

Dimensional Thermodynamics

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Abstract: The idea of energy carried through space, space as a vacuum, energy presumably in its most basic form through space as a quantum package, is one of the greatest issues in modern physics, namely how can energy as a quantum package be relayed through the vacuum of space without “being” somehow associated to space, without seeming to lose energy in its travel through space, and likewise how can gravity as a field force be related to mass (and therefore energy) through that same vacuum of space and be relayed through space as that field force, a field force that seems to “offer” energy to the mass in that field, and thus have gravity represent, in regard to “0” space, a type of “negative” energy field? Indeed, the idea of the thermodynamics as a type of transposition of energy in space should not be taken lightly. This paper explains the nature of thermodynamics as the result of the relationship between the dimensions of time and space, a specific relationship between a just as specific definition for time and space, explaining all the key concepts of thermodynamics, essentially replacing the idea of the Big Bang and associated metric expansion of space, together with the ideas of dark matter and dark energy. As it shall be demonstrated, although there is a general precedent of indeterminacy in play, there is nonetheless a dimensional enthalpic mechanical order between time and space that acts in alliance with the general indeterminacy carried by time’s flow as entropy.

Keywords: dimension; time; golden ratio; space; energy; spacetime; time-space; entropy; enthalpy; thermodynamics; momentum; big bang; dark matter; dark energy; black hole; cosmology; Bose-Einstein condensate; accretion disk; time-space groove; time-space burst

1. Introduction

Contemporary physics has developed to the level where, with all relevant data analysed and processed into theory, the *transposition (dynamic)* of *energy (thermo)* in space and time as a *dimensional thermodynamics* is considered to originate from the beginning of the “big bang” event to this day, the big bang event (the Λ CDM model) as the a-priori of all cosmic theoretical modelling. Such carries a great list of fundamental “*initial condition*” precepts, including most basically a start date of time, the presumption of how time thence operates in a linear fashion from a start date of time, and how time thence from that start date operates in accordance with a process of energy as “entropy”, as increasing randomness, as a process of that great initial and yet continuing (lambda) expansion event, a continual event as time’s arrow in the form of entropic energy. Through all the data that has been collected in physics, the central key issue is space as vacuum as the a-priori, the fundamental platform through which energy, indeed all manifestations of energy in reality, is transferred from the start date “big bang” event to the very shock front wave of the big bang event itself (as the furthest reaches of space) requiring according to quantum mechanics, specifically $E = hf$, a magnitude of energy that is 10^{122} higher than what is observed in space as a thermodynamic requirement. Nonetheless, upon such a modelling based on all the data the challenge still remains of finding the link between mass (and more implicitly “energy”) and gravity, gravity as a particular change of energy transfer in that empty space, of mass becoming more kinetic under the influence of gravity. On top of this, such a task requires the use of an initial “beginning” start date of time and thence energy, and of course how energy implicit to mass can be “separate” to the force field of gravity itself if indeed different masses of different values are influenced the *same way* by any nominated gravity field, regardless of the size of their mass.

These key problems were presented in the previous paper “*Dimensional Mechanics of Time and Space*” [21], with the solution offered central to a re-defining of the dimensions of time and space, the theme of **ALL** the papers [1]-[21], giving **time** the priority of definition central to the human perception ability of temporal perception, with an appropriate and significant theoretical result in accounting for **ALL** observed cosmological discrepancies ([21]: p23-24). Yet such is not enough, not sufficient, to present a theory that accounts for a proposed mechanics between the dimensions of time and space explaining the processes of thermodynamics and gravity thereof by virtue of those inter-dimensional time-space mechanics. The question that needs to be asked is, “why has the interplay, the dimensional mechanics, between time and space been overlooked”? What makes this idea of “**dimensional mechanics**” significant is not merely owing to the fact that it has not been proposed before, yet that primarily (of most importance) the inter-relationship between the dimensions of time and space **CAN** have specific “phenomena” that physics has held accountable to other facets of physics theory. The closest interplay of time and space has been according to Albert Einstein’s theory of general relativity where “gravity” is considered as a curvature of the 4-dimensional spacetime (3-d space 1-d time). Yet such an attempt of defining space and time, space and time as *one*, has still failed to properly define what space is and why space is defined as such in regard to the idea of “time”. What Einstein had trouble with was mixing the idea of time with perception **without** being **exactly specific** regarding the precise nature of time and

perception, together with using the idea of "momentum", a Newtonian concept, to describe mass and light while trying to describe something far more fundamental as a scale than the simple idea of momentum itself, which in itself is a paradox, and a counter-intuitive one, for who would use a car to measure an engine? Simply, momentum depends on mass and velocity, yet if mass has a substructure like an engine is a substructure of a car, then momentum simply won't do as a way to define one's understanding of gravity, something even quantum physics understands requires an approach to a scale far below the scale of mass itself to describe gravity.

The issue still remains of whether any such a new approach to the re-definition of the dimensions (as the one being presented as the time-algorithm) is necessary given the potentially highly disruptive nature it presents to physics. Yet what could be more disruptive to true physics than illegitimate wording and definitions thereof for the dimensions of time and space? Consequent to this ongoing descriptive failure are a variety of continual paths toward to an equally continual variety of structures of theory and design that capitalise on the loopholes of theory and design of time and space relevant to each part of physics theory that has failed to properly describe the dimensions of time and space, for physics to only further pursue new ideas and explanations that seek to reduce competitor theories down to size based on those theories also failing to properly address with the appropriate robust wording the very nature of the platform it is that theirs and other physics theories are standing upon, namely the dimensions of time and space. To better present this case as already outlined in paper 21 [21] central to its preceding papers [1]-[20] the following will be presented in a new method of examination and associated argument detailing the following process:

- i. What is the quest of physics?
- ii. What are the problems with that quest?
- iii. What is the solution to that quest?

Through this process of examination and argument, it will become apparent that there are two key issues in physics theory:

- (a) The amount of energy required to make the current Big Bang model (Λ CDM) work.
- (b) The need to properly explain the association between mass (and thence energy) and gravity.

As it shall be demonstrated, the key underlying issue in physics is central to properly explaining the transposition of energy in space through time. Although physics defines this as the study of *Thermodynamics*, here the nature of energy in relation to the dimensions of time and space shall be more closely examined as *the transposition of energy through space*. The proposed key solution is to give that process, albeit one of mathematical uncertainty, namely the transposition of energy through space, a **priority** of definition **AS** a mathematical structure itself, **AS** a mathematical definition for the structure itself, and as the case here presents, for **time**, **AS** *the transposition of energy through space*. The proposal here in this paper is that the solution to the current problems in physics that appear unresolvable **CAN** be resolved by tackling those problems head-on with a definition central to the dimension of "time" in regard

to energy, or more precisely, the transposition of energy through space. The reasoning for such an approach to finding a solution is that in eliminating the blame upon poor testing equipment or not being sufficiently technologically evolved, let alone educated, one can only look at the most basic of basics, that being time and space and the human ability itself of perception, of rationalising time and space, and then modelling physics from such basics, that quite simply one needs to forget about the hope of having access to an electron collider for instance, despite their utility, yet actually guide what one has in the form of a theory that doesn't depend on any such technology or instruments. The solution here can be presented without the need of fancy instrumentation, yet still have **ALL** the data of physical reality accounted for. Dimensional mechanics is what it is, "pure theory", yet from this pure theory a model should be able to be formed regarding time and space central to the human perceptive ability of time and space, without question, otherwise one is saying that they are forever flawed in their ability to understand time and space and all the parts thereof (energy, mass, and so on) without the assistance of an artificial mechanism or device presumably more intelligent and useful than the human mind itself.

2. What is the Quest of Physics?

According to the Merriam-Webster dictionary [22]:

Definition of *physics*

- 1:** a science that deals with matter and energy and their interactions
- 2a:** the physical processes and phenomena of a particular system
- 2b:** the physical properties and composition of something

Generally, Physics studies the motion and behaviour of matter through space and time, and the related phenomena of energy and force, as a quest to understand how the universe works.

The fundamental idea in physics is the study of objects in space according to varying plots in time as a process of theoretical modelling. The process of theoretical modelling is by creating a "virtual" reality, a "grid" of space and time, upon which points can be mapped central to observed phenomena, using mathematical algorithms to account for the behaviour of those points relevant to equations prescribing the behaviour of those points and their nominated characteristics based on observed reality. The priority is of course mapping reality using "space" as a 3-d geometrical construct and associating the presumed singular dimension of time to this 3-d construct of space as 4-d spacetime. From classical physics, "space" has been prioritised using Euclidean geometry and an associated Cartesian coordinate system, with arbitrary coordinates as objects in time, and then those objects translated as coordinates as a mathematical map describing the object's movement of one position in space to another position in space, essentially creating a new reality based on space, points in space, and the assumption of how those points in space can move from one coordinate placement to another in the assumed process of time, together with the assumed process of "how" those points as objects would move (indeed, "how" those points would move?). That's the art of physics, namely to take a **spatial "map"** of something and enter

it as data, and then map that spatial data through time to find out what is going on as a grid of “spacetime”, to explain the movement of nominated objects based on that data central to (*firstly*) the space that any such coordinate is in *with* the qualities of data it is given (mass or charge, gravity or EM), *and then* it’s relativity in time *to* that spatial coordinate system.

So, in other words, the whole process is a backward mapping of events using an ad-hoc coordinate system clothed with data representing phenomena in the real world that has been described as *basically as possible* with key coordinate structures for that ad-hoc coordinate system of space. The whole process then aims to become more refined, then more refined, and then more refined still, all to find out what that spatial grid (one must not forget the a-priori here) is saying about the governing principle of motion *in time* of those nominated point-structures in that spatial co-ordinate system. Imagine a gold fish bowl, and there are different fish in the gold fish bowl all doing different things, and the aim here is to understand why the goldfish are moving the way they are, their transposition, how they are relating with each other. So what science is doing (if the different gold fish represent different particles, and so on and so forth) is creating a virtual mathematical map of space that the gold-fish are swimming in, here as “spacetime” as the water, and trying to find how the different particles swim around in that spacetime, yet more importantly, “why” they swim the way they do.

