

TGD INSPIRED THEORY OF CONSCIOUSNESS

Some key notions and applications

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Basic notions of TGD

- **Space-time as a 4-dimensional surface in 8-D space-time**
- **Many-sheeted space-time**
- **Zero energy ontology**
- **Topological field quantization and the notion of field body/magnon**
- **Dark matter hierarchy and hierarchy of Planck constants**
- **p-Adic physics as physics of cognition and intention**

Some ideas of TGD inspired theory of consciousness

- **Quantum jump between time evolutions of Schrödinger equation as moment of consciousness. Free will outside space-time and Hilbert space. Resolution of basic problem of quantum measurement theory. Creative evolution.**
- **The notions of self and subself: subselves as mental images.**
- **Everything is conscious but consciousness can be lost by quantum entangling.**
- **Self hierarchy-hierarchy of quantum jumps- dark matter hierarchy: self hierarchy reduces to the hierarchy of quantum jumps.**
- **Many-sheeted space-time leads to a new view about entanglement: sharing and fusion of mental images. Telepathy as sharing of mental images.**
- **Qualia – increments of quantum numbers of subsystem in quantum jump.**

New view about time

- **Subjective** (experienced) time and **geometric** time different things.
- Subjective time as **sequence of sub-quantum jumps**: geometric time as physicist's **coordinate time**.
- Why the **two times are so closely related**? Why **arrow of time**?
- TGD assigns to positive/negative energy system **future/past light cone** : **fractal hierarchy of cosmologies with cosmologies**. Arrow of subjective time should have as space-time correlate the geometric arrow of time for lightcone.
- **Subselves correspond to zero energy space-time sheets**: determine the contents of conscious experiences. Do they **shift towards geometric future** quantum jump by quantum jump along background space-time sheet? Or are they **scaled up in size** so that upper end shifts towards geometric future? Space-time sheet would literally grow in both time directions! Special case of **cosmic expansion**.
- **Reversed arrow of geometric time** associated with negative energy parts of quantum states.

Implications of zero energy ontology

Communications possible also to the direction of geometric past using negative energy signals.

- **Phase conjugate laser beams** as negative energy signals.
- **Kozyrev's findings about three different signals from astrophysical objects.**
- **Advanced waves and retrocausality.**
- **Syntropy and entropy.** Generalization of second law.
- **Mechanisms of memory storage and recall, remote metabolism, mechanism of intentional action.**
- **4-D body and brain.** 4-D society. Our 4-D body continues conscious existence after biological death. The deceased would be still there.

Remote metabolism

- **Many-sheeted laser:** dropping of particles to larger space-time sheet liberates quantized zero point kinetic energy. **Metabolic energy currency of about .5 eV** zero point kinetic energy of proton at atom sized space-time sheet.
- **Quantum credit card.** Bank as **population inverted laser like system in geometric past.** System can get positive energy by sending negative energy to the geometric past. Laser returns to ground state as it receives the negative energy signal.
- Mechanism extremely **flexible:** only a system able to provide the energy to laser is needed. Evolutionary advantage in jungle!
- Possible technological applications of remote metabolism. Low frequency dark photons as carriers of negative energy over long distances. **No need to carry the fuel. Universal energy currencies!**

New view about memory

- No necessity to store memories about past to the brain of geometric now: **memories stored to the brain of geometric past**. Prediction: damage to the brain of now need not lead to loss of memories if memory recall mechanism is not lost.
- **Episodal memories** could correspond to sharing of mental images of the brain of geometric past by timelike quantum entanglement .
- **Declarative memories** communications with geometric past: negative energy signal to geometric past as memory recall. Response by positive energy signal as memory.
- **Bit representation for declarative memories**. Population reversed state=1, ground state =0 . Metabolic energy feed is needed to regenerate population inversion.
- **Are we conscious during sleep but do not remember anything?** Life cycle as single quantum jump at highest level of personal self hierarchy suggests that this is the case. How else could I **know that I existed yesterday**? The absence of the metabolic energy feed would imply the absence of memories about sleeping periods?
- **Telepathy**: could one experience memories/mental images of another person or is there some kind of cognitive immune system at work.

