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Towards a Common Fundamental Source of Inflation, Dark Matter, and Dark Energy within Thomas-Whitehead Gravity

Abstract

We review recent research on some of the applications of Thomas-Whitehead (TW) gravity. Rooted in string theory, having risen from one-dimensional symmetries on the string associated with the Virasoro and Kac-Moody algebras, in four dimensions TW gravity manifests as Einstein-Hilbert gravity augmented with projective symmetry. This projective symmetry endows TW gravity with two dynamical fields in addition to the metric: the rank-two symmetric diffeomorphism field and the projective connection that is not fully Levi-Civita connected. In this talk we review how the diffeomorphism field is able to act as an inflaton as well as a candidate for dark matter and dark energy.