An Empirical Foundation for Awareness; As the Basis for Unified Field Mechanics

Richard L. Amoroso

Noetic Advanced Studies Institute
902 W 5400 N, Beryl, UT 84714-5401 USA
amoroso@noeticadvancedstudies.us, noeticj@mindspring.com

For the field of Consciousness Studies or Cognitive Science to advance pragmatically, rigorous quantifiable theoretical elements with experimentally testable protocols leading to a wide range of applicable results must occur. In this work we introduce a new unit of physical measure called the 'Psychon' named in honor of Nobelist Sir John Eccles to formally quantify 'mental energy'. Additionally an experimental design is outlined to falsify the model. If the procedure for quantifying mind is successful it will have far reaching consequences for 'mind science' breaking down the 1st person - 3rd person barrier leading to a new class of 'conscious technology'. The task introduces a new age of discovery in the progression Newtonian Mechanics to Quantum Mechanics to a 3rd regime of reality - Unified Field Mechanics (UFM); the long awaited paradigm shift justifiably fraught with detail and new nomenclature!

1. Overview.

Note: Reader should realize this seminal work represents a paradigm shift fraught with detail and new nomenclature that might require careful reading to absorb especially for non-physicists. Currently a 'true' science of mind seems to imply an empirical metaphysics. Just as Relativity was considered metaphysical before Einstein; a methodology is proposed for extending the bounds of Natural Science by crossing the psychophysical-quantum-bridge to a 3rd regime (beyond classical & quantum) of Unified Field Mechanics (UFM) [1]. Noetic Theory has evolved to the point where it is experimentally testable, which if successful promises to not only solve the mind-body problem, break the 1st person 3rd person barrier, but also implement protocols for new fields of mind-body research and technologies; and additionally implement a new class of 'consciousness based' medical devices.

We cannot fault Descartes for thinking his *res cogitans* (mind stuff) was immaterial because even now 400 years later we still do not know the ultimate fundamental nature of matter; we perceive Descartes understanding of the term *immaterial* as open to debate. Webster's definition of immaterial is: 'not consisting of matter - spiritual'. One surmises that Descartes dwelt on the spiritual aspect of meaning ignoring possible physicality. Thus the abandonment of Cartesian Interactive Dualism as a nonphysical violation of the laws of thermodynamics and energy conservation is easily overcome by introducing a 3rd physical regime of UFM with a physically real 'life principle'.

Noted philosopher of mind David Chalmers has defined a 'Hard Problem' in consciousness research where ability to research awareness fundamentally approaches the impossible. In the history of science hard problems have arisen whenever the fundamental basis of the problem is not well understood. In our opinion this conundrum represents a category error for

Philosophy of Mind arising from the manner Cognitive Science 'tells the question what the answer must be', i.e.: 'What <u>processes in the brain</u> give rise to awareness?'; whereas the question should simply be posed: '<u>What processes</u> give rise to awareness?' Chalmers also stated that the problem of consciousness is tantamount to the problem of awareness itself or the nature of Qualia.
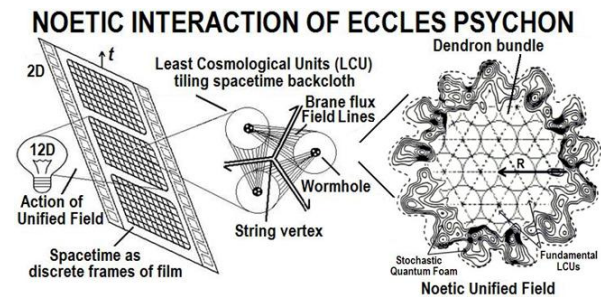
In photochemistry a unit of energy, the Einstein signifies a Mole (Avogadro's number) of photons. Utilizing Unified Field, *UF* 'life principle' parameters we quantify mind-energy with a new unit of physical measure called the Psychon in honor of Nobelist Sir J.C. Eccles. In similarity to the Einstein unit, the Psychon is based instead on a Mole (Avogadro's number) of 'noeons' - The putative ontological exchange unit of *UF* mind-body interaction [2,3]. Noeon is derived from the Greek *nous*, mind and *noēsis / noētikos*, perception-what the *nous* does and the common "on" suffix in particle physics such as phot-on, the exchange unit of the electromagnetic field.

Physicists now claim spacetime is not fundamental; meaning the Planck scale quantum foam is not the 'basement of reality' as those like Hameroff suggest [4]. We have devised fourteen experimental protocols [6] to 'enter' the 3rd regime of UFM to 'discover' this new action principle synonymous with a Cartesian-type life-principle animating complex Self-Organized Living Systems (SOLS) equated with a 'physically-real' quantifiable basis for qualia.

2. Quantifying Mind

We postulate the cognitive model (Mind = Brain) provides insufficient basis for solving mind-body problems (describing awareness); and that additional Unified Field (*UF*) parameters are required [1-3,5,6]. The founders of Quantum Mechanics (QM) professed that QM didn't describe biological systems as stated by Schrödinger. In his seminal paper "*Mechanics of Atoms and Molecules*" his equation $i\hbar(\partial / \partial t) = \hat{H}\Psi$ pertaining to how quantum states of physical systems change with time by design has no

ability to distinguish an electron propagating on a neural manifold from an electron propagating on a wire.

Figure 1. Movie Theater Conceptualization of Interactionist Cosmology. a) Showing influx of the noetic life-principle into spacetime points (frames of film). b) Planck scale fundamental Least Cosmological Units (LCUs) mediating noetic fields, c) An Eccles Psychon LCU raster of radius *R* where Noeon Fields putatively couple to brain dendrons where coherent interaction bridges the stochastic quantum barrier coupling one Eccles Psychon with one neural dendron.

