

# The Anticipation of Afterlife as Based on Current Physics of Information

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## Abstract

Individual consciousness is considered as an expression of an underlying, non-local, quantum field, that exhibits holographic properties. This paper pays special attention to the *interfacing* of this field of universal consciousness and our personal brain in relation to potential afterlife. We postulate a toroidal event horizon workspace of the brain that allows symmetric 4-D to 3-D quantum information flux and holographic 2-D personal memory integration. The geometry of a 3-D brain being embedded in a 4-D realm may explain the phenomena of functional brain binding, qualia, intuition, serendipity, synchronicity, extra-sensory perception, and well-established Psi-phenomena. Brain function is conceptualized as guided by zero-point energy field (ZPE) derived pilot waves that support consciousness also in the absence of neuronal activity, such as in near death experiences (NDE). Its toroidal organization exhibits quaternionic dynamics and thereby allows an opening to 4-D geometry and thus to universal consciousness and ZPE. This personal holographic workspace, that is associated but not reducible to the brain, collects active information in a 2-D "brain event horizon", an internal and fully integral model of the self. At death of the material body, this personal knowledge mental domain uncouples from the body, yet it is conserved because quantum information can never be destroyed. In NDE this uncoupling is only temporal but reveals universal consciousness in a fully transparent manner, since in this condition non-neuronal information processing is maintained by fractal semi-harmonic frequencies from ZPE that reflect an entangled personal register of each conscious being. The proposed concept, therefore contradicts the tentative, promissory materialist solution to the mind-body problem. Instead, it substantiates the notion that brain can act as a kind of 'receiver' by filtering of (sub)conscious states, through holographic resonance of universal consciousness with specific coherent oscillation domains in the body. Yet, it is recognized that our self-consciousness can also act as a damping filter for information from this universal knowledge field. The latter aspect of a "dual filter theory" is apparently removed at states of modified brain function such as NDE, deep meditation and use of psycho-mimetic drugs, that expose us to an unknown cosmic perspective. The presence of a mental field-receptive resonant workspace, might be termed our "supervening double", (or "soul", not implying religious doctrine), and provides an interpretation framework for widely reported, but poorly understood transpersonal conscious states. It even implies that death should not be seen as a transition to another state of existence, but rather that all of us are already belong to such an eternal domain in our present life. Therefore, the present model implies the potential for the survival of individual life, qualifying us as designated survivors and eternal beings.

**Key Words:** Afterlife, Holo-fractal brain model, Universal consciousness, ZPE field, Field- receptive workspace of human brain, Scale invariant consciousness, Mental aspect of brain function, Brain attractors, Mind –body problem, Transpersonal experiences, Near-death experience, Out of body experience, Qualia of conscious perception, Dual filter theory

## Introduction

Following the publication of the recent interview of the present author by Epoch Times, Israel, (**Meijer, 2019**), some readers asked for a more detailed outline on the item of immortal consciousness and potential afterlife. This paper addresses this important subject that, as always, raises quite some international interest and discussion, as treated in the following (see also **Further Reading list** at the end of this paper).

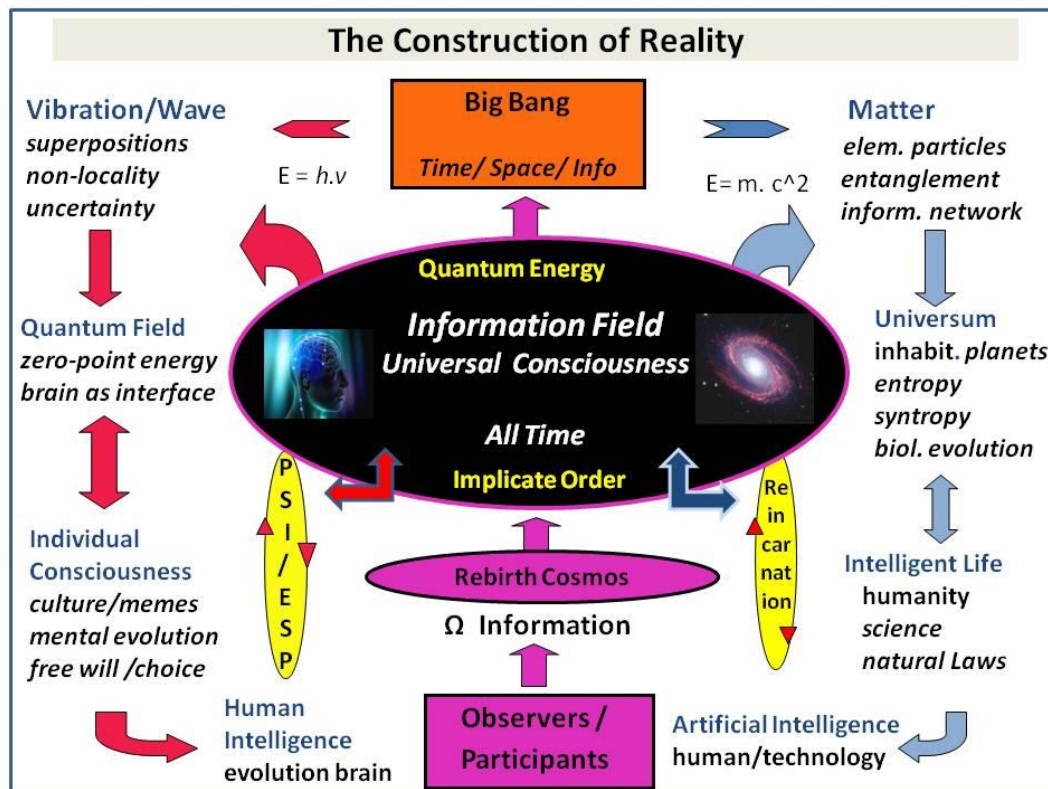
Man is a symbol and metaphor creating being, who apprehends the world through the power of imagination. The desire to give an enabling place to an “inevitable” individual death has led mankind to many powerful immortality and afterlife symbols. However, cell biology shows that humans are programmed to die and daily experience shows that we cannot escape fatal wear of our body. An incredible amount of thought has been written about afterlife and potential (im)mortality. There are many books and also academic dissertations about this subject with some really excellent! (**van Bergen, 2002, Vidal, 2012**, see also the “**Further Reading List**”, following the references). Today, molecular and genetic aspects of current longevity research shed a spectacular light on the first attempts to master immortality. In addition, we entered the era of digital immortality (**Meijer, 2013**). Current transhumanism advocates that human/machine hybrids (cyborgs) will be designed and the universe might be finally recreated by super-intelligent civilizations, providing a cyclic process of rebirth of our universe. (**Bostrom, 2003; Lloyd, 2006; Tipler, 1994**).

Yet, is this all wishful thinking or do we have a real perspective for some sort of afterlife in a cosmic setting? In other words, do we have to wait for completion of such technological developments (up to millions of years) or can we rely on more immediate answers to the question of “afterlife”. In this paper we postulate that the ten thousand of faithfully recorded Near Death Experiences (NDE) and reincarnation cases clearly have explanatory power and reveal the true nature of our individual consciousness as connected to universal consciousness and potential eternal being. It is shown, on the basis of quantum physics, that dying may be only virtual and should be interpreted in the framework of conservation of information, (**Meijer, 2013**).

While studying the nature of consciousness (**Meijer and Geesink, 2016, 2017**), we encountered reports about a non-material existence, a continuation of consciousness even while the brain was without cortical function and seemed to have stopped functioning, as discussed in many books on NDE, (for example by Pim **van Lommel, 2010**: “Consciousness beyond Life”). We argued that if herein an alternate reality was being described, it would be theoretically possible that the NDE reports might contain explanations for

(self)-consciousness, or useful hints about the nature of a reality, ordinarily not perceived in personal experience or by objective science.

At the instant of a severe trauma-inducing NDE's, such as a heart attack or violent vehicle collision, the suffering individuals report being puzzled about what has happened, as they are suddenly viewing their environment from a different perspective. Typically, they are now located above their body, so that they no longer see through their eyes, but see the environment from a different location.

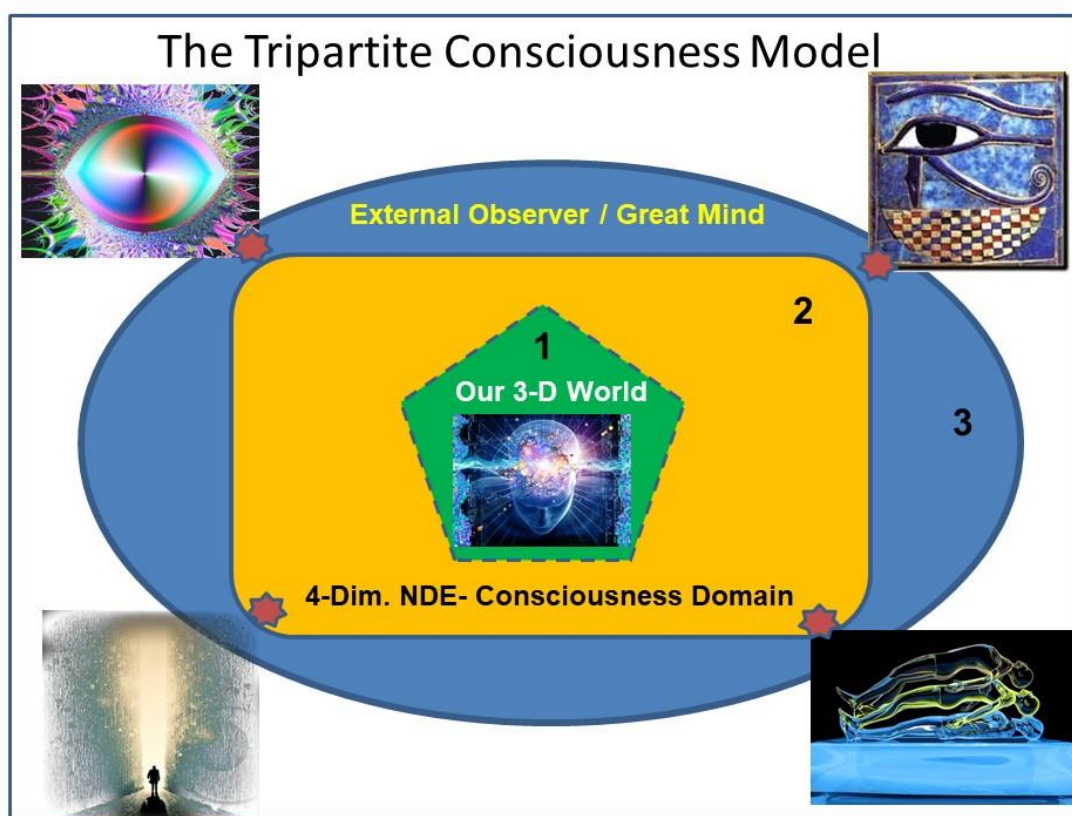


**Figure 1.** An integrated scheme depicting the Construction of Reality, with its material (right part of the figure) and mental (left), aspects. This concept assumes a central quantum information field, that provides the very basis for creation of our universe and dynamically evolves further through cyclic feed-back processes from the present reality, in which natural (among others human) and artificial intelligence play crucial roles in observation and participation (Meijer, 2012).

They also then start to notice that the fundamental nature of their sight has changed, as they seem to see through objects, can focus onto the vibrational atomic level of reality and obtain wide vistas across the whole cosmos, and even may experience panoramic views over 360 degrees. Individuals who have been born blind also report experiencing complex visual representations, colors and perceptions of distinct objects, that they never could have observed before, during their OBE (Ring, and Cooper, 1999). An excellent case has been made for the reality of discarnate consciousness by Greyson, 2019, and Pandarakalam, 2019.

*Here, we hypothesize that conscious perception during normal function of body and brain occurs not solely in the brain itself, but is realized by, permanently, receiving conscious states through resonant interfacing with an individual part of a dynamic universal consciousness (**Fig. 1**) in which the whole body is embedded. The differential qualities of perception thus are derived externally from this universal field of consciousness and not from intrinsic stored information in the brain.*

It is further proposed that the discrete EMF wave frequencies that we receive, inform our 3D reality through resonance with an underlying 4D universal field of consciousness (**Fig. 1**). We have earlier shown that *information* in the universe is fundamental and with energy and matter forms the building blocks for the architecture of reality (**Meijer, 2012**). One of the most interesting features of the OBE is the feeling that usual linear time no longer runs, and during the OBE it is reported that one can have simultaneously views of the past, current environment and, remarkably, also future scenes. **Hiller, 2011**, related this absence of running time to a sort of frozen time, realizing that formulation of Special Relativity predicts that photons do not experience time, and that NDE experience reveals a world of pure light.



**Figure 2:** The tripartite concept of consciousness: our 3-D world (domain 1, green) is permanently imbedded in a universal consciousness field revealed by NDE experiences (domain 2, yellow). All is part of the domain 3 supposed to be consisting of the great mind of an external observer (modified from **Hiller, 2011**)

A conjecture that seems best suited for the existence of a material brain within a universal consciousness domain is that there initially existed a domain of *pure consciousness* in which nothing else was contained, no light, no space, not even time. Such an initial domain is generally discussed in science in relation to a primordial external observer. It also has been associated, in common with most religions, with the presence of God. Thus, assuming such an external observer or Great Mind, a tripartite domain theory can be conceived (**Tiller, 2011**), as depicted in **Fig. 2**. Such a concept is consistent with many NDE reports: the feeling of an omnipresent and powerful being, (see Domain 3}, in addition to a world of universal consciousness (the 2<sup>nd</sup> Domain) and the physical world we occupy and normally perceive (Domain 1). Of note this concept implies that domain 2 should be seen as primary and that our world is permanently imbedded in universal or cosmic consciousness. A triadic dimension distinction model for consciousness was also proposed by **Neppe and Close, 2017**.

Reflection about the origin of the fabric of reality, such as the current Big Bang theories that postulate some kind of perturbation of quantum fluctuations, logically invite the hypothesis of an “initiator of events” or in other words an “external conscious observer”. However, current physics seems quite reluctant to allow the involvement of a “privileged observer”, or even, alternatively, the work of an alien intelligent species. Yet, such theories are certainly not less likely than the current mainstream *multiverse* speculations, that have an infinite number of solutions and an obvious lack of testability.

## **Modern Physics and its Implications for Afterlife**

As we all realize, the individual life is finite, despite the current advanced measures to prolong life: death remains ultimately unavoidable. However, there are theorists, such as some quantum physicists (**Amoroso,1999,2003; Goswami,1990; Berkovich-Ohana, 2014; Hameroff and Chopra, 2013; Wolf, 1985, 1996,1999, 2008; Kastrup, 2016; Bleicher, 2012b; King, 2003; Burke and Persinger, 2013; Lanza,2012; Carter, 2012; Schwarz et al., 2005, Schwarz and Begley, 2018; Schwartz, 2019; Pregmolato and Pereira, 2016** ), who at this point come to a very different conclusion: namely, that true permanent death is in fact, impossible! Our physical body, indeed, cannot escape its demise, but according to them, the information that determines our overall personality and reflects our life’s experience will be retained according to the law of conservation of information. Although, at first glance, this seems to be an unrealistic idea, it is perhaps somewhat more compelling when one realizes that our perception of the full range of reality is very limited and thus provides a very inadequate representation of reality! In the underlying knowledge field which is described by quantum physics, the preservation of information is postulated. Therefore, in the framework of the present essay, it certainly makes sense to discuss such alternative scientific perspectives (see also **Amoroso, 1999, 2006; Forberg, 2006, 2007, Greenfield, 2003, Lanza, 2012, Kastrup, 2016, 2017, 2018, 2019; Pregmolato and Pereira, 2016**).

In the 20th century, the standard model of physics, about the structure of matter and its building blocks, the elementary particles, was developed. This model, at the micro level, includes quantum mechanical theory. However, quantum mechanics is not compatible with the description of the macro world of the Universe, as described in Einstein's cosmological Theory of Relativity. There are now desperate attempts

to develop a "theory of everything" that would include modeling of the cosmos and quantum micro-world in a single set of equations. One example of this is the, so called, "Super String theory" or, even better, its successor the M-theory that even assumes at least 10 dimensions. The basic idea of the String theory is, that the real building blocks of elementary particles, such as electrons, protons, photons and quarks, are much smaller elements that can best be described as a sort of tiny strings or loops that vibrate at different frequencies in a discrete manner. This theory implies that at the smallest physical level can be conceived of as an assembly of vibrating entities!

