



Translocations In Space-Time and Simultaneous States of the Universe: Convergent Quantifications and Alternative Solutions from the Principles of Physics for the Challenges of “Time Travel” and “Parallel Universes”

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ABSTRACT

Translation of four dimensional axes anywhere within the spatial and temporal boundaries of the universe would require quantitative values from convergence between parameters that reflect these limits. The presence of entanglement and volumetric velocities indicates that the initiating energy for displacement and transposition of axes would be within the upper limit of the rest mass of a single photon which is the same order of magnitude as a macroscopic Hamiltonian of the modified Schrödinger wave function. The representative metaphor is that any local 4-D geometry, rather than displaying restricted movement through Minkowskian space, would instead expand to the total universal space-time volume before re-converging into another location where it would be subject to cause-effect. Within this transient context the contributions from the anisotropic features of entropy and the laws of thermodynamics would be minimal. The central operation of a fundamental unit of 10^{20} J, the hydrogen line frequency, and the Bohr orbital time for ground state electrons would be required for the relocalized manifestation. Similar quantified convergence occurs for the $\sim 10^{12}$ parallel states within space per Planck's time which solve for phase-shift increments where Casimir and magnetic forces intersect. Experimental support for these interpretations and potential applications is considered. The multiple, convergent solutions of basic universal quantities suggest that translations of spatial axes into adjacent spatial states and the transposition of four dimensional configurations any where and any time within the universe may be accessed but would require alternative perspectives and technologies.

Indexing Terms/Keywords

4-D space, Temporal Displacement, Single Photon Effects, Volumetric Mass Velocity; “Parallel Universes”, “Time Travel”, Entropy; Universal Set, 10^{52} kg

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INTRODUCTION

Considering the range of levels of space between the smallest calculable value of Planck's distance ($1.62 \cdot 10^{-35}$ m) and the estimated length of the total set (the universe, $\sim 10^{26}$ to 10^{27} m) and the range of durations between the smallest calculable value of Planck's time ($5.39 \cdot 10^{-44}$ s) and the ultimate age (final epoch) of the universe ($\sim 3 \cdot 10^{18}$ s) there should be myriad representations of organizations of matter. The capacity for transposition of any given organization of matter within a four dimensional axes in space-time to any of the extremely large numbers of alternate four dimensional axes has been considered too hypothetical to exhibit properties that could be described by modern physics. The classic metaphor, which is referenced pejoratively by some scientists, for translocations and transpositions within the temporal domain has been “time travel”. Analogous terms for transpositions within space have included “multiple” or “parallel” universes. The possible development of technologies to accomplish these capacities, if they are feasible, requires a combination of imaginative exploration, convergence of operations, and consistency with modern principles of physics. Here the convergence of quantitative solutions offers a different interpretation of these possibilities.

The relationships between increments of space (Δs) and time (Δt) define the levels of discourse by which phenomena are measured and perceived. For example in order to optimally discern picometer space measurements of increments in the order of picoseconds are required. To observe larger, more geophysical phenomena, megameter space requires megasecond increments. For a *process* to be discerned within any space-time level of discourse there must be at least two Δt s. When two or more Δt s are involved the intricacies of time, its perceived direction, and causality emerge as phenomena. However at the largest ΔS there is only one ΔT and hence the phenomena associated with processes would not occur or exist. If the ΔS is the universe then at that level there would be no process and hence no time. There would only be simultaneity. Accessing that totality would, conceptually, allow the potential localization to any four dimensional position within the total extent of the duration or volume of the universe.



THE POTENTIAL SOURCE OF TEMPORAL DISPLACEMENTS

If the upper boundaries for the space-time parameters of the universe and the lower space-time boundaries for the constituents of the universe are convergent phenomena then fundamental combinations of their respective values should reflect the properties of the space in which matter operates. The cube of Planck's Length ($4.25 \cdot 10^{-105} \text{ m}^3$) divided by Planck's time ($5.39 \cdot 10^{-44} \text{ s}$) results in a volumetric velocity of $0.79 \cdot 10^{-61} \text{ m}^3 \cdot \text{s}^{-1}$. When multiplied by the upper boundary of the final age of the universe ($3 \cdot 10^{18} \text{ s}$) as derived from several estimates [1,2], including the simplistic product of G ($6.67 \cdot 10^{-11} \text{ m}^3 \cdot \text{kg}^{-1} \cdot \text{s}^{-2}$) and the average mass density of the universe ($1.67 \cdot 10^{-27} \text{ kg} \cdot \text{m}^{-3}$) that accommodates most models [3], the volume is $23.7 \cdot 10^{-44} \text{ m}^3$. The cube root is $6.19 \cdot 10^{-15} \text{ m}$. This distance is within the order of magnitude of the diameter of the resting electron and the proton. The values may be more exact if the pervasive presence of π or 2π [4] is divided into those values, respectively.

In other words the linear space (width) occupied by the fundamental particles of the universe become realized when the volumetric velocity of Planck's values is applied across the total age of universe before the final epoch. The issue of intermediate values, such as the current age ($\sim 4.2 \cdot 10^{17} \text{ s}$), may be relevant from the context of contradictions between manifest mass and energy and dark energy and dark matter. Persinger [5] has suggested that the conspicuous convergence between the proportion ($\sim 14\%$) of actual mass and energy compared to the total energy is within the same measurement variability as the proportion of the present age of the universe relative to the final epoch. He suggested that what is now considered "dark matter" and "dark energy" is the matter and energy yet to occur before the final epoch. If this assumption is veridical then the future would be more related to the manifestation of those latent or potential states.

The concept of recondite matter and energy that exists in non-expressed or dormant states was developed by Eddington [6]. It was an extension of the digital concept that an entity either exists or it does not exist. His remarkably perspicacious and prescient model was based upon the essential dyad of a pair of observations for an event to be measured or perceived and the concept of dual roles. Each entity or unit partially creates its own environment but also behaves as a single entity or identity. As a contributor to the structure of the universe each unit is assumed to exist continually [7]. However as an individual unit it may exist or may not exist. Dormant ones are only activated when the particle manifests its electrical characteristics.

Eddington's model also concluded that there were 256 combinations of states. Four combinations of sets of 0, 1, or (0,0) (0,1) (1,0), (1,1) and the required pairs of pairs (4^4) were the source of the specific number of combinations. From this perspective 32 ($\sim 13\%$) were sufficiently convergent to be optimally manifested. A significant component of these numbers of states was dormant. A more recent variant of this concept was developed by Bordag et al [8] who argued that virtual particles representative of vacuum oscillations can become real particles if the state is immersed within a magnetic field with changing boundaries. This potential to transform what has not occurred into what could occur and then ultimately what does occur would be required theoretically if translocations of space-time axes were possible within the universe.

