Temporal Mechanics (D): Time-Space Metrics

Stephen H. Jarvis

email: shj@equusspace.com

©2021 Equus Aerospace Pty Ltd

Abstract: Here is presented the first of two additional instalments to what was initially envisaged to be a series of three papers, namely "Temporal Mechanics (A): Time-Space Constants", "Temporal Mechanics (B): Time-space Circuits", and "Temporal Mechanics (C): Time-Space Manifolds", here as Time-Space Metrics and in a subsequent paper as Time-Space Logistics. The importance of this fourth paper in this series of five upholds the need to detail what is recognized as an underlying theme through its three lead-up papers, namely time-space metrics being integral to the ideas of time-space constants, time-space circuits, and time-space manifolds, and what those "metrics" are, how those "metrics" can be demonstrated to exist from the microscopic scale (and elementary particle level) to the macroscopic scale (cosmological distances). Here therefore will be communicated the idea of a principle of relativity that conveys how the small scale relates with the large scale, how the elementary particle level works on a cosmological scale, and how that transference of metrics can be properly and consistently accounted for in the context of the previously presented time-space constants, circuits, and manifolds. In demonstration of these metrics will be derived the age of the perceived universe and the distance of the closest star to Sol, using the a priori metrics of Temporal Mechanics.

Keywords: temporal mechanics; temporal calculus; non-local; time-point; magnetic quantum shell; metric; Bohr radius

## 1.	Introduction

The utility of scales and measurements, "metrics" as can be simply known, is a way quite simply to "measure" reality, to measure space, to measure time, to measure the qualities of objects in space and time, in a standardised "metric" fashion. Commonly this is done with the basic metric system, namely the use of an arbitrarily defined measurement standard such as the metre for distance.

What shall be presented in this paper is the actual metric system utilised by Temporal Mechanics [1-33] *for time and space* in terms of the dimensional relationship between time and space, and how the dimensions of time and space are measured as per the basis of the accepted metric of distance, here as the known value for the $Bohr\ radius$ as $5.292 \cdot 10^{-11} m$, **from which using Temporal Mechanics, as shall be demonstrated, all other equations and constants for particle and field phenomena can be derived.**

Given Temporal Mechanics proposes a new a priori for time and space, a diversion to how Einstein linked space with time using mathematics, the mathematics of Temporal Mechanics here will be laid out on an a priori basis, using something more fundamental than light as a standard with space, namely "time".

Here, "time" is used as a way of measuring space, not light alone measuring mass/inertia (as per Special and general Relativity), although the speed of light (c) is still used (derived) as a constant for the interaction between time and space as a metric to measure events in space, as per a temporal definition of points in space, such as a locality in space communicating with each other at c.

This new process solves theoretic problems Einstein's Special and General theories of Relativity cannot, and derives all known equations and constants of atomic phenomena (including vacuum energy), together with conforming to the known and required set of metrics and measurements of the elementary particles, together with the known dimensions of the solar system and associated phenomena of the stars. In other words, it solves the problem of Einstein's *quaternionic spacetime* and associated cosmological constant discrepancy with the ΛCDM model's metric expansion of space, by initiating the *a priori* of space <u>with time</u> (not light), thus being able to go *sub-light , or more precisely sub-EM,* with its theoretic exercise of numbers and equations.

Following this paper, "Time-Space Logistics" will be presented to highlight the overall process of logic that Temporal Mechanics has expedited, and comparing this system of logic to that of Einstein's Special and General relativity, Quantum Mechanics, and then Standard Model of the atom, demonstrating the limitations of Einstein's theories of relativity.

2.   Time-Space Circuits, Constants, and Manifolds

Temporal Mechanics (and $temporal\ calculus$) proposes via its theoretic modelling a holistic joining of known *microscopic* fundamental principles and associated values locally for the physics of this reality and then applies the same fundamental logic and reasoning to cosmology, to the greater *macroscopic* scale, a process much like using a repeating pattern/algorithm as timestamps in space with the task of merging that pattern with known fundamental laws of the particles and their field forces, as extended all the way to cosmological phenomena.

The three preceding papers in this series of 5 papers are therefore required reading; given this is a series of five papers (papers 31-35) that aim to summarise papers 1-30 [1-30], papers 31-33 [31-33]

prepare for what is to be now presented for the general metrics of time and space, from the microscopic scale to the macroscopic.

As presented in paper 31 "*Temporal Mechanics (A): Time-Space Circuits*" [31], Temporal Mechanics presented the idea of time-space constants:

The motive here is five-fold:

- *To present a new basis for the physical use of mathematics, namely as a time-equation, based on the human perception temporal awareness ability, laying the foundation for a physics that conforms to our human temporal perception ability.*
- *To then re-work all of what current spatial mathematics lays claim to by using this new mathematical formalism.*
- *To, by this process, thereby link the field forces under the one mathematical process, namely upon this new temporal calculus formalism.*
- *To achieve such by not needing unproveable entities, entities such as dark energy and dark matter.*
- *To then present a new more accurate cosmological model, or rather, one more substantiated than the ΛCDM model.*

As this paper shall present, time represents a perception-limited 2-d spherical wave-front manifold based on a fundamental time-space circuit ($TS\varphi$) that naturally derives a 3-d volume in its passage, manifesting phenomena that the $TS\varphi$ primarily gives rise to by its specific interference patterns in space as a 2-d spherical-front phenomenon. Subsequently, a new model for cosmology is mandated, as one that involves the use of no unconfirmed ingredients or qualities (such as dark matter and dark energy).

The mathematics employed here is not given free-reign as otherwise described by the certain function of spatial geometry via physics' common calculus approach of infinitesimals (partial, or complete), yet abides by the common basic principles of time in relation to space according to the ability of human perception; the mistake that physics makes in giving mathematics free reign with space is not made here by this new $temporal\ calculus$ process, yet guided by the constraints of human temporal perception abilities.

It will therefore be noticed that through the theoretic building process of the temporal algorithm with space there is eventuated a specific mathematics, namely clear temporal steps of time-space interdimensional mechanics, temporal steps for each specific energy and mass phenomena in space as based on those relevant phenomena qualities, those temporal steps of inter-dimensional (time and space) development for particles and their field force carriers, a specific inter-dimensional relationship of time with space, yielding <u>the known</u> equations for phenomena as understood by contemporary metric-space physics theory and associated mathematical equation formalisms. Consequently by this process, each phenomenon in space will be demonstrated to have a specific requirement to fulfill under the umbrella of the time-algorithm, the time-algorithm in prescribing a 1-d time-space circuit ($TS\varphi$) temporal event resulting in a primary 2-d region of temporal activity in space enshrouding 3-d space, giving the 2-d temporal event the appearance of volume with associated known physical attributes of energy, light, and mass, as it only can.

Further to this in paper 31, page 8 presented the following ([31]: p8):

As a broad description, it was proposed that the idea of time represents a sea of time-points that give rise to the idea of 3-d space, time-points that give space its 3-d character. The idea of how the time-points interact with 3-d space then became formalised as time-space dimensional mechanics, presented through papers 20-30 [20-30]. There, the time-points were explained in the context of how they form basic elementary/subatomic/atomic particles, and why, focussing primarily on how time as the time-points is divided into a stream of time-now time-points, time-point streams. This was initially presented in paper 20 as the arrow of a triple set of time-now time-points [20]: p11-13), the time-equation as a most basic time-space circuit ($TS\varphi$).

The summary there is that time-points as a time-before event are non-local, and they become local as time-now points via the time-equation time-space circuit ($TS\varphi$) mechanism, a mechanism which inadvertently creates an uncertainty between time and space termed the time-space uncertainty principle (TSU) ([20]: p13), which most basically leads to a fundamental construction of a cloud of time-points in their streaming. This then lead as a development of the $temporal\ calculus$ of the time-space template (TST) (atomic template) ([23]: 17-20), ultimately leading to (as per the previous paper's proposal) a Magnetic Quantum Shell (MQS) ([30]: p18-20) which appears to be the overall atomic lynch pin, supporting the value of the CMBR (and associated vacuum energy), the permittivity constant, and permeability constant, all in the correct context of the electron shell model according to the Rydberg equation for electron shell modelling, the atomic shell model, together with proposing a value for a recently discovered value of energy tagged by researchers at CERN as particle X17 ([30]: p18-19). Also derived was the nature of motion of these time-space templates as described in chapter 7 of paper 30 ([30: p20-21), together with the idea of light polarisation in the MQS explaining the nature of the helical motion of light ([30]: p20).

What makes the time-before time-points as time-now time-points (time now as $t_N = 1$) is the issue, and how they behave in an overall field of time-points, leading to an overall universal model, not contradicting the known cosmological problems as presented in paper 17 ([17]: p3-4). The "circuit" nature of the time-space circuit ($TS\varphi$) itself was presented in paper 6, "The Relativity of Time" ([6] p2-4). Ultimately though, the answer to that question of the flow of time-now points as the time-space circuit ($TS\varphi$) requires an entire landscape of the process to unfold as an overall balanced steady state universal equation of time-points lending their description to the ideas of energy, light, and mass.

Paper 32, "*Temporal Mechanics (B): Time-Space Constants*", then presented the case for time-space constants ([32]: p5):

Temporal Mechanics and associated $temporal\ calculus$ have presented the case of re-defining the first principles of time and space, using "time" as the thing that measures space, as per a time-algorithm that is more closely related to the human temporal perception ability than mass. Here it is found that in using such a time-equation that "c" is not just a constant yet a way time measures space, namely as associated to time-points in space allowing the transmission of energy through space, through the vacuum, at "c". Simply, "c" is the most fundamental component to the time-point theory as how a time-point is requested to quantify the vacuum of space it is being associated to.

For instance, to measure a distance in space requires (if space is a dimensionless vacuum, no scale, other than our own 3-d perceptive constraints) "two" time-points while then having a line in time drawn between two time-points. How can a time-point measure distance in space? How can a line be drawn between those two time points as a value of measuring space? Simply, for a time-point to bear reference to another time-point reference is to entertain a new concept of time as a duration of time in assuming the idea

of "speed", namely spatial distance per however many units of time are being determined as time-points, timestamps, to be crossed through. This was presented in paper 20 figure 6 ([20]: p13, fig6):

Paper 33, "*Temporal Mechanics (C): Time-Space Metrics*", then presented the case of the time-space manifolds ([33]: p6):

> *Despite the obvious comparative difficulty, there are nonetheless basic principles that can be proposed to exist by Temporal Mechanics, and they do exist, basic manifolds and associated behaviour of light with those manifolds of space.*
>
> *So, the purpose of this paper is to present those basic principles in play on the cosmological stage of time and space in setting the temporal algorithm, the $temporal\ calculus$, in motion, on that grand scale of manifolds.*
>
> *The key points to consider as derived by $temporal\ calculus$ represent the three following classes of time-space phenomena characterisation:*
>
> *(i)   Time-space Principles ([25]: p38-41)*
> *(ii)   Time-space "Principles of Simplicity" ([30]: p11-13)*
> *(iii)   Time-Space Circuits, Constants, and Manifolds [31-32]*

The task of the most recent paper was to define the ultimate manifold termed the ***Black Expanse*** ([33]: p5-8) within which all phenomena of time and space would exist, a concept much like the Big Bang and black hole theory as one, except here the concept is one of making the proposed initial expansion of the proposed Big Bang an otherwise continual steady state event, as though contained within a void, contained within a veritable black hole, within a greater outer $E = f$ limited ***Black Expanse***.

Essentially, all the basic concepts for time-space were laid down as time-space circuits (paper 31 [31]) detailing the basic interoperation between time and space, time-space constants (paper 32 [32]) that emerge from the basic interoperation of time and space, constants such as c, and thirdly time-space manifolds (paper 33 [33]), how the combination of the time-space circuits and time-space constants results in time-space manifolds, veritable 2-dimensional spherical surface areas where the appearance of reality manifests as particle phenomena with associated illumination qualities.

Despite the general simplicity itself of those three features of circuits, constants, and manifolds, there existed a primary basis for all those three principles to be derived from, stated in paper 30 as the "5 Principles of Simplicity" ([30], p12-13):

(A) Space is an infinite void, a nothing, that when considered alone has no in-built ruler or measurement mechanism to measure its dimensional scope or size, other than time.