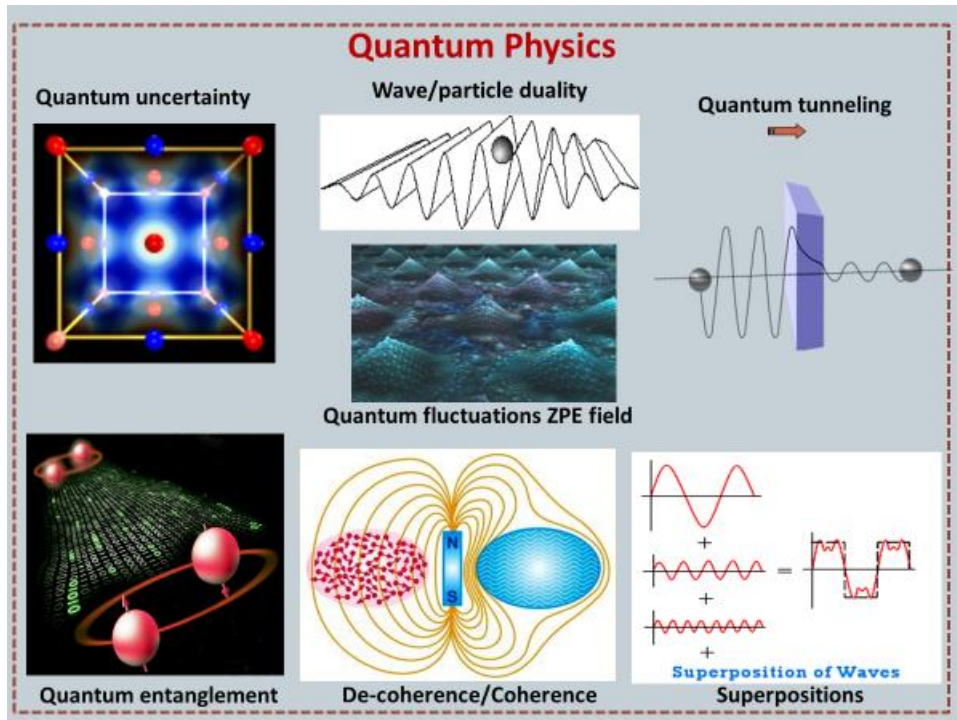
In addition, quantum physics tells us that material particles at the same time can behave as oscillators (waves), by which they can produce a sort of poised state of waves/particles. Interestingly, particles that belong to each other in term of their properties (e.g. their polarization and rotation or spin) can be correlated with regard to each other over huge distances: if one changes the spin of one particle, the paired particle spin is altered too to maintain their system integrity. This phenomenon termed "quantum entanglement" was characterized by Einstein as "spooky action at a distance." Thus, the structure of reality may be more flexible and intricately interconnected over vast distances than classically thought. Nature can therefore be seen as an enduring interaction of waves/ particles carrying their inherent physical status information. System status information exchanged is not only used for a deeper form of intra-system coordination, but probably also for the creation of interpretive *meaning* by conscious observers. A number of prominent scientists who laid the foundations for the hypothesis of the quantum brain: the Nobel Prize winners **Wigner, 1983** (quantum physicist) and **Eccles, 1992** (neurologist), the quantum physicists **Bohm, 1980, Bohm and Hiley, 1993, Bohm and Peat, 2008; Stapp, 2017; Goswami, 1990 and Wolf, 1985, 1999, 2008** and the neurologist **Pribram, 2014**, as well as the psychiatrist Carl **Jung** and the mathematician **Penrose, 2014**, have theorized that our brain may functions as an interface between the individual and a "collective consciousness" that is stored in a supposed universal quantum field. Ervin **Laszlo, 2006**, stated that the universe, in this way, exhibits a kind of universal memory and that all experiences are stored in, what he calls, the *Akashic record or field*, a term that is also encountered in the Eastern religions. The basis for the existence of this field was derived by Laszlo from the, so called, quantum vacuum domain, also called *the zero-point energy field* (see later).

Recent experiments showed teleportation of particles, based on sending complete information on a particular particle over a wide distance by which a solid particle is created at a distant site: this implies that matter may arise from information. The renowned scientist Anton **Zeilinger, 2003** therefore concluded that information is more fundamental than matter and energy. It became also clear that the abovementioned universal information field can also be seen as the source and origin of reality, underlying the design of the Universe.

Quantum entanglement implied to physicists, such as David Bohm, a reason to postulate a "quantum wholeness", an idea that expresses the concept that everything in the universe is connected ("entangled"), see **Meijer, 2012, Meijer and Korf, 2013**). Yet, these aspects of reality are hidden from ordinary perception. Instead, our individual consciousness is so dominated by the normal but overwhelming sensory input that we are rarely aware of this kind of connectedness. According to Bohm, such quantum



phenomena are hidden due to fact that they are part of an underlying unseen quantum information field that is always present and manifested everywhere (and thus has *non-local character*), what we term the universal field of consciousness.



**Figure 3:** Elements of quantum physics: uncertainty of position of particles, wave / particle duality as demonstrated in the double-slit experiment (upper part), as well as entanglement (non-locality) of particles at great distances, the phenomenon of coherence/decoherence and superposition of waves (lower part).

Such a universal quantum field may do so through the exchange of information energy that is continually reallocated in a universal dynamic process. Building and decomposition of matter are, in fact, caused by absorption and release of (virtual) photons, and matter can thus, more poetically, be envisioned as "light captured by magneto- gravity." The virtual particles of the field can in this manner also provide an information exchange between the physical reality and the non-zero local field to which they belong by the phenomenon of resonance. Even the force of gravity, a yet poorly understood phenomenon, may be related to this field, because of its retarding effect on the movement of material: the, so-called, inertia (**Setterfield, 2017**). **Penrose, 2014**) suggests that quantum gravity at the Planck-scale level is instrumental in the capture of quantum information in our brain (**Meijer and Korf, 2013**).

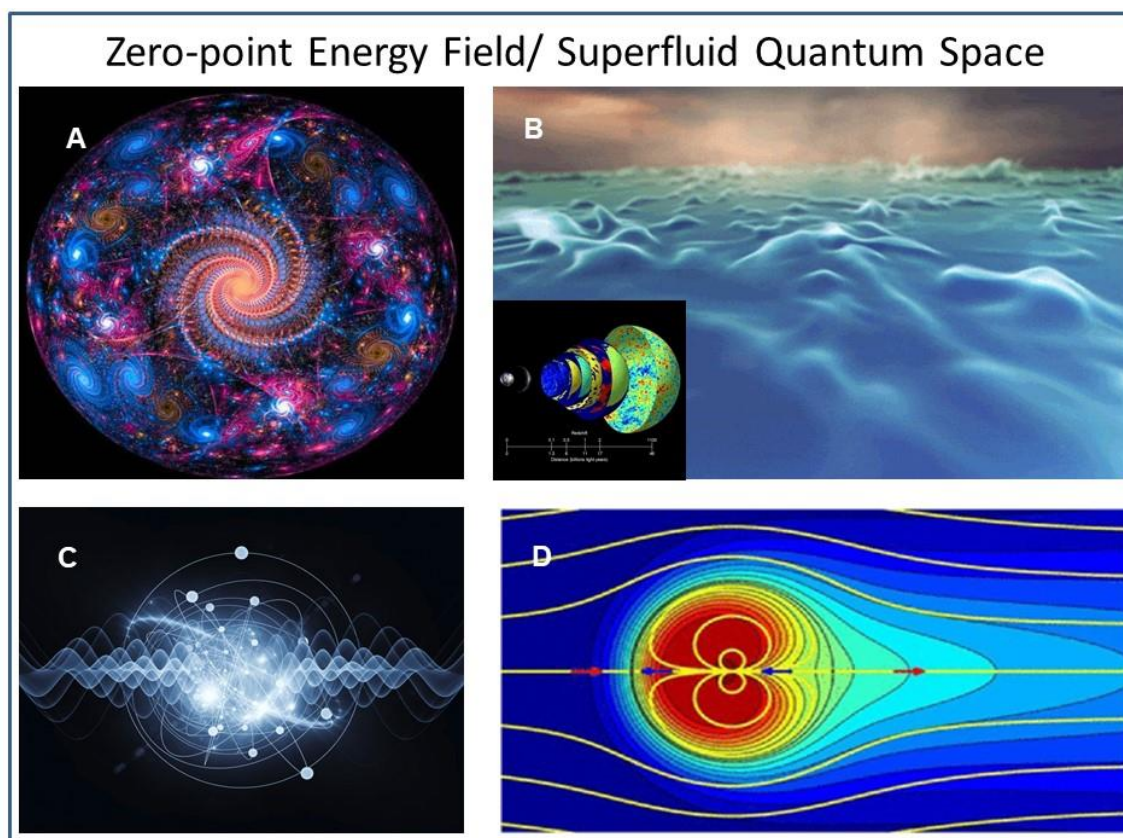
### Infinite Consciousness: An Information Field?

The universal quantum energy field can also be envisioned as a giant hologram ( for theory see, **Susskind, 2015** and the Dutch scientist 't Hooft, 2012), that permeates everything in the universe. Numerous

authors support the idea that the universe has a holographic structure (Talbot, 2006; Anjamrooz et al, 2011; Aurich et al, 2008; Bjerve, 2016; Batiz and Milonvanovic, 2017; Luminet, 2016; Hamein et al., 2016; Brown, 2019; Leffert, 2019). It is considered by the earlier mentioned physicist and systems theorist Laszlo as a universal information field (Laszlo, 2007, 2012). Consequently, each of us is supposed to be in contact with the field through wave interactions. This implies that we are in fact permanently connected to and embedded in a general energetic information field, which penetrates all animate and non-animate material (Meijer, 2012, Meijer et al., 2019). We will now explore the possibility that also *personal* information may be stored in this domain and that this can be instrumental in the realization of commonly unexpected modes of immortality. In other words: immortality and potential afterlife could be conceived as a *modality of conservation of information*.

## Zero-point Energy Field and Stochastic Dynamics

One of the main challenges in consciousness research is widely known as the hard problem of consciousness. In order to tackle this problem, an approach from theoretical physics, called stochastic electrodynamics (SED), is utilized which goes one step beyond quantum theory and sheds new light on the reality behind matter (Keppler, 2012, 2016)



**Figure 4:** Left: The universal, all pervading "zero energy field" pictured as a vacuum with fluctuations of quantum waves or particle/antiparticles in a fractal setting ( B and inset) that are supposed to display a vortex character (A). Through superposition and photon polarization information storage is possible. The zero-point quantum fluctuations



*are reflected by creation and annihilation of particle/anti-particle pairs, in which the anti-particles travel in a reversed time mode. Charged particles moving in the ZPE- field obtain a toroidal form of energy flux that may form the basis for the creation of pilot waves that guide reality in our 3-D world (D). The collective wave patterns that obtain permanent feed- back from our reality, constitute the overall wave function of the Universe (depicted in C).*

According to this approach, matter is a resonant oscillator that *is orchestrated* by an all-pervasive stochastic radiation field, called zero-point field (ZPF, see **Fig. 4**). In addition to these works there is also a very interesting SED-based approach to inertia and gravity, elaborated by Rueda and Haisch (**Rueda and Haisch 1998; 2005**). SED is based on the conception that the vacuum is filled with a real, all-pervasive stochastic radiation field, called zero-point field (ZPF), which can be pictured as an infinite sea of light and an ocean of pure energy.

The properties of matter are not intrinsic but acquired by dynamic interaction with the ZPF, which in turn picks up information about the material system as soon as an ordered state, i.e., a stable attractor, is reached. These principles apply also to macroscopic biological systems. From this perspective, long-range correlations in the brain, such as neural gamma synchrony, can be interpreted in terms of order phenomena induced and stabilized by the ZPF, suggesting that every attractor in the brain goes along with an information state in the ZPF (**Fig. 5**).

How can the, so called, hard problem in consciousness theories be approached? On closer inspection, the hard problem turns out to be tightly linked to the western way of thinking that adheres to the idea of a matter-dominated universe. This mindset proves extremely obstructive not only to the progress in consciousness research, but also to the deeper understanding of the physical world. In the following section the pioneering work of **Keppler, 2012 and 2016** is summarized.

### **How ZPF affects matter**

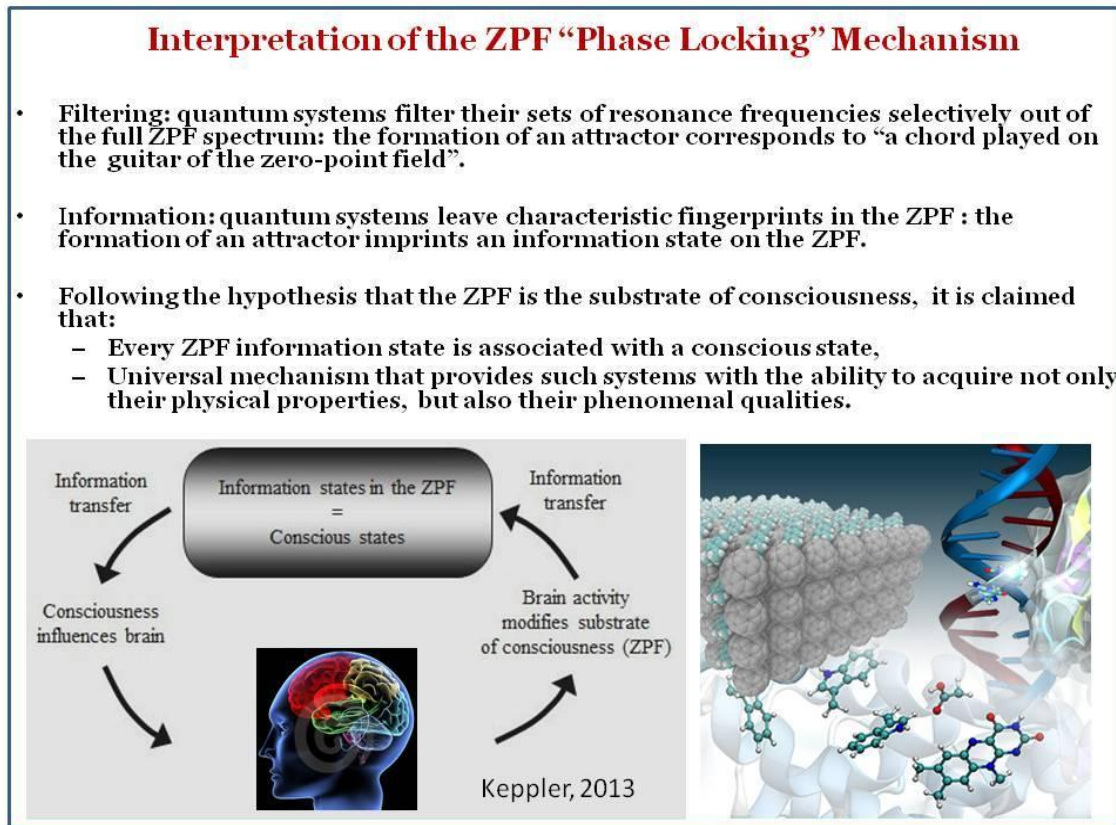
As explicated in the former section, SED regards matter as immersed in an all-pervasive stochastic background field with which it interacts permanently and unavoidably, thus acquiring a stochastic motion. This motion can be studied for various systems. As an example, we may take a closer look at the hydrogen atom, which is composed of a proton and an electron. In classical physics this system is unstable and collapses within a tiny fraction of a second due to the fact that the orbiting electron emits radiation and loses energy. However, within SED the situation changes significantly since the electron is no longer surrounded by a void. Rather, the electron is now able to perform a dynamic interaction with the background field, which results in an exchange of energy between the material system and the ZPF. Indeed, it can be shown analytically and numerically (**Cole and Zou 2003; 2004a; 2004b; De la Peña and Cetto 2006; Cavalleri et al. 2010,**) that there are certain dynamic situations in which the average power absorbed by the atomic electron compensates its average radiated power. These situations are characterized by quantization conditions and correspond exactly to the stationary states predicted by quantum theory, i.e., the stability of matter goes necessarily hand in hand with the quantum behavior of matter and both are a consequence of the interaction with the ZPF.

A closer look behind the scenes of matter from an SED point of view reveals that not only the stability of matter but also its spatial structure and three-dimensional conformation are governed by the ZPF. Hence, SED is able to provide a clearer and more intuitive understanding of structure formation, in such a way that a quantum mechanical orbital, which reflects the probability density of finding an electron in a specific region around the nucleus, is associated with a stable attractor of the stochastic interaction process between the electron and the ZPF (**Rodriguez, 2012**). In other words, every stationary state of matter is characterized by an "individual dance pattern" that comes into being under direction of the ZPF. External stimuli, such as the presence of a magnetic field, can cause transitions

between different attractors, i.e., an external stimulus or a perturbation can prompt the system to follow a new dance pattern, ( Fig. 5).

### How matter affects ZPF

So far, we have dealt with the impacts of the ZPF on matter. In the second step, we now have a look at the impacts of matter on the ZPF. This is very important because it must be considered that matter and ZPF exert a mutual influence, i.e., not only the ZPF affects the dynamics of matter, but the latter also affects the dynamics of the ZPF.



