

# TGD Based Model for OBEs

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### Abstract

Out-of-body experiences (OBEs) are often understood as experience of seeing oneself from a position outside of the body. OBEs are poorly understood in the framework of neuro science and pose a challenge for the reductionistic world view.

In TGD framework the notion of magnetic body provides an attractive starting point in attempts to understand what OBEs and related experiences are. The basic idea is that magnetic body serves effectively as a mirror defining a third person view as a cognitive representation also in ordinary wake-up state and that during OBEs this representation becomes sensory representation. Magnetic body need not always be a personal magnetic body but could correspond to a magnetic body receiving information from several brains (collective consciousness), magnetic body of another person, or be even associated with “dead” matter.

The progress in identifying dark matter as a phase of matter with large value of Planck constant making possible macroscopic quantum coherence has led to the vision about dark matter at magnetic flux quanta as quantum controller of ordinary matter in living systems. The Bose-Einstein condensates of dark photons decaying via decoherence to ordinary photons mediate interactions between ordinary and dark matter and the hypothesis is that dark photon “laser” beams from body and brain reflected at magnetic flux quanta give rise to third person aspect of consciousness which in OBEs and related experiences are realized as sensory representations. The identification of bio-photons as end products of the de-coherence of dark photon beams is natural.

Zero energy ontology and the notion of causal diamond (or CD defined roughly as the intersection of future and past directed light-cones) brings additional quantitative ingredients to the model. Sub-CDs define imbedding space ( $M^4 \times CP_2$ ) correlates for selves and by holography the 2-D partonic 2-surfaces at the light-like future and past boundaries of CDs are the ultimate space-time correlates for mental images. The moduli space for CDs makes possible a more detailed view about sensory representations.

A further new element is the vision about life as something in the intersection of real and p-adic worlds. The most important outcome is that the notion of number theoretic entanglement negentropy making sense in this situation is positive so that entanglement carries conscious information. The fusion of selves (in particular mental image) by negentropic entanglement is experienced as expansion of consciousness. It is negentropic entanglement between parts of biological body and corresponding parts of the magnetic body and biological body which makes living system living. This negentropic entanglement between magnetic body and biological body is important also for OBEs.

The model leads also to a model for dreams, hallucinations, sensory feedback from brain to sensory organs, and directed attention. Concrete models for how dark photons can give rise to experiences in various sensory modalities such as vision, hearing, olfaction, and tactile senses, are proposed.

## 1 Introduction

Out-of-body experiences (OBEs) [J5, J14, J15] are often understood as experience of seeing oneself from a position outside of the body. According to Susan Blackmore [J14]. OBEs are rather common: from 5 to 35 percent of subjects reports of having had at least one OBE. According to studies persons having OBEs seem to be perfectly healthy. OBEs are poorly understood in the framework of neuro science and pose a challenge for the reductionistic world view.

In TGD framework the notion of magnetic body provides an attractive starting point in attempts to understand what OBEs and related experiences are. The basic idea is that magnetic body serves effectively as a mirror defining a third person view as a cognitive representation also in ordinary wake-up state and that during OBEs this representation becomes sensory representation. Magnetic body need not always be a personal magnetic body but could correspond to a magnetic body receiving information from several brains (collective consciousness), magnetic body of another person, or be even associated with “dead” matter.

The progress in identifying dark matter as a phase of matter with large value of Planck constant making possible macroscopic quantum coherence has led to the vision about dark matter at magnetic flux quanta as quantum controller of ordinary matter in living systems. The Bose-Einstein condensates of dark photons decaying via de-coherence to ordinary photons mediate interactions between ordinary and dark matter and the hypothesis is that dark photon “laser” beams from body and brain reflected at magnetic flux quanta give rise to third person aspect of consciousness

which in OBEs and related experiences are realized as sensory representations. The identification of bio-photons as end products of the de-coherence of dark photon beams is natural.

Zero energy ontology and the notion of causal diamond (or CD defined roughly as the intersection of future and past directed light-cones) brings additional quantitative ingredients to the model. Sub-CDs define imbedding space ( $M^4 \times CP_2$ ) correlates for selves and by holography the 2-D partonic 2-surfaces at the light-like future and past boundaries of CDs are the ultimate space-time correlates for mental images. The moduli space for CDs makes possible a more detailed view about sensory representations discussed in the chapter “Quantum Model for Sensory Representations” [K16].

A further new element is the vision about life as something in the intersection of real and p-adic worlds. The most important outcome is that the notion of number theoretic entanglement negentropy making sense in this situation is positive so that entanglement carries conscious information. The fusion of selves (in particular mental image) by negentropic entanglement is experienced as expansion of consciousness. It is negentropic entanglement between parts of biological body and corresponding parts of the magnetic body and biological body which makes living system living. This negentropic entanglement between magnetic body and biological body is important also for OBEs.

The model leads also to a model for dreams, hallucinations, sensory feedback from brain to sensory organs, and directed attention. Concrete models for how dark photons can give rise to experiences in various sensory modalities such as vision, hearing, olfaction, and tactile senses, are proposed.

The appendix of the book gives a summary about basic concepts of TGD with illustrations. There are concept maps about topics related to the contents of the chapter prepared using CMAP realized as html files. Links to all CMAP files can be found at <http://tgdtheory.fi/cmaphtml.html> [L2]. Pdf representation of same files serving as a kind of glossary can be found at <http://tgdtheory.fi/tgdglossary.pdf> [L3]. The topics relevant to this chapter are given by the following list.

- Magnetic body [L5]
- Basic Mechanisms associated with magnetic body [L1]
- Geometrization of fields [L4]
- Quantum model of EEG [L6]
- Quantum model of memory [L7]

## 1.1 OBEs, Autoscopy, Heautoscopy, And Other Strange Experiences

### 1.1.1 Phenomenological characterization

The phenomenological characterization of OBEs [J2] has been discussed in [J15]. A precise definition of OBE is to have sensation of being outside the body. Autoscopy experience involves a also a sensation of seeing a mirror double of the body or part of it or at least experiencing its presence. There is a form of AS in which some internal organs are perceived. In one form of AS only the presence of double is experienced. AS experiences are often accompanied by physical difficulties such as migraine episodes and epilepsy.

Heautoscopy refers to an experience of meeting one’s alter ego, doppelganger. The main differences to AS is that in AS the double is mirror image and that alter ego is experienced to have also duplicated features of psychological self.

OBEs are classified to parasomatic and asomatic experiences according to whether the person experiences of having body or not. In aparasomatic experience a detachment from both the physical and parasomatic body is experienced. Blackmore suggest that OBE starts when sensory input from the body ceases while person remains conscious [J14]. This brings in mind the notion of subtle body of spiritual practices identified as the body experienced during lucid dreaming [J11]. The notions of guardian angle and ba-ka double of ancient Egypt, could relate to the double body too.

There is also a classification of OBEs to asensory, naturalistic and supernaturalistic ones. Asensory experience lacks sensory percepts about environment, naturalistic one involves perception

of familiar surroundings, and supernaturalistic other-worldly realms like heaven or visits to other planets and contacts with aliens.

One can distinguish between natural and enforced OBEs. Natural OBEs are triggered by exhaustion, illness, traumatic events, NDEs, meditation, etc.. Enforced experiences can result from intoxication, anesthesia, hypnosis, etc..

### 1.1.2 OBEs induced by electric stimulation

Relatively recently OBEs and AS experiences have been produced by an electric stimulation of the angular gyrus [J8]. Angular gyrus is located in the parietal lobe, near the superior edge of the temporal lobe, and is involved in processes related to verbal communication and cognition and also with the transformation of written language to internal monologue. The experience developed to a full fledged OBE as the intensity of electric stimulation was increased. The electric stimulation induced responses in vestibular and sensory-motor systems, two of three systems which govern body balance.

According to experimenters, OBE and AS frequently involves what they call pathological sensations of position, movement and perceived completeness of one's own body. These include vestibular sensations such as floating, flying, elevation and rotation, visual body-part illusions (illusory shortening, transformation or movement of an extremity) and the experiences of seeing one's body only partially during OBE or AS. Authors believe that these experiments yield neurological evidence about the common neurological mechanism behind OBEs and AS experiences.

[J15] [J3] has criticized the interpretation of experiments.

