



Scientists Determine Science. Can Science Lead to Its Source?

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Abstract

This paper shows the way how science can reach its Source from the standpoint of quantum physics, cortical brain-consciousness, and zero-point energy. The destination is the ground consciousness, consciousness-as-such, the *Essence* of the Multiversity. The milestones of the journey, and the process have been described. Three phase-transitions have been highlighted. Should the investigator be able to come back following completion of the journey, and speak the experience in a common universal language, we get the much-desired narrative for developing a science for the Source. The resonance between the inside and the outside of the investigator at the informational level, at the level of the self-life, and immersion of inside-consciousness into the ground consciousness leads to several revelations and discoveries, valuable for humanity.

Keywords: Ground consciousness; *Essence* of the multiversity; Cognitive orchestra; Information-States; Spider and Caterpillar model of consciousness

Introduction

Science investigates nature. Nature of consciousness is pursued and investigated by spiritualists. Mystics dwell in, and investigate consciousness. In this sense, spiritualism is the pursuit of a science for consciousness, and mysticism is for developing a science of consciousness. The philosophy of science for/of consciousness speaks in multiple versions. Science speaks in one common universal language, maybe in mathematical language, maybe as a theory. Spirituality has its own logic like science of nature. Can two kinds of logic meet? Top-down, can any spiritual input extend the scope of science where it has got stuck! Can spirituality extend science beyond ZPE, Quantum Void and Quantum Field Theory, mechanism of Life etc., etc.? Can spirituality bring clarity to our understanding of psychology, and the operators and operations therein? Can spiritual experience take us beyond brain-bound consciousness towards consciousness-as-such? Can spirituality open up new frontiers for research on what is life? If yes, we must go ahead with our attempt, irrespective of whether it is dualism, dualistic nondualism, or non-dualism or any of its variants. Bottom-up, which aspect of physical, cosmological and biological science offers us spiritual feeling and experience, leads us towards the source, helps us to refine ourselves as a cognitive being? How crucial is the role of science of information and different information-states in this pursuit?

For almost last fifty years the world has been observing six large and significant movements to understand consciousness and its nature; Scientific and Medical Network of UK, and lately Galileo Commission, Towards the Science of Consciousness (TSC) from Arizona, USA, Science and Nonduality (SAND) movement, Forum for Scientific Basis of Consciousness (SBoC), Bhaktivedanta Institute (BI) sponsored movement, and the science and scientists forum, in addition to several not-so-large National and International forms of such a movement. The last two of the six large movements are derived from the scientific wings of ISKCON (International Society of Krishna Consciousness) movement, the oldest of all six, with emphasis on both consciousness and life. Every form of movement has its origin, leadership, past, present and future. This paper is not meant for discussing those activities. This paper is an adventurous narrative of every scientist's dream pathway, although not chartered clearly yet, from the standpoint of the highest peak of Quantum Physics, Neuroscience, and Classical Physics, respectively from the Quantum Void to the Ground Consciousness, from Cortical Consciousness to Consciousness-as-such, from the Zero-point Energy (ZPE) to The *Essence* of the Multiversity.

The exploration is done by a biological being with an outside (objective, observable, measurable) and an inside (subjective, non-observable, understandable) involved in experience. We often forget that between material-reality and consciousness-reality there is a cognitive reality. In relation to

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bottom-up hierarchy of the material/sensory reality, cognitive reality and consciousness-reality, the biological reality represents the holograph of all three other realities with constitution of materials, cognitive ability and consciousness. Three pathways begin at apparently three different points of three different disciplines of science and seem to end at differently labelled destinations. Taking into consideration the ability of doing approximation by the human intelligence, an evolved biological reality at a desirable level, the goal of three journeys seems identical, it is to catch up with the leading front and the foundational operation of ground consciousness, the source of all causality, which is characterized by its ability to make a free “will”, or free “won’t”. All three paths are to extend the scope of science pushing its present envelope to the remotest possible horizon. The question, however, remains, whether one is right about one’s starting point, and the celebrated end point as compared to the well-described spiritual journey by the saints and the sages, and the mystical journey by the Seers irrespective of their religious cult? The author assumes that the answer is a resounding ‘yes’, subject to correction for any contingent modification.

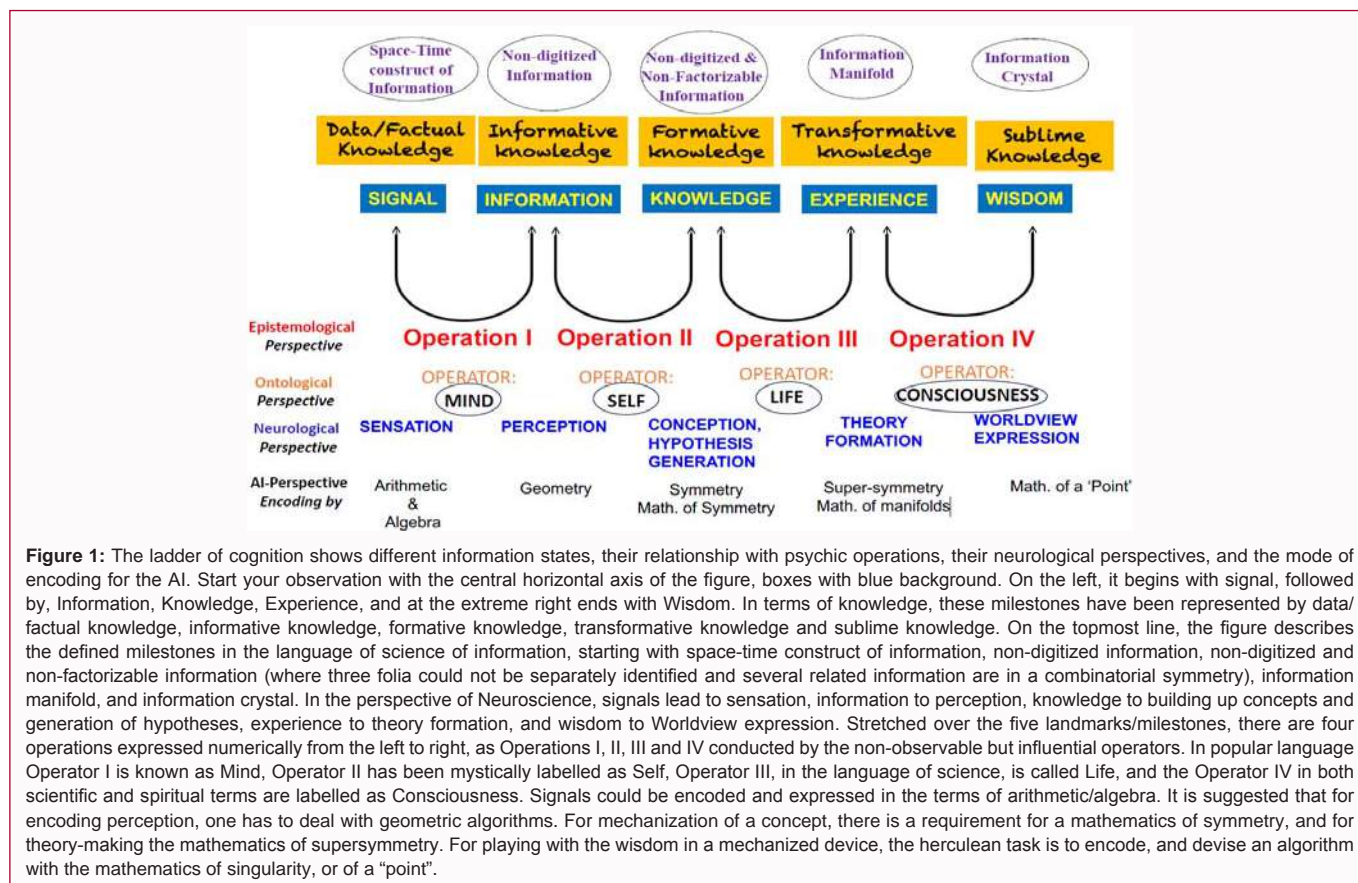
The journey of science towards its source makes a deep science. At this stage it is possible to approximate the beginning, final destination, and the important milestones in between. What is called transcendence in the language of spiritual journey, might be described as phase-transition in science, and inside-out and outside-in experience in behavioral science. The first inside-out and outside-in experience of the system involves different information states, the second one also includes self and life, and the third one is actually the immersion of all recognizable entities in the system-bound consciousness into the Source, followed by probable re-emergence! By reverting back from the source to this world, it is possible by the

system to express this great experience in the system’s behavior. For the reader’s readymade referential guide, the author suggests to keep the *Ladder of Cognition* (Figure 1) in hand.