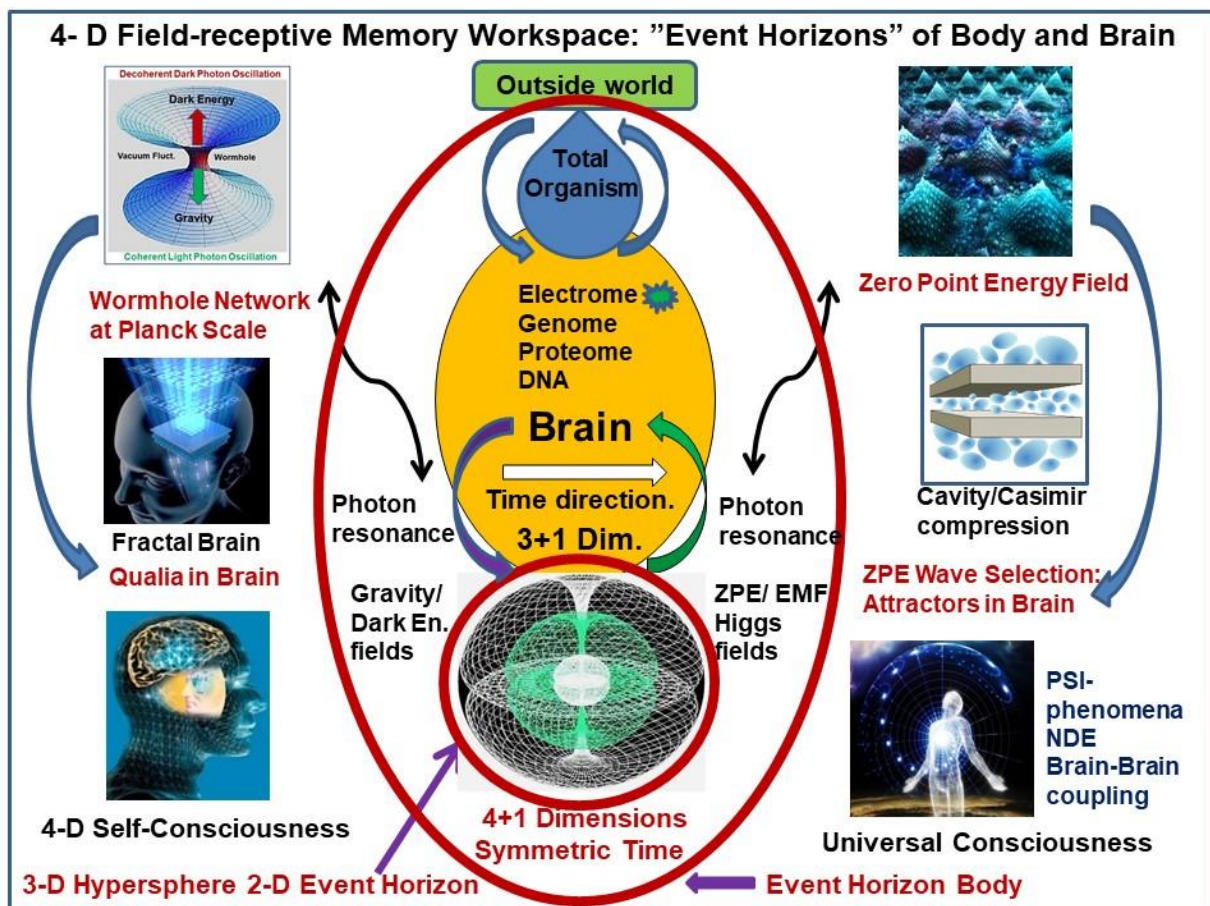
**Figure 5:** Filtering of resonance frequencies from the ZPE field (modified from **Keppler, 2015**), by a phase-locking mechanism yields the qualia for our brain function. In reverse, the quantum brain leaves fingerprints in the ZPE field and the resulting dynamic and permanently updated ZPE constitutes the very substrate for consciousness and life processes (inset below right).

From the study of simple nonlinear systems (**De la Peña and Cetto 2001; 2006**) one can learn that the ZPF is modified as soon as the system reaches a stable attractor, (**Fig. 5**). This aspect reminds us of modern versions of the guiding pilot-wave theory of David **Bohm ,1980; Bohm and Peat, 2008**), in which a number of authors propose a *back reaction* from our world to the supposed implicate order. Such a *bidirectional* flux of active information would imply that free-will based decisions of humans are transmitted to and integrated in the ZPE realm, meaning that the field is never static or deterministic but that intelligent species participate in the dynamic character of universal consciousness (**Meijer and Geesink, 2017, Meijer, 2018**). The free field with the initially random phase adapts itself to the new situation in such a way that the relevant frequency components involved in the maintenance of the equilibrium become highly correlated (**De la Peña and Cetto, 2001**). In other words, the

formation of a stable attractor results in a de-randomization of the local ZPF. This amounts to imprinting an information state on the ZPF. Different attractors are associated with different ZPF configurations and, hence, different information states.

## Consciousness in the Universe is Scale Invariant and Present in All There Is

It was previously postulated by us that consciousness in the entire universe arises through, scale invariant, nested toroidal coupling of various energy fields, an aspect that may include quantum error correction. In the brain of the human species, this takes the form of the proposed holographic workspace, that collects active information in a mental workspace coined the "brain- event horizon", representing an internal and fully integral model of the self, (Meijer and Geesink, 2017). This brain-supervening workspace is equipped to convert integrated coherent wave energies into attractor type/standing waves that guide the related cortical template to a higher coordination of reflection and action as well as network synchronicity, as known to be required for conscious states. In relation to its scale-invariant global character, support was found for a universal information matrix, that was extensively described earlier by David Bohm, 1980; Bohm and Peat, 2008, as a supposed implicate order.



**Figure 6:** Modeling of brain/mind relation in a 4+1-dimensional space-time framework (4+1 implies 4 spatial dimensions and one single dimension of time), on the basis of energy trajectories in a nested toroidal geometry. The

*opposing forces of Dark energy (diverging force) and Gravity (converging force) as well as discrete wave frequencies of electromagnetic fields, are instrumental in the generation and compression of individual life information. The human brain may receive quantum wave information directly derived from the Planck space-time level (left above) through quantum gravity mediated wave reduction, as well as through resonance with the ZPE field (right above). Our brain can perceive only 3+1 dimensions with a one-directional arrow of time. The material brain and its 4+1-D supervening field-receptive mental workspace should be seen as an integral whole, until bodily death of the organism. The 4th spatial dimension allows individual self-consciousness since an extra degree of freedom is required for self-observation and reflection, while in the mental context the time dimension is symmetrical, allowing to integrate past and future- anticipating events. The 4th spatial dimensions is also assumed to accommodate the bidirectional flow of information between the domains of self-consciousness and universal consciousness. Bottom-up information flow from the Planck scale, combined with top-down information conjugation from the ZPE field, constitute the event horizon of the brain, also integrating gravitational and dark energy related force fields, and supervenes the physical brain. Event horizons of brain and whole body are depicted in red ellipse and circle respectively.*

It plays a role in a spectrum of space-time theories in current physics. The presence of a field-receptive resonant workspace, associated with, but not reducible to, our brain, may provide an interpretation framework for widely reported, but poorly understood transpersonal conscious states and also the supposed algorithmic origin of life. It also points out the deep connection of mankind with the cosmos and our major responsibility for the future of our planet.

Consciousness can therefore be defined, as a state of a semi-stable system that has developed in a cooperative and cyclic operating mode so that it has become “causally self-observant”. Thereby, it can not only predict aspects of the local environment, but also can integrate memorized information and future-directed projections into a personal worldview that serves individual survival, development and social communication (**Forshaw, 2016a,b**). Yet, in the present paper a much wider context for consciousness is offered, in which our individual mind is seen as a part of a larger universal consciousness, being instrumental in the entire fabric of reality. This concept is based on our earlier consideration of an extended mind (**Meijer, 2015**).

## The Connecting Principle of Quantum Information in the Material Universe

We usually talk about two seemingly separate worlds: that of material particles and that of a hidden wave world with its force fields, such as gravity and dark energy. The special feature of the work of **Verlinde, 2011, 2016**, is that the author brings the two aspects together in the form of *quantum information as the most fundamental building block of the universe*, following the concepts of John **Wheeler, 1994** and more recently of **Zeilinger, 2003 a,b** as also pointed out earlier by **Meijer, 2012, 2014**.

Matter and thus particles can therefore be seen as condensations of force fields that interact and both can be described with quantum information, that is actually a form of energy (see later). The special property of the torus operator is to bring the various types of field information together in integrating the various types of energy flow. **Lefferts, 2019**, in his recent impressive essay on Cosmometry, conceived the torus dynamics as reflecting the processes of enfolding and unfolding of information in a Bohmian context.

In quantum theory, energy is quantized and thus consists of discrete vibrational units (vibrating strings or loops). The space is also quantized according to the theory, thus divided into small space parts. This matrix of such space units is usually called space foam, bearing units that function as operators. Known examples of such elements are twistors (**Penrose, 2014**) related to nested torus geometry. Such units are supposed to operate on every fractal scale, from very small (Planck scale) to very large (black holes), and can be conceived as the collection points of the various force fields: gravity-, dark energy-, zero-point energy-, electromagnetic-, and Higgs fields etc. (see later also the wormhole matrix hypothesis of **Haramain et al., 2018, Brown, 2019**).

In this manner, such operators integrate quantum information and store it on the edge of each fractal unit, that in the case of the black hole was called the "event horizon". The leading principle is that every object is fully described with information gathered on a virtual screen around the object (its event horizon). Therefore, quantum information, like energy, is never lost. **Verlinde, 2011**, among many physicists, also used the holographic principle, invented by the Nobel laureate 't Hooft (see for holography aspects see also **Sieb, 2016, 2018; Batiz, 2107; Alfonso-Faus, 2011 Talbot, 2006; Anjamrooz et al, 2011; Aurich et al, 2008; Bjerve, 2016; Batiz and Milonvanovic, 2017; Luminet, 2016; Haramain et al., 2016; Brown, 2019; Leffert, 2019**). The entire universe and also galaxies, suns, planets and even living systems are to be regarded as toroidal organized information fields, each projecting digital information on their respective event horizons.

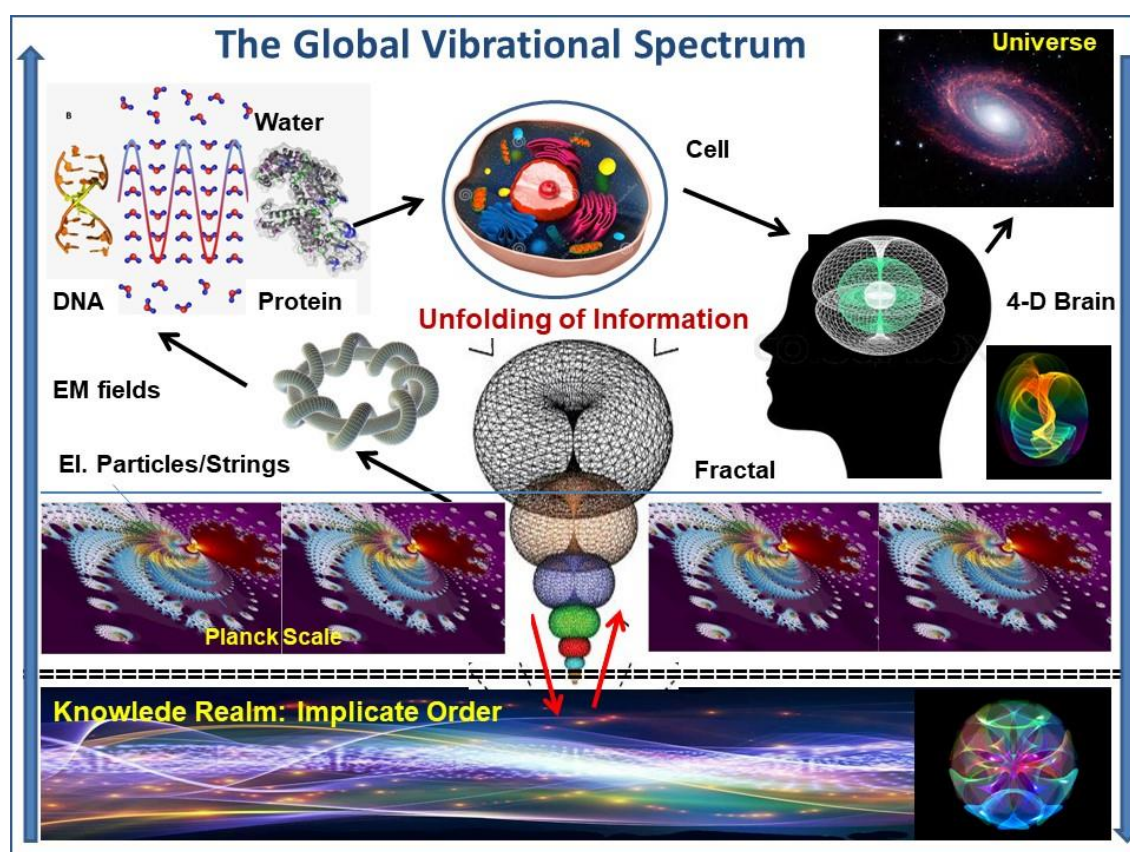
In this respect, it has been experimentally demonstrated recently that:

- 1) information is in fact a form of energy: when information is removed from a quantum system, energy is released in the form of heat (entropy), (**Bérut et al, 2012; Toyabe et 2010; Peterson, 2016**).
- 2) this also applies to the quantum world. Binary units (bits, say a kind of yes/no questions) are then Qbits, but now information can mix (superpose) and can show entanglement with other states of quantum information (**Lloyd, 2007, Nielsen and Huang, 2000**).
- 3) the suggestion of **Verlinde, 2011, 2016** and earlier **Zeilinger, 2000, 2003**, is that the information is intrinsic to matter (and even the source of it!).

Thus, information always arises from *interactions of wave/particles* and according to classical information theory, information/entropy represents the *potential* to ask yes/no questions in such an event with regard to a particular system (see **Lloyd, 2007, Meijer, 2013**). According to these concepts, information is in fact the sum of *expected* information obtained from such yes/no questions. An example is DNA in our cells which in itself contains a lot of *potential* information (digitally expressed in Bits), yet is only clearly expressed in the cell in relation with RNA and proteins. The intrinsic (hidden), information of an object is therefore the result of the entanglement of the stored (individual) information from the various constituting particles, providing a sort of global information by converting all of this information into a coherent information matrix, that is dynamic in time (**Keppler, 2013, 2016**). Some link this matrix with the so called zero-point energy field, (**Laszlo, 2007, 2012; Setterfield, 2002; Nation et al, 2012**).



That we cannot directly perceive this information aspect, is traditionally ascribed to a hidden 4th *spatial* dimension (not the dimension time!), which cannot be observed in our 3D world, but can be mathematically derived. Such supposedly 4th dimension could also explain the creation of dark matter in our 3-D world through selective wave exclusion in the ZPE field, according to the so-called Casimir effect (Wongyun, 2013; Green and Levin, 2007). Recently it has also become clear that even space-time itself may be derived from the above-mentioned quantum fluctuation field and, in particular, through the entanglement of quantum information that is locked in. Instrumental in this respect are a sort of “short cuts” in space, that connect one part of the space with another, via a so-called wormhole structure (Fig.7). This concept is called EP = EPR conjecture. (Maldacena and Susskind, 2013; Susskind, 2016; van Raamsdonk, 2010). This wormhole concept (geometrically quite similar to the central channel of the torus) was already known from the physics of black holes, but now appears to be present at every fractal scale in the universe up to the Planck scale where it constitutes the aforementioned *quantum foam* (Haramain, 2016; Ford and Roman, 2000; Lloyd, 2007; Loll, 2011, Wikipedia/quantum foam).



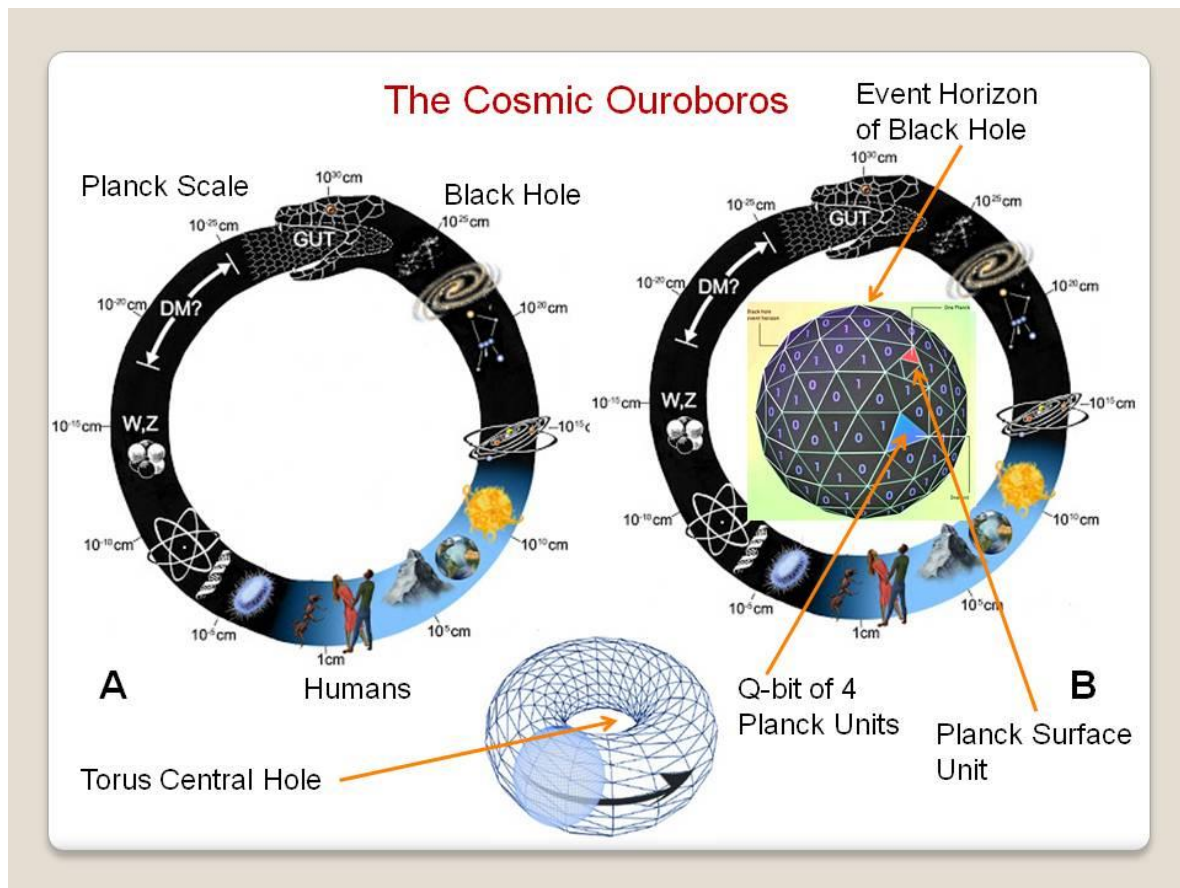
**Figure 7:** The flow of information in the universe from micro- to macro-levels (bottom to top) conceived as a nested toroidal operation that is fractal and scale-invariant and is initiated in a knowledge realm underlying the known wormhole matrix (quantum foam) at the Planck scale. Supposed quantized string activities produce elementary particles, atoms, molecules and life systems. The latter contain dedicated holographic memory spaces at the cellular and organ level. The human brain integrates internally and externally guided, conscious states. Further fractal and self-similar properties in a quantum fluid universe provide the architecture of cosmic macro-structures. from Meijer and Geesink, 2019).

