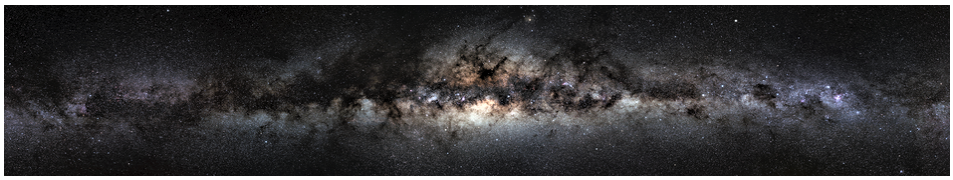

Contribution ID: **61** Type: **Oral**

Thermal Perturbations from Cosmological Constant Relaxation

Thursday, 9 December 2021 12:32 (18 minutes)

We probe the cosmological consequences of a recently proposed class of solutions to the cosmological constant problem. In these models, the universe undergoes a long period of inflation followed by a contraction and a bounce that sets the stage for the hot big bang era. A requirement of any successful early universe model is that it must reproduce the observed scale-invariant density perturbations at CMB scales. While these class of models involve a long period of inflation, the inflationary Hubble scale during their observationally relevant stages is at or below the current Hubble scale, rendering the de Sitter fluctuations too weak to seed the CMB anisotropies. We show that sufficiently strong perturbations can still be sourced thermally if the relaxion field serving as the inflaton interacts with a thermal bath, which can be generated and maintained by the same interaction. We present a simple model where the relaxion field is derivatively (i.e. technically naturally) coupled to a non-abelian gauge sector, which gets excited tachyonically and subsequently thermalizes due to its nonlinear self-interactions. This model explains both the smallness of the cosmological constant and the amplitude of CMB anisotropies.

Primary authors: KAPLAN, David E.; TANIN, Erwin (Johns Hopkins University); JI, Lingyuan; RAJENDRAN, Surjeet

Presenter: TANIN, Erwin (Johns Hopkins University)

Session Classification: Parallel 1: Axions and Other Dark Matter Particles