The first narrative of the journey is from the viewpoint of quantum physics. The second narrative is from neuroscience’s perspective. The last narrative is a psycho-physical narrative addressing the question, whether the universe is physical or mental beyond/across ZPE? Let us take up one by one.

From the Quantum Void to the Ground Consciousness

Quantum physicists are the first group of scientists to recognize the effect of an observer’s consciousness in observation. Since that time, beginning with Max Planck, Niels Bohr, Schrodinger and Heisenberg to most of today’s quantum physicists have recognized the role of consciousness in quantum physics. That there is some ‘vacuum space’ beyond these quantum activities could be guessed from the phenomenon of quantum discontinuity and quantum void, what respectively has been described as the ‘sink’ and the ‘fountainhead’ of all quantum activities. Therefore, quantum physics seems pathless when it reaches its fountainhead of all its activities i.e., quantum void! Is quantum void the end of the world, or is there more to travel and learn? In the context of *Quo Vadis Quantum Mechanics*, physicist Henry P. Stapp argues, “Quantum theory will go where it is most needed, which is into the effort to understand ourselves and in particular the connection of our minds to our bodies” [1]. In the context of *Unde Venis Quantum Mechanics*, Gerard ‘t Hooft’s work suggests that the underlying structure of quantum mechanics can be formulated with the help of a cellular automaton [2]. The author admits that there is more to travel for the final intellectually



comprehensible destination.

When we penetrate through this quantum void we experience at some point of time that the void stops emitting energy or any other thing on quantum basis, and remains silent and still as void only. The word 'quantum' (the tail) automatically gets deleted as an adjective of the void, meaning we step in the ground of consciousness (not to be confused with the Ground Consciousness). The ground of consciousness (in Sanskrit, Brahama-bhumi) begins posterior to quantum void. Sri Ramakrishna Paramahansa's exemplary analogy: The tadpole of water loses its tail in the course of metamorphosis into a frog of the land. This analogy he chose to describe the state of Sri Keshav Chandra Sen, the then President of Brahman Society of Calcutta when Sri Ramakrishna saw him for the first time. According to him, Keshav Sen was ready to step in the ground of consciousness. Many quantum physicists due to their innate habits, however, formulate here another field theory, called quantum field theory and faces the problem of infinity. However, following this first transcendence (science may use the word, phase transition) accompanied by outside-in and inside-out experience, the phenomenon of the quantum field appears as the messenger of Infinity!

The science for consciousness begins on its own ground, posterior to quantum void. Because of our fondness of the word 'quantum', we might describe this nest as the sub-quantum/pre-quantum nest of nature, or nest III of nature while the nest I is the nest of classical physics, and the nest II represents the nest where we do quantum physics. In the nest III, we observe information as the operational currency. We also observe structures of information and its different states, the seat(s) of memory, intelligence, and emotion.

We carry on At a point of critical instability, we undergo another outside-in and inside-out phenomenon! We are back to our self and life, however in a very finer, unconditional form! This is the sub-subquantum/pre-prequantum nest, the nest IV of nature. No force, field or energy, or even information is discernible as operational currency in this nest. Only currency is an intention (sent from somewhat deeper in the nest) which devises its own ethics (by self) and aesthetics (by life) to create and hand over an instruction sheet of information to nest III, where the operation of mind conceives it and delivers through the quantum void a quantum signal in nest II or through ZPE a classical signal (energy in unit of space per unit of time) in nest I! The described ground of consciousness covers pre-quantum and pre-prequantum nests of nature.

Carrying onwards deeper, finally one reaches a Ground that has no background. Everything, happening, and every event is on the foreground of this Ground. This is the Ground consciousness (nest V). No outside-in and inside-out phenomena happen at the portal of ground consciousness. However, there is immersion and merger of the self and the life as operator, along with the operations under their control, in this ground consciousness.

Operational currency of the foundational ground consciousness is free "Will", on the basis of which the letter of intent is created. The causal matrix is generated from consciousness's power of "will" or "won't"!

While in the nest I and II, the causality of events are explained on the basis of classical laws of Newtonian physics (and its extension as the Theory of Relativity), and Quantum physics respectively, in the nest III one could observe the phenomenon of retro-causality, feed forward loop in the biological control systems. In the nest IV, one

smells the source of causality while the nest V is apparently seen to be acausal in the worldly sense, and the Source of all causality in the perspective of consciousness!

From the Cortical Consciousness to Consciousness-as-such

PD McLean described human brain as a Triune brain [3], a nested combination of a reptilian brain, mammalian (limbic) brain, and human (cortical) brain responsible respectively for brainstem consciousness, limbic consciousness and cortical consciousness. From the behavioral point of horizon, brainstem consciousness keeps us alert, awake and oriented. Limbic system consciousness handles our pleasures, avoiding the unpleasant. Cortical consciousness bestows us with thinking ability, brings unification of lower and other consciousness, flashes out a consciousness of 'self' (self-consciousness), and bestows us with a holistic decision-making ability. What could be the next step in the brain-consciousness evolution, which is recognized predominantly as a cognitive evolution! On the New year day of 1985, the author published this new direction as Supracortical Consciousness [4] which got more consolidated in his 1987 book, *The Dynamic web of Supracortical Consciousness* [5]. One is in the virgin landscape of inexhaustibility of non-physical love. Historical examples of such biological nonphysical love is Plato's love for his student's elder sister, Job Charnock's (the English Founder of Calcutta City) love for a Bengali woman, and is also found in the description of British poet Thomas Hardy, American novelist and poet, Sylvia Plath, Indian poet Tagore and in numerous utterance of Sufi saints!

A person who is familiar with the inside of the system brain, having experienced this first inside-out and outside-in phenomenon in the perspective of neuroscience, and looking at the brain from outside, stands on a vantage point to describe the purpose and operation of the nervous system. The idea of supracortical consciousness opens up several worm holes, and the portal of white hole, leaving behind all prevalent views on neurocentric consciousness. The idea thus opens multiple new portals for post-materialistic science [6], and ushers the dawn of Immersive Neuroscience.

Standing on the brain, the author creates a worldview that the purpose of evolution of the brain as an organ in biological systems is to unify consciousness within and consciousness outside the system. The brain is neither the source of consciousness nor a user of consciousness. It is consciousness which uses the brain for its manifestations. An event horizon thus exists at the circum-cerebral boundary of the brain for high level cognition and its behavioral expression. To fulfil this purpose, (i) the brain has been made a "home", and probably the best home in a biological form, and the workplace for the members of the cognitive orchestra (Systems psyche) from the cognitive reality in nature. This is an example of nature's effort to make the non-observable, nonlocal, and global players of the cognitive reality to act locally and focally! (ii) As a cognitive system, the brain acts as a "sensor", rather a holistic sensor, for different information states. This is an example of the effort of a biological organ for naturalization of the Transcendental. Sudden flashes of thoughts, ideas, intuition, revelation are evidence of such activities. (iii) Finally, observably the brain operates as an organ for different behavioral expressions including its linguistics.

