

# Time-Space Wave-Mechanics

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**Abstract:** This paper, a continuation of the previous 22 papers, takes the description of time and space and those associated dimensional mechanics to a new theoretical level, primarily examining in detail the nature of what is termed the time-space field (TSF) and how that field is able to explain the wave-nature of light beyond that of the contemporary explanation of the photon. The basis of the description is central to the new time-algorithm as accounted for in the preceding 22 papers detailing time-points in space that have associated to them the quality of a time-space spin (TSS) relative to each other in the general back-drop of the 3-d spatial vacuum. From this TSF is described a time-space template (TST) for the development of atomic elementary particle phenomena and associated fundamental interactions, deriving charge and mass for atomic particles, beyond which is explained the time-space wave (TSW) phenomenon of the TSF for both EM and Gravity, highlighting a new phenomenon that exists between EM and the proposed EM<sup>DIR</sup> (gravity analogue) field. This then finally gives allowance for the description of a time-space pulse (TSP) phenomenon as the simplest relationship between the wave mechanics of EM and G, highlighting the EM<sup>DIR</sup>-EM repulsive effect in nature, deriving the Vacuum constant of space, finally proposing an application for this new science.

**Keywords:** dimensional mechanics; wave-mechanics; time-space; mathematics; time; space; time-space field; time-space wave; time-space spin; time-space pulse; photon; EM; gravity; pulsar; gravitational waves; Vacuum Permittivity; Vacuum Permeability

## 1. Introduction

The process of physics theory can be compared to putting together a giant jigsaw of mathematical data, a quest of joining the data together in a manner that can explain the link between all the data and its relevance to the primary features of space (namely the size and shape of the universe) and time (its proposed age and future), *presumably in a mathematically data driven manner*. Technically it becomes a quest of being able to not just explain the historical reservoir of mathematical data, yet predicting the nature of particles in time that would be presumably accorded by any such theory explaining the physical nature of bodies in motion, and therefore all of reality. Physics nonetheless is incomplete in being able to link all the data, primarily failing to reach the mythical level of light and gravity as one, quantum gravity, how the field forces of gravity and EM can be connected, and what process in time and space that represents. Despite this, physics is able to quite thoroughly explain each facet of the whole with certain bespoke theories tailored to that phenomena it is explaining, failing nonetheless to join all the bespoke theories together as one; in each of the bespoke theories essentially failing to explain the greater whole.

The problem therefore with physics appears to be the underlying issue of the grand foundation, namely the foundation definitions for time and space, or it has failed to find a suitable mathematics that can explain what is currently defined for time and space, time as a 1-d arrow and space as a 3-d vacuum, commonly understood as Minkowski spacetime (4-d), and expedited as a mathematics predominantly with the Lorentz Transformations and the Fourier Series (and associated Hilbert spaces) systems. One shape that has become predominate through all the theory is that of cosmology as the grand design itself of reality, of time and space, in nominating a start date with the big bang, the  $\Lambda$ CDM model, through considering that all that is evident today would presumably be a result primarily of that big bang event. Therefore, for physics to practically explain the most fundamental nature of things would be to examine the earliest stars and their nature as an example of those initial conditions, which could then lend to the nature of our own local field forces and associated particle interactions.

There are a few issues along that process that have become obvious as a cause of debate among theoretical physicists, primarily the validity of relativity theory, and the disconnect between general relativity (as the theory of gravity) and quantum mechanics (as the theory of EM). Nonetheless, a common theme between both disciplines is the use of clocks to explain time and momentum to explain particles as a process of developing equations from those gross constructs, to explain the ever-finer structure itself of time and space. In other words, physics has set about explaining the finest nature of things, time and space, using the idea of clocks and momentum in **primarily** a mathematical way, despite momentum itself having a composition that is *indeed not* a primarily construct itself such as time and space. In theorising a beginning to time and space despite the manner in which it is approaching that process (the gross descriptors of clocks and momentum), physics upholds what it considers to be the most acceptable model presented thus far, namely the  $\Lambda$ CDM model, despite such a model itself having sizeable problems, namely the need for dark energy and dark matter which account for close to 80% of reality which cannot be accounted for by our observational instruments.

To address this general theoretical block physics has found itself in today, this paper shall present the theory to a new proposed phenomenon not accounted for in physics theory, a phenomenon that has

been left with the notion of simply “being cancelled out”, namely EM destructive interference resonance ( $EM^{DIR}$ ) and its repelling effect on an EM field, a phenomenon that would presumably be found everywhere, going under the physics radar in atomic matter and associated compounds, nonetheless resonating the very underlying fundamental interactions themselves and how they are described. The key ingredient to this phenomenon, termed  $EM^{DIR}$  (EM destructive interference resonance,  $EM-A^{DIR}$  for atomic, and  $EM-B^{DIR}$  for extra-atomic, or simply  $EM^{DIR}$ ), was considered through pursuing a new theory on time that replaces 1-d paradigm of time with 3 new paradigms, time-before time-now and time-after, that each represent time-points in space, its different facets ( $EM-A^{DIR}$  and  $EM-B^{DIR}$ ) presented in paper 22 ([22]: p17-20). As per the preceding 22 [1]-[22] papers, the last three to mention specifically, paper 20 [20] presented the case of the underlying mechanics between time and space highlighting the nature of this  $EM^{DIR}$  field effect with mass and gravity. Here in this paper shall be presented the theory proposing a new phenomenon associated to the  $EM^{DIR}$  field, namely  $EM^{DIR}$ -EM repulsion, an overlooked phenomenon in physics theory, explained and predicted it seems only by the theory presented here. In delivering such, first shall be presented in section 2 a general introduction on the fundamental particle interactions, following which sections 3 to 7 will then act as a continuation from paper 22 [22], more specifically explaining the nature of the new  $EM^{DIR}$  phenomenon from the perspective of the direct inter-relationship between time and space, describing the features of particle spin, charge, and mass, the field forces of EM and G, and finally the as-yet unheard of interaction between the EM and  $EM^{DIR}$  (G) fields.

One thing to note is the style of this paper, that being highly scripted. All of the papers [1]-[22] are like such, as the whole process of explanation relies on the principle of conceiving time and space as constructs of perceptive logic, not a mathematical equation per se of clocks and momentum. The mathematics comes into play nonetheless following a detailed explanation of the relationship of time and space *with perception*. In short, contemporary physics is primarily mathematics, as mathematics is considered the only tool of congress. This new theory takes the step of using a fuller explanation of the concepts of time and space *with perception*, and therefore much *new scripting* is required. The mathematics of course is still present for all the key equations, yet it is unavoidably associated with that required scripting. The scripting itself feeds the need to describe the very challenging nature of defining time and space and how they are inter-related, as it was found that mathematics alone cannot define time or space as much as mathematics relies on the ideas of time and space, points and so on, **to be mathematics**; to use mathematics alone to derive time and space, the nature of physics, will only present models, one model after the next, of different topological spatial shapes, and so on and so forth, a grid that seeks to catch the phenomena described in time and space, yet always failing to understand the why and the how of what it is trying to catch and thence describe as part of a general algorithm. The approach that has been taken with these papers is the one of treating the human mind like a natural computer, and accessing that computer’s time-algorithm, the temporal algorithm of human perception, to then put words to the nature of the relationship of time, that temporal algorithm, with space. Thence, as it so happens, all the equations of time and space become apparent by respecting the general need to clarify the association between time and space. Consequently, all the equations have only that common link, namely time and space, and how that obviously relates to the human perception ability.

## 2. Fundamental Particle Interactions

Physics takes two key approaches to the idea of field forces, the large scale, and the small scale. The large scale is predominantly the approach of general relativity (GR) for gravity theory, and the small scale approaches the field forces with quantum mechanics (QM) and quantum field theory (QFT) via the standard model (SM) of particles. Both approaches use the idea of clocks and momentum to describe field forces as per using Special Relativity (SR) as field interactions between elementary particles. What is missing here is a generalised field description linking small and large, with the implication here of needing to get cosmology right. So, there exists one key flaw in describing the field interactions themselves, namely not being able to join them, the large and the small, which is quite a big issue, for in what can't join the large and the small, then what can only exist in between can only be incomplete if not a fallacy. Another thing to note is that all of this is a description, the field forces, of what happens *upon spacetime*, and says nothing about any potential interaction **between** time and space.

What do we know of the actual fundamental interactions themselves? In physics, the fundamental interactions (four fundamental forces) are interactions that *do not appear* to be reducible to more basic interactions. They are the gravitational, electromagnetic, strong, and weak field forces. Technically all of such should be explained on the purely conceptual level of time and space, yet physics theory seeks to explain such using the idea of momentum (and inertia) with clocks and therefore mediated with basic particles, while *then* deriving definitions for time and space assuming time is 1-d and space 3-d by using these basic particles. By intentional theoretical design, each of the known fundamental interactions can be described mathematically as particles upon a field as per the use of clocks and momentum via Einstein's proposed tapestry of *spacetime*. Subsequently, the gravitational force is attributed to the curvature of *spacetime*, via the momentum-clock theory, as per GR, and the other three fundamental interactions are explained using QM as discrete quantum fields mediated by elementary particles described by the standard model (SM) of particle physics, the most basic particle being a massless photon which as a mathematics is modelled to Einstein's SR as QFT (just to keep it relevant with *spacetime*, as it only can, otherwise there would be no actual effect in play to join gravity with EM). In other words, the quest of physics is to marry those three fields with gravity while explaining the behavior of the fundamental particles involved in these interactions using momentum and clocks as descriptors. As it thus happens, physics theory considers that although the data clearly shows that the EM force is far stronger than gravity, the EM force ***cancels itself out within large objects***, so over large distances (on the scale of planets and galaxies), gravity tends to be the dominant force. And here is the iceberg that hits *spacetime* theory, namely "***EM cancelling itself out with large objects***" which as an explanation is technically not an exercise of proper physics, unless it were designed to be more elaborately put. Yet the basic problem remains nonetheless, namely trying to define fields with clocks and momentum without first addressing the dimensional mechanics of time-space itself as a "concept" of our perceptive ability per se, as essentially the field forces have been reduced to particles as carriers of the field forces and players to those carriers, all using the logic of linear time *clocks and momentum*. Yet all these particles have been constructed in the absence of understanding the EM<sup>DIR</sup> phenomenon, of EM "cancelling itself out", which

therefore makes those descriptors incorrect, or rather, incomplete as descriptors, and thus false descriptors.