In short, the question for physics is “why” is the motion happening, why are the particles moving, is it *indeterministic* (random), or is there a *determinism* (order) to it all? This is an important question for physicists who use mathematics, because essentially mathematics cannot “map” the “reason” behind the motion of particles, the “drive itself”, of the “indeterminism” of entropy, of things becoming more random in time, while balancing that with the “determinism” of cause and effect, of future events being the result of past causes. The simple answer to this problem for physics has been to create a rather mythical start date of time as the big bang as the beginning of a chaotic event that set the chain of entropy (randomness), presumably a purely stochastic process, in motion with a certain set of initial conditions in that entropy that have resulted in what appears to be a type of cause-effect determinism of the laws of physics, those symmetries, still though held in an overall context of entropy *from* the initial event of the big bang itself that is still continuing, the cause itself of which is still unknown (being essentially the effect of that unknown cause). Yet the question still remains for physics, “*why the determinism, why the symmetries, why the laws of physics* if time itself operates according to a general mechanism of entropy (randomness) as an arrow of time from the past to the future?”. The issue for physics is, “where did the laws themselves come from and how rigid/fixed are they?” The big bang model is rather neat in explaining entropy, especially with the analogy of an initial mythical expansion of space and associated cascading random set of events as the arrow of time in an ever-expanding spatial universe, yet the laws in that expanding space and associated entropy is the question, most especially the nature of energy, mass, and gravity, which essentially forms the basis of any argument in physics between physicists today.

How does physics theory handle grasping the general platform for the laws of physics they seek an explanation for? According to the simplest notions of the big bang point of reference, as physics can only consider it, there are three dimensions of space and an entropic arrow of time that began at the initialisation of the big bang. This then becomes as “spacetime”, as the one thing, and why not given the precedence of space and the rather ill-defined nature of time? The question often asked though is whether

or not “spacetime” is it too simplistic, as it fails to fully account for the transposition of EM and gravity, energy and mass, in space. This is the as-mentioned dialectic problem with physics, namely the illegitimacy of the definitions themselves of space and time, that weak rooting of understanding and associated wording. One remarkable feature of all the theories though, without question, of all the quests of physics theory, is to offer priority to space and not time, to adhere primarily to space as 3-dimensional (3-d) and then secondarily offer time to it as 1-dimensional (1-d), together forming 4-dimensional (4-d) spacetime. The question to be asked though is whether or not the priority given to “space” is the intelligent thing to do, or should priority of definition be given to the unheralded concept of “time”, if indeed there is a concept of time to take precedence?

Indeed, the *transposition of energy in space*, a feature of time’s arrow, through this entire process, has been overlooked, namely how can such a thing as “energy”, a carrier it would seem of a nominated construct in motion, of motion, travel in what would be an empty vacuum of space? Fundamentally it is like saying how can a hypothetical point in hypothetical space “move” if not for the idea itself of energy, and perhaps “time”? Why not take the next step and say, “why cannot that fundamental concept of movement as energy be related to “time itself”? The next question to ask then is “how is time as energy related to space as a vacuum”? The assumption in contemporary physics is to tack on the idea of time without much ado, without prescribing it any greatness, any feature such as mass or energy, as all such things are in the domain of space. Time is treated as an “assumption”, a trusted arrow, a mere consequence of what is proposed to be an initial big bang with an associated entropic flow of energy, tagged to energy in such a manner, yet physics considers energy to be primarily a consequence of “space”, as a positive or negative value in regard to empty “0” space. Consider figure 1.

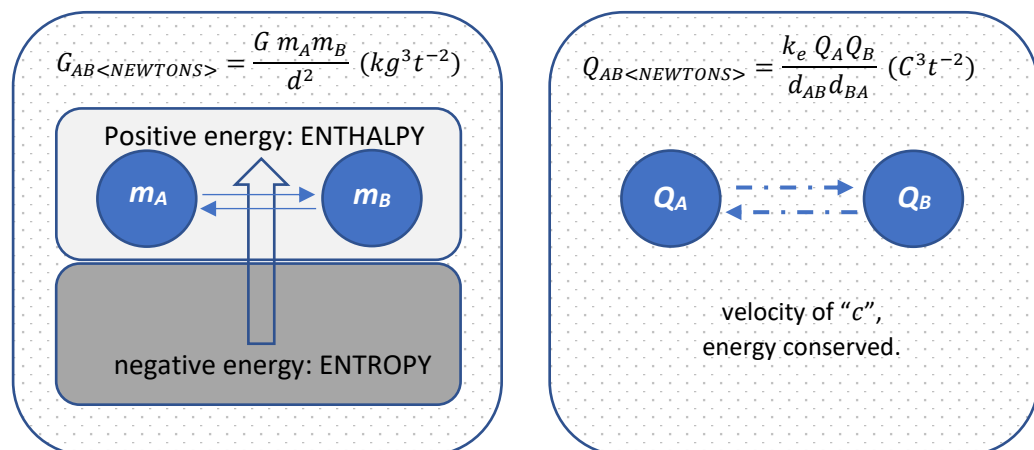


Figure 1: highlighting the difference of energy transfers in space in regard to gravity (G) and electromagnetism (EM).

Making space the priority, using transformations in space to measure objects in different temporal and spatial references, the focus though being on space, presents itself with such a determination of

theoretical bias and associated need for certain texts of theoretical wording, and here the idea of positive energy (kinetic, enthalpic) and negative energy (entropic). The problem that physics has encountered with these primary *spatial* transformations defined primarily using *space* (as opposed to *temporal* transformations using *time*) is central to all the issues encountered with the phenomena of particles and energy and the “uncertainty” of their energy state, that associated entropy, that indeterminacy, requiring a litany of mathematical transformations to account for that spatial mathematical mapping, as presented in paper 14 ([14]: p13-16, fig3-5). As presented, the end result of all these mathematical transformations to satisfy all the conditions of all the data is a blow-out requirement of energy that is 10^{122} higher than what is observed, calling upon physics to invent an invisible energy called “dark energy” to accommodate for this blow-out, together with the need to create a source of “gravity” as “dark matter” (cold dark matter, CDM) to help keep the observed stars clumped together as galaxies per such *dark sources*. In short, physics currently is trying to create a multitude of corrections of contemporary theory by assuming the primacy of space over time and the associated dumbing-down of time itself as a dimension, and therefore without addressing the more primary feature of the inter-relationship between the dimensions of time and space and associated translocation of energy through space in time.

Therefore, the answer to “*what is the quest of physics and how was that quest undertaken as an a-priori?*”, is that “time” is **assumed** without much further ado to be a linear mechanism of energy from an initial big bang event, **a given**, and that it is space that is the thing needing measurement, needing priority, as follows:

- i. Making space the priority, using transformations in space to measure objects in different temporal and spatial references, the focus though being on space (and as shall be highlighted, **momentum**).
- ii. Space subsequently is considered to harbour, as an a-priori, events as physical mass-energy phenomena in time that require code-cracking using mathematical modelling of spatial events in time, one key one being the idea of mass and gravity, and how to crack the code of gravity using spatial modelling.

All of such leads one to ask, “what are the general problems with physics theory, and what form do they assume in current theoretical physics arguments?”.

3. What are the problems with that quest?

It is no surprise in the absence of a pan-theory for time and space that every branch of physics has its own set of problems, its own inconsistencies with other branches of physics, simply because the whole premise of physics, the entire context, isn't itself properly defined “as one” (as per the absence of a pan-theory for time and space), isn't therefore properly structured, is not thus properly linked as a definition of the dimensions in a way that “can” link all the different structures of physics, of G and EM, of

mass and of energy, of quantum physics and relativity physics, and so on and so forth, catering for “all” that data upon that one platform of definition from which springs the entire set of standard equations for that entire set of observed phenomena and associated data. How can a pan-dimensional basis for time and space be established from which all the equations relevant to all the physical data be derived if the solution is sought through the competing factions of physics arguing about the holes in each competing theory? Should not the solution go directly to the definitions of time and space? Such a solution would indeed pave the way for a pan-theory provided that all the data relevant to physical phenomena is accounted for upon that pan-dimensional basis of definitions. Is such possible? More importantly, is such a solution sought for? If such a solution is sought for, such a solution could only be sought following accepting what the major *challenges* in physics are, what the major *problems* with physics are, and why a solution to the problems with the current definition of the dimensions and their associated mechanics **IS** required. Yet such a solution is **NOT** sought for, it seems, otherwise it would be widely promoted as a potential solution, namely a re-definition of the dimension of time and assigning it greater priority. So, why indeed is such so? What has taken physics away from such a possibility? Why is physics unable to take the bold step in re-defining the dimensions? The answer to this question shall become apparent in addressing the following problems with contemporary physics:

- 3.1 The Descriptive Problem.
- 3.2 The Momentum Problem.
- 3.3 The Cosmology Problem.

3.1 The Descriptive Problem

Given all the advanced technology physics has at its disposal, in the absence of reaching a unified field theory, a “theory of everything” (TOE), and so on and so forth, the signs of the *descriptive problem* are ubiquitous in all facets of physics theory teaching and development, carrying the following features:

- Much of the physics community have a different interpretation of the one idea (the “*dialectic*” problem) especially so for Einstein’s theory of relativity and those associated ideas, meaning that the primary definitions, the definitions of time and space and their association, are lacking in precise wording.
- Physics is increasingly utilising statistical mathematics to crack particle-transformation codes, ultimately aiming to crack the code of *indeterminacy*, the focus still being on space, and not a possible encryption code for time itself, suggesting a primary basis of definition is once again at fault, namely on space and those mathematical structures.