1. Only single subject person was studied. She suffered from temporal lobe epilepsy and the epileptic region was at distance of about 2 cm from angular gyrus. Hence one can ask whether genuine OBEs were in question and whether the results generalize to healthy persons.
2. The OBE was not typical. For instance, body was seen only partially and the conscious attempt of the subject person to examine it more closely led to its disappearance. The environment was not perceived.
3. The claimed localization of the spot inducing OBEs to angular gyrus might be an illusion. Same researchers have represented results in which the OBE is induced in a different manner. Interestingly, the experience is associated with the generation of 4 Hz theta wave, which corresponds to the dominating EEG band during sleep.
4. The reductionistic conclusion that OBEs can be reduced to neuropathology and are thus "only" hallucinations is not justified. What has been shown is that electric stimulation of angular gyrus helps to induce the OBE and this leaves a lot of room for theorizing.

### 1.1.3 Explanations of OBEs and related experiences

The explanations for OBEs can be divided to two classes.

1. Something is assumed to leave the body.  
This something could be something physical or non-physical ("astral"). In some cases people who have had OBE share reported of having perceived objects that were actually there and having experienced events and dialogue that truly happened. Charles Tart has documented the case of Miss Z [J6] who in controlled experiments was able to deliver the randomly selected five digit number which was in a position which could be seen only from the position out of her body. Telepathy would be an alternative explanation for this.
2. Nothing leaves the body.  
Parapsychological explanations involve remote sensing and hallucinations. Psychological explanations regard OBEs as basically hallucinations. The observation that electrical stimulation generates both AS and OBE could be seen as a support for this interpretation. Of course, one can ask what hallucinations really are. Furthermore, the reports about seeing internal organs during AS experience [J13] are not easily explainable as hallucinations.

TGD based model does not fit into either category. The model involves the notion of magnetic body serving as the third person receiving visual stimulus from the body and reflecting it back to the brain where it is processed. In this model the conflict between hallucinatory character of AS and OBEs and a real perception of body from outside is only apparent. The basic mechanism allows to develop also a more detailed model for dreams, hallucinations, third person aspect of wake-up consciousness, and directed attention.

## 2 TGD Inspired Model For OBEs

It is good to develop the model for OBEs by first summarizing what OBEs are and then listing the basic TGD specific ingredients of the model and then proceed by making questions (I hope that reader does not feel them to be leading).

### 2.1 OBEs, Autoscopy, Heautoscopy, And Other Strange Experiences

#### 2.1.1 Phenomenological characterization

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## 2.2 Questions

In the following the model is developed by posing questions about OBEs.

### 2.2.1 Where the information processing giving meaning to what is seen is carried out?

Seeing is much more than just receiving the photons on retina, since a lot of information processing is needed to give meaning to what is seen. This essentially involves a decomposition of visual input to recognized objects having relations to each other and to the past of perceiver. This applies also to the visual percepts during OBEs. The most natural candidate for the system processing the visual stimulus and giving it meaning is the brain of the subject person.

Sharing of mental images allows to consider an alternative interpretation based on telepathy. The sensory organs in other bodies receive the visual stimulus and other brains do the information processing. For instance, “unconscious” victim of accident could share the fused mental images of people around the place of accident. This would explain the case of Miss Z studied by Tart [J6] as telepathy.

### 2.2.2 Are OBEs “only” hallucinations?

In TGD framework the first possibility is that the sensory stimulus is always artificial and comes from brain to eyes and other sensory organs by back projection. OBE would be a dream like cognitive representation, simulation rather than a real percept. REM is expected to always accompany OBEs in this case.

There is an objection against this idea. If person is unconscious or has NDE, it is questionable whether she is able to construct such high level cognitive representation as the representation of the state of her own body as seen by outsider is, and even transform it to a sensory representation. One can also ask what hallucinations really are. In TGD framework hallucinations must be generated by an artificial sensory stimulus so that hallucinations and genuine OBEs might involve the same basic mechanism.

### 2.2.3 Does OBE originate from an actual sensory stimulus?

The well-known fact that body parts indeed contain holograms about other body parts [I8] (see the discussion in [K8] ) and the TGD view about the relationship between dark and living matter [K3] allows to consider seriously the possibility that OBE originates from an actual sensory stimulus.

The dark photon laser beams emanating from the body would be received by a magnetic body containing dark matter at some level in the hierarchy of magnetic bodies and would be reflected back to the receiving sensory organs along MEs possibly parallel to magnetic flux tubes rather than space-time sheets along which ordinary visual input arrives.

It is quite possible that several magnetic bodies in the hierarchy are involved. The magnetic bodies involved need not always correspond to a personal magnetic body and could receive input from several biological bodies and remote vision and telepathy might involve signals from brain reflected to a second brain via multi-brainy magnetic body. Magnetic bodies could be associated also with “dead” matter.

In this picture the case of Miss Z could be understood in two alternative manners. A dark photon beam possibly created by the visual representation of the random number (does “dead” matter generate sufficiently intense beams of this kind?) and reflected by personal magnetic body could be in question. Alternatively, the magnetic body involved could receive the information about random number from the brain of the experimenter and reflect it to the brain of the subject person.

### 2.2.4 Why does electrical stimulation induce OBEs?

Electrical stimulation of angular gyrus induces OBEs just as the stimulation of neurons of temporal lobe induces long term sensory memories. In neurological “brain only” approach the interpretation would be that the responses in the vestibular and somatosensory system induce the AS and OBE as hallucinations. In TGD framework the response in vestibular and somatosensory system would be interpreted as a response to an actual experience of being in a detached position and orientation, and brain would process genuine sensory data about being in detached position.

One might think that the temporal ordering between the experiences and these responses would allow to decide which causes what. In TGD framework negative energy signals propagating backwards in the geometric time are however a basic element of brain functioning and this criterion need not be apply.

One imagine two mechanism generating OBEs.

1. The mechanism inducing visual OBE and related experiences could simply turn off the ordinary sensory input so that only the dark photon beams from the magnetic body and reflected back from biological body would contribute to the visual stimulus. This would occur automatically during dreams and NDE experiences.
2. The sensory input from the magnetic body could be amplified. Time mirror mechanism (see **Fig.** <http://tgdtheory.fi/appfigures/timemirror.jpg> or **Fig.** ?? in the appendix of this book) could be responsible for this amplification [K20]. During epilepsy strong electric fields generated by brain during epilepsy induce starvation of neurons and the electrical stimulation of angular gyrus could have the same effect. Starving neurons would generate a



beam of phase conjugate (negative energy) dark photons received by magnetic body in order to get metabolic energy. The magnetic body would be in a state analogous to a population inverted (possibly many-sheeted) laser defining a hologram like representation of the body. The receipt of negative energy photons would induce a cascade like induced return to the ground state and amplify the dark photon beam arriving from magnetic body so that it would not be masked by the ordinary visual input anymore and would give rise to a percept.

## 2.3 Dark Matter Hierarchy, Zero Energy Ontology, Negentropic Entanglement, OBEs

Dark matter hierarchy, zero energy ontology, and the notion of negentropic entanglement lead to new insights also about OBEs.

### 2.3.1 Basic ingredients of the TGD inspired model

The model of OBEs involves several ingredients that are specific to TGD.