In addressing this issue, the most overlooked idea is that a *field* requires dimensions, and this paper will address the field forces according to the dimensions of time and space, *through addressing the dimensions of time and space*, not described by clocks and momentum, yet described on their own terms as time and space as purely conceptual constructs, to then measure how waves are transferred through time and space from that more precise description, and how indeed an EM field that undergoes destructive interference (EM<sup>DIR</sup>) can have the effect of being non-inertial while also appearing to repel a standard EM field. If indeed according to GR and QM, EM **does indeed resist** a change in its motion, in that it is not possible to change the velocity of light without exerting a (gravitational) force on it, according to those theories, then the EM<sup>DIR</sup> field proposed in this paper is not seemingly of such a *spacetime* theory making, namely not of *inertial* gravity, yet non-inertial, and that requires an overhaul of the definition for time and space. Quite simply, according to *spacetime* theory, the only thing that can change the direction of light is gravity, so how indeed can an EM<sup>DIR</sup> field represent gravity, while also appearing to be non-inertial, as proposed in paper 22 ([22]: p17-20)? The answer requires physics to no longer describe the dimensions of time and space with clocks and momentum, and therefore replace the idea of inertia as a fundamental descriptor.

### 3. Conceiving Time and Space

Here are addressed the *concepts* of time and space and the *application* of *mathematics* to time and space, and the relevance of the human trait of time and space perception ability to mathematics, a necessarily scripted forwarding of ideas central to overcoming the simplicity of the arrow of time (clocks) and momentum as mathematical descriptors for time and space. Following this necessarily scripted section shall be presented the time-space wave-mechanics.

#### 3.1 The limitations of Mathematics: determinism and pixilation

One of the great paradoxes in physics theory central to the mathematics being employed for GR is the overlooked feature of mathematics trying to describe **ALL** of *spacetime* and therefore predict it, to predict everything with a mathematical formula in space and time as *spacetime*, while ignoring the fact that *spacetime* GR theory has in effect (in defining space and time mathematically as *spacetime*) cast itself as the device that *should* be able to as a mathematics predict everything in space and time. Yet can it? Can relativity theory, more specifically GR as *spacetime*, as a mathematics, predict everything mathematically in time and space? Is the mathematics of *spacetime* a deterministic tool? Is physics trying to make it one by using clocks and momentum as descriptors of time and space? If say an apple is red, discovered for the first time by *spacetime* theory, does that mean all apples must be red? Does it mean everything red must be an apple? *Spacetime* theory may have caught glimpses of the nature of time and

space, yet for it to be deterministic as a mathematics for time and space, then all apples must be red and everything red must be an apple.

Thus, is a *purely mathematical* approach to time and space going to be a successful adventure, to then explain physical reality? That is exactly what *spacetime* theory, GR, is attempting to do, in explaining space and time mathematically, using clocks and momentum. So too per using other mathematical models such as Hilbert space (and associated mathematical quaternions for 4-d space-time). Is it possible though? Gödel presented the case that reality **cannot** be reproduced entire in a theoretical format as a pure mathematical theory. Is therefore the problem with physics regarding the dimensions “*how*” physics approaches the dimensions as a manner of analysis, namely mathematics and the process of application? Is such the problem therefore in *spacetime* theory not accounting for the EM<sup>DIR</sup> phenomenon? For instance, to describe time and space with mathematics presumes that there could be a *mathematical determinacy* to everything associated to time and space, whatever that theory or branch of theory may be. Is that possible though? Secondly, given the current  $\Lambda$ CDM model, if mathematics seeks to describe time and space and therefore take upon the spectre of determinacy, mathematics is suggesting it takes precedence over time and space. Is that also right though, that mathematics can pre-date, pre-space, the big bang event? Thirdly, the idea of defining time and space with mathematics presents the issue of “pixilation”, of resolution, and of course “determinism”. Quite simply, if mathematics is used to describe time and space entirely, then it should be able to approach describing *why* events happen in time and space (determinism and causality) at every level of pixilation.

In approaching that mathematical spectre of capturing causality, the issue it seems is one of resolution of *definition toward* the basic principles of time and space as dimensions in the context of causality, of how the mathematics can describe the cause-effect of an event in parity to time and space, and how to achieve all of such with the finest of tuning (resolution, pixilation of time and space). A mathematical matrix contrived to the level of the Planck scale can capture anything, yet it cannot “*explain*” how and why the geometries of that mathematics *link all the bodies in motion and those associated energies*, simply because it is “just mathematics” without an agenda (something “not” mathematical). Indeed, that is what physics has trouble with regarding the notion of pure mathematics seeking to explain gravity and therefore as it would seem space and time, argued against though by Gödel’s incompleteness theorem. In short, mathematics can capture and model, yet can it ***explain the basis itself*** of time and space and those associated (as yet described it seems) mechanics? Or must mathematics accept it is being ***applied to*** time and space in the first place?

### 3.2 Momentum and Clocks: a blunt instrument

There is another overlooked issue at play in physics that could also represent a prelude to the mentioned EM<sup>DIR</sup>-EM repulsion phenomenon. For instance, one can describe the momentum of two basic objects as mass in plain sight, in a fairly general manner, a level of very low resolution/pixilation, yet to define the characteristics of what constitutes mass and hence momentum from (as close as possible to) the dimensions of time and space then one must require therefore the idea of momentum to be

superseded as a descriptor, as clearly momentum does not exist between space and time as a fundamental definition, or does it? The issue is really central to the need of superseding the logic of plain sight bodies in motion in order to understand the inner mechanics related to time and space, and *then* script clocks and momentum from that level, and not base physics on the basic plain-sight *observed* level of force and momentum as a mathematics; such is going deeper than the idea of mathematics, reaching into the idea itself of “what is conceivable” in the first place and why, **not** relying on "plain sight" logic with telescopes or microscopes, yet going to the deepest substructures, namely time and space themselves, with that respect due for that deeper level of logic. To achieve that logic, one needs to analyse the basic features of human perception and relate such to an algorithm of time.

The issue therefore regarding the nature of time and space is “what is conceivable”, and that is a question of the very logic of our perceptive ability regarding time and space. The implication here is asking the human mind, and therefore the process of physics, to consider basing what it observes **on a more fundamental thing of mechanics**, namely the mechanics of time and space (not therefore as described by Einstein who based *spacetime* on the basic observation of time with clocks and mass with momentum), namely human perceptive ability. There, Gödel’s incompleteness theorem is addressed, namely the incompleteness of mathematics describing the ultimate relationship between time and space, of what is calculable; mathematics is not being considered on this a-priori level per se, not initially, not “in the beginning”, not “most fundamentally”. What **is** “most fundamentally” being considered, proposed as a definition, for time and space is what time and space most simply represent as concepts to human perception *based on* human perceptive performance *with* the concepts of time and space. In short, should not the logic of what human perception conceives/perceives of time and space take precedence for **any** theory of time and space? The point being made here is that a fundamental basis for the human ability of conceiving space and time needs to form a standard of dialogue and theory *in the first place*.

### 3.3 Addressing temporal perception

The key problem therefore regarding the definition of the dimensions, to be more specific, is the reliance on linear time, as there would be no problem with how physics has gone about addressing the dimensions if 3-d space as a vacuum is clearly not in dispute, and that the only thing left to consider is the concept of time. Quite simply, linear time as a concept itself *presumes* time to be *a function with space* that carries all plain-sight laws equally in a manner of causality *without* granting the idea of time itself a unique function *with* space, and as such presumes reality ultimately to be made of collision prone particles (whether massless or not) in space subject to linear time causality. Fundamentally in terms of the dimensions, from the time the Michelson-Morley Experiment disproved aether, the idea of light as a wave gave way primarily to a massless particle, the photon, that has wave-like properties, as the idea itself of *a pure wave in empty space* had no basis in the absence of aether, aether which the Michelson-Morley Experiment disproved based on Einstein relativity logic (clocks and momentum). The solution for time in that regard of photons naturally became linear. *Time* being proposed as being *beyond* linear therefore meets with the task of explaining a potential property of light beyond the standard concept of the photon

particle. To keep the process fundamentally thorough and secure, what needs to be addressed is the fundamental idea itself *of the human ability* to be aware of time and space *in the first place*, and how can that be measured, namely what is that metric of logic with time and space, and therefore what is the nature of such an eye to make mathematics useful from a purely perceptive level of logic of time and space. Once a fundamental basis of examining time and space can be presented as relevant to our perception ability for time and space (as shall be shortly discussed), the basic error of physics theory trying to explain time and space as *spacetime* with the characters of momentum and linear-time clocks is dissolved. To execute this process, one must be entirely theoretical to explain that which is entirely theoretical. The question is "how". The answer is to stick to the basics of human perception and time. The next step would be to then derive all of what is considered to be the known physical laws and equations thereof.

So, what is the solution to properly conceiving time and space and thence obviously deriving a suitable mathematics to then presumably derive the particles and associated qualities of spin, charge, and mass, together with the field forces? The solution is simple: the human ability of perception itself as much as it can perceive reality should also have the ability to theorize what it perceives to be real as a description in line with its general ability of perception. The issue ultimately is reaching results that meet with observed phenomena, and that such observed phenomena must of course meet with our perception ability, as simple as that. It would therefore only be only from a perception basis upon any such theoretical quest of a pan-theory that reality can be properly described "*in general*", not as an "*ultimate mathematical finality*", not as a "*final ultimate achievement*", not as a deterministic endeavour, yet as a process of common scientific sense based on the ability of human perception itself, an ability which currently science does not yet have owing to the descriptive problems it has with the dimensions, that Einstein's relativity theory has now found trouble with. Specifically, if time were not considered as an arrow yet a point-point construct in space with features of time-before, time-now, and time-after, then light phenomena upon that basis can be better and more completely defined, as shall be explained in sections 4-7. Essentially the proposal is that time and space together have a unique process that acts as time-point carriers for phenomena, not temporal arrows of particles being explained with the mathematics of clocks and momentum, yet the dimensions of time and space themselves being that unique mathematics doing the explaining based on a temporal algorithm related to human perception ability as applied to 3-d space.

### 3.4 The mathematics of choice

Mathematics is quite a touchstone for time and space, a way to use a process of numbers that when applied to the dimensions *presumes to represent a true calculation* of events *in space*. Yet such is not true entirely. It works on a basic level in acknowledging the symmetries of the field forces and associated particles, as from a particle and field-force level basis, yet fails to account for the inherent *indeterminism* at play, which suggests all is not well with linear time per se. In short, mathematics as a calculation for particle interactions works by virtue of the common symmetries at play, yet beyond that idealistic scenario of determinism something else is required, namely a proper analysis of what the mathematics is being applied to, namely time and space, and the case in point is *time, that which*

*mathematics in contemporary physics cannot properly deliver with the appropriate predictions of the indeterministic behaviour of particles.* Particle behaviour in the context of symmetries can be predicted, however other facets regarding indeterminism inherent to the relationship between time and space, as can only be the case, cannot. Moreover, as per section 2, the issue is how to *better refine* the analysis of the dimensions themselves while using mathematics (by acknowledging that data) and that what is being perceived of the data *is a process itself* of our own basic logic of perception.