Mechanism of intentional action

- **p-Adic space-time sheet as a representation of intention:** transformed to a real space-time sheet representing negative energy photon and propagating to geometric past. Induces neural activity in geometric past leading to a motor activity in geometric now. Flexibility and instantaneous reactions.
- **Libet's finding:** neural activity in brain begins by a fraction of second before the conscious decision. Is free will illusion? No: "before" refers to geometric time, not to subjective time.
- **Field body/magnetic body** containing large \hbar dark matter **intentional agent** using biological body as a **motor instrument** and **sensory receptor**.
- Fractal hierarchy in which control commands from boss propagate downwards in hierarchy of the layers of magnetic body and finally end down to the neuronal level.

Dark matter hierarchy and hierarchy of Planck constants

- **Dark matter** with large value of Planck constant would be macroscopic quantum phase since **Compton length scales as \hbar** . Macroscopic quantum coherence even in astrophysical length scales since gravitational \hbar gigantic (Bohr quantization of planetary orbital radii).
- **EEG photons with large \hbar** could have **energy above thermal energy** at body temperature. Explains why EEG correlates with the state of brain and contents of consciousness.
- **Effects of ELF em fields on brain of vertebrates (see this as example)**. **$B=.2$ Gauss**: not same as **Earth's $B=.5$ Gauss**. **Dark magnetic field in question?! Great leaps in evolution could correspond to the increase fo the largest \hbar in personal hierarchy of field bodies.**
- **Ormus as dark matter? Orgone energy real and related to dark matter?**

Field body as intentional agent

- Field body/magnetic body contains dark matter with large value of Planck constant. Receives sensory input from biological body and quantum controls it. **Biological body as sensor and motor instrument.**
- Sizes of magnetic field bodies astrophysical. **Light-life** defines scale for the largest field body certainly present (larger ones might be present). [p-Adic space-time sheets have literally infinite size and duration! Cognition cosmic phenomenon.]
- Field body would **share sensory mental images** generated by sensory receptors and also cognitive mental images generated by brain. Cognitive mental images would be also generated at field body.
- Fractal hierarchy of field bodies. **Fractal hierarchy of generalized EEGs** would be responsible for communications to and control by magnetic body.
- **Cell membrane as fundamental sensory receptor.** Sensory input would be communicated to magnetic body by generalized EEG

Field body as intentional agent

- **Magnetic body would use genome as a motor instrument by inducing gene expression.** Magnetic flux sheets go through genes.
- The larger the magnetic flux, the more genes associated with flux sheet. Generalization of the notion genome: **super genome** consisting of a large number of genomes organized like lines of text at the page of book defined by flux sheet. **Hypergenome** formed from supergenomes and can involve genomes of different organisms. Collective coherent gene expression.
- **Great leaps in evolution** would mean emergence of new hierarchy levels with larger \hbar and the organization of genomes to larger structures. Larger field bodies –more precise cognitive representations. Longer time scales of memory and planned action.
- Quantum control involves EEG: **cyclotron transitions of dark ions** at magnetic body. Alpha band contains cyclotron frequencies of biologically important ions. Narrow sub-bands on beta and theta bands (**Nunez**) predicted correctly.

New view about cell membrane

- **Experimental findings challenge pump-channel paradigm.** Cell membrane continues to function in absence of metabolic energy feed.
- **Ionic currents through cell membrane quantal . Independent of the structure of cell membrane.** Same currents for artificial membranes!
- **Cell membrane as Josephson junction.** Josephson current would generate part of generalized EEG (beta and theta bands for instance).
- **Could dominating parts of ionic and electronic currents be dark supra currents with large \hbar ?** Would not dissipate much energy.
- **Could sensory receptors purposefully generate small ohmic currents in order to measure the properties of chemical environment using the dissipation rate as measure?**

Applications of the notion of field body

- **Luminous phenomena:** plasmoids as primitive life forms.
- **OBEs:** Interference effects for light signals between field body and biological body allow field body to represent the motion of biological body as its own motion.
- **Memory of water:** also molecules have field body which water can mimick.
- **Psi tracks:** thought bubbles as field bodies.
- **Psychokinesis:** General mechanism of intentional action applied to other than own biological body. Favors retro PK.

