

Gravity as a Unification of Known Forces with Space Energy ©

Gravity as an Outcome of a Synergy of System Forces

Abstract

If science and technology can put together nature's tools such as in the unification of the electric and magnetic fields to do work as in electromagnetism for motors and generators, could not Nature herself do the same with the additional use of photons at the quantum energy level between Space and Matter to produce a final force that controls a constant acceleration of matter in Space as an Inertial Mass falls under that mysterious pull from the larger Gravitational Mass. Has the Gravity force/energy field remained undetected for centuries because although it is real, it may not be a unique separate force? It is how Nature has used electricity, magnetism, and the energy of space at the mass /space interface and the space between the masses in a system of applied energies to control the movement of physical bodies in Space.

Hidden Actions Give Illusion of a Fundamental Force

Could the hidden actions of nature combine the existing energies/forces to produce a new force that controls the movement of celestial bodies through it?

There is a magnetic field inherent throughout and within the energies of Space that is awakened with the movement of a current. This will generate a magnetic field in Space. There does not even need to be a charge imbalance. The magnetic energy field is an inherent property of Space. This is evident also when astronomers/astrophysicists examine the behavior of galaxies and observe a huge effect from the magnetic fields generated by the interplay of the electromagnetic bodies present within Space.¹

Thus, the very acceleration of a celestial body in Space is sufficient for Space to respond with a magnetic field. This paper proposes that Newton's Law of Gravitation acknowledged the "energy" of Space by assigning the action as a force at a distance concept; but he, of course, was not aware of the part played at the Gravitational Mass (GM) and Inertial Mass (IM) interfaces with Space at the quantum level of magnetic and electric fields. The interaction at the point of interface between the masses and the magnetic energy in space between them all play a role in Nature's energy/force special unique blend at work for control of matter.

*"Electromagnetic forces occur between any two charged particles, causing an attraction between particles with opposite charges and repulsion between particles with the same charge, while magnetism is an interaction that occurs exclusively between charged particles in relative motion."*²

A more Inclusive Gravity Force Equation

The recent previous paper³ published at the GSJ by this author examined the equations of Newton with the Lagrangian least action factors of kinetic and potential energies. That approach arrived at a Gravity Energy Field (GEF) velocity ten orders of magnitude higher than light speed 'c.'

This paper introduces new factors to include what might be happening at the mass/space interface for the GM and the IM. The new equation finds the same unique speed for the GEF.

Also, since the new equation also incorporates the Fine Structure Constant (FSC), it is found to give back that value with all unit dimensions canceling out. A FSC shown here based on light speed, \hbar , Planck mass, GM, IM and speed, Bohr's radius, GEF speed, and Newton's gravitational constant G.

Derivation

$F_I =$ Newton's 2nd law, Inertial force = $F_T =$ total force

$F_I = m_2 a = F_T =$ Energy field at Gravitational Mass/Space interface + Gravity Force of Space between two bodies - Energy field at Inertial Mass/Space interface

$F_T =$

$GM_1 m_e / L_p =$ Energy field at Gravitational Mass/Space interface.

$G =$ Newton's Constant $6.67408 \times 10^{-11} \text{ (m}^3/\text{kg}\cdot\text{s}^2\text{)}$

M_1 = Gravitational Mass; Earth used here 5.972200×10^{24} (kg)

m_e = electron mass 9.109×10^{-31} (kg)

L_p = Planck length = 1.616255×10^{-35} (m)

a = acceleration; for Earth = 9.8 (m/s²)

+ GM_1m_2/r^2 = Newton's Law of Gravity Force of Space between two bodies

m_2 = Inertial Mass; Moon used here 7.34700×10^{22} (kg)

r = radial distance

- Gm_2m_e/L_p = Energy Field at Inertial Mass/Space interface

F_T = total

$$F_i = m_2a = F_T = GM_1m_e/L_p + GM_1m_2/r^2 - Gm_2m_e/L_p \quad (1)$$

Converting force terms to energy, dividing by m_2 and rearranging gives

$$ar = (Gm_e/L_p) \times ((M_1 - m_2)/m_2) + GM_1/r \quad (2)$$

Note: Planck constants⁴

Planck length: $L_p = 1.61625 \times 10^{-35}$ (m)

Planck's h-bar $\hbar = 1.05457 \times 10^{-34}$ (Kg-m²/s)

Planck mass : $m_p = 2.176434 \times 10^{-8}$ (kg)

Planck length: $L_p^2 = \hbar G/c^3$; $G = L_p^2 c^3/\hbar$

Planck mass: $m_p^2 = \hbar c/G$; $G = \hbar c/m_p^2$

Giving: $L_p^2 c^3/\hbar = \hbar c/m_p^2$

Thus: $L_p^2 = \hbar^2 / m_p^2 c^2$ & $L_p = \hbar / m_p c$

$$L_p = \hbar / m_p c \quad \& \quad G = \hbar c / m_p^2$$

From eq. (2) $G / L_p = \hbar c / m_p^2 / \hbar / m_p c = c^2 / m_p$

Light speed $c = 2.99792458 \text{ m/s}$

Then: $ar = (c^2 m_e / m_p) \times ((M_1 - m_2) / m_2) + GM_1 / r$ (3)