1. Magnetic bodies and field bodies are excellent candidates for the “third person” seeing the ordinary body. Magnetic body could receive a visual stimulus from ordinary body and reflect it back as a visual stimulus during OBE processed by the brain of the subject person. Thus body would see itself from the perspective of the magnetic body. Also dreams and hallucinations might involve the same mechanism. In the case of hearing sounds created by subject person could be reflected back to her ears or more plausibly, microwave hearing [I3] could be involved.
2. Topological light rays (“massless extremals”, MEs) are an element of TGD having no counterpart in Maxwell’s ED and play a key role in TGD inspired theory of consciousness. The interpretation of MEs has remained somewhat obscure. The development of TGD based model for dark matter residing at magnetic flux tubes and characterized by large value of Planck constant implying quantum coherence in even macroscopic length and time scales changed the situation in this respect. The model for dark matter as macroscopically quantum coherent phase is discussed briefly in this book in chapter [K12] and more extensively in the book “Genes, Memes, Qualia, and Semitrance” [K3]. MEs can be identified as space-time correlates of Bose-Einstein condensates (“laser beams”) of dark photons. It is however still unclear whether ordinary laser beams actually correspond to dark photon Bose-Einstein condensates and become visible only in de-coherence to ordinary photons. Negative energy MEs can be identified as correlates for phase conjugate laser beams of dark photons. The so called time mirror mechanism is universal building block of basic biological and brain functions [K20].
3. Bio-systems as conscious holograms is one of the key ideas of TGD approach [K1]. Bio-holograms [I8] suggest themselves as primary sensory stimuli quite generally. Biological body could generate dark photon “laser beams” received by magnetic bodies and reflected back to retina or perhaps to pineal gland [J7], the “third eye”. This would explain AS as well as the images of internal organs [J13]. Also other systems, at least living systems, could be seen from the perspective of the magnetic body. Remote vision hypothesis testable by using living targets not visible in ordinary sense. This would give also rise to telepathy if reflection occurs from magnetic bodies of another person.
4. In TGD framework sensory organs are identified as seats of primary sensory experience and brain only constructs symbolic representations about percept, in particular identifies objects of perceptive field. This does not exclude a considerable back projection to sensory organs modifying the sensory input. Dreaming involves back projection to sensory organs inducing artificial sensory experiences as simulation. One possibility is that dreams and hallucinations represent direct back projection to sensory organs along neural pathways. An alternative view is that the projection involves dark photon beams generated by brain and reflected back from the magnetic body. If OBEs are hallucinations, the visual sensory memories of the subject person about herself could serve as building blocks to generate simulation about what person looks like when seen from outside.

5. Sharing and fusion of mental images is one of the basic notions of TGD inspired theory of consciousness [K20, K1]. One can ask whether OBE involves sharing of the visual experience of other persons involved about subject person. If this were the case, the presence of other persons would be necessary to have OBE. Sharing of mental images would explain the case of Miss Z as telepathy.

### 2.3.2 Dark matter hierarchy

The identification of dark matter as a hierarchy of quantum phases labeled by the values of Planck constant [K5] provides additional insights about OBE experiences. Planck constant is quantized and can have arbitrarily large values and since Compton length and other analogous quantum lengths and times scale as Planck constant, this means macroscopic and macro-temporal quantum coherence and a reduced rate of dissipation.

Also the magnetic body controlling biological body (actually onion-like hierarchy of them) is assumed to carry dark matter and (forgetting ontological delicacies) dark matter could be seen as the agent responsible for the quantum control of ordinary matter in living systems. The value of Planck constant becomes also a measure for the evolutionary level of the living system and great leaps in evolution can be identified as transitions increasing the maximum value of  $\hbar$  in “personal” hierarchy of magnetic bodies [K4].

### 2.3.3 Zero energy ontology and causal diamonds

Zero energy ontology is second new element of quantum TGD and states that all physical states have vanishing net values of conserved quantum numbers. Zero energy ontology provides a firm justification for the notion of negative energy signals consisting of (say) phase conjugate photons propagating to the geometric past. These negative energy signals are crucial element of the time mirror mechanism playing a central role in the general mechanism for intentional action, remote metabolism, and long term memory.

Causal diamond (CD) defined roughly as the intersection of future and past directed light-cones serves as an imbedding space correlate for zero energy state. Space-time sheets representing zero energy states are inside CD and the future *resp.* past boundaries of CD carry positive *resp.* negative energy parts of zero energy states.

What is important from the point of view of consciousness theory is that CDs serve as imbedding space correlates of selves and sub-CDs as those for sub-selves (mental images). Sub-CDs are very much analogous to music instruments in the sense that the frequencies which come as harmonics of the fundamental frequency defined by the proper time distance between tips of CD (coming as powers of two) resonate with the geometry of CD and put it to “ring”. Sub-CDs could be seen as an analog of radio receiver as far as sensory representations are considered and sending antenna as far as the motor control of biological body is involved. This allows to communicate sensory data from brain to sub-CDs at magnetic body CD in a highly selective manner. MEs (massless extremals) mediating the communications between magnetic body and biological body are also very much like strings of a music instrument. This picture generalize the earlier music metaphor applied to axonal pathways.

A more precise definition of CD is as the Cartesian product of the intersection of future and past directed light-cone with  $CP_2$ . The hierarchy of Planck constants brings in additional structure. There is identification of preferred  $M^2 \subset M^4$  defining a preferred time direction (rest system/quantization axis for energy) and spin quantization axis. The preferred geodesically trivial sphere  $S^2 \subset CP_2$  and the selection of point assigned with  $CP_2$  at the future and past boundaries of CD gives rise to a selection of quantization axes of color isospin and hyper charge.

Sensory representations are a key element of the consciousness theory and the moduli space of CDs charactering what kind of CDs are possible brings in new representational resources.

1. The moduli space of sub-CDs involves the position for the either tip of the sub-CD and the naive expectation is that this position could code for the position of the perceptive field. If so the representation would be very concrete and since the size of CD is already for electron with .1 lightseconds the representations is realized automatically in astrophysical scale.

2. The moduli space of sub-CDs assignable to the mental images with another tip fixed could represent geometric qualia. Without any further restrictions this space corresponds to proper time constant hyperboloid of future light cone. The values of time parameter come in powers of two. One can however quite well consider the possibility that only a discrete lattice of the hyperboloid is realized- at least in the intersection of real and p-adic worlds.
3. A Lorentz boost for sub-CD induces scaling of frequency and scaling of the object in the direction of the boost. Therefore boost coded to the fundamental frequency of CD could code for various shapes of a figure obtained by scaling. Boost of sub- $CD$  leaving the other tip of sub- $CD$  invariant could also code for the velocity of object. Also the velocity of the object of the perceptive field could be coded to the shape of sub-CD by performing corresponding Lorentz boots to it [K16].
4. The moduli space of CDs contains also the choice of quantization axes of energy (preferred rest system) and spin as well as the choice of quantization axes of color isospin and hypercharge identifiable as flag manifold  $SU(3)/U(1) \times U(1)$ . Mathematician Barbara Shipman has proposed that this flag manifold is involved with the representation of geometric data in honeybee dance [A1] and I have proposed a model for what might be involved [K6].

The moduli space of CDs is thus highly relevant for the representation of the geometric data associated with the objects of the perceptive field and the this data would be communicated using MEs with harmonics of the fundamental frequency of sub-CD so that sub-CD would act like radio receiver. This includes the position of the real object codable to the position of sub-CDs at magnetic body, the velocity of the object of the perceptive field codeable to the Lorentz boost changing the shape of sub-CD and represented as scaling of the frequency assigned with the stationary object. Also the shape of perceptive field would represent this kind of geometric data. This picture supports the interpretation of sub-CDs as spotlights of attention giving information about many-sheeted space-time inside the regions defined by the sub-CDs. It would seem that sub-CDs are dynamical objects created, destroyed, and shifted in quantum jumps. This picture is also consistent with the explanation for the arrow of psychological time based on zero energy ontology [K19].

### 2.3.4 Negentropic entanglement

The third new element is the notion of negentropic entanglement (see **Fig.** <http://tgdtheory.fi/appfigures/cat.jpg> or **Fig. ??** in the appendix of this book) making sense when entanglement probabilities are rational or even algebraic numbers. Negentropic entanglement makes sense in the “intersection of real and p-adic worlds” consisting of partonic surfaces whose mathematical representations make sense both in real sense and p-adically. Negentropic entanglement is possible also between different number fields in accordance with the idea that cognition corresponds to p-adic number fields and cognitive representations are realized in the interactions of realities and p-adicities. Living matter is identified as matter in the intersection between real and p-adic worlds. This view together with zero energy ontology allows precise definition for the idea that intentional acts transform p-adic space-time sheets to real ones and for the reversal of this transformation [K11].

It is natural to assume that negentropic entanglement is what makes living matter living and is involved with the sharing of mental images and with the formation of sensory representations by entanglement. Negentropic entanglement can be also time-like. MEs are excellent candidates for mediating this kind of entanglement whereas magnetic flux tubes would naturally mediate space-like negentropic entanglement. The sequence of negentropic entanglements would have as its upper ends sub-CDs at highest layer of the magnetic body and sensory organs as its lower ends. Even sensory organ could have negentropic entanglement with the real object of the perceptive field and this might be crucial element in the construction of the sensory representations. For instance, the deduction of distance of the object of perceptive field might rely on interferometry using the dark variants of visible photons with wave length which is is of the order of the distance to the object.