Such experience gathers or generates faith in the existence of inside and outside world. The active pole of growing faith condenses

as Devotion. Following concentration and ripening, devotion gets crystallized into Love. In reverse, the melting love from supracortical consciousness is manifested as devotion. The foundational strength of devotion is faith. Faith, devotion, and love, or love, devotion, and faith are always intermixed with each other and one pushes and is pulled towards the other.

As the experience of supracortical consciousness gets stabilized in the person, the person evolves cognitively along with massive organizational and transformational processes within the brain. Neuroscience will surely get enriched investigating such cases, when such personalities appear in a considerable number for statistical evaluation.

Three milestones of the cognitive evolution following such an experience, namely supracortical being, supracortical Godhead, and supracortical autonomy, exemplify *Transcendentalization of human nature*, and have been described in detail in author's earlier papers [6,7]. All three levels of the beings are creative, exhibit inexhaustibility in their activities, and exude love, devotion, and faith in their expressed behavior. According to the Indian traditional spiritual system the parallel designation of these three levels is Brahmachari, Swami, and Paramahansa. According to Ken Wilber's hierarchy, they could be designated respectively as Saint, Sage and Siddha! Simply they are Assistant Professor, Associate Professor, and Professor of the Science of Divinity.

The purpose of doing yoga and meditation is not to gain control over our autonomic nervous system (e.g., gaining the abilities of controlling heart rate or respiration or blood pressure), but to make our cortical system autonomous! Autonomy is bestowed on a system when it has achieved the desirable degree of perfection. Integrity of the brain is one of such qualities to assess such perfection.

Supracortical being has achieved classical and quantum integration of his brain. On the pathway of supracortical Godhead the brain achieves phenomenological integration. Supracortically autonomous brain has achieved perfectness in information management and decision execution, remaining ever-conductive to Mother Nature. He is the First-Person-Universal swimming comfortably in the Inter-universal *Essence*. Embodiment of this *Essence*, cherishes plurality without compromising individuality, encourages individuality without jeopardizing plurality! He leads with his Head, Heart and Gut (all three act as sensor of different information states in the environment).

Ideas and Evidence in favor of Supracortical Consciousness

There are ideas and evidence in favor of Supracortical Consciousness

Ideas

There is no evidence that consciousness is generated from the brain! However, this kind of top-down idea was with Aristotle saying, "Mind is attached to the brain", also found in ideas like, the radio reception theory of consciousness of Henri Bergson, brain as a biological reducing valve of Aldous Huxley, television analogy of brain function by George Wald and transmission theory of brain function by William James. According to Indian sacred scriptures such as Bhagavad Gita (chapter/shloka: 15/1) and Upanishad, the human body is like an inverted *Peepal tree* with its roots up, open to eternity and with branches down as biological body systems!

Evidence

1. Soft evidence from culture: Customary act of blessings on the top of the head prevalent across the culture, shaving of head for divine aspirants to achieve nearness to God and the belief-system (shaving the head and writing 'om' it).

2. Mystical experience: Pressure on the head, wide temperature variation on the top of the head, and the ceremonial spiritual event of *Shaktipat* from Guru on the disciple's head.

3. Neurophenomenological experience: Near Death Experience, Autopsy, Out-of-Body Experience, and Experience of flying in dream suggest consciousness is not bound to the brain but could freely move in and out of the brain.

4. Alan Aspect's experiment on nonlocality [8], reinforcement of this experiment by Nicolas Gisin [9], EPR Paradox described in brain's behavior [10] and the latest experiment on nonlocality in 2002 [11] could throw light of inter-netting of brains connecting various information states in deeper prequantum nests.

5. Electrophysiological phenomenon prior to "readiness potential" of cerebral cortex (Benjamin Libet) [12,13].

6. Calibrated magnetic stimulation of the cerebral cortex could lead to perceptual experience.

7. Instead of general anesthesia, surgical procedures could be performed by controlled hypnosis. In Liège, surgeons routinely operate on patients under hypnosis [14].

8. PET images have shown (Figure 2) that the changes in the head of the caudate nucleus in Obsessive Compulsive Disorder (OCD), could be reversed by psychotherapy, as well as with medication therapy.

9. Brain bridging, brain-brain interaction [15] has been demonstrated, that indicates supracortical communication across the brains. Evidence is emerging from Inter-netting of several brains [16,17], although limited presently to signal communication between brains [18]. The experiment proves that a cohort of several brains could be smarter in efficiency than a single brain. The question arises which one is better, to become smarter or to become aware? The answer might be to become smart for greater awareness!

10. It is said that the words are caged birds while the thoughts are birds from space, hyperspace and the spaceless Vast. The BCI (Brain-Computer Interface) is moving towards evidence for this. The latest version is the Neuralink (Elon Musk's tweet on 29th of January, 2024). Although under the cloud of non-transparency, absence of relevant scientific publication in any journal, and non-registration of the clinical trial [19] with the authority (ClinicalTrials.gov), it appears that the wireless Neuralink chips (containing 64 flexible polymer threads providing 1024 sites for recording) implanted within the brain (much more than sitting on the surface of the brain), connected to several single neurons. The device approved by FDA is dissociating ideas and thoughts-space from the behavioral execution by the brain's neuron and is close to Aristotle's Idea that Mind is attached to the brain.

From the Zero-Point Energy (ZPE) to the Essence of the Multiversity

Albert Einstein stopped extending classical physics following his encounter with ZPE. He labelled it as a cosmological constant. There is a major discrepancy between the theorized and observed values of

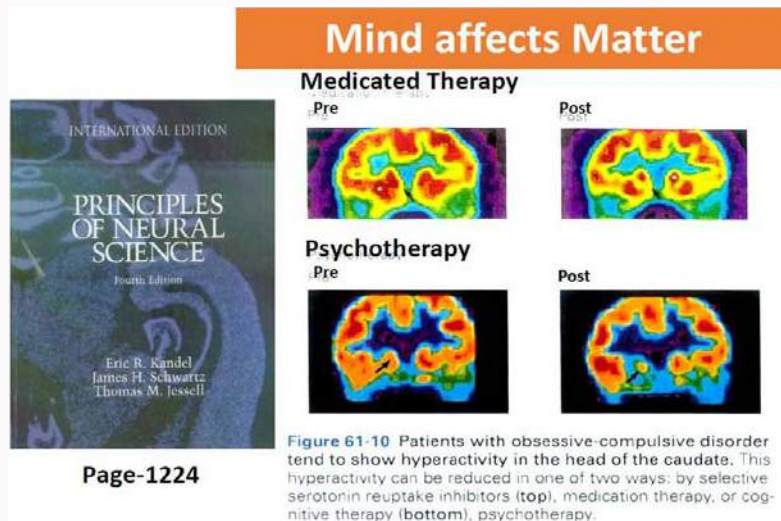


Figure 2: The figure is self-explanatory. The author acknowledges the older edition of the book, The Principles of Neural Science, for this figure. In the current edition, this figure is not available.

