

DOI: <https://doi.org/10.24297/jap.v23i.9717>**Sayed's Theory on Unification of Electromagnetism and Gravity Forces: Innovative Correlation of Electrodynamics and Gravity with Inevitable Violation of $E=mc^2$**

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Abstract

The unified universe is a function in the only Great Creator, Allah. The unification of the weak nuclear force and electromagnetism was achieved in 1979 by Noble laureates. This article is a theory and outstanding approach for unification of electromagnetism and gravity forces. The Sayed's electromagnetic-gravity force (SEMGF) equations were derived and generated by fusion of Newton, Einstein, Planck, Maxwell equations and Coulomb law. The violation of $E=mc^2$ is remarkably concluded. The unified equations lead to introduce the effect of electromagnetic gravity force on the measured and calculated speed of light. The acceleration, wavelength, gravitational constant, Planck constant, and speed of light were also integrated to develop Maxwell's equations. The magnetic to electric field ratio was postulated to be π . To verify some universal constants taking into consideration the electromagnetic gravity force, speed of light was served to be violated: -6×10^{16} m/s. The Planck force and acceleration were found to be in concordance with the calculated by SEMGF; 1.21029×10^{44} N and 5.6077×10^{51} m/s² respectively. The calculated gravitational constant (G) and electrostatic charge (e) values are; 6.67×10^{-11} Nm²/kg² and 1.602×10^{-19} C. Some values show differences that could be due to mutual and overlapping effect of the gravity and electromagnetism forces. It is a deep step for unification of gravity and electromagnetism.

Keywords: Sayed theory on unification of electromagnetism and gravity forces/ Light speed violation**I. Introduction**

The empirical and experimental physics of electricity and magnetism was long time tanged and developed by many great scientists (1,2,3) The Maxwell equations of 1865 that reformulated the electricity and magnetism observations led to the industrial revolution and paved the way for current technology; MRI body images, magnetic tape, generated electricity, optic, electric circuits, electric motor, generator, transformer, computers, radio, television, mobile phones, internet and GPS (1- 4).

Effect of gravity considered as a medium property in Maxwell's equations has a long history; 1920s. The difference between electromagnetism and gravitation is due to gravitational waves, similarly, are generated by the bulk motion of large masses, and will have wavelengths much longer than the objects themselves. Electromagnetic waves, meanwhile, are typically generated by small movements of charge pairs (opposite) within objects, and have wavelengths much smaller than the objects themselves. (5) In 1979, S. Weinberg, Glashow and Abdu Salam awarded Noble prize in physics for unification of the weak nuclear force and electromagnetism; the electroweak theory (6).

This article is a theory targets to produce equations and formulas for unifying and correlating the forces of gravity and electromagnetism in simple calculable and experimentally verifiable approach.

II. Chronology Review of electromagnetism and gravity

The following survey shows briefly the product of scientists in the field of electricity, magnetism and gravity (1,2,3,7).

- William Gilbert in 1600, discovered magnetism; Great magnet the Earth
- Coulomb law in 1785; electrostatic force (attraction or repulsion) between two charged objects, inverse square law
- J. Watt (1736 -1819), quantify the rate of energy transfer; 1 watt = 1 joule/second.
- Orsted's law 1820 ; the needle of a compass next perpendicularly to a wire carrying current turned.; discovery of electromagnetism.(8)
- Ampere's force law in 1820s for steady current; static fields, was late modified by Maxwell to be matched with varying current.
- G. Ohm's law 1827, the correlation between voltage, current and resistance.
- M. Faraday in 1831; father of electricity, discovered electromagnetism induction; electric motor.

