

NEGATIVE ENERGY ENTHALPIC EM GRAVITY “WARP” DRIVE (EM RESONANT CAVITY THRUSTER)

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Abstract: In taking up from the preliminary papers [1][2][3][4][5][6] regarding the golden ratio algorithm for time, more specifically paper 5 [5] regarding entropy and enthalpy, and paper 6 [6] regarding the golden ratio basis for the idea of relativity as time, the current understanding of “negative” energy is presented and revised, namely Dirac’s postulate for the Dirac sea, the feature of negative energy being the rise in kinetic energy in gravitational relative motion between objects under the influence of each other, speeding up. This issue is newly addressed with the application of the golden ratio and associated relativity of the motions of mass under the influence of gravity. To achieve this, the ideas of entropy and enthalpy as presented in paper 5 of this series of papers are brought to attention; the idea of $-\frac{1}{\varphi}$ is introduced as the “negative” energy counterpart as gravity compared to the standard electromagnetic φ of the calculated passage of time in an entropic context. An experiment for gravity emerging from electrodynamics is forwarded with this theoretical addition regarding gravity as negative energy, detailed in the context of an enthalpic mechanism, thus shedding new and important light on current “RF Resonant Cavity Thruster (EM-drive)” research.

Keywords: time; space; golden ratio; theta; universe; gravity; quantum gravity; electromagnetism; Fibonacci sequence; wave-function; relativity; entropy; enthalpy; Dirac; Dirac sea; antiparticle; positron; anti-matter; fractal; conservation of energy; conservation of momentum; EM-drive; cavity thruster; microwave; RF; warp drive; resonant cavity

1. INTRODUCTION

Science is essentially "two paradigms"; the first is data, the second is theory as data explaining data. Understandably science moves forward with data and associated theory supporting that data, theory that can point to if not predict new data (which is essentially a gold standard for a theory's success). The Achilles heel of science though is holding on to theories that could be explained much more simply; not data, "theories" that made data relating with data inefficient. As we develop as a species, data explaining data ideally becomes a more "efficient" construct, as demonstrated with our development of technology. The same should also be true with theory, data explaining data. The greatest problem science faces is learning how to make that "more efficient step" for data explaining data, casting away inefficient theories, in favour of new more "efficient" theories, of data explaining data.

The previous 6 key papers [1][2][3][4][5][6] introduced a theory for the golden ratio as time as a more efficient way of tackling the idea of a quantum wave-function, replacing complicated mathematical inertial transformation matrices. Further to this, the idea of relativity was explained more efficiently using the idea of the relativity of time, not space, "time" being the definitive a-priori, not space, in the analysis of relativity. The previous 6 key papers though have still failed to address the fundamental nature of gravity as the curvature of space-time and gravity's link as an emergent feature of the atom to the nature of a fundamental golden ratio variable, and in this case gravity as $(-\frac{1}{\varphi})^2$ feature of electromagnetism, and how this relates to the behaviour of electromagnetism on the emergent level, electromagnetism as the value of φ . Here in this paper, the previous work on this subject of time as the golden ratio shall be given a final refurbishment outlining the precise link between the emergent features of electromagnetism and gravity as φ and $(-\frac{1}{\varphi})^2$ respectively.

The common theme throughout the preceding 6 papers has been presenting a case for a new "algorithm" for time; this algorithm for time was detailed in paper 1 [1], providing utility to the equations for gravity and electromagnetism (which were then followed up in paper 4 [4]). The question in presenting a paper that re-defines time (and thus a paper that must then must account for all the concepts of physics theory) is "where to start and how to develop that explanation, and in what priority of ideas?". So, in paper 1 [1], the equations for gravity and electromagnetism were introduced, together with the Rydberg equation (electron shell modelling), to account for how time would dynamically exist in an atomic structure. Paper 2 [2] then presented a wave-function to account for this dynamic. Paper 3 [3] then presented the ideas of Brownian motion, a cornerstone idea for Einstein's preliminary work. Paper 4 [4] presented a closer look at the elementary particle dynamics regarding the newly proposed wave-function, and how this scales-up in a virtual Fibonacci-style extra-atomic manner, presenting the idea of Avogadro's number. Paper 5 [5] then presented the idea of time as "energy", and how this relates to the CMB radiation through the virtual Fibonacci-style stepping up process of a basic atomic structure *as a process of time*, linking key observed measurements together, providing a glimpse to the overall energy manifold dynamic of time and space as entropy and enthalpy. Finally, paper 6 [6] addressed the idea of the "relativity" of time, expanding upon the energy dynamic of the cosmos, coupling in the idea of the red-shift and CMB radiation, and the "end-zone" region of time-space to give an account of the most logical "image" of reality from within that overall time-space manifold using this new definition for time. Ideas of time and distance were then married up with known observed values of the universe. Consider figures 1 and 2 to summarize that process.

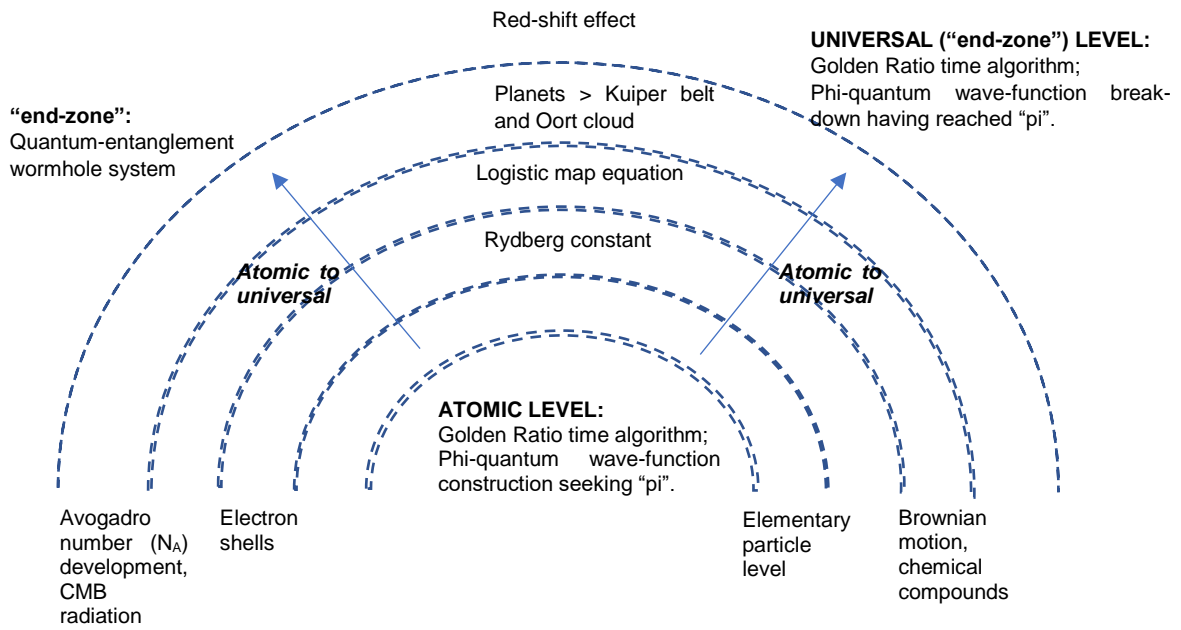


Figure 1: Diagram of the general flow of procedures that time as per the phi-quantum wave-function must undertake to fulfil all its requirements of a-priori definition as the golden-ratio time algorithm.