### 2.3.5 OBEs in more general framework

A general model for the remote mental interactions follows from a model for the living matter by assuming that also other biological bodies can serve as targets for the control action of the magnetic body or communicate sensory information to the magnetic body. The notion of negentropic entanglement favors biological systems as targets but it is of course an open question whether also “dead” matter could have negentropic entanglement with its magnetic body. Ordinary intentional action would represent a particular case of remote mental interaction in this framework.

Consider now OBEs in this general framework.

1. During OBE experiences the mental images constructed by brain about biological body could be absent due to the absence of the metabolic energy feed to the appropriate parts of brain taking care of the construction of cognitive mental images about biological body and communications of them to the magnetic body. The simplest representation would be in terms of bit sequences with bit 1/0 represented in terms of population inverted state/ground state of many-sheeted laser. Negative energy signals to the geometric past would be used to read these signals by inducing partial reduction of the population in inverted states. In absence of metabolic energy feed 1: s would gradually transform to 0: s. It is however essential that time-like negentropic entanglement is involved besides classical communications. This would make it possible to share the mental images.
2. In absence of these cognitive mental images to the magnetic body, magnetic body would not anymore provide strict cognitive representations of biological body and virtual world experiences would result. Since only magnetic body would contribute to the bodily experience, the low rate of dissipation due to large value of  $\hbar$  would explain the pleasant experience about the absence of the sensory noise.
3. This general picture could also explain why OBEs seem to correlate with neural disorders such as epilepsy and disorders relating to perturbed body image. During this kind of disorders the feedback provided by the sensory and cognitive input would be lacking from the brain regions suffering the neural disorder and magnetic body would be solely responsible for the body image. The lacking strict correspondence between the conformations of magnetic body and biological body would mean that the experience is hallucination from the point of view of biological body. At the imbedding space level the “conformations” of the magnetic body could be rather abstract and represented in terms of positions and other moduli of sub-CDs.

## 2.4 A More Detailed Model For OBEs

In the following a more detailed model for various aspects of OBEs is developed.

### 2.4.1 Do bio-photons result from the de-coherence of dark photon beams?

Bio-holography provides support for the body as a hologram (more precisely, dark photon hologram). For instance, an electric stimulation of ear during Kirlian imaging of a finger tip creates a Kirlian photo from which it is possible to abstract a hologram of ear [I8] (for a TGD based model see [K1, K8] ). This suggests that body parts can in some sense “see” each other. In particular, brain can “see” body parts (note that bacteria possess a primitive IR vision based on micro-tubules): this of course need not correspond to a conscious vision at our level of self hierarchy.

The biological function of bio-photons [I4] is poorly understood, and they are an excellent candidate for ordinary photons resulting when dark photon beam de-coheres. TGD based model of bio-photons can be found in [K9] and the identification as dark photons is discussed in [K3]. The findings of Peter Gariaev about the effects of visible laser light on DNA [I2] and so called phantom DNA effect [I1] provide a further support for the biological importance of bio-photons (see the discussions in [K3, K9] ).

### 2.4.2 What is the mechanism of out-of-body hearing?

Mechanism could be even more general and work also in the case of other qualia. In particular, hearing might involve similar reflection of sound waves at larger space-time sheets from the magnetic body and heard as “other-worldly” sounds.

A more plausible option is that the auditory sensation is generated by dark microwave photons reflected back from magnetic body. Microwave [K13] [I3] is indeed a well-known but poorly understood phenomenon and the generation of microwaves by plants after sunset correlates also with taos hum [I5] (see the discussion in [K10] ) which does not generate any response in microphones but reflects the features of the acoustic environment.

The auditory and visual hallucinations of schizophrenic persons would represent in this framework a genuine sensory input. The notion of bicameral mind introduced by Jaynes [J10] discussed in TGD framework in [K18] would fit also nicely with this picture. The “god” controlling the behavior of bicameral by giving explicit commands would correspond to some magnetic body, not necessarily that of the subject person, but a magnetic body receiving input from several brains in the social group and representing collective consciousness.

### 2.4.3 Where are the sensory receptors giving rise to the primary sensory experience?

The simplest guess is that the visual stimulus from the magnetic body is received by eyes. The fact that REM accompanies visual dreaming supports this view in the case of dreams. The receiving sensory organ could be also pineal gland [K2, K17], “third eye”, the seat of the soul according to Descartes [J7]. Pineal gland is known to contain retinal pigments and its counterpart in more primitive animals is known to function as a genuine eye. A simple test in the case of artificial OBEs is to look whether the electric stimulation of OBEs generates also REM.

If OBE hearing is indeed microwave hearing, the identification of the primary sensory receptors is not obvious, although their existence cannot be denied.

The insect olfaction relies on infrared light as discovered by Callahan [I7] (see the discussion in [K6] ). One might therefore wonder whether also humans possess olfactory receptors sensitive to IR light, and whether the emission of dark IR photons reflected from magnetic body could play some role in olfaction and in the generation of olfactory hallucinations. One can even ask, whether the molecular recognition mechanism underlying chemical senses relies on IR light. It is known that human nose contains so called vomeronasal organ [J1] sensitive to odors having sexual or social meaning but that these odors do not give rise to a conscious experience.

It is known that blind persons can learn to “see” when their skin is stimulated by electromagnetic fields representing the environment. Perhaps dark photon beams could induce also tactile sensations. Quite generally, the earlier proposal that information in all sensory modalities can be transformed to field patterns represented by MEs could sharpen to the hypothesis that the information in various sensory modalities allows a representation as dark photon beams inducing corresponding sensory qualia in the interaction with appropriate sensory receptors.

### 2.4.4 What is the mechanism causing the kinesthetic sensations during OBEs?

The model should also explain sensations of lifting, flying experiences, and the experiences of being in translational or rotational motion. The motion of the magnetic body with respect to the physical body should induce this kind of sensations. The basic idea is simple: generalize the mechanism allowing to hear the motion of a sound source. Generalizing from sound waves to dark photon beams, the sensation in question would be basically due to the Doppler shift of the dark photon beams travelling between biological body and the moving magnetic body. The change of the dynamical hologram resulting in the interference of a bodily reference beam and Doppler shifted reflected beam in quantum jumps could be responsible for the sensation.

This model could also resolve an objection against the hypothesis that sensory receptors experience the primary qualia. The objection is based on train illusion. When you sit on a train and look at second train which starts to move, you can have an illusion that it is your train that moves. The illusion is not a mere belief but involves a sensation of acceleration in the entire body. There are two options.

1. The sensation is a response to various bodily activities induced by the belief of being in an accelerated motion.
2. The sensation is caused by a primary sensory input induced by the acceleration. This sensory input must be produced artificially in the case of train illusion.

Consider first a genuine accelerated motion of the biological body. One could argue that in absence of visual, auditory or other sensory information about being in accelerated motion, there is no belief about being in accelerated motion so that acceleration is not perceived at all for option a). This makes option a) implausible. For option b) the acceleration of the biological body with respect to the object defining the rest system is directly perceived. The Doppler shift of the dark photon beams radiated from biological body and reflected back from the rest system would induce the sensation. Reflection could occur either from the rest system or a magnetic body associated with it.

One can imagine two mechanisms creating an illusory acceleration for option b).

1. If the fixation of the attention to the moving train means the presence of dark photon laser beams connecting biological body and train or a magnetic body associated with it, the Doppler shift of dark photon beams could induce the sensation of acceleration.
2. Directed attention could cause a personal magnetic body to mimic the motion of train so that the relevant part of it deforms in the direction of moving train to keep the distance to the moving train fixed. This would induce train illusion by the same mechanism as in case 1).

For both mechanisms the reflection of dark photon beams becomes the fundamental mechanism of directed attention. Attention would mean a formation very concrete bonds between subject and object or a representation of object at the personal magnetic body: the rays connecting the eyes of cartoon characters would represent a very profound idea about consciousness. Both views about attention mean a clear-cut deviation from the prevailing neuro-scientific thinking according to which the experienced world is virtual and completely detached from the real world.

