Accelerated Space Theory's.

By

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Preface

For a long time, it has been attempted, and it has been desired, to build a unified field physics, but so far all efforts have been in vain.

For over a century, physicists have considered mass and energy are two different manifestations of the same thing, that radiation conveys inertia between the emitting and absorbing bodies, that all forms of energy (kinetic, potential, thermal, electromagnetic, etc.) gravitate exactly as if they were mass, that the inertia of a body depends on its energy content, but, simultaneously, physicists consider the field as a geometric entity, not as a material object or material flow.

Energy is attributed to the field, but mass is not attributed to it, and therefore the field is stripped of all its mechanical attributes (mass, inertia, motion along a curved path, accelerated motion, gravity). This contradiction is probably the fundamental cause why the conversion of mass into energy is considered in nuclear phenomena and simultaneously there is no definitive definition of the process of energy conversion into mass. On the other hand, the phenomenon of mass conversion into energy has been considered an exclusive domain of nuclear phenomena; until now, gravitational phenomena have not been granted that privilege.

Energy has been attributed to the field, but mass has not been attributed to it. By stripping the field of mechanical attributes, energy has also been deprived of mechanical attributes. The so-called equivalence between mass and energy, where mass possesses mechanical attributes and energy does not, seems not to correspond to reality.

In the landscape of physical theories, a "False Paradox" underlies, masked for a century: the "Field Paradox", which is: "A geometric entity without mechanical attributes that is, nevertheless, capable of conveys inertia to the body that absorbs it."

It's not really a paradox, it's a dichotomy; "the dichotomy lies not in the field but in the theories."

It's a dichotomy that cannot be ignored or dismissed without argument; it's a "False Paradox" that must be resolved.

To approach a unified theory, we must evolve toward a field reality that involves

mass and possesses all the mechanical attributes of a mass. Currently, the attribution of mass to the field is uncertain; it's not a concept established with resoluteness, it is a concept timidly outlined, even, for example, it's stated that electromagnetic waves are not mechanical and do not involve material particles with mass. It's also stated that photons are massless: photons, the fundamental particles of light, have no mass but still carry energy and momentum; this is what it is said.

The greatest difficulty in physics seems to lie in finding a "common agent" that allows us to approach both the atom and gravity. In order to find this agent, I have recognized in the field the mechanical attributes corresponding to its mass, moved it along a curved path, accelerated it, and used it to find the relationship between electric charge and Planck's constant. I am proposing to use the field, with all its mechanical attributes, as a single agent, to bring us closer to gravity and the atom.

Until now, the field has been defined by its effect: the intensities of the electric and magnetic fields and the acceleration due to gravity. From today onward, we will also define the field by the mass in the form of radiation, emitted by a body that bends its trajectory. The additional energy (equivalent to an additional amount of mass) that a body gains by moving along a curved path, or that it has absorbed from a gravitational field, is emitted by the body in the form of a field. The mass of the electromagnetic wave moving along a curved path, emits radiation equivalent to the mass that a body loses or gains when it emits or absorbs radiation.

This research aims to resolve the "False Paradox" that a Field can convey inertia between emitting and absorbing bodies being simultaneously a "Geometric Entity" without mechanical attributes.
I propose understanding a field with all its mechanical attributes; therefore, we have investigated the movement of the field's mass along a curved trajectory and its accelerated motion, and here we present the results of these phenomena.

Perhaps amending the belief in a field without mechanical attributes but capable of conveying inertia to the body that absorbs it, could help resolve certain controversies among prominent physicists. Some have unsuccessfully sought to relate gravity to electromagnetism and have encountered insurmountable mathematical and conceptual obstacles along their chosen path; others have declared electromagnetism incapable of explaining nuclear phenomena. We have seen how the different theoretical trends in physics have debated determinism and indeterminism, problems such as the limitations of electromagnetism in explaining nuclear phenomena, and its incompatibility with gravity. In their passionate discussions, these leading figures in physics have defended their theories with very elegant arguments. Even today, a century later, the debate continues.

We have moved the mass of the electromagnetic wave along a curved path (we

have bent its trajectory), we have also accelerated it, and we have discovered that the mass that bends its trajectory emits mass in the form of radiation and we have generalized this principle as valid for all mass. This discovery for the movement of electromagnetic mass in an orbit, we generalize as a physical principle to the curvilinear motion of all mass. For masses like the planets and the sun, the mass emitted as radiation is the gravitational field.

