The Unification of Mechanics and Electrodynamics
(Theory of Everything)

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Walter Babin,
home@wbabin.net
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"...for in all chaos there is a cosmos, in all disorder a secret order, in all caprice a fixed law, for everything that works is grounded on its opposite."

The Basic Writings of C. G. Jung:

Abstract
It is demonstrated that the realms of mechanics and electrodynamics are distinct and separate, but are combined and interact at every level. Examples are given to show that the fundamental mechanical laws of physics apply to both. Further analysis confirms that in all respects, the two realms are negative reciprocals and the mathematical transformation from one to the other is implemented by inversion. This applies to both micro and macrocosms which are also reciprocals. Relativistic equations, properly interpreted and applied, provide the basis for inversion, inertia, anti-gravity, pair production, entanglement, identities, *et al.*, and a comprehensive cosmology emerge as a natural consequence of the theory. If there is any basis to the assumption of "dark matter", then according to the content of this paper, it is simply inertia applied universally.

Introduction
All salient aspects of this paper were originally stated in a paper presented to the International Scientist's Club, Congress, 2002, Russia[1], and a subsequent paper the following year, depicting graphical representation and some conclusions[2]. The added materials are a logical extension of the precepts identified at that time, or are directly related and were made explicit in subsequent investigations. The formulas of Newtonian mechanics are universal. The outstanding problems therein (inertia and anti-gravity) are resolved as an extension of the following. Galilean relativity is made explicit.

Definitions and Identities
The multiverse is deterministic[3]. The fundamental physical quantities of fields and masses are invariant **within each realm**. Planck's invariant $\hbar$, is the quantum of angular momentum attributed to light, which replicates most aspects of the electron in the first Bohr orbit[4]. The inverted Rydberg constant is the time, *t,* taken by an electron in the first Bohr orbit, multiplied by *2c.* It is also invariant, completing the electron-photon comparison. The electric charge *e,* is invariant and the ratio $e^2/\hbar$ is also the velocity of an electron in the first Bohr orbit. The electron field extends to the radius of the first orbit. In the most general sense, **electrodynamic interactions are field-based and those of mechanics are based on mass**.

The demonstrations in this paper are for the most part, limited to atomic and sub-atomic interactions. The Einstein-Lorentz equations are implemented with one simple caveat; the effect of any action cannot exceed its cause. There are no infinite masses without infinite motive forces. A detailed breakdown of relativistic equations are available in an earlier paper[5]. Finally, all mental constructs must follow the same phenomenological laws as physics or no corroboration is possible.

Relativistic - Mechanistic Formulae
1. It is necessary to show that total energies in both realms are the same, given the same magnitudes. In the case of energies associated with planetary (circular) orbit, the standard expression for the velocities is derived :

$$m_p m_s V^2/2(m_p+m_s) - m_p m_s G/r = -m_p m_s G/2r \quad (K - P = T) \tag{1}$$
$$where\ V = sum\ of\ speeds\ of\ the\ sun\ m_s,\ and\ planet\ m_p,\ relative\ to\ centre\ of\ mass,$$

 The first term contains the energy loss nominally called "reduced mass". In representing the velocity of the sun as a mass ratio and solving equation *(1)*, we will find,

$$v_p^2(m_p - m_s) = -m_s v_k^2/2 \tag{2}$$
$$where\ v_p = velocity\ of\ the\ planet\ and\ v_k = the\ speed\ relating\ to\ total\ energy$$

The last term equals the velocity displayed in the relativistic expression for total energy[6],

$$c^2(m_o - m) = -m v_k^2/2 \tag{3}$$
$$where\ m\ and\ m_o = relativistic\ and\ rest\ masses,\ c= light\ speed$$

The forms of the equations are the same and the light speed in equation *(3)* infers a limit. Relativistic and Newtonian masses are equal in conditions emulating orbit. The common resolution of equation *(1)* is to treat V^2 as variable. This is incorrect since it was predefined and cannot be changed. (Note the last term in the equation is erroneously defined as kinetic energy in special relativity.)

