Talk at Splinter Meeting

Splinter E

Cosmic messengers as tools for fundamental physics

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Lorentz symmetry is a cornerstone of modern physics. As the spacetime symmetry of special relativity, Lorentz invariance is a basic component of the standard model of particle physics and general relativity, which to date constitute our most successful descriptions of nature. Deviations from exact symmetry would radically change our view of the universe and current experiments allow us to test the validity of this assumption. In particular, the observation of energetic neutrinos, gamma rays, and cosmic rays can be used as sensitives probes of possible deviations from exact Lorentz invariance that are expected in different scenarios of quantum gravity.