on Earth) as it would on Earth's surface.

MATHEMATICAL ANALYSIS OF THE ABOVE STATEMENT

Let us consider an observer inside a rocket which is accelerated in deep space in the upward direction with an acceleration of 9.8 m/sec^2 .

Let him drop a ball from 1 m height from the floor and let the instantaneous velocity of rocket at that moment shall be V_i in the upward direction. An observer outside will see and calculate as follows: Due to the inertia, the velocity of the ball also will be V_i in the upward direction and will continue to move in upward direction with a constant velocity of V_i from the moment it is dropped. But the elevator will continue to move upward with an initial velocity V_i and accelerate further at 9.8 m/sec^2 towards the ball.

Let us consider the Ball meet the floor of elevator after t seconds from the moment it is dropped. For this to happen, the distance travelled by the elevator in t seconds shall be equal to the distance travelled by ball + 1meter, i.e. $(V_i t) + 1$. The distance travelled by elevator in t seconds will be $s = (V_i t) + \frac{1}{2} 9.8 t^2$. So, equating this we will get $(V_i t) + \frac{1}{2} 9.8 t^2 = (V_i t) + 1$ or $\frac{1}{2} 9.8 t^2 = 1$ or $t = 0.45174 \text{ seconds}$ (A)

(we note that the $(V_i t)$ terms on LHS and RHS are cancelled and the instantaneous velocity at the moment of dropping ball has been cancelled out in the calculations and are considered as Zero in many of the future calculations). Now, the observer inside the elevator will see the ball dropped from 1 m height accelerating downwards to floor and hit the floor in 0.45174 seconds .

Hence, he will calculate the acceleration of ball as $\frac{1}{2} a t^2 = h$ and $\frac{1}{2} a (0.45174)^2 = 1$ or $a = 9.8 \text{ m/sec}^2$. This is absolutely in consistent with the postulate and so far, there is no violations.

Rebound Height of the ball:

Case1- Inside the stationary elevator on earth.

For the easiness of calculations let us consider the collision of ball as perfectly elastic i.e., coefficient of reconstitution is equal 1 i.e., $\frac{v_{rebound}}{v_{impact}} = 1$ or $v_{rebound} = v_{impact}$ and v_{impact} ,

of the ball when it hit the floor can be calculated as follows:

$$v_{impact} = v_0 + a t = 0 + 9.8 * 0.45174 =$$

$$4.427052 \text{ m/sec} = v_{rebound}. \text{ Upon rebound, the ball will be}$$

having a kinetic Energy of $\frac{1}{2} m (v_{rebound})^2$ and a potential energy of Zero. At the maximum height of rebound, this kinetic Energy will be completely converted to Potential Energy mgh , so $\frac{1}{2} m (v_{rebound})^2 = mgh$ or $(v_{rebound})^2 =$

$$2gh \text{ (mass on each side cancels out as the inertial mass and gravitational mass are same as stated in Equivalence principle). Substituting the values, } h = 1 \text{ m.}$$

Case 2- Inside the elevator in space moving at a constant acceleration of 9.8 m/Sec^2

Everything seems fine till this point. However, as there is no gravity acting, we cannot impose a potential Energy to Ball in this case. But in this case observer outside will see and calculate as follows. Due to the inertia, the ball when dropped was moving upwards with a velocity of V_i . But the elevator will continue to move upward with an initial velocity V_i and accelerate further at 9.8 m/sec^2 towards the ball and the elevator floor hits the ball. As the instantaneous velocity when the ball was dropped V_i cancels out as mentioned before, we can consider the ball is at rest and the elevator moved up at an acceleration of 9.8 m/Sec^2 and the elevator floor hits the ball.

