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Running Vacuum Energy on EDT Lattice

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Euclidean Dynamical Triangulation as a lattice approach to quantum gravity has produced results that are compatible with semiclassical gravity in four dimensions. We explore the cosmological application of EDT by studying the behavior of the vacuum energy on the lattice. Although the lattice gravity calculations are broadly consistent with an emergent four-dimensional de Sitter space geometry, the calculations give corrections to a purely constant cosmological constant term. These corrections are well described by a simple model for running vacuum energy. The parameters of this model are fully determined by the lattice and can be compared with observational cosmology, which will strongly constrain this picture over the coming decade.

Topical area

Particle Physics Beyond the Standard Model

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