



Contribution ID: 214

Type: **Poster**

## **Quynh Lah Nguyen (Notre Dame): Constraints on Interacting Dark Matter from small scale structure**

*Wednesday, 21 February 2018 18:41 (1 minute)*

The core-cusp problem remains as one of the unresolved challenges between observation and simulations in the standard  $\Lambda$ CDM model for the formation of galaxies. Basically, the problem is that  $\Lambda$ 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 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. 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 this form of self-interacting dark matter will be summarized.

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**Session Classification:** Poster Session