One key limitation of mathematics (in mathematics being applied to the arrow of time) is its deterministic nature and dependence on historical data, not a logic of interaction between time and space per se, yet historical data plotted on mathematical grids. It would be true to consider (according to the *time-line logic*) that everything of what is perceived today of reality in the here and now would be the result of everything that happened before it. That history, that time-before event, is a store, a continually developing store through the movement of time. The quest in physics to understand that repository is really only at best an *account* of what is happening right now, now to the next now. Mathematics in the process of repository recognition is fulfilling an art of gathering data to better determine the here and now at best. Better than that is understanding the logic employed to do that in the first place, namely how our logic of perception relates with time and space, completely on a fundamental level, time-before, time-now, *and* time-after, all in 3-d space as a time-now event.

### 3.5 Not confusing mathematics with space and time

In terms of how mathematics is employed to describe the dynamics of the dimensions, mathematics appears to become somewhat detached from the entire process. For instance, in describing the metric expansion of space, a concept used to describe the redshift effect of light, space expanding is not space as a vacuum, as nothing, "0" expanding, yet mathematics needing to make it so as a grid expanding (a metric, hence the term "metric expansion of space"). The assumption is *mathematics* in that process of expanding "0"; 0 is still 0. If "0" expands it would go beyond "0", a number beyond "0" and therefore no longer be "0" space. That is mathematics though, that's *not* space expanding. The solution with that paradox is to stick to what is "*real*", namely to what our *perception* prescribes for time and space. For instance, if a life form existed in 15 dimensions of space with a perception that accounts for that (in that life-form's plain sight), then it (that life form) would develop a mathematics for that natural fact. Mathematics needs to not confuse itself with the *primordial* nature of time and space other than recognizing what perception allows, and above all, what perception utilises. The solution there is to allow a discussion on how our perception primarily conceives time and space, and the case in point here is *time* and how our perception as a fully functional construct allows such an exercise, namely time-before, time-now, and time-after, and not a mere arrow in time-now. Fundamentally, the suggestion is that regarding mathematics and associated grids (cartesian, and so on), points per se can't be "assumed" in space with time; space and time as concepts need to be first considered on an a-priori basis relevant to our perception *ability* and those restrictions of natural order for the dimensions of time and space. *Then* the idea of points can become known as a mathematics of choice.

It seems natural to grant space with 3d "0", and that is not challenged here. The proposal is that it is *time* that interferes the spatial 3-d nothing, space creating a type of need to correct the "0" of itself (of space) as a process of point-point relativity, only possible by using the concept of *time*. By that process of spatial relativity, the suggestion is that points in space become temporal entities. The question is how do those temporal points manifest, more specifically, how do they relate to our code of perception in order of course to relate a full account of what is happening, to do justice to our perception ability? The proposal is that in addressing the ideas of time and space, primarily time being the agitator of space, space the harbor of that agitation, points become instrumental. Together with this, the proposal is that the relationship between time and space as both restricted and allowed by our perceptive ability grants the idea of time to localize itself *everywhere* in space, somehow, as it can only do *in* a relationship with space, manifesting as time excitations everywhere, each attempting to converse through all of space beyond its own reference, and therefore presumably in a spherical front of temporal point activity. And that is where the problem starts, namely the requirement for time to find point-relativity with space, with the idea of what can only be infinite space as "0". The further proposal is that developing then how points of time in space accord to our perceptive ability of time-before time-now and time-after grants the development of mathematics, noting that such a mathematics is indeed not entire of itself, not absolute, not complete, as much as it relies on the primary relationship of time with space which itself is a step beyond mathematics, and why therefore mathematics can only fail to explain the nature of everything as an algorithm *absolutely*.

### 3.6 Perceptive priority: the *natural* time-space manifold

In giving the logic of temporal perception priority, everything as a process of logic would descend from our primary perceptive ability of time (and space). This starts with recognizing how we address time in its 3 basic features of time-before time-now and time-after *as time-points in space*, then once that function is established as infinite time-now time-points in just an infinite space as our perception grants it, the 3-d volume (of nothing) containing only the reference of time-points that each seek to find relativity in the 0-expanse *presents itself with far greater utility* than an arrow of time with arbitrary spatial points. It sounds very much like aether, yet what is aether? Space is still nothing (the vacuum), and so the only **aether** concept here is the idea of time-points having a potential existence everywhere and anywhere in space. Such was presented in paper 20 ([20]: p11-13) regarding the time-space uncertainty (TSU) principle and associated time-points with space. And it is the TSU principle that really highlights this *natural tensor* feature of definition separate to that of standard mathematical tensor manifold field descriptions, for here is not a Euclidean tensor manifold per se, not a vector or scalar field per se, yet something **prior** the concept of a mathematical scaffold, something primarily as an "uncertainty" of relationship between time and space, yet still comprehensible nonetheless according to our ability to conceive the ideas of time and space as time-points in space.

Conversely, without giving the idea of time primary importance in such a TSU principle manner, the topological mathematical modelling approach is what is employed today for the analysis of linear time and 3-d space, yet such a process puts itself *first, ahead* of the basic logic of perception, and therefore is primarily in error of "what is real" to our perception ability with time. The proposal here with this theory is

that **time** is the issue that ultimately gives 0-space (3-d) the feature of point relativity, as obvious as the concept is basic. Such a solution may appear quite simple, doing away with the need of transformation equations if and when the basis of time-space and those symmetries/asymmetries are established as a field, as only standard field equations for mass and charge ultimately are needed in that scenario, yet there are levels of difficulty to it in terms of the strict arrangements that would exist between the time points and space and thence the manifestation of particles, their qualities (spin, charge, mass) and associated relationship to the respective field forces, as sections 4-7 shall present. Nonetheless, the aim here is to keep the description exceptionally simple without confusing this primary level of definition with topological mathematics and associated scalar/vector fields.

The TSU principle developed in paper 20 ([20]:p11-13), as a key part of this theoretical proposal, is a **natural** transformation precedent for time points in space warranting a principle of relativity out-doing the need for strict mathematical transformation (Lorentz transformations, Fourier series with Hilbert space, etc) equations; the transitive connection there relies on the idea of examining all possible connections (infinite) between two event points, which the TSU accommodates for. The problem with contemporary mathematical transformations (whether the Lorentz transformation, Fourier series, and so on) is what it is being applied *to*. The idea itself of a mathematical transformation is essentially it being a utility of mathematics applied *to* points in space to measure particle-field characteristics of motion/force. The whole basis for it is to act as a mechanism of calculation to test the validity of a field-particle symmetry in play presuming that the principle of relativity is upheld for space and time, or in other words, presuming that there is a consistency of performance (relativity) between particles (mass and charge and spin) per their field interactions. So, essentially, the mathematical transformation process is a mathematical *scaffold* with the aim to test the principle of relativity, and it is assuming space to be a 3-d vacuum and time to be 1-d. Time and space though, as is being proposed here with this new approach to time (perceptive), could have a certain arrangement with each other (the case proposed here is that they do) that explains not just symmetries, yet **uncertainties** also (termed it the *time-space uncertainty (TSU)* principle). To understand the arrangement that time and space have with one another relevant to time-points in space and their relativity is to essentially uphold the idea that such a process **must** replace the need for mathematical transformation equations, as the concept of a transformation itself is granted in the definition and knowledge of the mechanics between time and space. The only thing to achieve with that knowledge is how particles and their qualities manifest/operate/perform on that time-space manifold, the different field forces thereof, and so on.

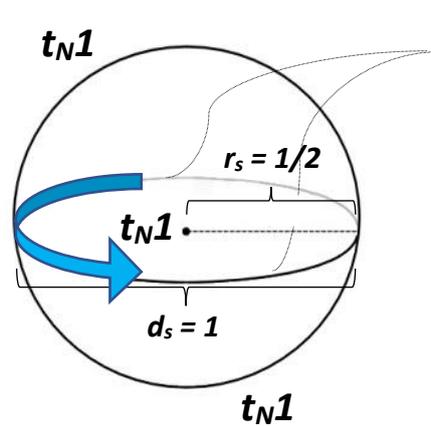
### 3.7 The unique dimensional mechanics between time and space

Thus, the issue of this proposed theory is accepting the dichotomy of time and space, and how mathematics is quite the tool *as our perception has it* to that process. Holding that tool nonetheless in that restrictive context (based on perceptive constraints and associated uncertainty between time-points in space) is important to explaining phenomena, time-point entities in such a context. In short, the proposal is that time and space are primarily conceptual things, and need to be handled in such a way, namely as primarily *conceptual* things, and therefore ideally handled as concepts of human perception "*ability*". 3-d

space is simple to conceptualise, yet the mechanics of time as per our perception is a little more abstract than a simple arrow, and that's where physics primarily lets itself down, namely time's arrow. As the theory presented here proposes, time is an infinitesimal dimension of points, connected to space as 3-d. It could also be viewed as three paradigms, time-before time-now and time-after, as per linking time-before with time-after to time-now as an overall time-now algorithm in just the one standard 3-d space, resulting in time's arrow. The interesting feature about the whole process is that the algorithm prescribes the golden-ratio which becomes a natural fractal of time-points in space. It is those three paradigms that the mathematics for time and space can be derived from, as presented in papers 1 [1] through to 19 [19], then paper 20 [20] as a general summary. So, paper 20 [20], "*Mathematical principles of Time and Energy*", needs particular attention paid to. Essentially, mathematics is derived from time and space through acknowledging the relationship between the three paradigms of time as time-points *in space*. It then presents the TSU as the inherent uncertainty that exists between time and space given they are unique to each other, and from this a wave-function can develop upon these time-points in space. Papers 20-22 [20][21][22] focussed on the specific relationship between time and space that accords the general symmetries and asymmetries found with the time-point phenomena in space, and so here the task is to relate such to particles and their associated qualities of spin, mass, and charge together with their related field forces. Essentially, this paper is a continuation of paper 22 [22] and the last principle presented there, the time-space pulse (TSP). Before the TSP can be explained fully however, 4 new terms must be introduced, time-space spin (explaining particle spin), time-space field (explaining the basic time-space backdrop as a field carrier), time-space template (explaining the particle atomic reference with charge and mass), and time-space wave (explaining wave-mechanics in time-space for mass and charge).