Even though ball is inside the elevator, once the ball is dropped, the ball and elevator can be considered as two different objects moving in the same direction. Here after collision, the momentum and kinetic Energy of the ball will be increased and momentum and Kinetic energy of Elevator will be decreased. For further analysis of the situation, let us assign value for mass of Ball and elevator. Let the mass of Ball 'm' is 1 kg and Mass of elevator including person inside, M is 10 Kg. Instantaneous velocity of Elevator when it collides ball, V_c will be calculated $V_c = V_0 + a t = 0 + 9.8 * 0.45174 =$

$$4.427052 \text{ m/sec. As the collision of ball is perfectly elastic, the momentum and energy have to be conserved. Therefore, Total momentum before collision = Total momentum after collision}$$

$m v_0 + M V_c = m v_f + M V_F$, where m the mass of ball and M is the mass of Elevator, v_0 is the initial velocity of ball, v_f is the final velocity of ball, V_c is the velocity of elevator when it hits floor, and v_f is the final velocity of Elevator.

Substituting values $0 + 10 * 4.427052 = v_f + 10 V_F$

$$v_f = 44.27052 - 10V_F \quad (1)$$

$$\text{Squaring both sides } v_f^2 = (44.27189 - 10V_F)^2$$

$$v_f^2 = 1960 + 100(V_F)^2 - 885.437V_F \quad (2)$$

$$\text{Total Kinetic Energy before collision = Total Kinetic Energy after collision}$$

$$\begin{aligned} \frac{1}{2} m (v_0)^2 + \frac{1}{2} M (V_c)^2 &= \frac{1}{2} m (v_f)^2 + \frac{1}{2} M (V_F)^2 \\ 0 + \frac{1}{2} 10 (4.427052)^2 &= \frac{1}{2} (v_f)^2 + \frac{1}{2} 10 (V_F)^2 \\ (v_f)^2 + 10 (V_F)^2 &= 196 \end{aligned} \quad (3)$$

Substituting equation (2) in (3) and solving

$$110(V_F)^2 - 885.437V_F + 1764 = 0 \quad (4)$$

Roots of above equation are 4.427052 and 3.622245. Substituting the value of 4.427052 for V_F in equation (1), $v_f = 44.27052 - 10 \times 4.427052 = 0 \text{ m/sec}$. Substituting the value of 3.622245 for V_F in equation (1), $v_f = 44.27052 - 10 \times 3.622245 = 8.04807 \text{ m/sec}$. After collision, ball is travelling 8.04807 m/Sec upwards and the elevator floor will travel upwards behind the ball with the new velocity V_{new} of 3.622245 m/Sec plus an acceleration of 9.8 m/sec^2 . The ball will travel upwards with a higher velocity until the velocity of elevator catch up with the rebound velocity of ball i.e., $V_{new} + 9.8 t = 8.0494 \text{ m/Sec}$ and then the elevator will exceed the speed of ball and observer will see the ball recedes finally until the elevator floor will hit the ball again. Time, t at which the speed of elevator equals the speed of ball $3.622245 + 9.8t = 8.0494$ or $t = 0.451753$. For the observer inside, the distance travelled during this time is the rebound height of the ball.

The distance travelled will be $\frac{1}{2} g t^2 = \frac{1}{2} 9.8(0.451753)^2 = 1$. This is exactly matching with the results in the stationary elevator at earth and Einstein equivalence is once again verified. This is happening only because, once the floor of elevator hit the ball, the velocity of the elevator is reduced to 3.622245 m/sec from 4.427052 m/sec which was the velocity of elevator at the moment before collision.

Case 3- Another ball of 1 kg is dropped from 2 m height simultaneously when the first ball was dropped from 1 m height. Let us drop another ball of 1 kg from 2 m height simultaneously when the first ball was dropped from 1 m height

