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Approaching the Einstein's everlasting dream; unification of general relativity and quantum mechanics

Monday 12 September 2022 17:00 (20 minutes)

General Relativity (GR) and Quantum Mechanics (QM) are fundamentally different theories explaining how nature works but with genuinely incompatible descriptions of reality. While GR handles gravitational force, at large scale, QM is the theory for the other fundamental forces of nature, at low scale. Events in GR happen continuously with deterministic outcomes. In QM, they happen in jumps with probabilistic outcomes. GR sees objects as point particles in continuous spacetime fabric. These are wave functions in QM. The measurements in GR are noncoherent and certain. Due to noncommutation relations in QM, the measurements are coherent with uncertainties. Based on the existence of a minimum measurable length emerging from string theory, doubly special relativity and black hole physics, the noncommutative Heisenberg algebra is generalized and thereby the gravitational fields are integrated to this fundamental theory of QM. I shall be discussing scientific results for the simultaneous GR quantization and QM gravitization, that the mutual unification would be possible at extreme conditions.

Is this abstract from experiment?

No

Name of experiment and experimental site

N/A

Is the speaker for that presentation defined?

Yes

Details

Prof. A,Tawfik

Internet talk

Yes

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