Cliff illusion might be an appropriate name for the disgusting feeling in stomach which one feels on the brink of a precipice. Sensory imagination about falling down is in question and could be induced by the deformation of the personal magnetic body such that it mimics free fall.

The floating sensations and strange deformations of personal body during OBEs could also correspond to the deformation dynamics of the magnetic body which could be also caused by external influences. If the size of the magnetic body is measured using Earth radius as a natural unit and if the personal magnetic body co-rotates with Earth, the variation of the effect of the solar wind could induce periodic deformations of the magnetic body as in the case of Earth's magnetic field. This could reflect itself as diurnal alterations in the shape of the body experienced during OBEs: a contraction during day time and an elongation during night time. Sunspot maxima induce magnetic storms and these could have strong effects on the shape of the body perceived during OBEs.

#### 2.4.5 What is the mechanism making possible to see internal organs?

Becker tells in his book "Cross currents" [J13] about a young cancer patient who told that he can see the interior of his own body. The patient could also locate the remnant of the tumor correctly. The simplest explanation is that magnetic body at some level of hierarchy reflects the dark photons emitted by the internal organs.

Usually this does not occur and one should understand why the emission occurred in the case of the cancer patient. There is evidence that bio-photons leak out from non-healthy organs [I4]: this might mean that organs send more intense dark photon beams reflected at the magnetic body.

Time mirror mechanism involving time reflection instead of ordinary reflection suggests itself as an alternative explanation. The cells suffering starvation generated phase conjugate dark photon beams in order to get metabolic energy. This in turn induced a cascade like emission of positive energy dark photon beams from the magnetic body instead of mere time reflection.

## 2.5 The Role Of The Magnetic Body In The Case Of Other Brain Functions

During the construction of the model of OBEs it became clear that the reflection of dark photon beams from the magnetic body could serve as a building block of several ordinary brain functions. It has been already found that dark photon beams could define a fundamental mechanism of directed attention.

### 2.5.1 Dreams and hallucinations and magnetic body

The reflection of dark photon beams from the magnetic body could be involved also with dreams and hallucinations so that the neurological similarity of AS experiences and OBEs does not mean that both are hallucinatory. The “subtle body” assigned by many spiritual traditions with the dreaming state (for a nice summary see [J11] ) would correspond to the magnetic body. In this case mental images constructed in brain would induce dark photon beams sent to magnetic body and reflected back. The mechanism would also naturally explain autoscopic and heautosopic experiences, in particular the ability to see internal organs.

### 2.5.2 The relationship of EMDR experiences to OBEs

Near-death experiences are not the only manner to get convinced about life after death. So called eye-movement de-sensitization and reprocessing (EMDR) discovered by Francine Shapiro [J4] induces what could be interpreted as after-death communications (see the discussion in [K15] ). The experiences of subject persons are claimed to be induced by this therapy in a highly reliable manner: according to [J4] 98 per cent of patients willing to participate the therapy had after death communication experience. It does not matter what the religious convictions of the subject person are and the experiences are actually rather easy to induce. It does not matter if the loss is traumatic or not or whether it is recent or occurred for decades in past.

The experiences resemble near death experiences (light tunnels, beautiful landscapes) and involve spiritual contact with the deceased. The EMDR technique involves getting the patient to move his or her eyes in a particular rhythmic fashion while at the same time attending to a particular aspect of the traumatic memory. How EMRD works is poorly understood as yet: possibly the fact that the shifting of eyes leads to increased brain processing is of importance. Notice that rapid eye movements REM are also involved with dreams.

A possible explanation is that EMDR experiences involves visual communication using dark photon beams and/or their phase conjugates with the 4-D magnetic bodies of the deceased ones located possibly in the geometric recent or past via the magnetic mirrors associated with them. Essentially the same mechanism as involved with long term episodal memories could be in question: the only difference would be that the magnetic mirrors now mediate information not from own 4-D body from the 4-D body of the deceased.

### 2.5.3 Third person aspect of conscious experience

Our conscious experience involves so called third person aspect giving a symbolic bird’s eye of view about ourselves. Magnetic body could take the role of the third person. At the fundamental level this representation could be based on sensory stimuli originating from body and reflected back to sensory organs. It would be completely masked by the ordinary sensory input in wake-up state but distilled by brain from the dominating sensory input and coded to a cognitive representation to minimize the amount of irrelevant information. A strong interference of this kind of sensory representation with ordinary sensory input would be obviously highly undesirable. The third person aspect could be present always and be based on the reflection of dark photons along MEs parallel to magnetic flux tubes.

### 2.5.4 Feedback to primary sensory organs via reflection from magnetic body

One objection against the hypothesis that primary sensory organs are seats of sensory qualia is that that sensory stimuli are only the raw material sculptured into actual sensory perceptions and that directed attention chooses what aspects of sensory stimulus are amplified and which neglected.

I have proposed that there is a feedback by projections to the primary sensory organs from brain generating artificial sensory stimuli modifying the primary sensory input. This feedback could be realized also as a reflection of artificial dark photon beams generated by brain from the magnetic body and received as such by eyes or received by brain and channelled to eyes via MEs parallel to visual pathways.

### 2.5.5 Does imagination involve feedback via magnetic body?

One can wonder, whether also imagination could involve reflection of dark photon beams from the magnetic body. In TGD framework the hypothesis that sensory qualia are generated at primary sensory organs and brain constructs only symbolic representations about experiences circumvents the basic objections such as the experience of phantom leg. In this framework imagination and cognition can be identified as symbol generating activities which are not initiated at sensory organs but at some higher level of the hierarchy starting from sensory organs and ending at the associative areas of cortex.

Imagination could however involve also transformation of symbolic representations to dark photon beams reflected back from the magnetic body. This input would not contribute to sensory input but might be abstracted from the sensory input and might serve as a kind of feedback. In absence of ordinary sensory stimuli the input from the magnetic body would dominate and imagined mental images would transform to dreams or hallucinations.

### 2.5.6 Sensory memories and magnetic body

In some exceptional cases often associated with a serious damage in cognitive areas of brain the feedback from the magnetic body could give rise to a genuine sensory representation making possible direct sensory memories. Examples are autistic persons with ability to remember visual scenes music pieces in every detail and also reproduce them.

One explanation is sharing of sensory mental images of geometric past. An alternative explanation is that the information about sensory memory is communicated from the geometric past in symbolic form and transformed to a dark photon beam reflected back from the magnetic body. The fact that angular gyrus is involved with the translation of written language to internal speech and the abstraction of meaning of visual metaphors supports the view that a transformation of linguistic statements to concrete images projected to the magnetic body occurs in this process.

I have proposed a mechanism [K16] explaining synesthesia. The association of different sensory modalities could also occur via a transformation of sensory input in given modality to dark photon beam reflected from magnetic body and generating a sensation in another modality. Synesthetes are also known to be capable of amazing sensory memory feats [J12] and I have proposed an explanation based on time mirror mechanism [K16]. Also in this case neurons in certain region of left brain hemisphere suffer starvation which should be lethal by standard wisdom.

As a matter fact, the starvation mechanism seems to be a very general mechanism: Callahan has found evidence that insects find more easily the plants suffering from under nutrition [I6] (see the discussion in [K7]). Even the fasting common in spiritual practices could be seen as a method to get body entangled with magnetic bodies by using time mirror mechanism.

## 2.6 Psychedelics Induced Experiences And Magnetic Body

There is a book about psychedelic induced experiences titled as “Inner paths to outer space” (<http://www.amazon.com/Inner-Paths-Outer-Space-Psychedelics/dp/159477224X>) written by Rick Strassman, Slawek Wojtowicz, Luis Eduardo Luna and Ede Frecska [J9]. It took some time to realize that I have actually have met the Luna and Frecska.

The natural TGD inspired hypothesis to be discussed in sequel in detail goes as follows.

1. Psychedelics bind to the same receptors as the neurotransmitters with similar aromatic rings (weaker assumption is that neurotransmitters in question possess aromatic rings). This is presumably consistent with the standard explanation of the effect of classical psychedelics as a modification of serotonin uptake. This binding replaces the flux tube connection via neurotransmitter to some part of the personal magnetic body with a connection via psychedelic



to some other system, which might be even in outer space. A communication line is created making among other things possible remote sensory experiences.