2. The prevailing view is that mechanical velocities are supplanted by those of special relativity and that the latter approach the former in the lower limits. This is incorrect. The formulas are not the same and diverge to infinity. A classical one-dimensional elastic collision between an electron and a mass-equivalent photon. $m_o = m_x$ would result in a Newtonian velocity v_n of

$$2m_x c/(m_o + m_x) = v_n = c \tag{4}$$

A similar configuration in a Compton collision gives, $cv_m = v_k^2$. If the mass ratio is modified and/or a two-dimensional collision is introduced,

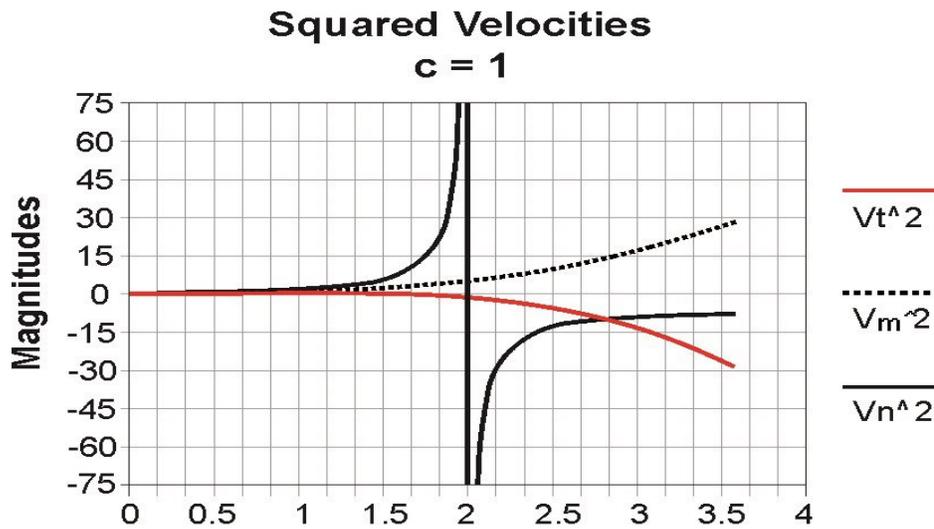$$cv_m Cos\ \phi 2m_x/(m_x + m_o) = v_n v_m = v_k^2 \tag{5}$$

$$where\ v_m = relativistic\ velocity\ and\ v_k = speed\ of\ total\ energy\ (geometric\ mean),\ \phi = electron$$
$$recoil\ angle$$

The Newtonian velocity v_n is implicit throughout[7]. It is a component of the squared velocity associated with total energy; an anomaly in itself since it does not appear to have a direction! Kinetic energy is expended potential, so we are dealing with a transfer. An earlier paper identifies it as a transfer to and from kinetic and inertial energies, through intrinsic magnetic moment/spin states[8]. The tendency would be to view it as an internal process, but it must apply to fields as well as masses.

Equation *(5)* is obvious mechanical with $2m_x c/(m_x + m_o)$ representing momentum velocity after collision. However v_m is also included, implying a recoil velocity. In relativistic equations, **it is the exact opposite**. The velocities are represented in terms of relativistic mass -
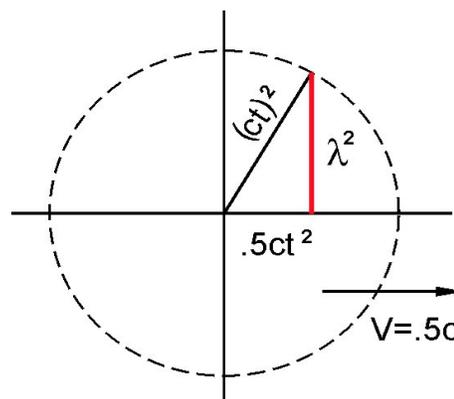
    Recoil: $c^2/v_n^2 = m + m_o/4(m - m_o)$
    Momentum: $c^2/v_m^2 = m^2/m^2 - m_o^2$
    Total Energy: $c^2/v_k^2 = m/2(m-m_o)$

The speed related to total energy in relativistic theory and Newtonian, is a combination of velocities from opposite realms and exist in both; the first indication of reciprocation (thesis, antithesis, synthesis).