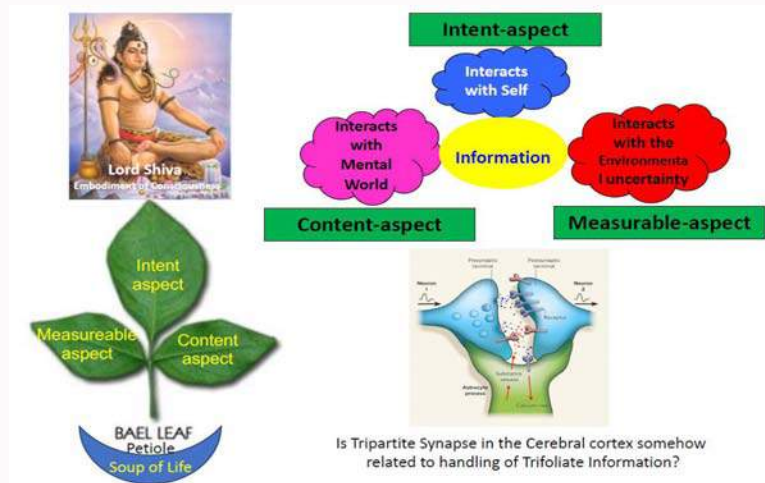


Figure 3: Non-digitized information has the structure of a Trifoliate leaf with a folium of intent (that interacts with self), a folium of content (that interacts with mind), and a folium that reduces uncertainty in the environment. When similarly meaning several information make a stable symmetry, then the individual folium are not identifiable. This is non-digitized and non-factorizable information, which constitutes the knowledge. Below right is the picture of a Tripartite Synapse in the cerebral cortex (taken from non-copy-righted Google Image). Its relation with trifoliate information requires more investigations.

ZPE; the value is non-zero but not greater than 10^{-120} Ap. One Ap is equal to one Planck’s mass per cubic Planck’s length. In theoretical physics, it is said to be the most serious fine-tuning problem because of its inexplicable smallness as found by experiments [20]. This energy signifies a role in preventing the collapse of the universe or preventing inflation from being eternal. This fact suggests its relationship with dark matter and the dark energy of the universe. The other relevance of this value is that only a small fraction of the stable vacuum is hospitable to “life”, which signifies a possible communication between systems cosmology and systems biology. Harold E. Puthoff and his co-authors have suggested a link of ZPE with quantum fluctuations of all matter fields (i.e. of leptons and quarks) and force fields (i.e., of photons and gluons). According to them the property of inertia is a manifestation of resistance to the accelerating effect of ZPE. ZPE also opens up the possibility for efficient interstellar propulsion. Finally, ZPE could be an alternate source of energy [21].

Across ZPE, no observation depends on our senses. The brain acts as a holographic sensor, and experiences the universe, which

is simultaneously a physical as well as a mental construction. The matter, here, is dark matter, construction is mostly mathematical, and abstract.

The moment one experiences and understands this, that is the *First Transcendence* (in the language of science may be called the first phase transition) from the mundane materialism. It might also be called the first outside-in and inside-out phenomenon. The result of this new resonance of the physical and mental is the discovery of a Science of Information and its different states [22]! Accompanied with it there is revelation of what Mind and its operation is.

Information appears as a trifoliate leaf (Bael leaf, most favorite of Lord Shiva, the embodiment of consciousness), with a folium of intent, a folium of content and a folium which reduces uncertainty (therefore, measurable) in the environment (Figure 3).

The experience of the contact of the physical and mental at a deeper level leads to Transcendence II, leading to the second outside-in and inside-out phenomenon. The result of such a second new

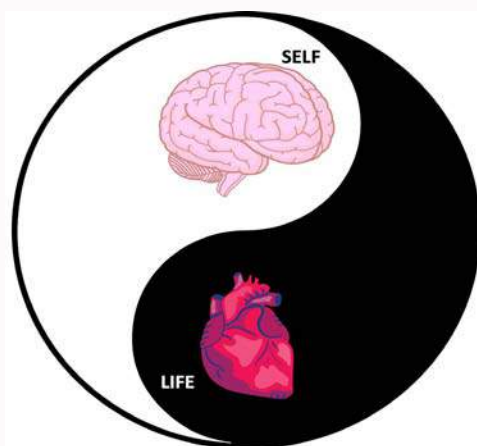


Figure 4: Relationship between Yang and Yin, the Self and the Life, the Brain and the Heart. The members in each of the three pairs maintain a tangled hierarchy, and each one reports directly to consciousness (Chi). The relationship between the Ground consciousness and the Operative consciousness (Mother Nature) is more fine with the fading of distinctive boundaries, as if between a coiled hibernating snake and its just awakened state starting movement.

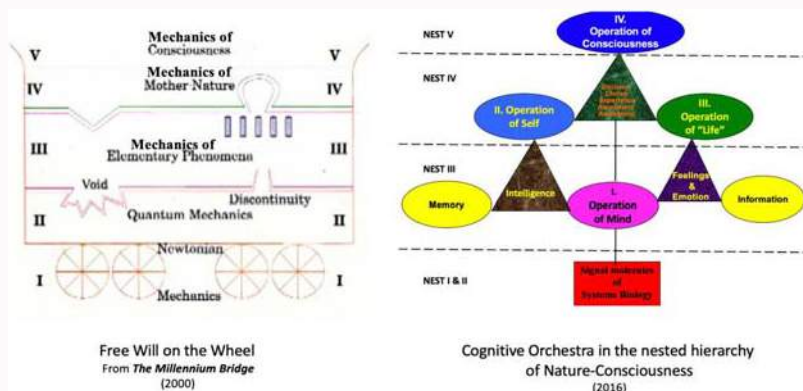


Figure 5: The Pentaune Model of Nature-Consciousness. How Free Will of Consciousness comes on the Newtonian wheel has been shown on the left side (from the author's book, *The Millennium Bridge*, 2000). The picture on the right side (from the author's paper, *System Psyche*, 2016) shows the members of the cognitive orchestra in the nested hierarchy of nature-consciousness.

resonance of the physical and mental is the discovery of a Science of the Self and a Science of Life. Self is the CEO of consciousness within the system. Self is the sentient entity which evokes the sense of 'I', me and mine. Self is the decision-maker of the system. Self is to which mind reports. Life, on the other hand, operates as a homeostatic manager, by generating information from an uncertainty between self (consciousness) and life (following the principle of *similia similibus* of *Samuel Hahnemann*). Information's sustenance is found to be in life [23]! Self and Life appear to maintain a tangled hierarchy! Both of them report to Consciousness (Figure 4).

We get to understand, at least in approximation, the symbol of Yang and Yin from China, or the God and His consort, as Shiva and Parvati in Advaita Shaivism, or Krishna and Radha of Vaishnava Bhakti-cult from India (surely not the Bard/Gemini and the Bing of Google's AI!!). For the consciousness researchers, this nest is the site of entrainment of network-based consciousness seated within our brain (dominated by self) and syncytium-based consciousness seated within the heart (dominated by life) [24]! Interestingly, both brain and heart (and also our gut) act as sensor of different information states compelling the leader to pursue three-derm leadership, to lead with the brain (ectoderm), lead with the heart (mesoderm) and lead with the guts (endoderm).

Still deeper experience of the contact of the deep physical and deep mental happens during the third phase transition, Transcendence III, leading not to a third resonance of the physical and mental, but to an Absolute Silence, Stillness, Emptiness and Nothingness resulting from immersion, plunging of the self and the life into a kind of consciousness, where there is no such individualized entity such as mind, self, and life! Such a kind of consciousness has been described as *Nirguna* (consciousness unqualifiable), formless, contentless, consciousness-as-such, consciousness unspeakable! The portal from the nest IV to nest V is the portal for the ultimate dimension. The nested hierarchy of nature-consciousness spectrum is shown in the Figure 5.