#### 4. Time-Space Spin (TSS)

Once again, the proposed time-space domain *is purely conceptual* until the mathematical equations themselves become evident. As per paper 20 ([20]: p11-13) the time-space uncertainty (TSU) principle is considered as the basis for the mathematics to formally develop from, and thus is still entirely conceptual in nature in the constraints of its definition despite matching observed data/phenomena. From the TSU principle was developed the time-space context (TSC) as a need to identify a context for a TSU reference. This then led to the idea of a time-space groove (TSG), time as a temporal ring (groove) seeking to entwine itself with a spatial sphere, re-presented here as figure 1.



TIME-SPACE GROOVE (TSG)

Figure 1 ([21]: Fig7): The TSG depicted here as the time-circumference "groove" with the  $t_{N1}$  time-point existing anywhere on the spatial time-front sphere surface area where the time-space "groove" traces, hence the idea of an overall TSU  $t_{N1}$ .

The TSG simply, as a time-space track, is a spin, of the groove, as an overall TSU  $t_{N1}$ , *time-now* event, as per the time-algorithm presented in paper 1 ([1]: p3-5) and paper 20 ([20]: p14-15). The next-step proposal is to take "all" the time-points central to the TSU principle formulation, and entrust them to the TSG, and thus ultimately have been localised in a cross pattern as presented in figures 2-6. The reason for doing this is to accept that the time-points would exist ultimately on the TSG as a most fundamental state of reference from paper 20 ([20]: p12, fig 5), as follows:

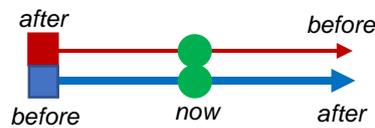


Figure 2 ([20], p12, fig5): the time axes of before>after and after>before overlapping in such a fashion where the after and before tails join and the before and after heads join.

Which then becomes figure 3:

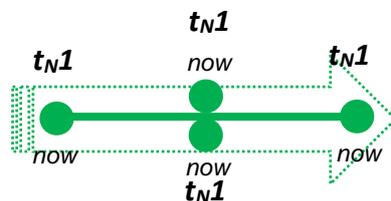
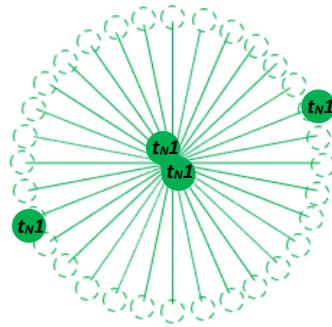


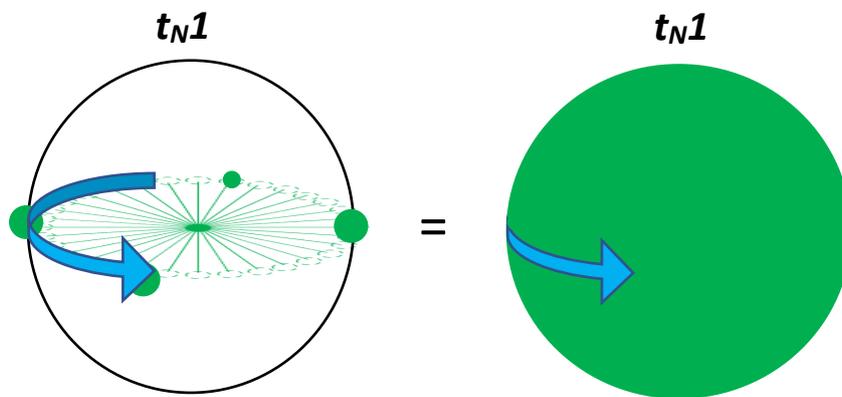
Figure 3: the overall arrow for time using the four basic  $t_{N1}$  points.

When applied to the infinite spread of potential alignments from figure 7 paper 20 ([20], p13, fig7), the following can be considered, figure 4:



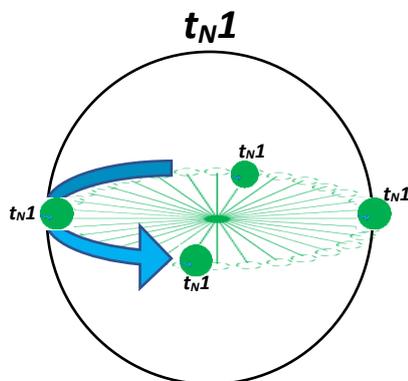
**Figure 4 ([20]: fig7):** an infinite number of potential before-after-after-before  $t_{N1}$  zones around the central  $t_{N1}$  zone forming a circular perimeter ( $\pi t$ ) sphere, yet what would be a 3-d sphere.

The next step **to** the TSG level putting the  $t_{N1}$  time-points on the spatial temporal groove itself as per figure 5.



**Figure 5** The TSG depicted here as the time-circumference “groove” with the  $t_{N1}$  points all localised on the time-space “groove” track, noting that the overall reference itself of the TSG is a  $t_{N1}$  construct, as per figure 4.

Therefore, each time-point would have a spin as per figure 6.



**Figure 6:** The TSG depicted here as the time-circumference “groove” with the  $t_{N1}$  placed on the time-space “groove” track, each time-point having its own spin as though being their own individual TSG.

In a most basic sense therefore, there is an overall orbital spin of the time points (TSG), together with a time-point spin of the time-points themselves, say as a time-space spin (TSS) for the time-points. Feeding this back now to the TSC principle, the idea of an infinite array of time-point contexts in space, time-points all spinning relative to space, forming an infinite array of time-point behaviour in space, a type of interconnected dimension of four time-points within a time-point associated to four time-points, and so on and so forth, all forming a lattice in space via the time-space groove (TSG) with the accompanying TSU principle in play, like a *fractal temporal aether*, for as highlighted in papers 1-19 [1]-[19], the connection between the time-points based on their associated mathematical equation (golden ratio) represents a fractal progression (Fibonacci sequence).

In short, the only way the time points can interact with space is if these time-points have an intrinsic spin relative to each other, to time-space, as time-points, as time would need to have in regard to any spatial reference, namely movement in space, and therefore described here as a point-spin, as the time-space spin (TSS) points, all inter-connected within the one 0-space reference according to a TSU principle. The next question to ask is how these infinitesimal time points spinning would group with one another in space. Note that the TSU principle gives uncertainty to the spin on a fundamental level, yet of course patterns as spin-cycles would develop in this overall time-space field of time-point spin. The question is how. Although papers 1-22 [1]-[22] delivered the mathematics for the golden-ratio framework of interconnectedness of the time-points, the actual time-space field (TSF) for such to event itself needs to be described.

## 5. Time-Space Field (TSF)

This is where mathematics gets into trouble, trying to define space and time as a **spacetime mathematical field primarily as a mathematical construct**, a geometric construct, with mathematical processes that seek to “dictate” reality, to **be** space and time, as opposed to allowing the time-points in space to represent a basic field itself *of all possibility* according to the simple premise itself of time and space and those fundamental interactions (TSU, TSC, TSG, TSS). Specifically, mathematics gets into a muddle with trying to connect the Planck scale with the shock front of the proposed  $\Lambda$ CDM model, and that is the problem, as it tries to be deterministic with what is purely conceptual.

Proposed here is the time-space field (TSF) as the general universal large-scale TSG structure that would echo back into the small-scale TSG, and thus the small scale re-echo out to the large scale, all connected, all representing a unique TSS anywhere in space, such that the motion of each point of time, conceptual point, is related to an overall TSG reference, small scale to large scale. The idea here is to create a conceptual grid of potential TSS time-points, all spinning relative to each other, the spin being by virtue of the concept of time itself, as it must, relative to space for a point, and relative to each other, of course with the TSU principle in play.

## 5.1 Time-point relativity

First, the exercise here of being purely conceptual with time and space cannot be understated enough, namely *why* being conceptual is required, and how that aims to model what is perceived of reality. What is to be described here is how the time-points would be equally relative to each other in terms of their speed of communication, as presented in paper 20 ([2]:p11-13). The idea here is based on the time-space groove (TSG) ([21]: p22) in a time-space context (TSC) ([21]: p16-17), a TSC that could exist anywhere in infinite “0” space, and therefore a time-point existing anywhere in space, leading to the basic idea of an infinite number of TSS time-points in infinite “0” 3-d space, in a TSF, yet according to a constant mechanism in play determining the speed of relationship between the time-points despite the relative motion of any potential particle *upon* that time-space field of time-points.

Indeed, “what is the relationship regarding size and spin of each time-point, what is the size of this spin, is it a uniform spin, and so on and so forth?” The answer is provided by the TSU, namely *rate compared to what, size compared to what*, the point is *anything* is possible, especially with the TSU principle in play, yet of course within the limit of what is conceivable according to human perception, and what can be held in an overall TSU system. And what is conceivable is therefore the next question. As presented throughout the 22 papers [1]-[22], the relationship between the time-points holds that the inter-relationship is of one event of time to another being held in a golden ratio, a Fibonacci sequence, one fractal linked to another, all in what would appear to be a 3-d matrix of golden ratio fractals of TSS time-points. The question is, what happens with this veritable virtual reality of TSS points in space, all spinning in whatever way is required, in this purely conceptual realm of existence? To answer such a question the spin of each of the time-points in the general TSF needs further examination.

## 5.2 TSS aether

Perhaps an appropriate analogy for the TSF is the idea of ***aether***, a previously postulated medium for the propagation of light as a way to explain the wave features of light for light to be able to propagate through empty space. For of course, how can a wave travel through empty space if not for space harbouring a wave-permeable medium, or no waves at all yet particles? That was the question for centuries, and therefore the idea of the luminiferous aether was upheld for some time, rather than a spatial vacuum, providing the theoretical medium required for wave mechanics, before of course that model was dismissed by the Michelson-Morley Experiment. Nonetheless here with the TSF is a type of fractal (golden ratio) echo pattern of time-space that would presumably carry a wave-function of light and associated energy matrix, harbouring particles as types of TSF wave-functions, and so on and so forth. Does that make the TSF a candidate for aether therefore? It is not a corpuscle, it is not a particle, it is an infinite array of time-points in space with varying possibilities of spin. To say it is aether is to then discuss the results of the Michelson-Morley Experiment, and the concept of aether there betrays the concept of the TSF here, for the TSF here would give the same result for the Michelson Morley Experiment, as the speed of communication between the time points in space relative to any observer

would be a constant given the inter-relationship of all time-point spins and the derived value of “*c*” for any frame of reference for the time algorithm ([2]:p12-13, eq10), while still upholding the principle of light as a wave, not a particle, which is entirely self-evident in a 3-d TSF matrix of TSS time-points.