The rhythm of the Universe.

$$\nabla^2(\mathbf{qBt}) = \frac{1}{c^2}\frac{\partial^2(\mathbf{qBt})}{\partial t^2}$$

The mass of the electromagnetic wave moving in an orbit, (moving along a curved path), just as any planet moves, emits mass in the form of energy and as a consequence its mass decreases in $(\frac{1}{c^2})HEt$ (HEt it is energy per unit area). Planets moving in their orbits also emit mass in the form of energy; in this case, the emitted energy is the gravitational field.

$$\nabla^2(\frac{E}{c^2}) = \frac{1}{c^2}\frac{\partial^2\mathbf{m}}{\partial t^2}$$

In our approach to the mystery of Gravity, we are proposing the phenomenon of energy into mass conversion as the engine of the wave equation of the gravitational field. The self-sustaining mechanism from this wave equation lies in the conversion of energy into mass, and vice versa, where mass and energy are converted into each other.

On the Physics proposed here.

The Physics I propose here is honest, the honesty of this work lies in its authenticity. You've probably never heard of:

- In the landscape of physical theories, a "False Paradox" underlies, masked for a century: the "Field Paradox"

- The "Field Paradox", which is: "A Geometric Entity without mechanical attributes that is, nevertheless, capable of conveys inertia to the body that absorbs it." It's not really a paradox, it's a dichotomy.

- The so-called equivalence between mass and energy, where mass possesses mechanical attributes and energy does not, seems not to correspond to reality.

- To approach a unified theory, we must evolve toward a field reality that involves mass and possesses all the mechanical attributes of a mass.

- The greatest difficulty in physics seems to lie in finding a "common agent" that allows us to approach both the atom and gravity.

- We are proposing to use the field, with all its mechanical attributes, as a single agent, to bring us closer to gravity and the atom.

- In our approach to the mystery of Gravity, we are proposing the phenomenon of energy into mass conversion as the engine of the wave equation of the gravitational field. The self-sustaining mechanism from this wave equation lies in the conversion of energy into mass, and vice versa, where mass and energy are converted into each other.

- Electrical, magnetic, optical and quantum quantities are related in a single equation, as a proposition to explain some physical phenomena.

This work wants to draw attention to the False Paradox that "a Field can convey inertia between emitting and absorbing bodies, being simultaneously a "Geometric Entity" without mechanical attributes", hopping that it can motivate other to evaluate it and to enrich the physical and philosophical consequences of what is proposed here.
I am proposing to use the field, with all its mechanical attributes, as a single agent, to bring us closer to gravity and the atom.

End of Preface

Electromagnetic Wave's Mass ($m = qBt$)

When a body emits a field, its energy content decreases by a certain quantity. The emitted field can convey its energy to another body that absorbs it. If this field is an electromagnetic wave and it conveys inertia to the absorbing body, then the emitted field's energy corresponds to a quantity of mass, which is equal to:

$m = \frac{EHSt}{c^2}$

E is Electric Field Intensity vector.
H is Magnetic Field Intensity vector.
S is Area unit.
t is Time unit.

From the electromagnetic theory of light we know that light and the electromagnetic properties of the physical medium are related as follows:

$c^2 = \frac{1}{\epsilon\mu}$

where:
c is light velocity.
ϵ is permittivity or dielectric constant.
μ is magnetic permeability.

Then:

$m = \epsilon\mu EHSt$

$m = \epsilon ES\mu Ht$

It is known, by Gauss law, the electric flux ψ over a closed surface S equals the total charge q in the volume V bounded by S :

$\psi = q = DS = \epsilon ES$

and knowing from electromagnetism that $B = \mu H$, being B the Magnetic Flux Density, also referred to as the Magnetic Induction, and being $D = \epsilon E$ the Electric Flux Density.
Then the Electromagnetic Mass is:

$m = \epsilon ES\mu Ht$

$m = qBt$

This equation satisfies the dimensional analysis.

Using electromagnetic wave's mechanical attributes.

