Abstract Submitted
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The shapes of Milky-Way-mass galaxies with Self-Interacting Dark Matter[1] DRONA VARGYA, ROBYN SANDERSON, University of Pennsylvania — The cold dark matter plus dark energy (ΛCDM) cosmological model has been successful at reproducing the large-scale structure of the Universe. However, on length scales smaller than ~ 1 Mpc and halo masses smaller than $\sim 10^{11}$ $M_\odot$, this framework is challenged by observations that halos are less centrally dense than predicted. One way to reconcile these observations with theoretical predictions, without affecting the large-scale structure, is to consider self-interacting dark matter (SIDM) models. In order to incorporate the effects of both baryonic and SIDM interactions, we use the Feedback in Realistic Environments (FIRE-2) suite of Milky-Way-mass galaxies on a cosmological background and compare the shapes of the main dark matter halo predicted by SIDM simulations (at interaction cross-sections σ/m of 1, 10, and 50 cm^2 g^{-1}) with CDM simulations using the same initial conditions. Even in the presence of baryonic feedback effects, we find that SIDM models produce potentially detectable differences in the inner structure of MW-mass galaxies.

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