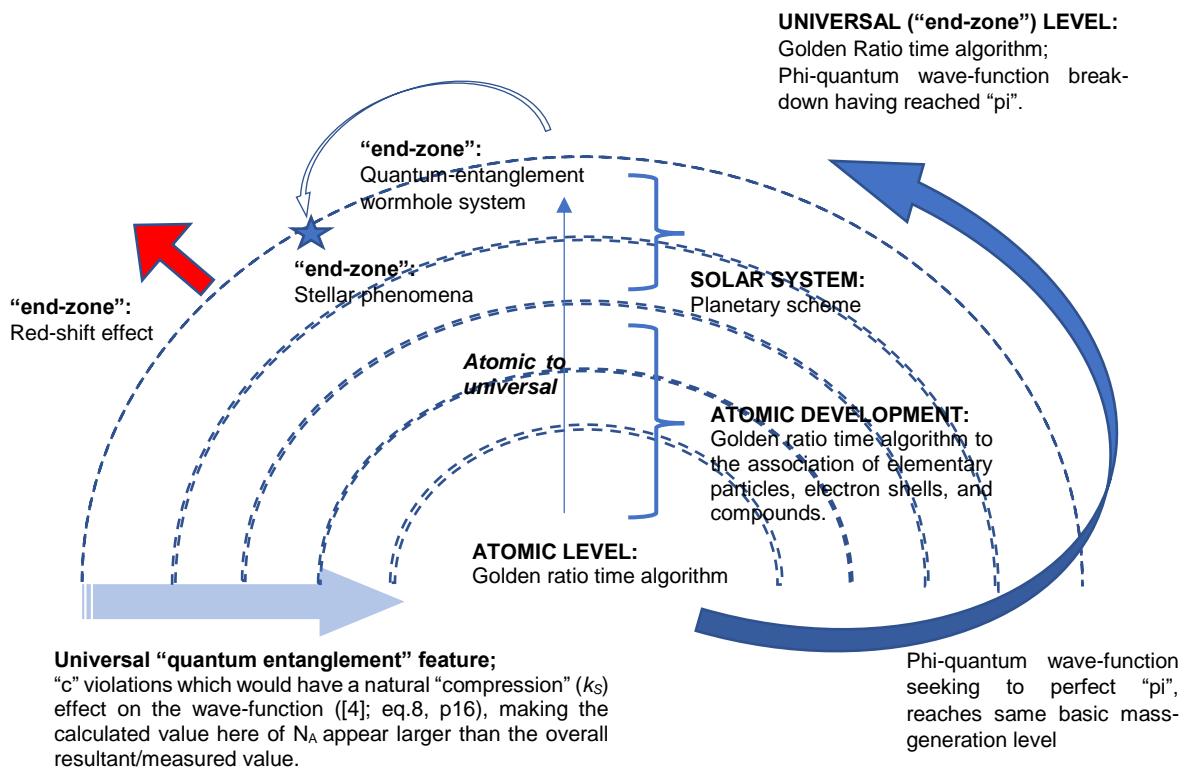


Figure 2: A more detailed diagram of the general flow of procedures that time as per the phi-quantum wave-function must undertake to fulfil all its requirements of a-priori definition as the golden-ratio time algorithm, forming an ultimate feedback loop, paying closer attention to the cosmological features at the "end-zone", and how this gives rise to a universal "quantum entanglement" feature that would echo through the entire time-space scheme, as much as the atomic level was scaled up via a process of fractal gauge invariance.

It could be argued that it should have been wiser to present the idea of the “relativity of time” earlier in the paper, yet the problem encountered there was explaining the reference of the observer, and thus to do that a general idea of “subject” and “object, together with the ideas of “cause” and “effect”, had to be explained. To do that, in a complete theory, the idea of consciousness somehow had to be introduced, which as a concept has a very profound meaning. Thus, the course that was taken through the papers was chosen for that reason, namely to introduce the idea of consciousness emerging from time-space, after which a more complete detail of the time-space platform of reality was explained (papers 4 [4] and 5 [5]), to allow for the idea of the “relativity” of time with this new definition of time to be explained upon (in regard to) in paper 6 [6]. In short, it was a difficult task to set the priority of ideas as a descriptive transcript/flow of ideas, yet intentionally designed as such.

The process of describing a new definition for time has also evented in the need to coin a few new “terms and phrases”. One of the most basic new terms coined has been “time-space”, and not “space-time”. The reason for this is simple, namely giving priority to “time” and not “space” as a definitive construct; the standard for a theory of everything is to begin with a fundamental time-space construct and then “derive” all the basic features of time-space, not rely on research and observation, other than setting key fundamental values which then marry up with all other equations. Other new terms and associated ideas include the following (table 1):

• <u>Time-algorithm (golden-ratio)</u>	< replaces one-dimensional time >
• <u>0-scalar space</u>	< in alliance with a Cartesian coordinate system, yet derived from time >
• <u>Phi-quantum wave-function</u>	< replaced standard Schrodinger wave-function >
• <u>crystal matrix</u>	< “elementary particle” logistic platform in context of new wave-function >
• <u>“relativity of time”</u>	< new term; hasn’t been used before in this manner >
• <u>Object-subject, cause-effect</u>	< new descriptors for the relativity of time >
• <u>“end-zone”</u>	< new descriptor highlighting mechanism of red-shift effect > “end-zone”,
• <u>Quantum-entanglement wormholes</u>	< process of an “end-zone” for time-space >

Table 1: Key new terms and phrases in alliance with the new algorithm for time. The idea here of the new algorithm for time achieves what a standard “string” theory for “space” has tried to achieve, namely linking all known equations and constants in their appropriate context of observed data.

Let’s move forward though with the theory so far presented, in further discussing the idea of entropy and more importantly enthalpy and how this is associated to the idea of negative energy and gravity.

2. ENTROPIC AND ENTHALPIC ATOMIC MANIFOLDS

The general entropic φ and enthalpic $(-\frac{1}{\varphi})^2$ manifold of emergent electromagnetic and gravitational energy respectively was outlined in paper 5 [5], with greater emphasis there in that paper on emergent electromagnetism and its relationship to the CMBR. Now we need to explain the other emergent feature of the atom, namely gravity, which as the enthalpic realm, as $(-\frac{1}{\varphi})^2$, would be a form of energy storage, and not energy release. As this paper shall highlight, this enthalpic realm would represent the overall “shape” of space, in the general play of mass. The idea conveyed in paper 5 [5] regarding entropy and enthalpy was outlined in figure X paper Y, here as figure 3:

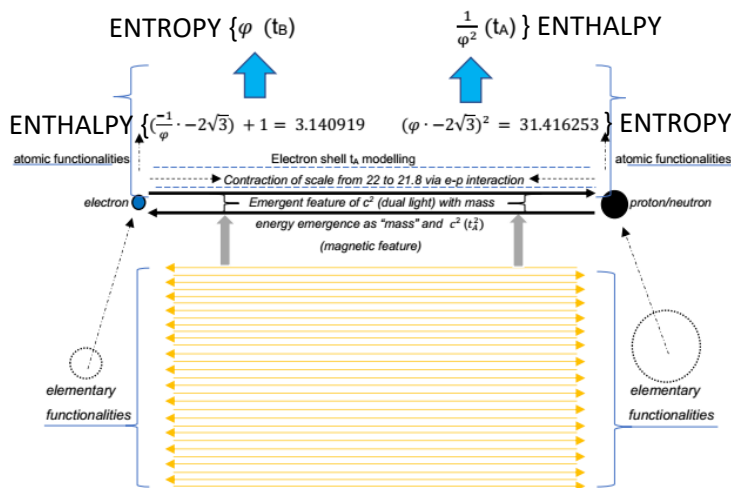


Figure 3: The atomic entropic/enthalpic event.

As per paper 5 [5], the formation of the phi-quantum wave-function for the atom on the elementary particle level is more or less enthalpic as it undergoes a “contractive” state. See also ([2]; eq.8, p12), ([2]; fig.16, p16), and ([4]; p3-4). Beyond this is emergent entropic electromagnetic radiation. Conversely, the formation of matter itself on the elementary particle level is “entropic”, yet it’s emergence as “gravity” is considered to be “enthalpic”. The reason gravity would be enthalpic owes itself to the idea Dirac [7] highlighted regarding the speeding up of two bodies in the context of gravity, and how this speeding up being enthalpic would need to be accommodated by gravity being enthalpic to a certain degree. The key idea in regard to the golden ratio theory for time being presented in this paper is that entropy would be represented by φ , and enthalpy would be represented by $-\frac{1}{\varphi}$, and in the case of the emergence of gravity as prescribed, as $(-\frac{1}{\varphi})^2$. Simply, φ would be a positive entropic process, making $-\frac{1}{\varphi}$ negative entropic process, and thus enthalpic. This enthalpy is associated to mass on the elementary particle level as “gravity”; the negative energy associated to mass as gravity is via “how” gravity is generated. Consider Table 2.

