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Physical Foundations of Schrödinger and Dirac Wave Equations and their Implications to Quantum Cosmology and Quantum Gravity

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Abstract

Introduction of stochastic definitions of universal Planck and Boltzmann constants (h, k) reveals hydrodynamic origins of both quantum mechanics and quantum field theory. Also, new perspectives regarding the quantum nature of internal atomic (spacetime, mass) versus external (space, time, mass), black hole, white hole, and Dirac anti-matter are discussed. The temperature limits (T = zero, T = infinity) of Huygens compressible ether are shown to correspond to formation of (black hole, white hole) at (circumference, center) of Poincaré disk. Also, the interesting problem of black-hole to white-hole transition of Rovelli due to Einstein time-reversible field equations is examined. Physical foundation of quantum mechanics, Schrödinger equation, and quantum mechanics wave function are examined. Also, physical foundation of quantum field theory and derivation of invariant Dirac relativistic wave equation from invariant modified equation of motion is presented. Identification of physical space as Huygens compressible ether, Casimir vacuum, leads to Poincaré-Lorentz dynamic as opposed to Einstein kinematic theory of relativity. The introduction of absolute frame suggests new perspectives regarding Einstein's GTR and the principle of general covariance. Classical Newton law of gravitation is related to the pressure of Casimir vacuum. Thus, modified form of equation of motion is applied to derive both Friedmann-Lemaître equations that result in de Sitter universe even in the presence of matter and radiation. The hydrodynamics of universe is shown to follow either Schrödinger (non-dissipative, non-relativistic) or Dirac (dissipative and relativistic) wave equations with the latter in accordance with dissipative deterministic theory of quantum gravity introduced by 't Hooft.

Keywords: Quantum mechanics . Quantum field theory. Quantum Cosmology . Quantum gravity . Black hole . White hole . T.O.E

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