## Torus as a Geometric Model for Information Flow in the Universe

A well-known example to illustrate the use of a metaphoric and archetypic figure in art and science is the Ouroboros: a serpent that seems to swallow its own tail, bringing together the extremities of its body in a circular mode, (Meijer, 2017, see Fig. 8, below). From ancient times it was seen as a symbol of eternal return and immortality. More recently, scientists such as Primack, 2006 projected on the snake body the relative size of the defined structures in the universe, going from the extremes of the smallest (so called, Planck) scale to the largest such as black holes and the entire universe. In this, humans seem to take an intermediate (almost anthropomorphic) position. (see Fig. 8, left). Yet, what do we actually really learn from this representation of cosmological scaling and the position that we, as human species, take in this respect? Evidently, it could be understood as a necessary *complementary* process, enabling people to internalize and integrate knowledge (a sort of *enfolding*) in a more holistic way, information that can be later *unfolded* spontaneously and then centered in the here and now. The process of "looking at" the cosmic Ouroboros, pictured below, can be seen as an explanatory trap in the case that it is only considered in a one-dimensional plane, even as depicted here as two-dimensional figure. However, no attention was drawn to any potentially circular dynamics around the serpent's body, at each point along its length. The particular explanation, clearly, avoids mention of the axis through the center of the circle along which the observer is located, as we know from the torus geometry treated above. Even more curiously the Ouroboros as pictured here, in a superficial way, takes the form of a zero, a container for nothing.

The mystery of nothing, of course, is a current preoccupation of physics, whilst having long been a preoccupation in relation to spiritual insight. "Nothing" is also that with which many are now faced in contemplating their socio-economic future. So, what's missing? In the circular figure, below, we recognize a flat torus (a circling circle), with its known central channel-like axis or central hole. It is in this sense that the empty central portion of the Ouroboros constitutes a form of neglected invitation to an "inplanatory process" (see later), effectively performed going "through" the plane of the Ouroboros as presented (Meijer, 2017).

How can we conceive the Ouroboros differently: not as an intoxicating bite or a suffocating swallowing of itself, showing a circular process of self-death, but rather from a completely different perspective. This is realized by asking the question: what can the tail offer to the mouth so that the figure turns into a symbol of resurrection and ultimate physical rebirth as alchemists and philosophers like Jung told us long ago? Here we should go into deeper layers of the toroidal inner structure (in-planation) that provides a superposition of wave information, recurrent coupling, and thereby information mirroring in a process of "physical self-reflection". In the framework of the cosmic Ouroboros in Fig. 8, we now ask which element in nature can connect the various material shapes of the universe (often with striking spiral features) at the various scales? (see Fig. 11 in more detail)



**Figure 8: The Cosmic Ouroboros** A: The hollow ring structure can be interpreted as empty, but alternatively can be seen as a flat torus. B: The alternative toroidal representation of the Ouroboros. The central hole is depicted here as a black hole spherical structure, on its surface bearing the basic units of information (in 0 and 1) that are projected on the black hole event horizon. Each Q-bit is composed of four Planck surface units.

A possible answer to this puzzle thus lies in the recognition of the central role of *physical information*, through which any of these structures can be described. The tail portion entails the smallest quantized (Planck) scale, supposedly composed of the smallest units of information: the Q-bit. The mouth portion of the serpent depicts the largest structure of black holes at centers of all galaxies, that not only gravitationally swallow information but, according to recent cosmological research, also *radiates* this information at their surface, called the event horizon. Here the smallest scale of the Universe meets the largest one known! In this model, the universe is conceived as a “living” structure that provides event horizon-mediated back-radiation of conserved information (in Bits or Q-bits) from huge numbers of black holes that are distributed throughout the entire universe. The radiated, entangled, information is supposed to provide a holographic projection of all there is, including our own planet and its life forms. In the foreseen, ultimate, fate of the universe, a final single black hole, that contains the total of all generated information, will pass the accumulated information to a, so called, connected white hole (**Fig. 10**). The supposed final black hole can in this manner function as a dedicated instrument for rebirth of our universe, in a cyclic operating mode (see **Meijer, 2015**)

Now, realizing this, we may no longer see the cosmic Ouroboros as a “suicidal machine”, but rather as an archetype that indeed symbolizes resurrection and eternity. Various dynamics of in-planation are fruitfully suggested by the dynamics of a torus as indicated above: its paradoxical nature as a mirror calls for self-reflexive dynamics. It can even be argued that, in addition, it exhibits contraction/relaxation loops, discussed earlier, in which the torus turns inside out in a vibrating mode, inviting strange loop trajectories. The “strangeness” of such a loop, see **Hofstadter, 2007**, further suggests that the toroidal Ouroboros is better understood as embodying a cognitive twist, relating “inside” to “outside” as with a Möbius strip.

A potentially interesting representation of the Ouroboros is a 7-coloured hypersphere which can be rotated through its toroidal center, offering a comprehensible illustration of such 4-D twistedness in 3 dimensions. Equally charming is the sense in which the thereby produced extra 6 dimensions of spacetime are sometimes conjectured to take the form of a 6-dimensional Calabi-Yau manifold that is built up from basic toroidal structures (see **Fig. 10**). This multi-dimensional space representation in physics, led to the idea of mirror symmetry, notably associated with so-called string or membrane-theory (M-theory). There is also the suggestive indication that the abovementioned 6 dimensions might be significantly associated with the 6-line coding of the *I-Ching* hexagrams.

## Electromagnetic Aspects of Dynamic Models of Consciousness

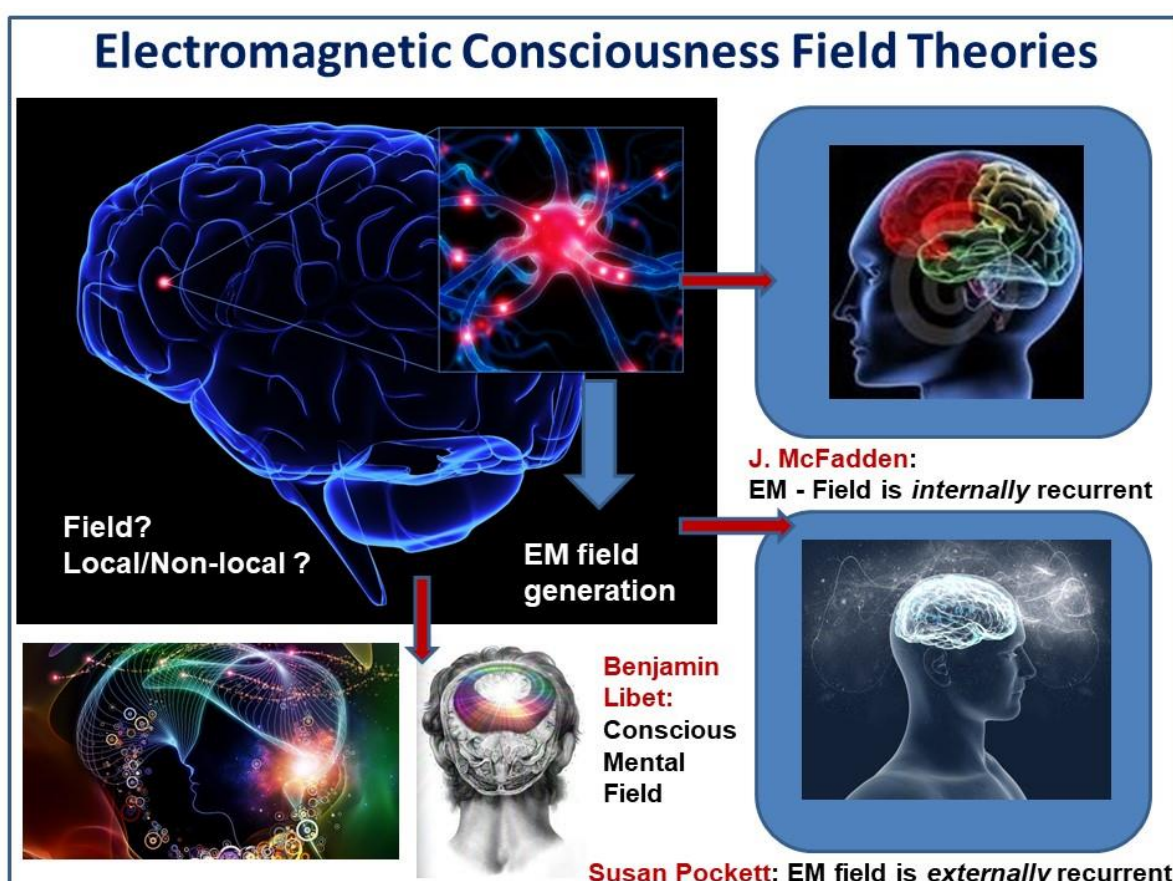
Many scientists have earlier suggested that basic information reaches our brain *from outside* (**Persinger et al., 2008, 2015; Grof, 1987; Jahn and Dunne, 2004; Tonneau, 2004; Wolf, 1985, 1999, 2008, Taneichi, 2015**), since the nervous system may also function as a receiver of subliminal signals. One could regard this as a physically defined “extrasensory perception”. In other words, we have to take into account a “sixth” sense in the form of a *vibrational, resonance sensitive macromolecular apparatus* in each of our cells (**Hameroff and Tuzcinsky, 2015**).

These receivers act as vibrational, resonance sensitive elements in cells and act as receptors and as emitters of quantum information, which functions as resonant oscillators with specific resonance frequencies, which are coupled with a natural quantum field (**Rouleau, 2014; Cifra et al., 2010; Meijer and Geesink, 2019; Bokkon et al., 2009, 2013; Dotta, 2013; Pereira and Furlan, 2007, Pereira, 2015; Persinger, 2008, Persinger and Lavalley, 2010**). The particular cellular sensors are composed of flexible three-dimensional structures of proteins, oligo-nucleotides and elements of the cell skeleton, that mutually communicate through discrete wave resonances and are sensitive to fluxes of photons, phonons, excitons and related quasi particles such as polarons (solitons) and polaritons. This bio-sensing apparatus of the cell, situated in an apparently electromagnetic cell, was tentatively called “*electrome*” (**de Loof, 2016**), and is under the continuous influence of natural occurring internal as well as external electromagnetic fields (**Meijer and Geesink, 2017, 2018, 2019**). In these recent studies we reported on a fractal series of discrete EMF frequencies that influence a wide range of animate and inanimate systems, are identical to frequencies that have been reported in cosmological studies and therefore likely represent a *spectrum of EM frequencies originating in zero-point energy field*.



We hold that this overall harmonic matrix of EM resonance produces quantum coherent vibration domains in aqueous brain compartments and intrinsic ions (**Geesink and Meijer, 2019**), proteins, DNA, in addition to membrane associated structures such as ion-channel and microtubular proteins. The particular macro-coherent wave connections are instrumental in creation of the *sub-conscious* brain function that maintains its information processing ability in the absence of neuronal transmission, for example in near death conditions. Yet this field-type of consciousness is absolutely required for bidirectional information transfer with the associated memory workspace and thus with the 3D to 4D interfacing with the universal consciousness realm (**see Fig. 12**), as it is reported in such ND experiences.

The latter all-pervading zero-point energy field potentially may resonant interaction with either life systems (**Setterfield, 2002; Laszlo, 2007; Keppler, 2012; Caligiuri, 2015**), or with physically defined mental dimensions (**Grof, 1987; Jahn and Dunne, 2004; Beichler, 2012b**). Also, bio-photonic type of communication (**Bokkon and D'Ángiulli, 2009; Dotta, 2013**), gravitationally sensing of information present at the Planck scale (**Penrose, 2014**) and even information projected from event horizons of black holes have been implied in such holo-fractal phenomena (**Maldacena and Susskind, 2013, Pourhassan et al., 2013**).



**Figure 9.** Current models of consciousness on the basis of long-range electromagnetic fields that may explain the simultaneous binding of distant brain nuclei involved in integral perception processes



In this respect it is worthwhile to mention that, based on quite solid evidence, the brain has been described as an electromagnetic workspace (**McFadden, 2007; Pocket, 2012; John, 2001, Fig. 9**). The universal force of electromagnetism controls all biological response” as **Hawking, 2010** noted in “A Brief History of Time”. Indeed, living systems are under the continuous influence of electromagnetic fields and it is proposed in the present paper that the native, non-trivial, photon/electron vibrations exhibited by such scalar fields are shared with resonating proteins and nucleotides that control cell function throughout the hierarchy of living system.

Of note, this inferred collective field concepts may constitute an interpretation framework for poorly understood phenomena such as mental states such as intuition, telepathy, far distance observation as well as near death experiences (see **Radin, 1997**) as well as near death experiences (**Beichler, 2012c; Bókkon et al, 2013**) and Psi phenomena (**Radin, 1997; Beichler, 2012b; Rousseau, 2011**), to mention only some of the many studies available on this topic (see later).

## **Evidence for a Supervening Resonant Mental Workspace in our Brain Function**

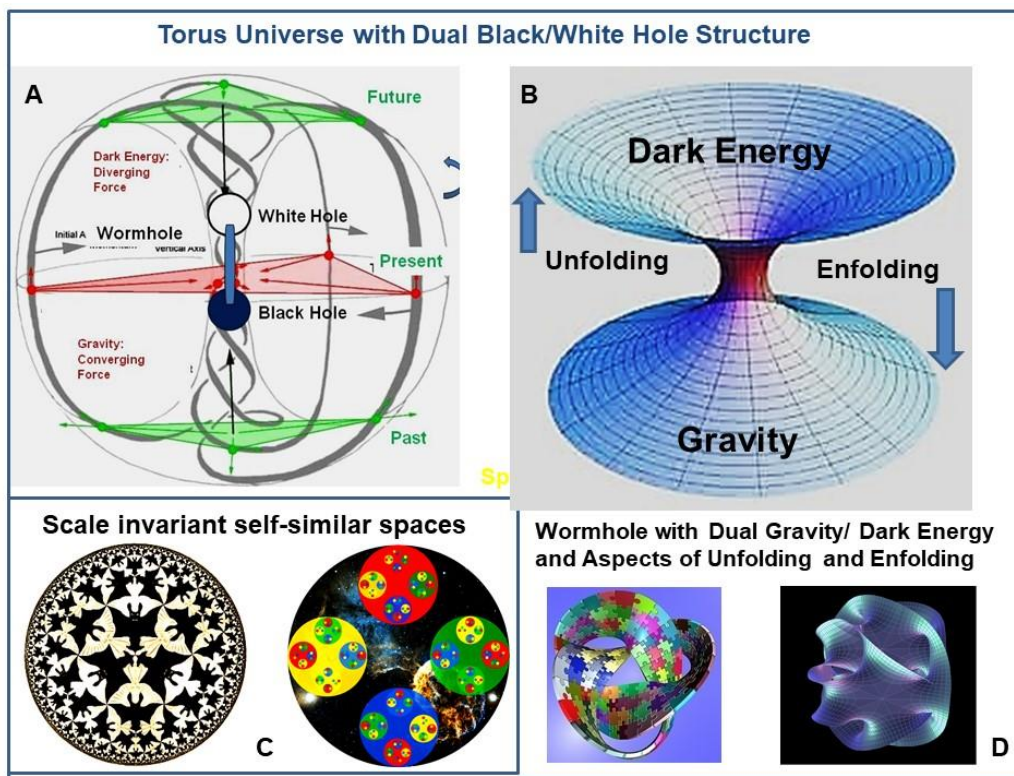
Subjective conscious experience exhibits a unitary and integrated nature that seems fundamentally at odds with the fragmented functional architecture of the brain that have been identified in neurophysiological studies, an issue which has come to be known as the *binding problem*. It is generally agreed that the supposed boundaries between these classical ” brain compartments” are arbitrary and that intentional and especially emotional factors influence the relative involvement of deeper layers of mind (also see for this aspect **Schwartz et al, 2005, Tammietto and de Gelder, 2010; Jahn and Dunne 2004, Rousseau ,2011, Meijer and Geesink, 2017; Beichler, 2012a**). This has become evident in a large variety of conscious states as influenced, for example: by emotional feelings, meditation, hypnosis, vivid dream states, rhythmic sound exposure, use of psycho-active agents and also in life- threatening events that induce near death experiences.