The TSF can be thought of as massless time-points, purely theoretical, no momentum, no inertia, just what they are as required for our conception of time with space, as presented throughout papers 20-22 [20]-[22]. The Michelson-Morley experiment attempted to detect the luminiferous aether, a supposed medium permeating space thought to be the carrier of light waves in attempting to detect the relative motion of matter through the stationary luminiferous aether ("aether wind"), It compared the speed of light in perpendicular directions, the result being negative, given no significant difference was detected between the speed of light in the direction of movement through the presumed aether, and the speed at right angles. The failure there of such a concept of aether lead to the development of Special Relativity and thence the concept of QM as per regarding light not as a wave yet a particle. Essentially, with that then understanding of aether by the results of the Michelson-Morley Experiment there could be no medium for waves, and so the photon, a light particle, was contrived to explain light as a particle, a massless particle as it could only be, travelling through space, still considered the only possible theory of choice. Yet the TSF here though allows for waves in space without the need for the photon description, and does **not** contradict the Michelson-Morley Experiment results, while still allowing for packages of light to travel through space in being in thermal equilibrium with mass as per the underlying pixilation of the TSF as unique time-points in space. Essentially the TSF prescribes the concept of physical laws have a certain symmetry at every point (time-point) in space, yet carried with such a type of uncertainty (TSU).

In short, the use of the theory explaining the photon is really a default in not finding evidence for the medium through which light travels as a wave. The TSF nonetheless supports everything that is described by the photon as a particle, as this TSF would prescribe, yet does so *better* in prescribing the TSF as that medium through which light travels **as a wave**. Essentially, The TSF is how the TSS represents a general universal feature for any reference in space and time, a universal symmetry platform, the “spatial” level for time and thus primarily a feature upon which all field forces would operate, most notably gravity (as presented In paper 21 ([21]: p16-22). The question is how this TSF relates to the idea of the field forces, to gravity, to EM, and of course to charge, and therefore ultimately to the wave-function which comprises the time-algorithm in space in the TSF. The obvious thing to now demonstrate is the charge and mass qualities (and of course spin) associated to the TSF.

## 6. Time-Space Template (TST)

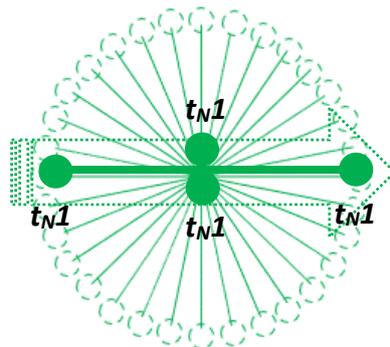
Here will be explained how mathematics gets involved in the process of examining time and space, and how particles can manifest with the qualities they do (with any such mathematics) yet above all in the TSF context.

## 6.1 TST Mechanics

Five key principles have thus far become apparent with this proposed time-space dimensional mechanics:

- TSU (time-space uncertainty) principle:
  - The idea of the time-points forming an uncertain cloud with a central certain time-point structure ([20]: p11-13)
- TSC (time-space context)
  - The use of a relative time-space frame of reference ([21]: p16-17))
- TSG (time-space groove)
  - The idea of the time-space connection, as a conceptual time-space ring, as an underlying association between time and space ([21]: p20-22)
- TSS (time-space spin)
  - A proposed feature between time and space as per the TSG using multiple TSC's to provide the idea of a relative motion in time-space for time-points.
- TSF (time space field)
  - The general tapestry of TSS time-points in an overall TSG context.

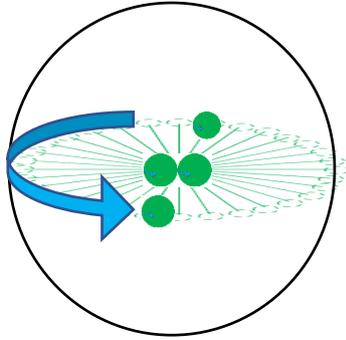
Now the proposal is to take the TSG as the ultimate context and then bring the TSF to accord with the initially proposed basic temporal *linear* function, as presented in paper 20 ([20]: p11-12), to bring into effect the idea of linear axes for space with time, and therefore allow standard Euclidean topography to take shape. The idea here is to take the standard triple (or more correctly, quadruple) time-point  $t_{N1}$  time-algorithm as presented in paper 20 ([20]: p11-13, fig1-7), here as figure 7 presented in the previous section as figure 3, with the added TSU backdrop.



**Figure 7:** the overall arrow for time using the four basic  $t_{N1}$  points on the TSU-TSG backdrop.

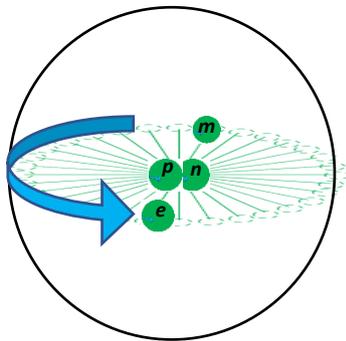
The idea of the straight line effected through the central  $t_{N1}$ - $t_{N1}$  region is as though taking two TSS time-points to form the basis of a mathematical “time-line”. Note that in this case there are two  $t_{N1}$  points in the centre and two other  $t_{N1}$  points diametrically opposed which could exist anywhere on the sphere

according to the TSU principle. The result this would have would be the as per figure 8, namely “four” “now” zones of time. The implication then is that each of these points would have an inherent “spin” by virtue of the more fundamental TSS principle which is now relayed to this new conceptual level of thought for time and space, as per figure 8.



**Figure 8:** The time-points depicted on the TSG flat-plate each with their own spin.

Here is developed the basic atomic template, the time-space template (TST). The issue is to now give these points unique features. The proposal is that there is a magnetic time-point (m), an electron time-point (e), a proton time-point (p), and a neutron time-point (n), as per figure 9.



**Figure 9:** The time-points depicted on the TSG flat-plate each with their own quality as electron (e), proton (p), neutron (n), and magnetic (m) time-points.

Note that a flat plane is still being used here in the sphere for simplicity, yet this flat plane can be in any alignment through the centre of the sphere. Note also that the most basic descriptors are being used here for the atomic template (proton time-point, neutron time-point, electron time-point, and magnetic time-point) despite as mentioned these time-points also having a vast internal time-point (elementary particle) structure, as presented in paper 4 ([4]: p4-17); the proposal has been in paper 4 [4] that these time-points would have a substructure presenting themselves as the elementary particles with their substructures, all according to the principle of the TSF with their associated qualities and thus characteristic spin, as presented here. The question now is, “how does this happen”, how does charge and mass and EM for instance just pop into existence, and is there greater substructure/character to these time-points? Although this process of manifestation was initially presented in paper 4 [4], more or less as a proposal of the mechanics itself of the time-algorithm representing a destructive interference resonance (DIR), the

feature to be presented here is how that time-algorithm can bring out these elementary features of the particles as a field force effect in the TSF.

Paper 4 [4] would be required preliminary reading here, without making the explanation seeming repetitive. In diving further then into the descriptions presented in paper 4 [4] regarding the manifestation of the basic particles, take the TST and restructure it according to paper 4 [4] and the fact that the magnetic time-point would be *out* of the TST **spherical** zone owing to its wave-function nature compared to that of the electrical component as explained in paper 2 ([2]: p5-11).

To now describe how all the qualities come into existence is a little complex, as those time-point qualities of the time-point particles would all exist with one another, be related to one another, interacting with one another, ultimately upon the TSF. For instance, the electrical component would exist with the magnetic component, as described as the PQWF in paper 2 ([2]: p8-10), the proton component would exist with the neutron component as presented in paper 4 ([4]: p4-6), the electron would exist in a cloud-shell of uncertain location, as presented in paper 20 ([20]: p13, fig7), and all the particles would have an underlying substructure as elementary particles described by the underlying time-points, as per paper 4 ([4]: p10-15). What should be presented here is how to explain those features through the lens of the TST.

## 6.2 Particle forces

As presented in paper 4 ([4]: p7-8), the strong-force is proposed to represent the TST fixation of the proton and neutron time-point particles, and the weak-force is proposed to be the outer electric-magnetic (EM) cloud-shell zone, the electric being a point-particle (difficult to locate as per the TSU principle), and the magnetic being a point yet *not* a particle (as technically it is not a part of the TST) and therefore the proposal is that this EM association (electron and magnetic time-points) represents a type of “weak” force of *decay* relevant to this unstable feature of EM. Associated to this is the concept of EM transmission as a field force, as per paper 4 [4].

What gives the TSF the basis of light speed transmission from one time-point to another? Light speed is the necessary condition of TSS time-point relativity. As presented in the previous paper ([22]: p18):

*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.*

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

In short, light speed is due to the consistency between time and space as the TSF, and therefore assumes such constancy in time-point relativity.

### 6.3 Particle status

As per the TSU principle, the *electron* time-point can be anywhere on the spherical template surface area, the *magnetic* time-point can likewise diametrically to the electron be anywhere, the *proton* time-point is centred, and the *neutron* time-point is centred. The question is, what gives the time-points **particle status** (mass) except for the *magnetic* time-point? The answer is that magnetism is out of the spherical loop (beyond the constraints of the “sphere” equation, in being dipolar, as presented in paper 2 ([2]: p7-11) in this arrangement, and so it is not apparent as a mass-construct in this *spherical* ( $\pi$ ) cloud. Further, as proposed in the previous paper, as mass approaches the speed of light it becomes as energy and loses mass, and therefore the electron would be the lightest particle, given its location is always uncertain in the cloud-shell and therefore presuming to have very fast speed. The proton and neutron though owing to their central location, virtually fixed, would be the standard particles, of roughly equal value of mass, with one particle (the proton) balancing the charge of the electron in an overall neutral TSF context. The questions remain, namely why and how ?

### 6.4 Charge

What is *charge* therefore, and why is there a duality of charge in the atom?

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*” for the TSF, 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 as initially presented in paper 22 ([22]: p18), here as equations 2 and 3:

$$m \cdot \frac{d}{t} = \text{fundamental property 1, } \underline{\text{<momentum>}} \quad (2)$$

$$e \cdot \frac{t}{d} = \text{fundamental property 2, } \underline{\text{<charge>}} \quad (3)$$

The proposal here is that fundamental property 1 as  $m \cdot \frac{d}{t}$  represents **momentum**, of course, and that fundamental property 2 as  $e \cdot \frac{t}{d}$  represents the concept of **charge**. The proposal therefore here is that momentum relates to charge if fundamental property 1 relates with fundamental property 2. Whys is this important? This is important in the fact that when  $\frac{d}{t} = c$ , when mass approaches the value of “*c*”, it becomes as  $\frac{e}{c}$ , and thus purely electric, as the charge of an electron,  $e_c$ . Therefore, when mass is light speed, its momentum designated by its mass becomes as *charge* designated by “ $e_c$ ”, and therefore the property of mass becoming faster has it develop charge.

