

The Imminent Creation of Sentient Androids?

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Abstract: - Onset of the imminent paradigm shift to the 3rd regime of Natural Science (Classical, Quantum, Unified Field) will sustain an explosion in technological innovation. Chief among these innovations will be the appearance of room temperature table-top Bulk Universal Quantum Computing (UQC) – a fundamental key element in producing Sentient Androids (SA). Controversy will occur around the meaning of Android, the nature of Sentience, what it means to pass the Turing Test, and if passing the Turing Test is a satisfactory demonstration of Sentience indistinguishable from a human. It is proposed that two classes of SA will be developed: 1) the Cognitive Science model of AI where passing the Turing Test will be deemed sufficient and 2) a Cartesian Dualism model requiring a life principle for sentience – where the brain is a form of naturally occurring conscious quantum computer.

Key-Words: - Algorithm, Android, Life principle, Mind-body, M-theory, Qubit, Sentience, Turing test, Unified field, Universal quantum computing

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1 Introduction

The Turing Test by general definition, is a method testing a machine's ability to exhibit intelligent behavior equivalent to, or indistinguishable from, that of human intelligence.

The nature of awareness, which includes sentience, has been called the *oldest and most difficult problem facing human understanding*. The current thinking that Mind = Brain has not helped. For example, cognitive scientists ask – How can the brain, a physical thing, generate a non-physical essence of the mind? This ghost in the machine is the central issue of the riddle of non-physicality. That there might be a Cartesian mind-stuff (*res cogitans*) and body-stuff (*res extensa*), a dualism of mind and body is currently politically incorrect. Thus, cognitive scientists claim mind stuff is nonphysical and violate laws of thermodynamics in order to destroy any efficacy; but Descartes did not claim his *res cogitans* was nonphysical, he claimed it was immaterial. Even today a valid definition of immaterial is spiritual; an extremely unacceptable term to most scientists. When Sir John Eccles was still alive (Nobel for synapse) it was said, *how can one argue with a Nobel Laureate* – Eccles was the last great Cartesian dualist. The nature of awareness has been called *the hard problem*. In the history of science, whenever a hard problem existed, later discovery has shown incorrect fundamental

questions had been asked. We provide empirical protocols to test for a Cartesian action principle.

Universal Quantum Computing (UQC) will essentially provide infinite computing power because superposed qubit states scale by a factor of 2^N , such that a mere 400 qubits has a number of possible states tantamount to the number of atoms in the universe, suggesting androids indistinguishable from humans will be constructed provided an appropriate system of algorithms is developed. This brings the issue of android sentience (self-awareness) to the forefront. The dominant cognitive approach to consciousness, aligned with the AI model, states that *mind equals brain* and once the specificity of algorithms is known, all of human intelligence could be replicated artificially. This so-called mechanistic view: *The laws of physics and chemistry provide a sufficient description of living systems; with no additional life principle required* is untenable. Our point of view entails an inherent Cartesian action principle driving the evolution of complex Self-Organized Living Systems (SOLS) and the physical processes of awareness – necessitating a physical distinction between mind and brain because human rationality contains something beyond the design criterion of machine intelligence. Based on the fundamental premise that awareness is associated with an Einsteinian-like Unified Field as an inherent aspect of the nonlocal

fabric of the physical universe. The architecture of a quantum computer designed to embody the physical elements of natural intelligence could allow consciousness to emerge within its core because the utility of the missing parameters of mind contained in the deeper ontology could function as a carrier to simulate a platform for the extracellular containment of natural intelligence.

In the mind = brain panoply it is argued that if we knew the correct algorithms all of human intelligence could be duplicated on today's existing computers. Current computing platforms are called Turing Machines as invented by Alan Turing in 1936. Generally, A Turing machine consists of a tape of infinite length on which read and write operations can be performed. The tape consists of infinite cells each containing symbols. It also consists of a head that points to the cell currently being read; it is linear and can move in both directions. It is argued that Turing machines cannot achieve sentience or free will because they cannot escape their linear programming – a property of nonlinear thought processes.

Turing proposed a test, now called the Turing Test: if a computer can pass for a human, it is intelligent. To clarify this issue philosopher John Searle created the Chinese Room argument: Imagine a native English speaker who knows no Chinese locked in a room with boxes of Chinese symbols (database) and a book of instructions for manipulating the symbols (program). People outside the room send in Chinese symbols which, unknown to the person in the room, are questions in Chinese (input). By following instructions in the program, the man in the room passes out Chinese symbols that are correct answers to the questions (output) enabling the person in the room to pass the Turing Test for understanding Chinese albeit he does not understand any Chinese.

With a UQC of essentially infinite computing power/database, it seems obvious Androids will easily outperform humans. For example, *IBM Super-computer Watson* defeated two of the *Jeopardy Quiz show's* greatest champions. Watson is massively parallel, employing a cluster of ninety IBM Power 750 servers, each using a 3.5 GHz POWER7 eight-core processor, with four threads per core. In total, the system has 2,880 POWER7 processor threads and 16 terabytes of RAM. Watson processes 500 gigabytes, the equivalent of a million books, per second. All content needed to be stored in RAM because data stored on hard drives would be too slow to be competitive with human Jeopardy champions.