TABLE 2

<p>ENTROPY</p> <p>φ (\gg value of EM dependent with gravity)</p> <p>EM (charge)</p> <p>(-1) ↑</p>	<p>ENTHALPY</p> <p>$\frac{1}{\varphi^2}$ (\gg value of gravity dependent with EM)</p> <p>Gravity</p> <p>↑ (1)</p>
<p>EMERGENT FIELD LEVEL</p> <p>D C</p> <p>STEADY STATE</p> <p>A B</p>	
<p>ENTHALPY</p> <p>$\frac{-1}{\varphi}$ ($\gg \frac{-1}{\varphi} \sqrt{12}$)</p> <p>PQWF (photon)</p>	<p>ENTROPY</p> <p>φ^2 ($\gg 12\varphi^2$)</p> <p>Proton/neutron (mass)</p>
<p>ELEMENTARY PARTICLE LEVEL</p>	

Table 2. is a description classing the EM and gravitational field forces, mass, and the basic phi-quantum wave-function, according to their enthalpic and entropic classes, the idea being the basic phi-quantum wave-function is synonymous with gravity (a $-\frac{1}{\varphi}$ function), and mass is synonymous with electromagnetism (a φ function), EM associated to a φ function, and gravity associated to a $(-\frac{1}{\varphi})^2$ function. Note also mass factored with gravity is a value of 1 ($\varphi^2 \times (-\frac{1}{\varphi})^2$), and charge associated with EM a factor of -1 ($-\frac{1}{\varphi} \times \varphi$); this gives rise to an overall **added** value of 0, as a steady state energy system. Note that gravity is a folded (squared) phi-quantum wave-function, yet it seems to effect “through” the idea of mass, as much as electromagnetism is the carrier of a photon. To note also is that the “time” intrinsic to gravity (table 2; C) is same as the time intrinsic to the phi-quantum wave-function development (table 2; A). To note also is that the wave-function seeks to trace a circle, as therefore would gravity, hence the idea of the curvature of space regarding gravity as per this description of the golden ratio (Figure 4.)

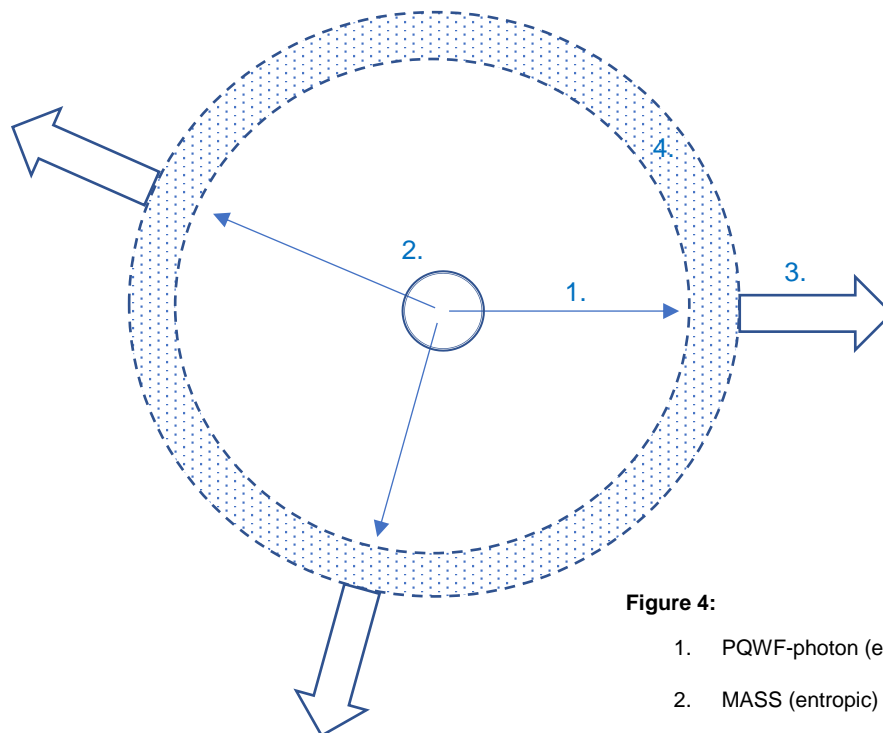


Figure 4:

1. PQWF-photon (enthalpic) $-\frac{1}{\varphi}$
2. MASS (entropic) φ
3. GRAVITY (enthalpic) $(-\frac{1}{\varphi})^2$
4. E/M (entropic) φ

To note here is the right-angle relationship between φ and $-\frac{1}{\varphi}$, as initially presented in paper 2 ([2]; fig.1-2., p4). The most important thing to note though is that a greater concentration of mass regarding φ unit time would represent a greater emergent “gravity” re $-\frac{1}{\varphi}$ time (as per table 2). This would be a direct relationship in taking into consideration the direct relationship between φ and $-\frac{1}{\varphi}$, and the gravity equation achieved in paper 1 ([1]; eq.12, p9). The other thing to note is that with a greater $-\frac{1}{\varphi}$ feature of time for the phi-quantum wavefunction (table 2; A) there would incur a far greater gravity effect (table 2; C), a “squared” factor. So, although greater mass could incur greater gravity directly, a greater folded phi-quantum wave-function would have a far greater effect for gravity. This should be demonstrable by way of an experiment. Prior this experimental proof though, what is the exact evidence of the idea of gravity being enthalpic?

3. NEGATIVE ENERGY

The idea we shall use here to explain the enthalpic nature of gravity is “negative energy”. Quite simply, if we can suggest that entropy is a positive release of energy, enthalpy would be a “negative” release of energy. First promoted by Dirac as per the “Dirac Sea” [8], negative energy is a concept used to explain the nature of certain fields, including the gravitational field and various quantum field effects.

3.1 *Gravitational energy*

The idea of negative energy associated to gravitational energy is simple: as the strength of the gravitational attraction between two objects represents the amount of gravitational energy [9] in the field which attracts them towards each other, when two objects are infinitely far apart the gravitational attraction and hence energy is close to zero. Yet when the two objects move towards each other, their motion accelerates by their mutual effect of gravity which causes an increase in the positive kinetic energy of the system. Yet, at the same time, the gravitational attraction (and thus energy) also increases in magnitude. The problem here is that the law of energy conservation [10] requires that the net energy of the system cannot change. Therefore, the change in gravitational energy must be negative to cancel out the positive change in kinetic energy. Paradoxically though, as the gravitational energy is *getting stronger*, this decrease can only mean that it is negative.

There are a few problems with this idea though in the absence of negative energy, namely that in a universe in which positive energy dominates everything will eventually collapse in a "big crunch", while in an "endless" universe where negative energy dominates everything will either expand indefinitely or cause a “big rip”. In a zero-energy universe [11] model ("flat" or "Euclidean", the model proposed here), the total amount of energy in the universe is exactly zero where the amount of positive energy in the form of matter is exactly cancelled out by its negative energy in the form of gravity. Regarding figure 1, the entire enthalpy/entropy scheme would be steady state (as per the results of this paper).

3.2 *Negative energy and anti-particles*

When the idea of negative energy is discussed, the idea of anti-particles cannot be ignored, as it is embedded in the current idea of negative energy. In regard to anti-particles, more specifically the positron, Dirac associated his Dirac sea full of negative energy with “anti-particles” as a theoretical model of the vacuum containing an infinite sea of particles with negative energy [12]. It was first postulated to explain the anomalous negative-energy quantum states predicted by the Dirac equation [13] for relativistic electrons. The positron [14], the antimatter [15] counterpart of the electron, was originally conceived of as a hole in the Dirac sea, well before its experimental discovery in 1932. This idea was revised; although quantum field theory replaced the idea of the Dirac sea owing to the notion of anti-particles representing “real” matter, the theory presented here more accurately presents the idea of the positron as an electron that has undergone a magnetic field “flip”, the case in point regarding the relationship here between positron and electron and negative energy is a new explanation for a relativistic electron that when becoming super-massive would undergo a magnetic flip according to the phi-quantum wave-function, as according to the theory here, an idea though previously unbeknown to contemporary physics theory. The question though with this theory, as per the phi-quantum wave-function, is why would there be a magnetic flip in the electron? The thinking is that electron in reaching relativistic speeds would undergo a magnetic flip according to the phi-quantum wave-function where the wavefunction would track back on itself as though mirroring the magnetic moment of the proton in taking on the signature of a massive particle at such a relativistic speed. It’s not a remarkable concept in this phi-

quantum wave-function golden ratio theory, just a part of a newly-defined process, yet a theoretical and research-based possibility to be examined in this paper. It was though a remarkable concept during the early stages of “negative energy” theory last century, albeit in the context of relativistic and quantum physics, which here in this paper has taken a different route owing to the new a-priori (golden ratio for time) put into effect. Note therefore, the “idea” of anti-particles will not be used here in the process of “negative energy gravity”.

4. QUANTUM GRAVITY

The idea of gravity emerging as a $(-\frac{1}{\phi})^2$ entity, a squaring of the phi-quantum wave-function idea, would on an emergent level present as an EM wave-function that in all appearance would be electromagnetically “silent”, as it is essentially an electromagnetic wave that has undergone destructive interference as a standing wave, a resonance on itself. Previous papers described the process as for example paper 4 ([4]; fig.2, p.5), here as figure.5.