(B) Time, or Temporality, is the concept of a uniform "time-now" event in space that is preceded by a pre-now (time-before) event of time-points and followed by an unknown time-after realm; the time-before realm in being non-local as an infinite array of infinitesimal time-points in symmetry with one another, a non-locality of time-points (time-before) in a uniform field of time-after potential time-points via time-

now, creating an arrow from time-before into time-after via a perceptible local datum reference time-now realm.

(C) *A datum frame of reference in the time-now realm, namely a locality, is what our consciousness naturally assumes, within this entire structure, as how there becomes the idea of a measurement process in space by identifying a network of non-spatial (non-local) time-points to prescribe a locality in space (reference in space), as upheld by the perception-based time-equation (arrow) leading to a mandate for 3-d space.*

(D) *Energy, the concept of transmission of a time-point datum-reference from one time-point datum-frame of reference to another at a "fixed"/constant speed, is how one datum reference acknowledges another via this transmission of energy, as the arrow of time, as non-local time-point energy transmission at a constant rate (commonly understood as light).*

(E) *Mass being the result of a time-point pairing, as one time-point joined to another as a new datum reference, as a destructive interference resonance (DIR) energy transmission (folding-over of data-transmission), as a time-point DIR interference producing the idea of a unique locality in space by this interference of time-points, a destruction of non-locality to produce locality, a locality which as mass associates with space to present with the need for itself to represent a uniform drive of spatial homogeneity as thus a general mass-force of attraction as the force of gravity (as shall be explained).*

Related to the 5 principles of simplicity, was the following as presented in paper 33 ([33]: p7):

> *Through all the developments of the interoperation of time and space (through the derivation of the CMBR, vacuum energy, vacuum permittivity, vacuum permeability, fine structure constant, qualities and metrics of the particles (charges, weights) and associated field forces, atomic/subatomic/elementary particle metrics), it became possible to propose how light operates outside the confines of an atomic reference, as a wave in an aether of time-points, non-local time-points, non-local time-points as compared to the defined locality of space. This led to the proposal of an ultimate $E = f$ manifold in space ([13]: p9-13, eq6-8) ([32]: p10-18), as the greater limiting sphere light would reach in its passage through space.*
>
> *Yet of course nothing is so simple to propose in so few words, as shall be highlighted shortly.*
>
> *One thing that can be proposed, and rather elementary nonetheless, is that beyond the $E = f$ manifold would logically be a void of time and space, a vast blackness of time and space, an absence of dimensionality, meaning that there would be no distance to measure between points **on and outwardly beyond** that $E = f$ (Oort Cloud/sphere) manifold, and thus according to the proposed $temporal\ calculus$ holding "c" as the construct of measuring distance in a time-point aether, there would be no light beyond that $E = f$ Oort Cloud (or for conventionality, $Epoch$).*

What really needs to be achieved though is how all of this represents a general overall schematic, from the $E = f$ manifold holding out the **Black Expanse** to a realm of non-local time-points incurring a 3-d space within which is projected a more subsequent 2-d reality of spherical surface area phenomena.

3.   The fundamental metrics of time and space

Merriam Webster defines a "metric" as [34]:

3: a mathematical function that associates a real nonnegative number analogous to distance with each pair of elements in a set such that the number is zero only if the two elements are identical, the number is the same regardless of the order in which the two elements are taken, and the number associated with one pair of elements plus that associated with one member of the pair and a third element is equal to or greater than the number associated with the other member of the pair and the third element

Temporal Mechanics explains this feature of metric analysis in physics in further detail, as presented in paper 31 ([31]: p4):

> *Physics is most basically a study of physical phenomena. The lineage of physics theory takes root from measuring physical phenomena using numbers and geometry, as a way to capture the dimensions of space, 3-dimensions primarily. This has been the case for millennia. The range of concepts physics seeks to describe with mathematics and associated geometries that transform from one place in 3-d space to another include the idea of mass, inertia, force, light, and energy, what constitutes mass and energy and light, and how that can be measured with mathematics, to then determine if that mathematics associated to physical phenomena can predict new phenomena and thus demonstrate that there is an underlying mathematics behind physical phenomena, behind reality, almost implying a type of mathematical order to reality, a type of mathematical determinism.*
>
> *Along this process though of measuring and seemingly trying to anticipate the nature of reality, of creating laws that describe symmetries in nature, consistencies of phenomena and associated laws, has been the need to create a start-date for physical phenomena as the current big bang model (ΛCDM) describes. The primary reason for the ΛCDM model is to explain the observed redshift effect of light from the stars, the only mechanism of explanation there being by giving space a mathematical feature, and thus explaining the redshift effect of light as a metric expansion of space.*
>
> *There, is the assumption of mathematics taking precedence with space as a **metric**, as a metric expansion of space, as a process of space expanding, to explain the redshift of light. Secondary to this is the idea of time, together with light being dragged along by the metric expansion of space from the big bang event. The big bang model though requires a huge amount of energy, 10^{121} more than what is observed of the current energy level of space (CMBR), thus requiring a thing called "dark energy", together with requiring a thing called "dark matter" to keep galaxies from flying apart in the context of this metric expansion of space.*
>
> *In short, the ΛCDM model proposes an explanation for the redshift effect via the tagging of space with a mathematical grid, making essentially space mathematical. To achieve this though, that theory has to employ phenomena not found, not evident, of the order of 80% of what it proposes should be accountable care of the required inclusions of dark matter and dark energy. Yet most of physics hammers away at that proposal and associated fundamental theoretic start point without question. That should be a problem, yet that problem is overlooked in the exercise of the hope that evidence for dark*

energy and dark matter can be found, primarily through mathematical theory as much as the issue in question of the expansion of space is described purely metrically, as a metric expansion of space.

Quite simply, contemporary physics uses the idea of a metric and tags it to space, to then use such a process as a primary feature of space, namely a metric, to then explain the redshift effect as an expansion of that metric of space, called the "metric expansion of space", as it only can if space is a veritable "nothing" that would only have mathematics itself to define it. Physics thence reasons that it is the metric of space that must be expanding, giving thus mathematics the driver's seat to primarily explaining all physical phenomena from the event that caused the metric expansion of space, proposed by physics as the Big Bang, all together called the ΛCDM model.

3.1   The Temporal Mechanics metric

Temporal Mechanics forwards the basic principle of time-points in space as the primary dimensional construct from which space can be mathematically derived, and thence all the constants, scales, and associated properties of fields and particles. Temporal Mechanics does not make space a primary metric, yet time.

The "metric" being defined here therefore is subjected to a massive interlinking of time-points in space, yet primarily as a unitary universal time-now metric.

What therefore is the actual metric of time-points in space?

The metric of the time points is that these time-points would each represent their own "point" existence, and thus in theory there would exist an infinite number of time-points, *primarily* in a dimensionless void of space. It is difficult to visualise just yet, however such is the initial proposal, namely that there would exist an infinite realm of time-points in space. Further to this, as these time-points have yet to be tagged to the known 3-dimensional limitations of space, these time-points can be stated to be "non-local", yet a universal uniform field of time-points, namely that they have yet to be localised to a definitive region of 3-d space, however represent the concept of a uniform field of time-points. This is presented in figure 1.

Figure 1: a general uniform realm of time-points (here as the white pixels), as a uniform field of time-points characterising a "uniform" universal time.
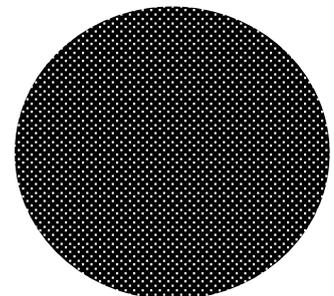
This infinite realm of time-points in space is then proposed to be "annexed" to a concept of human perception, the human perception ability with time.

Why use human perception to annex and explain these non-local time-points? Why not? The essence of theory presumes a level of consciousness, of intellect, as the codex of theory itself.

For instance, these time-points are immaterial, just like consciousness is immaterial; the whole purpose of this presentation is, in a way, to make an understanding of time-points relevant to human consciousness relayed as a theory of these time-points and how they relate to space and all associated phenomena. So, such has been decided as the path, namely using a temporal feature of human consciousness to explain this infinite realm of non-local time-points.

This idea of the temporal ability of human perception was presented in paper 1 [1], the whole process summarised in paper 30, p7-10 ([30]: p7-10), as follows:

> *After much trial and error and theoretic modelling and testing in Temporal Mechanics [1]-[29], the proposed algorithm for time represents an equation best modelled on the human perception ability of time, naturally, which is then applied to an infinite empty space, and then that algorithm for time is pushed to derive what it does via that process that is relevant to the basics of that perception ability and associated perception-based time-space constraints. More specifically:*
>
> o *The **temporal-algorithm (arrow)** itself as an equation is to be granted the **symmetry-breaking** trait requirement.*
> o *What that arrow-algorithm is applied to is granted **symmetry** status as the **symmetry of time-points in space**.*
>
> *Simply, the overall idea of symmetry, of the principle of relativity, is considered as the feature of non-local time-points in space, and the way those time-points interact above and beyond their basic time-point status as a field of time-points is a process of symmetry-breaking. On top of this though, the arrow-algorithm is proposed to conform to known restrictions of human temporal perception, namely that the future is an unknown realm, and reality exists in time-now, and yet the key operator of the time-equation is the continued potentiality (as a time-after feature) and yet also certainty of a time-before time-point, as presented initially in paper 1 ([1]: p3-10).*
>
> *Such is the mechanism of $temporal\ calculus$.*
>
> *Effectively, $temporal\ calculus$ is a key applied to an infinite realm of space, a key which generates concepts in space and time relevant to the human perception ability, concepts that are then checked with commonly understood concepts of physics; the specifics of that $temporal\ calculus$ abide primarily by what is humanly possible in terms of the human conscious ability of time, namely the arrow of time, and secondly how that time-algorithm needs to accommodate for the idea of symmetries and symmetry-breaking.*
>
> *Thus, given what needs to be achieved, what precise algorithm needs to be employed?*
>
> *As a standard for time, as a mathematics, clearly a minimum of two variables are required to form an equation, as sets. Paper 27, Time Scaling Space ([27]: p2-8), presents a summary of the context of mathematics in physics when used to measure objects in space. However, it is paper 8, Golden Ratio Axioms of Time and Space ([8]: p3), that gives a clear example of refining the time-equation down to its most basic features, as follows:*
>
> > *In mathematics, an equation is a statement that asserts the equality of two expressions. To present an "absolute" equation for time requires a type of equality to be established between two*

expressions/properties of time. What can we say about "time" that has two properties using both "1" (as t_N) and t_B, as an expression of equality?

If time is a singularity, we can relate time-before to time-after along a basic linear mathematical construct as via t_N. This has been the Achilles heel it seems of our logic of time, so let us break it down further. For instance, we know that placing t_B next to t_N requires a negative sign for t_B (equation 1) given t_B is a "backward/negative" step compared to t_N.

$$(-t_B) + 1 = \quad \underline{fundamental\ property\ A} \qquad\qquad equation\ 1.$$

Yet, if time is a singularity, we can present the case that t_N can also be "per" $(-t_B)$ as another equation as technically t_B would already be contained within the t_N construct, as it would have already happened (equation 2).

$$\frac{1}{(-t_B)} = \quad \underline{fundamental\ property\ B} \qquad\qquad equation\ 2.$$

Thus, if these two features represent fundamental properties of time, and time itself is a singularity, then <u>fundamental property A</u> must equate to <u>fundamental property B</u> (equation 3.)

$$(-t_B) + 1 = \frac{1}{(-t_B)} \qquad\qquad equation\ 3.$$

From equation 3, we arrive at the following (equations 4-5).

$$t_B^2 - t_B = 1 \qquad\qquad equation\ 4.$$
$$t_B + 1 = t_B^2 \qquad\qquad equation\ 5.$$

Equation 5 is interesting, as essentially it suggests that if we consider an "arrow of time" equation that is absolute, and we add the past as a "positive value" (as it would be in considering an arrow of time equation) to t_N, as past + present, only logically we would arrive at the future, let us call t_A (equation 6.)

$$t_B + 1 = t_A \qquad\qquad equation\ 6.$$

Yet as we know, $t_B^2 = t_A$ (equation 7.)

$$t_B^2 = t_A \qquad\qquad equation\ 7.$$

This time-equation explains the golden ratio being integral to the arrow of time.