Since June 2018, the US Summit is the world's

most powerful supercomputer, reaching 143.5 petaFLOPS. This is nothing compared to the theoretically infinite processing UQC will provide. Watson was designed for a specific purpose; it is easy to imagine a bulk UQC encompassing all of human intelligence, and thus being able to pass the Turing Test. Does this mean an android equipped with such a *brain* would be sentient? We suggest no because it will still be following a program and thus could not have free will in an absolute sense. What we cannot answer now, is whether a UQC modeled after Cartesian dualism incorporating the Extracellular Containment of Natural Intelligence could achieve sentience.

Generally, the simplistic distinction between a humanoid robot, a computerized machine capable of replicating a variety of complex human functions automatically, and an android is one of appearance; an android is meant to look and act like a human being even to the extent of being indistinguishable. Qubits reportedly scale at 2^N , such that only a few hundred qubits are tantamount to the number of atoms in the universe.

With crystalline holographic databases coupled with the processing power of bulk Universal Quantum Computing (UQC), [1], it seems logical that androids could be constructed as truly indistinguishable from a human being provided a proper system of algorithms could be developed. This scenario, however, brings the issue of the applicability of android sentience (self-awareness) to the forefront. The currently dominant cognitive model of awareness, closely aligned to the AI model, states that mind equals brain and that once the specificity of algorithms is known, all of human intelligence could be replicated artificially.

This is the so-called mechanistic view: *The laws of physics and chemistry are sufficient to describe all living systems; no additional life principle is required*, [2]. In this work we develop the point of view that the regime of Unified Field Mechanics (UFM), as Einstein himself claimed, supplies an inherent action principle describing life, or as we state: driving both the evolution of complex Self-Organized Living Systems (SOLS) and the physical processes of awareness. This Cartesian model (the distinction between mind and brain), where UFM parameters in conjunction with *conscious QC* (QC modeled with physical parameters of mind-body interaction), putatively could lead directly to the possibility for the construction of sentient (or sentient-like) Androids.

Constructing sentient robotic devices in our model requires three precursors:

1) Utility of 3rd regime Natural Science - Unified Field Mechanics (UFM) which Einstein himself stated includes an inherent life principle with experimental access to a physically real ‘light of the mind’.

2) Development of the fundamental principles of awareness (solving the Mind-Body problem); and

3) Implementing a special class of universal ‘conscious quantum computer’ (QC) modeled after the naturally occurring mind-body interface.

It is proposed that under certain conditions it is possible to construct a class of Sentient Androids (SA), what is feasible is the ability to construct androids able to pass the Turing Test as illustrated by J Searle’s Chinese Room Experiment. Two radical innovations are mandatory before such a scenario can be implemented: 1) Bulk Universal Quantum Computing (UQC) and 2) A proper solution to the Mind-Body problem.

An android is meant to look and act like a human being even to the extent of being indistinguishable. Generally, the simplistic distinction between a humanoid robot, a computerized machine capable of replicating a variety of complex human functions automatically, and an android is one of appearance. While a one-day hyper-supercomputer could have a sufficient holographic database and processing power to be truly indistinguishable from a human being, the issue of the applicability of sentience (self-awareness) to an android comes to the forefront. The currently dominant cognitive model of awareness, closely aligned to the AI model, states that mind equals brain and that once correct algorithms are known all of human intelligence could be replicated artificially. This is the so-called mechanistic view: ‘The laws of physics and chemistry are sufficient to describe all living systems; no additional life principle is required’. In this work, we develop the point of view that the regime of Unified Field Mechanics (UFM) supplies an inherent action principle driving both the evolution of complex Self-Organized Living Systems (SOLS) and the physical processes of awareness. These UFM parameters in conjunction with ‘conscious quantum computing’ (a class of quantum computer modeled with physical parameters of mind-body interaction) putatively lead directly to the construction of sentient (or sentient-like) Androids.

2 Extracellular Containment of Natural Intelligence

We delineate the framework for the discovery of the mind and the requirements for general universal quantum computing incorporating those elements into a class of ‘conscious’ quantum computing. Our approach to defining awareness does not adhere fully to the standard Cognitive approach where *mind equals brain* but rather to a Cartesian interactionist model where Descartes *res cogitans* (mind stuff) is considered a physically real coherent action of the Unified Field; instead of a ‘flashing stream of positrons’ as Asimov suggested, rather a stream of ‘noeons’ the proposed exchange unit of an Einsteinian UFM, [1].

Epistemology progressed from myth and superstition to the age of logic and reason. When logic failed Galileo was credited with founding the age of empirical science currently in effect. This evolution in modern times centered at first on the 3D Euclidean space of Newtonian or Classical Mechanics. Then at the turn of the 20th Century Quantum Mechanics and Relativity were created in a 4D Minkowski-Riemann spacetime. Now as we develop the ‘Age of Mind’ we enter a 3rd 12D String/M-Theoretic regime of UFM [1], [2], [3]. It is postulated that this UFM regime contains an inherent new action or life principle driving the evolution of complex Self-Organized Living Systems (SOLS) and mind or mentation (stream of qualia), [1], [4]. Therefore, sentient life is a form of the complex self-organized autopoietic system within which awareness is an evanescent process between local phenomenological and nonlocal ontological domains of Descartes *res extensa* (body stuff) interacting with physically real *res cogitans* (mind stuff).