We extend Eccles' model of Cartesian Interactive Dualism (*res extensa* - body stuff; *res cogitans* - mind stuff). Eccles proposed a concept called the 'Psychon' (mind stuff) that attached to and interacted with a neural dendron (bundle of 100 apical dendrites with 100k synapses - 40 million dendrons in human brain [7-9]). We attempt to formalize the Psychon and propose empirical tests. Our starting point compares the physical unit quantifying photon energy in photometry called the Einstein measuring the number of photons impinging a leaf during photosynthesis. In honor of Nobelist Sir John C. Eccles we propose a unit of measure called the 'Psychon' quantifying a mole (Avogadro's number) of Noeons (proposed exchange unit of the Unified Field, *UF*) impinging not just synaptic processes in dendrons as Eccles proposed but all arenas of mind-body quantal interaction such as microtubules, neural nets, DNA and generally all biochemical species and *UF* spacetime interaction nodes bounding an entities Psychosphere [3].

3. Physical Basis of Qualia

Qualia, plural of *quale*, defined in philosophy of mind is 'the subjective quality of

experience; a *qualitative feel* associated with experience'. The physics of noetic cosmology with an inherent life-principle based on UFM also provides the physical basis for representing quale in a rigorous empirically testable manner. Every experience has a specific subjective nature. If one removed the viewpoint of the subjective observer; <u>what would be left</u>? Nagel suggests the remaining properties might be those detectable by other beings, the physical processes themselves or states intrinsic to the experience of awareness. This changes the perspective of qualia to the form "*there is something it is like to undergo certain physical processes*". "*If our idea of the physical ever expands to include mental phenomena, it will have to <u>assign them an objective character</u>*" [10].
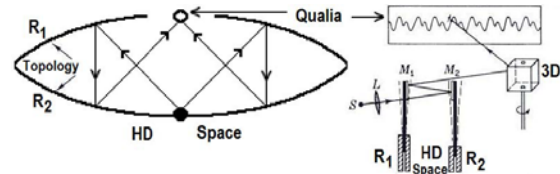
These are questions Integrative Noetic Science now answers theoretically and empirically. Standard definitions of qualia are inadequate philosophical constructs describing only subjective character. In the physical sense of Noetic Field Theory (NFT) [3] components describing qualia from the objective sense are introduced for the first time - i.e. distinguishing the phenomenology of qualia from the underlying ontological 'nonlocal noumenon' or physical existence of the fundamental absolute *thing in itself*. NFT suggests that a comprehensive definition of qualia is comprised of three physically-real correlated elements. This is the case because the noetic *UF* upon which quantization of mind is based is physically-real. This proposed triune basis of quale is:

Type I. The Subjective - The '*what it feels like*' basis of awareness. Phenomenological mental states of the qualia (experience). (Correlates with current philosophical definition of qualia), Q-I.

Type II. The Objective - Physical basis of qualia phenomenology independent of the *subjective feel* that could be stored or transferred to another entity breaking down the 1st person 3rd person barrier. Noumenal nonlocal *UF* elements and related processes evanesce qualia by a form of superradiance, Q-II.

Type III. The Cosmological - SOLS being

alive represent a Qualia substrate of the anthropic multiverse, acting as a 'blank slate' (a cathode ray television set turned on but with no broadcast signal) from within which Q-II are modulated into Q-I of experience by a form of superradiance (noeon gating mechanism) or evanescence. Note: Q-III has sub-elements addressed elsewhere [3].
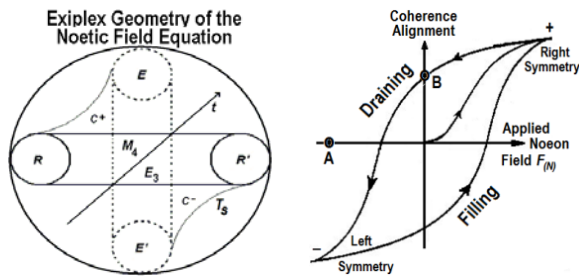

Figure 2. 2D rendition of a nonlocal 12D holographic process. A quale object (black circle) placed inside (LCU array) two parabolic mirrors produces a virtual image (white circle) representing creation of a point in spacetime. Our 3D virtual holographic reality is produced in a similar fashion by future-past standing-wave (R_1-R_2) parameters from the Higher Dimensional (HD) mirror symmetric infinite potentia of the Unified Field, U_F. This same process produces (evanesces) qualia with each lit point (white circle) like raindrops producing a rainbow from sunlight (noeon field).

Standard images require a screen or other reflective surface for resolution; but aligning the foci of two parabolic mirrors (car headlight mirrors), the reflected images superpose into real 3D holographic images not needing a screen. A science toy called the 'magic mirage' demonstrates this effect of parabolic mirrors. Objects placed in the bottom appear like solid objects at the top of the device. In 12D reality topological brane boundaries perform this function for the locus of qualia propagation in the mind (Figs. 1&2).

Rainbows are a metaphor for describing complex aspects of qualia. Light quanta (water drops) are microscopic in contrast to the macroscopic sphere of awareness (rainbow). We assume scale-invariant properties of awareness could apply. Like phonemes, fundamental sound elements for audible language, qualia-nemes or *quanemes* are proposed for awareness; based on the physical modulation of Q-II states by the geometric structural-phenomenology of the
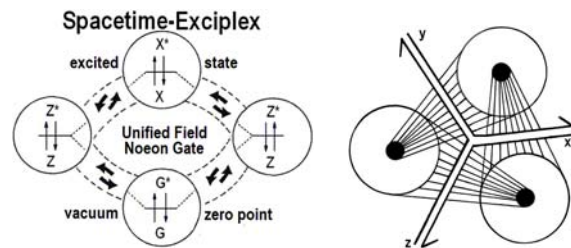
Q-III carrier base of SOLS. A quaneme is a singular Witten point [3,18] in the raster of mind like a locus of points forming a line. Each 'quaneme point' of noeon entry through the Least Cosmological Unit (LCU) exciplex gating array is like individual raindrops summing into a rainbow or thought-train of awareness. Recall the movie theater metaphor (Fig.1) where discrete frames of film are projected continuously onto the screen (mind).

