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Early universe cosmology in fundamentally motivated alternative theories of gravity and the principle of finite amplitudes

Monday 6 September 2021 15:30 (20 minutes)

The principle of finite amplitudes postulates that semi-classical transition amplitudes from the early universe up to current field values should be well defined. We will show in this talk that the application of this simple principle has strong theoretical constraining power for fundamentally motivated alternative theories of gravity and their solutions for the very early universe. In particular, we will present universes that emerge from the big bang in quadratic gravity and show that only inflating backgrounds (both isotropic and anisotropic) are consistent with finite quantum amplitudes. We will also present the analysis for non-singular cosmologies from limiting curvature gravity and fully α'-corrected string cosmology, which are shown to be consistent with the principle of finite amplitudes.

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