Coming back, emerging out towards the surface, with an inside becoming out, the mental construction begins. The investigator starts speaking, expressing it had been an unqualifiable experience etc. etc.! A very thin layer of mind declares, "it had been the last transcendence, the transcendence of the boundary of our universe!" Oh! There is not one single universe we live in. There are several universe(s)! The word universe does not have any plural because of the assumption in science, and so in the Worldview, that there is only one universe. The constellation of multiple universe(s) may be called in the English language, multiverse! The system of multiple universe(s) could be called, The Multiversity, the largest

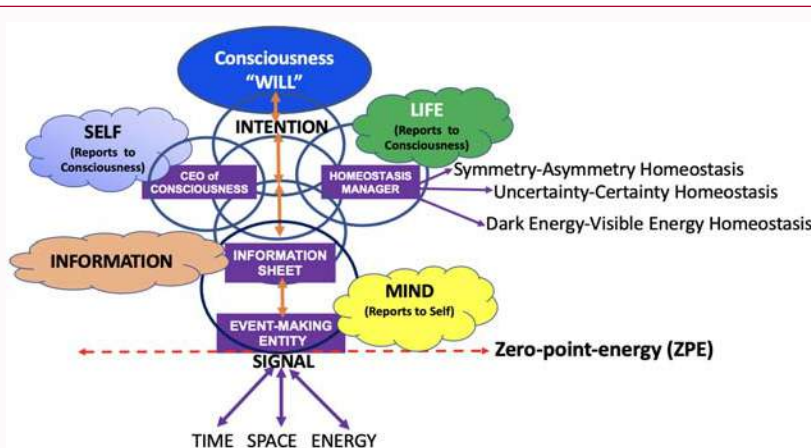


Figure 6: Consciousness, Self, Life, Mind and Information constitute the cognitive orchestra. In objective psychology, consciousness is the will-making entity, Self is the CEO of the system operating on behalf of consciousness, Life is the homeostasis manager and Mind is the event-making entity. At ZPE, the mind conceives information and delivers space, time and energy in the form of observable signals.

Table 1: Approximation Table of Phase Transition, Uncertainties, their Correction and Execution of Correction.

Phase Transition	Observed Uncertainty	Corrected by	Executed by
I	Between two Canonical opposite properties, e.g., velocity and position of an entity, say quantum particle	Non-digitised Information	Mind
II	Between properties of the entity and its Existence	Non-digitised and Non-Factorizable Information	Self
III	Between Existence and Non-existence of the entity	Information Manifold	Life
IV Coming back, getting reborn in the same body	Between Non-existence and a New existence of the entity!	Information Crystal (Wisdom)	Consciousness

Table 2: Phase Transitions and their distinctive properties in terms of process, discovery and revelation, cosmological approximation, and related cognitive evolution.

	Phase Transition from Nest II to III	Phase Transition from Nest III to IV	Phase Transition from Nest IV to V
Transition Process	1 st Transcendence. 1 st outside-in, and inside-out phenomenon	2 nd Transcendence. 2 nd outside-in, and inside-out phenomenon	3 rd Transcendence. Immersion, Merger
Revelation & Discovery	Science of Information. Science of Mind	Science of Self & Science of Life	Science of the Source
Cosmological Approximation	Peri-planetary space to Interstellar space	Interstellar space to Intergalactic space	Intergalactic to the Inter-universal space
Cognitive evolution of the Being. (This includes several back-and-forth movements before stabilisation)	Ordinary being to Sainthood. Cortical Being to Supracortical being	Sainthood to Sagehood. Supracortical Being to Supracortical Godhead	Sagehood to Siddha state. Supracortical Godhead to Supracortical Autonomy

intellectually comprehensible system! This multiverse is not the extension of the boundary of the existing universe as Megaverse, not hyperdimensional/multidimensional interconnected bubbles as in a metaverse, not a display of the superposed universe where the cat will be simultaneously dead in the one, and alive inside the other because two different universes follow two different laws. We are in the multiverse Type IV of Max Tegmark [25], the design of which has room for an infinite number of nested Hubble spheres, sourced from the one and only one substance, and governed by identical laws, maybe with contingent modification. Such multiple universe(s) form a system, called The Multiversity. There exists an *Essence* which these multiple universes originate from. The Source from which the multiverse originates could be called The *Essence* of the Multiversity. This consciousness is absolutely non-violent.

The cyclicity of the universe begins and ends here! The cyclicity of all “life”, as life-form, or as formless subtly operating entity also begins, and ends here. In the context of neuroscience, the point of the beginning and the end of immersive neuroscience is this, *Essence*.

Above is the narrated road map of a complex issue of science, humanity and spirit in a linear, hierarchical way. Such a mental

construction is always an approximation. The First phase transition or transcendence is from the quantum nest of nature to pre-quantum nest, the Second transcendence is into the pre-prequantum nest of nature, and the third transcendence is into the ground consciousness. Cosmologically [26], one is transcending through three voids; interstellar void, intergalactic void, and inter-universal void, respectively overcoming three grades of uncertainty described by Stephen Hawking in his Brief History of Time (quantum uncertainty of Heisenberg, a much deeper uncertainty, and finally, the uncertainty at the border of the universe) [27]! The nested hierarchy of nature-consciousness has been described in the Millennium Bridge [28]. See Table 1 below phase transitions, corresponding uncertainties, their correction and the executives involved. Table 2 shows phase transitions and their distinctive properties in terms of process, discovery and revelation, cosmological approximation and relation with cognitive evolution.

More on the Cognitive Orchestra

The members of the cognitive orchestra are non-observable, nonlocal. They constitute the cognitive reality in the nature-consciousness spectrum. They are identified by their specific

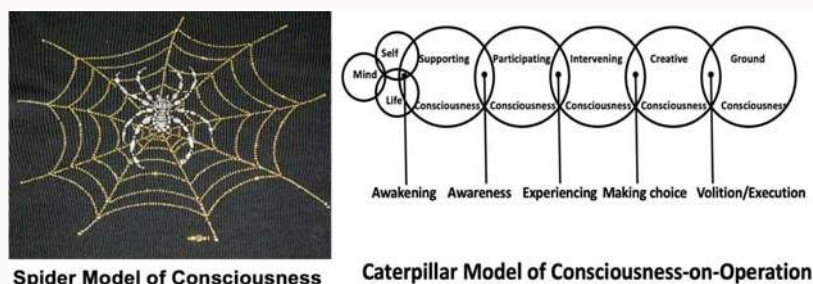


Figure 7: Two Models of Consciousness. In the Spider Model, Consciousness is compared with a spider which weaves the net but itself is outside the snare of the net. In the Caterpillar Model, Consciousness advances like a caterpillar supporting, participating, intervening, making a choice for, and executing volition for the cognitive orchestra. The effect is observable by the senses as an event/signal. Traced from the front to the behind there is awakening, awareness, having experience, making choices, and execution of the “will”/ “won’t”. The will-maker, Ground Consciousness, is free but the “will” once made gets bound in the causality chain.

operation, by what they do. The biological properties of the organ brain have evolved to host such operators and their operations from nature into the brain allowing them to use the brain as their playground. This appears to be neuroscience’s last frontier, how the brain makes nonlocal global operators to act locally and focally.

The cognitive orchestra (Figure 6) is also known as the Systems Psyche [29-32]. Five members of the orchestra are identified as consciousness, self, life, mind and information.