Magnetic fields extending to arbitrary large distances in Maxwell's theory are replaced with flux tubes in TGD framework. The magnetic bodies of psychedelics would carry very weak magnetic fields and would have very large  $h_{eff}$  - maybe serving as a kind of intelligence quotient.

2. This would be like replacing the connection to the nearby computer server with a connection to a server at the other side of the globe. This would affect the usual function of transmitter and possibly induce negative side effects. Clearly, TGD inspired hypothesis gives for the psychedelics much more active role than standard hypothesis.
3. Psychedelics can be classified into two groups depending on whether they contain derivative of amino-acid trp with two aromatic rings or phe with one aromatic ring. Also DNA nucleotide resp. its conjugate have 2 resp. 1 similar aromatic rings. This suggests that the coupling between information molecule and receptor is universal and same as the coupling between the two bases in DNA double strand and consists of hydrogen bonds. This hypothesis is testable since it requires that the trp:s/phe:s of the information molecule can be brought to same positions as phe:s/trp:s in the receptor. If also protein folding relies on this coupling, one might be able to predict the folding to a high degree.
4. A highly suggestive idea is that molecules with aromatic rings are fundamental conscious entities at the level of molecular biology, and that more complex conscious entities are created from them by reconnection of flux tubes. DNA/RNA sequences and microtubules would be basic examples about this architecture of consciousness. If so, protein folding would be dictated by the formation trp-phe contacts giving rise to larger conscious entities.

This model meets of course strong objection: finite light velocity does not allow communications with outer space in standard physics framework. In TGD framework Zero Energy Ontology changes the situation. Second objection is that the communications require huge amount of energy unless they are precisely targeted. The third objection is that quantum coherence in very long, even astrophysical scales is required. In TGD framework these objections do not apply.

### 2.6.1 Some background about psychedelics

Psychoactive drugs can be classified into three basic types. Some raise the activity level (excitation), some calm down (inhibition), and some change the character of consciousness profoundly. Psychedelics/hallucinogens [J9] belong to the third group. Psychedelics (such as psilocin, psilocybin, DMT, LSD) containing aromatic rings and many of them (such as psilocin, psilocybin, DMT) attach to serotonin receptors.

As the official term "hallucinogens" implies, psychedelic induced experiences are regarded as hallucinations in the materialistic world view although the denial of the reality of subjective experiences themselves requires a really hard-nosed skeptic. The title of the book reveals that the question posed in the book is whether these experiences could be about real world, kind of sensory input from distant parts of the Universe. The indigenous people using ayahuasca and similar psychedelics have regarded these experiences involving meeting of representatives of other civilizations as perceptions about real worlds. Also Terence and Dennis McKenna, who are pioneers of systematic study of the effects of various psychedelics, shared this view. In the materialistic ontology of standard physics this kind of interpretation is of course excluded. That hallucinations are in question is "obvious", too obvious actually!

The classical psychedelics are psilocin and psilocybin contained by mushrooms, DMT found in ayahuasca, and mescaline found in peyote cactus. DMT is an endogenous psychedelic and there is pumping of DMT through blood-brain barrier so that DMT could have important brain function.

The aromatic ring structures of psychedelics and neurotransmitters (<https://en.wikipedia.org/wiki/Neurotransmitter>) involved provide a more concrete view about the situation.

1. Classical psychedelics are derivatives of two basic chemical groups: tryptamine and phenethylamine which in turn derive from the amino-acids trp and phe.

2. Trp (<https://en.wikipedia.org/wiki/Tryptamine>) is characterized by pair of aromatic rings (6-cycle and 5-cycle). Psychedelic psilocin (<https://en.wikipedia.org/wiki/Psilocin>), psilocybin (<https://en.wikipedia.org/wiki/Psilocybin>), DMT (<https://en.wikipedia.org/wiki/N,N-Dimethyltryptamine>) have 2 aromatic rings. Neurotransmitter serotonin (<https://en.wikipedia.org/wiki/Serotonin>) has also two aromatic rings.
3. Phe (<https://en.wikipedia.org/wiki/Phenethylamine>) has single aromatic ring (6-cycle). Psychedelic mescaline (<https://en.wikipedia.org/wiki/Mescaline>) has single aromatic ring. Neurotransmitters dopamine (<https://en.wikipedia.org/wiki/Dopamine>) and norepinephrine have one aromatic ring. Note that both serotonin, dopamine, and norepinephrine (<https://en.wikipedia.org/wiki/Norepinephrine>) are associated with mood disorders: clearly control in long time scales is in question, which in TGD framework suggests very large size scales for the parts of magnetic body involved.
4. Remarkably, DNA and RNA nucleotides can be classified to those with two aromatic rings (pyrimidines A and G) and their conjugates with one aromatic ring (purines C, T and U). Note that also his and tyr are amino-acids ([https://en.wikipedia.org/wiki/Amino\\_acid](https://en.wikipedia.org/wiki/Amino_acid)) with single aromatic ring ([https://en.wikipedia.org/wiki/Simple\\_aromatic\\_ring](https://en.wikipedia.org/wiki/Simple_aromatic_ring)). Information molecules involve often aromatic rings. For instance, hormones involve often complex rings structures. Also hydrophobic second messengers (such as cAMP) ([https://en.wikipedia.org/wiki/Second\\_messenger\\_system](https://en.wikipedia.org/wiki/Second_messenger_system)) involve aromatic rings.
5. LSD ([https://en.wikipedia.org/wiki/Lysergic\\_acid\\_diethylamide](https://en.wikipedia.org/wiki/Lysergic_acid_diethylamide)), which is synthetic psychedelic, has 3 6-rings and one 5-ring.
6. The classification of the neurotransmitter receptors ([https://en.wikipedia.org/wiki/Neurotransmitter\\_receptor](https://en.wikipedia.org/wiki/Neurotransmitter_receptor)) provides further insights. They are classified into two groups. Ligand gated receptors can be excited and inhibited by certain neural transmitters. G-protein coupled receptors ([https://en.wikipedia.org/wiki/G\\_protein\\_coupled\\_receptor](https://en.wikipedia.org/wiki/G_protein_coupled_receptor)) modulate the actions of excitatory (glutamate, aspartate) and inhibitory neural transmitters (GABA, glycine). Most neural transmitters bind to G-protein coupled receptors and this is true for classical psychedelics and for serotonin, dopamine, and norepinephrine.

The first guess is that the presence of aromatic rings determines the character of the transmitter receptor pair and that G-protein coupled receptors having aromatic rings are above ligand gated receptors in the hierarchy and control them. They would correspond to two different levels in the hierarchy of magnetic bodies. Note that also LSD binds to G-protein receptors.

According to the book [J9], pineal gland might be in a special role concerning psychedelics.

1. Pineal gland is the only nucleus of brain, which does not appear as left-right pair: this suggests that its functions relate to a control of the entire brain in long time scales. Descartes regarded pineal gland as the seat of soul. Pineal gland is also known as “third eye” and in lower species it indeed serves the function of eye.
2. Pineal gland is responsible for the production of melatonin: the production rate varies with a circadian rhythm. Melatonin is a serotonin derived hormone and therefore has 2 aromatic rings: this suggests that the amount of serotonin is higher in pineal gland than elsewhere in brain. Melatonin helps in sleep disorders and affects also other parts of brain. One can ask whether melatonin is involved with establishing of distant flux tube connections during sleep - not only in pineal gland but also in other parts of brain - and whether these connections are built up during sleep.
3. There is some evidence that pineal gland can produce DMT from tryptamine (<https://en.wikipedia.org/wiki/N,N-Dimethyltryptamine>) *believed* to be released during dreaming, during spiritual and mystical experiences, and during the time of death. Taking the title of the book seriously, one can ask whether this eye is able to see also to cosmic distances possibly using large  $h_{eff}$  photons and whether DMT is involved.

### 2.6.2 Could instantaneous communications in cosmic scales be possible in TGD Universe?

In TGD inspired ontology the notion of magnetic body with astrophysical, galactic or even supergalactic size changes the situation completely. The basic communication tool would be touch of magnetic bodies generating reconnections and making possible signalling from the biological body to the member of distant civilization. The perception of the biological body of alien would differ in no manner from that of my neighbor since the mechanisms would be the same as involved with the transfer of sensory data to my personal magnetic body and control commands from there to biological body (at least through genome).

