

What does cosmology tell us about dark matter mass and interactions?

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Cosmological observables, from the CMB anisotropy to the census of galaxies in the early and local universe, offer the most direct and broad tests for the nature of dark matter, including a number of scenarios that are challenging or even impossible to test in a laboratory setting. I will review the status of the recent early-universe and late-universe searches for the identity of dark matter, summarizing the best current limits on scattering between dark matter and baryons, the non-thermal production mechanisms for sterile neutrinos, and mass bounds on thermal-relic dark matter. I will highlight the interplay between complementary probes of dark matter physics, using the example of the 21-cm signal from the Cosmic Dawn, the CMB primary anisotropy, and substructure in the Milky Way. Finally, I will discuss the prospects for unveiling the physics of dark matter in the coming decade.

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