Consciousness is responsible for quality management of information (one might apply Six Sigma and Lean Principle to assess management efficacy) within the system, and maintenance of overall *cognitive hygiene*. Consciousness is the sole member having the power to make a “will” or “won’t”. Of the five members, two of them, namely the self and information, have masculine properties. The other two, namely the mind and the life, have feminine properties. The feminine mind, the event-making entity, plays with masculine information in the nest III. The mind conceives information and delivers three children namely space time and energy. The self, the decision-making masculine entity of the system, operates with life, the feminine homeostatic (and funding) manager in the nest IV and together maintain the ethics and aesthetics of the system. Consciousness is gender-neutral and balances or neutralizes over-masculinity and over-femininity in the management system. Consciousness is expressed as a Spider Model where consciousness, like a spider, weaves the net, manages the net, but itself is outside the snare of the net. Consciousness, although, remains neutral and equal to all other four operators, it supports and upholds their activities, also participates in their fair game, and intervenes only, when necessary, has a creative R & D activity, and takes the final decision or, makes a ‘will’. This could be depicted by an advancing Caterpillar model of operative consciousness (Figure 7).

More on the Pentaune Model of Nature-Consciousness

1. Three great theories of physics, their respective problems, and the reasons.

All nests of Nature have their own importance. Taking cues from physics, we have stated that the Nest I is governed by the Theory of Relativity, nest II is Governed by Quantum Theory, and Nest III by quantum field theory (the role of information and its different states is yet to be accepted by mainstream science). Each of the three great theories of physics has one specific problem. The Theory of Relativity has the problem of singularity! Why? It tries to connect the nest I

directly to nest V ignoring the nests in between. Quantum Theory has the problem of measurement. It arises when one tries to connect nest II directly with nest V bypassing the nests in between. Quantum Field Theory has the problem of Infinity arising out of effort to connect nest III with nest V directly, overlooking the existence of nest IV.

2. Which of the five nests is of least importance while doing the science for consciousness?

Although quantum physicists first brought scientist’s attention to the role of consciousness in science, the quantum nest or the nest II of nature is of least importance for doing science of consciousness. Both during ascent or descent in the journey one can bypass nest II, because one gets communication between nest I and nest III through ZPE. Through ZPE, four disciplines of science communicate; systems physics, systems psychology, systems biology and systems cosmology [33].

3. Dropping of Tail from the body. What does it mean?

The analogy of dropping ‘quantum’ as the tail to step in the ground of consciousness requires more understanding. Four legged mammals of the land have tails! Even some birds have tails! However, all great Apes, bonobos, chimpanzees, gorillas and orangutans including humans, have no tail. There are two situations: The tail does not grow at all is one phenomenon, and the tail is there, which grows and drops during metamorphosis makes another situation. What is the relation between dropping of the tail from the body, or no tail from the beginning with the biological evolution of the brain, especially in the cognitive context, could be investigated in the neuroscience and anthropological research frontiers. We are yet to formulate the research question and research hypothesis! There is recently a paper on the genetics of tail loss in Apes [34].

4. In the context of subquantum nest of nature the author wishes to refer to Adrian Klein who has published his work on a new subquantum [35] integration (our nature nest III), explains deeper of a sentient reality (our nest IV) in a book titled, *Interpenetrating Realms I* [36]. Also, worth to recommend are the results of experimental bench work of William Tiller [37,38] of the Stanford University on intentionality originated from consciousness (our nest IV and V respectively).

The Reflection of the Pentaune Model of Nature-Consciousness in this Material World

The reflection of this Pentaune Model of Nature-Consciousness

Table 3: The reflection of the Pentaune Model of Nature consciousness is already there in the description of causality chain, sociocultural belief-system, in the chain of Governing command, News reporting system by the media and the press and in the criminal justice system.

Nest	Causality Chain	Socio-Cultural Belief Systems	The Chain of Governing Command	News Reporting System in the media and the Press	Criminal Justice System in the Court of Law
V	The Source of Causality	Will	Will	Truth	Conscience of the Nation systems
IV	Approaching the Source of Causality	Purpose	Letter of Intent	Ethics & Aesthetics	Ethics & Aesthetics, supporting the laws and the rules
III	Retro-causality	Phenomenology	Instruction Sheet	Interpretation & Meaning of the Events	Value-based interpretation of laws and rules
II	Laws of Quantum Physics	Micro events	Executive Signal	Microscopic Event	Judicial Rules & Laws
I	Laws of Classical Physics	Macro events	Carry on Signal	Macroscopic Event	

is already observable by our senses in the description of the causality chain, in political Governance, in the news reporting system of the media and the press, and in the criminal justice system in the court of laws, as shown in the Table 3.

More on the Dual aspect of the Experiential description of the Universe

All observations in science are psycho-physical. The Mind remains always the event-making agency.

At the classical level, the mind uses the signals brought to it through sensory routes. At the quantum level, the operators of the cognitive orchestra participate in converting quantum probabilities into sensory actuality of relevance. When the self (CEO of consciousness within the system) of the observer participates in the process of observation, the resultant description is of collapse of wave function. When the mind of the observer participates in observation, the resultant description is *decoherence*. When the observer participates in observation deeply involving his 'life', the scientists describe the result as an example of a symmetry-breaking process.

The description of the observation of the past-ZPE universe is simultaneously mental and physical. The duo are in eye-contact, and become identical or One through an inside-out or an outside-in process leading to either a discovery or to a revelation. Both the event of discovery and revelation result from an observation, although psycho-physical to start with, which has been happening at a non-sensory level of the brain, connecting locality and nonlocality. It can be proven that in every happening of experience the inside and outside of the brain communicate in terms of different information states. Existential experience involves self-life in such inside-out and outside-in communication.

When the outside becomes in, the result is a revelation! Wow! Wow! This revelation inside, changes the personality of the Being. A cortical being becomes a Supracortical being! A supracortical being attains Supracortical Godhead! Finally, the supracortical Godhead achieves Autonomy, as Supracortical Autonomy!

When the inside becomes out, there is a discovery! Again, a Wow, but of a different kind. Discovery brings out new worldly events. There are several examples: August Kekule's discovery of Benzene ring structure looking at six snakes arranging themselves in a particular fashion, Sir Crick and Watson's discovery of DNA structure looking at a spiral stair while enjoying a circus! The possible structure of information, proposed by the author, also came while the author was struggling mentally with what could be the structure of information as an omnipresent entity and was physically engaged in a prayer holding several trifoliate Bael leaves with their intact petioles in his folded hands. Similarly, when the author was struggling mentally about the relationship of Self and Life, the symbol of Yang

and Yin struck author's physical eyes and the senses! Perfect! Also, the Pentaune model of Nature-consciousness was constructed in 1997 following a deep professional crisis and a Spiritual Politics in life-experience at AIIMS, Delhi.

The Dual aspect has also been described in Sankhya Philosophy where Purusha (consciousness) and Prakriti (nature) are standing back-to-back without any eye-contact. Both are independently infinite! There is no creativity.

Kevaladvaita of Shankaracharya, the non-dual consciousness, denies the existence of duality in any form! This seems the best for personal ascent in spirituality! Nondualism is also relevant for science when one holds non-dual consciousness as the only constant and all other constants, man-made or natural (gods and demi-gods!) are flux in nature. *Achinta-Ved-Aved* of Sri Chaitanya uplifts the devotee through Self (Krishna) and Life (Radha) to pure Consciousness (Embodied by Sri Chaitanya Himself). They also have Five principles (Pancha Twata), probably signifying embodied five members of the cognitive orchestra. In the Dualism of Madhab Acharya, the God and the devotee begin as a duo, and interact physically through senses, mentally, and through self and life, and attain the final phase transition!

All roads lead to Rome! For a consciousness researcher all roads lead inside to consciousness-as-such, and outside, the *Essence* of the systems of Multiverse(s). It is not possible to comprehend intellectually beyond this at this phase of cognitive evolution of the brain. Apparently, we reach our ultimate intellectual cognitive limit (the ultimate cognitive closure theory of Colin McGinn), but astonishingly enter into a White Hole! Wow! Wow! Not a closure, but a sustainable new opening!