Furthermore, we postulate earlier that a dedicated part of the total brain activity is employed for the dynamic and ongoing construction of an *integral personal universe/worldview* (**Meijer and Korf, 2014**), *in which consciousness represents a meta-phenomenon* (**Linton, 2015**). Such an integrated representation of the outer world should not only include our individual ”autobiography” but also the intrinsic interactions with the external world, including the physical laws that determine it. It requires that we *recognize* our memories as true events as having relevance and significance for the present. The latter recognition aspect can only be realized if we see the present not only as a product of the *past*, but also as the anticipated (simulated) outcomes of multiple *future* projections. In other words there is no worldview of the present without probabilistic projection of our potential future and the latter implicitly signifies our long-term freedom of choice. Such an *internal* impression of the self, however, should be permanently validated via an integral and versatile external “state of art” of our Self that also should include potential subliminal and unconscious interactions, including time-retrograde (backward) projections of future events. The latter could be called ”remembering of the future”, a process that have been physically

defined and experimentally demonstrated earlier by **Aharonov, 2010**, in so called soft-stimulation quantum experimentation.

We submitted therefore, (**Meijer and Geesink, 2017**), that an *external* memory workspace is operating in the human brain in a 4-D setting (**Fig.6**). The latter can take into account the hidden interaction with all, natural, forces/fields and also can integrate symmetric time and thus an aspect of backward causation. The proposed field-sensitive information workspace could function as a *non-material and wave field-like* simulation domain for a spectrum of mental representations. These may undergo a superposition with the internal worldview, in order to monitor the quality of our individual being (**Fig. 6**). This “software-like” mental program should exhibit an extremely fast response time, make immediate selection within a spectrum of multiple simulations possible. It also should offer the integral organism an optimal qualitative and quantitative impression of the current state of the whole body as embedded in its environment and its development.

We envision such a monitoring system as *supervening* the basic neuronal communication networks, in order to generate a *global* type of a mental field (**Meijer and Geesink, 2017, Meijer et al., 2019**). By this guiding space-time domain, synchronic oscillations in the cortico-thalamic region of the brain would be induced through resonant coherent and condensed electromagnetic vibrations (standing waves) and/or attractor type of quantum information. The latter could, for example, be derived from non-linear and bidirectional interaction with the earlier mentioned stochastic zero-point energy field (**Keppler, 2012; Caligiuri, 2015**).



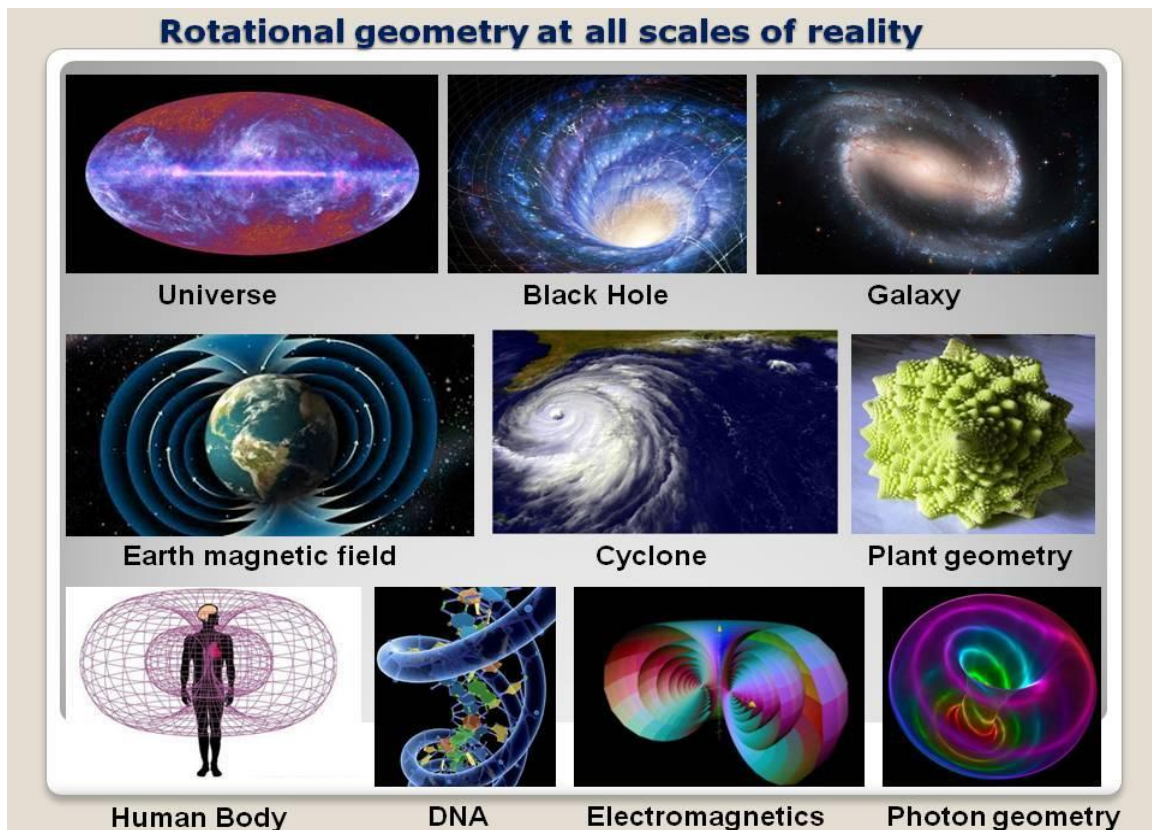
**Figure 10:** *Toroidal wormhole structure of the universe (A) with fractal features (C) that encompasses the aspects of Dark Energy (expanding force) and Gravity (compressing force) as well as Information-energy unfolding and enfolding (B). The Black Hole /White Hole transition may imply twisted ( strange loop) features as also present in multi-dimensional space models (D)*

## Cosmological Aspects of the Photonic Background Field

The findings on semi-harmonic EMF frequencies in life systems, may also be related to our previous suggestion (**Meijer and Geesink, 2016, 2018**) that the apparent musical harmony- like aspect of electromagnetic background field may reveal hidden variables of the so called implicate order as supposed to underlie our daily reality by David **Bohm, 1980, 1987**. The latter was later ascribed to zero-point energy field by **Lazslo, 2007, 2012**). If so, this implies that bio-molecular brain processes are coupled to a fine-scale structure of the universe, as suggested earlier by **Penrose, 2014**, and further defined in more detail by **Haramain et al., 2016**, as a unified, micro-wormhole entangled matrix on the Planck scale. Energy flow in the Universe may exhibit a toroidal patten throughout the various scales of its fractal structure (**Fig. 11**).

It is of great interest also that recent studies indicate that some black holes may predate the Big Bang on the basis of Bohmian quantum trajectories, do not exhibit a singularity and can function as a portal to another universe, by which implicitly the so called loss of information paradox is overcome (**Gambini and Pullin, 2013**). One of the models that was constructed presents the three-dimensional universe floating as a membrane (or brane) in a “bulk universe” that has four dimensions. The 4-D black hole would have an “event horizon” just like the known 3-D ones. The event horizon should be defined as the boundary between the inside and the outside of a black hole. In a 3-D universe, the event horizon appears as a two-dimensional surface. So, in a 4- D universe, the event horizon would be a 3-D object called a *hypersphere* (**Pourhasan et al., 2013**). The 4-D character of reality has been proposed earlier in many physics studies (**Sieb, 2016, 2018; Sirag, 1993, Smythies, 2003; Carter, 2014; Hardy, 2016;Tozzi andPeters, 2016b**).

The present paper, may directly contribute to an answer on the famous question of **Chalmers, 1995, 2019**: how can something immaterial like subjective experience and self-consciousness arise from a material brain? Yet, in order to rephrase this question we may wonder that if consciousness is indeed the most fundamental aspect of reality (**Zeilinger, 2003; Davies, 2007, Meijer, 2012**), how does consciousness result in the manifestation of matter? The, so called, panpsychism (every material object contains specific information), at first sight, may be a logical solution to Chalmers question, as put forward in the information integration concept of **Tononi et al, 2015 2016**. Yet the latter may rather be seen as a reductionist approach in the line of current materialistic physics, since one fails to envision the issue from the point of view of consciousness as *primary* (**Goswami, 1990; Kastrup, 2016, 2017, 2018; Keppler, 2012, 2013, 2016; Struppa et al, 2002; Pereira et al, 2015, Pregmolato and Pereira, 2016**).



**Figure 11.** Toroidal geometry shows identified structures in the whole cosmos, from macro-(left above) to micro (right below) scales of the fabric of reality. The inset, left below, depicts the supposed nested toroidal geometry of the human body, heart and brain.

Our brain model may also provide the potential for extra-sensory inter-individual communication and correlated brain signals (Hasson, 2012, Wackerman et al, 2003, Radin, 2004, Richards et al, 2005, Standish et al, 2004, Pizzi et al, 2004), since the postulated holographic workspace, projects its active information from a dedicated virtual screen in our brain, as described for event horizons in current cosmology. These projected multi-level fractal wave structures thereby contribute to the *integral wave function* of our universe (Fig. 4). The latter, in the form of the ultimate compressed information, in turn provides the necessary recipe for further evolution and a future rebirth of our universe, also operating in a toroidal rebound context, as treated earlier (see Fig 10, Meijer, 2012, 2015).

## Transcendental Experiences and the Resonant Mental Workspace

A closely related aspect of a event horizon memory workspace is labeled with the term *psi phenomena* such as clairvoyance, distant viewing, telepathy, psychokinesis and near death experiences (Tiller, 1990, Grof, 1987; Jahn and Dunne, 2004; Hameroff, 2012, Hameroff and Chopra, 2013; Rousseau, 2011, Lanza, 2012, Phipps, 2012, Carter, 2012, Venselaar, 2011).

The latter aspect is documented in thousands of international reports and nowadays open to scientific inquiry (Lake, 2015; Greyson, 2010, 2019; Schwartz et al, 2005; Bókkon et al, 2013, Hardy, 2016; Kastrup,



**2016; Schwarz, 2019**). The specific components of this experience, often with a long- lasting psychic impact on the recovered patient, include so called out of the body experiences, tunnel visions, and a remarkable clear and holistic state of awareness, verbally reported by the particular patients in retrospect. This is claimed to occur in the absence of the cortical activity that are normally shown in EEG's during vivid dream states. The typical descriptions of a felt dissociation from the body, in addition to an experienced *total life-panorama* (**Lake, 2015, Greyson, 2010, 2019; Schwartz et al, 2005; Pereira and Reddy, 2016**), as reported by a part of the NDE cases, may point at the existence of the radiant resonance mind field (**Meijer, 2013**), as considered in the present study. Such a "personal double" (**Vitiello, 2001**) that can largely influence cognitive brain function, is somehow persisting while other brain functions seem defective. This overall picture may indeed point at a supervening field character that is not directly dependent on normal brain activity and is open to the input of huge amounts of personal information apparently originating from an *external data source*. In our model (**Meijer and Geesink, 2017**), such a potential universal knowledge field would involve a fourth *spatial* dimension (see **Fig. 12**).

The particular holographic type of consciousness, situated in the particular event horizons as a sort of bordering memory domains, can effectively function as a nested information workspace, that in humans is instrumental in constructing a *mental model of reality for internal use in each individual*, thus functioning as a global reference system. It is instrumental in the overall monitoring of each individual (of any intelligent species that inhabits our universe). In addition, it should therefore be involved in the fine tuning with and updating of a supposed *universal consciousness*. The feature of quantum back-propagation can effectively implement a form of adaptive error correction (**Goncalves, 2017**), as has also been shown in the generation of cyclic/toroidal chaos by Hopfield networks (**Akhmet and Fen, 2014**).

The present model thus postulates a mental workspace in close connection to our brain. This raises a number of central questions: 1) is there a physical basis for such a workspace or should it be seen as an intrinsic mind/matter dualistic approach 2) If such a disembodied aspect of consciousness exists, how does it communicate with the physical brain? 3) If our brain is supervened by an updated inner projection of the outside world, and thereby tends to reduce "surprise", how does this affect free will (choice). With regard to the potential dualistic aspect, we stipulate that we consider our model as non-dualistic and, in this sense, agree with the Operational Architecture model of **Fingelkurz and Fingelkurtz, 2010, 2014** on separate phenomenal and neuro-physical aspects of consciousness, stating that *both aspects have an ontological relation but are not reducible to each other*. We respect the related concept of **Libet, 1994, 1996**, of a mind field, especially in relation to the aspect of retro-causality in conscious experience, but tend to disagree on his suggestion that "if such a field is defined by physics, it should be entirely different from presently known physical mechanisms" (see discussion by **Pockett, 2012, 2013**).

The implicit suggestion of a *non-material* and *extra-corporal* mental workspace, that supervenes our neural system and provides the dominant part of self-consciousness and may operate in addition to our daily experienced conscious state is supported by earlier and also more recent observations in fNMR studies that long term memory is *not correlated with scaled sizes of the brain*.



Savants with normal brain size can demonstrate a huge, disproportional, memory space (entire novels and even contents of telephone books are memorized in detail). Hydrocephalic patients that have only 5% of normal brain volume (micro-cephaly) can show quite normal intelligence and social behavior (**Forsdyke, 2014**). Other striking examples are patients with a largely destroyed forebrain that maintain a quite normal life (**Sasal et al, 2016**). Even the known split-brain patients that seem to develop two different types of consciousness in, the isolated, right and left *halves* of the brain, in fact show this aspect (**McGillchrist, 2016**). In addition, split-brain patients with disconnected hemispheres even perform better at some cognitive tests (see **Sasai et al, 2016**).

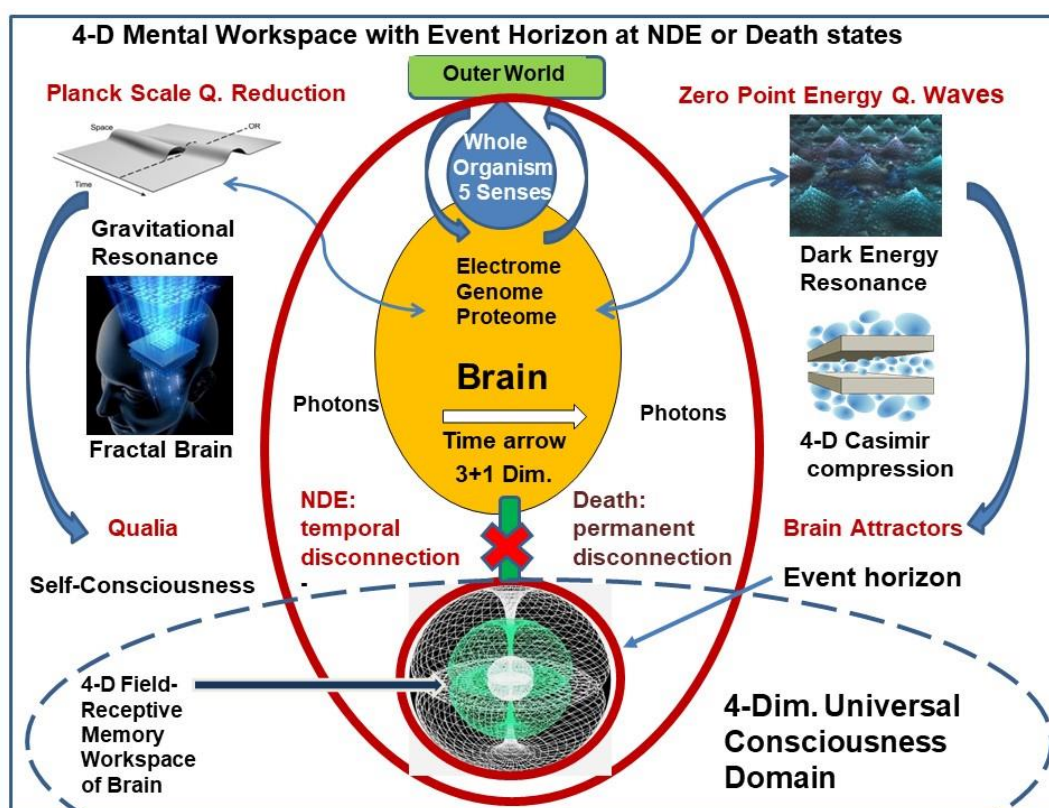
In more general terms, the aspect of non-material mental aspects of consciousness has been strongly pursued from neurological (**Nagel, 2012**), bio-physical (**Kepler, 2016**), philosophical (**Kastrup, 2016**), quantum-physical (**Henry, 2005**) and evolutionary viewpoints (**Grandpierre, 2014**). A recent paper of **Tononi (2016)**, reviewing the integration of information consciousness concept, mentioned an interesting view of **Sullivan (1996)**, that another type of consciousness becomes manifest in meditative states that in fact can be considered as rather information content-less, and could reveal a normally hidden part of consciousness that is normally masked or filtered away by the busy default activity of our brain (see also **Jahn and Dunne, 2004; Rousseau, 2011; Martin, 2013 ; Schwartz et al, 2005**). **Hardy, 2016**, takes a space-time approach by positioning individual consciousness and the Self in a *hyper-dimension* in which death is the just the severing of the link between this domain and the brain/body, leading to an independent holographic semantic field on a personal basis. The latter resembles the proposal of **Irwin, 2014**, seeing consciousness as a quantized space-time language that can be described by quasicrystal mathematics of the E8 geometry. It was also suggested that that self-consciousness could continue outside the body, but remains at the level of Planck-scale geometry, as related to generation of biophotons in which visual imageries are coupled to long term visual memory an NDE seems driven by visual processes (**Bókkon et al, 2013**).