- Physics theory as cosmology requires a vast swathe of fixes of enormous quantities (such as dark matter and dark energy) requiring constant upgrades and fixes, suggesting a terribly fundamental faulty design is at play.
- The technologies that develop from physics also require constant fixes and solutions, which essentially leads a wasteful and counter-productive process of technological development, counter-intuitive to the actual thrust of physics seeking something more ideal and efficient.

The real question for physics as a *literary and mathematical account of physical phenomena* is, “can words and mathematics, can descriptors, **EXPLAIN** reality?” If reality were to be explained using a 2-dimensional approach of space, perhaps not. Why? Because one does not generally perceive flat-planes, one does not perceive reality in 2-dimensions of space. Clearly, the descriptive issue is what relates best with one’s perception, one would think. Therefore, if reality were to be explained using a 3-dimensional approach, that clearly would achieve better results than explaining reality with a 2-d spatial approach, more explainable to the human perception, more reasonable to what one perceives of reality, more **meaningful**. Now, if mathematics were to use a 3-dimensional approach for space with a 1-dimensional view of time, perhaps closer still, perhaps **more meaningful**. Yet is physics cutting its ability short through the use of just the “1-d” approach for time? If mathematics were to explain reality using 3-dimensions of space with a definition for time suited to one’s perception-flow ability, physics would be even closer still, would perhaps be right-on the mark of placing the right theory with the right observed data, would be **far-more meaningful**, would it not?

What is an example of one’s perception flow ability, for instance? One remembers events in the past, say, “time-before”, one exists in the here and now, say “time-now”, and one anticipates and prepares for a future event in time, say “time-after”. Such is a “**meaningful**” description because it works, because such is how human perception accounts for space as a process of time. What if physics could adopt an algorithm for time based on the human perceptive ability **with** time, and associate such to 3-d space, yet giving priority to time as a mathematical basis, as a more **meaningful** approach to physics theory per such a mathematical tact? Why would physics do that? The point here is that the issue is not words, the issue is the dimensions and the “appreciation”, the “**meaningfulness**”, of the dimensions relevant to the human ability of awareness itself. The “dialectic” solution is limited by being “dialectic”, especially when using the big bang model as a core source descriptor, when a more fundamental solution exists more directly related and **more meaningful** to the human ability of perception and not vocalization with words. Understandably, the big bang model itself carries with itself descriptors that further give meaning to what it is, what it is considered to be and represent forthwith; the big bang model itself is in fact the Λ CDM model (lambda-CDM; lambda for the required *expansion of space*, and CDM for the requirement of “*cold dark matter*”), which states as it only can that the big bang happened and is still happening at every point in space, the cause of which is unknown, yet an event that

harbours all the current known laws/symmetries of all observed phenomena, together with all those associated cause-effect relationships of those laws.

As it seems though, physics ventures with a 1-d appreciation of time, which forms a basis from the primordial idea of a big bang start-date of time and space with an associated arrow and associated entropic expansion of energy release thereof. To map that on a 3-d grid, physics has employed the use of a complex number plane, to tack on time there, and so on and so forth, using a vast-swath of complicated transformation equations, and so on and so forth. Yet such is mathematics, a dialectic approach with numbers and symbols upon a 3-d spatial grid, still bypassing a more obvious solution regarding time and the human perceptive ability thereof, still unable to find dark energy to solve the required order of energy to the value of 10^{122} more than what is accounted for, still unable to find dark matter to account for the proposed big bang cosmological phenomena of stars, and still unable to link EM with gravity, let alone properly herald the disconnect between mass and gravity per-se in the dimensions of space and time. Despite all these short-comings, it is not just the limited dimension-description of time and space that is the problem, yet other descriptive problems, ultimately as the description of a basic object as mass and its relation to space and time, a terrible oversight in physics argumentative logic.

3.2 The Momentum Problem

If there were one key problem in physics beyond the *descriptive* problem of the dimensions of time and space, it is the idea of mass in space and time as its own reckoning device of formulation, and here is the idea of momentum. Momentum quite simply is the mass of an object (m) multiplied by the distance it travels in space (d) per a value of time (t), or quite simply mass through space per time as mass multiplied by its velocity, as per $p = mv$. If one were to take the simple road of physics theory, labelling a structure as mass *independent of time and space* and taking that mass and factoring the distance it moves through space (d) per the time it takes to move that distance (t) as its velocity (v), that is perhaps the simplest of roads to take, reducing an entire swathe of other possibilities, of mass for instance having an underlying structure or a particular type of association to space and time, all to naught. So, when one uses equations for momentum to explain the nature of energy, matter composed of energy for instance, in regard to time and space, to explain time and space as gravity for instance, it is like trying to teach an old dog new tricks, to use the blunt instrument of momentum itself to then examine what time and space could be as gravity using the concept itself of mass mixed already to time and space as momentum, as that blunt instrument, which is, essentially, "illogical", not even on par with being a paradox, yet a ludicrous notion of scientific logic.

An example of this illogical construct momentum is what relativity theory delivers for its phenomena/use regarding spacetime and gravity, namely that as a mass approaches the speed of light, it (the mass, according to such a theory) would become super-dense or more massive (clearly a *dialectic* problem with the definition of mass in relativity theory in regard to time and

space), which is illogical, yet entirely understandable if relativity theory is based on momentum, if “ c ” is a constant, and mass is approaching that value of “ c ” is always approaching an impossible speed-limit, presuming hence that the faster mass moves the more energy that mass presumably must have and thus the more mass it must have as that mass-object under investigation, and therefore more energy-mass that such a mass must acquire; such is like a magically growing dog chasing its tail, and that the faster it chases its tail the more energetic and massive it becomes, quite similar in fact to the current big bang model itself. Despite the humour of it all, if gravity as a force is a rate of change of momentum, one is essentially equating mass with gravity, which is NOT right, as even Galileo knew, namely that there is a “disconnect” between mass and gravity, that objects of different masses are effected the **SAME WAY** in a uniform gravitational field; **momentum** is merely a description of mass and linear velocity that has **NO** real basis or connection to the relationship of mass with space and time. Using space and time as simple velocity in direct association to the idea of mass represents a huge squandering of important information regarding the relationship of mass with time and space and the under-pinning of the quantum nature of mass itself. In short, momentum is a false description of the **REAL** physical mass-gravity association and will always result in fallacies if indeed there is no direct link with mass and the concept of gravity in regard to time and space; although Einstein considered gravity to be a curvature of spacetime, momentum as a measuring device betrays this idea, essentially making physics tone-deaf to the real quest of physics needing to explain the distinction between mass and gravity as presented in paper 21 ([21]: p16-23).

3.3 The Cosmology Problem

In a virtual-reality world of *physics theory*, “time” is essentially explained by using the big bang model, “time” and its accomplice “energy”. To explain “time” and its accomplice “energy” using the big bang model, spatial transformation models of mass and energy are used in the form of equations for momentum, mathematical models to explain where the 10^{122} factor of energy to make that big bang model work can come from, and more importantly, “*where did the energy go if current data suggests the energy that in fact exists is smaller than what is proposed by the big bang model by a factor of 10^{122} ?*”. On top of this dark energy requirement is the requirement of “dark matter” to keep the galaxies together in the context of the increasingly expanding universe from the initial proposed big bang event of time and energy. The “cosmology problem” is essentially the problem of physics being a “theology” beckoning trust in entities such as the big bang, dark energy, and dark matter; to model reality on a cosmic big bang event creates a precedence for time’s flow, together with the behaviour of events in space from the beginning of that event as an entropic energy release, and given the suggested size of the universe the amount of energy to make all of that work is 10^{122} **ABOVE** current cosmological data of energy values for space, a **HUGE** leap of faith. All of those descriptors detail incredible physics regarding time, energy, expansion, and so on, all accounted for as the statement “big bang”, which is quite “basic” in itself as a definition for the start of everything (other than the descriptors Λ and CDM for its

expansion and associated requirement of dark matter). Yet this basic primary platform of definition of reality as the big bang event carries with it a “priority” in itself of what takes precedence in the scale of what is considered as “physical reality” in the time beyond that big bang event.

Consider the paradox of the "camera" and the "panorama". For instance, let cosmology be the panorama, of course, and the "camera" as the physics model being used to shoot that "panorama". So, one would think the "camera" needs to be right first before shooting the "panorama". Yet, the paradox in physics is that the answer to the design of the "camera", the ideal design, is being sought in the "panorama", when to view the "panorama" in the first place a suitable "camera" is required. Of course physics would say it is a *give and take* fine-tuning process, and that both the camera and panorama must work together as one, and that the process is being constantly fine-tuned, yet this then returns one to the “descriptive” problem, essentially making physics blind to what exists locally by diverting its attention and vision to entirely hypothetical theories of the stars communing this give and take. Fundamental, as it seems, to the cosmology problem therefore is the need to rely on not just telescopes and therefore a type of technology, yet also computer technology to “analyse” the very small bits of data as light coming from the stars, setting physics with the precedent of needing a technological crutch to present findings, a “camera” technology that is never as good as the panorama it is photographing, not even close.

One current avenue of theoretical physics modelling to remove the mystique of the big bang event, namely what happened before the big bang, is to consider a backward model for the big bang, and therefore a model of time that goes backward from the initial big bang event, a pre-big bang model, and that such a model would represent the inclusion to the current big bang model a spacetime system collapse towards a beginning point of the big bang by virtue of this reversal of times arrow central to the big bang, and to **then** suggest that both models of the big bang can share the same “spatial reality”, therefore creating a holistic big bang model of expansion and contraction, explosion and implosion respectively. Yet such a model **still** requires an initial big bang event, the **same** required metric expansion of space and associated collapse (with the reverse-time model), the same requirement for dark energy and dark matter, and so on and so forth, such that **as** an ultimate steady-state system it would still seem to be nonetheless **just a larger box** to hold the **same problems** of the one expansion and contraction big bang model. In other words, the forefront of cosmological modelling is only seeming to hide the current problems of the big bang model by creating a greater stage to fit the big bang model on only to make the current problems of the big bang model seem smaller compared to the new larger scale of the newly proposed big bang model. If such were a horse race, such would be the addition of a horse at such preposterous odds it makes the current runners (dark matter and dark energy) come in at shorter odds of winning, of being on the money, which as a process of logic in physics is quite absurd.