We will discuss several experimental protocols under development that test these noetic hypotheses, [5], [6]. It is in this guise that we are able to propose that the mind-body interface is a form of naturally occurring ‘conscious quantum computer’, [7]; which under the right conditions could lead to the ‘extracellular containment’ of natural intelligence or awareness in an android. In addition, our QC model is radically different from those currently studied; it relies on a relativistic model of the qubit (r-qubit) and relativistic topological quantum field theory in conjunction with salient aspects of UFM. The r-qubit adds additional degrees of freedom causing the standard Bloch sphere representation of a qubit to be obsolete, [2]. The additional degrees of freedom require the development of a new class of quantum logic gates and algorithms. QC operation becomes a

duality, partially quantum mechanically (current thinking) and partially within the 3rd regime of UFM (new physics) in conjunction with brane dynamics correlated with Calabi-Yau mirror symmetry attributed to M-Theory, [2], [3].

This is key to surmounting the uncertainty principle which also puts an end to the major problem of decoherence, [5], [6], [8]. We suspect Bulk Scalable Universal QC cannot be achieved without these proposed improvements in QC modeling. Finally, we discuss the current state of the art for the ‘extracellular containment of awareness’ and the timeline for implementing the physical principles of mind and processing in a first sentient android prototype - not as Asimov suggested with a ‘flashing stream of positrons but rather with a noeon flux, the putative exchange unit of the Unified Field synonymous with a life principle and stream of qualia.

3 Directing Mind-Body Research

In contrast to current thinking, we can no longer accept reasoning that ‘the Planck scale is the fundamental basement level of the universe’ (reality), or that spacetime geometry is the fundamental domain where the psycho-physical bridge occurs; because spacetime is an emergent property associated with the regime of quantum mechanical uncertainty which we now know has a finite radius, [3], beyond which lies the domain of UFM. A sufficient basis for defining awareness requires parameters of UFM beyond this virtual veil of uncertainty. In the same way, a distinction between Classical and Quantum was discovered with each domain being a physical regime with its own laws and methods of investigation; the mind is also comprised of physically real matter that exists and operates in another arena hidden until now. Recall that UFM, [3], is just being formalized providing the long-anticipated 3rd regime of reality. Thus, our understanding of the physical world evolves from Classical to Quantum to Unified (CQU). The current description of our universe called the Standard Model, is presently governed by the rules of the Copenhagen Interpretation of quantum theory, electromagnetism, and Special/General Relativity cast in a Big Bang cosmology. A top-down description that reduces to an impenetrable barrier, a so-called stochastic quantum foam at the 10^{-33} cm Planck scale representing the lower limit of a reality where we (mind, awareness) as ‘observer’ is embedded in and made out of its emergent material properties. This Planck scale is not the ‘basement of reality’ as

Hameroff calls it, [9], only a temporarily closed door, [10], imposed by the Copenhagen interpretation of quantum theory that can now be opened and passed through with parameters of Noetic Field Theory (NFT): The Quantization of Mind, [1], [2], [3], [4], [5], [8]. This CQU progression is neither top-down nor bottom-up but entails what is described as a ‘continuous-state’ free fall-like cycling, [1], [2], [3], [8].

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. Events of quantum mechanics and with relativistic velocities are described by the Lorentz-Poincaré group of transformations in a 4D Einstein-Minkowski spacetime. In order to cross the Psycho-Physical Quantum Bridge noetic cosmology utilizes an extension of M-Theory requiring a new 12D set of transformations called the Noetic Transform because it includes properties of an inherent teleological anthropic principle described by the evolution of U_F dynamics, [1], [2], [3], [4], [5], [6], in the 3rd regime of Large-Scale Additional Dimensionality (LSXD).

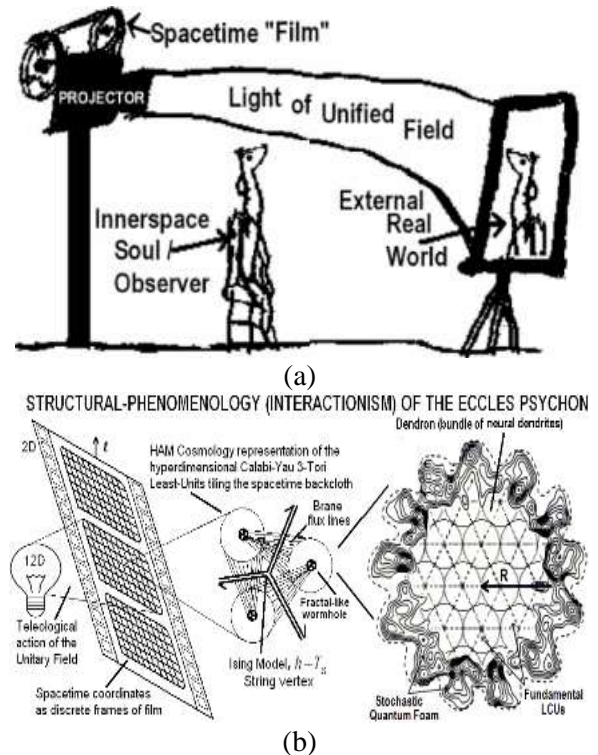


Fig. 1: a) Macroscopic movie theatre metaphor of anthropic awareness (like Plato’s analogy of the cave or virtual reality) and the observer’s (self) place in the theatre. Discrete frames (film) pass through the projector (spacetime) lit by coherent energy of the U_F streaming through the observer embedded in the theatre and appearing as the

continuous flow of reality (awareness) on the screen. b) Microscopic details of transduction of the U_F through the complex spacetime raster into every point, atom, and thus molecule of Self-Organized Living Systems (SOLS). c) Showing relativistic injection of the noetic field into spacetime points. d) Coherent interaction of the U_F bridging the stochastic quantum barrier coupled to a brain dendron of radius R correlated with an underlying array forming one Eccles Psychon unit within the brain.

