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Probing new physics with cosmic neutrinos

Wednesday, 13 November 2024 16:00 (30 minutes)

The cosmic neutrinos detected by the IceCube Collaboration present a compelling opportunity to explore potential new physics beyond the Standard Model and conventional relativity. In this presentation, I will discuss how the association of IceCube neutrinos with gamma-ray bursts can serve as a valuable framework for investigating Lorentz Invariance Violation (LIV) in neutrinos. Furthermore, I will examine the implications of these associations for probing possible violations of Charge-Parity-Time (CPT) symmetry between neutrinos and their antiparticles. By analyzing the temporal and spatial correlations between neutrino events and gamma-ray bursts, we can gain insights into the fundamental properties of neutrinos and their interactions, potentially uncovering new phenomena that challenge our current understanding of particle physics and the nature of spacetime. This research not only aims to test the limits of established theories but also seeks to open new avenues for theoretical exploration in the realm of high-energy astrophysics.

Primary author: MA, Bo-Qiang (Peking University)

Presenter: MA, Bo-Qiang (Peking University)

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