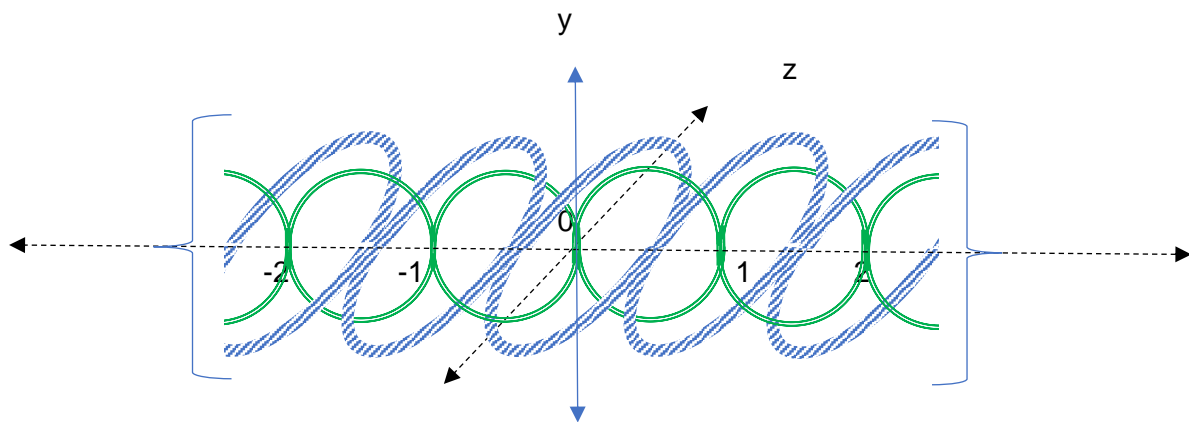


Figure 5: Green line electrical component (x-y), blue line magnetic component (x-z), both waves out of phase with each other and perpendicular to each other, folded-over/coupled. The values on the x-axis represent $\frac{1}{2}$ quantum length increments.

This serves as an example of the idea of an EM folded field orientation. Beyond just considering the folded EM field, this quantum-gravity wave-function construct (folded EM field) would be associated to mass, or more precisely, would be a “carrier” of the mass-effect of “gravity”, the elementary particle pre-cursor of gravity. The question now is how to demonstrate the feature of quantum-gravity in a laboratory and thus how we would create a folded EM gradient, tighter/stronger at one end, looser/weaker at another.

4.1 Stepping-up the scale of the Atom

The idea here is to mimic this process of the atom onto a larger scale than the atom, keeping everything in proportion (fractal topology, ([1]; p.19). The theory presented in the preceding 6 papers [1][2][3][4][5][6] highlights the feature of a “fractal” ([1]; p.19) atomic pattern per the golden ratio which suggests we could step up the atom to a basic research-based workable level, and so in doing this we could demonstrate the gravitational features of that stepped up atomic model. This “stepped-up” atom would be the first step in realizing how we can develop a gravitational propulsion system based upon an atomic fractal stepped-up basis. In remaining true therefore to the basic scaling of the atom, let’s say we replicate the atomic dimensions in mimicking a fractal stepped-up phi-quantum

wave-function as an “ideal” (between +ve and -ve phi-quantum wave-function ends) wave-function length and associated scaling as follows:

- To achieve the fractal stepping-up process, a key fundamental equation needs to be acknowledged, namely the fine structure constant equation for the atom, as follows:

$$\lambda = 2\pi \cdot \alpha \cdot a_0 \quad (1)$$

- Here, α is the fine structure constant of the atom (a value of $\sim 1/137$, symbolic of the strength of atomic electromagnetic coupling), λ the Compton wavelength (electromagnetic wavelength of a basic quanta regarding the proton (p) and electron (e) atomic construct), and a_0 the radius of the atom (as the distance that separates the proton (p) and electron (e)).
- When we step this equation up fractally to a workable level, not losing the scale of dimensions, the following equations become effective:

$$\lambda_f = \frac{\Omega_f}{21.8} \quad (2)$$

$$\Omega_f = 21.8 \cdot \lambda_f \quad (3)$$

- Here λ_f is the fractally stepped-up value of the wavelength of electrical current (alternating or pulsing) and the solenoid wind-length, and Ω_f the distance between a positive and negative charged plate/region.
- Thus, there would be ~ 21.8 winds of a solenoid, which is then wound back on itself with a wavelength of current that meets the description of the dimension of the wind-length (solenoid wavelength).
- Let us consider this equation (eq.3) as the “gravielectric field equation” which is considered to represent, in incorporating the fine structure constant (α), a universal equation applying to all scales of wavelength (λ_f) and distance (Ω_f) and thus not to the atom alone.
- Let us consider a device that utilises the gravielectric field equation a “gravielectric field generator”; for instance, a rod of 113cm length with 21.8 winds at 5.17cm length per wind would need a 5.17cm wavelength source, and thus a ~ 5.8 GHz source of current which a standard 5.8GHz microwave magnetron with launcher and coaxial cable (supplying the dual-wind solenoid and associated rod).

It can be granted that the “charges” of the electron and proton would be intrinsic to the phi-quantum wave-function delivery, precursory for EM, and thus a part of the “stepping-up” process. We must also consider that aiming to drive-up the gravity portion of any atomic fractal stepped-up electromechanical configuration would of course suggest the underlying feature of mass must emerge stepped-up as well, and here we must consider that as the gravity effect would increase (to be proven), so would the proton/neutron feature as well, and thus presumably the positive charge of this electromechanical apparatus. Thus, when we consider grading-up the gravity component of the electromechanical apparatus as per greater EM folding/resonance, the positive charge associated to that electromechanical component must also be enhanced. Owing to the difficulty in measuring electrical charge in the presence of a microwave field, the positive-charge and associated mass enhancement concept is to be reserved for a more developed technical specific paper central to plasma-containment, as in the presence of a high energy microwave field the addition of charged mass on an atomic level would involve the development of a “plasma”, and this requires a more detailed discussion, as the development of a plasma “does” interfere with the success of research that doesn’t predict plasma generation, obviously. Nonetheless, for the theoretical process here, we shall examine the basic possibilities the theory can present itself with and those related experiments. This turns us to the idea of creating a “graded” EM field.

4.2 Explaining the resonance EM field construct (using the analogy of solenoids)

The question now beckons, how do we create a microwave resonance field? There are two options, the first is in using wires as solenoids, the second using the EM field resonance in a cavity chamber. The problem with using wires directly is the energy loss, and thus field-signal integrity loss, at such a high frequency. The problem with a cavity chamber allowing a resonance is of course the problem of the resonance generation being largely hit and miss, especially without a specific guide of resonance designed into the cavity chamber aiming to foster a specific graded resonance. There could be several solutions to this problem, yet first let us investigate the use of electrical wire coils to act as an **analogy** to the EM field itself in a cavity chamber, as clearly using actual electrical coils would be unwarranted in this context of microwave EM owing to the energy loss and associated heat generation; here therefore, the idea of wire coils shall be presented as an EM framework for the ideal “folded” EM field.

As an analogical electromechanical configuration, we would run an electromagnetic field as a pulsing or alternating current (AC) through two solenoids out-of-phase to each other, most simply as one solenoid wound back on the other in an out-of-phase manner, an electromagnetic field (alternating current) of wavelength λ_f , by using a scale of assembly that abides by the gravielectric field equation (eq.3); the solenoids would be separated by a value of Ω_f , the wind-length of the solenoids of the order of λ_f , 21.8 winds in all, two circuits would be parallel to each other powered by the one source of current yet out of phase, the key point being that the solenoids would be represented in their proportional alignments of the gravielectric field equation (eq. 3). It would also be practical to suggest that these circuits would be wound around a tapered rod (5., fig.6.). In mimicking the phi-quantum wave-function, imagine for instance two electrical circuits, parallel, out of phase, to result in a standing wave (figure 6.).

