Contribution ID: **138** Type: **Talk**

Status and Potential for Detection of Warm Dark Matter in Structure Formation and X-ray Astronomy

Tuesday 25 March 2025 09:30 (15 minutes)

At dwarf galaxy scales and smaller, the thermal and kinetic properties of dark matter influence the growth of cosmological and galactic structures. These effects are observable through various methods, including dwarf galaxy counts, the Lyman-alpha forest, and strong lensing. I will review the current constraints and evidence for a small-scale cutoff in structure formation, consistent with warm dark matter (WDM). Additionally, I will examine the status of ongoing efforts to probe WDM particle decay using X-ray observatories and discuss the sensitivities of future missions. Sterile neutrino dark matter, a leading candidate for WDM, can be produced through various mechanisms in the early Universe, including enhanced production via non-standard interactions (NSI) among active neutrinos or via lepton-number driven resonant production via the Shi-Fuller mechanism. I will provide an overview of these production mechanisms, their interplay with structure formation constraints, and their implications for X-ray astronomy and neutrino NSI searches.

Author: ABAZAJIAN, Kevork (University of California, Irvine)

Presenter: ABAZAJIAN, Kevork (University of California, Irvine)

Session Classification: SESSION 5: Astrophysics and Cosmology-1