- C. Gauss law in 1835, the electric flux across any closed surface is proportional to the net electric charge ; first discovered by Lagrange in 1773
- J. Maxwell 1865, unified the electricity and magnetism in his famous four equations and theoretically calculated the propagation light speed for the first time, and concluded that EM waves are similar to visible light; classical electrodynamics.(9)

Formulation in SI units

Name	Integral equations	Differential equations	Meaning
Gauss's law	$\oint_{\partial V} \mathbf{E} \cdot d\mathbf{S} = \frac{1}{\epsilon_0} \iiint_V \rho dV$	$\nabla \cdot \mathbf{E} = \frac{\rho}{\epsilon_0}$	The electric field leaving a volume is proportional to the charge inside.
Gauss's law for magnetism	$\oint_{\partial V} \mathbf{B} \cdot d\mathbf{S} = 0$	$\nabla \cdot \mathbf{B} = 0$	There are no magnetic monopoles, the total magnetic flux piercing a closed surface is zero.
Maxwell-Faraday equation (Faraday's law of induction)	$\oint_{\partial \Sigma} \mathbf{E} \cdot d\boldsymbol{\ell} = -\frac{d}{dt} \iint_{\Sigma} \mathbf{B} \cdot d\mathbf{S}$	$\nabla \times \mathbf{E} = -\frac{\partial \mathbf{B}}{\partial t}$	The voltage accumulated around a closed circuit is proportional to the time rate of change of the magnetic flux it encloses.
Ampère's circuital law (with Maxwell's addition)	$\oint_{\partial \Sigma} \mathbf{B} \cdot d\boldsymbol{\ell} = \mu_0 \iint_{\Sigma} \mathbf{J} \cdot d\mathbf{S} + \mu_0 \epsilon_0 \frac{d}{dt} \iint_{\Sigma} \mathbf{E} \cdot d\mathbf{S}$	$\nabla \times \mathbf{B} = \mu_0 \left(\mathbf{J} + \epsilon_0 \frac{\partial \mathbf{E}}{\partial t} \right)$	Electric currents and changes in electric fields are proportional to the magnetic field circulating about the area they pierce.

Fig.1 : Maxwell's equations in differential and integral forms (10)

- T Edison in 1879, invented an incandescent bulb and built his electric car in 1912.
- N. Tesla (1857-1943) changed the scientific fields of electricity and magnetism.
- Lorentz force (electromagnetic force) in 1895, the combination of electric and magnetic force on a point charge due to the electromagnetic fields.
- I. Newton universal gravitation law, 1687, for the observed motions of planets and moons.
- Oliver Heaviside in 1893, the analogy and equations differing only by some small factors were first published before general relativity, by as a separate theory expanding Newton's law of universal gravitation (11)
- Gravitomagnetism (GEM) is a widely used term referring specifically to the kinetic effects of gravity, in analogy to the magnetic effects of moving electric charge. The most common version of GEM is valid only far from isolated sources, and for slowly moving test particles (11)
- Gauge Theory of Gravity with Internal U (1) Symmetry and Unification of Gravitational and Electromagnetic Fields (12).
- A. Einstein special and general relativity theories in 1905 (light and time) and 1915 ; new interpretation of gravity; the curvature of spacetime with mass and energy concept which was based on Maxwell equations.
- A group at Stanford University is currently analyzing data from the first direct test of GEM, the Gravity Probe B satellite experiment, to see whether they are consistent with gravitomagnetism (11)
- Sayed El Mongy, 2021, fused classic mechanics with relativity and quantum field theory led to violation of $E=mc^2$; faster than light speed (13) .
- Sayed El Mongy, 2023, published a deduced formula/theory for the quantum gravity force (14).

III. Derivation of unified electromagnetic-gravity force equations

i) Sayed force by Fusion of Planck, Einstein, Newton and Maxwell equations

The fourth differential Maxwell's equation is given as follow (9,15)

$$\nabla \times \mathbf{B} = \mu_0 \mathbf{J} + \mu_0 \epsilon_0 \frac{\partial \mathbf{E}}{\partial t} \quad 1$$

Where, $\nabla \times$ is the curl (vector function in Cartesian coordinates equals; $= \partial/\partial x + \partial/\partial y + \partial/\partial z$) and B is the vector magnetic field intensity (Nm/A). The constant μ_0 and ϵ_0 are the permeability and permittivity in vacuum. The J is the electric current intensity and $\partial \mathbf{E}/\partial t$ is the rate of electric field intensity change per time (N/C. 1/s). The value $\mu_0 \epsilon_0 = 1/c^2$; where c is the light speed (m/s). The equation 1 can be written as

$$\nabla \times \mathbf{B} = \mu_0 \mathbf{J} + 1/c^2 \frac{\partial \mathbf{E}}{\partial t} \quad 2$$