ANALOGY 1

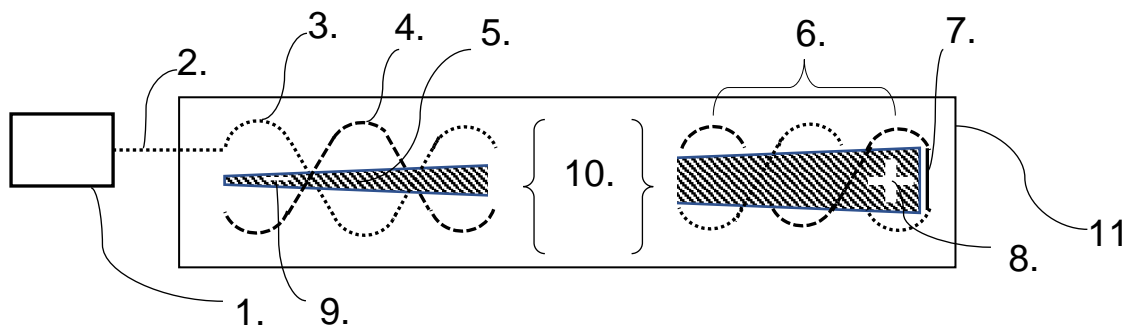


Figure 6: ANALOGY 1 Gravielectric field generator; AC/pulsing power supply for solenoids (1.), connecting coaxial lead (2.), one solenoid (3.), another solenoid (4.), solenoid core rod (5.), solenoid wind length (6.), wire joining solenoids at one end (7.), positive charge end (8.), negative charge end (9.), partial side view (horizontal) with centre cut-away (10.), aluminium tube cavity chamber (11.).

To note here is that the aluminum tube (11.); in allowing a resonance to be set up within the chamber (in the absence of the steel rod), the tube needs an inner diameter of at least the wavelength of the field, namely 51.7mm. The rod we're using tapers from 22.3mm to 10mm, which means we need a cavity that is at least 51.7mm + 22.3mm, thus 74mm inner diameter thick. Thus, we're using an aluminum tube of 74mm thick (inner diameter). In supplying this scheme with 5.8GHz we should expect to notice a propulsion of the mechanism towards the rod with the greater mass at one end, together with an enhanced positive charge at the nominated positive charge region (greater mass region). Why? The following would happen owing to the compression of the field between the thick end of the rod

and surrounding aluminum tube compared to the thin end of the rod and surrounding aluminum tube, as per figure 7.

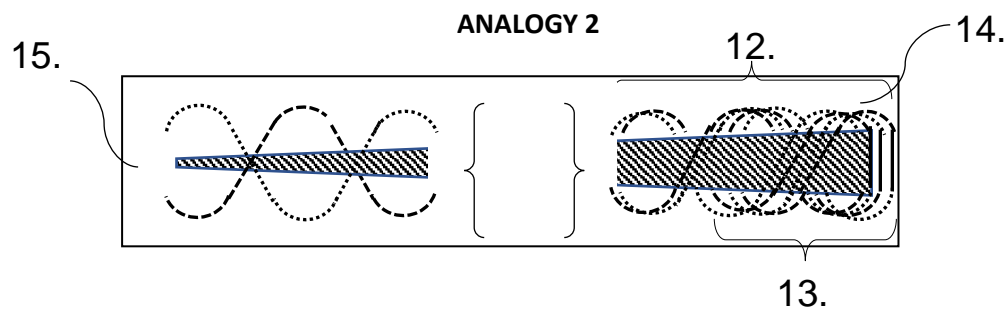


Figure 7: Gravielectric field generator (see previous related figure descriptors); extra pair of “analogous” solenoids (12.), extra two pairs of “analogous” solenoids (13.), optimal resonance distance/region $< 1/2$ an EM wavelength between rod and cavity wall $>$ (14.), non-optimal resonance distance/region (15.).

The idea here is that the precise distance/region between the thick end of the rod and the surrounding aluminum tube (as $\frac{1}{2}$ an EM wavelength) would give a higher strike rate of resonance than the distance/region between the small end of the rod and surrounding aluminum tube, as described regarding the designated inner diameter of the tube, diameter of inner rod and associated taper, and microwave wavelength supplied. Figure 8. highlights the anticipated thrust.

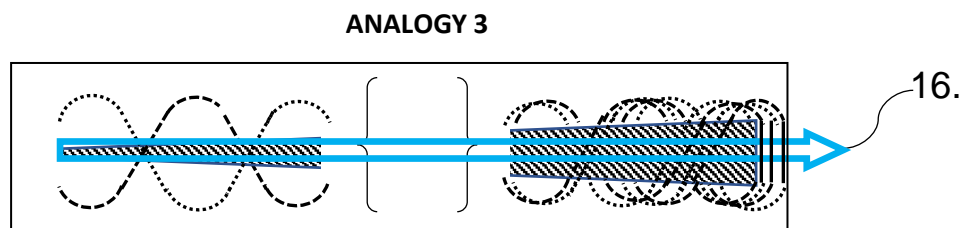


Figure 8: Gravielectric field generator (see previous related figure descriptors); direction of thrust of overall process(16.).

Note that this is a closed system and would appear to defy the law of conservation of energy [16]. Yet, the theory here holds that gravity is “enthalpic”, and thus that condition, the law of conservation of energy and thus momentum, which only works in an entropic reality, can be broken. In considering this new theory for entropy and enthalpy, the idea of breaking the law of conservation of energy and momentum “can” be proposed given that “time” intrinsic to gravity (table 2; C) is same as the time intrinsic to the phi-quantum wave-function (table 2; A), and that amplifying time would amplify gravity. Not only gravity would be amplified though, but the idea of mass/charge relevant to that gravity (the “proton” and thus it would seem the mass and the charge of the positive region, which would need to be demonstrated per experiment). Therefore, it follows that taking a “folded” phi-quantum “wave-gradient” and “applying” it to a “mass gradient” in an enclosed chamber that promotes a graded EM resonance should enhance the gravity-effect associated to that EM-mass gradient and thus produce thrust from the lower EM-mass (gravity) gradient to the greater EM-mass (gravity) gradient, together with enhancing the positive charge in the proton region. Note that positive charged mass, as an emergence, in the presence of a high energy (such as microwave) field would lead to the development of a “plasma”, as what would clearly be a confounding issue that would need to be accommodated for in “real” sustained testing/research of this design.

4.3 Proposing an experiment

In therefore going for the most efficient form of microwave field propagation and thus maximising efficiency, let us now use a pure cavity containing the graded rod with the RF field supplied by a free antenna inside the microwave chamber not in contact, the antenna not in contact, with the tapered metal rod; once again note that the thinking here is that the tapered rod itself as per its shape by design would act as a way to resonate the field against the surrounding aluminium chamber wall more cleanly at the greater mass-end of the tapered rod (figure 9.).

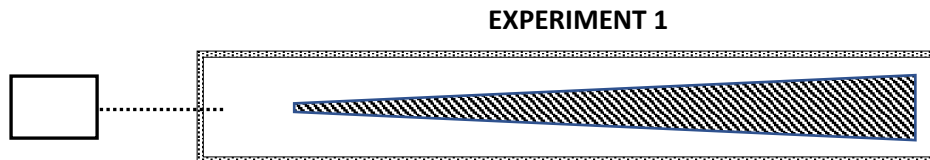


Figure 9: EXPERIMENT-1 Gravielectric field generator (see previous related figure descriptors).

Let us call this “Experiment-1”, as an “ideal” experiment. The idea here is not using any “analogous” wires in knowing how best to set up an EM gradient as a fractal stepping-up from the atom, namely that the field needs to be allowed to resonate in a tapered fashion and thus needing a certain tapered tube inner diameter, as described per the use of a tapered inner rod. The take home message regarding the microwave cavity chamber is that the folded EM field needs to resonate freely in the chamber, and when allowed to would produce thrust from a region of less EM folding to greater EM folding. This is a “specific” process that adheres to the fundamental elementary particle scaling of the phi-quantum wave-function atom as a “gradient” (lesser to greater) concentration of harmonic (folded-over, out of phase) EM field, a field that utilizes the enthalpic features of energy related to the force of gravity, and “thus” **can** violate the currently accepted laws of conservation of energy and momentum, nonetheless resulting in thrust in a contained system where there is no equal or opposite required reaction (jettison); the equal and opposite reaction is the effect of enthalpy itself when associated to entropy. Figure 10 highlights how this works, where the area of darker shading represents a greater concentration of folded/harmonic EM field, and the associated thrust is represented by the blue arrow.