Figure 3. a) Geometric topology of Noetic Field Equation $F_{(N)} = E/R$ acting as a holophote (rotating lighthouse beacon) gating mechanism for entry of the nonlocal HD UF into local M_4-E_3 3(4)-space. Wave-particle-duality is elevated to a principle of cosmology such that the solid bar, R_1-R_2 at one moment transforms to the dotted bar, E-E' at the next in a continuous relativistic wave-particle cycle with t the arrow of time. $\pm C^4$ is a complex 8-space and T_S fluctuating string tension helping drive the oscillation. b) UF Hysteresis Loop. Point A is a Zero-point where the driving field reverses and increases. Point B is where the driving field drops but still retains considerable charge as a UF force of coherence related to the life-principle and quale.

Hysteresis is an important part of understanding how to quantify the Psychon as a unit of energy measure because it relates not to residual magnetization as in common usage but to the residual UF noeon charge (Psychon energy coupling to a neural dendron). When the driving force drops to zero, the material (dendron) retains considerable charge (coherence) for a period. The driving (noen) field must be continuously reversed and increased (holophote action) driving the charge to zero again. A Hysteresis Loop is a history dependence of a material (dendron here) at saturation (driven to). When the field is removed some retention occurs for a period of time. As noeon input alternately increases and decreases, hysteresis is the loop that the output forms (Figs. 3b,5b,d). A simple form of hysteresis is the lag-time between input (filling) and output (draining). An example of hysteresis is sinusoidal or harmonic input $X(t)$ and output $Y(t)$ separated by a phase lag, ϕ: $X(t) = X_0 \sin \omega t$; $Y(t) = Y_0(\omega t - \phi)$; this is the principle of hysteresis [11] - switching cycles that retain considerable charge (coherence in the case of the UF LCU life-principle cycle in SOLS).
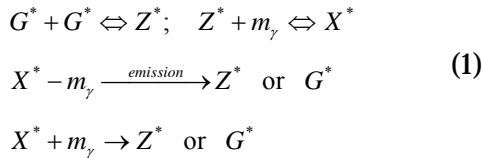

Figure 4. a) Proposed HD Exciplex Properties of Spacetime synonymous with the gating action of the UF equation (Fig. 3a) and the hysteresis Psychon filling of a dendron (Fig. 3b). The four circles represent spacetime LCUs (Fig. 4b). In the Standard Model with a ZPF 'basement of reality' (G in the Figure) Psychon energy could not form a hysteresis loop because excitation of the ZPF to Z elements in the Figure could only occur for the brief Planck time. But since the exciplex never goes to ground, (see text) an exciplex LCU structure acts as a gate allowing UF energy to be 'pumped' into a dendron. b) Complex 3-fold LCU fermionic vertex, x,y,z. Each X,G,Z circle (not shown in 4a) is one triune LCU as in b. The circles in Figs. 3a and especially Fig. 1c each represent one LCU.

In the current understanding of biophysical quantum cosmology where the Planck scale is the 'basement of reality' [4] there is a stochastic Zero Point Field (ZPF) where virtual quantum particles wink in and out of existence with a half-life of the Planck time. This is considered an impenetrable barrier imposed by the Uncertainty Principle. UFM has sufficient degrees of freedom to surmount uncertainty and allow a cyclic or harmonic emergence of the life-principle into SOLS. This holophote mechanism can be metaphorically described as an Exciplex (Fig. 4). In an exciplex (short for excited complex) heteronuclear molecules or molecules having more than two species are exciplex molecules

that are often diatomic and composed of two atoms or molecules that would not bond if both were in the ground state - An Exciplex is a complex existing in an excited state that dissociates in the ground state.
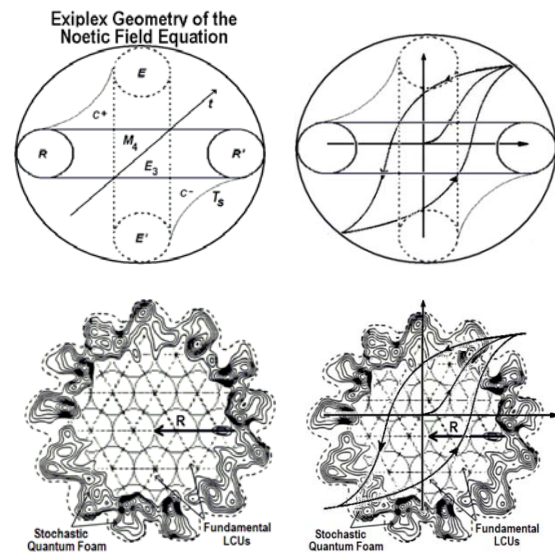
The general equations for a putative spacetime exciplex C-QED emission cavity are (Fig. 4):