The energy requirements for the four dimensional transposition or displacement of the same volume of an aggregate of matter-energy to another set of axes can be quantified. The two essential components required for this estimate would be the numbers of basic units (protons and electrons) composing the mass and the universal energy associated with each unit. For a 70 kg mass composed primary of water (such as a human being), there would be $4 \cdot 10^{28}$ protons within that mass. Balanced charge, which would include the electron, indicates that the total numbers of particles would be $8 \cdot 10^{28}$. Neutrons are assumed to be inclusive.

The required energy associated with each particular unit should reflect a basic quantum that is distributed throughout the volume of the universe in order to access any space-time point. This value should reflect the quantity when the properties of the smallest unit (Planck's distance) of the universe are related to its total properties. Classic quantification of force from the product of the mass of the universe (10^{52} kg), its length ($\sim 10^{26} \text{ m}$) and the square of the inverse of Planck's time (10^{86} s^{-2}) results in 10^{164} N . This value divided by the total number of Planck's voxels in the total volume of the universe (10^{78} m^3 per universe divided by 10^{-105} m^3 per Planck's voxel) results in $\sim 10^{-19} \text{ N}$. When applied across the most common wavelength (space) in the total set, the hydrogen wavelength (0.21 m), the product results in $\sim 2 \cdot 10^{-20} \text{ J}$. This could be considered a ubiquitous "space-time" energy that interconnects the structure of space-time [9]. It is also the most common solution for the dynamics within the physical-chemical bases to living systems [10].

The amount of this space-time energy multiplied by the numbers of particles in a 70 kg mass would be $1.6 \cdot 10^9 \text{ J}$. The equivalent energy per m^3 for the 70 kg person is $0.22 \cdot 10^{11} \text{ J} \cdot \text{m}^{-3}$. When multiplied by the volumetric velocity constant of $0.79 \cdot 10^{-61} \text{ m}^3 \cdot \text{s}^{-1}$, the energy per s is $1.7 \cdot 10^{-51} \text{ J} \cdot \text{s}^{-1}$. This value is significant in conditions where c^2 approaches 1 and hence only mass remains. If some phenomenon existed for about 100 ms (0.1 s) the value would be $< 2 \cdot 10^{-52} \text{ kg}$ or the upper limit for the rest mass of a photon [11]. This convergence was noticed previously when the total energy of the universe ($\sim 10^{69} \text{ J}$) was divided by the total number of rest mass photons (10^{104}) which results in an increment of $\sim 10^{-35} \text{ J}$. When divided by the age of the universe ($\sim 10^{17} \text{ s}$) the result is 10^{-52} J per unit s.

The possibility that the energy band associated with the frequency of light would be comparable to the energy of the equivalent of the rest photon mass distributed over the age of the universe would be consistent with the conditions to allow translocation throughout the volume. At the unit velocity where c^2 approaches unity and the energy of the rest mass photon is $\sim 10^{-52} \text{ J}$ the energy per Planck's time would be $10^{-8} \text{ J} \cdot \text{s}^{-1}$. For the increment of energy for one orbit of an electron ($10^{-16} \text{ s} \cdot \text{rev}^{-1}$) the value is $\sim 10^{-24} \text{ J}$. The frequency of this energy is effectively the precession frequency of the neutral hydrogen atom. Hence, two fundamental pervasive properties of the universe: the upper boundary of the photon rest mass and the hydrogen line might be related.



If the fundamental electromagnetic unit of the universe is the photon with an upper boundary rest mass of $<2 \cdot 10^{52}$ kg, then the total numbers of photon equivalents in the universe with a mass of $2 \cdot 10^{52}$ kg would be $\sim 10^{104}$. The average density in a universal volume of 10^{78} m^3 would be 10^{26} photons per cubic meter. The width of a photon within this matrix would be between 1 and 10 nm. This is within the domain of ion channels within plasma membranes of mammalian cells as well as the widths of the membrane. Such a solution suggests that the dissolution required for translocation and transposition would occur optimally within the spatial level that defines the electromagnetic dynamics of the plasma cell membrane [10].

Relating the two boundaries, the smallest and largest spatial values, to the time occupied by photons produces the type of contradiction required for the solution that only one photon could be involved with the translocation and transposition of axes. As calculated by Persinger and Koren [12], the duration for a given length of space to expand 1 Planck's length would be:

$$t = P_L (L \cdot H_p)^{-1} \quad (1),$$

where P_L is Planck's length, L is the width of the space and H_p is Hubble's parameter ($\sim 70 \text{ km} \cdot \text{s}^{-1} \cdot \text{MParsec}^{-1}$) whose centroid from multiple measurements is $\sim 2.4 \cdot 10^{-18} \text{ s}^{-1}$. There is some experimental evidence that predictions from equation (1) for the estimated diameters for an electron (about 1 ms) and a proton (about 3 ms) are related to excess correlations of photon-related reactions that involve either the electron or the proton [13,14].

However, if the smallest space is inserted, the time required to expand one Planck's Length is $\sim 10^{18}$ s. This is the final age of the universe. If the largest distance is inserted, the time required to expand one Planck's Length is 10^{-44} s, Planck's time. In other words the universe expands by one Planck's Length "instantaneously" with Planck's time. The much smaller Planck's Length would require the final age of the universe to expand one Planck's Length. Technically this means that the smallest length is related to the largest length at the upper and lower limits of the units that define process (time) across all levels of space. This property meets one of the criteria for holographic processes [15,16].

This perspective offers an alternative challenge to the potential for developing a process and technology for translocation and transposition of space-time axes occupied by mass. The solution is not large amounts of energy but the smallest amount of energy associated with perhaps the most fundamental electromagnetic unit of the universe: the photon. The quantification indicates that only one photon would be required to change the state that initiates and results in the transposition. That change in only one basic unit of an aggregate can alter the entire aggregate composed of millions of units has been shown for brain activity [17]. A similar process occurs for bacterial DNA [18]. Such minimum units would be more compatible with the role of information rather than bulk transfer of energy.

The processes that are implied for "time travel" from this perspective would not be linear or mechanical movements through a fixed n -dimensional geometry as suggested by several theorists and writers. That impedance would be extraordinary. Translocation could be re-conceptualized as moving from the single photon representation in one given space-time location into the whole of all photons that represents the total volume and total (final) age of the universe. This would be the total set. Then there would be a "re-conformation" to a single photon equivalent within another space-time location anywhere within the boundaries of the limits of the volume and duration of the universe. The process would then be reversed, resulting in the manifestation of the mass representation within a different space-time locus. Such a condition has often been employed to describe a hologram by which the unit reflects the whole and the whole reflects the unit. In specific situations there is at least one property where the sum of the units is equal to the unit.