To achieve this result, we utilize a battery of new physical assumptions (developed in ensuing sections):

- The LSXD regime of U_F dynamics is a ‘sea’ of infinite potential from which the 4D reality of the 3D observer cyclically emerges as a nilpotent resultant. Nilpotency - technically meaning ‘sums to zero’, [2], [11], is a required basis for the noetic cosmologies infinite potential simplistically like the entangled alive-dead quantum state of Schrödinger’s cat before a realized local event occurs.
- The action of the U_F mediated by noeon ‘flux’ (noeon is the exchange unit of the U_F) is the life principle both animating SOLS and supplying psychon energy for the physical evolution of qualia, [1], [2], [3], [4], [5], [6].
- The U_F does not operate as a usual phenomenal field (mediated by an energetic exchange quanta like the photon of the electromagnetic field) but as an energyless field by a process called ‘topological switching’ transferring a force of coherence ontologically between M-Theoretic branes, [4], [12]. Note: This property of U_F dynamics removes the problem of violation of the 2nd law of thermodynamics or the conservation of energy from Cartesian interactive dualism.
- The key process for the topological transformation of noeon exchange is a holophote action (like a lighthouse beacon) providing a gating mechanism acting as the psychophysical bridge between the potential of the U_F 12D space and the localized 4D spacetime and 3D matter it embeds, [1], [4].

4 Mind-Body Problem - Sentience

To solve the mind-body problem the scientific perspective must evolve beyond the usual Copenhagen Interpretation of quantum theory to the new physics required to explain, utilize and design experimental access to the U_F regime where

physical parameters able to explain psychophysical-bridging reside.

- The Planck scale cannot be considered the most fundamental level of reality. Three regimes of reality must be addressed: Classical \leftrightarrow Quantum \leftrightarrow Unified Field; all of which cycle continuously, [1], [2], [3], [4], [8].
- Qualia are not quantum phenomena per se but unified field phenomena. Quale ‘rest on’ the quantum regime (tip of the iceberg) only as part of the sensory transduction apparatus (Mind-body interaction).
- The Planck scale is not an impenetrable barrier, [3], even though considered so as an empirical fact demonstrated by the quantum uncertainty principle - UFM can be utilized to surmount uncertainty.

Fourteen empirical protocols have been proposed, [5], [6] (the 1st reviewed here) for demonstrating, gaining access to, and leading to a variety of experimental platforms for first-hand investigation of the physical basis of awareness (qualia) breaking down the 1st person 3rd person barrier as called for by, [13].

String theory has one parameter, string tension, T_S ; but has been fraught with the dilemma of a Googolplex (10^{googol}) or an infinite number of vacuum possibilities. By utilizing the Eddington, Dirac, and Wheeler large number hypothesis, [1], [8], we found an alternative derivation of T_S leading to one unique vacuum and what we call the ‘continuous-state hypothesis’ an alternative to expansion/inflation parameters of Big Bang cosmology, [8]. Simplistically the perceived inflation energy of Big Bang cosmology postulates a Doppler expansion from a primordial temporal singularity. But the noetic continuous-state hypothesis proposes a localized ‘eternal present’ as if in permanent ‘gravitational free-fall’, [1], [4], [8]. Since we are relativistically embedded in and made out of matter this condition means that all objects (in our 3D virtual reality) are embedded in LSXD in gravitational ‘free-fall’. This is better explained by two other interpretations of the quantum theory generally ignored by the physics community because they are myopically considered to add nothing. That of the de Broglie-Bohm Causal Interpretation, [14], and the Cramer Transactional Interpretation, [15]; where spacetime and the matter within it (matter is made of de Broglie waves) is created-annihilated and recreated over and over as part of the perceived arrow of time and creation of our 3D reality as a resultant from LSXD infinite potential as a ‘hyperspherical standing-wave, [1],

[2], [3], [10]. This can be understood conceptually by a movie theatre metaphor (Figure 1).

5 A Physical Basis for Qualia

Qualia, plural of *quale*, is defined as ‘the subjective quality of experience; a *qualitative feel* associated with an experience’. The physics of noetic cosmology with an inherent ‘life principle’ based on U_F mechanics also provides for the first time a physical basis for representing quale in a rigorous empirically testable manner. If experience has a specific subjective nature; if one removed the viewpoint of the subjective observer; *what would be left?* 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 assign them an objective character*”, [13]. This breaks down the 1st person-3rd person barrier: A major step in implementing extra-cellular sentience.

These are questions an integrative Noetic Science now answers theoretically and empirically. Standard definitions of qualia are an inadequate philosophical construct describing only the subjective character. In the physical sense of Noetic Field Theory (NFT): The Quantization of Mind components describing qualia from the objective sense distinguishes the phenomenology of qualia from the underlying ontological ‘nonlocal noumenon’ or physical existence of the fundamental *thing in itself*. NFT suggests that a comprehensive definition of qualia is comprised of a triune form considered physically real because the noetic unified field on which the NFT is based is physically real. The proposed triune basis of quale is as follows:

Type I. The Subjective - *What it feels like* the basis of awareness. Phenomenological mental states of the qualia of experience. (This is the current philosophical definition of qualia, Q-I)

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

Type III. The Cosmological - SOLS by being alive represent a Qualia substrate of the anthropic multiverse, acting as a ‘blank slate’ carrier (like a television set turned on but with no broadcast signal) from within which Q-II are modulated into the Q-I of experience by a form of superradiance. Note: Q-III has sub-elements called *quanemes* addressed elsewhere, [1], [4].