In the case of free space, no charges flow, the equation 2 to be :

$$\nabla \times \mathbf{B} = 1/c^2 (\partial \mathbf{E} / \partial t) \quad 3$$

Taking into consideration correlating of Einstein formula; $E=mc^2$ ($m=E/ c^2$) and Newton force formula; $F=ma$ ($m=F/a$), one gets:

$$1/ c^2 = F/E.a \tag{4}$$

Where, a is the acceleration (m/s^2), m is mass in (kg) and E is the energy (joule). Taking into consideration the Planck formula; $E=hv=hc/\lambda$, and substituting in equation 4, produces;

$$1/c^2 = F \lambda /h.c.a \tag{5}$$

Where, h is Planck constant (J.s) and λ is the wavelength (m). By substituting equation 5 in equation 3, produces;

$$\nabla \times B = (F \lambda /h.c.a) (\partial E/\partial t) \tag{6}$$

$$(F \lambda /h.c.a)=(\nabla \times B)/(\partial E/\partial t) \tag{7}$$

Using equation 7, one can generate many new correlations as follow:

$$F_s =(h.c.a /\lambda) \{(\nabla \times B)/(\partial E/\partial t)\} \tag{8}$$

Where, F_s is defined as **Sayed electromagnetic gravity force (SEMGE)**. Based on this equation, the following concluded remarks are obtained:

- The gravity and electromagnetic forces are unified; it is called SEMGE
- This force is correlated with the ratio $\{(\nabla \times B)/(\partial E/\partial t)\}$
- It is directly correlated with h.,c. and a
- It is inversely correlated with the wavelength λ
- The speed of light is affected by the ratio $\{(\nabla \times B)/(\partial E/\partial t)\}$; **Violating of $E=mc^2$**

Units' validation of the derived SEMGE formula number 8

$$\text{Newton (N)} = \{J.s) .(m/s) .(m/s^2)/m\}.\{(1/m^3) (N.m/A)/ (N/C) .(1/s)\} = \text{Newton}$$

$$\text{Newton (N)} = \{N.m.s) .(m/s) .(m/s^2)/m\}.\{(1/m^3) (N.m/A)/ (N/A.s) .(1/s)\} = \text{Newton}$$

Where C, A, J, s and m refer to Coulomb, Ampere, Joule, second and meter respectively.

Based on equation 8, one can generate many other new correlations as follow:

$$\lambda =(h.c.a / F) \{(\nabla \times B)/(\partial E/\partial t)\} \tag{9}$$

$$a =(\lambda F /h.c) \{(\partial E/\partial t) /(\nabla \times B)\} \tag{10}$$

$$c =(\lambda F /h.a) \{(\partial E/\partial t) /(\nabla \times B)\} \tag{11}$$

Table 1 shows the calculated speed of light taking into consideration effect of the SEMGE. The magnetic field lines encircle the current-carrying wire. Due to the circular field lines, it was postulated that the *ratio $(\nabla \times B)/(\partial E/\partial t)$ equals the π* ; ratio of circumference divided by the diameter of circle.

Table 1: Effect of Sayed's electromagnetic gravity force (SEMGE) on speed of light

Term	Tabulated λ value	Light speed (m/s) Calculated by SEMGE
De Broglie (electron)	2.42×10^{-12} m	7.95×10^{13}
Planck scale	5.603×10^{-9} m	5.809×10^{16}
Maxwell's equation	$\mu_0 \epsilon_0 = 1/c^2$	-3×10^8 Without effect of electromagnetic gravity force

Based on the simple calculations carried out by using SEMGE equations 8, 10 and 11, it can be observed that the **violation of speed light** is a must to get the right value of some universal constants. The Maxwell's light speed had not been taking into consideration the effect of gravity on measurements and calculations. The following parameters in Planck scale were calculated using different light speeds and tabulated in Table 2.