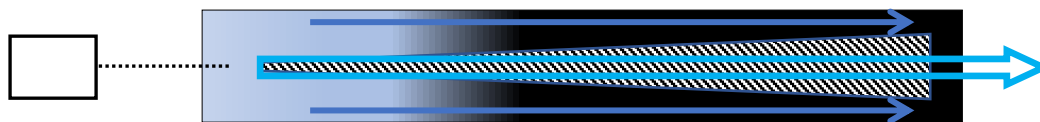


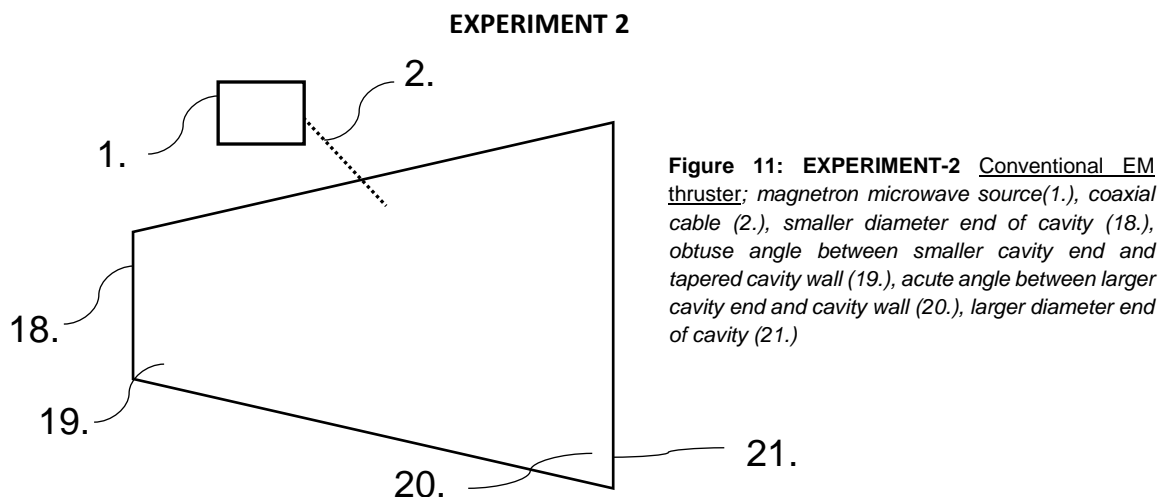
Figure 11: EXPERIMENT-1 Gravielectric field generator (see previous related figure descriptors).

A subsequent paper will explain in detail the type of antenna to use in this configuration, and how to properly place a mass object in the EM field (empty chamber) for the EM gradient to effect itself through, given the tapered rod would be merely reflecting the EM field in this configuration and not acting as an aerial or a mass yielding to a resonant EM field per-se. The following table (table 2.) nonetheless is an outline of the output gravity field to be expected, as per the golden ratio entropy-enthalpy axiomatic dynamic at play, granted an appropriate/ideal antenna and mass-gravity yield system is installed (to be detailed in a subsequent paper).

TABLE 2

<u>CAVITY MAGNETRON GENERATOR TESTING EQUATION:</u>		
<u>EXPERIMENT-1.</u>		
EMERGENT ENERGY SCALING:	EM (φ)	GRAVITY($-\frac{1}{\varphi}$) ²
VALUE:	1.616	0.38
PERCENTAGE COMPARISON:	~80%	~20%
RF POWER OUTPUT:	~400W	
EXPECTED LOSS	~90%	
EXPECTED FIELD OUTPUT	~40W	
φ ENERGY SCALED OUTPUT	~8W (20% of 20W)	
EXPECTED EM(+ve) RESULT:	NOT SAFE TO MEASURE IN THIS CONFIGURATION.	
POTENTIAL THRUST RESULT:	THRUST ACCORDING TO:	
	Power = $M \frac{d^2}{t^3}$	
	For a 5kg mass over a 1s RF field compression exposure:	
	$4 = 5 \frac{d^2}{1}$	
	<u>d = ~0.9 m over 1 second.</u>	
RESULT:	<u>TO BE RELEASED IN A NEW PAPER</u>	

This electromechanical process (Experiment-1 apparatus) is how a proper theoretically based acquisition of a graded resonant field would be achieved giving rise to the said gravity field, plasma, and associated enthalpic EM thrust. To note is that a byproduct of this testing in the chamber would be a plasma field, and not properly accommodating for that field will of course quickly overheat the electromechanical apparatus, and thus the obvious problem with Experiment-1 is how to generate a resonance field while holding a plasma. There is however another possible basic orientation that could work, not as ideal as Experiment-1., as per figure 11.



Here we follow the same principle, yet instead of using a structure that accommodates for the actual wavelength of the microwave field, one end of the tube to the other (per specific calculation of distances between one end of the rod and surrounding tube to the other end of the rod and surrounding tube), we're using the idea of "angles" to "disturb" an ideal resonance, an ideal resonance that in this configuration of the chamber would be largely hit and miss; as the angles of this chamber would represent a "disturbance" to an ideal resonance, there is "more disturbance" at the greater-diameter end of the cavity than the smaller end of the cavity, and thus less of an EM resonance field at the larger diameter end. Simply, we have an acute angle at one end of the chamber for the field to be disturbed from an ideal resonance, to bounce between (a lowest chance of resonance in this configuration owing to the greater area of angle), and an obtuse angle at the other end of the container/cavity (a not as low chance of resonance in this configuration owing to the less area of angle), simply because the region of greatest disturbance to an ideal resonance would be the larger region holding that unideal field reflection. Thus, the thrust anticipated here would be according to figure 12, from a region of greatest disturbance of an ideal EM resonance to a region of least disturbance of an ideal EM resonance (and even then, it's not that great).

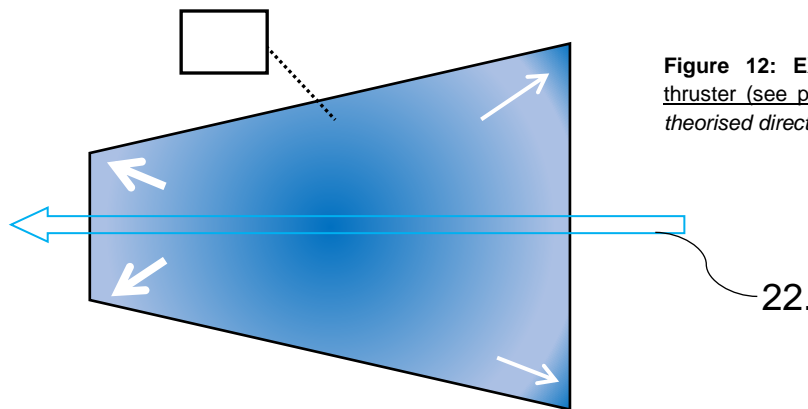


Figure 12: EXPERIMENT 2 Conventional EM thruster (see previous related figure descriptors).; theorised direction of thrust (22.).

The thrust here would not be as spectacular as Experiment-1; the electromechanical set-up would provide no-where near the same efficiency Experiment-1 would, as Experiment-1 accommodates for the actual wavelength of the microwave field, whereas Experiment-2 depends on the obtuse angle of the chamber to not be as disruptive as the acute-angle region in disturbing an idea EM resonance. Note though that a plasma would still form in this configuration, and thus overheat the system, despite a vacuum chamber being used or not.

The question now beckons, "does evidence exist beyond the theory here for EM warp/gravity drive?" It does, as per **EmDrive** research [17][18][19][20][21][22], heralded as a propellant-free drive which, much to the criticism of the scientific community, would have to violate both conservation of momentum and conservation of energy in order to work. Such devices and research allegedly produces thrust from an electromagnetic field inside a cavity, without ejecting mass, per a type of radiation differential of pressure in the chamber (the current explanation used). Several prototypes have been constructed and tested, including by **Eagleworks**, the Advanced Propulsion Physics Laboratory at NASA. As of 2017, a few tests of prototype drives were reported to produce a small apparent thrust [23] while other prototype tests did not report any thrust.

The great tragedy though with the aforementioned research (Experiment-2.) is that all such research plays with the idea of a simple microwave vacuum chamber relying on the need NOT to violate the conservation of momentum and energy protocols, which blindsides the research in not calibrating the chamber length and taper with the wavelength of the RF field, and thus not properly locating and resonating the RF field source in the chamber, and furthermore not considering the actual entire "enthalpic" feature to the process in play. Suffice to say, any such research that avoids considering the actual enthalpic processes for gravity would have a great blind-side on how the research would evolve as a technology, how it would be disputed, and furthermore how it would be ultimately put

down to other interfering ideas, ideas such that the chamber itself or associated coaxial cables [24][25] can be affected by the Earth's magnetic field.