Squared Velocities
c = 1

Note the hyperbolic configuration for v_n^2. Momentum velocity is represented as v_m, also reversed[9]. It is zero when v_n^2 is infinite. It is significant that relativistic mass (unfettered from cause) exhibits the same hyperbolic configuration as v_n^2. The speed of light is associated with transfer; a ratio between realms. There are no restrictions on other velocities.

3. Special relativity claims the length of an object is reduced in the direction of travel. This is not the case:.

Unit circle: *c = 1*, Object speed = *.5c, 1 - (.5ct)² = λ²*

The terms *(c-v)* and *(c+v)* represent light travelling in opposite direction in the reference frame of an observer[10]. The product of the terms apply physically, geometrically and mathematically to a distance perpendicular to the direction of travel **in the observer's frame of reference**. The result is the value of the half chord of the circle at .5 distance on the *x* axis. From the standpoint of a fixed observer, there is no necessity for modifications of either time or space and the equation accurately identifies the change in wavelength in his frame. Light speed is constant, but rotated, as found in the aberration of starlight[11]. Note that the slopes (tangents of the acute angles) of intersecting perpendicular lines are negative inverses. In subsequent arguments, the importance of this vector will be seen in the transfer of energy.

Newtonian Equivalents in Electrodynamics:
Heisenberg's probabilistic uncertainty principle is rejected entirely. While the statistical distribution of a Gaussian curve leads to a degree of predictability in the large, it is unpredictable in the small. The "principle" is equivalent to stating that the location of tails is unknown with a penny flip of heads.. What is denied, is the ability to deduce effects from causes, which negates any laws whatsoever.

The Bohr model of the hydrogen atom in its simplest form states[12],

$$e^2 = 4\pi^2 m r^3 / t^2 \qquad\qquad (6)$$
where e, m = electron charge and radius, r and t = radius and time of 1ˢᵗ orbit,

This is followed by the mechanical and electrical equations for,
潜 potential energy, $mv^2 = -e^2/r$,
acceleration, mv^2/r and $-e^{2}r^2$,
angular momentum $-mvr$ and e^2vr, *et al*.
In each instance, the form of the expression is unalloyed Newtonian, although the proportionality constant is **not** gravitational. Also,

$$m_i + m_o - m_f = m \qquad\qquad (7)$$
where m_i, m_f = initial and emitted photons' mass-equivalents, m_o = electron mass,
m = relativistic mass
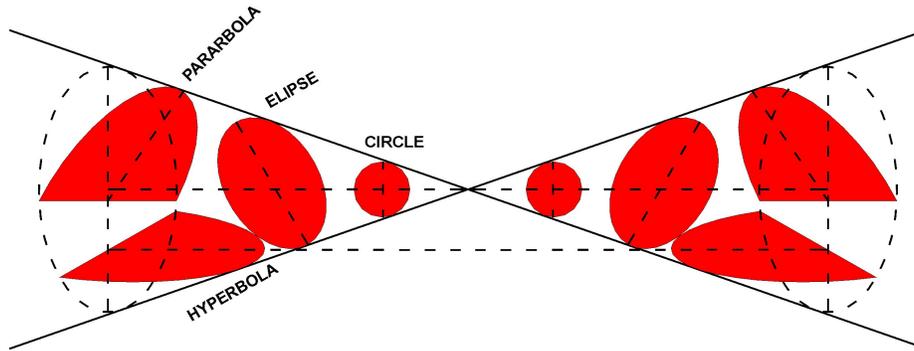
$$m_o/(1 - v_m^2/c^2)^{1/2} = m$$