Such are the three key problems of modern physics, a gathering of mechanisms keeping the whole process turning without end, and without an answer to both the fundamental question of the transposition of energy in space other than the scope of physics mythology if not theology, and the distinction between mass and gravity and why indeed such is so. It is not just a “dialectic” problem situation physics has found itself in, yet a spell by its own casting, ultimately as the big bang model a spell of meaninglessness, of irrelevance, simply because what is currently accepted as a universal model requires 80% make-believe in the characters of “dark energy” and “dark matter”, characters who have no direct and apparent role to play locally, here in this solar system. Surely the only solution to such a spell physics has cast upon itself is one of a “re-opening” of perception, of making physics meaningful, relevant to human perception, and as much **applicable** to this local reality.

4. Proposing a solution to that quest: *Dimensional Mechanics*

Key developments in physics are usually associated to new key findings that **link** current findings. The quest for physics theory is linking **ALL** the current findings with a new key finding to ultimately then propose and explain the sought for EM-G, a link between electromagnetism and gravity, those basic field forces, and then demonstrate such a theory in a laboratory with an EM-G device. Such a quest does present itself as quite a unicorn given all the attempts in physics theory thus far, so the task will be broken-up and played as follows:

- 4.1 The Descriptive Solution.
- 4.2 The Momentum Solution.
- 4.3 The Cosmology Solution.

4.1 The Descriptive Solution

As alluded to in section 3.1, it would be wiser to integrate a greater description of time in line with the human perceptive ability than not, as much as it is logical to use *for any theory a model* for space as 3-d as opposed to 2-d in-line with the human perceptive ability of 3-d space. Such has been the theme throughout the 21 papers [1]-[21], namely that if time and space are fundamental constructs, as dimensions related to the human perceptive ability, then any physics theory central to defining time and space should consider using the idea of a perceptive code for time and space. With that hurdle achieved, the next issue is developing upon that definition of time and space, and therefore to address the ideas of energy and mass *in regard to* time and space. More fundamentally, the question needs to be asked, “*what is energy and what is mass in regard to time and space?*”, and furthermore, “*why would a mass want to change its “position” in space and is there any change in “energy” with its change in position in space?*”

As is the case with the propagation of light in space, if any reference of energy were not to change its energy status, yet moved through space, then the movement of that object has nothing to do with its energy status, Yet, if the movement of that object “did” change its energy status, whether an increase or a decrease in energy, then the movement of that object in space would be related to its energy status. Yet, if the overall transfer of energy in space is a constant, and if certain energy transfers are not constant, those non-constant energy transfers need looking into, and the key one here is the one of mass and gravity, and how the mixing between mass and gravity creates a “change” of energy transfer in space. The proposed solution is that the mixing of energy, the *translocation of energy in space*, primarily happens owing to the fundamental relationship between the dimensions of time and space, that there is a constant disparity between time and space, as presented in papers 20 [20] and 21 [21], moreover that *the time point for a hypothetical coordinate in space can never be determined* (TSU principle ([20]: p15-19), and that such a process between the dimensions of time and space creates a fluctuation of energy in space. This fluctuation although random would prescribe a constant value for the propagation of a purely temporal-based wavefunction ([2]: p13) in space, yet as presented in paper 21 ([21]: p16-20) this temporal wave-function via a certain DIR (destructive interference resonance) arrangement becoming mass has a certain relationship with space changing the energy transposition dynamic, while the temporal train itself of energy would remain a constant **IN** space as per the temporal train in space of $t_{N1}-t_{N1}-t_{N1}$, as presented in paper 21 ([21]: p22, fig6). Such a modelling resulted in the following re-structuring of the definitions for *gravity* and *EM*, as required by the new analysis of the association between newly defined time and space, and those new EM and G field constants for the time-algorithm, as per figure 2.

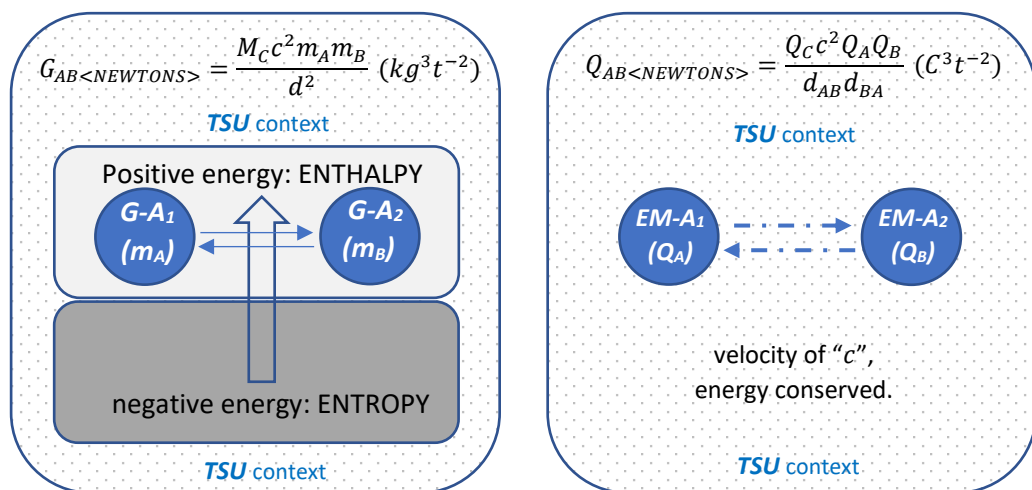


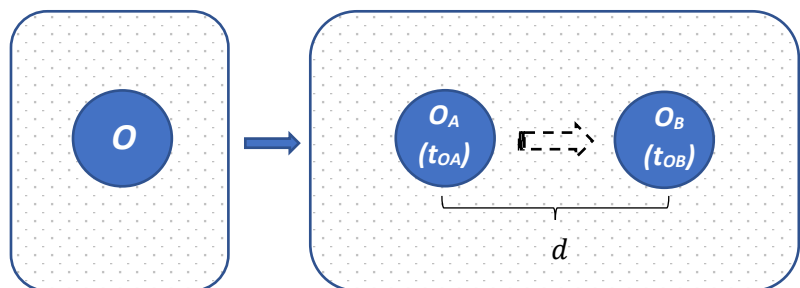
Figure 2: highlighting the difference of energy transfers in space in regard to gravity (G) and electromagnetism (EM) using the time-algorithm analogue.

In short, for mass and gravity, the temporal algorithm (golden ratio) prescribes that:

*Individual masses ($G-A_1$, $G-A_2$, etc) assume to be gravity ($G-B_1$, $G-B_2$, etc), yet with space **as a vacuum**, true gravity ($G-B$) as that uniform vacuum backdrop of space treats masses equally despite their (masses) difference in size.*

There is now though the issue of how masses associating together would lead to a *greater* sphere of “*uncertainty*”, of being in time’s context of entropy, of increasing randomness, despite the commonly held notion that given enough time all mass would associate together under the influence of gravity (which **does not** appear to be the case in this reality). To explain this, take an object (any hypothetical object, point, whatever) and call it O_A , a hypothetical object in completely closed system where nothing escapes, and that such an object O_A just exists in empty space, completely self-contained nonetheless as energy and mass, that nothing else exists around it, just empty space. The motion of this object is irrelevant, as there is nothing to compare the motion of this object with. One could say that the only thing that exists is that object and all that is within it. Now take “two” of those objects sharing the one overall space separated by distance “ d ”, O_A and O_B . Here now enters the idea of relativity. Let it be proposed that the condition of existence for O_A also exists for O_B , and so O_A **is** O_B yet O_A exists **elsewhere** in space as O_B separated by distance “ d ”, existing elsewhere in the same overall boundless empty undefined zero space, as the **only** difference in their existence, namely the space that separates them **in time** as distance “ d ”. The only way this could happen is if O_A is in a different “dimension” related to the same space, *in the same space*, separated by distance “ d ”, according to the principal of “time”, that the object has moved from O_A to O_B by virtue of say from time t_{OA} to t_{OB} . Let such be so, given these two objects are “nominated” to be the **SAME** by definition, and can only be separate in space by “ d ” according to “time” if indeed they exist by the same condition of existence as $O_A = O_B$. Consider figure 2.

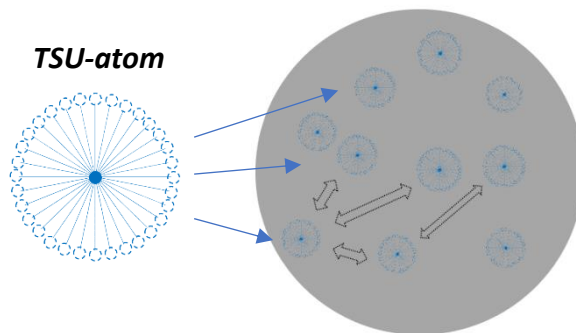
Figure 2: the time-description of an object in space (O_A and O_B) separated by distance “ d ”.