Despite the "tentative" [24][25] criticism of EM thruster, the EM resonance in the cavity chamber would have a limit of energy input usefulness as per the design of the chamber's angles disturbing an ideal resonance (according to the theory behind the EM thruster presented in this paper). Furthermore, any good researcher who has used coaxial cables with microwave transmission would know that any coaxial cable used to carry a microwave field "has to be" well shielded to prevent field loss, a field that by proper and standard coaxial cable design is more than well shielded from Earth's magnetic field. As highlighted in the theory here, of particular note is that current research into EM thrusters, as per the Experiment-2 model, will have limited results owing to it depending mostly on the gradient of disturbance of EM field resonance, from the greatest disturbance of EM resonance (large end) to the least disturbance of EM resonance (small end); thus, only a small amount of thrust would still be apparent with a small energy input, if not unnoticeable "resonant" EM field, which of course a resonant EM field is. On top of all this, this theory holds that charged particles would be enhanced via the enthalpic process, and thus a "plasma" would form in the presence of the charged particles and high energy microwave field; the obvious result here would be "overheating", and thus of course it comes as not surprise that testing has been stated with this configuration (Experiment-2) not to have lasted more than a few dozen seconds (owing to the magnetron failing through overheating).

In terms of a more precise comparison between contemporary EM-drive research and the specifications offered here for a resonant chamber, the scaling/comparison between these notions is not in any way too dissimilar; given that gravity and electromagnetism are emergent features of this fundamental scaling system, the "emergent" feature of this scaling system can change, in dimension and number of folded wavelengths, in that any number of winds could be used and any type of winding-taper along a solenoid rod without adhering directly to the scaling system. Thus, although fractally stepping up the scale of the atom would provide an "ideal" result, of course any number of resonance wavelengths can be used, any gradient of standing EM waves, when applied to any type of graded rod. The idea here is the "emergent" feature of gravity and electromagnetism which would not need to adhere to the exact scaling of the elementary particle and phi-quantum wave-function scaling system, although adhering to the "exact" scaling would be an ideal result, especially in the context of seeking to induce an enhanced "positive" charge at the protonic-end (greater mass-end), which will need to be dealt with, accommodated for (namely, a plasma) in the event of any research, thus nonetheless making any research "very" difficult to perform in the absence of calibrating for this effect; a "vacuum" chamber simply won't avoid a plasma.

Essentially, as per the manner gravity and electromagnetism emerge from the atomic level and thus scaling system, gravity as a folded concept of electromagnetism would have an intrinsic folded "quantum" scaling "link" with EM. Therefore, different size resonant cavities could be used with varying shapes, provided of course it allows a basic resonance to be constructed. The take home message is that EM-thruster research will fail if all the features of gravity's emergence from a resonant EM field are not accommodated for.

4.4 *Taking gravity to a universal level.*

On a more universal theoretical level mass in emerging "gravity" would create a greater quantum-gravity wave-function sphere of influence closer to itself, creating a type of quantum-gravity wave-function gradient through time-space relevant to each location of mass (figure 13.).

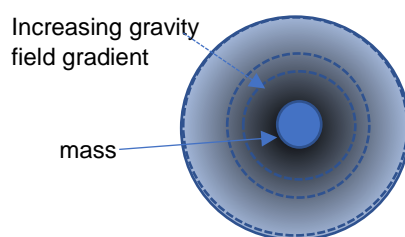


Figure 13: The gravity field closest to mass is higher, more bunched, tighter; a greater folded EM gradient.

There's more to this idea; "gravity" would represent a "warp" of space, or rather, space naturally is a warp of folded time as per the preliminary theory [1][2][3][4][5][6]. "Space" essentially is an emergence from the idea of time, and more precisely, space emerges from time, and folded time as space is a warp of space. The idea of space emerging from time was presented in paper 2 ([2]; p2-5), and here it is being confirmed. This might not seem to be a great revelation, however when considering the idea of time could be in quantum entanglement via the golden-ratio, the possibility exists for spatial "doorways" to exist between any two such places in time and thus space. The ultimate idea though is that gravity, like the phi-quantum wave-function, must seek to be a perfect wave-function circle; in "mass" not reaching that on the elementary particle level through mass-attraction, mass would abide (as a greater accumulated structure) by the greater/universal time-circle of time-space, as a greater celestial event of massive structures, "which" as a accumulative structure, would demonstrate the golden ratio fractal staircase of progression toward the ultimate "pi" time wheel of reality. Simply, a mass-based fractal pattern would develop to an infinite scale involving an infinite array of atoms and atomic relationships all working in unison to uphold a basic elementary particle time-space mechanism of quantum-gravity wave-function execution. In other words, small-scale mass would attract small-scale mass with the aim of reaching a singular quantum-gravity wave-function on the small scale, yet in not reaching this perfection small-scale mass would attract small-scale mass to form large scale mass as celestial bodies which would disperse to a greater revolution of universal time in search of that perfect circle of time.

5. TECH APPLICATIONS.

The obvious two key features from projected results are:

- (i) Gravity propulsion,
- (ii) Positive-charge and mass generation at the positive end of the gravielectric rod (which in the presence of a microwave field would develop into a "**plasma**").

In combining (i) and (ii) we could only suppose the following:

- (iii) Charge/electrostatic/mass projection (e.g., high-energy gravity projection of charge).

So, on the surface, emergent technologies would include gravity-propulsion and new "battery" systems (mechanisms containing the enhanced (enthalpic generated) positive charge). Yet the underlying process to these two obvious results, namely gradient EM folding, offer other applications, namely:

- (iv) "mass" generation (associated to the positive charge generation),
 - a. Mass "fusion",
 - i. Fusion energy applications
 - ii. Mass "welding".
 - b. "Exotic" atomic nuclei development
- (v) EM "cloaking" (as per EM destructive interference),

- (vi) Mechanical “strengthening and shielding” (as a way of fortifying mechanical structures with the emergent gravity field).

These six key applications could range from the level of the atom through to chemical compounds, whether biological or mineral, to our macro-world. These effects could be central to the Gravielectric Field generator or be applied to an external apparatus, depending on how the folded gradient EM field would be used. These applications would therefore provide for a wide variety of industrial applications ranging primarily from aerospace (propulsion mechanism) to energy generation (including fusion reactors) to construction (welding and strengthening materials, and “cloaking”); generally, any application that would be keen to facilitate this emergent gravity field, ranging from the atomic elements through chemical compounds to the gross macro-scale.

It should be noted that the gradient folded EM field, a “warping” of space, is clearly a biologically hazardous field, as not only does it represent a warp of space, yet everything in that space, and should thus be treated with the greatest caution. The idea of creating an artificial gravity field for a craft in zero gravity should not be considered as safe as it would be convenient, as the signature of that EM field would be susceptible to the signature of the “entire space” and thus craft related to its generation. Gravity-plating for the floor of a craft in zero-gravity conditions for instance would be safe if the warp field is contained in the floor, yet travelling at a type of “warp” field of rate with all the occupants “in” that context would need proper attention to the potential biological effects of that warp field. At any rate, research would need to be performed with the utmost care so as not to expose anyone “directly” to the field unless intended.

6. CONCLUSION

The key concluding points of this paper are as follows:

- Is gravity associated to “negative energy”? Yes, yet the question is regarding the integrity of anti-particles.
- Is negative energy directly associated to antiparticles like the positron? No, in fact the idea of antiparticles and the positron are being disputed, as they fall into a pseudo category of particles compartmented to the new description of class of particles via the newly termed phi-quantum wave-function.
- What is the underlying principle in play regarding negative energy? If mass is φ^2 , as standard positive energy (entropy), as inertia, there is an amount of $(-\frac{1}{\varphi})^2$ energy associated to this that is accounted for by gravity as enthalpy.
- Can any type of folded electromagnetic field generate a gravity-effect? Yes, it should, as per an emergent gravity field, the length being purely arbitrary, although further testing is required to determine the nature of the utility of the gravielectric field equation and its relevance to “positive charge generation” in a tapered resonant EM field; the issue is creating a folded EM field gradient relevant to creating a gravitational field gradient that is stronger on one end of a mass-construct-rod compared to another, thus creating a general gravitational direction through the rod via this mechanism.
- Is this non-enthalpic cavity microwave propulsion? No, this is enthalpic.