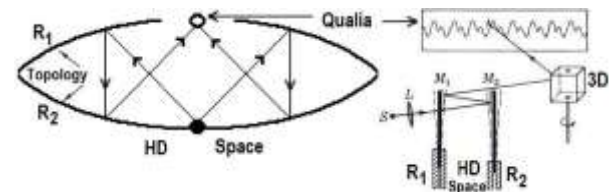


Fig. 2: 2D rendition of an HD holographic process. a) An object (small black circle) placed inside two parabolic mirrors (Casimir-like domain walls) produces a virtual image (white circle) representing the creation of a point in spacetime or stream of elements producing qualia. b) Our virtual holographic reality is produced in a similar fashion by Cramer future-past standing-wave parameters from the LSXD Calabi-Yau mirror symmetric infinite potentia of the U_F . As in Fig. 1, this same process produces qualia with each lit point like a raindrop producing a rainbow by the ‘light’ of the U_F .

Standard images require a screen or reflective surface to be resolved; but if the foci of two parabolic mirrors (Casimir-like vacuum plates) coincide, the two images superpose into a real 3D holographic image not needing a screen. A toy called the *magic mirage* demonstrates this effect of parabolic mirrors. Objects placed at the bottom appear as solid objects at the top of the device. In 12D LSXD reality Calabi-Yau brane topology performs the same function for the locus of qualia propagation.

The ‘light-house’ (flashing) action of U_F life principle energetics arises from harmonic oscillations of boundary conditions tiling the spacetime backcloth and pervading all SOLS. 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 a superposition of the two (Q-III and Q-II). This modulation of qualia occurs in the HD QED cavities of the individual’s psychosphere cognitive domain. The QED cavities are a close-packed tiling of LCU noetic hyperspheres; the Casimir surfaces of which reflect *quaneme* subelements. The best reflectors of em-waves are polished metal mirrors; charged

boundary conditions also reflect em-waves the same way radio signals bounce off the ionized gases of the Kennelly-Heaviside layers in the ionosphere. This reflective ‘sheath’ enclosing the cognitive domain is charged by the Noeon radiation (exchange particle of the noetic field) of the life principle, the phases of which are ‘regulated’ in the complex LSXD space.

How does the noetic theory describe more complex aspects of qualia? Like a rainbow, light quanta (water drops) are microscopic in contrast to the macroscopic sphere of awareness (rainbow). It thus seems reasonable to assume that scale-invariant properties of the LCUs modulating awareness would apply. Like phonemes as fundamental sound elements for audible language qualia-nemes or *quanemes* are proposed for subelements of awareness; all based on the physical modulation of Q-II states by the geometric structural phenomenology of the Q-III carrier base of living systems. The quaneme is a singular Witten point in the raster of mind like a locus of points forming a line. Each of these ‘quaneme points’ of noeon entry through the LCU gating array is like an individual raindrop that summates into a rainbow or thought train of awareness. This again takes us back to the movie theater metaphor of Fig.1 where the discrete frame of film (LCU gated) is projected continuously on the screen, in this case, the mind.

For cognitive theory, all intelligence/consciousness resides in the brain (mind equals brain). The situation is radically different for Cartesian interactive dualism requiring a life principle. The cognitive theory requires only one component - body stuff or matter; but interactive dualism requires three components: 1) Matter (Cartesian *res extensa*). 2) Mind stuff (*res cogitans*) and 3) Nonlocal Elemental Intelligence. Because of space constrictions these critically important aspects are only mentioned here, [1].

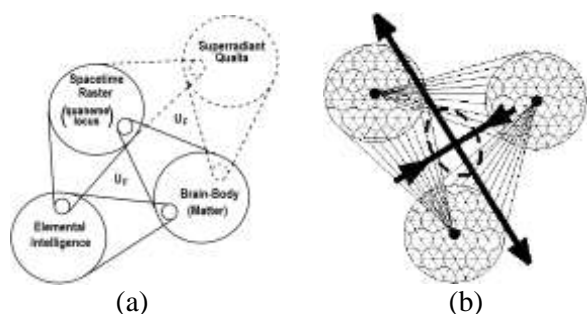


Fig. 3: a) The physical basis of the continuous superradiant generation of qualia from the three components of mind: eternal Elemental Intelligence, Brain-Body (Descartes *res extensa*), and the superradiant qualia (Descartes *res cogitans*)

mediated by the spacetime raster (quaneme locus) that gates ‘the light of the mind’ or U_F energy. The term quaneme is derived to parallel the phoneme component of sounds. b) LCU construct hidden nonlocally behind a local 3-space singularity (black cross vertex).

6 Unit of Mind Energy Measure

NFT elevates the concept of qualia from the traditional philosophical concept used in cognitive science to a physically real fundamental noumenon. Noumenon is defined as the ‘thing in itself’ beyond the veil of the 3D phenomenological world; in Kantian philosophy, a noumenon is something existing independently of intellectual or sensory perception. This fundamental physicality allows qualia to be ‘digitized’ in some form breaking down the 1st person-3rd person barrier and leading to profound new ‘conscious’ technologies. Nobelist Sir John Eccles coined a construct called the psychon, to illustrate how mental energy coupled to brain dendrons (bundle of neural dendrites), [16], to complete his Cartesian interactionist model of mind-body dualism, [1], [2], [3], [4], [5], [6].

