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Cosmological tests of ultra-light axions

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Ultra-light axions (ULAs) with masses in the range $10^{-33} \text{ eV} < m < 10^{-20} \text{ eV}$ are motivated by string theory and might contribute to either the dark-matter or dark-energy density of the Universe. We explore the impact of such axions on cosmological observables, like the CMB and galaxy correlation power spectra. We will discuss our use of precision cosmological data (from the Planck satellite and WiggleZ galaxy survey) to test the ultra-light axion hypothesis. After presenting limits to ultra-light axions from cosmological data, we discuss connections between ultra-light axions and primordial gravitational waves from inflation, and highlight the ability of upcoming CMB B-mode searches to provide an independent test of ultra-light axion scenarios.

Oral or Poster Presentation

Oral

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