For this process to occur the relationship between a property of the electron and the photon should exist over the ultimate age of the universe. If the value $2.4 \cdot 10^{52}$ kg [19], obtained by two methods, were assumed for the universal mass the estimated mass equivalence of the universe in photon units would be $1.4 \cdot 10^{104}$ photons per 10^{78} m^3 or $1.4 \cdot 10^{26}$ photons per m^3 . Assuming a spherical shape for the electron and hence a volume of $1.14 \cdot 10^{-44} \text{ m}^3$ there would be the equivalent of $\sim 2.3 \cdot 10^{18}$ photons per implicit second. To obtain one photon as an increment or unit $\sim 2 \cdot 10^{18}$ s must elapse, which is a duration very similar to the total age of the universe. This would suggest that the much smaller increments of time, e.g., a second, within our time frame by which the phenomena labeled as electrons are measured are infinitesimal components of what would be a single photon during the final epoch.

That the electron as a phenomenon can exhibit the potential to persist until the final epoch is a direct consequence of its orbital angular magnetic momentum when immersed within two superimposed magnetic fields with intensities that would be typically encountered in average space. The change can be described by:

$$\Delta m = (e^2 r^2) \cdot (4m_e)^{-1} B \quad (2),$$

where e is the unit charge, r is the Bohr radius of the electron, m_e is the mass of the electron, and B is the strength of the applied field. If the magnetic field strength of 10^{-12} T is applied, the magnetic moment is $10^{-40} \text{ A} \cdot \text{m}^2$ or $\text{J} \cdot \text{T}^{-1}$. If this magnetic dipole was immersed within a similar strength field superimposed and permeating the first, the energy would be in the order of 10^{-52} J. When divided into Planck's constant the resulting duration is within the range of 10^{18} s.

The capacity to exist across the age of the universe would be essential for translation and transposition. More critically these properties converge with the properties of a single photon. As sagaciously stated by Fickler et al [20] "single photons with helical phase structures may carry a quantized amount of orbital angular momentum, and their entanglement is important for quantum information science and fundamental tests of quantum theory. Because there is no theoretical upper limit on how many quanta of orbital angular momentum a single photon can carry, it is possible to create entanglement between two particles with an arbitrarily high difference in quantum number". This would potentially include



Rydberg-type atoms which exhibit electrons with very high principal quantum numbers. Because the core electrons attenuate the effects of the nucleus upon the outer electron, the electric potential approaches that displayed by an electron in a hydrogen atom. Enhanced responses to applied electric and magnetic fields are common characteristics.

ENERGY DENSITY OF THE ENTANGLEMENT OF FOUR-DIMENSIONAL SPACE

The original depiction of a four dimensional hyperspace where time was one of the four axes extended the Pythagorean relation for space. Minkowski [21] accommodated the fourth dimension by a product of a velocity and time. From his perspective the velocity was that of light in a vacuum. Entanglement that allows the excess correlation between any point of the universe would be a fundamental requirement for temporal displacement to any space-time position. This would be an extension of Mach's Principle [22] that any part of the universe is affected by all other parts and would require a velocity much faster than the speed of light. This would be essential to maintain the macrostructure of the universe [23]. A similar concept was explored by Rowland [24] for gravitational energy.

We [25] had assumed that to accommodate Mach' concept of the intercalated (angular) momentum of all matter a much faster velocity must exist intrinsically within the spatial dimensions of the universe. This velocity would not necessarily require the electromagnetic medium reflected in permittivity and permeability of a vacuum. These latter properties facilitate the creation of the conditions for causality and locality. To accommodate the coordination of large-scale spatial organizations of the universe within which excess correlation and non-locality are manifested, a different velocity was required.

One derived "diffusivity" parameter is $\sim 10^{23} \text{ m}\cdot\text{s}^{-1}$. It is similar to the geometrically adjusted value of the most universal length, the hydrogen line (0.21 m) divided by the time required for light at c to move across an electron (the "jiffy"). This order of magnitude can also be derived from the universal parameters of G (Newton's constant), M (the mass of the universe), D (the diameter of the universe) and T (the duration of the universe) in order to balance the four dimensional products of the simplest closed boundary: the circle. We [26] selected this "closed" symmetrical boundary because of its potential for infinite numbers of lines and states of momentum. For the present approach helical phase structures in the context of photons would be included when the adjacent distance between each sequential 2π radians of the helix approached Planck's distance in light of the unlimited quanta of orbital angular momentum that might be carried by a single photon [20].

The product of $2\pi r$, $4\pi r^2$, $4/3\pi^3$, and $2\pi r f$ is $21.3 \pi^4 \text{ m}^7\cdot\text{s}^{-1}$ and following the most parsimonious dimensional analyses it was:

$$21.3\pi^4 \text{ m}^7\cdot\text{s}^{-1} = G^2 \cdot M^2 \cdot D \cdot T^3 \quad (3),$$

which resulted in $2.4 \cdot 10^{23} \text{ m}\cdot\text{s}^{-1}$. The value should not be considered exact given the estimated values of M , D and T . For convenience the symbol ψ has been applied to this value. It is the lower case of the classic symbol (Ψ) for the Schrödinger wave equation. When the ratio of the magnetic field strength of the universe from its total energy ($\sim 10^{69} \text{ J}$) and the potential difference (Volts per m) for this energy was calculated, a similar velocity emerged [27]. In other words three approaches with different variables converged upon the same order of magnitude for the second derivative of space, i.e., velocity.

There are multiple examples of the convergent validity of this measure of "diffusivity". First it allows the condition of a hybrid property for the photon's energy. The product of the upper boundary for the rest mass of a photon ($2 \cdot 10^{-52} \text{ kg}$) ($3 \cdot 10^8 \text{ m}\cdot\text{s}^{-1}$) ($2.4 \cdot 10^{23} \text{ m}\cdot\text{s}^{-1}$) is $1.4 \cdot 10^{-20} \text{ J}$ which may be the quantity of energy that relates the universal space at the level of Planck's dimensions. The salience of this solution is increased if both the mass of the photon and this diffusivity term are assumed to be imaginary because the product becomes "real" in a mathematical sense. The upper limit of the electric dipole moment of an electron has been recently estimated from experimental measurements to be $8.7 \cdot 10^{-31} \text{ A}\cdot\text{s}\cdot\text{m}$ [28]. When multiplied by the entanglement velocity the magnetic moment is $1.74 \cdot 10^{-7} \text{ A}\cdot\text{m}^2$. When this condition is immersed within the median boundaries of intergalactic fields [29] the resulting ubiquitous energy would be $\sim 10^{-20} \text{ J}$. This shared energy between the photon and the electron because of the entanglement velocity could be an initial process to allow the information within the non-local photon to affect the material properties of the local electron.