Luminous phenomena

- Could light balls be **plasmoids**: primitive life forms. Dark matter at field body controlling ordinary matter in plasma state?
- **High temperature not a problem** if large $h\nu$ photons are involved. Even ELF photons could be possible.
- **Observations of Romanian research group support the view about plasmoids as primitive life forms.** (E. Lozneanu and M. Sanduloviciu (2003) ,Chaos, Solitons and Fractals, Volume 18, Issue 2, October, p. 335)
- **Many-sheeted laser and remote metabolism**: dropping of particles to larger space-time sheets and remote metabolism. Universal metabolic energy quanta present already in prebiotic stage: chemistry would bring in only the storage of energy.
- Plasmoids would prefer regions of **tectonic activity** if they could liberate metabolic energy. Dropping of particles to larger space-time sheets could occur in these regions.

OBEs and field body

- **Field body can change its shape. The relative motion of field body and biological body generates interference patterns.** These hologram-like interference patterns might be fundamental for the generation of bodily sensations.
- **Generalized somatosensory representations at the level of field body.** Sensory input takes care that representation remains realistic.
- **OBEs might result when sensory input is absent and field body changes shape or moves with respect to biological body. Train illusion.** The belief that train moves generates a sensory representation as a motion of field body. **Illusion of falling down from cliff** resulting from the thought of falling down.
- **Sensory deprivation (think tanks) and the state between sleep and awake optimal for generating OBEs.**

Psi tracks and PK

- **Field bodies give rise to cognitive representations.** The intersection of field body and its p-adic counterpart consisting of rational valued space-time points a discrete cognitive representations also crucial for realization of intentional action.
- **Psi tracks: "thought bubbles" as dynamically generated field bodies?**
- **Our own field bodies might be able to perform PK** by applying general mechanism of intentional action. If target quantum critical system feeded by metabolic energy the situation is optimal. For computers this probably not the case.
- **Retro PK most natural** in this framework. For ordinary PK target could draw energy from the PK- able person by sending negative energy signals.
- **Population inverted laser like system** optimal for retro PK. Find whether intentional action can bring this kind of system to

Memory of water

- Also **molecules have magnetic field bodies** acting as intentional agents controlling the molecules. Nanomotors not only look co-operating living creatures but are such!
- The field body of molecule would contain besides static magnetic and electric parts also dynamical parts characterized by frequencies and temporal patterns of fields. **Right brain sings-left brain talks** metaphor might generalize.
- The effects of molecule to water would be characterized to some degree by its field body.
- Water could possess a hierarchy of field bodies. Water could be able to **mimic the field bodies of molecules using water molecule clusters**. Vibrational and rotational spectra.

- The action of pulse patterns on water could have explanation in terms of **bit representation based on many-sheeted lasers**. Analogy with computer storage of memories. Cognitive code. **Water memory could rely on this kind of representation.**
- **De-coherence of dark photons to ordinary ones might be a basic mechanism of biocontrol at all levels.** Transformations of low frequency dark photons to ordinary photons with high frequency.
- **"Scaling law of homeopathy": $f(\text{high}) = 2 \cdot 10^{11} f(\text{low})$** as one particular instance of de-coherence (C. Smith (2001), Learning From Water, A Possible Quantum Computing Medium}, talk in CASYS'2001, 5th international conference on Computing Anticipating Systems held in Liege, Belgium, August 13-18).
- **De-coherence might be associated with water memory.** Dark negative energy signal with low frequency could travel a long distance before de-coherence to ordinary high frequency photon inducing dropping of particles to larger space-time sheets and giving possibly rise to primitive intentional action, remote metabolism, or memory recall. Even in case of water.

