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Cosmological and Astrophysical Implications of Sterile neutrinos[1]

KEVORK ABAZAJIAN, Univ of California - Irvine

Cosmology has entered an even more precision-driven epoch, with many of the basic parameters of cosmology being known to the few-percent level. However, some unresolved tensions remain between large scale structure measures of cosmology and primary cosmic microwave background measures. This may indicate new physics in the neutrino sector, since neutrinos are the second most abundant particle in the Universe, and the least quantified. New neutrino physics may include extra (sterile) species of neutrinos, massive neutrinos, or both. I will review the status of these measures as well as the prospects for the resolution of the tension(s). Neutrinos also play a dominant energetics role in Type II supernova explosions, and the presence of new neutrino physics also has implications for supernova physics, which I will also review.

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