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Cosmological and astrophysical constraints on decaying axion-like particles

Thursday 28 July 2022 11:00 (18 minutes)

Many extensions of the Standard Model feature spontaneously broken new symmetries that give rise to bosonic particles with naturally small masses and couplings, so-called axion-like particles (ALPs). In my talk I will discuss the case of MeV-scale ALPs, which are predicted to be long-lived on the time scales relevant for particle physics and cosmology. A particular focus will be on lifetimes in the range of (thousands of) years, for which decaying ALPs can have an observable effect on the Cosmic Microwave Background and primordial element abundances. I will discuss how to constrain such ALPs using astrophysical and cosmological data and show that there remains viable parameter space for the case of non-thermal ALPs.

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