Many-sheeted 3-space

To the beginning



wormhole throats

3-space sheets correspond to physical objects

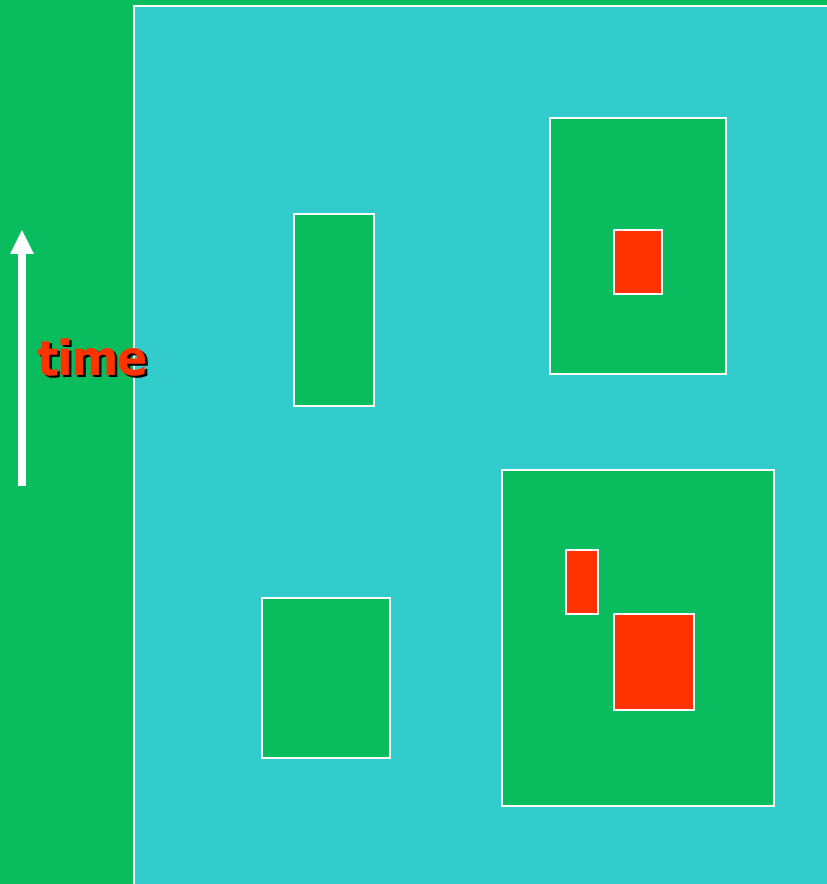
Topological condensation

Wormhole contacts

Wormhole throats contain elementary particle quantum numbers

Many-sheeted space-time

To the beginning



Hierarchical fractal structure

Space-time sheets correlates for to zero energy states

Zero energy ontology

To the beginning

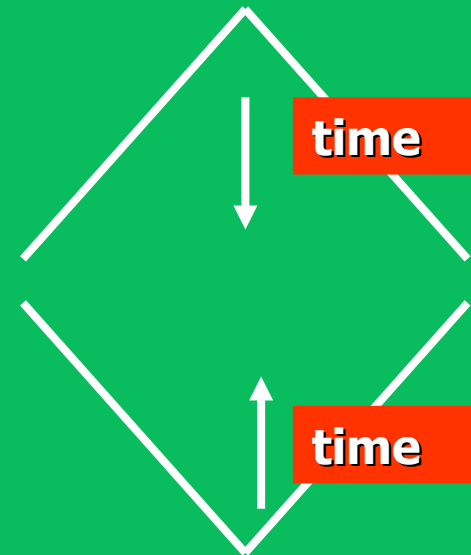
Zero energy states creatable from vacuum

Big bang-big crunch analogy

Communications to geometric past

Timelike entanglement

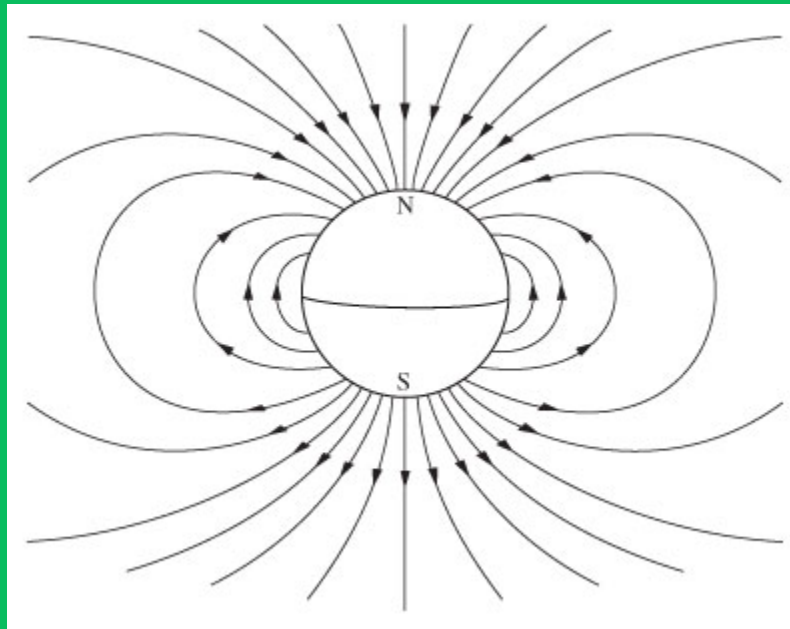
Boundaries of **past light cones** contain **negative energy matter**