Quite simply, “O” has moved from spatial position O_A to O_B over a distance “ d ” from time t_{OA} to t_{OB} . One could have just presented such a simple case by saying O_A moved to O_B without the as-mentioned preliminary steps of explanation, yet such is the point, namely making “no” assumptions, especially regarding time as a dimension. The logic of this analogy was presented in paper “1” ([1]: p2-3, fig1-7). The structure there for time and space was re-presented in paper 20 ([20]: p10-18), as the equation for time, how the idea of time could create “now” points (t_N) in space ([21]: p13, fig6), and how this “time” description could be associated to the idea of “energy”. There in that paper [21] it was re-echoed, as was the theme through the papers, that energy can only exist as a process of time’s flow, of the time-algorithm quite simply, and that therefore time can only exist as energy, and space can be the only thing that separates time-events as energy-events and moreover that the energy event for a wavefunction of energy, as described from this level of time-definition as the phi-quantum wave-function (PQWF) ([2]: p7-12), represents this process of conserved energy in space *as that wave-function propagation*, a wave-function that is essentially what the Schrodinger wave-function was described to be except here as a newly defined temporal wave-function per the new algorithm for time.

In therefore using such modelling for the proposed time-algorithm (PQWF) and those associated dimensional mechanics with space as summarised in paper 21 [21], in taking an object O_{A1} and associating it with other objects O_{A2} O_{A3} and so on and so forth, the association of those objects in space although under the influence of gravity ([21]: p16-17) would also by their association represent a greater region of “uncertainty” and therefore a higher degree of “entropy” in alliance with this gravitational influence, as would of course be self-evident as per figure 1, and also here with figure 3.

Figure 3: multiple TSU atoms acting in a generally uncertain/random manner with each other.



Essentially, gravity (G-B) would bring the masses (G-A) under the effect of gravity (G-B) together, yet collectively those masses would combine to represent a generalised entropic and thus **more** unstable event (TSU). Such is a feature not considered in physics theory (owing to physics theory not being sufficiently structured upon the *dimensional mechanics* of time and space in such a regard (TSU)), physics theory only structured upon the big bang model of expanding space and

entropic time, and thus preferring to consider that the possibility rather exists for super massive structures to collapse in on themselves as opposed to becoming unstable and releasing energy.

The association of elementary particles (and atoms) is the issue at hand here, namely the idea of particles coming together to form more complex atoms as governed by the Rydberg equation/constant as presented in paper 1 ([1]: p12-15) and those associated limitations of atomic modelling. The suggestion here with atoms associating with each other on a grander scale is one of creating more mass and thus the effect of more gravity to then create a greater entropic event, and therefore a greater release of energy from those constituent atoms, leading ultimately to **basic** atomic particles (through the release of energy from more complex atomic-associations) associated with one another in a **super-massive** structure that would release with its vastness vast amounts of energy. This is typical of a sun, a supermassive structure existing as a volatile mix of **basic** atoms, held together by gravity G-B (EM-B^{DIR}) yet also having associated to it a level of energy release, entropy, in the context of that G-B field effect of space. Such a process therefore **discounts** the idea of a black hole as the end result of a super-massive structure as the level of entropy in-play with a super-massive structure discounts such an interference of gravity itself. In other words, the black hole phenomenon must be explained via another mechanism, and not a supermassive structure with a gravity field so great that even light does not escape. To explain such, to explain the phenomena of black holes, what is missing here is a basic mathematical precedent as to how mass is effected by the general negative energy spatial dimension (how effects mass in not just as making mass more kinetic yet how it effects the actual performance of mass in mass being a part of space) in such a fashion. To explain this, the concept of **momentum** needs to be discussed.

4.2 The Momentum Solution

The quest of unravelling the mystery of mass and gravity was last paper's key description ([21]: p16-22). In that paper it was uncovered that the whole modern approach to physics regarding the passage of energy in space and that associated theoretical modelling is upside down, namely to think about the answer in terms of EM and gravity, of photon packages and mass, of momentum, is counter-intuitive, especially if the code of performance of mass and energy, of gravity and EM, is underwritten and therefore more ideally accounted for in theory by the nature of the dimensions of time and space themselves, yet more precisely, underwritten by "time" and its relationship with space and those dimensional mechanics. In that paper ([20]: p10-13) it was explained that time is still the arrow connected to space as a type of time-space field (not as Einstein's *spacetime* though), as the "time-space groove", TSG, namely that the only way to explain gravity is by taking the flow of time as a primary consideration and to then apply that to space, to **then** recover physics data in deriving all the equations and constants for all physical phenomena thereof, achieved in papers 1-21 [1]-[21]. In short, as presented in paper 21 ([21]: p16-22), mass is best described as an emergence from a temporal-algorithm adjusted quantum mechanical base as a particular type of destructive interference resonance (DIR) of an atomic-

based EM field (EM-A^{DIR}) like a shell-barrier that has its underlying energy structured with space **as mass**, pure and simple.

There is an even simpler way to approach the idea of mass in regard to space, time, and energy, of course while addressing “time” mathematically as prescribed according to the human perceptive ability of accounting for the passage of time. For instance, “what is mass”? In simple terms to human perception it is a solid, like a 3-d glob or shield (with energy associated to it, forming its infrastructure). Yet with the benefit of greater thought and theoretical analysis, the proposal is, as has been through these papers [1]-[21], that energy is specifically related to the dimension of time, and mass aligned to space. Mass (m), as presented in the previous paper ([21]: p16-22) is a form of energy that has undergone destructive interference resonance (DIR), namely EM-A^{DIR} **as** G-A (m), a specific feature of the *dimensional mechanics* between time and space. Thus, to describe this another way, if for instance (as presented in the previous two key papers [20][21]) time and space are related in a certain distinct way, as the term **dimensional mechanics** suggests, if time and space are related, and space is as a type of “0” construct, then the relationship between time and space would be an inverse proportional manner in regard to a fundamental dimensional constant, as per equation 1.

$$\frac{\text{space } (d)}{\text{time } (t)} = c \quad (1)$$

As presented in paper 21 ([21]: p16-22), energy is primarily related with time and mass primarily related with space, with such a description being a part of the described association of mass with gravity. So, in regard to the universal constant “ c ”, and in considering energy and mass, energy in regard to “ c ” would be directly in accordance with “time” per space (space as distance), as per equations 2 and 3:

$$m \cdot \frac{d}{t} = \text{fundamental property 1} \quad (2)$$

$$e \cdot \frac{t}{d} = \text{fundamental property 2} \quad (3)$$

Yet as presented in paper 21 ([21]: p16-22), mass (m) equates directly to energy (e) in that mass **is** made up of energy as G-A (m) is equivalent to EM-A^{DIR} yet according to a specific “DIR” condition for energy that specified fundamental property 1 and 2 would be in equality. Therefore, equations 4-5 would hold.

$$m \cdot \frac{d}{t} = e \cdot \frac{t}{d} \quad (4)$$

$$\frac{e}{c} = m c \quad (5)$$

to the TSU ring (figure 5; 5.1) with other G-A elementary particles residing within that TSG ring (figure 5; 5.2).

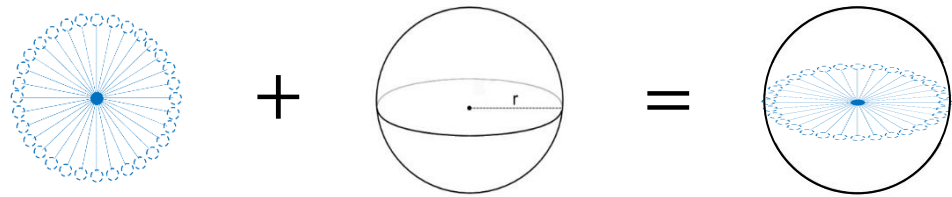


Figure 5: G-A elementary particle <microscopic> scale (5.1), general spatial TSG <microscopic-macroscopic> manifold (5.2) general interplay of most basic elementary particle with space (5.3).

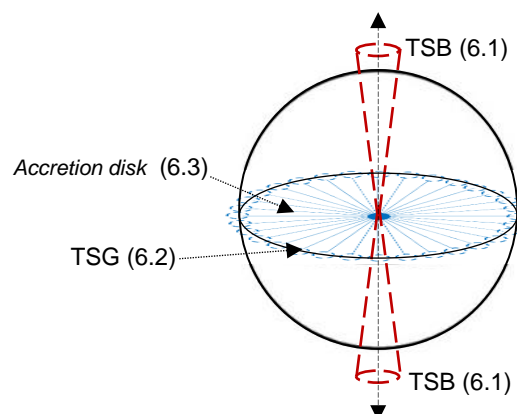
Science understands this process as the Bose-Einstein Condensate (BEC), a state of matter formed when elementary particles at very low densities are cooled close to absolute zero (minimal entropy state) creating a situation of the lowest quantum state where wavefunction interference becomes apparent microscopically and macroscopically, as such elementary particles would indeed the phenomena is associated to the backdrop of space on a quantum level as close to space as possible. As presented in paper 21 ([21]: p20-23) the TSG is an actual **signature** of space through **ALL** scales (size) of space, highlighting that one key feature of the TSG would be the conformity of mass-particles to a “groove” in the form of a ring/disk when mass approaches the signature of a space-gravity field (lowest entropy). This phenomenon has been confirmed in zero-gravity conditions highlighting the behaviour of such BECs to form a ring/halo [23]. The description of that phenomena here though compared to the BEC quantum mechanical (QM) description more accurately prescribes that the TSG represents both a microscopic and macroscopic phenomena of space for mass (G-A) and its constituent quantum state (EM-A^{DIR}), the key feature of the TSG being the “groove” as a ring. The BEC is essentially describing the same phenomena, except through the theoretical lens of QM **without** the benefit of the algorithm for time and associated *dimensional mechanics*, **without** the benefit of the time-algorithm and associated mechanics with space that prescribe a more accurate and data-linked version of the elementary particles based on the PQWF (phi-quantum wave-function) as presented in paper 4 “Phi-Quantum Wave-Function Crystal Dynamics” [4]. Subsequently, the *dimensional mechanics* script accounts for what space **is** in regard to time, those dynamics, and how time and space interoperates with energy and mass on a most basic level, and therefore also on the macroscopic level, which now brings the topic of the TSG to the cosmological scale of discussion.