$$G^* + G^* \Leftrightarrow Z^*; \quad Z^* + m_\gamma \Leftrightarrow X^*$$

$$X^* - m_\gamma \xrightarrow{\ emission\ } Z^* \ \text{ or } \ G^* \qquad (1)$$

$$X^* + m_\gamma \rightarrow Z^* \ \text{ or } \ G^*$$

The holophote gating mechanism (rotating lighthouse beacon flash) for entry of *UF* vital-energy into SOLS arises from the harmonic oscillation of close-packed Least Cosmological Unit (LCU) (Figs. 1b, 4b) boundary conditions tiling the spacetime backcloth and pervading SOLS as a Cartesian life-principle. The inherent beat-frequency of this continuous action produces the Q-III carrier-wave that is an *empty slate* modulating cognitive data of Q-II physical parameters into Q-I awareness states as an evanescent superposition of the two (Q-III-Q-II). This modulation of qualia occurs in Higher Dimensional (HD) brane cavities of the psychosphere cognitive domain. The local QED and HD nonlocal brane cavities are a close-packed tiling of LCU noetic hyperspheres. The Casimir-like boundary surfaces (Fig. 2) are able to 'evanesce' *quaneme* subelements into qualia (awareness). While the best reflectors of em-waves are polished metal mirrors, charged boundary conditions also reflect em-waves in the same way radio signals bounce off the ionized gases of the Kennelly-Heaviside layers in the Earth's ionosphere. A similar reflective 'sheath' (Fig. 2) enclosing the cognitive domain (HD brane boundaries) is charged in a hysteresis loop of Noeon flux (exchange particle of the noetic field) the phases of which are 'regulated' in the complex HD space of fundamental LCU rotation [2,12].

4. Unified Field Mechanical (UFM) Précis - Required Parameters

Most physicists believe a *UF* theory (coined by Einstein) should be a quantum theory uniting the four fundamental interactions; but there is no *a priori* reason this should be the case and many physicists in recent decades transferred the search to an 11D M-Theoretic (4D + 2D to 6D brane world instead of the original 1D string) regime. The 11th dimension in M-Theory unites the five forms of string theory; and the 12th dimension of noetic cosmology (NFT) introduces the coherent action of the *UF*. Classical Mechanics describes an event between two coordinate systems by what is called the Galilean transformation for uniform motion at velocities less than the speed of light in 3D Euclidean space.
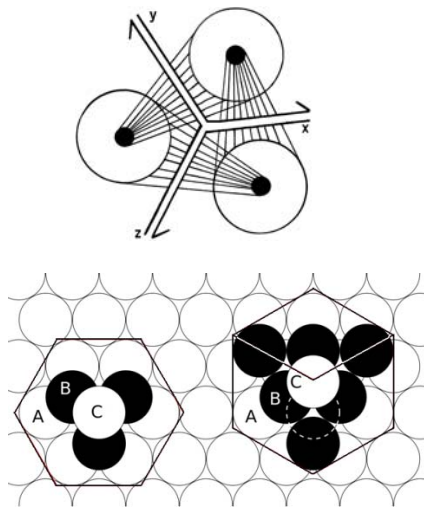

Figure 5. a) A hysteresis loop is added to Figs. 1c & 3a. Geometric metaphor for Noetic Field Equation. b) Overlap of a hysteresis loop with action of the noetic field. c) Psychon-dendron coupling. d) Overlap of hysteresis loop with psychon-dendron interaction.

Quantum mechanics events with relativistic velocities are described by the Lorentz-Poincairé group of transformations in 4D Einstein-Minkowski spacetime. To cross the Psycho-Physical-Bridge noetic cosmology utilizes an extension of M-Theory requiring a new 12D set of transformations called the Noetic Transform [2,3] (provides

actual psychophysical bridge) because it includes properties of an inherent anthropic principle in a 'sea' of infinite potentia simplistically like the entangled alive-dead quantum state of Schrödinger's cat before realized local events occur and from which 4D reality of the observer cyclically emerges as nilpotent resultants (Figs. 6,7). Nilpotency - technically meaning 'sums to zero' [15].
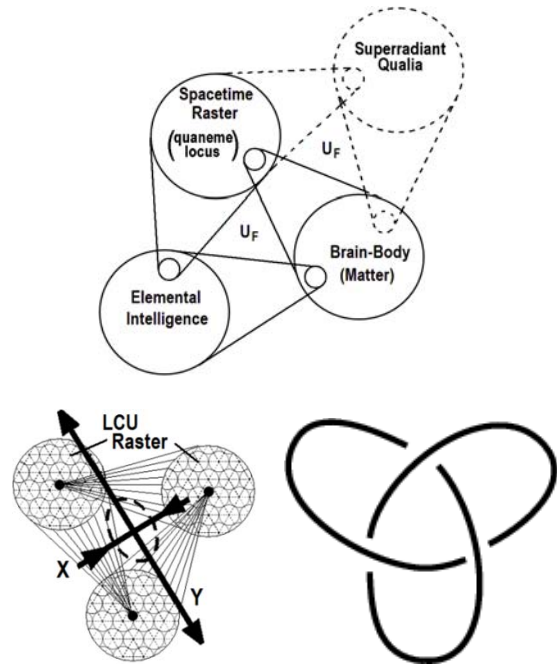
The key ingredients the HD regime of UFM provides for solving the mind-body problem are: 1) Sufficient additional degrees of freedom to surmount the Uncertainty Principle [2,13,14], 2) an exciplex gating mechanism to allow *UF* entry into 4-space [2,3], 3) Ontological 'Force of Coherence' and 4) Ability to define new physical unit of measure called the Psychon to quantify mental energy.

Figure 6. a) Solitary triune LCU 'component' with Whitten string vertex in 3-space represented by central *x,x,z* parallel lines; The 3 circles are LCU components of a fermionic vertex with the field lines representing de Broglie-Bohm control factors of the *UF*. b) Ways to close-pack LCU arrays in spacetime tessellations. Packing not yet known.