A mechanical addition of the mass-equivalent photon with the electron, less the "reduced mass" emission (90 degrees for simplicity) equals the relativistic mass[13]. It is unlikely to be mass that is transferred. Release and absorption of the intrinsic magnetic moment/spin is the likely commodity. This is then suggestive of ionization energy (potential), which provides an explanation for the electron g_s. factor of 2 (less anomaly)[14]. Note that time and space are **not** modified in a Compton collision, yet the mechanical conservation laws are preserved.

The motive force is the determining factor with respect to the transfer of energy. Its distribution can be specifically determined since the target and angle of emission are known. The relativistic equations in all respects, provide the same results as those of mechanics. They would be redundant except that **they operate at right angles to the X axis and contain an inversion**.

Geometric Foundations
There is no difficulty in understanding that the so-called conic sections are the basis for mechanical physics. One might say that physics is their actualization. What has not been recognized with respect to physics, at least, is that they are **dual and are in fact negative reciprocals**. The circle for example is

dual with co-incident centres. It is contended that the dual realms of mechanics and electrodynamics are their physical representation and one is the inertia of the other.

Based on experiment (entanglement), any physical entity in one, would be represented by its precise opposite in the other. Any action in one would be reversed in the other. The action would be immediate since the components of the sections are interdependent but there is no transfer between realms. With respect to "entanglement", infinite speed may or may not be involved since the geometric forms can be considered to extend to infinity. Local entanglement may apply to circles and their displacements, while non-local to their transformations into the para-hyper figures at any distance. The theory obviously covers both the animate and the inanimate.

Meaning of the "Relativistic" Transformation Equations
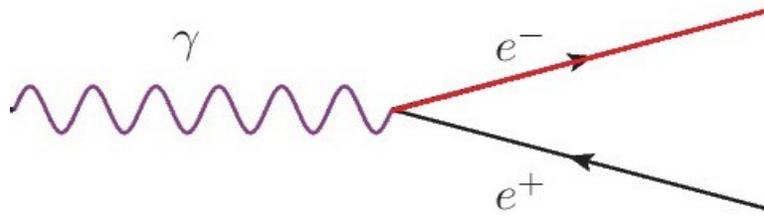The basic relativistic transformation equation is[15],

$$1/1 - v_m^2/c^2 \ = \ c^2/(c-v)(c+v) \tag{8}$$

The denominator contains a constant, and a rate of change of that constant, relative to a speed/ light speed squared. The basis of the equation **identifies the reciprocal motion in the two realms of mechanics and electrodynamics**: kinetic and inertial effects. Apply mass or charge and the denominator is representative of the conservation law, Potential - Kinetic = Total. (The formula $1/1 - v_k^2/2c^2$ is the same as *(8)*, but is P - T = K.) However, mass or charge must be squared! This confirms that they and their antitheses are multiplied; the root of which, would then contain equal elements of both kinetic and inertial energy. The inversion (where mass or charge becomes the numerator, confirms it is representative of the **opposing realm** and is a manifestation of the active/reactive law of mechanics. The transfer **is a reduction in the observer's realm and the reciprocal as an increase in the other.**

$$m_p m_e \ - m_p m_e v_m^2/c^2 \tag{9}$$

In the case of the positron at optimum, it is the disappearance(?) from one realm and the final appearance in the other with opposite charge, mass and direction to the existing electron, with braking. [The transfer is not likely the total positron. A schema or blueprint (biologically, a DNA) or field is transferred which takes on substance in the target realm. Consider the photon. Light is the transfer.] Note that energy for the particle is already available to create/transfer the positron if the idea of ionization energy mentioned earlier is correct.

m_o gamma creating a positron-electron pair

Equation *(9)* contains a squared mass. We might also replace the masses with a squared charge, the more fitting exchange based on the equation itself . In either case, the squared value is an accurate representation of the energies involved, in consideration of the antithetical values and inertial effects (see A. Einstein's equivalence of momentum and kinetic energy equation[16]). The square root is then the combined effect of opposing forces as applied to mass, or charge, or both.