Let us trace the motion of 2nd ball which is dropped from 2 m height. The ball will travel up at a velocity V_i at which it is dropped and the floor of elevator will travel up ($V_i + 9.8t$) This is true until the floor hits the first ball. Time for this is 0.451753 sec as calculated in equation the previous section. So, the distance between the 2nd ball and elevator floor until this moment will be $\frac{1}{2} g t^2 = \frac{1}{2} 9.8(0.451753)^2 = 1 \text{ m}$. Now the distance between the floor of lift and 2nd ball will be 1 m Just after the collision of the first ball on the elevator floor, elevator will be travelling with a velocity of 3.622245 m/Sec + acceleration (as explained before). So, the equation for time for the elevator floor to hit the 2nd ball from this moment shall be $(3.622245t) = \frac{1}{2} (9.8 t^2) = 1$. Solving for the equation, $t = 0.214 \text{ sec}$. So, the total time taken by the 2nd Ball to hit the floor will be $0.451753 + 0.214 = 0.66583 \text{ sec}$. Hence the observer inside the elevator will see the ball dropped from 2 m height hitting the floor after 0.66583 sec and he will calculate

the acceleration of the 2nd ball as follows $\frac{1}{2} a t^2 = 2$ or $\frac{1}{2} a (0.66583)^2 = 2$ or $a = 9.02261 \text{ m/sec}^2$.

This is not breaking the equivalence of inertial mass to gravitational mass, but definitely breaking the Einstein's equivalence principle.

EINSTEIN'S THEORY OF GENERAL RELATIVITY

The major three reasons why GR has to be revisited is explained below. Einstein's theory of general relativity is purely formulated based on Einstein's equivalence principle and the accelerated elevator analogy to gravity is the foundation of the theory. As the aforementioned thought experiment (case 3) of dropping double ball breaks the Einstein's equivalence principle and hence the analogy and the theory becomes invalid. The SI unit of gravitational constant G is $(\text{m}^3/\text{s}^2\text{kg})$ or $(\text{Nm}^2/\text{kg}^2)$. Is there any physical meaning for this unit? Isn't it weird? Despite being meaningless units, the Value of G used in the Newton's Gravitational formula is used in the Einstein Field equation also. The weird units of Gravitational constant 'G' is suggesting that it can be represented by some more fundamental constants that provides some physical meaning and hence implies that General theory of relativity is either wrong or needs improvement. The incompatibility of theory relativity with quantum mechanics makes it disconnect from the fundamental particles and demands for further explanation on why space time shall be curved.

NEWTON'S GRAVITATIONAL LAW

Newton's theory beautifully explained a wide range of gravitational phenomena, from the orbits of planets and comets around the Sun to the tides and the Earth's oblateness (the Earth is an oblate spheroid, meaning it is slightly flattened at the poles). Even today, rocket engineers use Newton's theory to calculate trajectories to reach other worlds within our solar system. However, the primary issue at the time was the assumption that any two massive objects would attract each other gravitationally instantaneously, without any direct interaction between them. When asked how one object could act on another without physical contact, Newton responded, 'But hitherto I have not been able to discover the cause of those properties of gravity from phenomena, and I frame no hypotheses.'

NEOCLASSICAL FIELD THEORY OF GRAVITY

Comparison of gravity and electrostatic force:

As we know $F = G \frac{m_1 m_2}{r^2}$ is an inverse square law very similar to coulomb's law for electrostatic force $F = \frac{K_e q_1 q_2}{r^2}$. Since modern science accept the following regarding electrostatic force, similar concepts/postulates can be applied to gravitation force also. An electrostatic field is a force field surrounding a stationary electric charge. In a vacuum, this field spreads out in all directions, unhindered by particle interference, and the strength depends on the quantity of charge and the distance from it. So, we can apply similar concept of gravitational charge and gravitational field.

Like gravity, electric force acts at a distance. The idea that a force can act at a distance is pretty mind-blowing, but it's what nature really does and we experience and accept this in case of electrostatic force.

Similarly, we can accept this for gravity also. The electrostatic equations are time independent and as far as the source charge is not moved, the action on the test charge is instantaneous. So, the gravitational equations also can be considered as time independent and instantaneous. Also, the electrostatic field does go to infinity, it is a long-range force, but the strength diminishes with distance so in the limit as $r \rightarrow \infty$ then $F \rightarrow 0$. The same will be applicable to gravitational field also.