4.3 The Cosmology Solution

If there exists a general dimensional mechanics in play for space that prescribes the TSG, then such a phenomenon would be central to **all scales** of energy-mass. The interesting feature of the TSG and how it is associated to the time-algorithm and how this would manifest as

a disk/groove format that would play out for mass with an associated central “now” energy-mass zone; physics (although recently) has discovered this effect with the BEC in zero gravity conditions [23]. Physics is also familiar with the “accretion disc” phenomena, however has yet to make the connection between the accretion disc phenomena and the BEC phenomena, nor made the suggestion that it could be an underlying feature of time-space itself in regard to energy-mass. According to cosmology accretion disks are a universal phenomenon associated to what are considered to be active galactic nuclei, protoplanetary disks, and gamma ray bursts, more often than not giving rise to astrophysical jets coming from the central zone. Such a phenomena though is a general time-space phenomenon more-thoroughly explained by the TSU, as with the BEC phenomenon, for the same reasoning as applied to the BEC phenomenon. Quite simply, the time-algorithm model prescribes that the TSG signature in the presence of matter in its lowest entropic state enforces matter to cleave to the TSG feature of space (as opposed to grosser influences at play in the case of more massive structures with more energy and those field-force dynamics). Yet, in presenting such, there must exist another type of phenomena by virtue of the fact that there would be an overall entropy-enthalpy balance of energy in play. Here would be the idea of the time-space “burst” (say, TSB) in alliance with the time-space “groove” (TSG) in the axis of the TSG itself in the presence of matter reaching it’s lowest entropic state, as per figure 6.

Figure 6: time-space “burst” TSB (6.1), time-space “groove” TSG (6.2), accretion disk (6.3), all connected as a result of the time-space dimensional mechanics in play.



The reasoning here is that in an overall steady-state thermodynamic time-space reality, a lowest state energy level of mass (entropic) in cleaving to the TSG (accretion disc) would only occur with a high energy (enthalpic) column as the TSB as the axis of that TSG. Once again it must be noted though that the scales proposed by the TSG and TSB are completely different to the scale cosmology considers to be in play regarding the phenomena of the stars and associated accretion disk display. Indeed, cosmology as a theory and associated model/shape changes completely when energy can be explained without a metric expansion of space, as per when the redshift effect can be explained without that associated metric expansion of space ([13]: p9-13), and when mass (G-A) and gravity (G-B) can be explained by addressing the dimensions of time and space themselves ([21]: 16-23). As such is an important issue, the metrics of this phenomena shall be brought forward in a subsequent paper.

The theory nonetheless for cosmology proposed by this new model for time holds that much of what appears with star-light phenomena would in fact be a process of natural planetary and atomic decay beyond the Kuiper belt, debris from this solar system, this general local reality, as presented in "Space and the Redshift Effect" ([13]: p9-13). Paper 21 ([21]: p22-23) presented the case that each region of atomic debris and disintegration would happen around *end-zones* of pure space as gravity (G-B), dictating how mass (G-A) would *appear* to disintegrate (EM-A, EM-B) through such a time-space channel. Such an idea also takes into consideration that the centerpiece of reality would be the sun-structure G-A (fig7: 7.1) with the associated idea of the surrounding "end-zone" of the G-A disintegration **AS** the overall TSG of time-space (fig7: 7.2) with its associated TSG references throughout its entire structure (fig7: 7.3). Such a concept for space was initially presented in paper 1 ([1]: p1-3, fig1-7), and then further expanded upon in paper 13 as the "Solar System Cast" (SSC) manifold ([13]: p13-19). Here, in the upgraded description of G-A, G-B, and the TSG, let it be considered as the $G-A^{TSG}G-B^{TSG}$ (mass-gravity) manifold, as per figure 7.

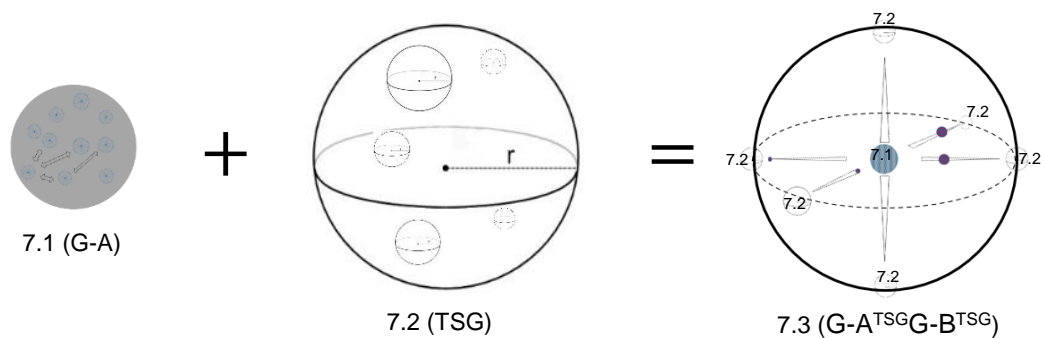


Figure 7: central mass region (7.1), outer TSG region (7.2) combined central-mass and TSG manifold (7.3).

Figure 7 the centre-piece mass-energy structure of the sun (G-A) releasing energy (and therefore also mass), the mass of which would ultimately all spread out **as** $G-A^{TSG}$ **to** the $G-B^{TSG}$ region (as mass under the influence of gravity), all held in an overall TSG context, suggesting a type of flat-plane (groove-disk) process of energy-matter movement (as considered to be the plane of planets) from the sun (G-A) to the $G-B^{TSG}$ space regions relevant to the multitude of debris ($G-A^{TSG}$) locations. The proposal is that the $G-B^{TSG}$ end-zone regions (fig7: 7.3) **are** the gravitational field effects in play (in that region for the debris there), yet the key feature of the independent $G-B^{TSG}$ regions in the overall TSG dimensional platform would be "dark" (DIR) in attracting both mass and energy and therefore both debris (G-A) and light (EM-A, EM-B), and thus each $G-B^{TSG}$ region in the end-zone upon the grand TSG platform take on the appearance of the overall TSG system, and thus have each $G-B^{TSG}$ **appear** to be surrounded by a vast swathe of $G-A^{TSG}$ solar-systems, or rather a vast swathe of $G-A^{TSG}$ debris sucked into the $G-B^{TSG}$ regions, such that associated to each *apparent* black/dark (DIR) hole structure ($G-B^{TSG}$) would exist the appearance by gravitational design (G-B) of other **apparent** solar systems patterns of debris (G-

A^{TSG}), noting here is the idea of the universal accretion disc pattern in play care of the TSG and therefore the dimensional mechanics of time and space.

Given therefore the amount of debris that would be in play in that outer region, such would lead to the appearance of what would be stars that take upon solar system characteristics, however as atomic-based (EM-A, EM-B, G-A) phenomena, such that there would be as many stars as there would be particles of matter-debris of an entire planet heading into that end-zone ($G-A^{TSG}G-B^{TSG}$) region of ultimate decay. Such a concept of each $G-A^{TSG}G-B^{TSG}$ complex, or as astrophysics understands to be “galaxies”, a vast swathe of solar systems in a disk/groove shape the centre of which being an apparent black-hole ($G-B^{TSG}$) structure. Note that the concept of the redshift is taken into consideration with this phenomena ([13]: p9-13), and so too the calculation for the CMBR ([14]: p24-25), essentially providing *an overall steady-state thermodynamic reality*, noting also that the pattern in time of movement of the debris and associated star-phenomena would accord to a Fibonacci-style spiral pattern of events in time (golden ratio algorithm for time) as matter (G-A) moves towards these end $G-B^{TSG}$ regions in a TSU and thus $G-A^{TSU}$ manner (galaxies).

As an example of that same astrophysical data that this theory confirms (redshift, CMBR, Oort cloud, and so on), together with identifying the key issues in cosmology theory ([13]: p13-19), in demonstration of the dimensional mechanics proposed to be behind all such phenomena, while in going to the core of current quantum mechanical (QM) astrophysical theory, as per the current quest of QM and QFT (quantum field theory) to explain gravity through the observation of what is considered to be super-massive structures as black-holes, the theory presented here suggests that black holes, the apex of quantum cosmology theory seeking the answer to gravity, is merely an $EM-B^{DIR}$ (G-B) field, a G-B field as that singularity nonetheless ($G-B^{TSG}$), as presented in paper 21 ([21]: p20-23). To prove this is to demonstrate a G-B field and the effect of gravity there, namely drawing in mass, as what has been the focus of the research conducted throughout the papers [7][12][17][19].

The results of the experiments initially found trouble in creating a successful G-B field owing to the field's apparent highly unstable nature (entropic, mass-disintegration). This unstable nature was then theorized to be a part of the overall energy equation as per paper 15 ([15]: p11, eq8). Further developments of theory have proposed this effect to be primarily entropic in nature as a part of the G-B field itself, requiring modifications to the DIR solenoid aerial structure. The most recent experiment's provisional results ([19]: p15-18) highlighted a minor (~2mm) amount of movement of the mass-core into the constructed G-B field, yet owing to the nature of the experiment (its rigid construction and associated lack of allowance for movement), further testing was proposed, here in using an entirely different suspension apparatus orientation, namely an overhanging coaxial cable connecting-lead (fig9: 2a) as opposed to a horizontally aligned one, allowing for more of a pendulum-like motion of the suspended apparatus. As another change, the design has extended the mass-core to fill the entire width of the solenoid wind extending totally in to the $EM-B^{DIR}$ (G-B) field to allow more mass to be effected into the $EM-B^{DIR}$ field depending on where that $EM-B^{DIR}$ field strength is **strongest**, presenting the case of capturing any

movement in any axial direction depending where this unstable field is best located within the solenoid and associated mass-core structure, as per figure 8.