Energy Transfer
Energy transfer from one realm to the other requires that one rotate at infinity, just as required in transferring from one dimension to the next higher. A more direct route would be through the foci. There should be no question at this point, that the intrinsic magnetic moment/spin vector is the 4th coordinate; specifically, rotation as the three dimensional manifestation of it, since there is no representation for spin in Cartesian coordinates. Please check an earlier paper for a detailed description[17]. Speeds comprising total energy, v_k^{2}, are a confirmation of this concept in that they move in opposite directions. The smallest change in relative velocity identifies a change in state and the degree of existence in one or the other. Galilean relativity applies since a change in one frame automatically implies the opposite in the other.

Some Observations
a. It is postulated that time and space are the inverses of one another. Time is space in the opposing realm. As one increases, the other decreases. They are a dynamic ratio.
b. Orbitals are best described by opposing standing waves; multiples of the first Bohr orbit. This is consistent with the invariance of the electron and field, but suggests our picture of the electron is simplistic. One problem is the appearance of a magnetic force operating at right angles to its field. The more likely answer would be individual positive and negative magnetic effects with induced electrical fields at right angles, driving counterpart particles/particle representations in opposite directions. Orbital displacement shows up as fine line energies of v^2/c^2 in spectroscopy. This indicates a partial emergence of the positron/field as a contribution to the emission.
c. A light wave implicitly contains an inverse electron-positron pair structure (photon) and null charge. Speed in one implies inertia in the other. The limit to its speed is the combination of inertial and kinetic effects.
d. All collisions are hyperbolic, a fact that would explain the infinite speeds associated with experiments with light signals transferred by wire. They are no doubt examples of "entanglement"[18]

To advance further, requires a specific understanding of what constitutes mass, gravity and their inverses.
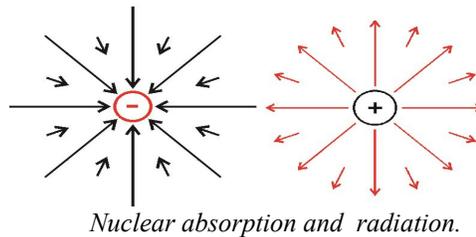
Cosmology:

In order to create something from nothing, it is necessary to create its antithesis, the absence of something. An inversion of the conic sections creates spheres having the dimensions of an electron field in the first Bohr orbit. We assume a lattice of alternating spheres, consistent with the structure of wavelengths of light (which is obviously dual). This is suggestive of Dirac's negative energy "holes" or Leibnitz's monads; a series of ones and negatives in mathematics; their combination invariably reducing to minus one, or an infinite series of ones..Whatever is substantive inverts towards the centre at the classical electron radius. (Inversion in a sphere is indicative of all masses at all magnitudes.) If we now assume a **statistical** closest packing we find,

$$m_e c x = m_p v_m \qquad\qquad\qquad (10)$$
$$\text{where } m_p \text{ and } m_e \text{ are electron and proton masses, } x = \text{compression constant}$$

and the creation of a hydrogen atom; the nucleus being comprised of reciprocal particles in opposite realms.

Nuclear absorption and radiation.

There is every indication that the initial "structure" prior to the inversion remains (photon-like). It is the propagator of light which is subject to its inertial effects. This would account for the regularity in spectrometry and would exhibit the perfection of Platonic archetypes. Matter conforms to the laws of mechanical physics and is not completely constrained by the archetypal configuration.