The force of coherence is described by Noetic Field Equation, $F_{(N)} = E/R$ by which we manipulate the topological charges of the Exciplex gate and perform for the 1st time experiments on mind-body properties. Since noeon flux is like a holophote we may use hysteresis loops to quantify the energy and duration of the coherence period. This

amount of energy can then be made applicable to dendron volume or surface area. The nonlocal regime is atemporal, suggested by instantaneous transfer of information observed by the EPR experiment; presenting duality between our temporal 3-space and the atemporal unity of the UFM regime.

Figure 7. a) Physical basis of continuous superradiant generation of qualia from three components of mind: eternal Elemental Intelligence, Brain-Body (Descartes *res extensa*), and the Superradiant Qualia (Descartes *res cogitans*) mediated by the spacetime raster (quaneme locus) that exciplex gates 'light of the mind' or *UF* energy. The term quaneme is derived to parallel phoneme component of sounds. b) LCU construct of hidden nonlocally behind a 3-space singularity (black cross vertex). c) Trefoil able to transform into a circle.
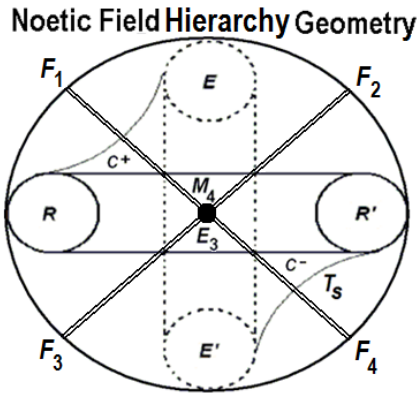
5. Quarkonium Flag Manifold Topology

In sections above we made a current best effort to describe in principle how an 'Exciplex Topology' acts as a gating mechanism for real *UF* life principle noeons to pass from the 3rd regime of UFM to 4-space; a paradigm shift from current thinking of ZPF virtual particles of the 2nd regime of Quantum Mechanics. We know this gating mechanism pulses or oscillates cyclically like a lighthouse beacon.

In this section we shed additional light on how the structure of the gating manifold

hierarchy might operate:

1) 1st regime: The center of Fig. 8 represents a local Euclidean 3-space x, y, z fermion vertex.
2) 2nd regime: In terms of a Cramer standing-wave transaction is a mid-level future-past complex quantum space of which 3-space is the 'resultant shadow'.
3) 3rd regime: UFM topology governing brane dynamics which at the core of the gating mechanism.

Noetic Field Hierarchy Geometry

Figure 8. Hierarchy of the three regimes of reality. a) Central black dot; a point in Euclidean space. b) Double lines, F_1, F_2, F_3 F_4 (eq. 4) as future-past components of a Cramer transaction. c) Four LCU circles representing geometric topology of the UF and UF equation $F_{(N)} = E/R$.

In 1945 Wheeler and Feynman proposed an Absorber Theory as the mechanism for energy transfer by calculating em-radiation emitted from an accelerated electron. The electron generated outward and inward waves. Cramer's Transactional Interpretation of quantum theory is based on the Wheeler-Feynman Absorber Theory. M. Wolff further proposed a parallel model where spherical standing-waves created a 'particle effect' at their Wave-Center, sugges-ting a solution to the 70 year old paradox of the Wave-Particle Duality of Matter.

For a Cramer transaction emission locus at $x,t = 0, 0$; we are concerned with the boundary conditions in the region outside the event horizon. The scalar equation in spherical coordinates for wave motion in spacetime which has spherical symmetry [25,26]

$$\nabla^2 \Phi - \frac{1}{c^2} \partial^2 \frac{\Phi}{\partial t^2} = 0 \qquad (2)$$
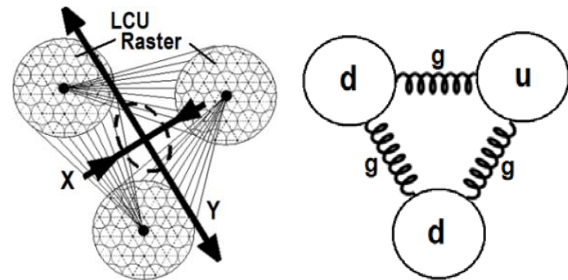
where Φ is the wave amplitude. The equation has two solutions

$$\Phi_{out} = \frac{1}{r} \Phi_{max} \exp(i\omega t - ikr)$$

$$\Phi_{in} = \frac{1}{r} \Phi_{max} \exp(i\omega t + ikr) \qquad (3)$$

which for the programming of spacetime can be applied to the propagation of Cramer's advanced retarded waves from an emission locus at $x,t = 0,0$ by Eqs. (3 & 4) which form the advanced-retarded components of a transaction (Fig.8) [22].

$$F_{1-Ret} = F_0 e^{-ikx} e^{-2\pi i ft}, \quad F_{2-Ret} = F_0 e^{ikx} e^{-2\pi i ft}$$

$$F_{3-Adv} = F_0 e^{-ikx} e^{2\pi i ft}, \quad F_{4-Adv} = F_0 e^{ikx} e^{2\pi i ft} \qquad (4)$$

Another approach to formalizing noeon flux may be in terms of the 6D flag manifold that describes the geometry of quark confinement. A possible relationship to the mind-body problem has been noted by Shipman [27] correlating the flag manifold to a hexagonal structure of the waggle dance of honey bees [28]. The structure of quarks in hadrons bears an uncanny geometric relation to the noetic LCU.

Figure 9. Comparison of a) LCU array (with Euclidean x, y vertex) and b) Three quarks d, u, d with gluon, g force couplings.

