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Black holes: information loss but no paradox?

Abstract

For last four decades all attempts to resolve the fate of information in black hole evaporation process, respecting fundamental principles of quantum mechanics and equivalence principle of general relativity, have faced various difficulties. For these approaches, the main aim has been to ensure no loss of information in evaporation process. In this talk, we first summarize the problem associated with them and then put forward a novel approach where the influence of gravity on quantum dynamics can in fact erase information and thus diffusing the paradox altogether. In our view, the root of the problem lies in the foundation of quantum theory, precisely, in so called "measurement problem" that gets enhanced under the influence of gravity. We show how a gravitationally influenced stochastic collapse can resolve both of these problems (i.e., the measurement problem and the information paradox) satisfactorily.

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