Second, the duration required to traverse the known universe at the "entanglement" velocity (ψ) would be about 8 min. This discrete duration for entanglement has been shown experimentally [30]. Third the persistent "excess correlations" between water-based phenomena on earth and water molecules on the sun [31] might be explained if this velocity were involved. The solar-earth traversal time would be $\sim 10^{-12} \text{ s}$. This is the order of magnitude of the duration of the dynamic and unique system, the hydronium ion [32], that determines pH. Finally this value when applied to satellite orbits is within the same order of magnitude as the estimated drag ($\sim 10^{-16} \text{ s}$) that has been attributed to inertial frameworks.

From this perspective the modified Minkowski hyperspace (4D) would be:

$$4D = \sqrt{x^2 + y^2 + z^2 - \psi^2 s^2} \quad (4),$$

Assuming an isomorphism for the space occupied by a 70 kg person the first three components would be the addition of the squares (0.4 m^2) of each of the three spatial planes. The value required for the final product of $4 \cdot 10^{46} \text{ m}^2\cdot\text{s}^{-2}$ such that the solution for the square root is not an imaginary number would be $0.12 \cdot 10^{-46} \text{ s}^2$. This is equivalent to $2.86 \cdot 10^{23} \text{ Hz}$. The energy associated with this frequency, obtained by multiplying by Planck's constant ($6.67 \cdot 10^{-34} \text{ J}\cdot\text{s}$) is $1.89 \cdot 10^{-10} \text{ J}$. The energy density determined by dividing by the volume ($7 \cdot 10^{-2} \text{ m}^3$), is $2.7 \cdot 10^{-9} \text{ J}\cdot\text{m}^{-3}$. This is the order of magnitude and



within the range of coefficients that describe the average energy density of the entire universe based upon quantum [33] and macroscopic [34] approaches. For example 10^{69} J (the estimated total mass-energy equivalence) divided by 10^{78} m^3 is $10^{-9} \text{ J}\cdot\text{m}^{-3}$. In the present perspective the convergence of the average energy density of the universe with that obtained from the entanglement velocity in space-time could reflect the condition of a universal “condensate” where each unit behaves as any other unit within the volume.

Stated alternatively, the energy required for the translocation and transposition of axes for a 70 kg person when the excess correlation velocity is accessed could be within the same magnitude as the energy density anywhere within the universe when considered from the context of its total age. Such *a priori* homogeneity can be a property for transpositions. Many electronic systems operate because all processes occur within a relatively narrow band of parameters, such as ± 5 V. Even very weak interactions occur quantitatively when two systems share the same vector parameters. For example both the human cerebral cortices and the Schumann Resonances display magnetic field strengths in the order of 10^{-12} T and about 20 mV across the 11 cm averaged length. Saroka and Persinger [35] demonstrated experimentally, by measuring both phenomena simultaneously, that real-time coherence occurs between these two energy sources for ~ 100 to 500 ms once every ~ 30 s.

Such vector similarities, from the perspective of signaling, are consistent with the Lorentz Lemma [36] which relates any two electromagnetic fields if: 1) they are the same frequency, 2) occur outside the source, and 3) occupy an isotropic medium. The relation is formalized as:

$$\text{del}\cdot(\mathbf{E}_a \times \mathbf{H}_b) = \text{del}\cdot(\mathbf{E}_b \times \mathbf{H}_a) \quad (5),$$

where \mathbf{E} refers to the electric field vector component, \mathbf{H} refers to the magnetic field in $\text{A}\cdot\text{m}^{-1}$ and the subscripts refer to two different sources in space. The aggregate is $\text{W}\cdot\text{m}^{-2}$. As an example human cerebral activity and the Schumann Resonance generated between the earth's surface and the ionosphere both share a 7-8 Hz power peak as a fundamental frequency. Both exhibit functional magnetic fields in the 10^{-12} T range and electric fields in the order of 0.1 mV to $1 \text{ mV}\cdot\text{m}^{-1}$. The flux power density would be $\sim 10^{-12} \text{ W}\cdot\text{m}^{-2}$ [37] and is almost identical (even to the coefficient) for the photon emissions from the human cerebrum during specific cognitions [38].

ACCOMMODATING ENTROPY AND APPARENT ANISOTROPY OF THE TEMPORAL VECTOR

For isotropic access to any space-time location within the total extent and duration of the universe the challenge of the anisotropic properties of entropy must be addressed. The limits of the reversibility of “temporal direction” within energetic and dynamic systems have been central to thermodynamic theories and are often implicitly contained within the laws (the second) associated with it. The Loschmidt paradox and the classic Boltzmann-Loschmidt propositions addressed the concept of “time-reversal” during the late 19th century. Whereas entropy would dominate such that organization of matter would decrease Loschmidt-type time reversals would require a decrease in entropy. It would be correlated with a hypothetical reversal of the velocities of all molecules within an aggregate.

Recently Garner et al [39] calculated the ultimate physical limits of reversibility. They explored the spatial extent of the Loschmidt echo that is the backward direction of “time” within which entropy decreases. Assuming that the universe was comparable to an ultimate quantum computer, they derived a value for the largest length (of an object) that can be tracked to the maximum level of detail for the entire duration of the universe. According to their derivation:

$$r_s < r_U [\sqrt{t_P \cdot t^{-1}}] \quad (6),$$

where r_U is the radius of the universe, t_P is Planck's time, and t is the present age of the universe (13.8 Gyr), the solution was $\sim 10 \mu\text{m}$. This specific parameter may be critical to access to the entire set of space-time. At the velocity of light in a vacuum, $10 \mu\text{m}$ is equivalent to $3 \cdot 10^{13}$ Hz. The energy equivalence, by multiplying Planck's constant, is $\sim 2 \cdot 10^{-20}$ J which has been postulated to the ubiquitous quantity that could interconnect space-time.

Such convergence would be essential. It would allow the backward localization in space-time to be accessed by entering the energy unit that is distributed throughout all of space-time. This boundary for the physical limits to reversibility is also essential to prevent the catastrophic influence upon locality and its primary temporal component: causality. If there was not such a limit then causality, which is effectively excess correlations with values approaching unity, would be fragmented. The present assumption predicts that as the reversing process approaches this boundary it would enter the entire temporal-spatial set of the universe and no longer be bound by causality or locality. Instead it would transiently occupy the entire set before it is translocated and transposed to some other space-time value within the past.