This equation process was presented in paper 1 ([1]: p4) via a different mechanism, the "perceptive" model mechanism as follows:

If light is "energy" and reality as we know it operates according to a process of entropy [6], namely increasing randomness, then "time" has an interesting feature that requires more investigating as it flows from t_B to t_A; if indeed the future is unknown, then we can suggest the following:

$$t_A = ? \qquad\qquad (2)$$

Let's propose that the idea of increasing entropy obeys the following process of time: time divides from a singularity in the "past" t_B to a duality in the "future" t_A, where t_A is two possibilities of t_B (fig. 8.):
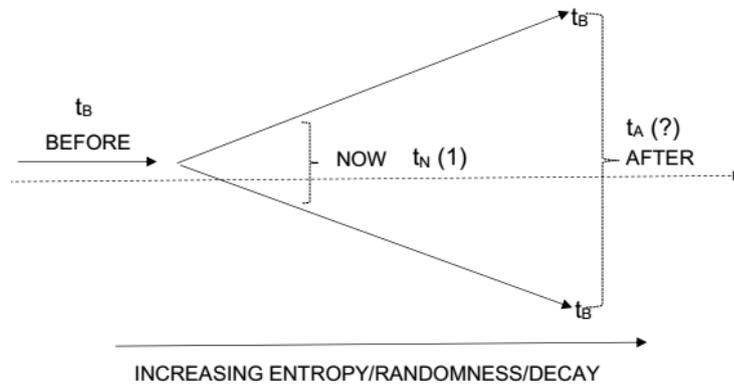
Paper 1, Figure 8.

Here t_N represents that process of time-dividing, becoming dual time as t_A, as two possible outcomes for t_B, as a process of symmetry-breaking for a vector of 0-scalar space (as it involves a process of an uncertain outcome), yet here we are assigning this feature of symmetry-breaking to time. Let us suggest the following:

$$t_A = t_B^2 \qquad (3)$$

Now consider the following as a standard for time's flow:

$$t_N = 1 \qquad (4)$$

Here time "now" has a constancy (in its application to space), a uniformity (eq. 1.) that has the potential for entropy, of division, of diversity, of symmetry-breaking for S_2 (compared to S_1). Let us also consider a standard:

$$t_N = t_A - t_B \qquad (5)$$

Simply, t_B when applied to space (as 1, t_N) leads to t_A, as a proposed equation for "time". Thus:

$$t_B + 1 = t_B^2$$
$$\frac{t_B + 1}{t_B} = t_B$$
$$\frac{t_B^2 + t_B}{t_B^2} = \frac{t_B^2}{t_B}$$
$$\frac{t_A + t_B}{t_A} = \frac{t_A}{t_B} \qquad (6)$$

Both processes result in the same golden ratio equation.

This process of applying *temporal perception* to the infinite realm of time points can be presented in figure 2.

Figure 2: using the golden ratio scale as a symbol in the time-point field to categorize the fundamental time-point ratio values in play on a perceptive codex term.
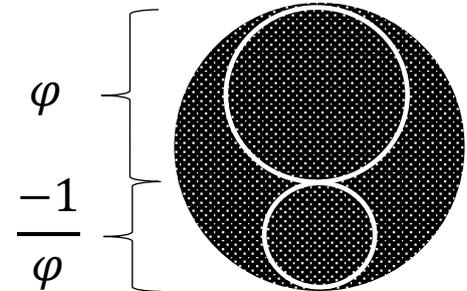
Note here with figure 2 the idea of an infinite realm of non-local time-points being transferred to a code of temporal perception as the golden ratio algorithm as the two different circles differentiated in size by a golden ratio scale, ***somehow*** as a spatial representation. And so, the next step was to apply that golden ratio algorithm to the idea of "space" as distance between time-points in that golden ratio time-algorithm. This was achieved **as the process of derivation in paper 1** [1], as also presented in paper 30, pages 10-11 ([30]: p10-11).

This primary equation was then applied to standard Euclidean geometry in paper 2 [2] to land the idea of a 3-d spatial grid and associated wave-function of time (EM).

To note of interest regarding this time-equation forming the basis of $temporal\ calculus$ are the following key points:

- *t_N as time-now is the **locality** factor.*
- *t_B as time-before, as the primary time-point, is the **non-locality** factor.*
- *t_A (as t_B^2) is the idea of **symmetry-breaking***
- ***Symmetry** is the idea of a field of t_B time-points in space, as the certainty, as the past would be.*
- *Thus, the whole algorithm itself as a process of **symmetry** and of **symmetry-breaking**.*
- *The concept of light, "c", is the run of the equation, as a locality via t_N, as a flow of time in "time-now", t_N.*

What $this\ temporal\ calculus$ represents therefore is a type of abstract algebra, yet perhaps more accurately, a bespoke algebra with conditions specific to the task it is employed to execute. Here the temporal algorithm is employed to capture the idea of symmetry and symmetry breaking using non-local time-points that manifest the idea of mass in a paradigm beyond the non-local time-point realm. It is also aimed to capture the full ability of human temporal perception awareness; if there is a liberty granted to human perception to devise mathematical systems, then there would be a liberty granted to a mathematical formalism based on the human perception ability.

3.2   Temporal Mechanics Metric Building

What had to happen as the next theoretic step is the remarkable thing, namely the inclusion of the concept of a circle, of the surface area of a sphere to be more precise, as the propagation of the surface area of a sphere from each non-local time-point in space to account and therefore derive 3-d space, **as the process of derivation in paper 2** [2].

The next theoretic step to make was to present the case that the idea of "consciousness", assumed here in the idea of temporal perception as the golden ratio equation, is the "perfection" of that circle, the "perfection" of that sphere, the need for that equation for "π" to "fit" to make the assumption of temporal perception as the golden ratio equation actually *work*. **Such was paper 3** [3].

In short, papers 1-3 [1-3] laid down the foundations for a theoretic building process from the non-local time-points to space, to then derive the idea of physical phenomena, particles and field forces, and their associated constants and properties in regard to this interoperation between the non-local time-points and derived 3-d space. **Such was paper 4** [4].

In those first four papers [1-4], the following measurements were derived, as summarised in paper 25, p20-21:

$$G_{AB<NEWTONS>} = \frac{M_C c^2 M_A M_B}{d^2} \ (kg^3 t^{-2})$$
<div align="right">gravity ([1]: p8, eq11)</div>

$$Q_{AB<NEWTONS>} = \frac{Q_C c^2 Q_A Q_B}{d_{AB} d_{BA}} \ (C^3 t^{-2})$$
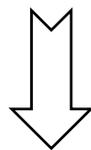<div align="right">charge ([1]: p10, eq14)</div>

$$\frac{1}{\lambda} = Z^2 \cdot \frac{1}{\left(\frac{1}{n_1^2}\right) - \left(\frac{1}{n_2^2}\right)} \cdot \frac{\lambda_e}{2(2\pi a_o)^2} = R_\infty Z^2 \cdot \frac{1}{\left(\frac{1}{n_1^2}\right) - \left(\frac{1}{n_2^2}\right)}$$
<div align="right">Rydberg constant ([1]: p14, eq25)</div>

$$\left(\frac{-1}{\varphi} \cdot -2\sqrt{3}\right) + 1 = 3.140919$$
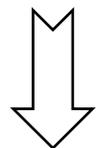<div align="right">electrical monopole ([2]: p8, eq3)</div>

$$(\varphi \cdot -2\sqrt{3}) + 1 = -4.605020$$
<div align="right">magnetic dipole ([2]: p8, eq4)</div>

$$(\varphi \cdot -2\sqrt{3})^2 = 31.416253$$
<div align="right">magnetic (time-space) template ([2]: p10, eq6)</div>

$$\frac{\lambda}{2\pi} = \frac{a^0}{2\pi \cdot 21.8} = \frac{a^0}{137}$$
<div align="right">fine structure constant ([2]: p12, eq9)</div>

FROM THE METRIC MEASUREMENT OF THE BOHR RADIUS USING THE TEMPORAL CALCULUS,
THE FOLLOWING EQUATIONS/CONSTANTS AND ASSOCIATED METRICS CAN THENCE BE DERIVED

$$\frac{19.8 \cdot \lambda}{e_c} = \frac{19.8 \cdot 2.426 \cdot 10^{-12}}{1.60218 \cdot 10^{-19}} = 2.998 \cdot 10^8 \ ms^{-1}$$
<div align="right">speed of light ([2]: p13, eq10)</div>

$$k_e = \frac{3 \cdot 2e_c}{4\lambda} \cdot c^2 = \frac{6 \cdot 1.6 \cdot 10^{-19} \cdot (3 \cdot 10^8)^2}{4 \cdot 2.426 \cdot 10^{-12}} = 8.9 \cdot 10^9 \ Cms^{-2}$$
<div align="right">EM coupling ([2]: p13, eq13)</div>

$$k_e = \frac{3 \cdot 2 \cdot 20 \cdot c}{4} = 30c \qquad\qquad \text{EM coupling to time-space template ([2]: p14, eq14)}$$

$$k_{e`} = \frac{3 \cdot 2 \cdot 21.8 \cdot c}{4} = 32.7c \qquad\qquad \text{energy shell quota ([2]: p17, eq16)}$$

$$e_c \cdot f = E \cdot \left(\frac{c}{19.8}\right)^2 \qquad\qquad \text{Plank analogue ([3]: p3, eq1)}$$

$$x_{(t_B+1)} = k \cdot x_{t_B}(1 - x_{t_B}) \qquad\qquad \text{chaos; initial conditions ([3]: p4, eq3)}$$

$$M_C = \left(\frac{2}{3}\right)^2 \cdot M_p \qquad\qquad \text{gravity constant ([4]: p7, eq1)}$$

$$\pi\ error\ gradient = 6.022 \cdot 10^{23} \cdot mass\ of\ neutron \qquad\qquad \text{Avogadro's number ([4]: p16, eq9)}$$

Of course also, a basic metric standard needed to be pronounced, here as the metric of c (point (D) of the "5 Principles of Simplicity", previous section) in regard to the Bohr radius, the basic standard of temporal transmission between time-points in the atom that actually measures the distance of space, a derived value based on making one key calculation of distance known by physics for c, and thence derive all the other constants from that one arbitrarily chosen measurement of known distance for c per unit of time, namely the speed of light itself as measured.

To be highlighted here is the core golden ratio algorithm for time that is translated to the idea of a circle, and thus as a golden ratio algorithm, the idea of two circles, yet not necessarily two circles, yet two features of the one temporal function, defined as the "phi-quantum wave-function", as presented in paper 2, "*Golden Ratio Axioms of Time and Space*" [2], presenting the case for the new EM wavefunction describing the "E" and "M" properties of electromagnetism (EM). What then had to be derived was the idea of electron charge and mass, and that of its "magnetic" counterpart, which for much of the papers proved elusive until paper 23 ([23]: p21) where the charge of the electron was derived, equations as summarised per paper 25, p21-22 ([25]: p21-22).

