Contribution ID: **82** Type: **not specified**

Effective field theory of the cuscuton

Thursday, 15 June 2023 15:00 (20 minutes)

I will introduce the effective field theory (EFT) of the cuscuton. The cuscuton has the intriguing property that when present in a theory it does not propagate any scalar degrees of freedom, but only the two gravitational ones. Even more interestingly, it appears in several places in cosmology, such as in modified gravity, varying speed of light theories, and it has been shown to be the low-energy limit to Horava-Liftzing gravity. Using a geometric description we derive an EFT for the cuscuton. The resulting action is comprised from the Einstein-Hilbert term coupled to a scalar as well lovelock terms such as the dynamical Gauss-Bonnet action. We show this theory does not propagate a scalar degree of freedom. This framework can be extended to incorporate additional terms in the cuscuton EFT, leading to a richer phenomenology.

Secondary category for the parallel session (optional)

Cosmology

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Session Classification: Parallel: Cosmology 3

Track Classification: Parallel Sessions: Cosmology