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Cold plus warm dark matter models

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Analyses of the cosmic microwave background anisotropies and of galaxy survey data allow for the possibility that dark matter particles were born relativistic yet became non-relativistic well before matter-radiation equality. Such “warm” or “cold plus warm” dark matter models may still have observable signatures at sub-Mpc scales, e.g. modifying the structure of galactic halos and their abundance. I will summarize these signatures and discuss particle physics models that provide such candidates. Although these dark matter particles have interaction strengths much weaker than neutrinos, I will argue that the combination of data from astrophysics, cosmology, and forthcoming particle physics experiments will enable us to constrain these models and learn about the properties of these candidates.

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