Formalizing the ‘Psychon’ as a unit of measure is made possible by a comprehensive science of qualia or fundamental basis of awareness. In meditative science, it is said that ‘energy follows thought’. Here we postulate that the qualia of awareness are comprised of a real physical flux of energy related to the new physics of the unified field, U_F , [4]. In honor of Nobelist Sir J.C. Eccles (synapse discovery), we propose to quantify this mental energy in terms of a new physical unit called the Psychon. The Einstein, a physical unit of energy measure named in honor of Albert Einstein for his explanation of the photoelectric effect in terms of light quanta (photons) bears conceptual similarity and we thus use that as our starting point. The Einstein is used to measure the power of electromagnetic radiation in photosynthesis where one Einstein represents one mole or Avogadro’s number of photons (6.02×10^{23}). In general physics, the energy, E of n photons is $E = n\hbar\nu = n\hbar(c/\lambda)$ where \hbar is Planck’s constant and ν the frequency. The second part of the equation is energy in terms of the wavelength, λ (in nanometers, nm) and the speed of light, c . Adapting this photon energy equation to measure Einsteins is similar, $E = N_0\hbar\nu = N_0\hbar(c/\lambda)$ where the energy of N_0 photons is instead in Einsteins, E . In photometrics, the measure used is one microeinstein per second per square meter, where one microeinstein, μE is

one-millionth of an Einstein or 6.02×10^{17} photons imping a leaf for example.

A similar unit of measure to quantify the mental energy of quale called the Psychon as one mole or Avogadro's number of noeons is created. The force of all four known phenomenological fields (electromagnetic, strong, weak, and gravitational) are said to have exchange quanta mediating the field's interactions by a quantal exchange of energy. 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 the regime of unification is not quantum but instead correlates with the ontological parameters of UFM, [3].

The trefoil knots (as Planck scale quaternion vertices) are holomorphic to the circle. Since energy is conserved, we may ignore the complexity of the LSXD Calabi-Yau and AdS5 Dodecahedral symmetries and use the area of the circle, in this case, a resultant continuous rotation of two circles as a 2-sphere quantum state or perhaps better as a torus as the coupling area of one psychon to a dendron. This idea is further conceptualized illustrating how a 3D object emerges from spacetime.

In considering psychon energy it appears easier to calculate the nonlocal brane area rather than the local volume or surface area of a neural dendron or array of microtubules etc. Recall that the intestinal villi are purported to provide the area of a football field. In any case, we will not calculate here but leave it for a later publication since we still struggle with the conceptual problems relating to the geometric topology of noeon coherence. Recall that the de Broglie-Bohm interpretation entails a nonlocal pilot wave or quantum-potential said to guide the evolution of the wavefunction ontologically. This concept was not very successful in 4D, but when carried to LSXD it works elegantly and the pilot-wave-quantum potential is like a *Super Quantum Potential* becoming synonymous with coherent aspects of the U_F . Note that the U_F provides the basis for gravitation, [1], [8], and the life principle for living systems not just the evolutionary flow of qualia in the mind.

A bit more neon-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 equation for a torus, $\left[\left(\sqrt{x^2 + y^2} \right) - R \right]^2 + z^2 = r^2$, where r is the radius of the rotating circle and R is the distance between the center of the circle and the axis of rotation. The volume of the torus $2\pi^2 Rr^2$ and the surface area is

$4\pi^2 Rr$, in the above Cartesian formula the z -axis is the axis of rotation. We apply this to the holophote action of noeon flux. In atomic theory electron charged particle spherical domains fill the toroidal volume of the atomic orbit by their wave motion. If a photon of specific quanta is emitted while an electron is resident in an upper (like the U_F domain) more excited Bohr orbit, the radius of the orbit drops back down to the next lower energy level decreasing the volume of the torus in the emission process. Like Einstein, the psychon is defined as a measure of one mole of noeons, purported to be the topological exchange complex of the Unified Field, U_F which provides the energy that animates the stream of awareness or qualia.

Using the noetic field equation, $N_F = \varepsilon / \rho$, [1], [4], we need to calculate the energy of the noeon field from its space-time hysteresis loop. This is a practical and conceptual challenge that is hard to meet. Imagine trying to calculate the surface area of the dendrite and synaptic boutons in a dendron, neural network, or array of microtubules for example. Instead, imagine a helicopter-like those used to put out forest fires carrying a bucket of water retrieved from a nearby lake (U_F). 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 the trees and other objects on the ground. When Eccles loosely defined the psychon-dendron correlation he did not consider Avogadro's number of noeons to enter into the picture. The question is can we correlate helicopter buckets of the U_F with the volume or surface area of an array of the hysteresis loop modulating energy of coherence entering the local space-time of a dendron?