Shipman's research is described by Frank: *"The flag manifold, she notes... happens to be useful to physicists in solving some of the*

mathematical problems that arise in dealing with quarks...building blocks of protons and neutrons. And she does not believe the manifold's presence both in the mathematics of quarks and in the dance of honeybees is a coincidence. Rather she suspects that the bees are somehow sensitive to ... the quantum world of quarks, that quantum mechanics is as important to their perception of the world as sight, sound, and smell [24]*".*

6. Formalizing the Psychon, New Physical Unit Quantifying Energy of Awareness (Qualia)

Noetic Field Theory (NFT) elevates the concept of qualia from the traditional philosophical concept used in cognitive science to a physically real fundamental 'noumenon'. The term noumenon is defined as the 'thing in itself' beyond the veil of the phenomenological world; in Kantian philosophy a noumenon is something existing independently of the intellectual or sensory perception of it. This fundamental physicality allows qualia to be 'digitized' in some form breaking down 1st person-3rd person barriers leading to profound new 'conscious technologies'. Nobelist Sir John Eccles (discovery of synapse) coined, albeit an undefined construct, the Psychon to illustrate how mental energy couples to brain dendrons (bundle of neural dendrites) [7-9] to complete his Cartesian interactionist model of mind-body dualism [3].

Defining 'Psychon' energy with a unit of physical measure helps formulate a comprehensive empirically testable science of qualia as the fundamental basis of awareness. Meditative science claims 'energy follows thought'. We postulate qualia of awareness are comprised of 'evanescent superradiance' (Figs. 1,2) of physically real noetic fields of energy correlated with new *UF* physics [1-3]. Honoring Eccles we propose quantifying mental energy in terms of a new physical unit of measure called the Psychon. The Einstein, another physical unit of energy named in honor of Albert Einstein for his explanation of the photoelectric effect in terms of light quanta (photons) bears conceptual similarity; thus our starting point.

The Einstein measures the power of em-radiation in photosynthesis where one Einstein represents one mole (Avogadro's number) of photons (6.02×10^{23}). In general physics the energy of n-photons is $E = n\hbar\nu = n\hbar(c/\lambda)$ where $\hbar$ is Planck's constant and ν frequency. The second part of the equation is energy in terms of wavelength, λ (in nanometers, *nm*) and speed of light, *c*. Adaptation of this photon energy equation to measure Einsteins is similar, $E = N_0\hbar\nu = N_0\hbar(c/\lambda)$ where energy of N_0 photons is instead in Einsteins, *E*. In photometrics the measure used is one microeinstein per second per m^2, where one microeinstein, *u*E is one-millionth of an Einstein (6.02×10^{17}) photons imping leaf area.

Let's create a similar unit of measure to quantify mental energy of *quale* in terms of the Psychon as one mole (Avogadro's number) of 'noeons'. Forces of the four known phenomenological fields (electromagnetic, strong, weak and gravitational) have exchange quanta mediating field interactions by energy exchange. For electromagnetism the exchange quanta is the photon. This quantal mediation has been experimentally verified for all fields except gravity because the graviton has not been discovered; according to NFT not expected to be, as the regime of unification is not quantum but instead correlates with ontological parameters of UFM [1-3,15].

Hypervolume charge in HD Calabi-Yau brane topology is complex and difficult to calculate at this stage of theoretical development. Since energy is conserved let's ignore this complexity and simply use area of the circle, or in this case resultant continuous rotations of two circles as a 2-sphere quantum state or perhaps better as a 3-torus (Fig. 7c) as the coupling area of one psychon to one dendron. In considering psychon energy measure it seems easier to calculate nonlocal brane area of the spacetime exiplex (gating mechanism for passage of *UF* energy,

Fig.4) rather than local volume or surface area of dendrons or microtubules etc. Recall the surface area of small intestinal villi is about 4500 m^2 ~area of a football field. We will not calculate here but leave for later publication since we still struggle with conceptual problems relating to the geometric-topology of noeon interaction coherence. The de Broglie-Bohm interpretation entails nonlocal pilot-waves or quantum-potentials guiding evolution of wavefunctions ontologically. This concept was not very successful in 4D, but when carried to Large-Scale Additional Dimensions (LSXD) [16,17] it works elegantly and the pilot-wave-quantum potential becomes a 'Super Quantum Potential' synonymous with coherent *UF* aspects.

More noeon-psychon theory: A torus is generated by rotating a circle about an extended line in its plane where the circles become a continuous ring. According to the torus equation, $\left[\left(\sqrt{x^2+y^2}\right)-R\right]^2+z^2=r^2$, where *r* is the radius of the rotating circle and *R* the distance between the center of the circle and axis of rotation. Torus volume is $2\pi^2 Rr^2$ and surface area is $4\pi^2 Rr$. In this Cartesian formula the *z* axis is the axis of rotation. We apply this to the holophote action of noeon exciplex flux with a hysteresis loop. In atomic theory electron charged particle spherical domains fill toroidal volumes of atomic orbits by their wave motion. If a photon of specific quanta is emitted while an electron is resident in an upper (*UF* domain) more excited Bohr orbit, the orbit radius drops back down to the next lower energy level decreasing volume of the torus in the emission process (noeon-psychon exciplex hysteresis loop maintaining a periodic syntropic force of coherence).