Table 2 : Calculation of some constants in Planck scale using SEMGF

Term	Light speed	Tabulated value (F)	Calculated by SEMGF
Planck force (F)	- 3x10 ⁸ m/s	1.2103x10 ⁴⁴ N	6.25x10 ³⁵ N
Acceleration (Planck)	- 3 x10 ⁸	5.608x10 ⁵¹ m/s ²	1.087x10 ⁶⁰ m/s ²
Planck force	- 5.809x10 ¹⁶	1.2103x10 ⁴⁴ N	1.21029x10 ⁴⁴ N
Acceleration (Planck)	- 5.809x10 ¹⁶	5.608x10 ⁵¹ m/s ²	5.034x10 ⁵¹ m/s ²

The relative concordance of the calculated Planck force and acceleration values with the declared proofs the correctness of SEMGF formulas. The big difference in Planck force and acceleration values at Einstein's light speed reflects and shows **violation of E=mc²**.

ii) Sayed force by Fusion of Einstein and Newton Gravity constants.

Taking into consideration the Newton gravity law (F=Gm₁m₂/r² or G= F r²/m₁m₂) and Einstein gravity constant (κ=8πG) formula (13,14) with equating the two gravity constants, one gets;

$$F = 8\pi G m_1 m_2 / r^2 \tag{12}$$

For simplicity, considering m₁=m₂ in equation 12 and consider Einstein formula; E=mc² or m=E/ c², with substitution in equation 12; one gets

$$F = (8\pi G m / r^2) . (E / c^2) \tag{13}$$

$$1/c^2 = F.r^2 / 8\pi m G E \tag{14}$$

Where, G , m and r are the Newton gravitational constant , mass , distances between two masses respectively. By fusion of equation 14 and Maxwell's equation number 3, it produces

$$\nabla \times B = (F.r^2 / 8\pi m G E) (\partial E / \partial t) \tag{15}$$

$$F = \{(\nabla \times B) / (\partial E / \partial t)\} . (8\pi m G E / r^2) \tag{16}$$

Expressing the energy in Planck formula; E=hc/λ and substitution in equation 16; one gets

$$F_s = (8\pi m . G . h . c / \lambda r^2) . \{(\nabla \times B) / (\partial E / \partial t)\} \tag{17}$$

Based on this equation, **Sayed electromagnetic gravity force (SEMGF)**, one concludes:

- Sayed electromagnetic gravity force unified gravity and electromagnetic forces
- It is affected by the ratio $\{(\nabla \times B) / (\partial E / \partial t)\}$
- It is directly affected by m, G, h and c
- It is inversely affected by λ and r²

Units' validation of the derived formula number 17

$$\text{Newton (N)} = \{ \text{Kg} . (\text{J} . \text{s}) . (\text{m} / \text{s}) . (\text{N} . \text{m}^2 / \text{kg}^2) / \text{m} . \text{m}^2 \} . \{ (1 / \text{m}^3) (\text{Nm} / \text{A}) / (\text{N} / \text{C}) . (1 / \text{s}) \} = \text{Newton}$$

$$\text{Newton (N)} = \{ \text{Kg} . (\text{N} . \text{m} . \text{s}) . (\text{m} / \text{s}) . (\text{kg} . \text{m} / \text{s}^2) . (\text{m}^2 / \text{kg}^2) / \text{m}^3 \} . \{ (1 / \text{m}^3) (\text{Nm} / \text{A}) . (\text{A} . \text{s} / \text{N}) . (\text{s}) \} . = \text{N}$$

Newton = Newton , in both side

The equation 17 can be rewritten to calculate different other parameters such as;

$$G = (F \lambda r^2 / 8\pi m h c) . \{(\partial E / \partial t) / \nabla \times B\} \tag{18}$$

$$c = (F \lambda r^2 / 8\pi m h G) . \{(\partial E / \partial t) / \nabla \times B\} \tag{19}$$

Using the derived SEMGF formulas, some constants were also calculated and given in table 3.