$$\frac{4\pi r_2{}^2}{s_x} - \frac{4\pi r_1{}^2}{s_x} = 12\ (z) \qquad\qquad \text{maximum redshift value ([13]: p9, eq1)}$$

$$E = h_x f \qquad\qquad \text{variable photon energy equation ([13]: p11, eq5)}$$

$$r = 73{,}500\ au \qquad\qquad \text{Oort cloud distance ([13]: p11, eq8)}$$

$$V_A = \frac{21.8}{20} \times \frac{19.8}{20} = 1.079 \qquad\qquad \text{vacuum energy factor ([14]: p23, eq8)}$$

$$\sim 10^{-9}\ Jm^{-3} \qquad\qquad \text{vacuum energy value ([14]: p23, eq9)}$$

$$\sim 10^9\ Hz \qquad\qquad \text{Lamb shift value ([14]: p24, eq10)}$$

$$t_B = \sqrt{\frac{21.8 \cdot 1.079}{N_A}} = 6.25 \cdot 10^{-12} \text{ s}$$ cosmological CMBR value ([14]: p25, eq12)

$$2.7 \times \frac{22}{21.8} = 2.725 \ (temperature)$$ lowest temperature (CMBR) ([14]: p25, eq13)

$$e = m \cdot c^2.$$ Einstein's equation ([14]: p26, eq18)

$$532 \times 1.079 = 574 \ arcseconds \ per \ century$$ Perihelion of Mercury ([14]: p28, eq19)

$$\frac{\pi}{4} = 1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \frac{1}{9} \dots etc$$ π algorithm ([15]: p7, eq4)

$$e^2 + \varphi^2 \sim \left(\sqrt{\frac{19.8}{20}} \ \pi\right)^2$$ general energy equation ([15]: p11, eq8)

$$\sqrt{2} + \sqrt{3} \cong \pi$$ π approximation ([16]: p8, eq1)

$$e^2 < ENTROPY > + \ \varphi^2 < ENTROPY > \cong \left(\sqrt{\frac{19.8}{20}} \ \pi\right)^2 < ENTHALPY >$$ energy equation ([20]: p10, eq2)

$$m \cdot \frac{d}{t} = fundamental \ property \ 1$$ momentum ([23]: p21, eq2)

$$e \cdot \frac{t}{d} = fundamental \ property \ 2$$ charge ([23]: p21, eq3)

$$\cong 1.67 * 10^{-27} kg$$ proton/neutron mass from charge ([23]: p22)

$$\varepsilon_0 = \frac{1}{4\pi} \times \frac{1}{Q_C \cdot c^2} = \frac{1}{4\pi \cdot k_e}$$ vacuum permittivity ([23]: p30, eq5)

$$\varepsilon_0 = \frac{1}{\mu_0 \cdot c^2}$$ vacuum permeability ([23]: p30, eq7)

Ultimately then the case presented itself to derive the lightest elementary particle, as presented in paper 25, p51 ([25]: p51):

> To address the TSET-e$_1$ mass value therefore, to note clearly here is that the idea of "e" is being considered as a "$fundamental \ property$", and that $e_c = \frac{e}{c} = fundamental \ property \ 2$. In therefore using that same line of logic in having successfully derived the proton (and neutron) mass from charge on the TST level, and now applying the same logic to the TSET level, two things need to be factored:

(i)   The "12" factor, as presented.

(ii)   The fact that a new charge level is being encountered as a new electron analogue (as TSET-e$_1$), and this would therefore invoke a new "c" factorial according to $fundamental \ property \ 2$.

(iii) $m = \frac{e}{c^2}$ ([2]: p16, eq15) still holds as $m = \frac{e}{c} \cdot \frac{1}{c} = \frac{e_c}{c}$

Therefore, the equation for the mass of TSET-e₁, the value of the mass gap m_{MG}, would be as follows:

$$m_{MG} = \frac{e_c}{c} \cdot \frac{1}{12} \cdot \frac{1}{c} = 1.5 \cdot 10^{-37} kg \tag{10}$$

This would be the value for TSET-e₁ as confirmed by researchers from UCL, Universidade Federal do Rio de Janeiro, Institut d'Astrophysique de Paris and Universidade de Sao Paulo [26].

Through this entire process, all the particle and field features of the characters of these equations, their persona, were accurately derived with this golden ratio $temporal\ calculus$ codex and compared to known particle and field phenomena matching the same phenomenal description. Yet something very interesting evolved, namely the idea of reality actually representing an image upon the surface area of a sphere, a 2-d spherical manifold. The importance of this was realised in paper 30, "*Non-Local Time-Point Theory: Magnetic Quantum Shell (MQS) Modelling*" [30], with the derivation of the X17 particle, pages 18-19 ([30]: p18-19), and the importance there of the magnetic 2-d shell construct as a key phenomenal manifold in reality related to EM and particle phenomena.

*According to paper 2 ([2]: p17), there exists a scale in play for the magnetic template EM-coupling dynamic of 32.7, <u>as an adjusted EM-coupling factor</u>, as by definition of the e and m time-points, thus time-points which are linked via the phi-quantum wave-function ([2]: p4-11), a condition that would fix not only the electron number per shell at a maximum value, yet define the concept of a shell itself <u>as a spherical surface area</u>; such is what is proposed for the uniform magnetic quantum shell surface area structure, namely this theoretic maximum value **factored** to the energy of a single electron, as though although the electrons can be of any number in the atom, the electron feature abides by a code of being uniformly **held** by the 32.7 EM-coupling factor of the MQS, almost like an axis the electron builds around as a value for atomic modelling of EM-coupling stability for each electron, of course in the constraints of the Hyperfine structure of the shells and associated inclusion of the Rydberg equation.*

Therefore, this primary 32.7 EM-coupling factor would be applied to each electron as a value of energy-mass, as a quantum representation of the shell, and thus surface area, as it can only represent, and therefore the proposal is that equation 1 and 2 apply for the energy value of the magnetic shell for each electron as a mass value for the magnetic component of the 32.7 EM-coupling factor:

$$32.7 \cdot electron\ mass = MQS\ shell\ unit\ mass \tag{1.}$$

$$32.7 \cdot 0.511\ MeVc^{-2} = 16.7\ MeVc^{-2} \tag{2.}$$

Research by the "$Institute\ of\ Nuclear\ Research\ (Atomki)$" through work at $CERN$ has uncovered a value for such an energy in the atom of $16.7\ MeV$, ascribing this value to a particle named $X17$ [32][33][34]. $Atomki$ has though not identified this as the magnetic shell confining an electron in the atom though, as that theory has not been formulated by contemporary modelling, and thus the energy value remains a mystery to the physics community.

3.3   Temporal Mechanics metric synchronisation

The importance of this magnetic quantum shell (MQS) system [30] was then *taken to* this current series of five papers (time-space circuits, constants, manifolds, metrics, and logistics), to describe how ultimately these manifolds, these surface areas, would work to the level of the proposed $E = f$ feature of light in space, as Temporal Mechanics derived, all the way to the proposed **Black Expanse** beyond the Oort cloud. This was the purpose of papers 32-33 [32-33], specifically the previous paper, "*Temporal Mechanics (C): Time-Space Manifolds*", chapter 4, "The Macroscopic Manifolds" ([33]: p8-17).

To then compact all of such into a diagram from the level of the infinite non-local time-point realm, consider figure 3.
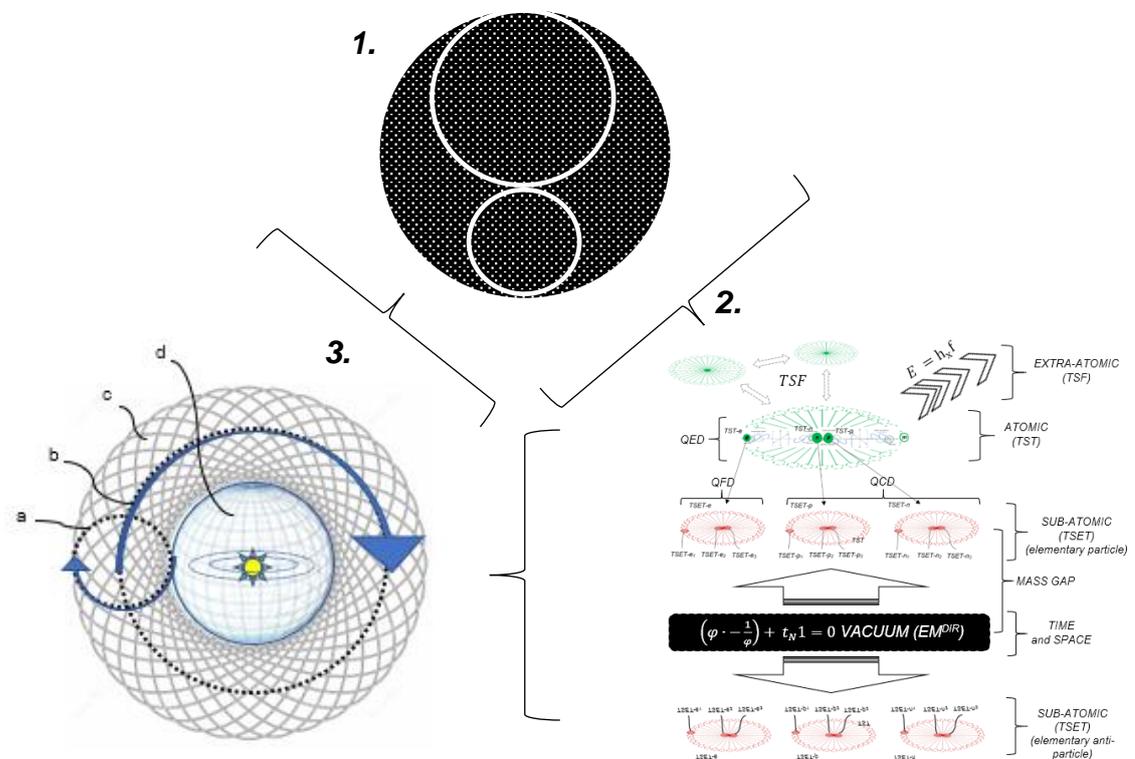

Figure 3: an amalgamation of the non-local time-point golden ratio field (1.; from figure 2), accompanied to the microscopic scale (2.; ([33]: p11,fig2)), and then applied to the macroscopic scale (3.; (25]: p48, fig15)).

As the diagrams present, the more fundamental 2-d realms (manifolds) become apparent, as the primary dimensional realm providing the features of the elementary, subatomic, and atomic particle phenomena, presenting the phenomena of the greater macroscopic manifolds of the Heliopause, Bow Shock, and Oort Cloud.

All of such can be described as an equation from an infinite time-point aether (T_∞) projected to what would appear to be a 3-d spatial realm (S_3) (*note that 4-d spacetime is being by-passed here, as a*

different process of definition for the dimensions is in play) which is then projected to 2-d space as the surface area of a 3-d spatial sphere as a temporal construct ($T_1 S_2$), as equation 1.

$$T_\infty + S_3 = T_1 S_2 \tag{1.}$$

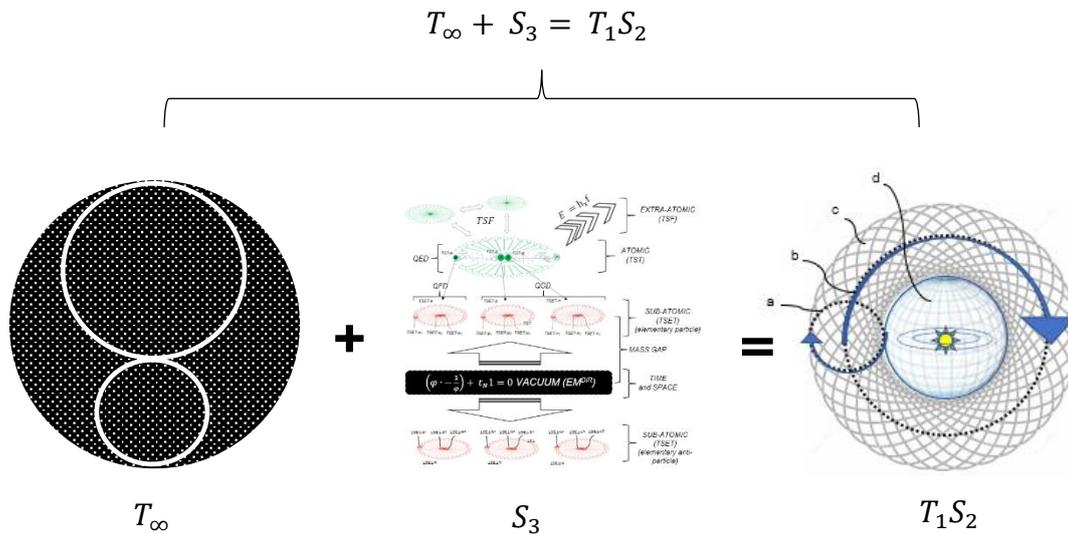This is represented in the following diagram utilising figure 3, here as figure 4.

$$T_\infty + S_3 = T_1 S_2$$

$$T_\infty \qquad\qquad S_3 \qquad\qquad T_1 S_2$$

Figure 4: the infinite non-local time-point field T_∞ which when associated with the microscopic spatial scale S_3 presents with the general macroscopic features of reality $T_1 S_2$.