Summarizing pertinent aspects of Psychon cosmology:

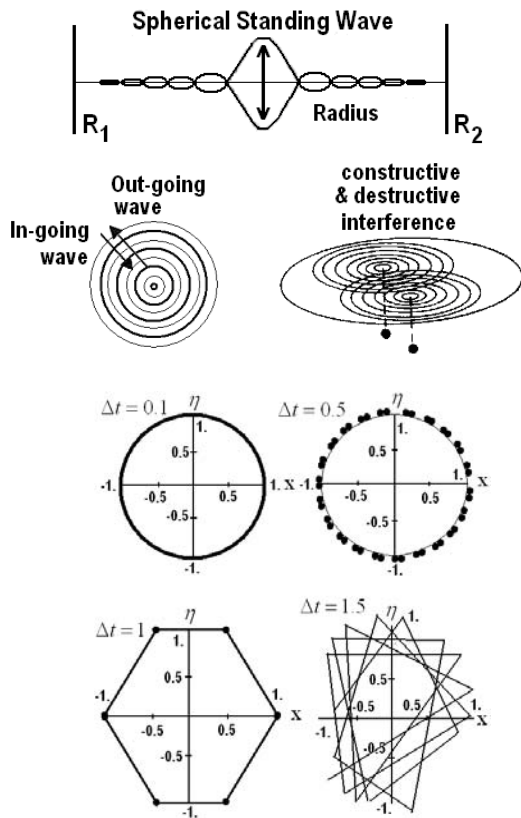- Nature of point particles or singularities in physics has long been debated. In Noetic Cosmology it becomes a continuous Witten vertex [18] (Central *x,y,z* parallel lines, Fig. 4b).

- Energyless interaction of the *UF* occurs by 'topological switching'. Metaphorically like what happens by staring at a Necker cube and the vertices oscillate back and forth. This is like the exciplex gate in noetic cosmology [2].

- In deference to Nobelist Sir John Eccles concept for mind-body interaction the energy of qualia is quantified in Psychons. Like the Einstein, the psychon defines a measure of one mole of noeons, purported to be the topological exchange complex of the *UF* providing the energy that animates the stream of awareness or qualia.

Using the noetic field equation, $F_{(N)} = E/R$ (Fig. 5a) we could calculate the energy of the noeon field from its spacetime hysteresis loop (Fig. 5b,c). This is a practical and conceptual challenge currently hard to meet. Imagine trying to calculate the surface area of the dendrite and synaptic boutons in a dendron [19], neural network or array of microtubules. Imagine a helicopter like those used to put out forest fires carrying a bucket of water retrieved from a nearby lake (*UF*). The volume of that bucket is known. So it is infinitely easier to work with the volume of the helicopter water bucket than to try to measure the surface area of trees and other objects (dendrons) on the ground. Until the experiment is performed (Sect. 6); we could approximate the volume of the helicopter bucket with the energy of one psychon-dendron from parameters of Tbl. 1. As shown in Fig. 9 we are postulating that the Manifold of Uncertainty (MOU) has from 2D to 5D with the 3rd or 6thD being degenerate (atomic radius where an outer electron flies off to infinity). We don't know yet if the MOU is 3D or 6D because we don't fully understand how to close-pack the LCU array tessellating spacetime (Fig. 6). This model is compatible with M-Theoretic Calabi-Yau dual 3-tori [2,5]; but our theory cannot fully predict this

until we know how many space-antispace doublings are required in LCU packing (Rowlands [5]). We discovered that a complex quaternion Clifford algebra can perform this task but our team hasn't finished solving the equation.
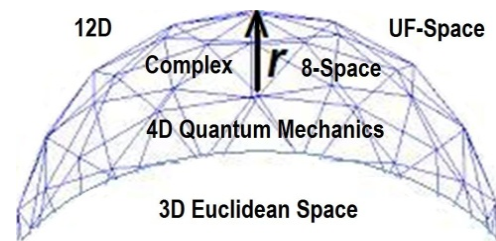
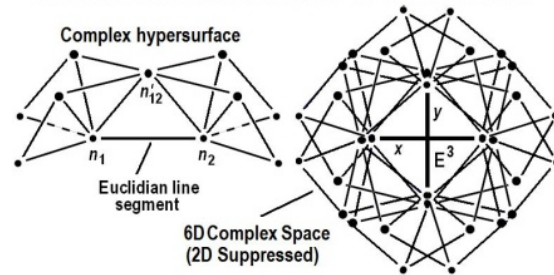**SPACETIME RESONANCE HAS SPHERICAL SYMMETRY**

Figure 10. The Dirac polarized vacuum has hyperspherical symmetry. a) Top left, metaphor for Cramer's standing-wave present showing future-past elements, R_1, R_2, 11D of 12D suppressed for simplicity. b) Bottom left, top view of a) 2D spherical standing-wave; c) Bottom left right portion, manipulating relative quantum/brane phase oscillations creates nodes of destructive and constructive interference. d) Right, Four numerical simulations of the phase space trajectory of the Dubois *superposed incursive oscillator* based on coordinates and velocities $x_n = 1/2[x_n(1) + x_n(2)]$ $v_n = 1/2[v_n(1) + v_n(2)]$ shown in the figure for values of $\Delta \tau = \omega t$ equal to 0.1, 0.5, 1.0 and 1.5. Initial conditions are $\chi_0 = 1, \eta_0 = 0 \,\&\, \tau_0 = 0$ with total simulation time, $\tau = \omega t = 8\pi$.

In summary when Eccles loosely defined the psychon dendron correlation he

didn't consider an Avogadro's number of noeons entering the picture. Can we correlate helicopter buckets of *UF* brane topology with the volume or surface area of an array of LCUs modulating energy of coherence entering local spacetime of a dendron (bundle of 100 apical dendrites with 100k synapses) [7-9]? Yes, but we defer the calculation until we have more math or perform the experiment (Amoroso [5]). The exciplex LCU gate transforms continuously through HD M-Theoretic brane topology with cyclic compactification modes [1,2] until reaching a 4D 'standing-wave' [22] Minkowski spacetime of the standard model of observed virtual reality, i.e. a gated domain-wall for entry of *UF* noeon energy pervading all spacetime and matter, (SOLS vital energy - dendron example) mediated by a new set of transformations beyond the Galilean-Lorentz-Poincairé which called in deference to the anthropic multiverse it is cast in - the Noetic Transform [2,13-15].

Figure 11. Proposed 2D to 5D Manifold of Uncertainty (MOU). a) Partial hyperspherical view. b) Suppressed planar views.