Table 3: Calculation of some universal constants using SEMGF

Term	Light speed	Tabulated value	Calculated by SEMGF
Planck force	$\sim 3 \times 10^8$ m/s	1.2103×10^{44} N	1.557×10^{37} N
G constant	$\sim 3 \times 10^8$ m/s	6.674×10^{-11} Nm ² /kg ²	5.185×10^{-1} Nm ² /kg ²
G constant	5.809×10^{16} m/s	6.674×10^{-11} Nm ² /kg ²	0.2678×10^{-11} Nm ² /kg ²

The relative difference in gravitational constant (G) value could be due to the mutual effect of gravity and electromagnetism. The big difference in the calculated G value at Einstein's light speed shows and emphasizes violation of $E=mc^2$.

iii) **Sayed force with fusion of Coulomb force and Maxwell equation**

As a matter of fact, any matter including the huge mass of galaxies consists of atoms; positive proton, neutral neutron and negative electron, whatever their numbers, distribution, configuration and shape. Fusion of the Coulomb law between microscopic static charges and Newton law of gravity between macroscopic masses leads to the following formulas (1,2,3,15):

$$F = G m_1 m_2 / r^2 \tag{20}$$

Where, F is the force of gravity in Newton (N) , mass m in (kg), distance in meter (m) and the gravitational constant G in (N m²/kg²)

$$F_c = k q_1 q_2 / r^2 \tag{21}$$

Where, F_c is the Coulomb force (either attraction or repulsion) in Newton, k is the Coulomb constant in (Nm²/C²), q₁ and q₂ are charges in (C) and the distance r between them in meter (m) and the Coulomb (C)=Ampere(A). Second(s). This law can also be written as

$$r^2 = k q_1 q_2 / F_c \tag{22}$$

By substituting equation 22 in 20 , generates;

$$F = (F_c / k q_1 q_2) (G m_1 m_2) \tag{23}$$

Taking into consideration Newton formula; F=ma with considering Einstein formula; m=E/c², and supposing m₁ =m₂ , one gets

$$m.a = (F_c / k q_1 q_2). (G m. E/c^2) \tag{24}$$

$$a = (F_c / (k q_1 q_2). (G. E) (1/c^2) \tag{25}$$

$$(1/c^2) = k q_1 q_2 .a / (G. E .F_c) \tag{26}$$

By substituting value of 1/c² of equation 26 in equation 3 , and Planck formula; E=hc/λ , one gets

$$\nabla \times B = (k q_1 q_2 .a / (G. E F_c) (\partial E / \partial t) \tag{27}$$

$$\nabla \times B = (k q_1 q_2 .a \lambda / (G. h.c F_c)) . (\partial E / \partial t) \tag{28}$$

$$F_s = (k q_1 q_2 .a . \lambda / G.h.c) . \{(\partial E / \partial t) / \nabla \times B\} \tag{29}$$

$$F_s = (k e^2 .a . \lambda / (G.h.c)) (\partial E / \partial t) / \nabla \times B) \tag{30}$$

Based on this equation, **Sayed electromagnetic gravity force (SEMGF)**, one also concludes:

- Sayed electromagnetic gravity force unified gravity and electromagnetic forces
- It is affected by the ratio $\{(\partial E / \partial t) / \nabla \times B\}$
- It is directly affected by k q₁q₂, a and λ
- It is inversely affected by G, h. and c.

Units' validation of the derived formula 29

$$\text{Newton (N)} = \{(\text{Nm}^2/\text{C}^2)(\text{C}^2.\text{m}/\text{s}^2. \text{m})/(\text{Nm}^2/\text{kg}^2).(\text{J}.\text{s}). (\text{m}/\text{s})\}. \{(\text{N}/\text{C})/.\text{s}\} / (1/\text{m}^3) (\text{N}.\text{m}/\text{A})\}$$

$$\text{Newton} = \{(\text{Nm}^2/\text{C}^2)(\text{C}^2.\text{m}/\text{s}^2. \text{m})\}/\{(\text{Nm}^2/\text{kg}^2).(\text{N.m.s}). (\text{m}/\text{s})\}.\{(\text{N}/\text{A.s})/\text{s}\}/(1/\text{m}^3).(\text{Nm}/\text{A})\}=\text{N}$$

Where, C, kg, J and A are Coulomb, kilogram, Joule and Ampere respectively; Coulomb C=A.s.