Here, space as three dimensions encapsulates the infinite dimension of time, as $T_1 S_2$, meaning despite there being 3 dimensions of space and an infinity of non-local time-points processed according to the temporal perception ability prescribed as the golden ratio algorithm, the resultant phenomenal dimension is 2-d, and thus a type of holographic projection as would be perceived, of course by design, yet the important feature being that the information of reality is all based on the surface area membrane of the interaction of time-points and space, that proposed MQS scheme [30].

This macroscopic 2-dimensional MQS feature was also presented in paper 32 with the calculation of the of the Heliopause manifold, namely as a temporal (s) 2-d spatial (m^2) calculation, as per pages 14-17, specifically equations 1-5 (32]: p14-17, eq1-5).

Another basic issue to note is that "c" is how time measures space. And so therefore to measure space from the ultimate macroscopic level, from the Oort Cloud level of $E = f$, the volume of that space needs to be calculated and then factored in toward a microscopic level by a value of "c" to that inner volume level, as what would be a measure of a "c"-factored level within the most ultimate macroscopic level.

This idea was presented in paper 25 ([25]: p50-51) regarding the microscopic level in the manner of calculating the mass of the lightest elementary particle in calculating what exists as mass below the structure of a subatomic mass, using a factor of "c" and "12" for the mass of the proton, stepping below that.

Here though the process of the macroscopic scale is different to the microscopic scale, as it can only be, as they are two very different things; the thinking is to use a basic scaling of "c" with the value of energy in terms of volume, and not mass (mass, as was used on the microscopic scale), namely the volume of the Solar System to the Oort cloud, specifically as $\frac{4}{3}\pi r_O^3$ where r_O is the distance of SOL to the Oort cloud, derived to be $1.1 \cdot 10^{16} \ m$ (73,500 au), as per equation 1:

$$\frac{4}{3}\pi r_O^3 = \frac{4 \cdot \pi \cdot (1.1 \cdot 10^{16})^3}{3} = 5.58 \cdot 10^{48} \ m^3 \qquad (1)$$

This value is then proposed to be factored back a value of "c", taken within itself, as "c" is the standard of measurement between time-points measuring space.

So, the calculation here aims to derive what the next manifold would be from the overall ultimate manifold of $E = f$, from that ultimate macroscopic manifold of $E = f$, as follows:

$$\frac{5.58 \cdot 10^{48}}{c} = 1.86 \cdot 10^{40} \qquad (2)$$

The value of "r" for this value, this new value for r, say r_H, then equates to the following:

$$\frac{4}{3}\pi r_H^3 = 1.86 \cdot 10^{40} \qquad (3)$$

$$r_H = 1.643 \cdot 10^{13} \ m \qquad (4)$$

$$r_H = 110 \ au \qquad (5)$$

This value would represent the basic time-space manifold within the macroscopic $E = f$ manifold.

Therefore, if the $E = f$ manifold represents the process of mass disintegrating to a macroscopic sub-light level, to a macroscopic elementary particle level, as a particle zone in time-space, then this new manifold of distance r_H from SOL would represent the basic **subatomic** level, a **plasma** level, as per the following diagram.
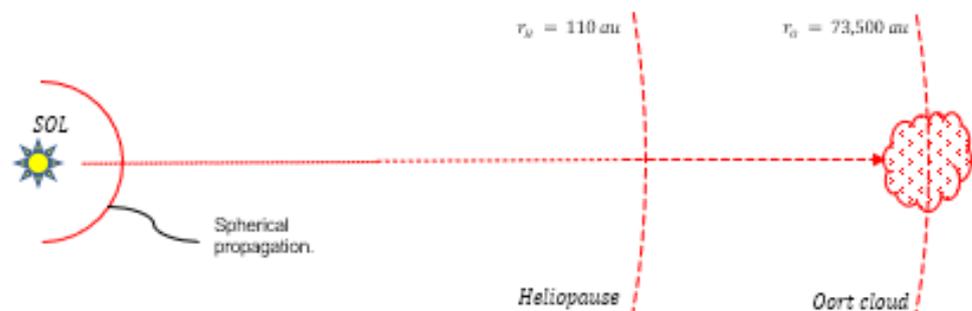
Paper 32, Figure 1: a universal scale from a source of light as the Sun outwards in a spherical wavefront of light a distance of $r_O = 73,500 \ au$, tracked back a time-scale measurement of "c" to the Heliopause as $r_H = 110 \ au$.

Astrophysics knows r_H as the Heliopause [35].

Once again, r_H would represent the basic scaling from the macroscopic $E = f$ level to a universal level of "c" within that zone, to the next most basic level, and here this is proposed to be the macroscopic **subatomic** level, a level of quantum stagnation, where in all appearance the plasma-styled solar wind would appear to measure equally with any apparent interstellar wind, leading to a type of static plasma sphere. Thus notably, at and beyond this Heliopause would be a marked increase in plasma particle activity. To what point though?

There is still the issue of factoring the value of "12" on the Oort Cloud level, that required ultimate macroscopic $E = f$ level, as presented in paper 13 ([13]: p11-12) to fulfil the general entropy-enthalpy equation for energy, as was appropriated on the microscopic level in paper 25([25]: p50-51).

The thinking here with this Oort cloud macroscopic manifold and associated Heliopause manifold is that the value of "12" would be factored "into" "c" by a certain mechanism **inverse** to what was proposed on the microscopic level, namely as a process of enhancing the Heliopause by a factor of 12 regarding volume. Note that this process would be an inverse application to the process used on the elementary particle level, for here is a new process, a macroscopic process, **not** a microscopic process, and thus the process of application of the "12" factorial would be inverse to how it was applied on the microscopic scale, despite still using "c" as a measurement standard between time-points in space as was used on the microscopic scale.

The process here therefore is taking equation 3 of the Heliopause and factoring it out to the Oort Cloud level by a factor of 12, as follows, equation 6:

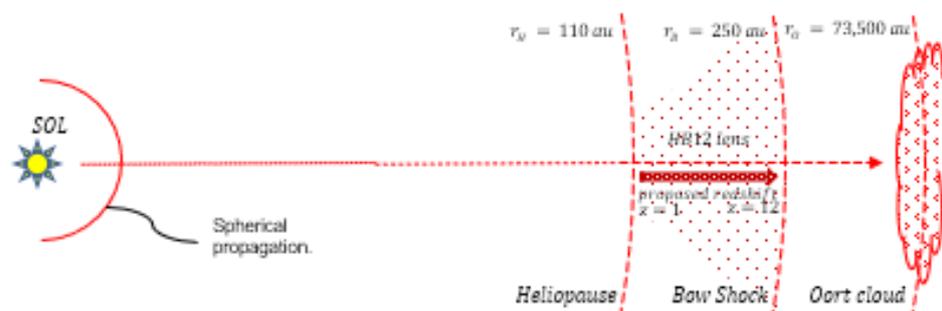$$\frac{4}{3}\pi r_H^3 \cdot 12 = 2.23 \cdot 10^{41} \tag{6}$$

The new value here for r_H, say, r_B, is therefore as follows:

$$\frac{4}{3}\pi r_B^3 = 2.23 \cdot 10^{41} \tag{7}$$

$$r_B = 3.75 \cdot 10^{13} \, m \tag{8}$$

$$r_B = 250 \, au \tag{9}$$

Astrophysics has proposed a manifold meeting a similar description as the Bow Shock ($\sim$230 au) [36]. This can be demonstrated in the following diagram:

Paper 32, Figure 2: a universal scale from a source of light as the Sun outwards in a spherical wavefront of light a distance of $r_O = 73,500\ au$, tracked back a time-scale measurement of "c" to the Heliopause as $r_H = 110\ au$, while then factored by "12" upon the r_H level to arrive at r_B, the proposed Bow Shock manifold.

The thinking of this region is that it represents, in theory, a general layer where the CMBR bleeds down as the $z = 1 > z = 12$ redshift process, from the Heliopause to the Bow Shock, noting that "c" is being accompanied here with "12" as a measure of distance between time-points in space, here as a factor of "12", yet not only this, yet doing this while light and associated plasma behaves like a type of pressure "shock" front to the space beyond which (towards the Oort cloud) where matter in theory would disintegrate, and light lose its integrity.

Once again, this takes root from the idea that all phenomena would involve the MQS ([30]: p18) as the 2-d interaction of time-points with space, the "electron" being the primary agitator of that phenomena, as presented in paper 23 whereby it is the charge of the electron that is focal to all other mechanisms and derivations of atomic phenomena, paper 23, p21-22 ([23]: p21-22):

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:

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

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

*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 π and the mass of a proton (or neutron) can be calculated. Why a factor of π? The mass of the electron would have been "per" π, 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 π and thus the $5.3 * 10^{-28} kg$ value needs to be factored with π, giving:*
    - *$\cong 1.67 * 10^{-27} kg$*

Essentially, Temporal Mechanics proposes that the phenomena of the stars is actually a projection intrinsic to the greater manifolds of this solar system reality, the manifolds of the Heliopause, Bow Shock, and Oort Cloud.

To note is that Temporal Mechanics never sought out to explain the phenomena of the stars from data in the context of the proposed ΛCDM model and those assumptions, from astrophysics, the phenomena of the redshift effect in particular, *__yet to derive the basis for their existence__*, as with first deriving the basis for the existence of particles and their associated field force attributes. To achieve this, Temporal Mechanics has had to re-define the a priori of time and space, to then demonstrate the interoperation of time and space as proven and known particle phenomena and associated field effects, according to all the relevant metrics and associated constants prescribed to that phenomena. Such has been the case presented in this paper thus far.

To demonstrate the validity of such, Temporal Mechanics will now explain an added feature to the great manifolds of reality, from the Heliopause manifold to the Bow Shock manifold to the Oort Cloud manifold, namely how the $T_1 S_2$ dimensional realm presents the case for the metric of the nearest star, that associated distance to SOL, and why what would appear to be the closest star *would be that calculated distance*, together with then deriving the age of the proposed time-space system as it would present itself as a feature of a "longest" *cycle* of time.

To achieve such, one new manifold needs to be presented as based on the $E = hf$ principle, on the concept of light itself as it appears to our awareness, light that is atomic based. As shall be demonstrated, this new manifold joins all the other greater $E = f$ manifolds, with ultimately this new manifold presenting the phenomena we understand of the stars.

4.   Cosmological metrics

In developing upon the idea of the macroscopic $E = f$ based manifolds of the previous paper, *"Temporal Mechanics (C): Time-Space Manifolds"* [33], distances were initially calculated for r_H (Heliopause manifold) and r_B (Bow Shock manifold) as relative to r_O ($E = f$, Oort Cloud manifold), as initially presented in paper 32 "*Temporal Mechanics (B): Time-Space Circuits*" [32] and then further expanded upon in paper 33 [33], in accounting for a proposed theory for the redshift effect. To further that theoretic design, what needs to be finally presented for the system of manifolds is a manifold projected from the central $E = hf$ region, a focal manifold it would seem, focal to the other $E = f$ based manifolds (r_O, r_H, and r_B), here in this case from SOL, from the general/predominant $E = hf$ temporal reference, SOL.

4.1   The r_E Manifold

Let us present the case therefore that the *c-metric* (a requirement here for $temporal\ calculus$, namely using c as a way to measure distance in space) manifold extending from SOL represents r_E, an altogether new manifold, yet acting as the focal $E = hf$ manifold for the $E = f$ based manifolds, where the $E = f$ based manifolds come into proper $E = hf$ focus, and therefore most likely the manifold upon which the holographic universe comes into focus, as a display of $E = hf$ light.

In being consistent with using c as a way to measure distance, let us suggest that the value of this new manifold would be calculated in accounting for the distance light travels *from the sun (SOL)* relative to *the fixed $E = f$* reference. Indeed, how?

Let us calculate this new manifold using the **_Earth reference_**, and therefore consider it, say, as r_E; r_E quite simply is proposed to represent a primary focus of light of SOL as viewed from Earth (E).

In adapting to the fixed r_O principle, let us say that r_E would also need to be a fixed temporal reference from Earth, and therefore how far light would travel **_for one full cycle of the Earth around SOL_**, as a measure, namely a process of time that accounts for Earth returning to its same location relative to SOL according to the proposed fixed $E = f$ manifold of r_O, most basically.