The $\sim 10^{-20}$ J increment is also important because of how it is related to one of the most fundamental power densities for photon flux we have measured within the laboratory. Several experiments [40, 41] have shown that photon fluxes in the order of $10^{-12} \text{ W}\cdot\text{m}^{-2}$ seem to reflect a fundamental coupling to other forces such as the ambient magnetic field strength. Interesting when this flux density is applied across the square of the hydrogen line the power or energy per s is within error measurement of the wavelength of the neutral hydrogen frequency of $1.42 \cdot 10^9$ Hz.

The results of the calculations have indicated that a property embedded in photon density may be central to the potential for translocation and transposition of mass within space-time. Consequently there should be a relationship between the “ubiquitous” space-time energy of 10^{-20} J and a permeating feature of photon flux density that reflects parameters with universal penetration. Previous calculations [42] have supported this feature. When photon flux power



density ($10^{-12} \text{ kg}\cdot\text{s}^{-3}$) is set equal to energy (10^{-20} J) per second the connecting relation is a term composed of an inverse diffusivity and frequency. Diffusivity is the inverse of the product of resistivity and magnetic permeability.

The wave impedance (376.73Ω) distributed across the hydrogen wavelength is $7.79 \cdot 10^1 \Omega\cdot\text{m}$. When divided by the magnetic permeability of a vacuum ($1.26 \cdot 10^{-6} \text{ N}\cdot\text{A}^{-2}$) the diffusivity is $6.32 \cdot 10^7 \text{ m}^2\cdot\text{s}^{-1}$. The inverse is $0.16 \cdot 10^{-7} \text{ s}\cdot\text{m}^{-2}$. The simplest frequency to relate the photon density to energy would be the orbital time of a ground electron; the Bohr value is $\sim 6.59 \cdot 10^{15} \text{ s}^{-1}$. In other words the product of $1.5 \cdot 10^{-20} \text{ J}$, the inverse diffusion of $0.16 \cdot 10^{-7} \text{ s}\cdot\text{m}^{-2}$ and the Bohr frequency is $1.6 \cdot 10^{-12} \text{ W}\cdot\text{m}^{-2}$. Applied at a universal level the basic energy unit is related to photon flux density by the same parameters that define wave impedance and the magnetic permeability of space at times that define a single electron orbit.

A relationship between the Hamiltonian or the energy within a time-invariant system without the assumption of a potential and the Schrödinger wave function is traditionally expressed as variants of:

$$(\hbar^2 \cdot 2m^{-1}) (d^2\Psi \cdot dx^{-2}) \quad (7),$$

which can be expanded to:

$$(\hbar^2 \cdot 2m^{-1}) \cdot [(nL_x^{-1})^2 + (nL_y^{-1})^2 + (nL_z^{-1})^2] \quad (8),$$

and when accommodating the universal constant often selected to represent the rate of rate of change of a circular surface (8π) at a universal boundary, results in:

$$(\hbar^2 \cdot 16\pi m^{-1}) \cdot [(nL_x^{-1})^2 + (nL_y^{-1})^2 + (nL_z^{-1})^2 \cdot \psi^2 t^2] \quad (9).$$

This reflects a four dimensional geometry where m is the mass of the universe (10^{52} kg), n is a principal quantum number ($n=1$) for the ground state electron of the hydrogen atom, L is the Planck's Length, and the compound term is the entanglement velocity and the corresponding frequency to result in a positive value. The energy from the combination of this wave function is $\sim 10^{-52} \text{ J}$. This quantity of energy is the same order of magnitude, as shown earlier, that would be required to displace a 70 kg person embedded within the volumetric velocity.

ESTIMATES OF NUMBERS OF SIMULTANEOUS STATES IN SPACE

The marked paucity of matter within space is evident when the volume occupied by a hydrogen atom, the major constituent of the universe, is considered in context of the volume it occupies. Assuming a sphere and a radius of $0.88 \cdot 10^{-15} \text{ m}$ for the proton [43] and $2.82 \cdot 10^{-15} \text{ m}$ for the classic electron the equivalent volumes would be $2.85 \cdot 10^{-45} \text{ m}^3$ and $9.24 \cdot 10^{-44} \text{ m}^3$, respectively. The volume of a hydrogen atom (38 nm) would be $5.89 \cdot 10^{-31} \text{ m}^3$. This means that only about one part per trillion (10^{-12}) of the space is occupied by matter at the smallest of temporal units. If the volume was saturated there would be $\sim 3.2 \cdot 10^{12}$ different states or "parallel" atoms depending upon the temporal unit within the "same space".

If the proportion were expanded to include the 10^{78} m^3 of the universal volume, this would constitute "parallel" universes. The frequency equivalent of Planck's time, $3.23 \cdot 10^{43} \text{ Hz}$, divided by $3.2 \cdot 10^{12}$ universes would allow 10^{31} Hz per universe within which phase modulations and information could be manifested. Thus the law of impenetrability is not necessarily violated because the implicit statement "matter cannot occupy the same space at the same time" is determined by the quantification of these two abstracts. The actual metric (quantity) of the increment by which space and time are coupled would be subject to the laws of impenetrability.

The time required for one orbit of an electron which essentially defines the properties of local matter such as Planck's constant and the magnetic moment of an electron is $\sim 1.5 \cdot 10^{-16} \text{ s}$. Discrimination of perceptual phenomena as continuous, serial, and causal occurs within temporal increments of tens of msec. Consequently multiple states could exist below the limens of both perceptual "now" and the discrete duration which defines the properties of matter. They are the ones reflected at the level of chemical reactions and would strongly influence the properties of inorganic and organic matter in our temporal and inertial frames. There is quantitative evidence [44], based upon calculations, that within a single orbit of an electron the dual properties of wave and particle that define it and the photon are present. Within this threshold transitions from virtual particles originating within the vacuum energies into real particles could occur. Bordag et al [8] indicates that the manifestation requires the presence of a changing electromagnetic boundary.

The numbers of different phases that could be expressed within a single orbit of an electron would be $3.23 \cdot 10^{43} \text{ Hz} \cdot \text{vacuum oscillation}^{-1}$ divided by the electron's orbital frequency ($6.8 \cdot 10^{15} \text{ Hz}\cdot\text{orbit}^{-1}$) or $0.48 \cdot 10^{28}$ vacuum oscillations per orbit. Quantitative values for a single vacuum oscillation have yet to be discerned. However if the energy of the upper boundary of the rest mass of a photon ($\sim 2 \cdot 10^{-52} \text{ kg}$) as c^2 approaches unity is assumed, the energy associated with this number of oscillations would be $0.96 \cdot 10^{-24} \text{ J}$. When divided by Planck's Constant, $6.626 \cdot 10^{-34} \text{ J}\cdot\text{s}$, the frequency is $1.44 \cdot 10^9 \text{ Hz}$ which is remarkably proximal to the neural hydrogen line ($1.42 \cdot 10^9 \text{ Hz}$). It is not unreasonable to expect that the properties of this line would not change across the phase-shifted states of space. This may accommodate the remarkably conserved property of the hyperfine basis of hydrogen frequency derived from a reversal of electron spin in any given hydrogen atom once every $\sim 10^{14} \text{ s}$ or 10 million years.