For simplicity, at this stage of development, we use the general unexpanded form of the Noetic U_F equation, $N_F = \varepsilon / \rho$ where N_F is the force of coherence of the U_F , ε the relativistic rotational energy, and ρ the 'cavity' radius. The cavity represents a hysteresis loop of the LSXD brane energy dynamics. The cavity relates to the volume of the Calabi-Yau mirror symmetric dual 3-tori of the lighthouse gating mechanism. The gate cycles continuously through LSXD symmetries of M-Theoretic space through various compactification modes, [2], [8], until it reaches a 4D *standing-wave* Minkowski spacetime of the standard model of observed reality, i.e. a Copenhagen domain wall of noeon energy pervading all spacetime and matter, i.e. SOLS as the *life principle* (in our example a dendron). This process, further described by the physics of the gating mechanism is mediated by a

new set of transformations beyond the Galilean-Lorentz-Poincaré called in regard to an anthropic multiverse it is cast in - the Noetic Transform, [2].

We derived our definition of the noeon (from the Greek *nous*, mind and *noēsis* / *noētikos*, perception-what the *nous* does) and the common “on” suffix in particle physics such as the phot-on as the fundamental exchange unit of the anthropic unified noetic field.

Although U_F dynamics entails a ‘force of coherence’ this does not seem to entail a 5th force. The ‘coherence’ implied is the resultant action; perhaps that is misleading. The U_F is primary - an originator of all the other forces that bring noeons, which are then immediately returned to the sea of infinite potential. This cyclical process energizes living systems, qualia, gravitation, etc. One sees that the anthropic principle provides all these phenomena - Life, the Light of the Mind (qualia), and Gravitation! More work has to be done on noeon dynamics. This is what the experimental protocols are designed for - rigorous investigation.

7 Bulk Universal Quantum Computing

Quantum Computing (QC) has remained elusive beyond a few qubits. Feynman’s recommended use of a “synchronization backbone”, [17], for achieving bulk implementation has generally been abandoned as intractable; a conundrum we believe arises from limitations imposed by the standard models of Quantum Theory (QT). It is proposed that Feynman’s model can be utilized to implement Universal Quantum Computing (UQC) with valid operationally completed extensions of QT and cosmology, [2]. Requisite additional degrees of freedom are introduced by defining a relativistic basis for the qubit (r-qubit) in a higher dimensional (LSXD) conformal scale-invariant context and defining a new anticipatory-based cosmology (cosmology itself cast as a hierarchical form of a complex self-organized system) making correspondence to unique 12D Calabi-Yau mirror symmetries of M-Theory. The causal structure of these conditions reveals an inherent new Unified Field, U_F “action principle” (force of coherence) driving self-organization and providing a basis for applying Feynman’s synchronization backbone principle. Operationally a new set of transformations (beyond the standard Galilean / Lorentz-Poincaré) *ontologically* surmounts the quantum condition (producing decoherence during both initialization and measurement) by an acausal energyless

(ontological) topological interaction, [2]. Utilizing the inherent LSXD regime requires new commutation rules and corresponding I/O techniques based on a coherent control process with applicable rf-pulsed incursive harmonic modes of LSXD spacetime manifolds described by a spin-exchange continuous-state spacetime resonance hierarchy.

We postulate bulk universal QC cannot be achieved without surmounting the quantum uncertainty principle, an inherent barrier by empirical definition in the regime described by the 4D Copenhagen interpretation - the last remaining hurdle to bulk QC. QC operations by surmounting uncertainty with probability $\equiv 1$, requires redefining the basis for the qubit. Our form of M-Theoretic Calabi-Yau mirror symmetry cast in an LSXD Dirac covariant polarized vacuum contains an inherent ‘Feynman synchronization backbone’. This also incorporates a relativistic qubit (r-qubit) providing additional degrees of freedom beyond the traditional Bloch 2-sphere qubit bringing the r-qubit.

Review of bulk UQC prototype design able to incorporate a sentient android:

- We arbitrarily choose a class-II mesoionic xanthine crystal stable at room temperature for ~ 100 years with 10 evenly separable quantum states in its ground state configuration. The xanthine is programmed by rf-pulsed Sagnac Effect resonance to overcome I/O decoherence, [2], [8]. This is the holographic ‘neural net android brain.
- For greater efficiency (intelligence) quantum dot ring laser arrays manufactured with internal mirrors may be utilized instead of IC arrays. The quantum dots would be arrayed on a suitable substrate rather than an IC.
- Another android brain model could utilize a class II mesoionic xanthine doped multilayer graphene molecule array (currently under study) where it may be possible to operate a QC by forms of Quantum Hall effects, bilayer graphene alone, or a stand-alone mesoionic xanthine configuration since several mesoionic xanthine molecules have pertinent polar properties.

Because the model surmounts the quantum uncertainty principle in a complex 12-space the current Bloch (Riemann) sphere representation of qubits (classical 2-sphere model) is a nonphysical mathematical representation too primitive and not suited for actualizing bulk universal QC. For the past several years our model was based on a relativistic (r-qubit) where the additional degree of freedom was an aid to surmounting uncertainty, [2], [6], [8]. Recently we realized this 4D r-qubit, while

on the right track was also insufficient. This arose from extending the quantum theory to the regime of the Unified Field, U_F primarily based on extended LSXD versions of Cramer's transactional interpretation and de Broglie-Bohm's interpretation of QT. This was as much a breakthrough in nilpotent cosmology as QT. We discovered there was more to a quantum state than a Copenhagen 'particle in a box'; the quantum state was conformally scale-invariant requiring a representation utilizing a system of dual continuous-state Calabi-Yau mirror symmetric 3-tori (class of Kähler manifolds), [6], [8]. One surprise is that this cosmology contains an inherent 'synchronization backbone', [17], which ends up like getting half the QC for free; making the essential process of surmounting uncertainty almost simplistic, [2], [6].