The basic objection against the possibility suggested by the title of the book is that finite light velocity poses absolute upper bound for the distance of objects with it is possible to be in contact during “trip”. One must be however very cautious here: the assumption that signals propagate only to singlet direction of time is essential also and derives from classical thermodynamics. In TGD framework second law continues to hold true but the arrow of geometric time for zero energy states changes in each state function reduction occurring to the either boundary of CD. Hence instantaneous communications (“remote seeing” !) using reflection in time direction become possible even over cosmological distances and define among other things the mechanism of memory in TGD Universe.

Time consuming and expensive space travel would become un-necessary: our magnetic body giving us cosmic size together with zero energy ontology making possible instantaneous “seeing” of both future and past by reflection of photons in time direction would be enough. Memory and anticipation would be basic examples about seeing in time direction. This view would also resolve Fermi paradox. We could be actually in a continual contact with the distant civilizations but without realizing it. One can ask whether similar contacts could take place in psychedelic induced experiences. Memories and future plans would be examples of “seeing” in time direction. The continual re-creation of the Universe by quantum jumps would of course mean that the actual future/past need not be same as those which are “seen”. Shamans identify various plants as conscious entities teaching them - in TGD framework this would translate to magnetic bodies of representatives of distant civilizations remotely teaching the representatives of more primitive civilizations.

What is the precise meaning of the catchy phrases “communications with geometric past/future”, “time reflection”, and “seeing in time direction”.

1. The recent view about state function reduction in Zero Energy Ontology leads to a precise identification of self as conscious entity. Self corresponds to a sequence of state function reductions leaving the passive boundary of causal diamond (CD) invariant and also Zero energy states correspond to superpositions of state pairs at opposite boundaries of CD. State function reduction leaves the member of the state pair at either boundary of CD (call it passive boundary) invariant - this is the counterpart of Zeno effect.

In the analog of unitary evolution following each reduction the position of active boundary is shifted to geometric future and the state at it is changed. This is the counterpart of unitary time evolution at active boundary. The increase of the temporal distance between the tips of CD gives rise to the experienced flow of time. Negentropy Maximization Principle (NMP) eventually forces the first reduction to the opposite boundary of CD: self dies and reincarnates at the opposite boundary and growth of the CD continues at opposite direction. The new self has arrow of time opposite that for the old one. The first state function reduction generates negentropic entanglement and can increase the value of  $h_{eff}$  so that evolution becomes possible.

2. In this framework geometric memories correspond naturally to time reversed sub-selves defining mental images. The space-time region (active boundary of CD) wherefrom they receive sensory information is indeed in geometric past of the self so that the interpretation as episodal memory makes sense. Also classical communications are naturally associated with sub-self and its time reversal. Note that precognition is memory from the point of time-reversed self. During sleep we precognize our geometric future.

Consider now communications with distant objects in this framework.

1. Negative energy signal would mean death of sub-self representing mental images and its re-incarnation in the geometric past accompanied by negative energy signals received by the new sub-self. The death of the time-reversed sub-self generates a sub-self with original arrow of time receiving the accompanying positive energy signal. The dying sub-self sends a signal received by its re-incarnation!
2. Communications with distant parts of the cosmos would be experiencing the time reversals of one's own mental images! We would be quite literally cosmic entities. Study of cosmos would be study of our own minds. In this situation mind is only conscious about itself. If Mind is conscious about other Mind it must fuse with it to single Mind by generating negentropic entanglement, otherwise it has no experience about other Mind. As far as conscious experience is involved, there is only one Mind. This is the TGD analog for One Mind theory and is able to avoid the paradox.

If the sub-self representing self model dies as one falls in sleep and re-incarnates as its own time reversal at the opposite boundary of CD, sleep could involve communications with distant parts of the Universe. Pineal gland generating DMT could play a key role in this process.

### 2.6.3 Why information molecules containing aromatic rings should be so important?

I have considered the question of the title in [L8] [K14] ([http://tgdtheory.fi/public\\_html/articles/anesthetes.pdf](http://tgdtheory.fi/public_html/articles/anesthetes.pdf)). The basic idea is that aromatic ring can carry the analog of supra-current as electron pair and this current generates a dipole magnetic field represented as flux tubes around the ring. This makes molecules with aromatic rings basic conscious entities in living matter. The flux tubes can carry dark matter and if there are several molecules with aromatic rings near each other, reconnections can take place and give rise to larger structures with building bricks connected by pairs of flux tubes carrying supra currents and dark cyclotron photon signals.

DNA would be the fundamental structure of this kind. Each base-pair would contain  $1+2+1+1=5$  (two rings from sugars) aromatic rings and longer DNA sequences would define larger conscious entities. Microtubules contain also aromatic rings assignable to 2 amino-acids phe and trp appearing in the tubulin molecules. Of course, all proteins contain these aromatic rings possibly integrating by flux tube connections to larger conscious entities. In this picture it would not be surprising if the basic information molecules would also involve aromatic rings.

DNA letters A,G and their conjugates T,C have the ring structures of trp and phe respectively and base pairs in the double DNA strand correspond to trp and phe ring structures connected by hydrogen bonds. Could the information molecule-receptor protein coupling rely on similar couplings with trp and phe playing the role of fundamental plugs. This hypothesis predicts that more complex information molecule-receptor pairs should have geometries in which trp:s and phe:s can meet each other naturally. Also protein folding could involve similar trp-phe self-couplings by hydrogen bonds determining the folding to a considerable degree. Protein folding would be determined basically by the generation of negentropic entanglement dictated by NMP and its understanding would require quantum theory of consciousness.

### 2.6.4 Psychedelic-receptor complex as plug-in to cosmic internet and a new perspective on remote seeing?

If one - just for fun - takes seriously the claims of shamans, one must ask whether our brain has well developed tools available for building contacts with distant civilizations and what these tools might be. The receptors of neural transmitters are obviously the natural candidates for the pathways to cosmos. In the case of neural transmitters these would serve as pathways to the personal magnetic body (with onion-like structure). Neural transmitters could be however replaced with psychedelics if they have a geometric structure allowing a binding to the corresponding receptors. If psychedelics have flux tube connections to very distant parts of the Universe, a connection is generated.

1. One can argue that evolutionary pressures have forced living matter to develop highly standardized connections to various parts of the personal magnetic body and possibly also other magnetic bodies. Personal magnetic body has astrophysical size and EEG frequencies would correspond to communications in Earth size scale. Receptors serving as Josephson junctions

emitting Josephson radiation with frequency characterised by  $h_{eff}$  are natural candidates for plug-ins.

2. The model for cell membrane as Josephson junction leads at the microscopic level to the view that the proteins associated with various ion pumps, channels, and receptors (of also neurotransmitters in postsynaptic junction) define Josephson junctions to which magnetic flux tubes are associated and characterized by local value of Josephson frequency, that is membrane potential and Planck constant  $h_{eff}$ . As the information molecule is attached to a receptor, a connection to some part of the some magnetic body would be generated and split as the molecule is not present. These connections are possible in the scale cell, organelle, organ, organism, population and maybe even in the scale of cosmos. Psychedelics affect serotonin receptors so that serotonin spends longer time in receptor.
3. The simplest picture is that the connection corresponds to a pair of flux tubes. As the connection is broken, the pair has suffered reconnection cutting it to two U-shaped closed flux tubes. When molecule is attached to the receptor, these U-shape closed flux tubes reconnect. The actual situation is of course expected to be more complex but the basic principle would be this.
4. Neurotransmitters and also other information molecules can be seen as molecules at the ends of flux tubes having ends in some fixed subsystem X. The attachment of neurotransmitter to the receptor would builds a flux tube connection between postsynaptic neuron and X. The magnetic bodies in question characterised by passwords defined by collections of cyclotron frequencies corresponding to a hierarchy of space-time sheets. The Josephson frequency associated with the receptor is inversely proportional to  $h_{eff}$ . The natural guess is that it corresponds to the cyclotron frequency of the magnetic body part for electron, proton, or some ion associated with it. Josephson frequencies should serve as kind of passwords and receptors would be in one-one correspondence with these passwords defining gateways even to the outer space if the value of Planck constant is large enough.

The basic difference to ordinary view is that information molecules build only connections: after the establishment of a connection dark supracurrents and dark photons take care of the communication. Attaching the information molecule to receptor is like clicking a link in web.