The perimeter of space involved with the single electron orbit with a circumference of $\sim 3.26 \cdot 10^{-10} \text{ m}$ divided by the numbers of vacuum oscillations per orbit ($0.48 \cdot 10^{28}$ vacuum oscillations per orbit) would be $6.67 \cdot 10^{-38} \text{ m}$ which is much less than Planck's Length. To achieve Planck's Length 240 orbits would be required which would involve a total discrete time of $0.37 \cdot 10^{-13} \text{ s}$ or $2.7 \cdot 10^{13} \text{ Hz}$. The energy associated with this manifestation from multiplying the value by Planck's constant is $1.8 \cdot 10^{-20} \text{ J}$. This is the fundamental space-time unit discussed in the previous sections. The length equivalent



of this energy within the electromagnetic spectrum is 10 μm . This length was calculated by Garner et al [39] to be the incremental limit for movement forward or backward in space time. This could reflect the threshold at which the displacement expands to the space-time of the universal set and hence would only appear to be the limit.

For multiple parallel states to be potentially coherent and transiently intercalated there should be a cohesive factor that integrates the universal space. The “entanglement velocity” which would subservise excess correlation within the universal volume and represent the physical substrate for Mach’s Principle is $\sim 2 \cdot 10^{23} \text{ m} \cdot \text{s}^{-1}$. The effective distance when divided by the 10^{31} Hz per universe is $2 \cdot 10^{-8} \text{ m}$ or 20 nm. This value converges with the value for the separation between two plates that satisfy the conditions for Casimir energies which arise from vacuum zero point potential fluctuations or virtual particles [8]. When this energy is set equal to magnetic energy (a macroscopic effect) the volume in both equations cancel as shown by:

$$\pi^2 240^{-1} (\hbar c \cdot a^{-4}) m^3 = B^2 (2\mu)^{-1} m^3 \quad (10),$$

where B is the magnetic field strength, m^3 is the occupying volume, and “a” is the distance between the two topological Casimir plates or surfaces. As a result there are only two variables: a^4 and B^2 . If the intensity of the latter is selected for the energy associated with the hydrogen line and the electron’s orbital magnetic moment, then the only unknown value is for “a”. Under these conditions, the solution is 24 nm. Compared to the optimal displacement length of $\sim 11 \mu\text{m}$ the value for “a” would constitute a phase shift of $2.4 \cdot 10^{-3}$.

This specific phase shift may reflect an intrinsic operation by which parallel states are separated and when modified might converge. The Aharonov-Bohm effect [45], which incorporates the concepts of the magnetic A vector potential, has been described as:

$$\Delta\theta = qVt\hbar^{-1} \quad (11),$$

where q is unit charge, V is the voltage, t is the duration within the voltage field and \hbar is the modified Planck’s constant. If the duration within the voltage field is the duration of a Bohr orbit ($1.5 \cdot 10^{-16} \text{ s}$), the phase shift is $3.2 \cdot 10^{-3}$. According to the experimental results of Giovaninni et al [46] the phase shift in velocity of structured photons travelling in free space was between 2.25 and $4.5 \cdot 10^{-3}$. The convergence of these experimental values for the differential velocity of structured photons that would potentially reflect “information” regarding the ultimate structure of local matter and the phase shift from the transformation from Casimir forces to magnetic field equivalents (equation 11) indicates a quantitative pathway through which translocation and transposition of axes might occur. Many experimental demonstrations of the Aharonov-Bohm effect emphasize the importance of the interference patterns when electron beams are recombined [47]. This reiterates the holographic potential of this mechanism.

If Casimir energy is set equal to Rydberg energy:

$$E = R \cdot h \cdot c \quad (12)$$

which reflects the ground state of an electron where R is the Rydberg (wave) number ($1.097 \cdot 10^7 \text{ m}^{-1}$), h is Planck’s constant and c is the velocity of light, and solved for volume, the linear distance is 93.25 nm which approaches the limit of the Lyman series in hydrogen spectra. The ground state of the hydrogen atom would be the lower boundary and hence the condition where homogeneity could be manifested across space-time.

POTENTIAL DIMENSIONS OF ACCESS

Gravitational energy is frequently described as the product of G ($6.67 \cdot 10^{-11} \text{ m}^3 \cdot \text{kg}^{-1} \cdot \text{s}^{-2}$) and the mass squared divided by its length. So if:

$$\pi^2 240^{-1} [\hbar c \cdot a^{-4}] \cdot m^3 = G \cdot \text{kg}^2 \cdot L^{-1} \quad (13),$$

all are constants except mass, volume and length. Assuming the length is 24 nm (equation 10) and the volume is the space occupied by the Rydberg solution above, the resulting quantity approaches Planck’s mass which is $2.2 \cdot 10^{-8} \text{ kg}$. Given there is $\sim 7 \cdot 10^{-12} \text{ pg}$ of DNA per cell, the mass equivalent from the Rydberg solution results in $0.31 \cdot 10^7$ cells or neurons within a space occupied by the brain. The presence of the cosmic unit of $\sim 2 \cdot 10^{-20} \text{ J}$ per cell would result in an aggregate of $6.2 \cdot 10^{-14} \text{ J}$ which is remarkably similar to the mass equivalent of an electron. This convergence may be significant if it were a limen at which translocation and transposition might be initiated.

The inclusion of energies and processes by which real particles become virtual particles and virtual particles become real particles could identify the contexts in which transformation of axes could occur. If matter in 4-D space becomes virtual matter within vacuum oscillations of the entire universe then there would be minimal amount of energy required for translocation within any component of its space-time boundary. The matter, such as the 70 kg person, within one tensor coordinate would have the capacity to become virtual matter without necessarily forfeiting its spatial organization, pattern or information.

