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A Unified Electro-Gravity Theory of a Spinning Electron, and the Fundamental Origins of the Fine Structure Constant and Quantum Concepts NIROD DAS, New York University, Tandon School of Engineering — A new Unified Electro-Gravity (UEG) theory is developed to self-consistently model a spinning electron. In its basic form, the UEG theory introduces a modified gravitational field proportional to the energy density surrounding the charge, with the constant of proportionality referred to as the UEG constant. The resulting stable mass, its associated classical radius, and the UEG constant, are shown to be closely related to the fine structure constant of electrodynamics, revealing - for the first time - the fundamental origin of the fine structure constant. The UEG theory of the spinning electron could also explain different quantum mechanical and quantum electrodynamic principles/phenomena, such as: (a) the Casimir effect in terms of the new UEG force, (b) the energy and frequency shifts in any electrodynamic transition in terms of a non-linear mixing process of the associated UEG and electromagnetic fields, (c) the quantized nature of the charge by directly linking it to quantization of the angular momentum through the UEG theory, (d) quantum wave frequency in terms of the spinning UEG field, and (c) the quantum wave-particle duality through an equivalent pilot-wave concept, based on the inseparable nature of the physical central charge and its surrounding spinning UEG field.

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