The University of Texas at San Antonio

UTSA Physics and Astronomy

Dr. Brandon Bozek

University of Texas at Austin

Friday, March 30th, 2018
AET 0.204
3:15 PM

Sterile Neutrino Dark Matter in Dwarf Galaxies and the Local Group

Despite immense success in describing the universe on large scales, the Cold Dark Matter (CDM) model faces several outstanding conflicts between observations of low-mass (“dwarf") galaxies in the Local Group and the low-mass dark matter halos expected to host them. Warm dark matter models may resolve the small-scale tensions found in CDM by suppressing structure formation on sub-galactic scales. A subset of these models, involving “sterile neutrinos”, are further motivated as a possible source of a 3.55 keV X-ray line that has been detected in multiple astrophysical contexts. I will present high-resolution simulations of dwarf galaxies and the Local Group that we are using to explore how various dark matter models affect the formation of galaxies and the growth of structure on small-scales. I will also discuss how we are using simulations that accurately model the dark matter distribution of the Local Group to study the dark matter interpretation of the X-ray flux. In both cases, I will show how future observations may enable fundamental discoveries about the nature of dark matter.

Department Contact Information
Veronica.Castellanos@utsa.edu
http://physics.utsa.edu