According to equation 10, the specific level of space where this deformation from real matter into virtual matter as zero point vacuum oscillations with the capacity to be transformed to real particles in some other space-time position is 24 nm (the width of microtubules in cells). It may be relevant that if there are $3.2 \cdot 10^{12}$ worlds existing in space simultaneously and Planck’s frequency ($3.23 \cdot 10^{43} \text{ Hz}$) is the temporal unit, there are 10^{31} Hz per universe. When the entanglement velocity of between 2.2 and $2.8 \cdot 10^{23} \text{ m} \cdot \text{s}^{-1}$ is involved per 10^{31} Hz per universe the resulting “connecting distance” would be between 22 and 28 nm. This range overlaps with the space in which Casimir virtual particles and magnetic field related real particles converge. For interconnectivity between the different universal states to occur an excess correlation velocity



would be expected. The product of this optimal distance ($2.4 \cdot 10^{-8}$ m) and the oscillation per universe (10^{31} s^{-1}) is $2.4 \cdot 10^{23} \text{ m} \cdot \text{s}^{-1}$, or ψ , the universal diffusivity velocity.

With the base frequency of 10^{31} Hz per universe the equivalent energy based upon multiplication by Planck's constant would be $6.6 \cdot 10^{-3}$ J. This is a mass equivalent of $0.7 \cdot 10^{-19}$ kg which is about $4 \cdot 10^7$ protons. If they were hydronium-based protons at pH 7.0 then 10^{14} water molecules would be required to obtain this number. This is equivalent to about 10^9 cc. That is the volume of a single cell. Simplistically this suggests that one spatial unit by which the translocation and transposition of space-time axes would occur is the volume of the living cell. One obvious implication is that if a cell from one of the simultaneous states transpositions into another state, what happens when that single cell divides with its previous characteristics within the parallel universe?

DEVELOPING THE TECHNOLOGY

Although quantitative convergences across levels of space-time are compelling for a hypothesis, only the experimental verification would demonstrate the potential for this possibility. Basharov [48], while studying entangled atomic states, reiterated previous approaches that non-interacting atoms that decay in a common thermostat field first lose quantum correlations during relaxation. This is followed by an increase in entanglement in an ensemble of non-interacting atoms. He calculated the operator of the resonance interaction between the atoms and the transverse component of an electromagnetic field. The central operation for his innovative derivation was:

$$\sqrt{[(2\pi \cdot \hbar \cdot q \cdot c \cdot M) \cdot p^{-1}]} \quad (14),$$

where \hbar is the modified Planck's constant, q is the unit charge, c is the velocity of light in a vacuum, M is the magnetic moment, and p is the momentum. If we assume the values for an electron where p is its rest mass multiplied by the fine structure velocity, then the resulting magnetic moment is $3.84 \cdot 10^{-22} \text{ A} \cdot \text{m}^2 (\text{J} \cdot \text{T}^{-1})$.

Within a changing 1 nT magnetic field the resulting energy would be $3.84 \cdot 10^{-31}$ J. The value is important because after dividing by Planck's regular constant, the frequency is ~ 500 Hz which is 2 ms. This within the range of 1 ms that we have assumed to be associated with expansions of the electron by one Planck's Length. The 1 nT value is a consistent value that is inversely related with the photon flux density ($10^{-12} \text{ W} \cdot \text{m}^{-2}$) emitted within space and from living systems [49].

Having visualized many years ago a central role of the photon and its contribution to the manifestation of electron orbital and magnetic phenomena, Stanley A. Koren and Michael A. Persinger had included optocoupler-Triac components within circuitry to generate magnetic fields within focal points between three orthogonal spatial planes. The "4-D" nature of the fields [50] were represented by the sequential production of a magnetic field between pairs of apposing solenoids in the X, Y, and Z planes and then the production of the field in all three planes simultaneously before the cycle repeated. The solenoids were reed relays or switches (Radio Shack, SPST 5VDC; 275-0232).

Each solenoid cylinder was about 2 cm in length and 0.6 cm in diameter with about 516 turns or ~ 50 m of copper wire. Calculated inductance was $\sim 4 \cdot 10^{-3}$ H which can be described as the measure of magnetic flux which links the circuit when electron fields within a circuit are moving. If an Aharonov-Bohm type geometry is applied then the ratio of the diameter of the cylinder divided by the velocity of light ($6 \cdot 10^{-3}$ m divided by $3 \cdot 10^8 \text{ m} \cdot \text{s}^{-1} = 2 \cdot 10^{-11}$ s) is then divided by the movement of the coupled electric field along the length of the solenoid ($2 \cdot 10^{-2}$ m) divided by the fine structure velocity ($2.19 \cdot 10^9 \text{ m} \cdot \text{s}^{-1}$) the resulting ratio is $2.19 \cdot 10^{-3}$. This is well within the range of the phase shift predicted by the Aharonov-Bohm effect for 10^{-20} J within a duration of 1 Bohr orbit.

Preliminary experimental work indicated that the effect of the magnetic fields upon cells or organisms within the center of the exposure box where fields converged may be the consequence of this configuration behaving as a "magnetic containment" within which photon patterns from the optocoupler circuits were translocated and transpositioned within the exposure area and whatever matter was contained within it [51]. This would meet one of the criteria for a non-local effect. It could be manifested as slowing or acceleration of the biological phenomena (such as growth rates in cell cultures or malignant tumors in mice) depending upon whether or not the field strengths were below or above a critical value. Although this non-linear effect has more parsimonious explanations, the predictions were compatible with our calculations of the "temporal displacement" of the biological states to before or after the reference point.

Within our DAC (digital to analogue) system involving the optocouplers that we have employed to generate complex magnetic fields with enhanced capacity to induce excess correlation [52] the involvement of 1 nT is revealing. Applying the elementary relationship between the strength of the field B within a cylinder, electric current can be obtained as:

$$I = [(B \cdot 2\pi r) \cdot \mu^{-1}] \quad (15),$$

where r is the radius and μ is (magnetic) permeability of space. Assuming the typical width of a p-n junction in the optocoupler is about 1 μm , the current involved with a fluctuation of 1 nT would be $2.5 \cdot 10^{-9}$ A. Nanoamp subthreshold flutters are expected and measured in our circuits. In fact MEDA fluxgate magnetometers with a sensitivity of 1 nT have shown fluctuations through the application solenoids within the interface of the three spatial planes, not carrying any particular signal, when the circuit is operating but in the default mode.

The relationship of this current to photons depends upon the validity of the calculations by Das and Misra [53] who showed that a photon whose upper limit for rest mass is $\sim 2 \cdot 10^{-52}$ kg displays a charge $e_r < 3 \cdot 10^{-33}$ of a unit charge ($1.6 \cdot 10^{-19} \text{ A} \cdot \text{s}$), or $\sim 10^{-52} \text{ A} \cdot \text{s}$. Our previous calculations have indicated the importance of the vacuum zero point oscillations in these processes as quantitatively expressed by the Zitterbewegung of $3.23 \cdot 10^{43} \text{ s}^{-1}$. The multiplication of the



Zitterbewegung by the “charge” of a photon results in $3.2 \cdot 10^{-9}$ A. One interpretation of this quantity is that the application of Basharov’s central formula for the decoherence and entanglement in radiative decay of a diatomic system to the optocoupler solves for the persistent entanglement of the equivalent of *one photon* that is either highly correlated with or responsible for the equivalent 1 nT fluctuations through the circuits.