5. Psychedelics would replace the ordinary neural transmitters building up this kind of flux tube connections in the normal situation so that the the connections could be to quite different places.

One might be able to test this crazy hypothesis.

1. Pineal gland could still serve as the “third eye” but utilizing large  $h_{eff}$  photons. Fishes and birds are able to navigate to their birth places. This mechanism could involve dark electron Cooper pairs at the magnetic flux tubes of Earth’s magnetic field generated by visible photons with energies above energy of red light making possible to move along magnetic flux tube: as the direction of flight ceases to be along it and spin direction of cyclotron Bose-Einstein condensate changes, cyclotron transitions induce dark photon emission at energy of visible photons in turn generating visual sensation. This would explain why radiation at MeV frequency leads to disorientation (cyclotron transitions are induced resonantly). This need not be enough. Could also “remote seeing” by pineal gland using the dark light coming along flux tubes (or maybe even active variant of this process by sending light which is reflected back in time direction). What about remote seeing in the “usual” sense of the word: could psychedelics help also in this process?
2. The role of DMT is especially interesting. Body synthesizes it and pumps it through blood-brain barrier. I learned in private discussion that the experiences induced by DMT are relatively predictable (Terence Mac Kenna has described it as a sudden “dropping” to another world somewhere “below” through some kind of wall) whereas other psychedelic substances induce rather unpredictable experiences. Could it be that DMT corresponds to a permanent connection to some fixed external magnetic body or to a higher layer of level of personal magnetic body with permanent reconnection to some part other magnetic body? DMT as

also other psychedelic substances would only help to induce the signal as Josephson radiation. This would be analog to the higher probability of remote mental interaction due to pre-bonding. What happens during sleep: is this connection generated during sleep: what about concentration of DMT during sleep in various brain regions.

3. The information molecule-receptor complex would be associated with the communications to a part of magnetic body determined by the flux tube assignable to the information molecule and possible communications from magnetic body as sensory experiences such as psychedelic experiences and mediated by radiation in opposite time direction. Also control commands from magnetic body - assumed to be realized as signals in opposite time direction as compared to sensory signals - are important and a natural assumption is that the commands initiating gene expression enter through genome via flux sheets traversing through DNA: the time scale for gene expression is slow and also other mechanisms are very probably involved. If both genome and cell membrane can (on general grounds it seems that they must do so) send signals in both time directions, the general vision about motor action as time reversal of sensory perception implies that cell membrane receives also control commands.

More generally, the complex formed by reacting biomolecules and catalyst could form a complex receiving control commands from the magnetic body. A temporary fusion of a catalyst molecule and of reacting molecules could serve as the analog of the information molecule-receptor complex. The protein Josephson junction associated with this complex would receive in a resonant manner cyclotron radiation from the magnetic body inducing a transition to a state in which the potential barrier preventing the reaction would be lower.

4. An interesting but ethically questionable test for the hypothesis would be following. Transfer neurotransmitters associated with the of subject B to the brain of person A, and see what effect they have on conscious experience of A. If the proposal is correct, person A would have flux tube connection to the magnetic body of B, and might receive some memories of B for instance. Could transplants induce similar effects? Heart transplants are reported to have strange effects suggesting that heart (having a lot of neurons) has emotional memories.

Irrespective of whether one takes seriously the thought game leading to this proposal, one must admit that it would provide deep for the notion of "information molecule".

### **3 The Interpretation Of My Own OBE Type Experiences In Terms Of The Proposed Model**

My own personal experiences have served as a test bed for the basic ideas of TGD inspired theory of consciousness. I find it practical to divide these experiences into two classes. The first class of experiences have repeated relatively often during years after the great experiences. The Great Experiences in turn involved a rich spectrum of experiences which I group into the second class. There is some overlap between these categories.

#### **3.1 Visual Experiences And Kinesthetic Sensations**

The first class of strange experiences involves several kinds of visual experiences and kinesthetic sensations.

1. When I lightly close my eyes during ordinary wake-up consciousness and in calm state of mind, I see dimly a complex flow in the visual field. This flow brings in mind time dependent magnetic field or incompressible flow of fluid. The direction of flow can be either inwards or outwards and can change. The flow can be also colored. The straightforward interpretation would be as a visual stimulus from the magnetic body which does not give rise to concrete images.
2. I have had many AS experiences in which I have seen my body in strangely deformed state and have had a sensation of floating. This experience is often followed by the experience of raising to the roof and I have made attempts to test whether the levitation is real or

not. The experiences have ended to a wake-up to ordinary state of consciousness. Quite concrete sensations of what I have identified as “electrical storms in temporal lobes” have often accompanied these experiences.

3. I have had also flying experiences: typically there is some critical height which I cannot exceed. I have had also experiences about being in completely dissipation free spinning or translational motion, which bring strongly in mind what purely quantal motions of this kind feel like. The translational motion has been possible only in a finite volume defined typically by the walls of the room. I have also experienced my children to bring me back when I have tried to go too far. A possible interpretation is that my magnetic body is bound to that of room so that it is not possible to leave it.
4. I have often experienced quite concretely a return to my own body during wake-up as a kind of contraction somewhat like djinn returning to a bottle. After a visit to Holland where I was subject to a treatment by a healer, I waked up to a rather long-lasting experience in which I felt that the entire room was part of my body. The world around me was strangely peaceful and calm, somewhat like the world in the pictures I saw in fairy tales in my childhood.
5. Two illusions analogous to train illusion but involving a 2- or 3-dimensional wave motion instead of linear motion deserve also to be mentioned. I sat in a calm state of mind on cliff on beach and enjoyed looking the waves. Suddenly I got a long lasting sensation that the cliff is in a wave like motion as if I had seen the cliff from the perspective of the moving surface of sea and thus in a wave like movement with respect to it. The explanation would be magnetic body began to mimic the wave motion somewhat like a person listening very attentively begins to mimic the facial expressions of the speaker. Since magnetic body also serves also the dual role of a sensory canvas to which sensory mental images are projected [K10], the situation would be like projecting sensory mental images to a deformable screen along which deformation waves propagate. The projected sensory images such as the visual image about cliff would inherit the wavy character.

Anyone who has enjoyed free floating in a windy sea for a sufficiently long time has probably experienced a sensation about a wave like motion inside the body after the return to the shore. The sensation continues surprisingly long time. As far as I can remember, this experience is absent during free floating. Also this experience might relate to the fixation of bodily attention to the wavy sea inducing a mimicry of wave motion by a relevant magnetic body as in the previous case and continuing for a considerable time after the return to the shore. During free floating in sea this sensation is weak since the relative motion is minimal but at the shore the situation changes since the body is in a relative 3-D motion with respect to the magnetic body.

### 3.2 OBE Type Auditory Sensations

Also OBE type auditory sensations have often occurred.

1. The AS experience have often started usually by a gradual amplification of sounds such as the sound of refrigerator and have involved the rather frightening sensation that the refrigerator attracts me towards it and wants to fuse my self with its own (for this reason I have been forced to minimize this sound). A possible explanation is that magnetic body in this kind of situation contributes to the auditory stimulus the secondary sound representing the sensory stimulus that it has received from the body and a positive feedback loop is generated. Representation as microwaves is perhaps the most plausible option.
2. When I wake up during night-time, I can sometimes hear a kind of wind blowing and often I realize that ordinary wind is not in question when I see that there is completely calm outside. This wind has preceded sometimes a loss of consciousness. A microwave stimulus arriving from magnetic body along magnetic flux tubes and transformed to auditory sensation could be in question. Obviously this sensation would be direct auditory counterpart for the flow in visual field experienced during wake-up.

3. To listen one's own snoring during sleep or just before wake-up as an outsider is a rather bizarre experience and often it takes time to realize that it is really me. The interpretation in terms of microwave dark photon beams modulated by the snoring and reflected back from the magnetic body would be the simplest one.
4. Sometimes I also hear my own breathing as double with a time laps of a fraction of second between the copies. This gives some idea about size of the magnetic body possibly involved. For microwave hearing the size of magnetic body would correspond to a wavelength of typical EEG wave and would be of the order of Earth circumference for 7.8 Hz. If ordinary sound waves are in question the size of magnetic body involve would be of order 10 meters.

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