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New Insight on Neutrino Dark Matter Interactions from Small-Scale CMB Observations

Tuesday 23 May 2023 16:00 (15 minutes)

In this talk, I will discuss the possibility of using cosmological observations to constrain models that involve interactions between neutrinos and dark matter. I will show that small-scale measurements of the cosmic microwave background with a few per cent accuracy are critical to uncover unique signatures from tiny couplings that would require a much higher sensitivity at lower multipoles, such as those probed by the Planck satellite. Interestingly, analyzing the high-multipole data released by the Atacama Cosmology Telescope (both independently and in combination with Planck and Baryon Acoustic Oscillation measurements) an intriguing 1σ-preference for a non-vanishing coupling is found both fixing and varying the effective number of relativistic degrees of freedom in the early Universe. This result aligns with other CMB-independent probes, such as Lyman-α.

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