Indeed, the question should be asked, "how would one revolution of Earth seem relevant to measure distance for c?". It must be, as this is the measurement reference being considered, namely from Earth as a general "fixed" construct, and thus in being fixed the measurement must represent the time between those fixations, as a year, and thus as the distance light travels in one Earth year, in the context of the overall fixed reference of r_O, of the Oort Cloud manifold.

Therefore, extending this measurement out into the already derived system of $E = f$ manifolds (noting that the r_O manifold is by definition fixed, as the **Black Expanse** is fixed), the value of r_E is reached as the distance of a light year*, known to be* <u>**63,241 *AU***</u>, of course noting $1\ AU$ is the distance between SOL and Earth. This is represented in figure 5.
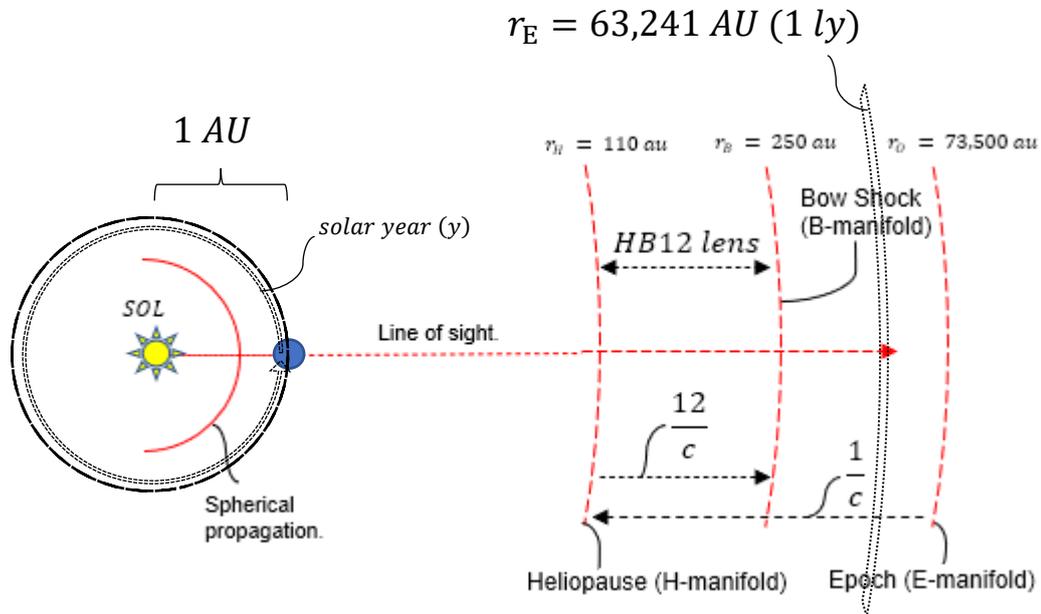
$$r_E = 63{,}241\ AU\ (1\ ly)$$

Figure 5: as per based on figure 1, paper 33 ([33]: p9, fig1), calculating the distance of the r_E manifold using the idea of Earth as a solar year (y) reference as one revolution around SOL, calculating this value thence as, based on c, $63{,}241\ A$U.

4.2   Distance to nearest apparent star

To note though is that to measure a value of r_E light in this Temporal Mechanics context, is to measure a value that bears primary reference to the r_O Oort Cloud manifold, as by definition that is how r_E phenomena must ultimately be defined in the context of time-space circuits, constants, and manifolds, namely scaled with r_O (and thus r_H and r_B) as presented in paper 33 [33], such that all the manifolds based on r_O come into focus at the $E = hf$ r_E manifold.

Therefore according to the r_O Oort Cloud manifold, the value of r_O is actually $1.16\ r_E$, and thus r_O represents a metric of 1.16 in regard to r_E, and there 1.16 light years (ly).

To therefore measure how this light field at r_E displays itself is to measure the <u>***surface area***</u> *of the r_E scaled r_O **sphere***, and therefore the following equation results, equation 2, for that metric.

$$\pi \cdot (1.16)^2 \ = \ 4.23 \text{ ly} \tag{2.}$$

What this means is that there are 4.23 light years measured ___as a metric___ in regard to the reference of Earth for the idea of light perceived in the r_E to the $r_O(r_H r_B)$ manifold systems as a virtual (holographic, namely manifold-filtered) SOL entity, as defined from a SOL entity basis, as highlighted in figure 6.
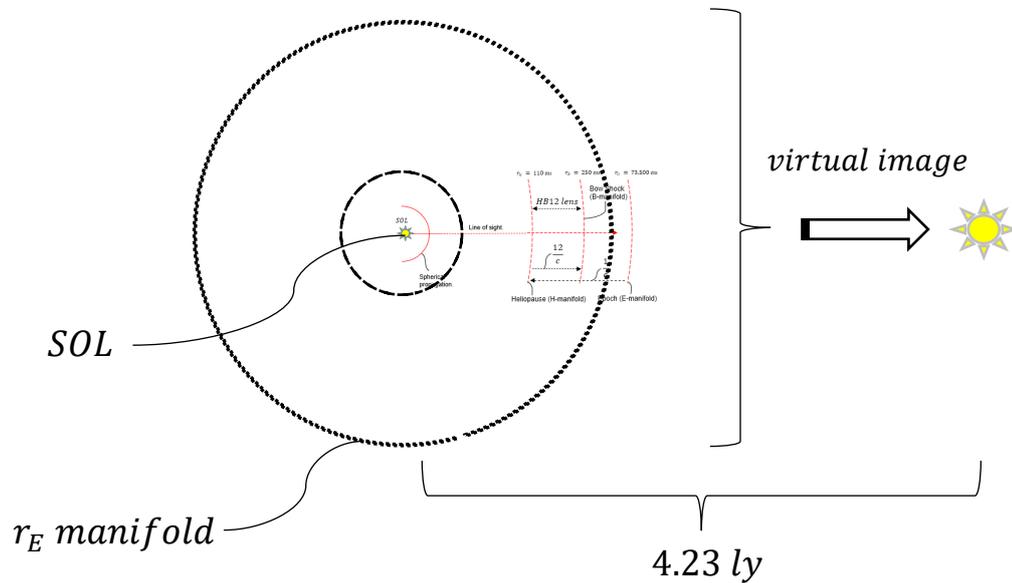

**Figure 6**: Calculating the light year (ly) distance of SOL to the nearest r_E based virtual SOL.

This proposed SOL-Earth based phenomenon per this r_E manifold would represent a *virtual* phenomenon, a *virtual SOL*, as such is the basis of definition here, and therefore would appear itself as a presence of light as SOL appears to the reference of Earth, yet here according to what would be an automatically adjusted process of illumination metrics in terms of size and brightness, parallax, and so on, as can only be the case, with all the required r_O based time-space circuits of the r_H and r_B manifolds in play, as a "focus" of light phenomena dictated by the time-space circuits in play at the Heliopause (r_H) and to the Bow Shock (r_B), as presented in paper 33 [33]. In other words, the $4.244 \, ly$ value would be, as Temporal Mechanics derives, the closest distance as light years to what would appear to be the nearest virtual SOL from this SOL and the reference here on Earth, the most fundamental reference nonetheless and therefore closest reference for the SOL r_E manifold in reference to the r_O Oort Cloud manifold, as a particular holographic *virtual SOL* image.

4.3 Distance to furthest apparent star (age of system)

The next theoretic task is acknowledging greater steps in this process, that beyond this most fundamental r_E manifold step would exist more distant placements of light activity modelled on the c based SOL and Earth relationship, according to this r_E manifold.

In expanding upon such a proposal, the case can be presented that all other manifestations in that overall stellar manifold system, that r_E surface area manifold in relation to the r_O manifold, would represent distances in space (and thus time in light years) from what would appear to be that closest virtual SOL light year reference. In other words, the r_E manifold would act as a type of manifold screen (as per definition for a surface area manifold structure) detailing how light *could* appear in one region on that r_E manifold, *yet could also be somewhere else* depending on where that point source of light based on SOL is defined to be, and so on and so forth, as varying apparent projections of light in that r_E manifold system, leading to apparent *light year* distances *well beyond* the standard value of *4.24 ly*. This is presented in figure 7.

Figure 7: Extension of distance of virtual $SOLS$ from A (nearest virtual SOL holographic effect), to B, to C, as varying *virtual* locations on the r_E manifold, E.
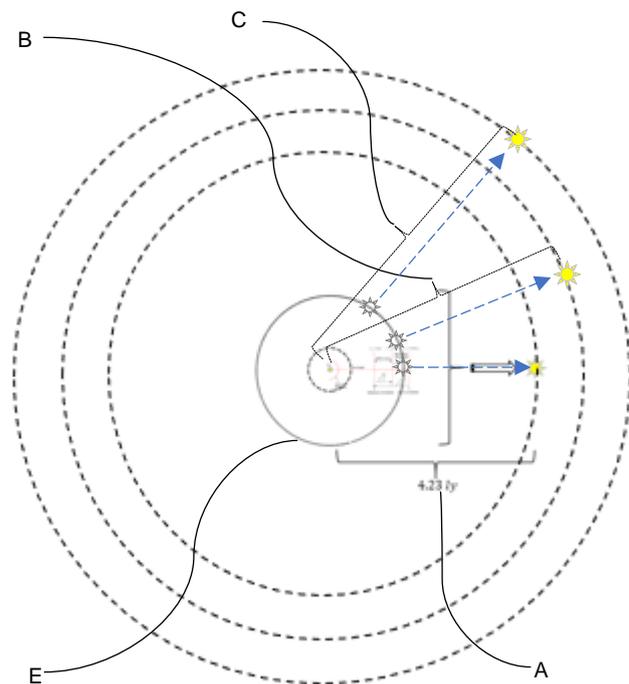
To address this is to address the relationship of light between Earth and SOL, namely how through an entire *__1 solar year of Earth__* light can be relayed the number of times it can, as a Temporal Mechanics SOL-based time-space circuit. Such is presented in figure 8.
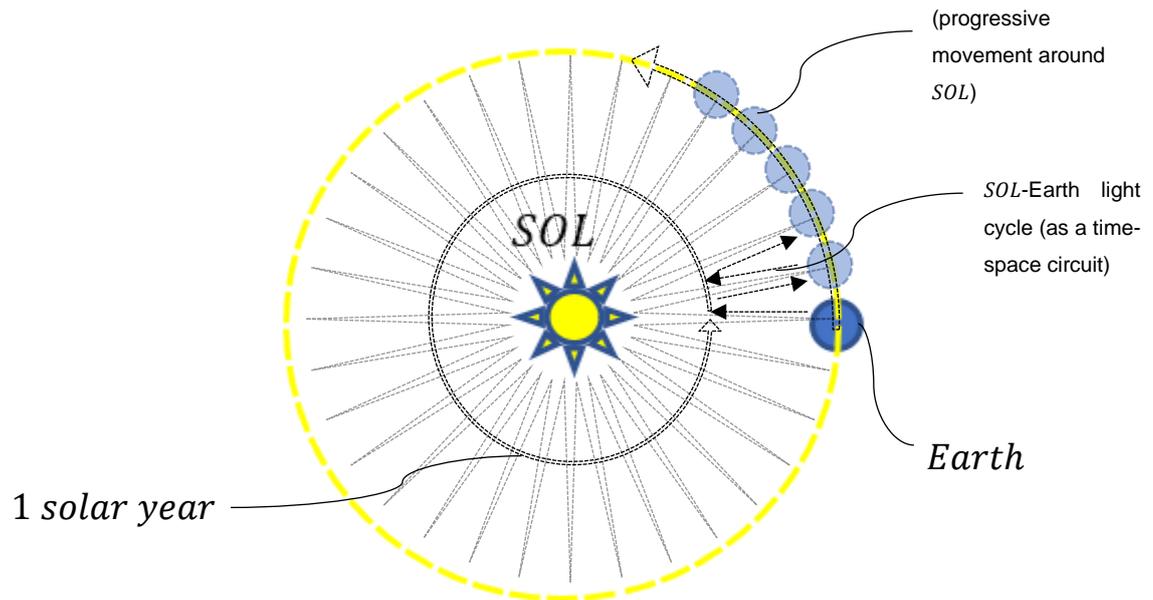
Figure 8: taking into context the time-space circuits in play as a c-metric between SOL and Earth for 1 year.

For instance, in view of figure 8, the maximum distance of light from SOL in light years would be calculated based on the **_accumulated_** interaction of light between SOL and Earth **_in one Earth solar revolution period_**.

