

A local-realistic alternative to unification attempts between general relativity and quantum theory

Part 2: The case of rotational motion

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“The intellect seeking after an integrated theory cannot rest content with the assumption that there exist two distinct fields totally independent of each other by their nature” — A. Einstein, Nobel Lecture, 1923.

Abstract

In another paper presented at this conference (Suleiman, 2020), we underscored the fundamental and mathematical difficulties in unifying general relativity theory and quantum theory. We proposed an alternative route to unity based on our recently proposed information relativity (IR) theory (Suleiman, 2014, 2018, 2019). IR is a local-realistic theory based on modifying Newtonian dynamics by accounting for the time delay in the travel of an information carrier from its source to a spatially separated receiver. For the case of rectilinear uniform motion, we showed that the theory transformation between two reference frames predicts a matter-dark matter duality for all moving bodies regardless of their mass and relative velocity. We demonstrated that the theory is successful in predicting and explaining many experimental and observational results in small particle and quantum physics as well as in cosmology and astronomy. It also suggests that the puzzling dark energy is the energy of the intergalactic dark matter of the receding universe. In this paper, we extend the theory transformations to the case of rotational motion. We utilize the derived transformation to explain physical phenomena at small and large scales. For atomic and quantum scales, we explain the “hydrogen atom problem,” and the famous phenomenon of spin entanglement. For cosmology, we show that the same set of transformations predicts the

amounts of dark matter in galaxies and suggest a novel explanation of gravity, according to which dark matter is the hidden medium that tells matter how to move.

Keywords: information relativity, dark matter, matter-dark matter duality, quantum entanglement, hydrogen atom problem, dark matter in galaxies, dark matter in the solar system, gravity.

References

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