Table 3: Calculations of some parameters taking into consideration impact of SEMGF

Item	Tabulated value	Calculated by SEMGF equations
Planck force ,F	1.2103x10 ⁴⁴	1.740x10 ⁵⁰ N, at Einstein light speed
Planck force ,F	1.2103x10 ⁴⁴	- 1x10 ⁴² N, at Sayed light speed
Gravitational constant, G	6.67x10 ⁻¹¹	6.67x10 ⁻¹¹ Nm ² /kg ²
Electrostatic charge , e	1.602x10 ⁻¹⁹ C	1.602x10 ⁻¹⁹ C

It is known the gravity is of spin 2, while Maxwell’s field theory is spin 1. The ratio of the gravitational force to the electromagnetic force is approximately 1.84x10⁻⁴³.

iv) **Sayed Force with fusion the Maxwell wave equations**

The Maxwell’s wave equations is shown in the following figure number2 (16)

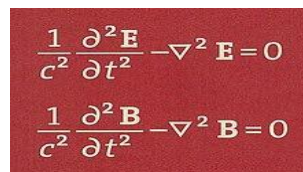


Fig. 2: The Maxwells wave equations in Vacuum

Based on the abovementioned derivation in item (ii), and Maxwell’s wave equations (for magnetic and electric fields) as shown in the figure 2, the following formulas can be deduced;

$$1/c^2 \partial^2 B/\partial t^2 = \nabla^2. B \tag{31}$$

$$1/c^2 = F.r^2/8\pi mGE \tag{32}$$

$$(F.r^2/8\pi mGE) \partial^2 B/\partial t^2 = \nabla^2. B \tag{33}$$

$$F_s=(8\pi.m.G.E /r^2).\{(\nabla^2. B)/(\partial^2 B/\partial t^2)\} \tag{34}$$

$$F_s=(8\pi.m.G.h.c /\lambda.r^2).\{(\nabla^2. B)/(\partial^2 B/\partial t^2)\} \tag{35}$$

Based on this equation, **Sayed electromagnetic gravity force (SMGF)**, one concludes:

- Sayed’s electromagnetic gravity force unified gravity and electromagnetic forces
- It is affected by the ratio $\{(\nabla^2. B)/(\partial^2 B/\partial t^2)\}$
- It is directly affected by m.,G.,h. and c
- It is inversely affected by λ , and r^2

Units’ validation of the wave equation formula 35

$$\text{Newton} = (\text{kg}) (\text{Nm}^2/\text{kg}^2). (\text{J.s}). (\text{m}/\text{s})/(\text{m.m}^2). \{1/\text{m}^2\}.(\text{Nm}/\text{A})/(\text{Nm}/\text{A}).(1/\text{s}^2)\}$$

$$\text{Newton} = (\text{kg}) (\text{Nm}^2/\text{kg}^2). (\text{N.m.s}). (\text{m}/\text{s})/(\text{m.m}^2). \{1/\text{m}^2\}.(\text{Nm}/\text{A})/(\text{Nm}/\text{A}).(1/\text{s}^2)\}$$

$$\text{Newton} = \text{Newton}$$

In a similar way one can deduce another wave equation for electric field and their ratio as follow;

$$F_s=(8\pi.m.G.h.c /\lambda.r^2).\{(\nabla^2. E)/(\partial^2 E/\partial t^2)\} \tag{36}$$

$$F_{S1}/ F_{S2}=\{(\nabla^2. E)/(\partial^2 E/\partial t^2)\}/\{(\nabla^2. E)/(\partial^2 E/\partial t^2)\} \tag{37}$$

$$F_{S1}/ F_{S2}=\{(B)/(\partial^2 B)\}.\{(\partial^2 E)/(E)\} \tag{38}$$

The following texts summarize some recent published articles related to this topic. The ratio of the gravitational force to the electromagnetic force is approximately 1.84x10⁻⁴³ (17) indicating that gravity is extremely weak compared to