Science and Nonduality

It is not possible to reach the level of nonduality from the present state of science with the symbolic equation, $Aum = mc^2$. However, the equation attracts scientists in general and physicists in particular, and provokes them to walk through, and investigate non-dual consciousness. The science of consciousness, however, occupies the huge unnoticed space in this symbol between 'Aum' and the 'e' (Figure 8)!

This gap has been specifically addressed in the authors paper, *The Source and the Genesis: In the Language of Science* [39].

When one starts pushing the envelope of the present science, one finds the velocity of light is the ultimate constant in the nest I, which excludes simultaneity of events. Pushed in nest II, one finds another limit of Planck's constant, which excludes any possibility of continuity of events. Pushed obliquely but a bit deeper, one is guarded by an entropy barrier that excludes any possibility of identity of events. One

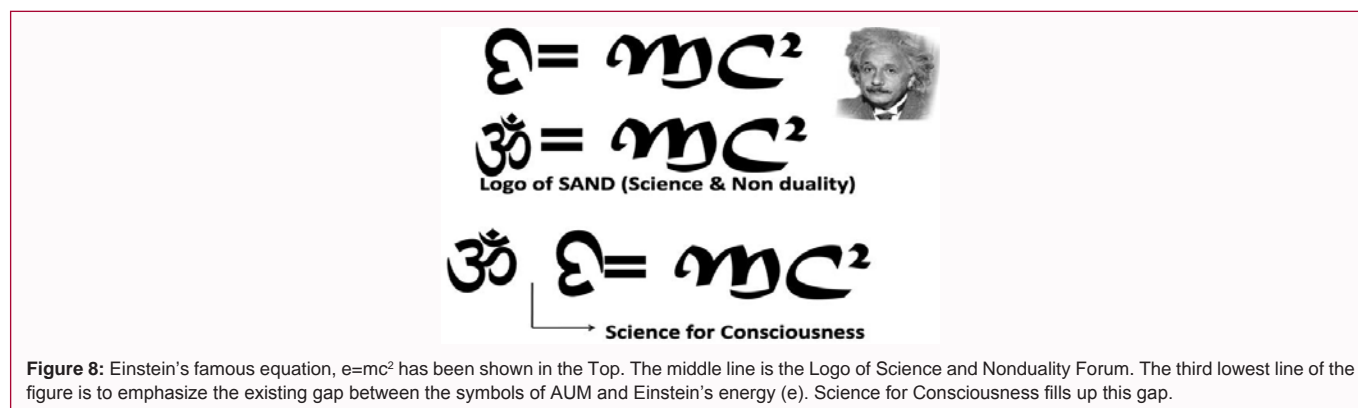


Figure 8: Einstein's famous equation, $e=mc^2$ has been shown in the Top. The middle line is the Logo of Science and Nonduality Forum. The third lowest line of the figure is to emphasize the existing gap between the symbols of AUM and Einstein's energy (e). Science for Consciousness fills up this gap.

comes back to Einstein's cosmological constant, Zero-Point Energy (ZPE), or quantum void to start the deeper journey!

Standard physics working on the material reality, does not take care of the cognitive reality and even of the biological reality; consciousness reality is far away from standard physics! Because it is silent on 'life', it gets stuck with the problem of uncertainty, problem of symmetry, and the problem of dark energy. We identify an entity as live, when it can overcome uncertainty, make new symmetry, and one which can transform dark energy into visible energy! Without real time involvement of ZPE, it is impossible for physics (meaning physical phenomena) to shake hands with biology (meaning biological phenomena).

There is another aspect of life in its subtle form, as life-as-such, which might have some presumptive relation with matter in its subtle form. We do not know the source of strong and weak nuclear interactions! All of the fundamental fermions (i.e., quarks and leptons) are subject to the weak interaction. In contrast, the strong force affects not leptons but only quarks. It is said that as electrical charge is the source of electromagnetic force, so the source of strong force is the color of the quarks. This color considered as the primordial color is a quality from which emerges a quantity of force! This color opens up speculation that this might be sourced from life-as-such, the subtle part of life! Particles without color, such as leptons, cannot 'feel' the strong force; particles with color, for example the quarks, do 'feel' the strong force. Also, life-as-such might be responsible for the great matter-antimatter asymmetry in the universe. It has already been stated above that "life" accounts for dark energy and dark matter homeostasis with observable matter and energy. The question remains, could this life-as-such explain all the contradictions within the standard model of particle physics?

Transcending this biological and cognitive reality, we reach our destination, the non-dual consciousness, the Source of all science.

Can AI lead us towards the Source and help Enlightenment?

AI is in the developing stage. It needs a good science to put its arm on the shoulder of it for growth. Science for/of consciousness is this science for AI. Since our present AI science is based on neural networks, server-cloud, peri-planetary satellite, algebraic algorithm, semiconductor chips, and some non-biological sensor materials, we are at the present milestone. This itself, indeed, is a great advancement! However, it is fraught with dangers, and has dangerous consequences for humanity. If AI can be trained for 'good', it can also be trained for 'evil'. Once trained, there is no way to de-learn! We reach a point-of-

Table 4: The Metaphor: Intelligence and Water.

	INTELLIGENCE OF	WATER
1	Calculator	Capsule of Water
2	Computer	Pouch of Water
3	DeepMind Program	Bottled Water
4	AI in Different forms	Tap Water from different Tanks
5	Cortical being	Water from the Well
6	Supracortical being (Saint/Brahamachari)	Water from a Natural Lake
7	Supracortical Godhead (Sage/Swami)	Water from a River
8	Supracortical Autonomy (Siddha/Paramahansa)	Ocean water
9	Ground Consciousness, the Nirguna Brahman	The Source of all Water

no-return! The programmer has no control of the machine's output. Creation of Frankenstein is not very far! Furthermore, there is a total lack of transparency in what the technologists are doing!

In a recent business meeting in February 2024 in Dubai, Sam Altman in a video message said, "There's some things in there that are easy to imagine where things really go wrong. And I'm not that interested in the killer robots walking on the street direction of things going wrong," Altman said, as quoted by the Associated Press. "I'm much more interested in the very subtle societal misalignments where we just have these systems out in society and through no particular ill intention, things just go horribly wrong."

Different levels of intelligence could be best described by a metaphor of water (Table 4).

What does the science for/of consciousness offer in such a scenario? The science for/of consciousness shifts our focus from the neural network to the whole brain and its tripartite synaptic transmission, server-cloud to natural cloud, peri-planetary satellite to interstellar satellite, algebraic algorithm to geometric algorithm, semiconductor chips to superconductor and other exotic matter chips or hybrid chips, and from non-biological sensor materials to biological sensor material such as brain-organoid and 3D printed brain, biomaterials from jellyfish, octopus, sea-urchin, coral etc., and we will go several milestones ahead. There is likely to be a trade-off between the speed, check points, and the reliability.

AI in its present state is absolutely a fool. It does only what it is programmed for by the intelligence of the programmer. A person imbibes from the company it persistently keeps. If we keep the company of a fool persistently, our fate is understandable. We require the company of enlightened persons, and an enlightened

environment for moving towards enlightenment.

Our brain, however, cannot be equated with a robot or a piano, both of which are only material vehicles. Robots and a piano do not have life. They are not capable of overcoming uncertainty, repairing broken symmetry, or using dark energy. Our brain can! Robots and a Piano do not have a sentient entity working within, which can evoke a sense of I, me and mine within them. The brain has! Robots and a Piano does not have operational consciousness to make a 'will'. The brain has!