Postulates:

Accordingly, Neoclassical gravitational field theory Postulates are the following:

- 1) Proton, Neutron and electrons possess gravitational charges.
- 2) Gravitational charges of particles are all of same signs.
- 3) These charges interact with each other at distances and attract each other.
- 4) Gravitational field is a field surrounding the gravitational charges and extended to infinity.
- 5) Gravitational charge of Neutron, g_n is 1.43164×10^{-37} gagi (a newly proposed unit for gravitational charge)
- 6) Gravitational charge of Proton, g_p is 1.42959×10^{-37} gagi
- 7) Gravitational charge of Electron, g_e is 7.7859×10^{-41} gagi

The charges interact with each other and exerts an attractive force on other particles as follows Gravitational Force, $F_g = (g_1 g_2) / (4\pi \epsilon_{0g} r^2)$ where g_1 and g_2 are gravitational charges of particles in gagi (a newly proposed unit for gravitational charge), of the interacting particles and ϵ_{0g} is the gravitational permittivity of free space, $8.8541878188(14) \times 10^{-12}$ ($g_a g_i^2 / Nm^2$). This value is arbitrarily taken to match with the electrical permittivity of free space as this is in turn related to the speed of light in vacuum. A change in the value of this constant necessitates a change in gravitational charges of the fundamental particles to achieve the desired result

INTERACTION BETWEEN TWO ATOMS OF CARBON 12 KEPT AT 1 METER APART.

Carbon 12 contains 6 number of Neutrons, 6 number of protons and 6 number of electrons
Force exerted by a neutron of one atom to the neutron of another atom

$$F_n = \left(\frac{g_n g_n}{4\pi \epsilon_{0g} r^2} \right) = \left(\frac{g_n g_n}{4\pi \epsilon_{0g} 1^2} \right) = \left(\frac{g_n g_n}{4\pi \epsilon_{0g}} \right)$$

There are 6 Neutron in an atom, so the total force exerted by 6 neutrons on one neutron of another atom

$$F_n = 6 \left(\frac{g_n g_n}{4\pi \epsilon_{0g}} \right)$$

As there are 6 Neutrons in other atom, the total force exerted to the 6 neutrons of another atom shall be

$$F_{NN} = 6 \times 6 \left(\frac{g_n g_n}{4\pi \epsilon_{0g}} \right) = 6.63152 \times 10^{-63}$$

Similarly, the total force exerted by the Protons of one atom to the Protons of another atom shall be

$$F_{PN} = 6 \times 6 \left(\frac{g_p g_p}{4\pi \epsilon_{0g}} \right) = 6.61253 \times 10^{-63}$$

The total force exerted by the Electrons of one atom to the Electrons of another atom shall be

$$F_{ee} = 6 \times 6 \left(\frac{g_e g_e}{4\pi \epsilon_{0g}} \right) = 1.96138 \times 10^{-69}$$

The total force exerted by the Neutrons of one atom to the Protons of another atom shall be

$$F_{NP} = 6 \times 6 \left(\frac{g_n g_p}{4\pi \epsilon_{0g}} \right) = 6.62202 \times 10^{-63}$$

The total force exerted by the Protons of one atom to the Neutrons of another atom shall be

$$F_{PN} = 6 \times 6 \left(\frac{g_p g_n}{4\pi \epsilon_{0g}} \right) = 6.62202 \times 10^{-63}$$

The total force exerted by the Neutrons of one atom to the electrons of another atom shall be

$$F_{Ne} = 6 \times 6 \left(\frac{g_n g_e}{4\pi \epsilon_{0g}} \right) = 3.60651 \times 10^{-66}$$

The total force exerted by the Protons of one atom to the electrons of another atom shall be

$$F_{Pe} = 6 \times 6 \left(\frac{g_p g_e}{4\pi \epsilon_{0g}} \right) = 3.60134 \times 10^{-66}$$

The total force exerted by the electrons of one atom to the Neutrons of another atom shall be

$$F_{eN} = 6 \times 6 \left(\frac{g_e g_n}{4\pi \epsilon_{0g}} \right) = 3.60651 \times 10^{-66}$$