electromagnetism. The electric and magnetic charge-to-mass ratios are important physical quantities that prove gravity is an electromagnetic force. The unification of electricity and magnetism was achieved in the 1800s by Michael Faraday and James Clerk Maxwell but science still can't explain what those two phenomena actually are (18). An electrodynamic version of the unified electro gravity (UEG) theory, which rigorously models the spinning motion of an electron based on a unified-electro-gravito-magnetic (UEGM) effect (19) A Universal Mathematical Field Theory (UMFT) is established, considering Maxwell's equation combined with Coulomb, Newton and GR(20) _The linearization of the Einstein Field Equations on Minkowski space-time leads also to a linear theory of gravity; but this theory is spin 2, while Maxwell's field theory is spin 1. Hence the two theories are distinct (21) For optical properties one should directly handle Maxwell's equations in curved spacetime (22). _A tenth experiment was merely a control experiment to understand basic quantum behavior of magnetism (23) Newton's law of universal gravitation is a solution of Maxwell's equation, as are the laws of Coulomb, Faraday, Ampère and Biot-Savart (24) Using the conservation of energy principle, gravity and magnetism are related by the energy required for particle spin. The energy used for magnetism is the lost energy of gravity (25). _A continuous field theory of electromagnetism is developed from which gravitation and antimatter emerge in solutions. (26). Disadvantages of Maxwell's equations; it do not account for quantum mechanics, quantum electrodynamics and very high speeds (relativistic electrodynamics.(27). A third type of magnetism? Altermagnetism named top physics breakthrough Of 2024 (28). Italian scientists freeze light, super solid state, unlocking a new quantum mystery (29).

Conclusion

This theory is a new approach for unification of electromagnetism and gravity forces. Innovative formulas called Sayed's electromagnetic gravity force (SEMGF) were derived. The formulas were used to calculate universal constants as validation and verification to its correctness. The calculated values were found to be in good concordance with the established ones. The Maxwell equation for light speed calculation has to take into consideration the effect of electromagnetic gravity force. The gravitational constant (G) and electrostatic charge (e) values were calculated by SEMGF and found precisely to be; $6.67 \times 10^{-11} \text{ Nm}^2/\text{kg}^2$ and $1.602 \times 10^{-19} \text{ C}$ respectively The calculations show inevitability violation of light speed limit; consequently incorrectness of $E=mc^2$; in other words, it is not absolutely correct.

Acknowledgment

Allah; my God and Creator, your universe is unbelievable, unimaginable and in accelerating expansion. Please accept my wonder, mental and cordial respect. When I look at your universe, I feel ignorance. Please forgive me.

Conflict of interest

There is no any conflict of interest with anyone

References

1. James H. Dann, James J. Dann, Jason P. Murphy, Byron J Philhour, 2006," The People's Physics Book", Textbook Website <http://scipp.ucsc.edu/outreach/index2.html>).
2. Yaroslav Kurylev, 2012, " Maxwell's Theory of Electrodynamics", Edited by Adam Townsend & Giancarlo Grasso 19 May 2012, MATH3308 Maxwell's Theory of Electrodynamics.
3. COSTAS J. PAPACHRISTOU, 2020, " INTRODUCTION TO ELECTROMAGNETIC THEORY AND THE PHYSICS OF CONDUCTING SOLIDS", Manuscript of textbook published by Springer (© 2020), ISBN 978-3-030-30995-4
4. <https://www.kcl.ac.uk>
5. <http://www.tapir.caltech.edu/~teviet/Waves/differences.html>, Differences between gravitational and electromagnetic radiation, Caltech,.
6. James Russell Farmer, 2021, "Grand Unification: of the four fundamental forces of physics", ISBN-13: 979-8670102285. <https://www.amazon.com.be/-/en/dp/BO96YFG1XS>. Reviewed in the United States on 29 March 2023. Book Abstract.
7. <https://www.Wikipedia/electromagnetism>
8. <https://physlab.org/class-demo/oersteds-law/>
9. Maxwell, J. (1865). "A dynamical theory of the electromagnetic field." Philosophical Transactions of the Royal Society of London, 155: 459–512. doi: 10.1098/rstl.1865.0008.