Can this maximum value be calculated, namely the maximum light year distance in this scheme of light *running from SOL to Earth and then returning to SOL from Earth* as a basic time-space circuit for this new manifold proposal, namely in regard to the r_E manifold and thence what is presented as a holographic image as per figure 7?

It should be, as it would be primarily relevant to the number of times light can travel from SOL to Earth and back again, a solar time-space circuit in regard to Earth, during a full Earth solar cycle (~365 days), a SOL-Earth time-space circuit, which would then be measured as distance.

According to known observations, the number of times light travels to the Earth and back again from SOL is about 980 seconds, given it takes light 490 seconds for light to travel from SOL to the Earth.

Given there are 31536000 seconds in a year, this equates to 32,179 times, namely $\frac{31536000}{980} = 32,179$.

As a temporal *spherical* manifold factor though, as must be the case, if this number of steps (32,179) represents **_a virtual accumulated AU-based radius for an overall r_E manifold_**, as it must, and then equated as $\pi r_E{}^2$ (r_E as the SOL c-metric time-space circuit distance, as between Earth and SOL, as it must be for Temporal Mechanics) there is the value of 3.253 billion if $r_E = 32,179$, as per equation 3.

$$\pi \cdot (32,\!179)^2 = 3.253 \cdot 10^9 \tag{3.}$$

The issue now is factoring that $3.253 \cdot 10^9$ value with the $4.24\ ly$, as must also be the case (4.24 being the standard r_O adjusted measurement for this r_E manifold scheme, as a basic standard context here for the location of a virtual SOL on this proposed manifold).

This overall value therefore would represent the maximum virtual SOL distance of light from the Earth as the number of times light from SOL to Earth and back occurs during one Earth solar revolution (year), as applied through this r_E filter, as per equation 4.

$$3.253 \cdot 10^9 \cdot 4.24 \;=\; 13.8 \cdot 10^9\ ly \qquad (4.)$$

This value is **<u>13.8 billion light years</u>**, namely that when the r_E manifold is geared using all the time-space circuit loops of light between Earth and SOL as per the metric of c, and then standardised to the apparent distance of the nearest virtual SOL, the *apparent* age of the observed time-space system, or as Temporal Mechanics understands, the value for the apparent distance of the apparent furthest SOL-Earth event manifestation, namely 13.8 billion years, is calculable.

4.4　Number of apparent stars in Milky Way, and galaxies

What of the apparent number of stars in the perceived galaxy, in the Milky Way, the Milky Way structure as derived in paper 33 ([33]: p16-17)?

This would represent the 13.8 billion value, as a measure of distance regarding c, as described, as a basic value of virtual/apparent (holographic) SOL activity, of virtual extended activity of light between SOL and Earth factored to the r_E manifold, and then factored with the r_H manifold to produce the r_H manifold adjusted stellar light effect of the Milky Way.

However, for the r_H manifold and associated $H_c MQS$ ring phenomena ([33]: p13-14), that ring phenomena requires an additional factor for this r_E process of light, namely an *EM coupling factor* to an overall *time-space template*, to that overall r_H time-space manifold, as from an $E = hf$ (r_E) manifold to the $E = f$ based r_H manifold, and the thinking here (in being consistent with the process of logic of Temporal Mechanics) is that this would be an analogue of the k_e equation ([2]: p14,eq14), namely $k_e = \frac{3 \cdot 2 \cdot 20 \cdot c}{4} = 30c$ (except on this larger/macroscopic scale), yet here with the coupling of the r_E scheme to the r_H scheme c is already factored into that association, by definition (with the r_O manifold), so the factor used here is only "30".

Thus the following equation for the number of these SOL light points becomes evident for the Milky Way $H_c MQS$ ring, as per equation 5:

$$30 \cdot 13.8 \cdot 10^9 \;=\; 414 \cdot 10^9 \qquad (5.)$$

This then proposes the number of apparent stars (virtual $SOLS$) in the observed Milky Way Galaxy as ~414 billion, noting that this would also need to be a r_E (virtual SOL) phenomena.

According to Temporal Mechanics, it would therefore be logical as per paper 33 ([33]: p16-17), to thence present the number of galaxies based on the known number of points of SOL light activity in the H_cMQS ring scheme.

And so, according to paper 33 ([33]: p16-17), the number of perceived *galaxies* in the perceived universe would represent the perceived extension of the r_H manifold to the r_B manifold, and this would represent a value in the same ballpark as the number of stars in this galaxy, namely ~ 414 billion, given the process defined to be in play there.

4.5 Temporal Mechanics Cosmological picture

The general picture of the stars therefore primarily relies on the actual r_E manifold as the focus itself of virtual light activity that is then filtered/adjusted through H_cTSG and associated $HB12$ scheme ([33]: p13-16, fig4-7):
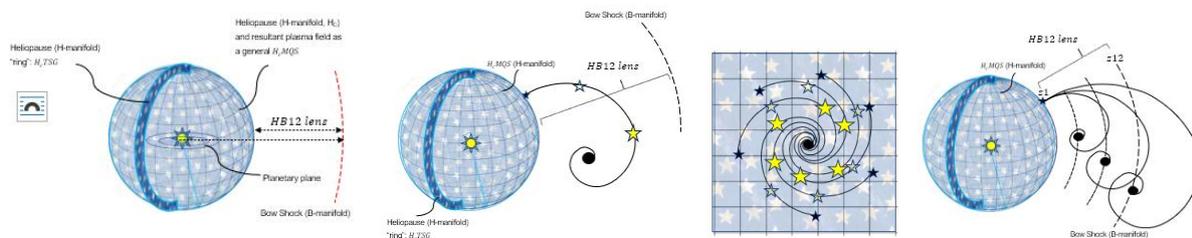

Figure 9: H_cTSG and associated $HB12$ scheme from paper 33 ([33]: p13-16, fig4-7)

With all these r_E based phenomena of virtual $SOLS$, it should be noted, as presented in paper 33 ([33]: p12, p15), that accompanying this r_E manifold effect would be the general random particle pair production and planetary debris, primarily associated to the greater r_O-based manifolds of r_H and r_B, primarily the r_H (H_cMQS) manifold, as presented in paper 33: p12-13 ([33]: p12-13):

> This H_cMQS zone would have two key characteristics, the first being a dissemination of matter/debris from the planetary plane into this general H_cMQS sphere, effected by a macroscopic TSU principle for time here on this level, a process of natural debris dispersion by this macroscopic TSU effect, the TSU presented as a microscopic effect in paper 20 ([20]: p11-13), and secondly a fundamental time-space groove (TSG) phenomena to the H_cMQS structure ([30]: p 23-25), given its fundamental $\frac{1}{c}$ link with the E-manifold, with the system $Epoch$.

All of such presents, in theory, quite a phenomenon regarding the greater manifolds of this solar system when accompanied with the r_E manifold, so much to suggest that a virtual universe of stars should become apparent, with this SOL being a part of a galaxy among billions of *virtual* galaxies each holding billions of *virtual* $SOLS$ themselves.

Yet the question must be asked, "is Temporal Mechanics close to estimates made by contemporary astrophysics through its own systems of observation and measurement?"

The following is what is considered today by astrophysics via observation and calculation:

- the number of galaxies to be estimated between 200 billion to 2 trillion, depending on how the data is being processed.
- the number of stars in the Milky Way to approximately number 400 billion.
- the age of the Universe to be 13.8 billion years, as according to the metric expansion of space ΛCDM model and associated star-light data available.
- Proxima Centauri is measured to be the closest star from SOL at $4.246\ AU$.

Temporal Mechanics is spot-on with the apparent age of the Universe, the distance to the closest star, Proxima Centauri, the number of stars perceived in this apparent galaxy of SOL, and in the ballpark of what is proposed to be the number of galaxies in the apparent universe of stars.

It should be mentioned though that the cosmological model employed by contemporary astrophysics (2021) is the ΛCDM model, a model which has large problems with its general calculations for the metric expansion of space and associated energy requirements, namely not successfully explaining the cosmological constant in the manner Temporal Mechanics has, namely as per correctly deriving the vacuum energy value ([13]: p23, eq9), vacuum permittivity ([23]: p30, eq5), and vacuum permeability ([23]: p30, eq7), nor being able to account for the Axis of Evil, the Flatness problem, and the Horizon problems, all of which Temporal Mechanics has resolved.

The model of cosmology presented by Temporal Mechanics laid the groundwork via the time-space manifolds of the previous paper, yet required the inclusion of the r_{E} manifold to uphold the standard atomic $E = hf$ effect of light, as presented here.

To ask if the stars are solar systems as images therefore, indeed they are as *images*, as they are based on the r_{E} process, yet the real question is if they are real physical solar systems like our own. Temporal Mechanics has explained what they are, and why they are what they are, and how their phenomena is what it is, as based on all the required metrics this local reality of ours relies on. The most important feature of cosmology that Temporal Mechanics has explained, has laid groundwork for, is the redshift effect and thus what would be an apparent expansion of space in regard to light, while not conflicting with the vacuum energy value, and thereby resolving the cosmological constant problem, while also resolving the Axis of Evil problem.

Quite simply, there would exist a r_{E} focus of $E = hf$ quantified light associated to the $E = f\ r_{\mathrm{H}}$ and r_{B} manifolds (and associated time-space circuitry effects), primarily via an EM coupling factor in play between the r_{E} and r_{H} manifolds.

4.6   The Geocentric Model: solving the "Axis of Evil problem

The big issue here therefore is why the r_{E} manifold and thus Earth-SOL reference is primary for the manifestation/focus of the stars. Why not use a Mars-SOL reference or a Venus-SOL reference? It

would just seem that, with all things considered, Earth is the calculated reference-zone for the stars to be centralised to, almost making the Earth in reference to SOL as the centre of the time-space system, so to speak, if not Earth itself as the ultimate centre, in theory, the ultimate sweet spot of conscious exercise if indeed as Temporal Mechanics proposes that consciousness is an emergent and required feature of the relationship between time and space, as presented in paper 3 [3], "*The Emergence of Consciousness from Chaos*". This therefore suggests that "life", consciousness, would only be found on Earth, not Mars or anywhere else, unless of course the entire system makes a fundamental change to its entire perceivable structure.

The scientific achievement here though is explaining and solving the known "Axis of Evil" problem. The "Axis of Evil" problem prescribes that there must be a type of Geocentric (Earth-central) cosmological model in play, as follows [35]:

> *But when you look at CMB map, you also see that the structure that is observed, is in fact, in a weird way, correlated with the plane of the earth around the sun. Is this Copernicus coming back to haunt us? That's crazy. We're looking out at the whole universe. There's no way there should be a correlation of structure with our motion of the earth around the sun — the plane of the earth around the sun — the ecliptic. That would say we are truly the center of the universe.*
>
> *Lawrence Krauss – Physicist/Cosmologist, Ambrose Swasey Professor of Physics, Chairman of the Physics Department of Case Western Reserve University*

Here, Temporal Mechanics has solved this problem in understanding how Earth is centralised to the metrics of the appearance of the stars and associated vacuum energy phenomena, calculated by $temporal\ calculus$ to be the known measured relatively uniform value.

Previously Temporal Mechanics proposed a type of dynamic solar system, of planets slowly moving out from the sun to the outer manifolds, a proposal, as a way to explain how planets would be formed, namely at SOL via cyclic supernova type events, and that the planets would through time slowly migrate outwards ultimately becoming debris. Yet, it would seem that there must always exist a sweet-spot, Earth, for consciousness, for life, a source reference to perceive reality best, given how accurately the entire star-scape is accounted for from the Earth reference, making the Earth reference a necessary if not eternal reference.

Thus, the presentation of theory here now delivers a more startling suggestion, namely that everything, the planets, the stars, is likely entirely steady-state, and the only thing that changes through time would be upon the general platforms that must exist, cycles, that could not exist if not for everything not existing. Of course there would be variations to this cycle, how SOL could still nonetheless provide debris for the outer manifolds, and how all of such would be a steady state system, by design, still nonetheless with the appearance of the arrow of time as entropy; of course also, general symmetry-breaking based variations take place with the process of particle pair production, a type of natural chaos (within this proposed albeit overall order).

