

Invitation

to the seminar of Division of Elementary Particle Physics of the
Institute of Physics of the Czech Academy of Sciences



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Quantum Gravity in the Wild: Black Hole Echoes, the Big Bang, and a Cosmic Glitch

Abstract: General relativity describes the Universe with extraordinary success, yet black hole horizons, the Big Bang, and cosmic acceleration point toward regimes where its classical description may be incomplete. Can observations turn quantum gravity into an empirical science? I will discuss three possible windows. Quantum structure near black-hole horizons may produce delayed gravitational wave “echoes” and departures from the Kerr geometry. In the early Universe, the quantum running of couplings in quadratic gravity can generate inflation and make testable predictions for the cosmic microwave background. At late times, DESI’s apparent preference for evolving dark energy might instead reflect a “cosmic glitch in gravity”: a small mismatch between the strength of gravity measured locally and on cosmological scales. A recent CMB and DESI analysis finds cosmological gravity to be roughly one percent weaker than Newtonian gravity. Intriguingly, the inferred glitch is of the same order as the inverse de Sitter scrambling time in Hubble units. The same logarithmic dependence on horizon entropy controls the black-hole echo delay, suggesting that quantum horizons might leave related observable imprints across vastly different scales.

When: Friday, August 21, 2026 at 2PM

Where: Dvořák hall, FZU, Pod Vodárenskou věží 1, Prague

For more information, please see <https://indico.fzu.cz/event/351/>