10. <https://physics.stackexchange.com/questions/256739/what-are-the-differences-between-the-differential-and-integral-forms-of-e-g-ma>).
11. <https://www.Wikipedia / Gravitomagnetism>
12. H. Peng, Y. Y. Peng, K. S. Wang (2015), "Gauge Theory of Gravity with Internal U (1) Symmetry and Unification of Gravitational and Electromagnetic Fields", Open Science Repository, DOI:10.7392/openaccess.45011848).
13. Sayed A. El-Mongy, (2021), —Revolutionary Approach for Fusion of the Classic, Relativity and Quantum field Theories: Sayed,s Acceleration Equation and Probable Violation of $E=mc^2$, Journal of Advances in Physics, Vol 19. DOI: <https://doi.org/10.24297/jap.v19i.90487>.
14. Sayed A. El Mongy, 2023, —Theory of the Unified Gravity: Sayed,s Quantum Gravity Force (SQGF) as a Function in Wavelength and Planck Length with Inevitability of Light Speed Violationll, Journal of Advances in Physics Vol 21 (2023) ISSN: 2347-3487. DOI: <https://doi.org/10.24297/jap.v21i.9414>
15. Stoil Donev,1997, " INTRODUCTION to EXTENDED ELECTRODYNAMICS" arXiv:patt-sol/9711002 , <https://doi.org/10.48550/arXiv.patt-sol/9711002>
16. https://ar.wikipedia.org/wiki/maxwell_eqs.
17. <https://brainly.com/question/37908717>. What is the ratio of Electromagnetic force to gravity?
18. Rodney Bartlett, 2024, "EDQG (ElectroDynamic Quantum Gravity)", ResearchGate, https://www.researchgate.net/publication/387083314_EDQG_ElectroDynamic_Quantum_Gravity DOI:10.13140/RG.2.2.14964.46723).
19. Nirod K. Das, 2023, " New Perspectives in Gravitational Physics and Electrodynamics, Toward a Unified Electro-Gravity Theory of Nature", wpmucdn.com, <https://bpb-us-e1.wpmucdn.com > files > 2024/08>).
20. Hui Peng, 2023," Maxwell equations derived from (Coulomb's Law +velocity), Maxwell-type Gravity derived from (Newton Law + velocity), Spin-Electromagnetism derived from (Coulomb' Law + spin) —by Universal Mathematical Field Theory (UMFT)", HAL Id: hal-03941834. <https://hal.science/hal-03941834v1>
21. D. H. Sattinger, 2013," Maxwell's Equations, Hodge Theory, and Gravitation", arXiv:1305.6874v2 [physics.gen-ph] 3 Nov 2013.
22. Jai-Chen Hwang, Hyerim Noh, 2024," On gravity as a medium property in Maxwell equations", arXiv:2401.08888v1 [gr-qc].
23. Khumalo, B. (2021). Magnetism Organizes into a Wave: Meaning for Standard and a Fundamental Model. *Academia Letters*, Article 3505. <https://doi.org/10.20935/AL3505>.
24. Valeriy Pakulin, "Newton's law of gravitation is the solution of Maxwell's equation", 2022, DOI: 10.13140/RG.2.2.32181.55524, <https://www.researchgate.net/publication/359861688>.)
25. Jeff Yee ,2020, "The Relationship of Gravity and Magnetism", <https://www.researchgate.net/publication/340362832>, DOI: 10.13140/RG.2.2.22123.28961)
26. Raymond Beach, "The Geometrization of Maxwell's Equations and the Emergence of Gravity and Antimatter", Preprints.org Posted Date: 12 January 2024, doi: 10.20944/preprints201711.0022.v8.
27. <https://www.geeksforgeeks.org/maxwells-equation/>. 2024.
28. Johannes Gutenberg University – Mainz, 2025, "A third type of magnetism? Altermagnetism named top physics breakthrough Of 2024".
29. https://www.moneycontrol.com/italian_scientists_freeze_light

Biography



Prof. Sayed Ali El-Mongy studied Ph.D. in Germany. He is an Academic supervisor and nuclear affairs consultant. He has more than 130 published articles. He has guested in many T.V. with published tenth newspaper articles. He awarded Who's Who in science and engineering award. He has several published theories in astrophysics. He traveled to USA, Canada, Russia, most EU states, NATO, Arab league states and the IAEA. He was V. Chairman of Egypt nuclear regulatory and radiological authority (ENRRA). Currently He is on-leave from the Egypt Atomic energy authority- the National center for nuclear safety to the distinguished UAE.