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Self Interacting Dark Matter and the Galaxy Core-Cusp problem QUYNH LAN NGUYEN, GRANT MATHEWS, University of Notre Dame, QUYNH LAN NGUYEN COLLABORATION — 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. The problem is that Λ CDM simulations predict that the center of galactic dark matter halos contains a steep power-law mass density profile. However, observations of dwarf galaxies in the Local Group reveal a density profile consistent with a nearly flat distribution of dark matter near the center. Many solutions to this dilemma have been proposed. We 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. We also summarize a theoretical model as to how self- interacting dark matter may arise. We implement this form in simulations of self-interacting dark matter in models for galaxy formation and evolution. Constraints on properties of this form of self-interacting dark matter will be summarized.

> Quynh Lan Nguyen University of Notre Dame

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