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Transitioning Dark Sectors and the Hubble Tension

Tuesday, 13 July 2021 17:15 (15 minutes)

I will discuss the implications of self-interacting dark-sectors with light degrees of freedom and mass thresholds on early universe physics. Such models exhibit a relative increase in the energy density of the dark sector when the temperature crosses a mass threshold. Of special interest are models with mass thresholds below $\mathcal{O}(\mathrm{MeV})$. In this region of parameter space, the transition (increase in energy density) occurs after BBN, allowing for $N_{\mathrm{eff}} > 3$ and consequently a larger value of H_0. Additionally, the transition occurs during the epochs probed by cosmological data. I will talk about the cosmological constraints on these models using the most recent data including the 2018 Planck CMB spectra, baryon acoustic oscillation (BAO) data and local measurements of the Hubble constant. The analysis shows a preference for a transition at the KeV scale and we find that these models can alleviate the H_0 tension allowing for $H_0 = 71.4$.

Are you are a member of the APS Division of Particles and Fields?

No

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