

Interacting Dark Matter and the Galaxy Core-Cusp Problem



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The core-cusp problem remains as one of the unresolved challenges between observation and simulations in the standard Λ CDM model for the formation of galaxies. Basically, the problem is that Λ CDM simulations predict that the center of galactic dark matter halos contain a steep power-law mass density profile. However, observations of dwarf galaxies in the Local Group consistently reveal a density profile consistent with a nearly flat distribution of dark matter near the center.

A number of solutions to this dilemma have been proposed. In this talk I discuss the possibility that the dark matter particles themselves self interact and scatter. The scattering of dark matter particles then can smooth out their profile in high-density regions. This talk will summarize a theory I have worked on as to how self-interacting dark matter may arise. I will then summarize progress I have made toward simulating self-interacting dark matter in models for galaxy formation and evolution. Constraints on properties of self-interacting dark matter will be summarized.

Tuesday

April 4

12:30 P.M.

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