

Mathematical Aspects of Consciousness Theory

This book discusses general mathematical ideas behind TGD inspired theory of consciousness.

PART I: New Physics And Mathematics Involved With TGD

The Clifford algebra associated with point of configuration space ("world of classical worlds") decomposes to a direct integral of von Neumann algebras known as hyper-finite factors of type II_1 . This implies strong physical predictions and deep connections with conformal field theories, knot-, braid- and quantum groups, and topological quantum computation.

In TGD framework dark matter forms a hierarchy with levels characterized partially by the value of Planck constant labeling the pages of the book like structure formed by singular covering spaces of the imbedding space $M^4 \times CP_2$ glued together along four-dimensional back. Particles at different pages are dark relative to each other since purely local interactions (vertices of Feynman diagram) involve only particles at the same page. The phase transitions changing the value of Planck constant having interpretation as tunneling between different pages of the book would induce phase transitions of gel phases abundant in living matter.

Part II: TGD Universe as topological quantum computer

The braids formed by magnetic flux tubes are ideal for the realization of topological quantum computations (tqc). Bio-systems are basic candidates for topological quantum computers. In DNA as tqc vision nucleotides and lipids are connected by flux tubes and the flow of lipids induces tqc programs.

Part III: Categories, Number Theory And Consciousness

Category theory could reflect the basic structures of conscious thought. The comparison of the inherent generalized logics associated with categories to the Boolean logic naturally associated with the configuration space spinor fields is also of interest.

The notion of infinite prime was the first mathematical invention inspired by TGD inspired theory of consciousness. The construction of infinite primes is very much analogous to a repeated second quantization of a super-symmetric arithmetic quantum field theory (with analogs of bound states included). Infinite primes form an infinite hierarchy and the physical realization of this hierarchy imply infinite hierarchy of conscious entities and that we represent only a single level in this hierarchy looking infinitesimal from the point of view of higher levels. The notion of infinite rational predicts an infinite number of real units with infinitely rich number theoretical anatomy and single space-time point becomes a Platonia able to represent every quantum state of the entire Universe in its structure: kind of algebraic Brahman=Atman identity.