It is of interest that **Tozzi and Peters, 2016b**, gave their work a much broader context by applying their hyperspace toroidal model and the Borsuk-Ulam theorem to a cosmological interpretation of evolution of our universe, in which the start of the universe is envisioned as a loss of dimensions from a multi-dimensional symmetric manifold, picturing a pre-big bang scenario. **Merali, 2008**, earlier commented on the doughnut-shaped universe concept (**Aurich et al, 2008**, see **Fig. 11**).

The striking similarity with the 3-D brain as a “personal universe” (**Meijer and Korf, 2013**), supervened from a 4D- toroidal hyperspace domain, again points to a scale invariant symmetry breaking as a dominant feature of reality. In this respect it was put forward earlier that a hyperspherical universe, in which the present universe is nested in surrounding a toroidal hypersphere, can directly be derived from Einstein’s relativity theory on the basis of a re-interpretation of the Klein-Gordon equation, as performed by the famous Italian mathematician Fantappiè (see **Galloni, 2012, Chiatti, 2007**).

As mentioned above, we tentatively add to this configuration a toroidal fourth dimension of self-consciousness in continuous contact with an extended consciousness or awareness continuum that is

defined by us and many others as *universal consciousness*. The latter aspect rejects the usual framing of a mental workspace as a dualistic concept, since we envision our proposal of the extended brain as being *derived* from universal consciousness, as the very source of all that exists (see **Goswami, 1990, Meijer and Raggett, 2014**). A similar discussion was raised in relation to the very elegant consciousness model of **Fingelkurz et al, 2010, 2014**, called nested operational architectonics of the brain. In this model it was postulated that an electromagnetic brain field (see also **Kida et al, 2016**, for a fractal representation) connects a mind-subjective space-time to a distant physical space-time.



**Figure. 12:** The mental workspace (bottom middle) as part of universal consciousness in a 4-dimensional domain. A temporal break connection is at stake in NDE experience and permanent disconnection occurs at bodily death

This all-pervading system represents a non-local and retro-causal space memory, operating via recursive information feed-back/feed forward processing of polarizable electromagnetic quanta of the vacuum (**Brown, 2018**). We may speculate that this represents a pre- big bang information domain, in the framework of biological cosmogenesis. Such a pilot wave system may also have exerted an ordering influence during (pre)-biological evolution, at all scales of the universe.

In our model, the fractal geometry of the torus takes a central position in brain physiology, as was also put forward by **Tozzi et al, 2015, 2016, 2017; Knierim and Zhang, 2012**. The toroidal generation (scattering) of quasi wave/particles such as polaritons and polarons (solitons) is a crucial aspect of information integration of the various force fields that are involved. Solitons have been proposed widely

as axonal information carriers in the brain (Wikipedia), in which myelinated nerve fibres function as light guides for solitons and bio-photons in this manner bridging electromagnetic and spin aspect of neural information processing (Kumar, 2016).

## The Event Horizon Consciousness Model in Relation to Afterlife and Immortality

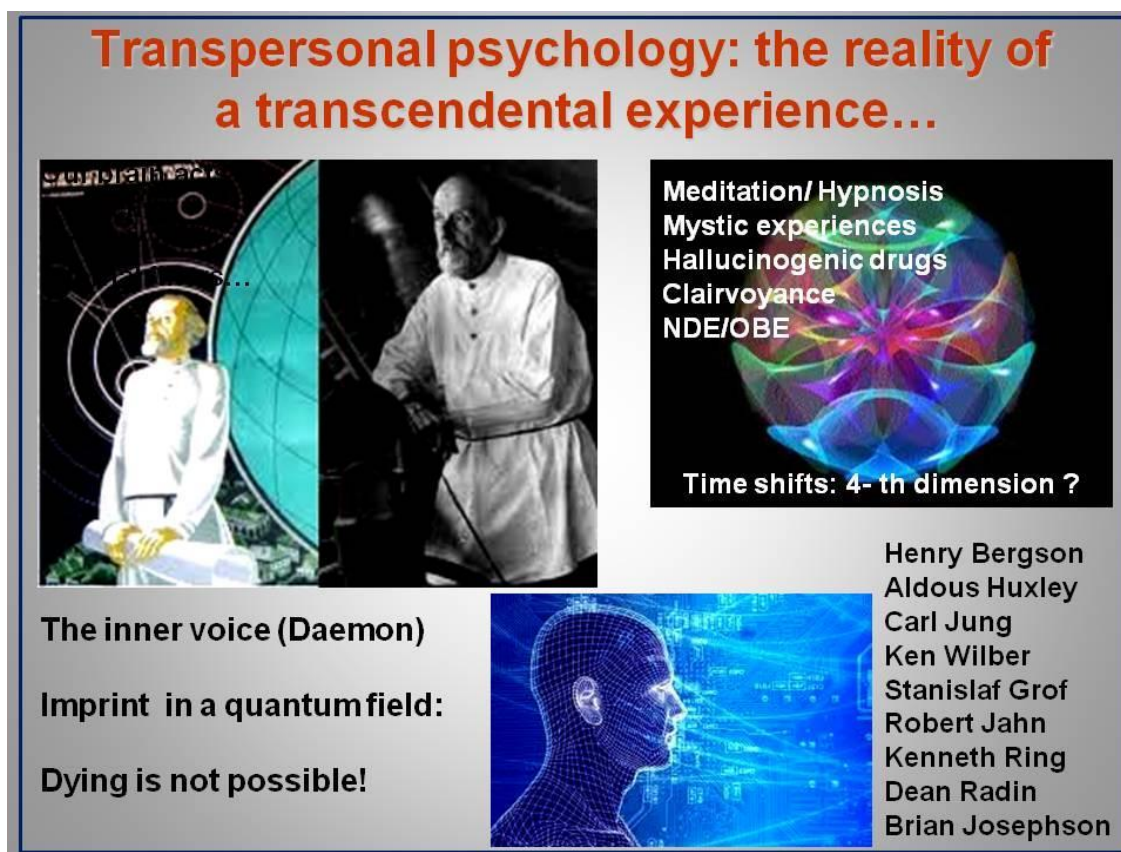
With regard to the second point on the communication item, we propose a multi-factorial informational connection on the basis of quantum holographic principles (see Fig. 6 and 12). Yet, all of the various communication mechanisms mentioned here are clearly *interrelated*. They include long range and bidirectional correlations of the supervening mental workspace with the physical brain through phase-locked quantum resonance, that is instrumental in the holonomic sharing of quantum information through 4-D to 3-D projection and phase-conjugation (Mitchell and Staretz, 2011). A similar multifactorial process has been proposed in relation to information conservation by event horizons of black holes (Van Raamsdonk, 2010; Pourhasan *et al*, 2013; Verlinde 2011, 2016).

If consciousness and in particular *self-consciousness* is related to permanent contact with the 4-D hypersphere information workspace (see also Prakash *et al*, 2008, Sieb, 2016, 2018, Taneichi, 2015), by which in fact probability is converted to meaning, this can be envisioned as a “storyline”, implying that consciousness can observe itself from a geometric distance. This aspect is crucial in the understanding of the earlier suggestion made by Penrose, that consciousness contains an intrinsic non-computable component. Zizzi and Pregiolato, 2013, stated in this respect that to approach the non-computable aspect, a sort of mathematical *meta-language* will be required. In other words: if self-consciousness observes the brain memory and awareness states, by this very act it changes both of them. The only possibility to address this paradox seems the potential to link or integrate past and future events in the framework of quantum approaches.

Relevant examples are the transactional interpretation of quantum physics of Cramer, 2004 and the, so called, soft quantum wave stimulation concept of Aharonov *et al*, 2010, 2013 in which future states interact with the past states to create the present, (treated in Meijer, 2012). In the bidirectional flow of energy according to re-interpretation of the Gordon-Klein mass/momentum/energy equation of Fantappiè and the retro-causality considerations of Auletta and Ellis, (reviewed by Meijer, 2012) such a mechanism is plausible. It is of interest that recent calculations of Song, 2007, indicate that consciousness should, at least partly, reside outside the brain and that it is *applied to the brain than rather than generated by it*, as also discussed earlier by Tonneau, 2004; Pregiolata and Pereira; Pereira and Reddy, 2016; Beichler, 2012 c; Pereira, 2015; Lanza, 2012; Lazlo, 2007, 2012; Berkovitch- Ohana, 2014). This is so, since the conscious activity of an observer observing the change of an observable is, per definition mathematically not computable (Song, 2007).

## Transcendental aspects of NDE: Preview of Afterlife?

The phenomenon of near-death experience also raises deep philosophical questions. This experience shows that consciousness, under those circumstances, apparently can observe a physical world without involvement of the normal senses. There are even documented cases in which during the near-death experience, observations were made by the patient at great distances from the body, that later were verified as being absolutely correct.



**Figure 13:** Transpersonal experiences: the researchers (bottom right), the techniques for them to arouse or experience (top right) and the postulate of the internal filters in our brains (top left). Personal information from a supposed quantum field, is experienced as clairvoyance or described as an inner voice (called "Daemon" in classical Greece philosophy).

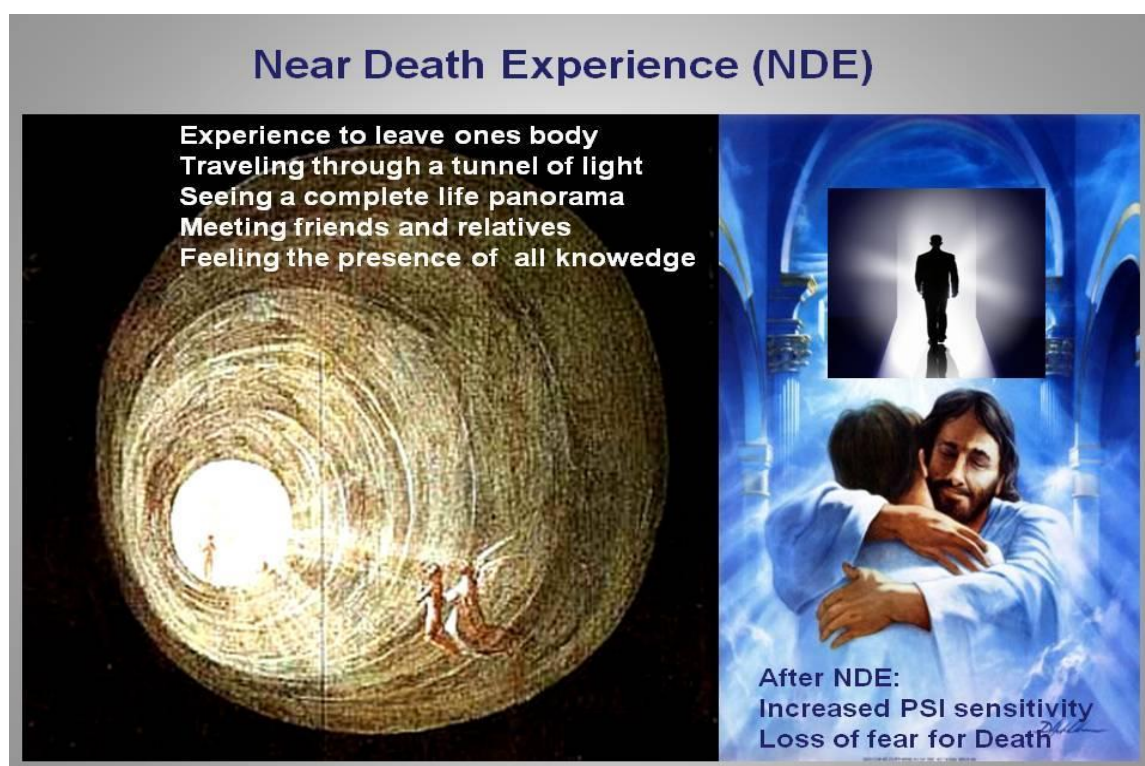
The question arises whether our normal sensory perceptions act as a filter for this kind of conscious extra-sensory perceptions. Transpersonal experiences has been studied by Greek philosophers referring to the "Daemon" as an inner advising voice, and more recently by a spectrum of renown scientists (**Fig.13**).

From the testimony of many persons reporting NDE, it is inferred that their perception during near-death experience is faster, broader, more realistic and pure of nature than during an ordinary dream. Also during the use of certain drugs, meditation and rapid change of gravity (falling down and traffic accidents), "out of the body" and NDE-like experiences are generated, but they do not have the quality and character



content of the expanded NDE experiences as they were in many cases reported (see **Fig.14**). Recently an interesting study was presented (**Venselaar, 2011**), in which the NDE is described fully physically as a 5-stage process that includes a) separation of photonic consciousness from the body, b)a journey to a tunnel of light after strong contraction involving mini- black hole and wormhole modalities and observation of cosmic structures, c)being at the presence of light at a border, having a life review and experiencing specific light shifts, d) a subsequent return to the body and e) final unification with the physical body.

“Life after life” is pictured as a being of light, due to the fact that damaged or dying atoms of our physical body release countless photons (light energy). Since our daily consciousness is connected to the brain, these exotic photons, are supposed to be transformed into another broader transcendent consciousness, in which such photons are indestructible. The particular photonic body is capable to 'carry' information about who we were and are.



**Figure 14:** *The general characteristics of a Near Death Experience*

#### **The panorama of life: better than memory ....**

Impressive is that during a near death experience, the patient is confronted with a full and bright panorama of his/her entire life, in which he/she is not only relives the life from his/her own ego perspective, but also from the perspective of each person with whom one has been in contact during one's lifetime. This experience from the perspective of the other, according to many of the NDE patients is complete, including the thoughts and feelings of every person who crossed one's path in life. Of note, the majority of NDE witnesses, subsequent to their profound experience, live a more conscious life, being



more open to others and more interested in the big questions of life,( see **Greyson, 2019; van Lommel; Carter,2012 Bokkon et al., 20132001, 2007; Pregnolato and Pereira, 2018, (Fig. 14).**

### **Is NDE only due to previously stored images in the brain?**

The extraordinary near-death experience of Vicky Noratuk showed that even blind people can see again during a near death experience! From her birth she had a shrunken eyeball and optic nerve and an undeveloped visual cortex. So even if there would be a yet unknown activity of the brains during the near-death experience, she did not possess a healthy sense organ that could transfer her visual impressions to her consciousness through the brain, nor a memory for detailed images. After she had her experience, she described this as "it felt like the place where all knowledge is". A faithfully executed study with 31 similar cases of blind vision (**Ring and Cooper, 1997**), revealed that blind persons, including those blind from birth, do report classic NDEs of the kind common to sighted persons. Further citing the article: "Thus, what we have here is an adumbration of a process that begins with Mind, fully independent of brain becoming self-referential, that is, becoming identified with consciousness itself, and then converting this noumenal consciousness into a dualistic modality that generates the familiar phenomenal world. What we have called transcendental awareness is at least the beginning of the reversal of that process by which, even though the traces of an everyday dualism remain, the individual is enabled, however temporarily, to experience the world from a perspective independent of brain functioning and the operation of the senses. Each of these theories formally entails such a state of awareness, and specifically in blind persons, during NDEs or OBEs".

The modern NDE research thus leads, just as investigation of reincarnation (see below), to the hypothesis that consciousness continues to exist in some form after death. Death, according to this hypothesis, is only an illusion. It is, in this consideration, only a transitional state to another form of conscious life, but without the experience of a physical body. According to some quantum physicists, such as Alan **Wolf, (1996,1999, and 2008)**, *dying is more precisely, not a transition to another phase, but rather every individual is at every moment of one's life already represented in the non-material dimension of the aforementioned quantum information field (Fig. 12)*. In other words, conservation of individual information is a continuous process and is permanent.