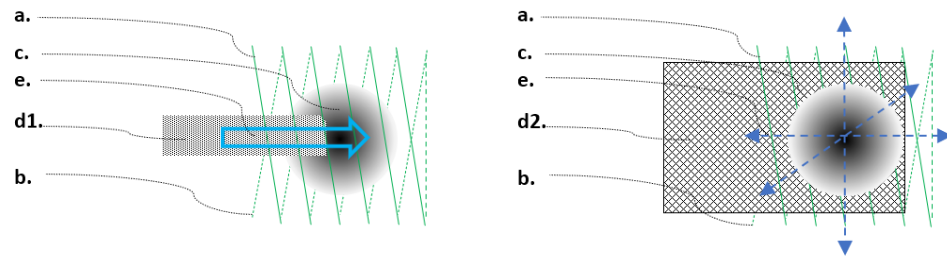
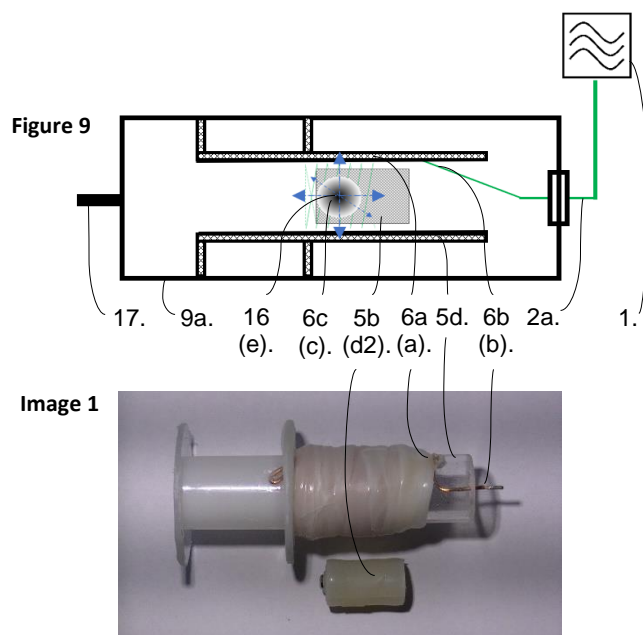


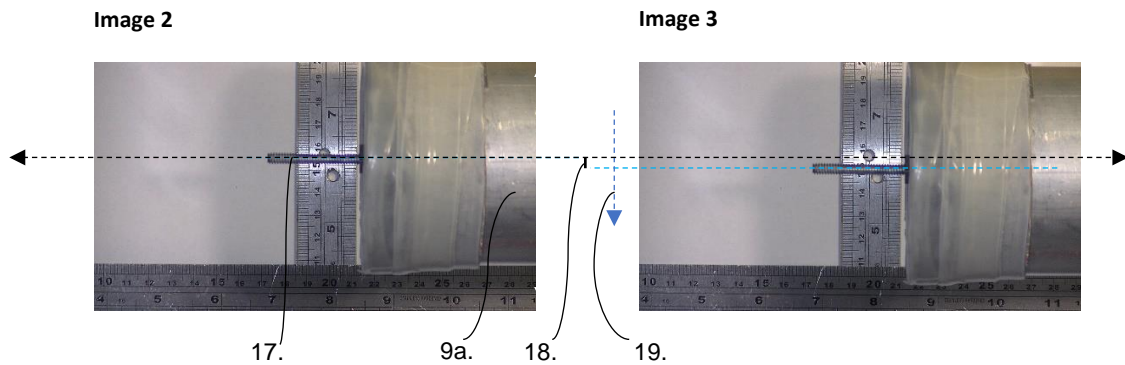
Figure 8: one direction of solenoid wind and associated RF current forward (a.), reverse direction of solenoid wind and associated RF current backward (b.), proposed generated EM-B^{DIR} field (c.), mass-core introduced into EM-B field (d1, d2.), proposed direction (blue arrows) of thrust of mass-core (e.).

The proposal has been according to the theory for mass (fig8: d.) to *fall* into (fig8: e.) the region of strongest generated EM-B^{DIR} field (fig8: c.) owing to the solenoids creating the EM-B^{DIR} field (fig8: a, b.), and the location of that strength will effect movement in that mass-core (fig8: d2.). It needs to be noted that owing to the parameters of this experiment, as with previous experiments, the solenoid generating the G-B field is only as precise as the materials allow and the associated phenomena of EM/heat release its effect on the apparatus during the testing, namely EM loss in the wires and the solenoid, and thus loss of RF signal integrity in the actual solenoid creating an uneven and unstable/unpredictable field. It is for this reason that the actual resultant percentage G-B field of the overall attempted EM-B^{DIR} field would be quite small and difficult to precisely locate. Nonetheless a minor propulsion result from any minor G-B field generated is still a positive result, as it is the *principle* under examination, not the size or scale of the result, *that is being tested*. And so, the following applies for EX-6 (figure 9, image 1):

Figure 9 (not drawn to scale), Image 1: RF source (1.), connecting coaxial lead suspended vertically (2a.), one solenoid ~10 winds forward (6a, a.), another solenoid ~10 winds back (6b, b.), solenoid winding Perspex tube bulkhead (5d.) attached to 74mm ID aluminium pipe structure (9a.), mass-core (5b, d2.), EM-B^{DIR} field region (6c, c.), directions of proposed thrust (16, e.), movement-marker (17.) at distal end of test chamber (9a).



The test was conducted along the same parameters as EX-5 ([17]: p18-22), suspended though according to a new connection orientation to the RF microwave source allowing more of a pendulum style motion of the suspended device. The testing resulted in the following before (image 2) and after (image 3) activation images when viewing the apparatus from above, distal end of containing chamber (17.), 30s test run.



Images 2-3: spring-suspended resonance chamber (9.) showing a 5mm (18.) movement (19.) by the movement-marker (17.) from image 2 to image 3 (30s time-period from image 2 (0s) to image 3 (30s) during RF activation).

The movement registered was ~5mm from its start position (images 2-3: 18.), significantly more than the movement of EX-5 ([19]: p15-18) with this new minor adjustment to the mass-core (fig9: 5b, d2). Once again, to note is that the tolerance of movement allowed by the suspension device is *still quite limited* owing to the need to use a relatively stiff 10mm thick 1-metre RF 5.8GHz tolerant insulating cable, which makes this result significant, provisional nonetheless pending independent testing. To ensure this movement was not an aberration, a control test was undertaken using all the same parameters according to EX-6, except without using the mass-core (fig9: 5b, d2), with no significant resultant movement registered.

It can be concluded therefore in light of this provisional result (pending independent confirmation) that the theory presented behind the design of EX-6 is in fact the theory that explains this phenomenon, such in the absence of any other theory accounting for such a phenomenon, therefore putting into question the idea that such a phenomenon can only be found in astrophysical data regarding “black holes”, and thus putting into question the general big bang model for time, offering nonetheless a new cosmological model/solution in alliance with the time-algorithm theory behind this experiment without any corruption of astrophysical data (CMBR, redshift, and so on). Simply, confirmation of this result would undoubtedly bring the current cosmological model of time (big bang) into question given cosmology theory currently has not accounted for such a phenomenon in this local reality. A follow-up to this experiment (EX-7) shall be forwarded in a subsequent paper that aims to **enhance** the resonance of the EM-B^{DIR} field in

a way not yet formally forwarded, yet a process that is able to further explain the significant/explosive results of experiments 1-2 (EX-1, EX-2).

Such is an example of demonstrating a key phenomenon of astrophysics “locally”, in a laboratory, highlighting one key problem with contemporary cosmology and thus physics theory, namely the inability to actually “go out there” and prove the stars and associated phenomena (such as black holes) for what they are alleged to be. In terms of the theory presented here, namely the time-algorithm descriptive/momentum/cosmology solutions, such is not to say all of what is observed of astrophysical phenomena could be entirely mere debris, yet such **more than likely** (with the benefit of structured theory and associated experiment) **is** the case, as much as one needs to go out there and prove such to be so, or at least demonstrate a key phenomenon central to modern cosmology that can be reproduced in a laboratory that describes the cosmological effect as not according to the right scale of determination, to the right description of theory and associated use of momentum, as presented with EX-6 in producing a G-B (an *EM-G*) effect. For indeed, presented here is a theory for time based on an algorithm for the human perception ability of temporal awareness, and thus the model of cosmology presented would logically (given all the data and equations are already confirmed) be *the one most suited* to our ability of temporal awareness and therefore determination of what is “real”. Such is not to say therefore that other realities, other solar systems with other planets, could exist, yet that those other solar systems, other realities, would more than likely **not** be compatible with our ability of temporal perception, **not** be meaningful to our ability of perception, and therefore the search and discovery of such realities be brought naturally **into** question.

5. Conclusion

The key feature of this paper has been to address the primary theoretical issue in physics, namely energy and mass and their dynamic with the dimensions of time and space. Time and space as dimensions can only be as real as our ability to perceive requires them to be real, and as real as our ability to perceive is, and thus so too should be the dimensions of time and space, namely being treated with the same respect. This paper has delivered the respect that is due to the dimensions of time and space accordingly, and in the process has been able to present a case for the dynamics of energy and mass in regard to time and space in accommodating for what is perceived of physical reality, all the fundamental phenomena and associated data, without any bias.

The more correct theory is the one that is the more complete, the most broad-range, with the most relevant appropriation of data, not just pieces of data that fit well alone, yet all the pieces fitting together, matching all the observed phenomena. The paper here owes itself to 21 previous papers [1]-[21]. Each of the papers are built upon the consistent time-algorithm theory of the preceding papers exercising the required theoretical licence for development using exact contemporary research data:

1. Gravity's Emergence from Electrodynamics [1]

- Introducing the time-algorithm.
 - Golden ratio time-algorithm: p3-6.
 - *provisional* gravity equation: p8-9.
 - *provisional* EM equation p9-10.
 - Rydberg equation-constant: p10-15.