The total force exerted by the electrons of one atom to the Protons of another atom shall be

$$F_{eP} = 6 \times 6 \left(\frac{g_e g_p}{4\pi \epsilon_{0g}} \right) = 3.60134 \times 10^{-66}$$

So, the total forces exerted by the particles of one atom on the particles of another atom can be expressed as follows:

$$F_{NN} + F_{PN} + F_{ee} + F_{NP} + F_{Ne} + F_{PN} + F_{Pe} + F_{eN} + F_{eP}$$

$$= 2.65025 \times 10^{-62}$$

Total force exerted by one atom on another atom of C12 is $2.65025 \times 10^{-62} \text{ N}$

INTERACTION BETWEEN 1 KILOGRAMS EACH OF CARBON 12 KEPT AT 1 METER APART.

Total number of C12 atoms in 12 gram is 6.022×10^{23} . So total number of atoms in 1 Kg of C12 atoms will be $\frac{6.022 \times 10^{23} \times 1000}{12} = 5.01833 \times 10^{25}$ numbers. Therefore, total force of 1 kg of C12 atoms exerting on one c12 atom shall be $F = (2.65025 \times 10^{-62})(5.01833 \times 10^{25}) = 1.32998 \times 10^{-36}$.

Total force of exerted by 1 kg of atom on another 1 kg of atom kept 1 meter apart shall be $F = (1.32998 \times 10^{-36})(5.01833 \times 10^{25}) = 6.6743 \times 10^{-11} \text{ N}$

GRAVITATIONAL FIELD DUE TO GOLD.

Now let us extend this to the case of gold atom. Stable isotope of gold is Gold 197 for which Number of neutrons is 118, number of electrons and protons are 79 numbers each. As there are 118 Neutrons in each gold atom, the total force exerted by the 118 neutrons of one atom to the 118 Neutrons of other atom shall be

$$F_{NN} = (118 \times 118) \left(\frac{g_n g_n}{4\pi\epsilon_{0g}} \right) = 2.56492 \times 10^{-60}$$

Similarly, the total force exerted by the Protons of one atom to the Protons of another atom shall be

$$F_{PN} = (79 \times 79) \left(\frac{g_p g_p}{4\pi\epsilon_{0g}} \right) = 1.14636 \times 10^{-60}$$

The total force exerted by the Electrons of one atom to the Electrons of another atom shall be

$$F_{ee} = (79 \times 79) \left(\frac{g_e g_e}{4\pi\epsilon_{0g}} \right) = 3.40027 \times 10^{-67}$$

The total force exerted by the Neutrons of one atom to the Protons of another atom shall be

$$F_{NP} = (118 \times 79) \left(\frac{g_n g_p}{4\pi\epsilon_{0g}} \right) = 1.71473 \times 10^{-60}$$

The total force exerted by the Protons of one atom to the Neutrons of another atom shall be

$$F_{PN} = (118 \times 79) \left(\frac{g_n g_p}{4\pi\epsilon_{0g}} \right) = 1.71473 \times 10^{-60}$$

The total force exerted by the Neutrons of one atom to the electrons of another atom shall be

$$F_{Ne} = (118 \times 79) \left(\frac{g_n g_e}{4\pi\epsilon_{0g}} \right) = 9.33886 \times 10^{-64}$$

The total force exerted by the Protons of one atom to the electrons of another atom shall be

$$F_{pe} = (79 \times 79) \left(\frac{g_p g_e}{4\pi\epsilon_{0g}} \right) = 6.24333 \times 10^{-64}$$

The total force exerted by the electrons of one atom to the Neutrons of another atom shall be

$$F_{eN} = (79 \times 118) \left(\frac{g_e g_n}{4\pi\epsilon_{0g}} \right) = 9.33886 \times 10^{-64}$$

The total force exerted by the electrons of one atom to the Protons of another atom shall be

$$F_{eP} = (79 \times 79) \left(\frac{g_e g_p}{4\pi\epsilon_{0g}} \right) = 6.24333 \times 10^{-64}$$

So, the total forces exerted by the particles of one atom on the particles of another atom shall be

$$F_{NN} + F_{PN} + F_{ee} + F_{NP} + F_{Ne} + F_{PN} + F_{pe} + F_{eN} + F_{eP} = 7.14386 \times 10^{-60}$$

Total force exerted by one atom on another atom of Au_{197} is $7.14386 \times 10^{-60} \text{ N}$

INTERACTION BETWEEN 1 KILOGRAMS EACH OF Au_{197} KEPT AT 1 METER APART.