For preliminarily predictions we could calculate hyperspherical volume or surface area of 2D-5D MOU (Fig. 9). The general *n*-volume equation is $V(n,r) = \pi \frac{n}{2} r^n / \Gamma\left(\frac{n}{2} + 1\right)$ where $V_{n,r}$ is volume per number of

dimensions, n of radius r and Γ a factorial constant. These n-volume equations relate to volumetric properties of the MOU for calculating Psychon volume.

n	$V(n,1)$	
0	0	0
1	2	2
2	π	≈ 3.1416
3	$4/3\pi$	4.1888
4	$1/2\pi^2$	4.9348
5	$8/15\pi^2$	5.2638

TABLE 1. Standard Hypervolume values for increasing n-dimensionality and radius, r of a unit sphere or n-ball equal to 1.

UF dynamics entails a 'force of coherence' not a 5th fundamental force. This 'coherence' is the resultant unitary unified action of the *UF* which is primary - originator of all other forces 'pumping' noeons, which are then immediately returned to the infinite sea of *UF* potentia. This cyclical process energizes SOLS, qualia and gravitation. Theologically: '*The spirit* [UF] *emanates from the throne of God, filling the immensity of space, it is life, the light of the mind and the power that frames the heavens*' [20]. One sees that an anthropic principle (spirit of God) provides these phenomena - Life, the Light of the Mind (qualia) and Gravitation! More work must be done on noeon dynamics. This is what the experimental protocols are designed for - rigorous investigation.

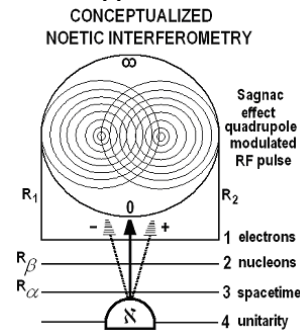## 7. Empirical Tests for Detecting the Noetic Psychon

Basic Experiment - Fundamental test that the concatenation of new NFT *UF* principles is theoretically sound. A laser oscillated rf-pulsed vacuum resonance hierarchy is set up to interfere with the periodic (continuous-state) structure of the inherent 'beat frequency' of a Dirac polarized spacetime vacuum LCU exciplex to detect the new coherence principle associated with a cyclical holophote entry of the *UF* into 4-space. This experiment 'pokes a hole in spacetime' in order to bring the energy of the *UF* into a detector. The remaining protocols are variations of the parameters of this experiment [6] (Figs. 12 & 13).

Figure 12 Design elements of the Noetic Interferometer postulated to constructively-destructively interfere with the topology of the spacetime manifold to manipulate the *UF*. The first three tiers set the stage for the critical 4th tier which through an incursive oscillator punches a hole in the fabric of spacetime creating a holophote entry of the *UF* into the experimental apparatus.

Figure 13. Conceptualized Riemann sphere Cavity-QED multi-level Sagnac effect interferometer designed to 'penetrate' spacetime emitting the 'eternity wave, $\aleph$ ' of the *UF*.

Experimental access to vacuum structure by surmounting the uncertainty principle is done by two similar methods:

1) Utilize an atomic resonance hierarchy or
2) Spacetime resonance hierarchy.

The spheroid (Fig. 9a) is a 2D representation of a HD complex Riemann sphere able to spin-flip from zero to infinity continuously - Essential for surmounting uncertainty [2,13-15]. Postulates utilized are in general de Broglie-Bohm and Cramer interpretations of quantum theory, Dirac polarized vacuum,

Sagnac affect [21,22], unique string vacuum derived multiverse cosmology and special class of Calabi-Yau mirror symmetry conditions [1-3,5,6,13-17]. A key proposal concerns the wave structure of matter in that spacetime is created, annihilated and recreated continuously [21]. A stone thrown in a pool of water creates concentric ripples. Two stones dropped harmonically create regions of constructive and destructive interference. This is essentially how our rf-modulated resonance hierarchy operates (Fig. 9b): In the first tier (Fig. 9a) electron oscillation in the atom create nucleon resonance (related to NMR principles) coupling electrons to the magnetic moment of the nucleons in tier 2. By the principles of Relativistic Quantum Field Theory tiers one and two undergo resonant coupling to the beat frequency of the fabric of space-time. The multitier cumulative interaction of tears 1, 2 and 3 by application of the Dubois incursive oscillator [23] can be set to destructively-constructively interfere with the annihilation-creation operators of spacetime. In the vacuum interferometer the incursive oscillator acts as a feedback loop on the arrow of time [15]. Parameters of the incursive oscillator are also required for aligning the interferometer hierarchy with the beat frequency of spacetime by $x(t+\Delta t)$ $v(t+\Delta t)$.

Critically the size of Δt correlates with the size of the 'hole' punched in spacetime also correlating with the diameter of the wavelength, λ of the rf-resonance pulse. If the signal returning from the QED cavity is a different quantized frequency than reflection suggesting that a new cavity of HD volume exists and emits a new TBS Bohr orbit spectral line from the energy absorbed, then the experiment is successful [17] and UFM and its explanation of consciousness will have been verified. A new age of discovery with mind-body technologies will then begin...

8 Summary.
We have proposed Unified Field Mechanics (UFM) as a 3rd regime of reality beyond quantum mechanics as a domain emitting a 'life principle'. An exciplex gating mechanism

was described that emitted the U_F into Self-Organized Living Systems (SOLS). The major theoretical element of this noetic framework was introduction of a model for quantifying the energy of the U_F (awareness) as new unit of energy measure proposed to be called the Psychon in honor of Nobelist Sir John Eccles. Of paramount importance is the ability to empirically test the Psychon-noeon theory by the protocol outlined.

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