Many authors in consciousness studies conclude, after really exhaustive and scrupulous research, that in a manner not understood, some people (or detailed data on them) persist, at least temporarily, after their death. This, in some way, leads to the transfer of personal information to young children that become aware of this information and interpret it as their former life (**Braude, 2003; Phipps, 2012; Carter, 2012, and Wikipedia on Reincarnation**). It is clear that we arrive here at the borders of knowledge and that we experience something that is far beyond our present human understanding. Nevertheless, the phenomenon of children report is, in itself, established in thorough research, and despite the absence of a satisfactory explanation, is recognized as such in scientific circles, albeit without the notion that this represents a process of rebirth or reincarnation. An impressive report of a "skeptical" scientist is depicted in the link about reincarnation, that provides an interesting view on this possible modality of

immortality (**Phipps, 2012**).

The notion that can be inferred from the sections above, namely that consciousness of all living entities belongs to a collective "web of information", should implicitly be supplemented with the reverse side of this concept: that individual consciousness, through this interfacing, is just as much an expression of the universal (nonlocal) consciousness. In this respect we are, according to this quantum concept, truly part of the unity of nature, as Spinoza already postulated. These phenomena could also be related to an underlying non-local information field because they concern influences at a distance or messages from the future experienced by people. The central question is how for the necessary information for these phenomena can reach the brain and how these extra-sensory communication / perceptions occur from a mechanistic point of view. The latter is of great importance for future investigation, because it may provide answers to study the, well known, evading aspects at sequential PSI observations, as well how the signal strength of ESP experiences could be improved. Both aspects could be related to the inbuilt filters in our brain that should protect us against too much disturbing information (see **Jahn and Dunne, 2007, Radin, 1996, 2006, Kastrup, 2016, 2017, 2018**).

The entity that we define as consciousness, the soul, or the self, (that which makes me who I am), does not stop existing just because someone has entered the period beyond death" (**Parnia, 2013**). Therefore, since science cannot explain the source of the most basic characteristic of "waking" consciousness, the sense of self, this opens the door for a new hypothesis. Does "waking consciousness" independently take shape as the result of brain-based abilities that arrive around ages two to three? Or does it result from adaptation of an already present "consciousness" to life on earth as cognitive brain faculties become active and our experiences expand? Of note, the idea that self-awareness may originate outside the brain is not new. The idea of the "self" was our most prized, yet unexplainable, possession reaches back to Greek philosophy. **Parnia, 2011** seems to convey immortality on the new entity. As such, it reasonably might be expected to possess a unique identity of its own. Would this then continue to serve waking consciousness as our perceived self-identity? Remember that we normally are not aware of memories stored in our right cerebral hemisphere hence we forget the source of our self-identity. *Personal information from a supposed quantum field, is experienced as clairvoyance or is also described as an inner voice (called "Daemon" in classical Greece philosophy.* As early as 1994, the Nobel Laureate and Australian neurophysiologist Sir John **Eccles, 1994** claimed, "The odds are 10 to the power 10.000 against the uniqueness of the individual self being derived from the genetic uniqueness that built the associated brain. The uniqueness of the individual self must therefore arise from some "external source".

But is this also true for the personal wave information, that is the non-material aspect of these atoms/elementary particles. In other words, is this information destroyed? Some quantum physics claim that information cannot be lost (the law of conservation of information) and that due to entanglement of the wave type of these building blocks, the personal structure and functional organization of individual life will survive bodily death (see the references of **Wolf, 1989, 1999, 1990 Hameroff and Chopra, 2013**). As the consequence of the persistent storage of this information in the universal quantum field, together with the total imprint of our personal experiences (our complete biography) in this domain, the personal

profile would be retained and would also be available for resurrection (**Tipler, 1996, Hameroff and Chopra, 2013**) and, in principle, may be maintained for a later reincarnation.

Could consciousness exist outside the body after death? The latter authors believe it can: "According to the Orch- OR consciousness model, under normal conditions in an intact, healthy brain, consciousness occurs as frames or snapshots extending through multiple spatiotemporal levels from networks to neurons to microtubules to quantum forces (see also **Meijer and Korf, 2013**), down to and including Planck scale geometry. When the blood stops flowing and metabolic energy can no longer drive microtubule quantum coherence, quantum information relating to the subject's conscious experience and memory isn't necessarily lost or destroyed, but may dissipate to the universe at large, remaining entangled as a unified soul-like entity grounded in Planck scale geometry. If the body is resuscitated, the quantum information can return, and the subject may report an NDE or OOB experience. If the body is not resuscitated and the patient dies, the entangled quantum information constituting the subject's consciousness and memory may persist in spacetime geometry, perhaps entering an embryo in the context of reincarnation". Could the universe – empty spacetime geometry – conceivably host consciousness on the loose? There is ample energy in the form of zero- point fluctuations, so the question is whether information can be registered in the nothingness of spacetime, and transcend from Planck scale to biological scale. Many will see this daring hypothesis as an empty speculation or, at best, an understandable illusion, but for others it will provide wide perspectives for potential answers to an ancient quest of mankind, regarding individual survival and the reality of afterlife (**Carter, 2012**).

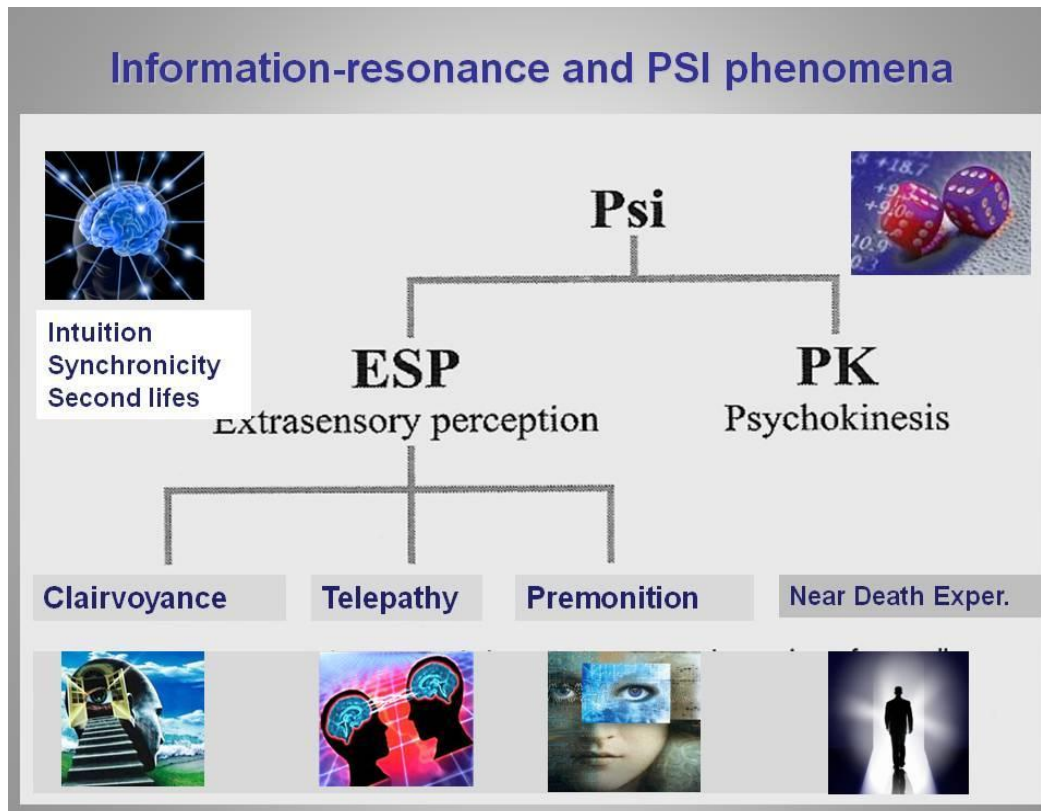
### **Extra-sensory Perception: Information from Another Domain?**

Examples are, the fairly normal, (trans)-personal feelings of intuition, serendipity, synchronicity as well as feelings of "high", and dreams (**Fig. 13 and 15**). But, also, more "transcendent," or paranormal aspects such as channeling, out of body experiences and near-death experiences (NDEs) might be discussed in this framework (**Radin,2006; Jahn and Dunne, 2006; Braude, 2003; Kastrup,2016; Carter, 2012**). The general question here is whether the so called "normal" and "beyond normal" experiences are so sharply separated and whether they do not constitute a continuity of reality.

The quantum consciousness models treated above may also be instrumental in the explanation of a number of so-called transcendental experiences in the category of PSI phenomena (see **Fig. 15,**) such as clairvoyance, telepathy, remote viewing and psychokinetic. These phenomena could also be related an underlying non-local information field because they concern *influences at a distance* or messages from the future, experienced by people. The central question is how for the necessary information for these phenomena can reach the brain and how these extra-sensory communication/ perceptions occur from a mechanistic point of view.

It is important to note that much of PSI / ESP research in this field is carried out at a scrupulously accurate manner (**Schwarz, 2019**), to exclude any form of statistical bias and misinterpretation. Yet, this research

is often focused on the direct detection of, so called, paranormal phenomena and less on the underlying physical mechanisms of information transfer. The latter is of great importance for future investigation, because it may provide answers to study the well-known evading aspects at sequential PSI observations, as well how the signal strength of ESP experiences could be improved. Both aspects could be related to the inbuilt filters in our brain that should protect us against too much disturbing information (see **Jahn and Dunne, 2007, Radin, 1996, 2006,**).



**Figure 15:** Various forms of extra- sensory perception and Psi phenomena

## How Information Is Received in Brain: a “Dual Filter” Hypothesis

The modern scientific understanding of mental phenomena asserts that the brain is the sole causal agency of mind. This view is substantiated by the correlations ordinarily observed between subjective mental states and objective brain states. Yet, there is an increasing amount of evidence suggesting that, under certain extraordinary circumstances, the correlation between peak subjective experiences and brain-states breaks. This strongly indicates either that the brain is not the sole causal agency of mind, or (and more likely) that it is not a causal agency at all.

An alternative hypothesis for the relationship between the mind and the brain was put forward by **Kastrup, 2016, 2017, 2018**, that is entirely consistent with current neuroscience data and increasingly supported by the latest scientific evidence. The latter author deserves credit for highlighting the crucial

aspect of idealism again in science philosophy (see for a splendid dialogue with some renown materialists **Kastrup, 2019**). The particular hypothesis explains not only why brain states are, ordinarily, tightly correlated to mind states, but also how, under extraordinary conditions, subjective experience can occur independently of the brain. The theory offers a rational, evidence-based, yet fundamentally different perspective on the nature of consciousness, life, identity, and death than that offered by materialism. The following section provides a compilation of Kastrup's ideas.

There is an undeniable correlation between brain states and subjective experience. Alterations of consciousness accompanying physical trauma to the brain, as well as the use of anesthetics and psychiatric drugs, are also examples of the tight link between mind and brain that many of us are personally familiar with. Laboratory studies have provided evidence that this correlation is even more specific than one could infer from direct experience: particular conscious experiences have been linked to specific neuronal activation patterns in the brain (**Metzinger, 2000**). Experiments with Transcranial Magnetic Stimulation (TMS) have also demonstrated that deactivation of specific brain regions correlates tightly to specific changes in subjective experience (**Pascual-Leone et al., 2002**). Therefore, any theoretical hypothesis purporting to explain the ontological status of mind must be able to explain why and how subjective experience seems, ordinarily, so tightly correlated to brain processes.

Much of the neuronal processing in our heads, entailing the exact same kind of neurons that otherwise lead to awareness, is completely unconscious (**Eagleman, 2011**). Such seemingly insurmountable difficulty in logically deducing the qualities of experience from the properties of matter is called 'the explanatory gap' (**Levine 1999**), or 'the hard problem of consciousness' (**Chalmers 2003, 2019**).

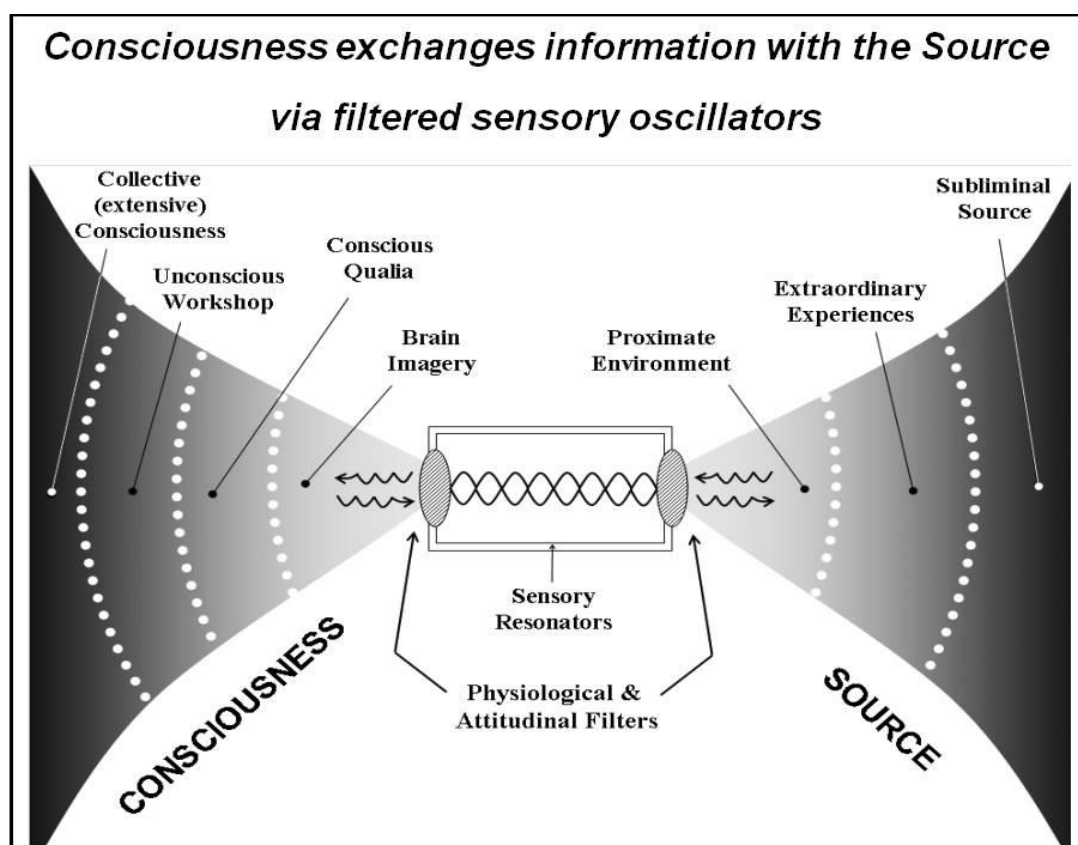
Now, if consciousness is primary and irreducible, then the brain cannot be the causal agency of mind; mind must exist *a priori*, ontologically preceding the brain. How can we then explain the empirical observation that, ordinarily, mind states correlate tightly to brain states. The hypothesis here is that the function of the brain is to *localize* consciousness, pinning it to the space-time locus of the physical body. In doing so, the brain *modulates* conscious perception in accordance with the position and perspective of the body in space-time. Indeed, there would be clear survival advantages for the brain to evolve to do just that: by localizing and modulating subjective experience according to the space-time locus of the body, the brain coaxes mind to identify itself with the body and, therefore, contribute actively to the body's survival.

According to the so called 'filter' hypothesis of mind-brain interaction, as earlier proposed by **Jahn and Dunne, 2004**, (see **Fig. 16**), no subjective experience is ever created by the brain, but merely *selected* by it according to the position and perspective of the body in space-time. This selection process is akin to a '*filtering out*' of conscious experience: analogous to how an analog radio receiver selects, from among the variety of stations present concurrently in the broadcast signal, that which one wants to listen to; all other stations being filtered out and never reaching the awareness of the listener. As such, all subjective experiences exist *a priori*, irreducibly; the brain merely selects those that are useful for the survival of the physical body. The brain activation patterns that ordinarily correlate to conscious experience reflect the



filtering process at work: They are analogous to the circuit oscillations in the radio's tuner, which correlate tightly to the sounds the radio produces.

The presence of such circuit oscillations obviously does not mean that the radio is *generating* the broadcast signal itself, but merely selecting a subset of information from a preexisting signal. Analogously, brain activation patterns do *not* mean that the brain is generating the correlated conscious experience, but merely *selecting* it from a broader, irreducible superset (see again **Fig.5**).



**Figure 16:** The dual filter hypothesis: The human brain filters conscious information states such as qualia from the collective consciousness field (left), but at the same time it filters subliminal information by attitudinal behavior, modified from **Jahn and Dunne, 2004, 2007**

Therefore, the ordinarily observed correlation between brain and mind states is a direct and necessary consequence of this selective filtering out of subjective experience: when the filtering mechanism (i.e. the brain) is interfered with – physically, as in a blow to the head, or chemically, as during anesthesia– the filtering process that modulates our conscious experience is perturbed, so that corresponding perturbations of experience follow ( **Fig. 5**). In conclusion: the hypothesis offered here remains consistent with all observed correlations between subjective experience and measurable brain states.

For there to be a survival advantage in capturing an otherwise unbound consciousness within the space-time confines determined by the brain, consciousness must have materially-irreducible causal efficacy on brain function. In other words, there must be downward causation from consciousness towards brain

structure and/or activity, otherwise consciousness would be merely a useless ‘spectator’ providing no survival advantage. As it turns out, there is indeed significant empirical evidence that downward causation does occur. Experiments have been performed in which subjects could physically alter their own neuronal wiring – thereby reversing previously diagnosed brain pathologies – simply by directing their conscious intent (**Schwartz and Begley, 2004**). This surprising effect is known as ‘self-directed neuroplasticity,’ and it suggests that conscious intent is not only ontologically independent from, but can also causally affect, brain activity and structure, thereby potentially tilting the survival fitness of an organism.