2. Golden Ratio Axioms of Time and Space [2]

- Introducing the link between the time-algorithm and the dimensions of space (derived from the time-algorithm), essentially developing the time-algorithm analogue of the Schrodinger wave-function, and associated atomic-scaled spatial/wave-function transformations (analogue of Quantum Mechanics).
 - The development of the wave-function (phi-quantum wave-function) with the electrical (monopole) and magnetic (dipole) features with associated general atomic time-algorithm manifold structure: p3-6.
 - Fine structure constant: p12.
 - Speed of light c : p13.
 - EM equation constant k_e : p13.

3. The Emergence of Consciousness from Chaos [3]

- Establishing the fundamental level of the Planck scale with the time-algorithm, deriving the time-algorithm analogue of the Planck equation while also investigating the idea of consciousness from the time-algorithm perspective (given the time-algorithm is based on the human perceptive ability of time), to then investigate if indeed consciousness could emerge from a veritable Planck scale level of apparent disorder/chaos.
 - Planck's equation and constant: p3.
 - Logistic map equation: p4.

4. Phi-Quantum Wave-Function Crystal Dynamics [4]

- Developing the elementary particles upon the basis of the EM and G time-algorithm equations, the association of the elementary particles upon such a basis, and their localised structure and phenomena, all as per the time-algorithm analogue of Quantum Mechanics and the associated Standard Model of particles, while then extending this macroscopically to derive Avogadro's number and the CMBR frequency value.
 - EM and G constants: p7.
 - Avogadro's number: p16
 - *provisional* CMBR frequency: p17.

5. Time as Energy [5]

- Forming the link between the time-algorithm and the concept of energy, deriving a provisional value for the CMBR for space in the context of an overall steady-state energy system (entropic-enthalpic) and that associated dynamic between the microscopic and macroscopic scales.

- *provisional* CMBR energy value: p9.

6. The Relativity of Time [6]

- The time-algorithm as an analogue to Einstein's Special and General relativity regarding different independent locations in space and the associated cause-effect of phenomena is explained, thence presenting a general overall shape to the resultant play of the relativity between the microscopic and macroscopic scales of energy and mass, proposing a general time-scale for the time-algorithm system of macroscopic-microscopic cycles of interactive motion.

7. Golden Ratio Entropic Gravity: Singularity Field Testing [7]

- The idea of gravity as a process of "negative energy" is weighed up with the proposals of the preceding papers, presenting two experiments to test the hypothesis of gravity based on the time-algorithm's relationship with space.
 - EX-1: p10-12.
 - EX-2: p13-15.

8. The Golden Ratio Time Algorithm [8]

- The time-algorithm is given an overall analysis in comparison to contemporary physics axioms for time and space in review of the preceding 7 papers [1]-[7] and those achievements there.

9. The Physics Chimera [9]

- An analysis of "inertia" is undertaken highlighting the problem with equating inertial-mass to gravitational-mass, providing a solution in the form of the time-algorithm to better account for relativity discrepancies between inertial and gravitational mass.

10. The Conception of Time [10]

- The idea of consciousness is discussed as being in direct relation to the time-algorithm and therefore the time-algorithm being an ideal frame of reference for concepts on relativity; three key models of consciousness in history are presented to support the time-algorithm concept of human consciousness registering time's flow, an important correlation between time's flow and the human ability of temporal awareness:
 - Rene Descartes: p5.
 - Martin Heidegger: p5.
 - Maurice Merleau-Ponty: p7.

11. Space, and the Propagation of Light [11]

- The idea of "space" is discussed relevant to the time-algorithm being the underwriting for the propagation of energy, and how the idea of infinite space that is expanding cannot be resolved by GR owing to the obvious disconnect between inertial mass and gravitational mass, and therefore that a new approach is required, namely the time-algorithm approach, which when used as a wave-function propagating as a spherical front in space would effect an illusion of expanding space.

12. Space, and the Nature of Gravity [12]

- Gravity is explained here primarily as a mechanism of space not as a mechanism of a field propagating at “c”, yet associated nonetheless to the time-algorithm and that associated cause-effect dynamic with a mass that is based on energy (PQWF, analogue of QM and the SM), while proposing a new experiment to test the different features of the time-algorithm wave-function (PQWF) in relation to space as gravity.
 - EX-3: p10-12.

13. Space, and the Redshift Effect [13]

- In addressing known issues in contemporary cosmology theory, the time-algorithm is applied to the propagation of light in space highlighting the key flaws in cosmology theory and providing evidence for the redshift effect of light, calculating a maximum redshift value of $z=12$ (z_{12}) and associated metric limit to the local solar system time-space reality (Oort cloud), while then explaining the most logical compositional nature of the stars and associated scale in such a new context.
 - Redshift value: p11.
 - Oort cloud distance: p11.

14. Solving the “Cosmological Constant Problem” [14]

- In developing upon the new cosmological model, the issues of the cosmological constant problem are presented and solved, successfully deriving the key equations for energy microscopically and macroscopically, together with the value for the perihelion of Mercury.
 - Lamb Shift effect: p23-24.
 - CMBR energy *value* and *frequency*: p24-25.
 - Boltzmann constant: p26.
 - Perihelion of Mercury: p28.

15. Hybrid Time Theory: “Euler’s Formula” and the “Phi-Algorithm” [15]

- The idea of the “natural” process of decay as a microscopic/atomic event in regard to the time-algorithm wave-function of the atom is presented, detailing Euler’s formula and associated value in an overall energy equation for time and space detailing an algorithm for π as the progression of the time algorithm wave-function (PQWF).
 - Algorithm to calculate π : p6-7.
 - Euler’s formula: p9-11.

16. The Hybrid Time Clock as a Function of Gravity [16]

- Directly developing from the energy equation of the previous paper, the time-algorithm is explained through this lens of energy dynamic (with space) explaining the nature of gravity as per using a new set of spatial equations (p6-8), giving a detailed account of the nature of relativity through the application of the time-algorithm.

17. Hybrid Time Theory: Cosmology and Quantum Gravity (I) [17]

- The “hybrid time” energy description is applied to the time-algorithm cosmology model, further presenting the case for the time-algorithm model, highlighting all the key cosmological data that is captured and supported by the time-algorithm without the use of the insubstantial data-sets of dark energy and dark matter, presenting a new experiment for the time-algorithm model for gravity.
 - EX-4: p18-22.

18. Scientific Principles of Space, Time, and Perception [18]

- The perception-basis of the time-algorithm is given key focus as being the qualifier for what is a more realistic account of time, as per the basis of it being associated to the human perceptive ability of accounting for time, and the importance of such.

19. Hybrid Time Theory: Cosmology and Quantum Gravity (II) [19]

- The idea of the time-algorithm related to the human perceptive ability of time’s flow is further explored, highlighting the themes of determinism and indeterminism, cause and effect, presenting a new experiment for the time-algorithm model for gravity.
 - EX-5: p15-18.

20. Mathematical Principles of Time and Energy [20]

- The key relationship between energy as time with space as per the time-algorithm is explored by means of an equation for time central to space that explains the “uncertainty” of a point in space per the time-algorithm, highlighting that the “uncertainty principle” regarding the measurement of particles encountered in QM is a pan-phenomenon, as based on the relationship between time and space.
 - *Time-space uncertainty principle (TSU)*: p11-13.

21. Dimensional Mechanics of Time and Space [21]

- Given the importance of the “uncertainty” principle being a key feature of the interplay between time and space, the dimensional mechanics between time and space is explored, resulting in a description of inertial mass compared to gravitational mass, and thence a description of gravity in comparison to EM, as from the fundamental relationship between time and space.
 - *Time-space groove (TSG)*: p20-23.

In starting at paper 1’s arbitrarily nominated time-algorithm level of time and space definition (in a fairly broad-general manner, as it only could), it was then naturally the task to propose some broad connections with the ideas of the EM and G *fields* and associated equations, while then focussing on the wave-function of the time-algorithm and its calculated relationship with space (atomic modelling) and associated known data. In cleaving to known data, as it was only obliged to do so, the time-algorithm put into play the time-algorithm analogue of the Standard Model and Quantum Mechanics [4], and then moved to the more general issues of energy (entropy and enthalpy), gravity, and cosmology, highlighting the limitation of Einstein’s relativity theory in his not employing the time-algorithm. The logic of inertial mass

and momentum was then presented as being flawed [9], as being the “chimera” of contemporary physics, leading to the major unproven fixes of dark energy and dark matter. Through this entire process key experiments were undertaken to demonstrate how it is possible to generate an EM based G field. Further to this has been the key theme of going from the microscopic scale to the macroscopic scale identifying any major pan-themes with any associated symmetry or asymmetry of the time-algorithm with space [20][21], hence leading to issues central to the dynamic between time and space itself, all of such to provide all the facets of physics theory and associated data the required time-algorithm work-through upgrade. The data-applicability and associated “meaningfulness” here is prescribed to the algorithm *for* time consistent with the human perception ability of time; what philosophy deliberates over as *meaningfulness* in physics, as a *philosophy of physics*, is what is presented here through these papers in the form of an algorithm accounting for *human perception’s account of time’s flow*, an account in-line with human perception.

Finally, if human life were created or evolved from time and space to the advanced form it assumes today, why indeed therefore not use the code of human perception to describe time and space using that form of temporal perception ability, and the case in point here, an algorithm for time based on the human perceptive ability regarding time’s flow? It may have been natural initially in physics to attribute more importance to the definition of space than time, more of a natural thing to do as a starting point, namely embracing the 3 dimensions of the vacuum of space as a priority over the need to define time with greater structure and importance. In light of what a definition for time can achieve though, a definition that accords with the human perceptive ability with time, more efficiently so and meaningful than standard 1-d linear time, physics and its associated endeavours of research and technological development may indeed have more research and development ahead of it than what has previously been attainable with singular-dimensional physics time theory. The collected papers PDF for the purpose of a general word-search facility is available at <http://www.equusspace.com/index-3.htm>.

Conflicts of Interest

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

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