8 Conclusion - Criteria for Sentience

Sentience is suggested to be synonymous with an entity having subjective experiences also known in Philosophy of Mind as experiencing qualia. Sentience is often considered to be distinct from other aspects of the mind like intelligence, self-awareness, or free agency. The issue of conscious machines remains difficult compounded by the 'Chinese Room' analogy suggesting it could also remain a challenge experimentally. The problem cannot be solved philosophically only laid bare to certain probabilities. It is possible to list salient components of awareness. We suggest four: Sentience, Intelligence Self-awareness and Free will.

Must a conscious system be considered alive? We have addressed this issue elsewhere in what we have termed System-Zero: The proteinaceous unit called the prion, (responsible for neurodegenerative encephalopathies) a particle 'below' the virus. System-Zero propagates from normal to infectious by a conformational change in the protein structure by action of the force of coherence of the U_F .

Following the assumptions: 1) A physically real noetic 'life principle' exists synonymous with the action of the U_F , 2) The mind-body interface is a form of naturally occurring 'conscious quantum computer' (not that the QC is conscious but modeled after such principles) and 3) Combining the two concepts leads to truly sentient androids when applied to a class of QC systems modeled after the noetic mind-body interface.

The noetic QC Android model is empirically testable with experimental protocols summarized. Access to the U_F action of the life principle requires surmounting the quantum uncertainty principle.

Furthermore, the required universal bulk QC cannot be achieved with 4-space parameters and requires M-Theoretic principles of UFM cast in LSXD, [18], [19]. We believe implementing sentient Android devices is only this far away!

References:

- [1] Amoroso, R. L. (2010) *Complementarity of Mind and Body: Realizing the Dream of Descartes, Einstein, and Eccles*, New York: Nova Science Publishers.
- [2] Amoroso, R.L., Kauffman, L.H. & Rolands, P. (2013) *The Physics of Reality: Space, Time, Matter, Cosmos*, Hackensack: World Scientific.
- [3] Amoroso, R.L., Kauffman, L.H. & Rolands, P. (2015) *Unified Field Mechanics: Natural Science Beyond the Veil of Spacetime*, London: World Sci.
- [4] Amoroso, R. L., & Di Biase, F. (2013) Crossing the psycho-physical bridge: elucidating the objective character of experience, *J Consc Explor and Research*.
- [5] Amoroso, R. L. (2013) Empirical protocols for mediating long-range coherence in biological systems, *J Consc Explor and Research*.
- [6] Amoroso, R. L. (2010) Simple resonance hierarchy for surmounting quantum uncertainty, in Amoroso, R. L., Rowlands, P., & Jeffers, S. (eds) *AIP Conference Proceedings-American Institute of Physics*, Vol. 1316, No. 1, p. 185.
- [7] Amoroso, R. L. (1997) The theoretical foundations for engineering a conscious quantum computer, in M. Gams et al (eds) *Mind Versus Computer: Were Dreyfus and Winograd Right?* Amsterdam: IOS Press, 43, 141-155.
- [8] Amoroso, R.L. & E.A. Rauscher, E.A. (2009) *The Holographic Anthropic Multiverse: Formalizing the Complex Geometry of Ultimate Reality*, Singapore: World Scientific.
- [9] Hameroff, S. & Powell, J. (2008) The Conscious Connection: A Psycho-physical Bridge between Brain and Pan-experiential Quantum Geometry in D. Skrbina, (ed.), *Mind That Abides: Panpsychism in the New Millennium*, New York: Benjamins.
- [10] Amoroso, R.L. (2013) "Shut the front door!": Obviating the challenge of large-scale extra dimensions and psychophysical bridging, in R.L. Amoroso, L.H. Kauffman, & P. Rolands, P. (eds.) *The Physics of Reality: Space, Time,*

Matter, Cosmos, Hackensack: World Scientific.

- [11] Rowlands, P. (2007) *Zero to Infinity: The Foundations of Physics*, Singapore: World Scientific.
- [12] T. Toffoli, M. Biafore & J. Leao (eds.) *Physcomp96*, Cambridge: New England Complex Systems Institute; <http://arxiv.org/abs/quant-ph/9701027>
- [13] Nagel, T. (1974) What's it like to be a bat?, *Philos Rev.*, 83, pp. 435-450.
- [14] Holland, P. R. (1995) *The quantum theory of motion: An account of the de Broglie-Bohm causal interpretation of quantum mechanics*, Cambridge: Cambridge university press.
- [15] Cramer, J. (1986) The Transactional Interpretation of Quantum Mechanics, *Rev. Mod. Phys* 58, 647-687.
- [16] Eccles, J.C. (1992) Evolution of consciousness, *Proc. Natl. Acad. Sci. USA* Vol. 89, pp. 7320-7324.
- [17] Feynman, R.P. (1986) Quantum mechanical computers, *Found. Phys.* 6, pp. 507-531.
- [18] Amoroso, R. L. (2017) *Universal Quantum Computing - Supervening Decoherence – Surmounting Uncertainty*, London: World Scientific.
- [19] Havel, T.F. & Doran, C.J.L. (2004) A Bloch-sphere-type model for two qubits in the geometric algebra of a 6-D Euclidean vector space, arXiv:quant-ph/0403136v1.

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