The process is consistent with a Compton collision with a 90 degree "reduced mass" emission. It emulates an electron, with a proton-equivalent photon as the motive force. Spiralling inward, the velocity approaches the speed of light, and the electron would exhibit the presumed mass of the photon, (a proton on inversion) and the total energy approaches $m_p v_m^{2..}$ The magnetic field equals the electric, allowing passage through the coulomb barrier at c with sufficient energy, when stopped, to create a neutron. The motion of electron/proton about the centre of mass identifies a mechanical force, indicating no requirement other than mass and/or charge is necessary in creating nuclear/orbital shells. The nucleon and electron have no relative motion, therefore, no radiation.

With respect to a particle or the microcosm in general, there is no reason to assume either realm has preference, thereby introducing the idea of inversion from one to the other. This may be effected by external sources, but more likely, a preponderance of energy in one or the other. A transfer by velocity is detailed above and there does not appear to be any other source.

An inversion of the microcosm becomes the the magnitudes required in a solar system which, in turn, inverts into macrocosmic proportions. It is the equivalent of geometrically ascending to higher dimensions. This is in harmony with the alchemical dictum "As above, so below". Another scenario is the inversion of the microcosm to that of the "universe" with solar magnitudes being the median. The uncertainty lies in the lack of accurate universal magnitudes. An inversion in one realm and level, is by

definition, an inversion in all. All levels are accessible from at least the mid-level. Inversions are likely to be a periodic occurrence and we may assume the entire multiverse appears and disappears with the breath of Brahma in increments of 432 billion years.

Quantitative and Qualitative

An earlier paper identified the vast archetypal systems that underlie all of existence[19]. While the quantitative is constrained by well-understood laws[20], there are no laws governing the qualitative. It is most powerful when devoid of motion. A physical example would be superconductivity. Psychologically, it would be called an "authority" function. Its trademark is uncritical acceptance of any theory, even to the extent of religious fervour.

The combination of a subjective philosophy (ontological relativity) and complexity provides theories that are independent of any basic principles. This leads to the unrestricted propagation of metaphysical concepts, which are then accumulated into vast mathematical edifices with no grounding in theory, experiment, or logic. One such, is the current assumption of a probabilistic basis for all physical laws, with no consideration for the obvious fact that it precludes the existence of any physical laws. When put in motion, it consumes manpower, requires vast expenditure and produces nothing of value.

CERN was built to prove the standard model; a fallacy based on exchange particles that exceed the mass of almost 1/2 the atomic elements in the periodic table They, happily, never leave the nucleus and exist only long enough to satisfy the theory. CERN's construction was an astounding act in itself, since any theory should prove itself in practical application, not by theory **extension** with no confirmation of its tenets. Nothing of the standard model has appeared to have contributed anything to technology and that which was sought was not found. Still it continues. Any business founded on the same principle would be bankrupt before completion, but CERN has an unlimited supply of public funding, (administered by another authority function) and shows all signs of continuing indefinitely..

Based on the above cosmological theory, a strong possibility exists that CERN is creating its own astrophysical phenomena.

Summary:

A synthesis between the two realms of physics has been accomplished. They are shown to be reciprocals and both subject to the laws of mechanics. Inertia is explained and energy transformation is made explicit. The mystery of entanglement is removed. The existence of a constant corresponding with gravity confirms a counterbalance is possible. Definitions for space and its dual structure is give and the meaning of relativistic equations is made clear. Sufficient to say at this point, that a solid foundation has been established for theoretical physics based on known mathematical and geometric principles. I believe it meets all the criteria of a "new" theory in that it,
Incorporates proven theories
Contains experimental proofs
Explains hitherto unexplained phenomena.
Introduces something new.

Of greater importance is that it opens a vast new area of exploration that crosses all of existence, including that of life itself. A primary goal must be to establish that which is common to all disciplines. A definition and breakdown of gravity, anti-gravity and mass has been purposely ignored.

Walter Babin, Oct. 8, 2019

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