Contribution ID: **22** Type: **not specified**

Cosmological Stasis from Dynamical Scalars

Friday 24 May 2024 14:50 (25 minutes)

It has recently been realized that many extensions of the Standard Model give rise to cosmological histories exhibiting extended epochs of cosmological stasis —epochs wherein the abundances of multiple energy components (such as matter, radiation, or vacuum energy) remain effectively constant despite cosmological expansion. In this talk, I shall discuss a novel realization of stasis involving a collection of scalar fields, each of which dynamically transitions from a period of slow roll to a period of rapid oscillation around its potential minimum as the universe expands. As I shall demonstrate, not only does cosmological stasis arise in such scenarios, but unlike in previous model realizations of this phenomenon, one finds that many properties of the stasis depend non-trivially on the initial conditions. For example, in the presence of an additional cosmological energy component, the system exhibits a tracking behavior wherein the effective equation of state for the universe as a whole evolves toward the equation of state of this energy component. The emergence of such tracking behavior has potential model-building implications in the context of dark-energy and cosmic-inflation scenarios.

Author: THOMAS, Brooks

Co-authors: Dr HUANG, Fei (Weizmann Institute); Prof. DIENES, Keith R. (University of Arizona); Dr HEURTIER, Lucien (King's College London); Prof. TAIT, Timothy M. P. (University of California Irvine)

Presenter: THOMAS, Brooks

Session Classification: Cosmology