ACCOMMODATING INFORMATION

If the intrinsic energy that would allow the material manifestation of the translocation and transposition of four dimensional axes is contained within the local space, the most likely candidate to facilitate the required non-locality would be the information associated with structured photonic fields [46]. As noted the estimated numbers of photon equivalents within the universe would be $\sim 10^{104}$. According to Boltzmann’s final solution for entropy:

$$S = k \ln \cdot W \quad (16),$$

where S is the energy of entropy, k is the Boltzmann constant ($1.38 \cdot 10^{-23}$ J) and W are the numbers of states, a critical energy is obtained if one assumes the numbers of states equal the total numbers of photon equivalents within the universe.

The product of $1.38 \cdot 10^{-23}$ J and \ln of 10^{104} ($2.40 \cdot 10^2$) is $3.31 \cdot 10^{-21}$ J. When divided by the unit charge, the equivalent voltage is ~ 20 mV. It is the same as the increments of change generated by the DAC software to produce the magnetic field patterns. All of the temporal configurations of our magnetic fields are generated by converting numbers, each from 1 through 256, to values between -5 V to +5 V where 127 is 0 V. This results in 40 mV per number. Because the two solenoids that generate the magnetic field in any of the three spatial planes are connected in series, the change in voltage during the switch of a number is 20 mV. If some process could interface with the universal value for entropy, then theoretically any space-time locus could be accessed. Professor Stanley Koren, the creator of the circuit, has often referred to the marked similarity between the structure of the point durations that compose the magnetic field patterns and the properties of quantum wells.

The quantification developed here suggests that the level of space at which any technology would be focused to initiate the transposition might begin with the dynamics of the cell membrane. We [55] have shown that the ion-independent 26 mV derived from the Nernst equation’s constant (set for 310°K or 37°C) is coupled to $4.27 \cdot 10^{-21}$ J which is the thermal noise limit or kT boundary. It is also associated with the energy associated with the loss or the gain of one bit of information into or from entropy as well as that lost when there is a convergence of operations. The convergence of the intrinsic Nernst solution for any plasma membrane surface at the kT boundary could allow access to the intrinsic “information” that is contained within the processes that mediate entropy.

Several published experiments from our laboratory have demonstrated that when two loci separated by non-traditional distances (to simulate non-locality) share the same rotating magnetic fields with changing angular velocities excess correlations reliably occur. The two loci behave as if they have been transposed and superimposed into the same space. From a perspective external to the frame of reference this could be perceived to be the “same” particle appearing in two different spaces “at the same time”. This only occurs if specific sequences of fields are presented whereby the group and phase velocities of the angular velocities are dissociated. Dotta and Persinger [30] showed that simultaneous photon generation from chemiluminescent reactions within two loci separated by 10 m or 3 km resulted in a doubling of the photon output if and only if the two loci shared the excess correlation magnetic fields. In other words the two loci behaved as if they were the same single space. In this experiment photon flux density and not parity were measured. If the implicit polarities were transposed then doubling would be expected and indeed was measured.

Murguan et al [56] and Dotta et al [57] also showed this effect with subtle shifts in pH. Because the polarity of pH is intrinsically contained within the measurement the symmetrical parity of excess correlations and entanglement were clearly measured. When successive discrete quantities of proton donors were injected into one volume of water (decrease in pH) in one locus a smaller but complimentary increase in pH occurred in the other volume 5 m in distance. This only occurred when the temporally discrete, saltatory magnetic fields generated within the circular arrays of eight solenoids were shared in both locations. The duration of the excess correlation was about 8 min. Both the shift in pH [57] as well as the doubling of photon emissions [30] within the excess correlation paradigm exhibited “space memory”. We inferred this by the conspicuous enhanced bursts of photon emissions that reflected the previous injection intervals for the reactants as well as the reciprocal shifts in pH within spring water (even though no experimental manipulation occurred) when only the parallel fields were activated in these “entangled” spaces. This effect was only evident for about 2 to 3 days before random measurements returned even though the fields were activated.

This ~ 3 days displacement for potentially “spontaneous” excess correlations have been reported for subjective experiences [58] often attributed to shifting temporal parameters or abstract geometries such as “tesseract”. The effective “temporal displacement” between the diminished or enhanced growth of malignant cells by these applied magnetic fields (which can be manipulated by both the intensity and the point duration of the applied magnetic fields) is often equivalent to $\sim \pm 3$ days. The presence of this potentially critical temporal increment as an intrinsic resonant property of local space-time structure was discerned with the daily spectral power density profiles of background photon flux densities collected over a four year period [59]. There was a sharp conspicuous peak at 3 days.

Of particular relevance to the concepts developed here were the experimental results reported by Juden-Kelly and his colleagues [60]. He placed a random number generator (RNG) in each of the two separate circularly rotating magnetic fields. During the same configuration and for the same duration of excess correlation noted for the photon and



pH phenomena, a negative deviation in random distributions in one locus was associated with a positive deviation in these random distributions in the other. The capacity to alter “random” variation which is intrinsic to the transformation from structure to entropy would be important for the control of translocations and transpositions of material organization.

CONCLUSIONS

Translocation and transposition of axes in four dimensional geometries have been usually relegated to imagination and to complex mathematical derivations as reflected in Kurt Gödel's [61] remarkable insights. However quantitative convergence when the smallest and largest space-time values and universal “constants” are intercalated strongly suggests that the energies would not be insurmountable. They may involve the initial translocation and transposition of only one photon. There is experimental evidence that a single photon can induce interactions between distal photons within matter [62, 63]. A central role of a universal quantum of $\sim 10^{-20}$ J, access to the energy coupled to the upper limit of the rest mass of the photon, and the interaction between quantities associated with the neutral hydrogen line and the single orbital time of an electron in context of the universe's mass and final epoch are expected. There are solutions and approaches that might minimize the presently perceived inhibitory factors for temporal symmetry as required by the second law of thermodynamics. Inclusion of the approximately one trillion simultaneous states of universal organization can be accommodated. Although the final process may be quite different than traditional depictions, temporal displacements through the universal set and within different phase shifts of that set might be a precise exercise in quantification and technology rather than more abstract theory.

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Author's Biography with Photo



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