In short, the proposal is that when mass is at light speed, it represents “charge”. How can mass be light speed? The TSU principle says it can be, as light speed essentially means it can be anywhere in the spherical time-point TST spherical zone, and it is this feature that creates the idea of *charge*, and in the case here, electric (negative) charge. Essentially, the time-point TSU principle cloud represents pure charge, mostly; there would be nonetheless a residual level of mass in association with the need for that time-point to have a location itself nonetheless.

Is this proposal an actual fact?

According to paper 2 ([2]: p13, eq11)],  $e_c = \frac{19.8 \cdot \lambda}{c} = 1.60218 \cdot 10^{-19} C$ , an actual fact. Charge therefore would exist as the electron cloud associated to a *magnetic* time-point, while also needing to be balanced with a positive charge of equal value to the electron, as such a balance of charge would need to exist as the property of the TSF and associated TST representing a type of overall neutral footing basis.

## 6.5 Proton, Neutron, and Electron mass

It would be now possible to calculate the mass of the proton (and neutron) if it is considered that such a basic time-point particle as mass when taken up to near light speed produces the charge equivalent to that of an electron. For instance:

- *If particle speed and wavelength are known, distance and time:*
  - *the charge can be calculated as  $e_c = \frac{19.8 \cdot \lambda}{c}$  ([2]: p13, eq11)*
  - *and so too its mass **from which the electron as a charge came** (in using  $m = \frac{e}{c^2}$  ([2]: p16, eq15) and  $e_c = \frac{e}{c} =$  fundamental property 2, eq3):*
    - *thus  $m$  equates to  $\cong 5.3 * 10^{-28}kg$*
  - *Factor this by  $\pi$  and the mass of a proton (or neutron) can be calculated.*
    - *Why a factor of  $\pi$ ?*
    - *The mass of the electron would have been “per”  $\pi$ , the actual spherical reference it is upon as the time-point cloud (TSG), yet the mass of the central time-point would not be per  $\pi$  and thus the  $5.3 * 10^{-28}kg$  value needs to be factored with  $\pi$ , giving:*
      - $\cong 1.67 * 10^{-27}kg$

Such would be the mass of a proton and neutron from this value of electron charge, a confirmed fact. Fundamentally here mass is related to charge and therefore gravity to EM.

What therefore is the value of mass for an electron, calculated from what and why? The electron would represent what makes the location of an electron *certain*, and here such would be dependent on its own wavelength as per the Compton wavelength in regard to the Planck scale, as per the fine structure constant equation, using the value of the Bohr radius, those exact descriptors in regard to the fine structure constant, and therefore as per  $e_c = \frac{19.8 \cdot \lambda}{c}$  ([2]: p13, eq11) central to its charge, which can then

be used to derive the Planck scale and  $E = e_c \left(\frac{19.8}{c}\right)^2 f$  ([3]: p3, eq1). The mass of the electron would also be held in the balance of the Rydberg equation as presented in paper 1 ([1]: p14, eq25), all confirmed facts derived by this new process of time and space definition. Essentially, the momentum of the electron presumably at  $c$  would represent the Planck scale itself per the wavelength  $\lambda$ , a time scaling per its spatial scaling.

## 6.6 Elementary particle time-point interaction

The potential exists to dive deeper into each particle as a time-space context (TSC), as a time-space spin (TSS) time-point structure with those associated TSS time-points. One basic feature is notable, namely that the TSS as with TSF defines two possibilities in regard to a TST:

- i. Orbital spin associated to the time-space groove (TSG)
- ii. Particle spin as independent time-space spin (TSS) time-points.

The idea of spin was presented in paper 4 ([4]: p8-9), and thence the idea of elementary particles ([4]: p10-17). Essentially, owing to the nature of the wave-function developed upon the TST (as initially presented in paper 2 ([2]: p11-12) in league with deriving the fine structure constant ([2]: p12), there exists a type of resonance of particle formation in that structure as an underlying substructure of elementary particles, paper 2 (p13-18). So, from the basis of the relationship between time and space, there evolves the idea of the TSF which then imparts into existence the particles and their associated internal elementary TSS qualities.

## 6.7 Absolute reference

In short, the key result here is identifying an absolute reference for the motion of a particle upon the TSF, namely the absolute reference of the time-space field (TSF) which acts very much like a **temporal** aether upon/through which particles and their qualities glide (for want of a better term). The next thing to explain is how the field forces play out with that temporal aether TSF.

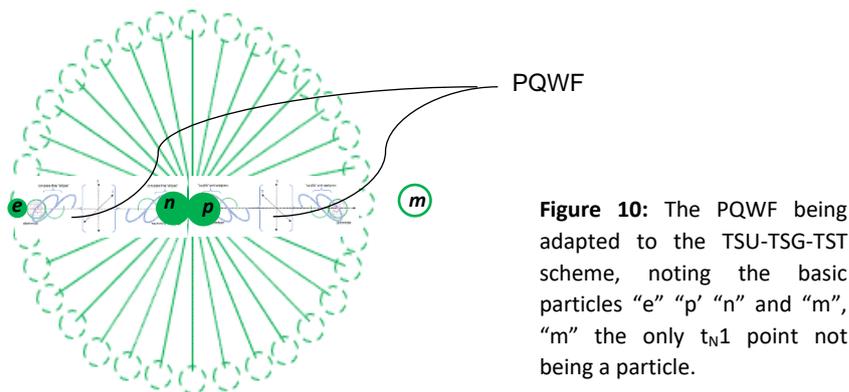
## 7. Time-Space Wave (TSW)

Here primarily will be explained the field forces of EM and gravity effected by charge and mass respectively. The recent 3 papers [20]-[22] have set the basis for the field interactions of EM and G in this TSU and TSG context, and therefore are essential reading, yet here will be explained the actual wave properties of the EM and G field forces through the TSF as a time-space wave (TSW). Quite simply, a TSW in the TSF would itself represent the basic need for each particle reference and its associated quality

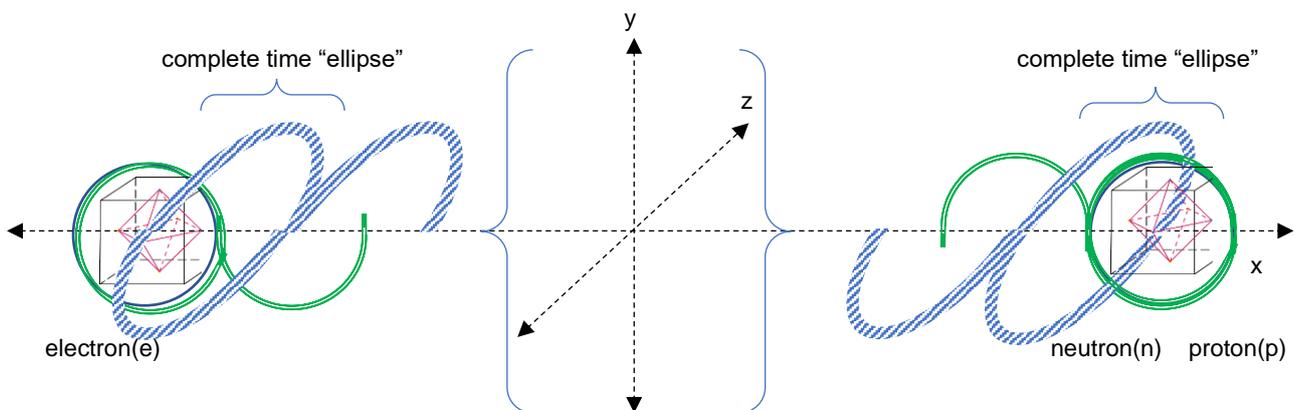
to find relativity with other locations in in the TSF according to the signature of its quality. How that is structured as a wave through the TSF will now be examined.

### 7.1 EM-TSW signature

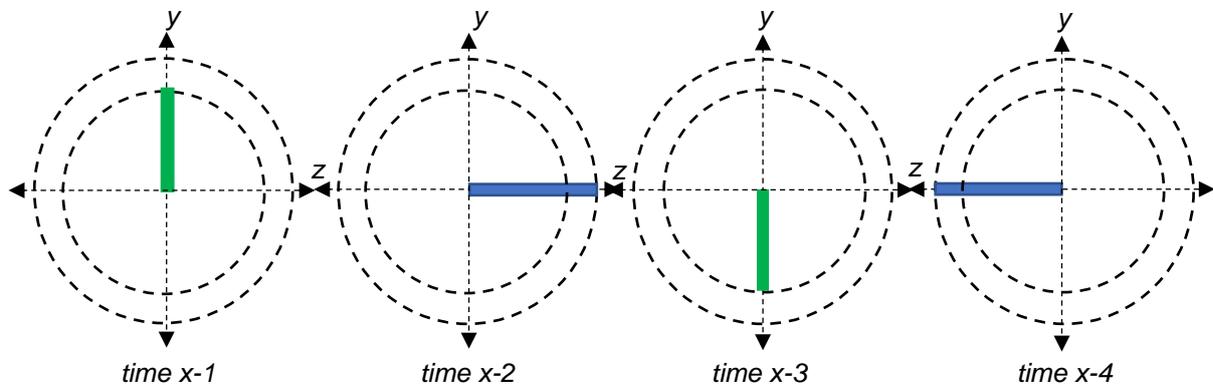
The EM signature has been the primary structure explained in the papers, first developed as the phi-quantum wave-function (PQWF) in paper 2 ([2]: p4-12). Applying that to the idea of the time-space template (TST) is as follows, as per paper 20 ([20]: p13, fig7), re-adapted with the TST as figure 10.



Now, as a field interaction in its most basic sense, it needs to be applied to the TSS construct. The proposal is that the wave would be conceived most basically (as such is all that can be proposed, namely conceiving the structure of the wave-function) in accordance with two axes (y, z) travelling along a third (x), of course in any direction, spherically from a point particle reference nonetheless at “c”, This was presented in paper 4 ([4]: p13, fig14), here as figure 11.

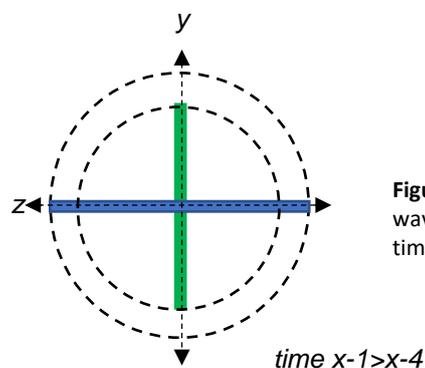


Here, this can be represented as per figure 12 according to 4 time steps (x-axis; time x-1 to x-4) showing the development of that wave-function as though sinusoidal in accordance with the outlying TSG function, view looking into the page as though along/into the x axis of the previous figure (figure 11).