Since distance = rate x time; then $r = vt$

$$av_2 t_2 = (c^2 m_e / m_p) \times ((M_1 - m_2) / m_2) + GM_1 / v_1 t_1$$
 (4)

$$v_1 = \text{Gravitational Energy Field speed}$$

$$v_2 = \text{Inertial Mass speed}$$

The Bohr radius⁵, a_0 , is:

$$a_0 = \hbar / (m_e c \alpha)$$

$$m_e = \hbar / (a_0 c \alpha)$$

$$\alpha = \text{Fine Structure Constant } 0.007297353 \text{ (no units)}$$

$$m_e = \text{electron mass } 9.109 \times 10^{-31} \text{ (kg)}$$

$$av_2 t_2 = (c \hbar / (a_0 \alpha m_p)) \times ((M_1 - m_2) / m_2) + GM_1 / v_1 t_1$$
 (5)

Solving for v_1

$$v_1 = GM_1 / (t_1) \times ((a v_2 t_2) - (c \hbar / (a_0 \alpha m_p)) \times ((M_1 - m_2) / m_2))$$
 (6)

$$(6.67 \times 10^{-11})(5.97 \times 10^{24}) / (0.00001) \times ((9.8 * 1 * 1) - ((2.99 \times 10^8)(1.05457 \times 11^{-34}) / \dots$$

$$\dots(5.29 \times 10^{-11})(0.007297)(2.176 \times 10^{-8}) * ((5.972 \times 10^{24} - 7.347 \times 10^{22}) / (7.347 \times 10^{22}))$$

$$v_1 = 4.07 \times 10^{18} \text{ m/s} \quad \text{the speed of Gravitational energy field}$$

Solving for the Fine Structure Constant, Alpha (α):

$$\alpha = ((\hbar/(a_0 m_p)) \times ((M_1 - m_2)/m_2)) / ((a v_2 t_2) - (GM_1/v_1 t_1)) \quad (7)$$

Returns the value for Alpha of 0.007297353; (1/137.036) All dimensions cancel

Summary

The values of one were purposely chosen for velocity v_2 & time t_2 in this specific calculation. The Moon velocity of ~ 1022 m/s changes the Gravity Energy Field ($\sim 4 \times 10^{15}$ m/s); still seven orders of magnitude above 'c'.

The important factor to show here is that we see that the velocity of the GEF is variable according to the system being studied.

A time for t_1 (0.00001) was chosen to be consistent with work done by Tom Van Flandern who received his Ph.D. degree from Yale in Astronomy, specializing in celestial mechanics. He found in his work that the speed of gravity is $\approx 6 \times 10^{18}$ m/s. Not instantaneous, but much higher than the accepted standard value 'c' by ten orders of magnitude; the Gravity Energy field not being the same as gravity waves⁶.

This approach to searching for an understanding of gravity indicates that it is a speed that does and needs to change with the celestial system analyzed and it would need to be consistently higher than light speed 'c' to effectively do its work. It is meant to search for a physical mechanical understanding of how Nature would maintain a consistent acceleration for a body in the field of a gravitational mass and maintain such seeming control over systems of immense size over unimaginable vast distances.

It is a much more reasonable conclusion that Universe is working in a way that far exceeds the constraint of light speed 'c.' Currently the accepted work of General Relativity is not compatible with quantum theory and vice versa. The macro and the micro are at odds.

This paper has found that the answer requires a unique understanding on how the system works both on the micro and the macro scale as the factors involved show even the Fine Structure constant depends on both macro and micro terms including light speed, h bar, Planck mass, GM, IM and speed, Bohr's radius, GEF speed, and Newton's gravitational constant G .

Also, it is known that the Fine Structure Constant is not a fixed constant, but does vary on different scales. Alpha's role in the process is unknown.

To what degree motion, energy, matter, Space, magnetism, magnetic fields, electric fields, and "the gravity field" might be related appears not to have been researched enough and is far from understood. For physics to find the right direction in the future, it needs to reexamine the past.

References

1. <https://www.youtube.com/watch?v= H4xrVzd65Q>
2. <https://en.wikipedia.org/wiki/Electromagnetism>
3. <https://www.gsjournal.net/Science-Journals/Research%20Papers/View/9692>
4. https://en.wikipedia.org/wiki/Planck_units
5. https://en.wikipedia.org/wiki/Bohr_radius
6. <https://www.metaresearch.org/cosmology/cosmology2/the-speed-of-gravity-what-the-experiments-say>