Boundaries of **future light cones** contain **positive energy matter**

Field body

To the beginning

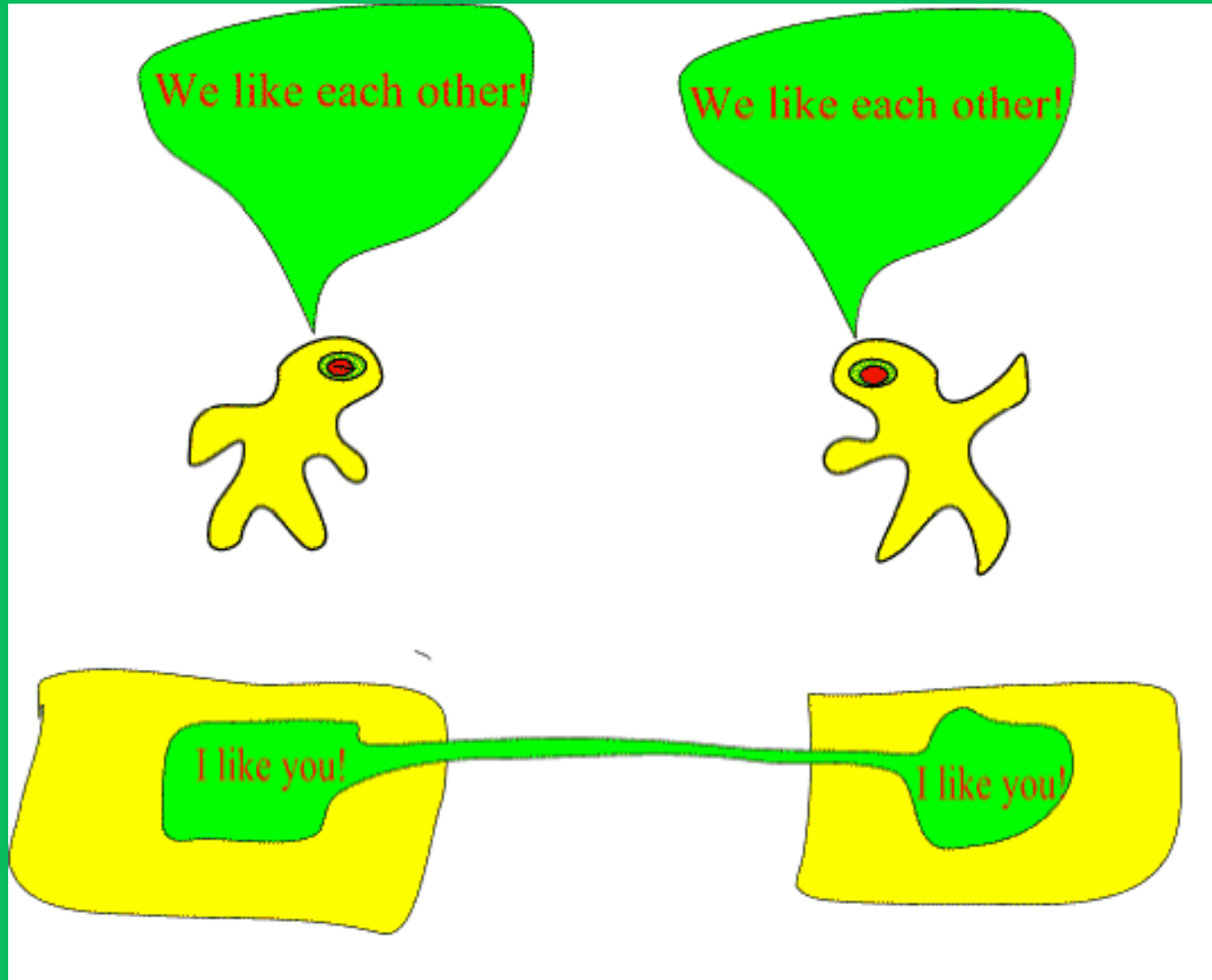


One can assign to each system its field body. Not possible in Maxwell's theory