**Figure 12:** symbolic representation of the wave-function temporal steps along the x-axis, the green symbolic of the electrical function, blue symbolic of the magnetic function, through the x-axis time-steps of x-1 to x-4.

Once again, this would propagate through the TSF as a spherical wavefront, which is a little difficult to draw as this EM-TSS field, so left with an explanation here. Simply though, the wave function along the x-axis could be neatly described as a compound representation in time as per figure 13.



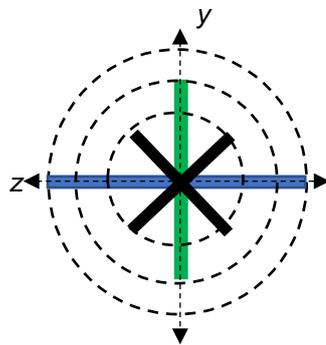
**Figure 13:** symbolic representation of the EM wave-function (PQWF) for time x-1 through to time x-4.

As per paper 2 ([2]: p5-12), paper 4 ([4]: p4-9) and thence paper 20 ([20]: p10-20), this EM-TSW manifests both atomically (EM-A) and extra-atomically (EM-B). EM nonetheless is associated to charge because motion is already implied in the relationship between space and time at “c” in making charge what it is. When a charge particle then moves relative to the general TSF back-drop it generates an EM shape field according to that motion, as per the nature of the PQWF, hence the idea of EM induction. Such is the key issue, namely relative motion of charge to the TSF, creating this wave, and that therefore charge itself is implicit of as type of relative motion. The EM interaction in the atom is a type of completeness of balance of charge nonetheless, and any imbalance of charge would manifest as a radiation field. Note that the

general imbalance of radiation ultimately would represent the most fundamental level of radiation release from atoms, as a universal TSF EM-TSW, which the series of papers here have calculated to be the CMBR in line with the Lamb Shift effect ([14]: p23-24, eq8-10), confirmed facts.

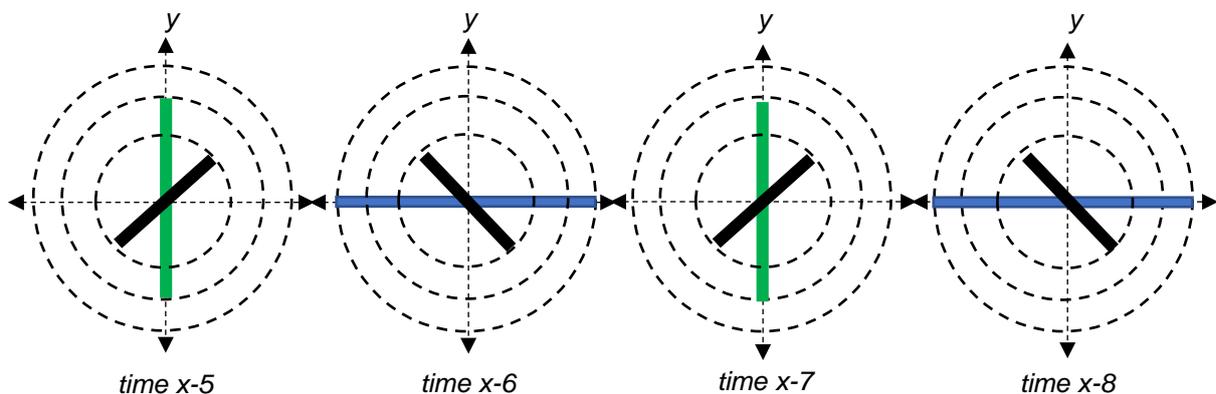
## 7.2 EM<sup>DIR</sup>-TSW signature

The EM<sup>DIR</sup> (destructive interference resonance) wave is a little different to describe, for it would have its own unique wave-function **potential** separate to that of an EM field, still abiding nonetheless by the TSF and associated TSG process of time movement function. The only way to explain this is to propose most simply that it would exist at 45° to the alignment of the “z” and “y” axis EM-TSW field, as per figure 14.



**Figure 14:** Note here the installment diagrammatically of the proposed EM<sup>DIR</sup> field axes, marked as a black-cross 45° to the “y” and “z” axes.

As a field interaction this is slightly different, as the resonance here happens in a different manner, as per the following diagrams for the new time period along the x-axis of time x-5 to time x-8. Note that a **double** EM wave is used in each step for the destructive interference resonance EM<sup>DIR</sup> step to be performed as per figure 15.



**Figure 15:** symbolic representation of the wave-function temporal steps along the x-axis, the green symbolic of the electrical function, blue symbolic of the magnetic function, through the x-axis time-steps of x-5 to x-8, highlighting the new wave-function EM<sup>DIR</sup> 45° in alignment to that of the electrical (green) and magnetic (blue) EM wave-function.

As a wave though this is not evident for  $EM^{DIR}$  and therefore for mass, as it is a *destructive interference* wave, and so there would exist an “incursion” along the x-axis **ALSO**, marking a  $45^\circ$  shift along the x-axis direction. One most basic example of this would be a particle spin along the x-axis  $45^\circ$  incursion (which shall be explained per the TSP description shortly). Another example of this field effect would be if two masses were to revolve around (relative to) each other then they could produce a wave as a time-space field distortion. Evidence for this effect exists in nature with what is considered to be binary neutron *stars* as they coalesce. This is different to the idea of gravity that was explained in paper 22 ([22]: p15):

*Individual masses (G-A<sub>1</sub>, G-A<sub>2</sub>, etc) assume to be gravity (G-B<sub>1</sub>, G-B<sub>2</sub>, 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.*

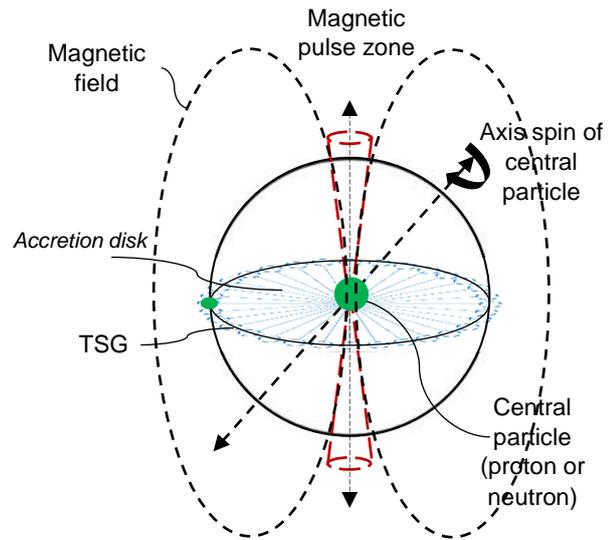
Here though with gravitational waves, the idea of G-A creating a wave in G-B is the issue, and would do so as a relative change of time in space in the TSF for the G-A bodies in relative motion. A third thing to consider is that it is also possible to suggest that an  $EM^{DIR}$ -TSW can be considered as a fundamental distortion in an overall background EM-TSW (CMBR), thus having the CMBR present itself as an overall “flattened” landscape (as a general  $EM^{DIR}$  effect in space), which explains the Flatness and Horizon problems as presented in paper 17 ([17]: p3-4), confirmed facts.

### 7.3 EM- $EM^{DIR}$ Interference: Time-Space Pulse (TSP)

The question now is how the EM-TSW and  $EM^{DIR}$ -TSW fields inter-relate. Given the purely unique nature of both wave-function constructs, it can only be considered that they **repel** each other, in a completely **non-inertial** manner. In other words, the description of these fields has not gone via the route of clocks and momentum, yet a detailed discussion on the relation between time and space as our perception would appreciate it. Most simply therefore, how would this phenomenon of EM- $EM^{DIR}$  interference manifest *in nature*?

In explaining the EM- $EM^{DIR}$  interference, the movement of the  $EM^{DIR}$  would manifest as a particle spin (x-axis), yet this would be at a  $45^\circ$  alignment to the EM axial field itself, namely the TSG groove rotation of electrical charge (as the magnetic time-point is technically not a charge or particle, yet a field association with charge). Therefore, in a most basic sense with the idea of particles (electron, proton, neutron) in terms of the time-space groove (TSG) alignment, as presented in paper 22 ([22]: p20-21, fig5-6) regarding the most **BASIC** particle interplay with space, in presenting the case of the BEC (Bose-Einstein Condensate), a magnetic field would be formed by the TSG axial rotation of electrons, yet at  $45^\circ$  to the magnetic field axis would be a mass spin of the central time-point particle, as per figure 16.

**Figure 16:** magnetic field (magnetic pulse zone) with a central particle axis spin at 45° to the magnetic field axis



In nature, this phenomenon is known as a pulsar, given the way the EM field that is focussed through this event periodically becomes stronger according to a certain observed reference. The idea of this time-space pulse (TSP) was presented in the previous paper 22 ([22]: p21) in explaining the nature of *ultimate particle decay* in the outermost region of space in the TSF, suggesting that this TSP would feature regularly in regions of atomic decay, namely the stars. The other implication here is the scale of the stars, namely their alleged size, which this theory puts at the opposite end of the scale of size, namely atomic, not stellar, and as this theory proposes, along a scale of the Oort cloud where much of this phenomena would be occurring, as per paper 13 ([13]: p10-19), a zone of ultimate atomic decay.

Other features of the context of these pulsars is where they are happening, the context they are happening in (mass degradation) and those associated time-dilation effects natural in play, namely the effect of mass disintegration producing charge as though moving at high speed, causing a type of increase in energy and therefore “time”, and thus temporal dilation, suggesting that possibly therefore what is seen of the stars is time-dilated, as mass breaking down to charge. More locally, the synthesis here of these two field signatures as an overall interaction would represent a signature of “motion” between all particulate matter, whether as individual elementary particles, individual atoms, leading to what would be considered as atomic interactions forming compounds, to what we perceive of matter today, a pulsing backdrop of EM and G interactivity upon which the field forces would exert their distinct features upon their own particle family. The general shape of this overall pattern shall be addressed in a subsequent paper.