Total number of Au_{197} atoms in 197 gram is 6.022×10^{23} . So total number of atoms in 1 Kg of Au_{197} atoms will be $\frac{6.022 \times 10^{23} \times 1000}{197} = 3.05692 \times 10^{24}$ numbers. Therefore, total force of 1 kg of Au_{197} atoms exerting on one Au_{197} atom shall be

$$F = (7.14386 \times 10^{-60})(3.05692 \times 10^{24}) = 2.18383 \times 10^{-35}$$

Total force of exerted by 1 kg of atom on another 1 kg of atom kept 1 meter apart shall be

$$F = (2.18383 \times 10^{-35})(3.05692 \times 10^{24}) = 6.675 \times 10^{-11} \text{ N}$$

This is matching to the newton's gravitational equation with a slight error

GRAVITATIONAL ATTRACTION BETWEEN TWO OBJECTS

The above is true for all the elements (with minor errors) regardless of their atomic structure and if we extended it to larger units of molecules also, the same results equivalent to the result of newton's gravitational formula is obtained. This is because whether it is atoms or molecules, the number of nucleons in a kilogram will be approximately equal.

The gravitational field of one object depends only on the number of neutrons, Protons, and electrons, present in the

body. As the force exerted by or to the electrons are negligible, we can neglect that from further discussions.

Consider the case of the earth. A single Neutron on the surface of the earth will be pulled towards the center of earth by all the neutrons and protons present in the earth according to the inverse square law of neoclassical gravitational field theory. Total force acting on this neutron will be the sum of the forces exerted by all the neutrons and protons present in the earth. This is applicable to any neutron on the surface of the earth and the total force acting on any neutron at the surface of earth will be same.

Similarly, Any Proton on the surface of the earth will be pulled towards the center of earth by all the neutrons and protons present in the earth with same force.

Regardless being a part of an atom, a molecule or any other complicated structure, these particles all are accelerated with same rate (as the force exerted by the earth on these individual particles are same) towards the earth. Hence total force acting on object will be the sum of forces acting on the nucleons present in the Object, but the acceleration of the object is dependent only on the number of nucleons present in the attracting body (here, it is Earth) i.e., more the number of nucleons present in an object on the surface of Earth, more the force exerted by Earth on the object. More importantly, nothing, in the universe can escape from gravity as far as they contain proton, neutron or electron.

In case of Free fall, as the individual particles are all falling with constant acceleration, their relative position remains same and there will not be any other force acting between the falling

objects as in the case of any two objects moving with same velocity. However, we cannot deny the force of gravity acting between the body on free fall and the body exerting gravity.

CONCLUSION

In general, the neoclassical gravitational field theory proves the following:

- 1) Theory eliminate/disintegrate the meaningless gravitational constant into more fundamental constant with real physical meanings. The equation for Gravitational Force $F_g = \left(\frac{g_1 g_2}{4\pi\epsilon_0 r^2}\right)$ doesn't have any absurdity as the gravitational permittivity of free space is a constant with a unit of $\frac{(gagi)^2}{N m^2}$ and the $(gagi)$ units assigned to gravitational charges will be cancelled out to give a real world physical unit of Nm^2 .
- 2) Theory proves that gravity is a force and not acceleration due to geometry of space time.
- 3) Theory explains, why the equidistant objects are accelerated at same rate due to gravity.
- 4) Theory explains why, nothing in the universe can escape from gravity.

Hope, this will be an inspiration for those who believe that modern science needs a revisit and need to walk little backward and explore other paths ignored by us in past thinking that we are moving forward in the right path.

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