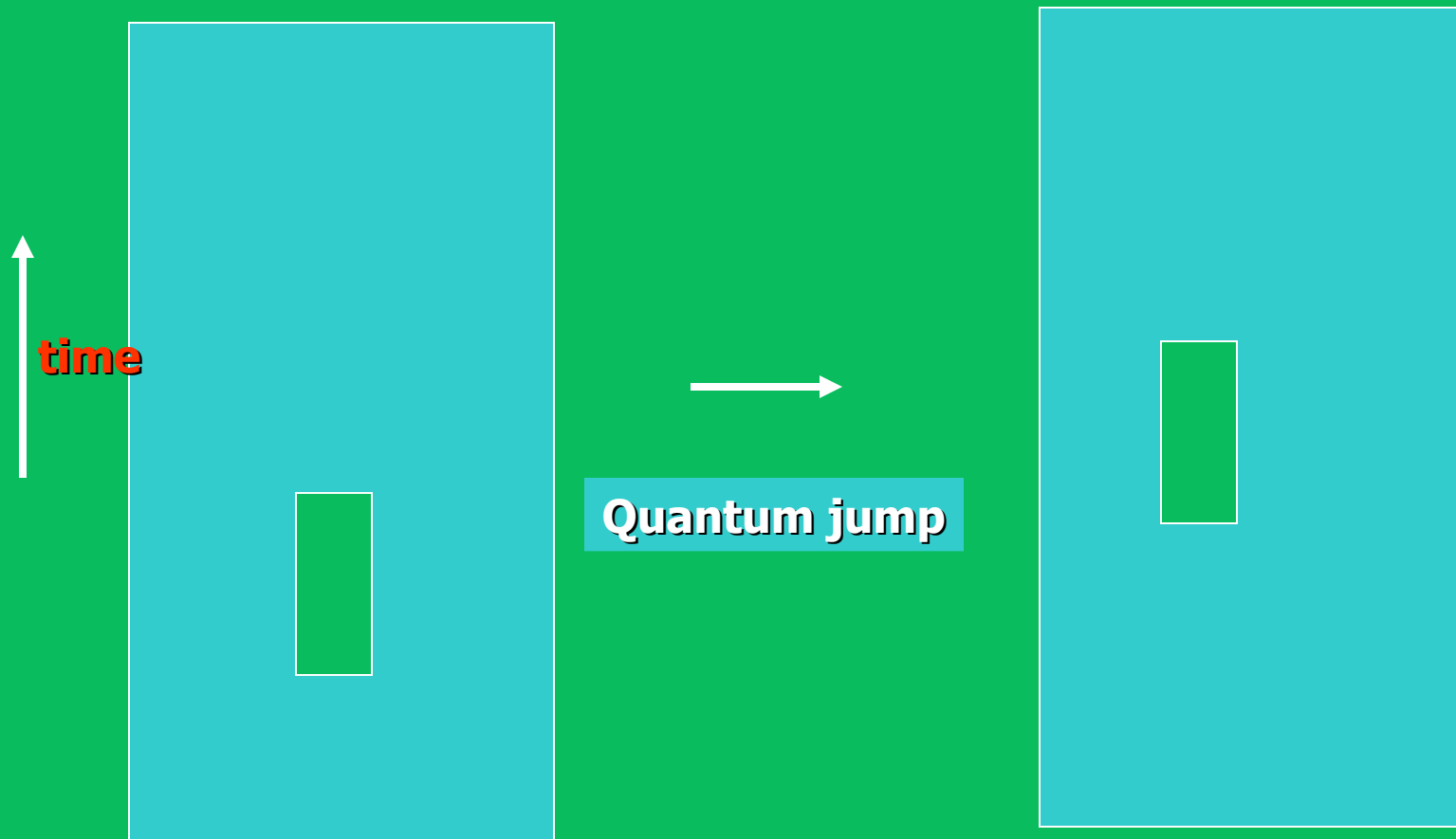
Magnetic field decomposes into quanta which correspond to space-time sheets. Field lines are thickened to flux tubes carrying quantized magnetic flux. Also magnetic walls are possible.