The first aspect of a ‘dual filter’ hypothesis, as proposed in the present paper, implies that consciousness, in its unfiltered state, is unbound. As such, consciousness is fundamentally unitary and non-individualized. The emergence of multiple, separate, and different conscious perspectives, or egos, is a consequence of the filtering process: different egos, occupying different points in the fabric of space-time, retain awareness of different subsets of a universal superset of all potential subjective experiences; the rest being filtered out. It is the differences across subsets that give each ego its idiosyncratic characteristics, personal history, and sense of personal identity. The part of the universal superset of subjective experiences that is filtered out becomes, then, the unconscious mind of the respective ego. Since each ego retains only an infinitesimally small part of the universal superset.

Importantly, the ‘filter’ hypothesis predicts that one can conceivably have experiences that do *not* correlate to one’s brain states. Since here the brain is seen merely as a mechanism for filtering out experiences, it is conceivable that, when this mechanism is interfered with so as to be (partially and/or temporarily) deactivated, one’s subjective experience could delocalize, expand beyond the body in time and space, and perhaps even beyond time and space as such. In other words, the ‘filter’ hypothesis predicts that transpersonal, nonlocal experiences can conceivably happen when particular brain processes are (partially and/or temporarily) *deactivated*. The key element of this second prediction of the ‘dual filter’ hypothesis is that non-local, transpersonal experiences are predicted to correlate precisely to certain *reductions* of brain activity.

Moving now to the second key prediction of the ‘dual filter’ hypothesis, there is indeed a broad pattern of empirical evidence associating nonlocal, transpersonal experiences with procedures that *reduce* brain metabolism (**Fig. 17**):

**a)** Fainting caused by asphyxiation or other restrictions of blood flow to the brain is known to sometimes induce intense transpersonal experiences and states of non-locality. The highly dangerous ‘chocking game,’ played mainly by teenagers worldwide, is an attempt to induce such experiences through partial strangulation, often at the risk of death (**Neal, 2008**). Erotic asphyxiation is a similar game played in combination with sexual intercourse. The effect has been described as ‘a lucid, semi-hallucinogenic state [which,] combined with orgasm, [is said to be] no less powerful than cocaine’ (**Shuman, 2007**)

**b)** Pilots undergoing G-force induced loss of consciousness (G-LOC) – where blood is forced out of the brain, significantly reducing its metabolism – report experiences similar to the notoriously nonlocal and transpersonal NDE (**Whinnery and Whinnery 1990**);

## The Science of Self-transcendence and Neurotheology, How to Promote Mystical Experiences and Perception of Universal Consciousness

### Self-transcendence correlates with brain function impairment

B. Kastrup, 2017, J. Cognition and Neuroethics, 4, 33-42 and Sc. Am.



- Cerebral Hypoxia: Holotropic Breathwork, program. hyperventilation
- Deep Meditation: Long-term meditation practicing by monks
- Physiological Stress: Near Death experiences, G-force, fainting
- Electromagnetic inhibition: Transcranial magnetic stimulation
- Trance- induced inhibition : Psychografic imaging by media
- Chemical inhibition: Psychedelics : DMT, Psilocybine, and Ayahuasca
- Stroboscopic light therapy inducing release of de DMT in the pineal gland

**Figure 17:** Various conditions that reduce overall brain activity can promote perception of universal consciousness or mystic experiences

c) The technique of “Holotropic Breathwork”, as well as more traditional Yogic breathing practices, use a form hyperventilation to achieve a similar effect: They increase blood alkalinity levels, thereby constricting blood vessels in the brain and causing hypoxia and dissociation (**Rhinewine and Williams, 2007**). This, in turn, reportedly leads to significant transpersonal, non-local experiences (**Taylor, 1994**).

d) Psychedelic substances have been known to induce highly complex, intense, non-local, transpersonal experiences (**Strassman et al. 2008**). It had always been assumed that they do so by exciting the parts of the brain correlated to such experiences. Yet, a very recent study has shown that psychedelics actually do the opposite. The study reported that ‘profound changes in consciousness were observed after [the administration of the psychedelic], but surprisingly, only . in cerebral blood flow were seen. (**Carhart-Harris et al. 2012a**) Indeed, the researchers ‘observed no increases in cerebral blood flow in any region (**Carhart-Harris et al. 2012b**). Even more striking, they reported that ‘the magnitude of this decrease [in brain activity] predicted the intensity of the subjective effects.’ (**Carhart-Harris et al. 2012:1**) In other words, the intensity of the experience was *inversely* proportional to the activation of the brain, precisely as predicted by the ‘filter’ hypothesis;

e) The use of Transcranial Magnetic Stimulation (TMS) can inhibit cortical function in highly localized areas of the brain by extinction of the associated electromagnetic fields. When the neuronal activity in the angular gyrus of a patient with epilepsy was inhibited in this way, Out of Body Experiences (OBEs) were reportedly induced (**Blanke, 2002**).

f) If the trend above is consistent, we should be able to extrapolate it further: Brain damage, through deactivating certain parts of the brain, should also induce non-local, transpersonal experiences under the right circumstances. And indeed, this has been reported. Two prominent examples are the case of neuroanatomist Dr. Jill Bolte **Taylor, 2009**, who underwent a profound transpersonal experience as a consequence of a stroke, and a systematic study recently carried out in Italy (**Urgesi et al. 2010**). In the Italian study, patients were evaluated before and after brain surgery for the removal of tumors. Statistically significant increases in feelings of self-transcendence were reported after the surgery.

g) Treated before, Near-Death Experiences are the ultimate example of non-local, transpersonal experiences associated with not only reduced, but *absent* brain activity. Evidence for the validity of NDEs continues to be collected under scientific protocols, and has been mounting (**Greyson, 2019, Greyson and Kelly, 2009**). The pattern here is not only clear, but striking. The most complex, coherent, intense, non-local, and transpersonal experiences people report are associated precisely with reductions, or even elimination, of brain metabolism. This is consistent with the ‘filter’ hypothesis discussed here, and contradicts the materialist assumption.

### Conclusions of this section

The broad pattern that associates peak transpersonal, non-local experiences with reductions in brain metabolism seems to contradict the tentative, promissory materialist solution to the mind-body problem. Instead, it substantiates the notion that the brain is a kind of ‘filter’ of consciousness, which selects from a universal superset of irreducible subjective experiences those which correlate with the space-time locus of the body. It is reasonable to think that there were survival advantages for the brain to evolve this capacity, which the empirical evidence for downward causation further substantiates. This ‘filter’ hypothesis explains how traditional techniques for the attainment of transpersonal insight work: by reducing the activity of certain brain regions, they (partially and/or temporarily) take the filtering mechanism offline, allowing consciousness to de-clench and expand beyond the space-time locus of the body. From this perspective, physical death is not the end of consciousness, but its liberation.

## Final Conclusions and Summary

In treating hard problems in consciousness conceptions (**Chalmers, 2010, 2019**), we should formulate the proper scientific question: why do we propose a mental consciousness on basis of a 4th dimension? In the present work, we advocate an extra spatial dimension together with symmetrical time concept, thus a bidirectional arrow of time. We also emphasize the importance of proper definitions: one should clearly differentiate between *consciousness in general* (awareness due to integration of information from the environment that all living beings have in order to survive and that is for 90% automatic or subconscious)

and *self-consciousness* representing the ability that we can be conscious of being conscious and can perform introspection. The latter requires an extra degree of freedom, like a certain distance to ourselves and thus an extra 4th spatial dimension.

The memory workspace that is conceptualized in the present study is called mental, since it is not observable and according to known principles of physics can be localized in a 4th dimensional (see **Fig. 11**). Why is such a construction necessary anyhow? This is in order to communicate with the supposed mental, and 4th dimensional universal consciousness. In fact, the event horizon workspace takes care of interfacing a purely mental domain with a 3-D material brain. The 4-D downscaling to 3-D world occurs by known holographic principles: our 3-D brain only collects the shadows of a 4-D mental world (**Deli et al, 2019**).

In order to treat NDE experiences anyway, we depend on material verbal report of NDE experiencers. At the same time some of us can feel the 4-D world in meditative introspective conditions and other special conditions as treated above, that is, if the normal filter for such experiences of our material brain is somehow removed (see previous section on alternative filter hypothesis). The mechanism of holographic communication occurs by wave inference of photons and solitons as known from ZPE field. This latter is an immaterial and not observable *wave phenomenon* that exhibits mental properties. It can be conceived as a reality-steering implicate order, that entertains pilot waves and their implicit back reaction. The latter implies a non-static and permanently updated universal consciousness to which all individuals contribute through bidirectional information flux. Self-consciousness of humans, thus, depends on contact with a 4-D personal workspace that we conceive as mental and, as such, is an integral part of 4-D universal consciousness. This pictures how our 3-D material brain can interact and communicate with the 4th dimension. Therefore, the definition of **Fingelkurz, 2010, 2014.**: it can be seen as a mental workspace associated with the brain but not reducible to the brain (not produced by the brain!).

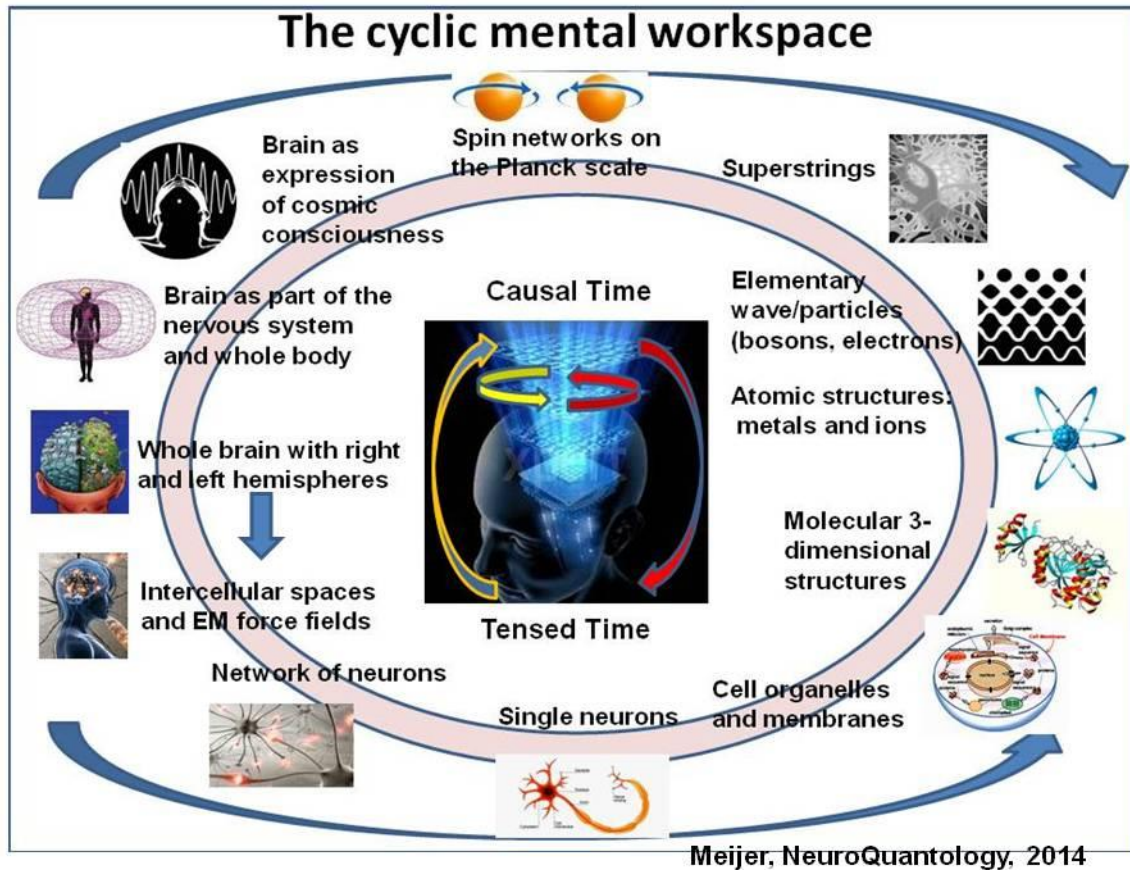
The latter implies a potential independence of this personal memory workspace from the material brain (**Fig. 17**), that becomes manifest if connection with the material brain is temporarily disconnected (NDE) or permanently broken down (Death) (see **Fig. 11**). In reverse, we can faithfully hypothesize that NDE experience is a direct and strong demonstration of the existence of universal consciousness, since it displays individual life panorama's and deep visions not explainable by material modalities.

*Here is what the NDE reports tell us about space and time:*

- Time does not run in the usual way; instead there is an experience of an eternal now.
- Time does have representation of past, present, and future states, but not as a unidirectional; flow, such as we experience here. Instead, different times correspond to different locations in a multidimensional space which is reported to be higher than the usual four of space-time.
- An observer located within the universal consciousness, is able to simultaneously view segments of the past, present, and future at will (the future is at times reported to be fuzzy).
- Space has a form of reality in the universal consciousness realm, because entities are experienced in perception to be separated from each other, and at varying degrees of separation.



- One of the remarkable features of the function of consciousness operating within the universal domain is that our integral mental workspace or “the soul” is able to move about and across any “distance,” however great it appears to be, with apparent instantaneity.



**Figure 18:** The mental workspace associated with the brain is an integral part of a cyclic or spiral arrangement of vibratory elements from the micro- (right part) to macro level (left part), indicating that cosmic consciousness can be conceived as producing matter and vice versa through a common field : the spin network at the Planck scale (from **Meijer, 2014, 2015**)

The main thesis of this article on the nature of space, time, and consciousness is that in science and philosophy the dominant paradigm of materialism should accommodate ongoing research that implies materialism is incomplete for explaining all of reality. This, in spite of the recent claim that “consciousness is a state of matter” (**Tegmark, 2015**). For this peculiar concept the author did make a special invention: that of a supposed “perceptronium”, being a hypothetical *substance* that *feels* subjectively *self-aware* and stores and processes information....., and, ultimately, may turn out as Tegmark’s own “discovery of mind”.

Thus, the treated reports from NDE/OBEs and paranormal phenomena imply that there is a reality hidden from ordinary materialistic sense perception that informs our brain and mind to form true knowledge. The latter process requires a physically defined interfacing of a 4-D realm with our 3-D world. This unique

*feature can be realized by a toroidal event horizon workspace that allows symmetric 4-D to 3-D information flux and holographic 2-D personal memory integration. A further pre-requisite for information transfer between the sub-conscious brain and the associated workspace is non-neuronal information processing under NDE conditions at a flat EEG.*

This combination of physical aspects of NDE (mental/physics bridging) presented here, is broadly supported in current literature with respect to harmonic brain oscillations (**Atasoy, 2018, Deli et al, 2019**), the concept of a mental workspace associated with the brain (**Fingelkurz, 2016, Hardy, 2018**) and the aspect of a fourth spatial dimension in brain function, (**Tozzi and Peters, 2016**) as well as that of toroidal geometry of brain function (**Tozzi and Peters, 2017, Deli et al. 2019 and Atasoy et al, 2016**).

In his thesis on the beginning and end of our Universe, **Vidal (2012)** stated: “But how can we imagine to seriously care for such an issue as cosmological immortality? We can summarize five steps towards it. The first is to realize that your individual death is normal and inevitable in the long term. The second is to develop psychologically, and fulfill all your needs to grow the hierarchy of needs up to the need of self-transcendence. You then surpass yourself to become compassionate and identify with the process of cosmic evolution. Even if you accept individual death, you still refuse death as a whole, namely the idea that nothing would continue to evolve after the predictable death of your body, society, species, Sun, galaxy and universe. You then set the immortality of the evolutionary process as a goal”.

Finally, **Schwarz, 2019**, in a lucid report recently postulated: “In mind/body research particularly, the issue of consciousness has attained a new prominence, as evidenced by the growing number of placebo studies, research on meditation mindfulness and its effects on the brain, and its practical use in things like posttraumatic stress disorder (PTSD); studies on the role of psychophysical self-regulation in healing; prospective research on near-death experiences (NDE); studies suggesting the reality of reincarnation; and research into the relationship of genius and spirituality. The great irony is: from where does an Einstein, a Newton, a Planck, a Ramanujan, a Jung, a Salk come? The answer, as each of them has said quite clearly, is that their great insight came in a special state of consciousness, when all things seemed interconnected and interdependent and out of space and time. Those individuals who produce extraordinary research do so not by force of intellect or will alone, although these are important, but because they have had nonlocal intuitional insights *at the same time that there was a crisis*. What makes these key figures revolutionaries, then, is not just the quality of their work. They are also revolutionaries because of the source, mechanism unknown, from which their information derives. At the deepest level the process by which the information is obtained is as revolutionary as the information itself. Second, the already recorded 13 million near-death experiencers will increase in number thanks to increasingly sophisticated acute care medicine and cardiopulmonary resuscitation.....We are moving into a new world!”

Dirk K F Meijer, Groningen, 11-10-2019

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