I) Let's move the mass of the electromagnetic wave along a curved path, that is:

$\frac{\partial^2(qBt)}{\partial x^2} = t[\frac{\partial^2 q}{\partial x^2}B + 2\frac{\partial q \partial B}{\partial x \partial x} + q\frac{\partial^2 B}{\partial x^2}]$

All terms of this equation are dimensionally equal, so, for what we want, it is enough to work with the first term:

$[(\frac{\partial^2 q}{\partial x^2}B)t]$

From the first term, working with $\frac{\partial^2 q}{\partial x^2}$, we have:

$\frac{\partial^2 q}{\partial x^2} = \frac{\partial}{\partial x}\frac{\partial q}{\partial x} = \frac{\partial}{\partial x}\frac{\partial q}{c\partial t} = \frac{1}{c}\frac{\partial i}{\partial x} = \frac{1}{c}\frac{H\partial x}{\partial x} = \frac{H}{c}$

$\frac{\partial^2 q}{\partial x^2} = \frac{\partial}{\partial x}\frac{\partial q}{\partial x} = \frac{\partial}{\partial x}[\frac{\partial q}{c\partial t}] = \frac{1}{c}\frac{\partial i}{\partial x} = \frac{1}{c}\frac{H\partial x}{\partial x} = \frac{H}{c}$

$\frac{\partial^2 q}{\partial x^2} = \frac{H}{c}$

Then:

$[(\frac{\partial^2 q}{\partial x^2}B)t] = (\frac{HB}{c})t$

Using $E = cB$, we have:

$\frac{\partial^2 m}{\partial x^2} = (\frac{1}{c^2})HEt$

This means the mass of the electromagnetic wave moving along a curved path, conveys mass as a field, in an amount equal to $(\frac{1}{c^2})HEt$, where HEt is energy per unit area.

II) Let's accelerate the mass of the electromagnetic wave, that is:

$\frac{\partial^2(qBt)}{\partial t^2}$

The result of the second derivative is:

$\frac{\partial^2(qBt)}{\partial t^2} = [B\frac{\partial^2 q}{\partial t^2} + ... + q\frac{\partial^2 B}{\partial t^2}]t + ...$

As all the terms of the result of the second derivative are dimensionally equal, we will now work with any single term:

$\frac{\partial^2(qBt)}{\partial t^2} = [B\frac{\partial^2 q}{\partial t^2}]t$

$\frac{\partial^2(qBt)}{\partial t^2} = [B\frac{\partial^2 q}{\partial t^2}]t = B[\frac{\partial}{\partial t}\frac{\partial q}{\partial t}]t = B[H\frac{\partial x}{\partial t}]t = cBHt = HEt$

$\frac{\partial^2 m}{\partial t^2} = HEt$ which is, dimensionally, energy per unit area.

III) How many units of curvilinear movement are there in one unit of accelerated movement?

The electromagnetic mass that moves along a curved path

$\frac{\partial^2 (qBt)}{\partial x^2} = (\frac{1}{c^2})HEt$

implies a mass per unit area equal to $(\frac{1}{c^2})HEt$, that is, mass in the form of a field.

The accelerated electromagnetic mass conveys a quantity of energy per unit area.

$\frac{\partial^2 (qBt)}{\partial t^2} = HEt$

Then:

$\frac{\partial^2 (qBt)}{\partial x^2} = (\frac{1}{c^2})\frac{\partial^2 (qBt)}{\partial t^2}$

$\frac{[\frac{\partial^2 (qBt)}{\partial t^2}]}{[\frac{\partial^2 (qBt)}{\partial x^2}]} = c^2$

In one unit of curvilinear movement there are c^2 units of accelerated movement.
c^2 is the quantity of units of accelerated movement in one unit of curvilinear movement.

IV) The acceleration is to the curvature as the energy is to the mass.

$\frac{\frac{\partial^2 (qBt)}{\partial t^2}}{\frac{\partial^2 (qBt)}{\partial x^2}} = \frac{E}{m}$

Mass contains of energy what curvilinear movement contains of acceleration

$E\frac{\partial^2 m}{\partial x^2} = m\frac{\partial^2 m}{\partial t^2}$

V) An approach to Gravity

The mass of the electromagnetic wave moving in an orbit, (moving along a curved path), just as any planet moves, emits mass in the form of energy and as a consequence its mass decreases in $(\frac{1}{c^2})HEt$ (HEt it is energy per unit area). Planets moving in their orbits also emit mass in the form of energy; in this case, the emitted energy is the gravitational field.

$\nabla^2(\mathbf{qBt}) = \frac{1}{c^2}\frac{\partial^2(\mathbf{qBt})}{\partial t^2} = (\frac{1}{c^2})HEt$

The accelerated electromagnetic mass contains a quantity of energy which is c^2 times the quantity of energy that the electromagnetic mass emits when it bends its trajectory.

If we generalize the results of accelerating and bending the trajectory of the electromagnetic wave mass to all mass, we can consider that:

$\frac{\partial^2 m}{\partial x^2} = (\frac{1}{c^2})\frac{\partial^2 m}{\partial t^2}$

Which tells us that the gravitational phenomenon is governed by a wave equation.