Sharing of mental images by entanglement of sub-selves

To the beginning

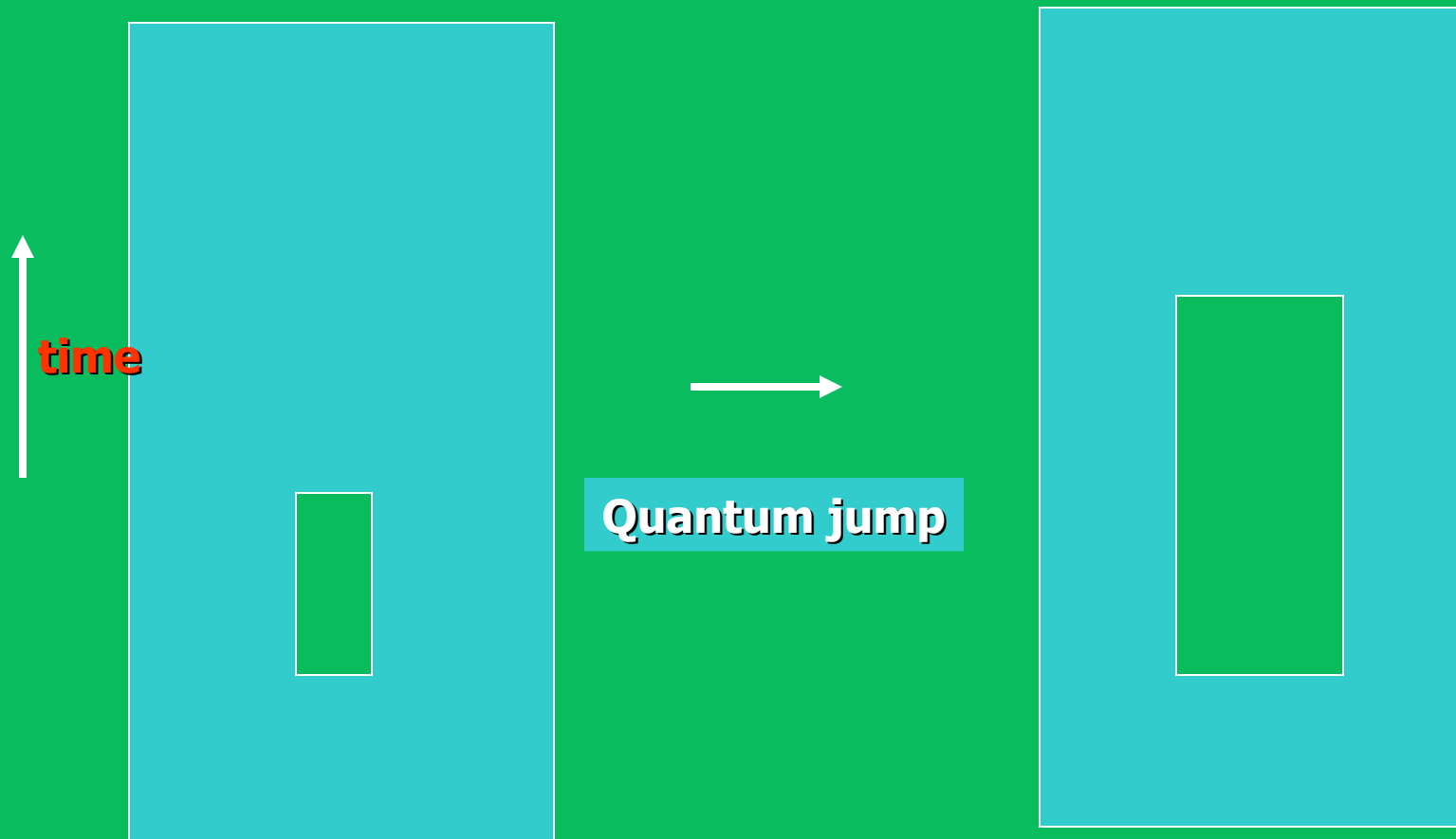


Arrow of time: option I



Space-time sheets representing mental images drift towards geometric future

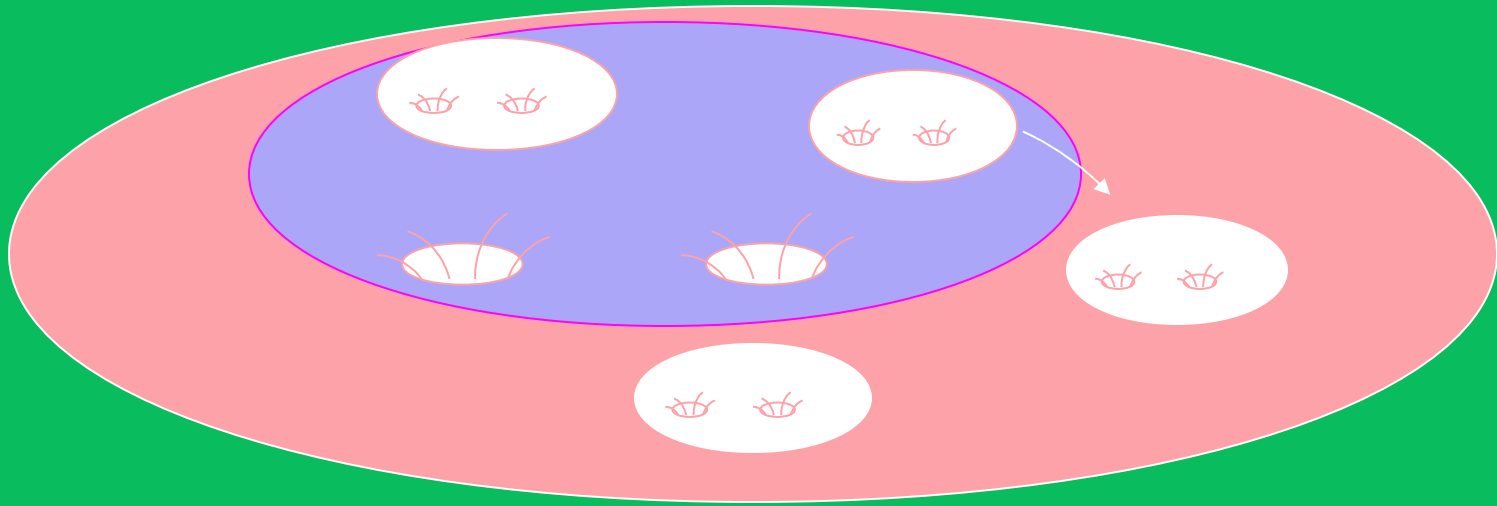
Arrow of time: option II



Space-time sheets representing mental images "grow":
scaling up in quantum jump as in cosmic expansion

Many-sheeted metabolism

To the beginning



**Free particle drops to a larger space-time sheet
and liberates zero point kinetic energy**

Space-time as 4-D surface in 8-D spacetime

To the beginning

- Generalization of string model: **1-D string in 10-D space replaced with 3-D lightlike surface in 8-D space H.**
- **8-D space H obtained by replacing the points of the 4-D spacetime of Special Relativity with certain 4-D space known as CP_2 .**
- **Poincare invariant theory of gravitation motivated by energy problem of general relativity.**
- **Geometry of CP_2 codes for known elementary particle quantum numbers.**
- **Geometrization of known fundamental interactions.**

Dark matter hierarchy and hierarchy of Planck constants To the beginning

- **Finding: planetary orbits seem to obey Bohr rules. Gravitational Planck constant gigantic and proportional to the masses of planet and Sun.**
- **Dark matter corresponds to ordinary dark matter with Planck constant different from ordinary one. Planck constant quantized and can have arbitrarily large values. Planck constant characterizes space-time sheets mediating various interactions between particles: "relative field bodies".**