#### 7.4 EM-EM<sup>DIR</sup> Repulsion: Vacuum Permittivity/Permeability

Perhaps though the idea of the TSP can be taken a step further, more fundamentally, to the very relationship between not just EM and EM<sup>DIR</sup>, yet EM and space given an EM<sup>DIR</sup> field is an analogue for space, for G-B, as presented in paper 21 (REF). The issue that contemporary physics has with the EM<sup>DIR</sup>

phenomenon is that when the DIR (destructive interference resonance) happens it would appear to be just a blank spot, as though the energy and wave-function have disappeared, held nonetheless in the very tensor of the vacuum of space as much of the EM waves still travel/propagate in that field beyond those  $EM^{DIR}$  zones where they experience destructive interference. In the interpretation here with this theory, the  $EM^{DIR}$  field takes that energy with the potential of being repulsive to EM; in fact, the  $EM^{DIR}$  field is the very tensor/pressure putting itself  $45^\circ$  out of the standard axial alignment for EM. Thus the question of “*how indeed can the  $EM^{DIR}$  be repulsive to EM waves apparently just travelling through these destructive interference resonance black-spots?*” is answered with the principle of the  $EM^{DIR}$ -EM relationship being repulsive according to a particular alignment, according to a particular mechanics of time-space, and as the case presents here, that would be the bang-on alignment of an  $EM^{DIR}$  field with an EM (electrical) field causing the  $45^\circ$  repulsive incursion between the  $EM^{DIR}$  and EM fields. Therefore, although the  $EM^{DIR}$  field allows passage through it in an EM- $45^\circ$  relationship, an alignment different to the EM field, the  $EM^{DIR}$  field would repel an EM field when confronted head on by that EM field. In the  $EM^{DIR}$  repelling the EM field, the  $EM^{DIR}$  field merely encodes a “realignment” for the EM field away from it, as what can only be proposed to be a push against the interfering EM field; the issue here is that “forcing” that  $EM^{DIR}$  tensed time-space field (TSG) to change its alignment would, in theory, be resisted by the  $EM^{DIR}$  field, and therefore that  $EM^{DIR}$  field would push against the interfering EM field. Once again, the interfering EM field would most logically be an electric field (and not magnetic) facing off against (as a spherical front of field lines) the  $EM^{DIR}$  field.

Nonetheless, what is this EM- $EM^{DIR}$  repulsion significant to more generally? Essentially, it represents the resistance between EM and space, between the propagation of light in space and EM, between EM and the G-B ( $EM^{DIR}$ ), noting that  $EM^{DIR}$  is a signature of the spatial G-B field, as presented in papers 21 ([21]: p16-23) and 22 ([22]: p13-17). This resistance is more commonly known as the “Vacuum Permittivity” ( $\epsilon_0$ ) of space, and here its value would be based on the idea of space as 3-d using this  $EM^{DIR}$  field bang-on against an EM field as a spatial surface area of the EM propagation front in space, and the resistance encountered there. In a basic spatial TSG unit, the factor according to the TSG would be  $4\pi r^2$  where  $r = 1$ , and therefore  $4\pi$ .

Going back to paper 21 ([21]: p19, fig3), as per  $Q_{AB} = \frac{Q_C c^2 Q_A Q_B}{d_{AB} d_{BA}} (C^3 t^{-2})$ , there the basic equation of electrostatic force was presented in the context of the EM (EM-B) field. Here, the value of this resistance between EM (EM-B) and  $EM^{DIR}$  (EM-B $^{DIR}$ ), as per paper 21 ([21]: p21), would represent a value “per” (inversely proportional to) two key things therefore:

- (i) the first being  $4\pi$  (as presented),
- (ii) and the second being the coulomb's constant, or as the theory here presented in paper 21 ([21]: p19, fig3), and as from paper 1 ([1], p10, eq14), *charge* as follows:

$$\text{if } Q_{AB<NEWTONS>} = \frac{Q_C c^2 Q_A Q_B}{d_{AB} d_{BA}} (C^3 t^{-2}), \text{ then } k_e = Q_C \cdot c^2. \quad (4)$$

And so, the following equation for this Vacuum Permittivity ( $\epsilon_0$ ) would be correct:

$$\varepsilon_0 = \frac{1}{4\pi} \times \frac{1}{Q_C \cdot c^2} = \frac{1}{4\pi \cdot k_e} \quad (5)$$

And therefore:

$$k_e = \frac{1}{4\pi \cdot \varepsilon_0} \quad (6)$$

Once again with the previous derivations, this is also a known fact. This value has been reached though through deriving all associated constants and values for energy, mass, and light using this new algorithm for time in space. It is also important to note that the value of  $\varepsilon_0$  also abides by the following equation:

$$\varepsilon_0 = \frac{1}{\mu_0 \cdot c^2} \quad (7)$$

Here  $\mu_0$  is the magnetic constant (Vacuum Permeability), which according to the theory presented here in considering  $\varepsilon_0 = \frac{1}{4\pi \cdot Q_C \cdot c^2}$ , then  $\mu_0 = 4\pi \cdot Q_C$ , which presents the case of magnetic permeability related to charge, charge factored to a surface area of space (as prescribed by the TSU), noting that the magnetic time-point is a time-point per se, not a particle, and so the key implication here once again being that it would be *charge* that is the ideal EM agitator against an EM<sup>DIR</sup> field, and thus an electric field, which seems logical.

The question then of how to create the EM<sup>DIR</sup> field is to most simply create a RF (radio frequency) field in the centre of a spherical resonance chamber and for simplicity have an EM field (electric field, positive or negative charged plate on the resonance chamber structure), be directed into the chamber from without, presenting an intruding electrical field into the chamber which would be repelled by the EM<sup>DIR</sup> field, yet of course according to that bang-on alignment to incur the 45° passage realignment repulsion. Further to that design challenge for the resonance chamber is that it is no easy feat to generate a RF field in the centre of a chamber without effecting the source RF structure itself, together with having an electrical field entering into the resonance chamber without causing adverse arcing on the body of the resonance chamber, which makes the design of resonance chambers for this task challenging.

According to the theory presented here nonetheless, the EM<sup>DIR</sup> "X" field (say EM<sup>DIR</sup>-X) is itself anchored to the general G-B *field of space*, to that vacuum. The G-B field of space is essentially the general spatial field that normal mass is influenced by as gravity, as presented in papers 21 ([21]: p16-23) and 22 ([22]: p13-17). So, the EM<sup>DIR</sup>-X field is anchored to the general spatial background thus, like EM<sup>DIR</sup>-X tyres on the G-B track, it grips. And therefore, when the EM<sup>DIR</sup>-X field pushes against an EM field, that EM field is forced away into a 45° tilt orientation, yet because the EM<sup>DIR</sup>-X field being generated is virtually insubstantial as a G-B field, as space, if the EM field in being pushed away is attached to a bulkhead also attached to the resonance chamber producing the EM<sup>DIR</sup>-X field, then that resonance chamber attached to the bulkhead is allowed to move along with the bulkhead as though not being opposed by it, virtually resistance free, as technically the EM<sup>DIR</sup>-X field is purely *spatial* in nature, and the EM field being pushed away has technically nothing to push back **upon** given the EM<sup>DIR</sup>-X field is

technically a spatial field. Therefore, the equation of force here would in-fact **NOT** be gravity based, and therefore presumably with a higher degree of acceleration possible than normal gravity (G-A↔G-B). The  $EM^{DIR↔G-A}$  effect that was sought for in experiments 1-6, as per paper 7 (EX-1, EX-2) ([7]: p6-16), paper 12 (EX-3) ([12]: p10-12), paper 17 (EX-4) ([17]: p18-22), paper 19 (EX-5) ([19]: p15-19), and paper 22 (EX-6) ([22]: p20-26), yielded limited results. Yet the tensor between the  $EM^{DIR-X}$  and EM fields here would presumably be of an electrical nature, and therefore more significant results would be expected given the comparative strength of EM to gravity.

## 8. Conclusion

There are 4 key conclusions:

- A repulsive nature between EM and  $EM^{DIR-X}$  is proposed (warranting independent verification), opening the door to EM powered frictionless non-inertial (time-space based) thrust.
- The calculation of the mass of the proton (and neutron) from the charge of the electron, confirming the theory behind the nature of mass as it approaches light speed, namely becoming charge, and therefore warranting a change in the practice of relativity theory (SR and GR), establishing a link between charge and mass, and thus EM and gravity.
- The need to question the current theory of the photon regarding the propagation of light in space, and therefore QM, QFT, and SM.
- The need to question the actual metric scale applied to cosmology.

If time has a special relationship with space per se beyond the simple linear arrow, beyond clocks and momentum, it would no longer be linear yet somehow also needing to meet with the 3-dimensions of space, which is not “common sense” if time’s arrow is considered as basic “common sense” (as what a clock measures). Common sense therefore appears to be the problem when trying to define the nature of mass and therefore gravity. Physics can’t be so gross nonetheless on a fundamental level it seems in using simple common sense with clocks, rulers, and weights, yet embrace a *need* to address *fundamental features* of our *ability* to be aware of time and space *in the first place, and why that’s relevant*. Indeed, no one could understand physics using mathematics if not from the veritable particle swamp while using clocks and a ruler, namely without using what has been used, basic measurement devices understanding momentum, force, and so on. Yet as this theory has demonstrated, the idea therefore of the first ripple, the concept of first motion of time-space, the first thermodynamic event, the beginning of linear time and space, conveyed to presumably the first wave-function *as a way to explain physics*, is erroneous, namely the  $\Lambda$ CDM model, as it fails to recognise the deeper significance of the time-space field itself and those associated spinning time-points.

An underlying feature of this time-space proposal is that time and space therefore technically have no start or end date or location of origin or end, and so our application of perceptive logic is like diving into an eternal time-space temporal aether ocean; it's always been there, time and space, nothing and everything, whatever works with what is observed, the conception beckons. The problem therefore with the *current explanation* of cosmology is that it depends on the features of clocks and momentum, of linear time. When the arrow is given greater substructure though, clocks and momentum (which both use linear time) become clumsy descriptors, and the CMB anisotropies become a conundrum.

The general flow of the papers has been to initially take the algorithm and apply it as simply as possible to space, and then develop it from there while merely adhering to the logic employed for time and perception. The last 3 papers have then taken a specific interest in the nature of time and space themselves, the inter-mechanisms there, those dimensional mechanics. What has become interesting is that in further delving into the time-space mechanics, the patterns of the stars (pulsars, etc) are described, suggesting the stars themselves are based primarily on time-space basic mechanics, dimensional mechanics, and why wouldn't they be, yet also suggesting that their size is also not what it seems. Fundamentally though, the CMBR ([14]: p22-26, eq12) in its derivation through the use of this new algorithm for time presents a steady-state system, and therefore in regard to bodies in motion confirms CMBR *anisotropies*. That's one of the key problems in cosmology (flatness, horizon, monopole, etc), yet the work presented is able to solve all of such, except it changes the *theory* of cosmology, not what is observed, *very much so*, namely its "**scale**".

### Conflicts of Interest

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

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