$\nabla^2(\frac{E}{c^2}) = \frac{1}{c^2}\frac{\partial^2 \mathbf{m}}{\partial t^2}$

The self-sustaining mechanism from this equation lies in the conversion of energy into mass, and vice versa, where mass and energy are converted into each other.

The movement of a body in an orbit is to the acceleration, as the mass is to the enegy

VI) A very special transformation

In our approach to the mystery of Gravity, we are proposing the phenomenon of energy into mass conversion as the engine of the wave equation of the gravitational field.
To overcome a theoretical obstacle associated with the speed of light and the well-known Lorentz transformation, we will use a very special transformation:

$\mathbf{e}^{\frac{v^2}{2c^2}}$

When we develop this function in series, it approximates to Lorentz transformation.

$\mathbf{e}^{\frac{v^2}{2c^2}} = 1 + \frac{v^2}{2c^2} + ...$

But we get a different interpretation: The speed of light "c" is the speed that the field reaches in the phenomenon of conversion of mass into energy and in the phenomenon of energy into mass conversion, which is the engine of Gravity.

Electric Charge and Planck's Constant relationship's.

When light strikes an atom on a metal surface, electrons from the atom are extracting, this phenomenon is called the Photoelectric Effect. For the photoelectric effect to occur, the radiation must supply, and the atom must absorb, an amount of energy "$h\nu$" that equals the energy "$q\int Edl$" needed by the elementary unit of electric charge "q" to move a space "dl" in an electric field of intensity "E".

This physical phenomenon is represented by the following equation:

$$q\int Edl = h\nu$$

Now we will use some ratios between optical, electromagnetic and mechanical quantities, which, being equal to each other, we can use any of those ratios for any other.

$$h\nu = qEdl$$

$$h\nu = qcBcdt$$

$$h\nu = c^2qBdt$$

Here we have something we already know, the energy of an electromagnetic wave, which, in this case, equals the energy quantum of the radiation.

$$q\int Edl = h\nu$$

$$qc\mu\int Hdl = h\nu$$

$$c\mu q\int \frac{dq}{dt} = h\nu$$

In physical phenomena similar to those we are analyzing here, the unit of electric charge "q" that absorbs a quantum of energy moves from an initial potential to a final potential. The energy in the initial state corresponds to an initial wavelength λ_0. The energy in the final state corresponds to a final wavelength λ. Each of these wavelengths corresponds to a frequency, which is determined as follows:

$$\nu = \frac{c}{\lambda}$$

The quantum of energy involved in this phenomenon can also be expressed as a function of wavelength λ, then:

$$c\mu\int qdq = h\frac{c}{\lambda}dt$$

If ν and ν_0 are the frequencies that correspond to the energy in the final and initial states of the movement of the elementary unit of electric charge, then:

$c\mu \int_{q_0}^{q} q dq = h \int_{\lambda_0}^{\lambda} \frac{d\lambda}{\lambda}$

$\frac{c\mu}{2}(q^2 - q_0^2) = h ln \frac{\lambda}{\lambda_0}$

$\frac{\lambda}{\lambda_0} = e^{\frac{c\mu}{2h}(q^2 - q_0^2)}$

$\lambda = \lambda_0 e^{\frac{c\mu}{2h}(q^2 - q_0^2)}$

$\frac{c}{\lambda} = \frac{c}{\lambda_0 e^{\frac{c\mu}{2h}(q^2 - q_0^2)}}$

$\nu = \frac{\nu_0}{e^{\frac{c\mu}{2h}(q^2 - q_0^2)}}$

$\nu = \nu_0 e^{-\frac{c\mu}{2h}(q^2 - q_0^2)}$

$h\nu = h\nu_0 e^{-\frac{c\mu}{2h}(q^2 - q_0^2)}$

The energy involved in the phenomenon we are analyzing is:

$h(\nu - \nu_0) = h\nu_0[e^{-\frac{c\mu}{2h}(q^2 - q_0^2)} - 1]$

When $q = Nq_0$, where N is an integer, we have:

$h\nu = h\nu_0 e^{-\frac{c\mu q_0^2}{2h}(N^2 - 1)}$

It is important to note that $\frac{1}{2}c\mu q^2$ is dimensionally equal to Planck's Constant.

We are looking at a single equation that relates electrical, magnetic, optical, and quantum quantities, as a proposition to explain some physical phenomena.

The electromagnetism is said to be incompatible with the existence of atoms, but it is only with the atoms that possess the structures that have been described to date.
The proposition is to explore the possibility of using these equations in some adjustment of the current models.