- **Scaling up of \hbar means scaling up of Compton length and scaling down of dissipation rate. Dark electron can have very large size. Dark matter macroscopically quantum coherent phase and zoomed up version of ordinary matter.**
- **The larger the Planck constant the higher the "IQ" of system is. Hierarchy of conscious entities.**
- **Forces a generalization of the notion of imbedding space.**

p-Adic physics and real physics

To the beginning

- **p-Adic number fields completions of rationals** to continuous number fields just like reals. One for each prime $p=2,3,5,7,\dots$. The notion of continuity different than for reals.
- Reals and p-adic number fields must be fused to single coherent whole by gluing them together along common rationals and algebraics. Also the notion of space-time generalizes.
- **p-Adic space-time sheets the space-time correlate of cognition and intentionality:** "mind stuff" of Descartes. p-Adically infinitesimal is infinite sized in real sense. p-Adic space-time sheets infinite in real sense. **Cognition and intentionality literally cosmic phenomena.**
- **p-Adic and real space-time sheets intersect along common algebraic points.** Cognitive representations always discrete. The larger the real space-times, the better the representation.
- **Intentionality and cognition visible in real physics by interaction via intersection of real and p-adic space-time sheets:** effective p-adic topology in real sector. The success of elementary particle mass calculations suggests that cognition and **intentionality is present already in elementary particle length scales.**
- **Physics must be formulated using the generalized notion of number.** p-Adic space-time sheets obey formally same equations as the real ones.