4.7   The Earth cycle through time

The question now therefore focusses on the linearity of historical events, for instance from a prehistoric age to today, as though with temporal linearity our appearance as life presumes to be the first time we as humans have been here from a previous prehistorical era, all of which must be questioned. The question there is whether or not prehistory was merely a cycle of change itself compared to today, as a part of cycles that carry on eternally. The other question is of course regarding past civilisations and do any remnants exist in the form of what would be considered as alien life, and more to such, why it would be important to honour the cycles of time, of the passage of time and the required changes, suggesting therefore that the idea is to keep everything real and contextual here on Earth in time, namely upholding required cycles and associated life, all of such derivations sure to provide for deep discussion, especially with need to keep the integrity of the celestial objects intact, including Earth.

Finally, calculating the age of Earth, of this solar system, would entail a process of calculating the age of the r_E scheme, that EM appearance associated to time-space circuits, and thus to particle matter, which itself as an EM phenomenon would be calculated by measuring the calculated age of the furthest proposed star phenomenon, namely 13.8 billion light years, here as years. Although science calculates this value to be roughly 4.54 billion years, the issue is how matter would present a "maximum" radiocarbon dating and what that value logically would be, noting that a "maximum" value would represent a level of maximum decay and therefore be unreadable; 4.54 billion years would thus appear to be a measurement based on what is *readable*. Ultimately the idea of dating the time-space reference of Earth via a radioactive decay process would represent, must represent, a feature synonymous with how the greater manifolds fit with each other, how this relates to the Earth and SOL, and thus how the overall system would work as a holistic entity. Once again, as is evident by Temporal Mechanics, the phenomena of the stars if not reality itself is no simple "line of sight" phenomena (despite being thoughtfully based on a metric expansion of space as per the ΛCDM model), yet something far more fundamental to the actual nature of interaction between the dimensions of time and space, phenomena this series of five papers aims to highlight (time-space circuits, constants, manifolds, metrics, and logistics), in summarising the general work of Temporal Mechanics.

5.   Conclusion

It would all seem quite fantastic to have a theory based on the human ability of temporal perception using the metric of the Bohr radius to then derive what is perceived generally of reality as within those parameters of definition, namely Temporal Mechanics deriving all that physics measures, all apparent philosophical points of view aside, except for using a different a priori, a more fundamental a priori for time, with the inclusion of a temporal perception codex, solving what contemporary physics' models get stuck in, namely the cosmological constant, Horizon, Flatness, "Axis of Evil", and so on, problems. Yet indeed is not the concept of television quite fantastic, of relaying 3-d images that can be presented in 2-d form, to our living rooms, conveying a 3-d type show?

If there is room for a philosophical point of view here, in many regards we as a species must adapt to our reality, despite what theory presents this way or that, despite the fact that many theories suggest we do just that, namely adapt to reality, to whatever reality our conscious mind has us be focussed on. Indeed, it is no oddity we stargaze while also staring at plasma screens, if not at the same time. The question is "*what natural construct unbeknown to most of us has us accustomed, desiring, to do such, what are we actually adapting to we are not cognizant of*?". As presented in this paper, that would appear to be the highly *virtual/holographic* r_E manifold, and how it presents the manifestation of the stars, as programmed by the three key $E = f$ manifolds (r_O , r_H, and r_B), as though performing as a macroscopic scaled virtual screen transmitting virtual images of solar systems.

And so, is there any problem in our adapting to any greater manifolds of reality contemporary physics has yet to acknowledge, greater "holographic manifolds", greater 2-d screens presenting reality to us as though modelled on our own solar system, our own sun, presenting to us as the case here has it as the stars, as 3-d images like our own sun and solar systems, yet holographic images nonetheless? We have adapted quite well to the idea of plasma screen technology and associated transmission of the one reality we perceive in our daily lives from one location to the next via 2-d screen displays. The model of cosmology presented here by Temporal Mechanics is no different to what we are familiar with.

In conclusion, Temporal Mechanic presents the fundamentals of time and space and those interactions according to our human temporal perception ability, yet that model can only ultimately be judged on what it can prove locally in a way the current ΛCDM model (*primarily based on Einstein's Special and General relativity, and associated strings of physics schooling, and there are many, key of such being Quantum Mechanics and the Standard Model of particles*) cannot. What can be demonstrated as per Temporal Mechanics nonetheless as proof closer to home, *laboratory proof*, proof central to the Temporal Mechanics unique EM^{DIR} effect and associated particle pair production phenomenon description, is the subject of a subsequent paper. Prior such, an upcoming paper, paper 5 in this series of Temporal Mechanics papers (paper 5 titled *time-space logistics*), will explore how it is possible for a code of temporal perception to derive the distance to the nearest apparent star and the age of the universe, how such a thing could be possible, or was it a mere fluke, as with all the derivations of the equations and constants for particle and associated field force phenomena, and not just how it is possible, yet **why** it needs to be possible.

Conflicts of Interest

The author declares no conflicts of interest.

References

1. Jarvis S. H. (2017), <u>Gravity's Emergence from Electrodynamics</u>,
   DOI: <u>10.13140/RG.2.2.35132.28804/1</u>, <u>https://vixra.org/abs/1704.0169</u>

2. Jarvis S. H. (2017), <u>Golden Ratio Axioms of Time and Space</u>, DOI:
   <u>10.13140/RG.2.2.30099.12327/1</u>, <u>http://vixra.org/abs/1706.0488</u>

3. Jarvis S. H. (2017), <u>The Emergence of Consciousness from Chaos</u>, DOI:
   <u>10.13140/RG.2.2.23388.23683/1</u>, <u>http://vixra.org/abs/1707.0044</u>

4. Jarvis S. H. (2017), <u>Phi-Quantum Wave-Function Crystal Dynamics</u>, DOI:
   <u>10.13140/RG.2.2.10045.10726/3</u>, <u>http://vixra.org/abs/1707.0352</u>

5. Jarvis S. H. (2017), <u>Time as Energy</u>, DOI: <u>10.13140/RG.2.2.23466.88009/3</u>,
   <u>http://vixra.org/abs/1711.0419</u>

6. Jarvis S. H. (2018), <u>The Relativity of Time</u>, DOI: <u>10.13140/RG.2.2.13400.55044/3</u>,
   <u>http://vixra.org/abs/1801.0083</u>

7. Jarvis S. H. (2019), <u>Golden Ratio Entropic Gravity: Gravitational Singularity Field Testing</u>, DOI:
   <u>10.13140/RG.2.2.35399.14246/1</u>, <u>http://vixra.org/abs/1904.0485</u>

8. Jarvis S. H. (2019), <u>The Golden Ratio Time Algorithm</u>, DOI: <u>10.13140/RG.2.2.35399.14246/2</u>,
   <u>http://vixra.org/abs/1905.0081</u>

9. Jarvis S. H. (2019), <u>The Physics Chimera</u>, **DOI:** <u>10.13140/RG.2.2.28499.02084/1</u>,
   <u>http://vixra.org/abs/1906.0127</u>

10. Jarvis S. H. (2019), <u>The Conception of Time</u>, DOI: <u>10.13140/RG.2.2.10258.71363/1</u>,
    <u>http://vixra.org/abs/1906.0441</u>

11. Jarvis S. H. (2019), <u>Space, and the propagation of Light</u>, DOI:
    <u>10.13140/RG.2.2.15833.67689/1</u>, <u>http://vixra.org/abs/1908.0388</u>

12. Jarvis S. H. (2019), <u>Space, and the Nature of Gravity</u>, DOI: <u>10.13140/RG.2.2.17320.93443</u>,
    <u>http://vixra.org/abs/1909.0656</u>

13. Jarvis S. H. (2019), <u>Space, and the Redshift Effect</u>, DOI: <u>10.13140/RG.2.2.14287.43683/1</u>,
    <u>http://vixra.org/abs/1911.0064</u>

14. Jarvis S. H. (2019), <u>Solving The Cosmological Constant Problem</u>, DOI:
    <u>10.13140/RG.2.2.25730.63686/2</u>, <u>http://vixra.org/abs/1912.0451</u>

15. Jarvis S. H. (2020), <u>Hybrid Time Theory: "Euler's Formula" and the "Phi-Algorithm"</u>, DOI:
    <u>10.13140/RG.2.2.13078.91205/2</u>, <u>http://vixra.org/abs/2001.0233</u>

16. Jarvis S. H. (2020), <u>The Hybrid Time Clock as a Function of Gravity</u>,
    DOI: <u>10.13140/RG.2.2.27053.64487/1</u>, <u>http://vixra.org/abs/2001.0401</u>

17. Jarvis S. H. (2020), <u>Hybrid Time Theory: Cosmology and Quantum Gravity (I)</u>,
    DOI: <u>10.13140/RG.2.2.20045.79847/1</u>, <u>http://vixra.org/abs/2003.0659</u>

18. Jarvis S. H. (2020), <u>Scientific Principles of Space, Time, and Perception</u>,
    DOI: <u>10.13140/RG.2.2.16207.84648/1</u>, <u>http://vixra.org/abs/2004.0260</u>

19. Jarvis S. H. (2020), <u>Hybrid Time Theory: Cosmology and Quantum Gravity (II)</u>,
    DOI: <u>10.13140/RG.2.2.23972.22405</u>, <u>http://vixra.org/abs/2005.0053</u>

20. Jarvis S. H. (2020), Mathematical Principles of Time and Energy,
    DOI: 10.13140/RG.2.2.34441.67683/3, http://vixra.org/abs/2005.0179

21. Jarvis S. H. (2020), Dimensional Mechanics of Time and Space,
    DOI: 10.13140/RG.2.2.21001.88169/1, http://vixra.org/abs/2005.0286

22. Jarvis S. H. (2020), Dimensional Thermodynamics, DOI 10.13140/RG.2.2.29715.71202/2,
    http://vixra.org/abs/2006.0194

23. Jarvis S. H. (2020), Time-Space Wave-Mechanics, DOI 10.13140/RG.2.2.10565.68320/3,
    http://vixra.org/abs/2007.0223

24. Jarvis S. H. (2020), Temporal Calculus (The Calculus of Time-points in Space),
    DOI: 10.13140/RG.2.2.15362.09929/3, http://vixra.org/abs/2008.0111

25. Jarvis S. H. (2020), Temporal Calculus: solving the "Yang-Mills Existence and Mass Gap"
    problem., DOI: 10.13140/RG.2.2.33774.43843/2, http://vixra.org/abs/2008.0226?ref=11562969

26. Jarvis S. H. (2020), Temporal Calculus: Time Scaling Space,
    DOI: 10.13140/RG.2.2.28539.75043/2, https://vixra.org/abs/2009.0091

27. Jarvis S. H. (2020), Temporal Calculus: Resolving Elementary Particle Formation and
    Confinement, DOI: 10.13140/RG.2.2.20191.07844, https://vixra.org/abs/2009.0177

28. Jarvis S. H. (2020), Temporal Calculus: Resolving Einstein's Theory of Relativity (Special and
    General), DOI: 10.13140/RG.2.2.12474.21447/1, https://vixra.org/abs/2010.0017

29. Jarvis S. H. (2020), Time and Non-Locality: Resolving Bell's Theorem,
    DOI: 10.13140/RG.2.2.12651.98086 (researchgate.net), https://vixra.org/abs/2011.0002

30. Jarvis S. H. (2020), Non-Local Time-Point Theory: Magnetic Quantum Shell (MQS) Modelling,
    DOI: 10.13140/RG.2.2.11032.83206/2, https://vixra.org/abs/2012.0040

31. Jarvis S. H. (2021), Temporal Mechanics (A): Time-Space Circuits,
    DOI: 10.13140/RG.2.2.28879.10407, https://vixra.org/abs/2101.0022

32. Jarvis S. H. (2021), Temporal Mechanics (B): Time-Space Constants,
    DOI: 10.13140/RG.2.2.31751.21925/2, https://vixra.org/abs/2101.0148

33. Jarvis S. H. (2021), Temporal Mechanics (C): Time-Space Manifolds,
    DOI: 10.13140/RG.2.2.30214.70720/1, https://vixra.org/abs/2102.0047

34. https://www.merriam-webster.com/dictionary/metric, webpage accessed 15th March 2021

35. https://www.edge.org/conversation/lawrence_m_krauss-the-energy-of-empty-space-that-isnt-
    zero