The behavior a live brain expresses (including linguistics), might be classified as unconditioned, conditioned and automated. The automated behaviors can be mechanized in robotics without human flaws. Conditioned behaviors can be tried on robotics, as Open AI-LLM programmers have been trying! Strategic thinking and Creative thinking require participation of life and a sentient self in addition to consciousness, and for signaling those it requires a mind.

The frontier of neuroscience is how the nonlocal global players such as consciousness, self, life, mind and even information use the evolved organ brain as a local and focal playground for getting their activities expressed in the behavior. The similar frontier exists in cell biology, although in a limited way and also in brain-less animals like octopus, jellyfish, sea-urchin, corals etc.

Finally, we must admit that the intelligence acts as an obstruction for final enlightenment too, unless the intelligence sees and recognizes its Source. "Prachodayat Aum"!

Summary, Conclusion and Perspective

In summary, this paper creates a broad scope for research and investigation with the narrative of the pathways from the quantum void to the ground consciousness, from the brain-bound consciousness to the brain-independent consciousness-as-such, from ZPE to the *Essence* of the Multiversity. The milestones and the processes have been addressed in approximate detail. This opens up the way for doing science in search of its Source. Eight different models are there in this paper, which might be found helpful in this sojourn.

Should the scientists be earnestly keen to know the Source of the science, keeping their both skepticism and the hunger for knowledge alive, we may conclude by saying that all paths lead to Rome, the Ground Consciousness, consciousness-as-such, the non-duality.

In this work even the operative consciousness could be described as an object process in the subjective consciousness! The paper throws open an advanced, new, and a unique perspective for an integrated multidisciplinary adventure where Science, Humanity and the Spirit operate in an indivisible fashion to create the Akhanda Worldview holding the Ground Consciousness, consciousness-as-such, the *Essence* of the Multiversity as the final fusion of the objectivity and the subjectivity.

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References

1. Stapp HP. Quantum theory of the human person. In: Quo vadis Quantum Mechanics? Elitzur A, Dolve S, Kolenda N, editors. Springer. 2005.
2. Hooft 't G. The cellular automaton interpretation of quantum mechanics. Springer Open. 2016.
3. Holden C. Paul MacLean and the triune brain. *Science*, 1979;204(4397):1066-8.
4. Mukhopadhyay AK. States of Consciousness -A holistic Hypothesis. Supracortical Consciousness an existing Reality. In: Frontiers of Research for Human Biologists. Next Hundred years. Conscious Publications, New Delhi. 1985.
5. Mukhopadhyay AK. The dynamic web of supracortical consciousness. Conscious Publications, New Delhi, 1987.
6. Mukhopadhyay AK. Supracortical Consciousness. An opening to multiple new doors of science. In: The Enworlded Subjectivity. Its Three Worlds and Beyond. Project History of Indian Science, Philosophy and Culture (PHISPC). Vol. XI, Part 4. Balasubramanian R, editor. Pub. Center for Studies in Civilization, New Delhi. 2006;380-446.
7. Mukhopadhyay AK. Science of Divinity: Part IV. *Arch Neurol Neurosci*. 2022;12(2).
8. Aspect A, Dalibard J, Roger G. Experimental test of Bell's inequalities using time-varying analyzers. *Phys Rev Lett*. 1982;49:1804-7.
9. Gisin N. Can relativity be considered complete? From Newtonian nonlocality to quantum nonlocality and beyond. *The Message of Quantum Science, Lecture Notes in Physics*, 899, Springer-Verlag, Berlin Heidelberg. 2015;195.
10. Grinberg-Zylberbaum J, Delaflor M, Attie L, Goswami A. The Einstein-Podolsky-Rosen paradox in the brain: The transferred potential. *Phys Essays*. 1994;7:422-8.
11. Hu H, Wu M. Spin-mediated consciousness: Theory, experimental studies, further development & related topics. 2002.
12. Libet B. Neural processes in the production of conscious experience. *The Science of Consciousness*. Velmans M, editor. Routledge, London and New York. 1996.
13. Libet B. Do we have free will? *J Conscious Stud*. 1999;6(8-9):47-57.
14. Laureys S. In: Conversation with Anouk Bercht. *The Science of Consciousness*. Scientific American. New York, 2019;227.
15. Koch C, House P. Brain Bridging. *Nature*. 2020.
16. Miguel N. Beyond boundaries: The new neuroscience of connecting brains with machines and how it will change our lives, 2012.
17. Martone R. Scientists demonstrate direct brain-to-brain communication in humans. Work on an "Internet of brains" takes another step. *Scientific American*. 2019.
18. World Science Festival. Mind melds and brain beams: The dawn of brain-to-brain communication, 2016.
19. Drew L. Elon Musk's Neuralink brain chip: What scientists think of first human trial. *Nature*. 2024.
20. Bouso R, Polchinski J. The String Theory Landscape. *Scientific American*. 2004;291(3):78-87.

21. Puthoff HE. Physics and Metaphysics as Co-emergent Phenomena. In: Life and Mind. Savva S, editor. Trafford Publ. 2006.
22. Mukhopadhyay AK. Science of Information. Glob J Sci Front Res. 2021;21(1):15-30.
23. Mukhopadhyay AK. A radical view of information. On its nature and science. Frontier Perspectives. 2008;16(2):19-29.
24. Mukhopadhyay AK, Relan J. The DeepScience of NeuroCardiology. Ann Psychiatr Clin Neurosci. 2020;3(2):1030.
25. Tegmark M. Parallel Universes. Sci Am. 2003;288(5):40-51.
26. Mukhopadhyay AK. Deep science of CosmoNeurology the multiverse and the supracortical consciousness. J Neurosurg Imag Tech. 2020;6(3):347-66.
27. Hawking S. A brief history of time; from big bang to black hole. Updated and Expanded Tenth Anniversary Edition.
28. Mukhopadhyay AK. The Millennium Bridge. Towards the Mechanics of Consciousness and The Akhanda Paradigm. Conscious Publications, New Delhi, 2000.
29. Mukhopadhyay AK. Systems psyche: Its structure, operation and possible molecular links. Psychol Behav Sci Int J. 2016;1(3):555565.
30. Mukhopadhyay AK. Cognitive canvas: Molecular embroidery, fabric and the base. EC Psychol Psychiatry. 2018;7(7):428-39.
31. Mukhopadhyay AK. Consciousness, cognition and behavior. J Neurosurg Imag Tech. 2020;5(2):278-99.
32. Mukhopadhyay AK. Axiology of nature consciousness reality: Relevance in consciousness study, psychology and psychiatry. World J Psychiatry Ment Health Res. 2021;5(1):1028.
33. Mukhopadhyay AK. Einstein's abandoned otherworld: How conscious "Will" manifests in a 4-D world? EC Psychol Psychiatry. 2022;11(5):01-08.
34. Xia B, Zhang W, Zhao G, Xiang X, Bai J, Brosh R, et al. On the genetic basis of tail-loss evolution in humans and apes. Nature. 2024;626:1042-8.
35. Klein A. The physics of subquantum. Bioelectrogravitics of vacuum-fed biological human Cobe. In: Bordon AR, editor. The coming long vitality of the earth human. Biomind, Lulu press 2011.
36. Klein A. Interpenetrating realms: Collection of studies, articles, communications (1990-2021), 2021.
37. Tiller WA. Science and human transformation. Subtle Energy, Intentionality and Consciousness. Pavior, USA, 1997.
38. Tiller WA, Dibble, WE, Kohane MJ. Conscious acts of creations. The Emergence of a New Physics. Pavior, USA, 2001.
39. Mukhopadhyay AK. The Source and the Genesis: In the Language of Science". EC Psychology and Psychiatry. 2023;12.1:29-43.