Quantum Hardware of Living Matter

This book represents a view about quantum hardware of living systems in TGD framework. Since the vision is bound to look highly speculative, it is good to emphasize that the most important predictions follow almost without any reference to the classical field equations using only quantum classical correspondence.

The new conceptual elements are the notion of many-sheeted space-time having fractal hierarchical structure, 4-D spin glass degeneracy of the preferred extremals of Kähler action providing huge information storage capacity, topological field quantization, the notion of magnetic/field body serving as intentional agent using biological body as sensory receptor and motor instrument, zero energy ontology leading to a new view about energy and about the relationship between experienced and geometric time, dark matter hierarchy realized in terms of book like structure of 8-D imbedding space with pages labeled by values of Planck constant, the assumption that the phase transitions changing the value of Planck constant provide a key control tool in living matter, and p-adic length scale hypothesis allowing quantitative grasp to the situation.

1. Three chapters of this book are devoted to the model of high T_c super-conductivity relying strongly on the notions of quantum criticality and dark matter.

2. Two chapters discuss quantum antenna hypothesis inspired by topological light rays (M(assless) E(xtremals)) and the notion of wormhole magnetic fields. Notice that the notion of wormhole magnetic field was introduced much before the hypothesis that bosons and also interaction fermions have a natural identification as wormhole contacts emerged. The recent view about quantum TGD suggests the interpretation wormhole magnetic fields as dark scaled up versions of elementary particles identified as Kähler magnetic flux tubes identified as pairs of magnetically charged wormhole contacts carrying at the second wormhole throat neutrino pair neutralizing the weak isospin of the fermion at the second wormhole throat. For ordinary value of Planck constant the length of is flux would be given by weak length scale. Therefore weak interactions in biological length scales are involved giving rise to large parity breaking effects. Also scaled up QCD is involved and implying hadron like states in biological length scales.

3. Two chapters are devoted to the possible biological implications of the hypothesis that dark matter corresponds to macroscopic quantum phases characterized by a large value of Planck constant and is the key actor in living matter.

4. A possible identification of quantum correlates of sensory qualia is discussed assuming that qualia are in one-one correspondence with the increments of quantum numbers in quantum jump. Also a simple model for sensory receptor is introduced. The recent view about cell membrane as almost vacuum extremal of Kähler action explains large parity breaking effects in living matter and also the peak frequencies of photoreceptors in retina. Also a model for the cell membrane as a kind of sensory homunculus with lipids identified as pixels of a sensory map representing basic qualia follows naturally. Furthermore, EEG photons and biophotons can be identified as decay products of same dark photons.