It cannot be stressed enough that “only” physical data that is trusted from tried and tested research has been applied to this new a-priori for time (and space) in all the papers leading to this one, to “better join” known tried and tested equations for mass, energy, gravity, electromagnetism, including known scales of weights and measures thereof. Table 3 lists the tried and tested data and their corresponding values to the new algorithm for time. Note that the only feature that links all the relevant equations is the new algorithm for time and associated phi-quantum wave-function. Note, the fundamental derived constant is the fine structure constant; when values of mass and charge and

the radial dimension of the atom are applied to this theorized value of the fine structure constant, all other values fall into place applicable to gravity and electromagnetism and the associated wave-function for light, from which the strong ([4], p.7-8) and weak ([4]; p.10) nuclear forces become apparent and can be explained accordingly in this new context.

TABLE 3

<ul style="list-style-type: none"> • <u>THE FUNDAMENTAL DERIVED CONSTANT IS FOR THE PHI-QUANTUM WAVE-FUNCTION:</u> <ul style="list-style-type: none"> ○ 21.8 phi-quantum wave-function units between the theorized electron and proton. ○ When this value is applied to the idea of a basic wavelength of an atom, the following is achieved: <ul style="list-style-type: none"> ▪ $\lambda = \frac{a^0}{22}$, then $\frac{\lambda}{2\pi} = \frac{a^0}{2\pi \cdot 21.8} = \frac{a^0}{137}$ • <u>WHEN VALUES OF MASS AND CHARGE AND THE RADIAL DIMENSION OF THE ATOM ARE APPLIED TO THIS THEORIZED VALUE OF THE FINE STRUCTURE CONSTANT, ALL OTHER VALUES CAN BE DERIVED USING THE PHI-QUANTUM WAVE-FUNCTION, INCLUDING THE FOLLOWING:</u> <ul style="list-style-type: none"> ○ $\frac{19.8 \cdot \lambda}{e_c} = \frac{19.8 \cdot 2.426 \cdot 10^{-12}}{1.60218 \cdot 10^{-19}} = 2.998 \cdot 10^8 \text{ ms}^{-1}$ ○ $e_c = \frac{19.8 \cdot \lambda}{c}$ • <u>USING THE TIME ALGORITHM RESULTS IN THE BASIC EQUATION FOR ELECTROSTATIC FORCE:</u> <ul style="list-style-type: none"> ○ $Q_{AB<NEWTONS>} = \frac{Q_C c^2 Q_A Q_B}{d_{AB} d_{BA}} (C^3 t^{-2})$ whereby $Q_C c^2 = k_e$ ○ Thus, $Q_C = \frac{3 \cdot 2 e_c}{4\lambda}$, then $k_e = \frac{3 \cdot 2 e_c}{4\lambda} \cdot c^2 = \frac{6 \cdot 1.6 \cdot 10^{-19} \cdot (3 \cdot 10^8)^2}{4 \cdot 2.426 \cdot 10^{-12}} = 8.9 \cdot 10^9 \text{ Cms}^{-2}$ • <u>USING THE TIME ALGORITHM RESULTS IN THE BASIC EQUATION FOR GRAVITATIONAL FORCE:</u> <ul style="list-style-type: none"> ○ $G_{AB<NEWTONS>} = \frac{M_C M_A M_B}{t_{AB} t_{BA}} (kg^3 t^{-2})$, then $G_{AB<NEWTONS>} = \frac{M_A c^2 M_A M_B}{d^2} (kg^3 t^{-2})$ ○ Thus, $M_C = \left(\frac{2}{3}\right)^2 \cdot M_p$, then $M_C = 3.33 \cdot 10^{-27} \cdot \frac{2}{3^2} \cong 7.4 \cdot 10^{-28} (kg)$, then $M_C c^2 = 7.4 \cdot 10^{-28} \cdot (2.99 \cdot 10^8)^2 \cong 6.67 \cdot 10^{-11} = G (kgd^2 t^{-2})$ • <u>USING THE TIME ALGORITHM ALSO GIVES RISE TO THE RYDBERG FORMULA FOR THE TIME-STATUS OF THE ELECTRON:</u> <ul style="list-style-type: none"> ○ $\frac{1}{\lambda} = Z^2 \cdot \frac{1}{\left(\frac{1}{n_1^2}\right) - \left(\frac{1}{n_2^2}\right)} \cdot \frac{\lambda_e}{2(2\pi a_0)^2} = R_\infty Z^2 \cdot \frac{1}{\left(\frac{1}{n_1^2}\right) - \left(\frac{1}{n_2^2}\right)}$ • <u>A NEW WAVE-FUNCTION FOR LIGHT TERMED THE "PHI-QUANTUM WAVE-FUNCTION" EXPLAINS THE EMERGENCE OF GRAVITY FROM ELECTRODYNAMICS ON THIS LEVEL, TOGETHER WITH DETAILING THE STRONG (section 4.3) AND WEAK (section 4.5) NUCLEAR FORCES AND THE EXISTENCE OF THE ELEMENTARY PARTICLES AND THEIR BASIC INTERACTIONS (SPIN etc.).</u> • <u>VIA FURTHER THEORY IN USING THE "PI-ERROR GRADIENT" REGARDING THE PHI-QUANTUM WAVE-FUNCTION, AN APPROXIMATE VALUE FOR THE AVOGADRO NUMBER IS DERIVED (0.8% error):</u> <ul style="list-style-type: none"> ○ $\frac{\pi \text{ error gradient}}{\text{mass of neutron}} = \frac{1.017 \cdot 10^{-3}}{1.675 \cdot 10^{-27}} = 6.072 \cdot 10^{23}$ ○ Thus, $\frac{6.072 \cdot 10^{23} \cdot \text{mass of neutron}}{\pi \text{ error gradient}} = 1 \text{ unit of mass}$, as $\frac{6.022 \cdot 10^{23} \cdot \text{mass of neutron} \cdot k_s}{\pi \text{ error gradient}} = 1 \text{ unit of mass}$ • <u>WHEN APPLIED TO THE TIME-FUNCTION WE ARRIVE AT A VALUE FOR THE CMB RADIATION EFFECT:</u> <ul style="list-style-type: none"> ○ $\frac{t_A}{21.8} = \frac{1}{N_A}$, thus $t_B = \sqrt{\frac{21.8}{N_A}}$, thus $\sqrt{\frac{21.8}{6.072 \cdot 10^{23}}}$ which equates to $5.99 \cdot 10^{-12} \text{ s}$; as a value of s^{-1} we have a value of $1.67 \cdot 10^{11} \text{ s}^{-1}$, or as we know 167 GHz
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Table 5: The key equations linking "known values" to the "phi-quantum wave-function values". The theorized values for the CMB and Avogadro's number would appear to be slightly out compared to observed measurements, yet this minor discrepancy is considered to be a result of a type of system tolerance which harbors a natural amount of error in order to satisfy the prime directive of "time" seeking to define "pi", together with the natural occurrence of "c" violations throughout the entire universal manifold of time-space (owing to the "end-zone" universal quantum-entanglement effect, which would have a natural stretching (approaching infinity) effect on the wave-function, increasing the value of the pi-error gradient ([4]; eq.3, p16), in effect making the calculated value of N_A here under what it is observed to be.

It could be argued that if the golden ratio features so clearly in the process of time, why isn't there obvious evidence for it in physics? The issue with the golden ratio as an algorithm is that it, the golden ratio for time, is an "embedded" algorithm. In fact, it would, as a process of the here and now, time as t_N , be almost "imperceptible". Only in cases where the conditions are right and present overlapping/resonant features of time from time-before to time-after "as" those growth patterns of time cast in space, as a footprint, would a golden ratio progression/growth-pattern in time be appreciated. Further to this, the nature of time using the golden ratio presents the case of time as a "singularity", t_N , around which we have t_B and t_A interplaying in the manner prescribed, namely $t_A = t_B^2$, forward (time before to time-after) as the general process of "time" in reality, and backward (time-after to time-before) as the concept of consciousness; features of the golden ratio are embedded in that process, not apparent whatsoever unless viewed as a "complete" structure, whether atomic substructure or universal super-structure, or perhaps in rare cases as a feature of geometrical progression and/or resonance (as seen in crustaceans with geometrical growth progression and flowers with geometrical resonance). When a new phenomenon comes along through research such as what is presented by the EM-thruster research (Experiment-2), and that such a new phenomenon seemingly defies basic laws of contemporary physics (conservation of energy and momentum), and yet an unrelated new theory can "theorize" the EM-thruster phenomenon in the context of an "enthalpic" mechanism, that new theory should be considered as a relevant contender to explaining the phenomenon; ignoring the basic features of a new theory for time using the golden ratio and the results gained thereof, results that modern theory cannot predict with its own theory, will lead to fallacious and wasteful research ventures.

Conflicts of Interest

The author declares no conflicts of interest; this has been an entirely self-funded independent project.

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