

Intimate relationship between sterile neutrino Dark Matter and extra radiation in the early Universe

Tuesday, 31 August 2021 17:45 (15)

keV-scale gauge-singlet fermions, allowed to mix with the active neutrinos, are elegant dark matter (DM) candidates. They are produced in the early universe via the Dodelson-Widrow mechanism and can be detected as they decay very slowly, emitting X-rays. In the absence of new physics, this hypothesis is virtually ruled out by astrophysical observations. In this talk, I will demonstrate that new interactions among the active neutrinos allow these sterile neutrinos to make up all the DM while safely evading all current experimental bounds. Neutrino interactions mediated by a sub-MeV scalar can also lead a lower bound on the amount of extra radiation in the early Universe. Such models can, therefore, receive strong constraints from next generation cosmology experiments, like CMB-S4

Reference to paper (DOI or arXiv)

<https://arxiv.org/pdf/2011.02487.pdf> (accepted in PRL)

Your gender (free text)

Primary author(s) : SEN, Manibrata (UC, Berkeley); KELLY, Kevin (Fermilab); ZHANG, Yue (Carleton University)

Presenter(s) : SEN, Manibrata (UC, Berkeley)

Session Classification : Discussion Panel Cosmology 2

Track Classification : Cosmology and particle physics