Contribution ID: **1060** Type: **Invited talk in the parallel session**

Hunt for the Sterile Neutrino Dark Matter

Wednesday, 7 July 2021 11:10 (20 minutes)

In this talk, we present an effective model for the sterile neutrino dark matter candidate. Due to new physics at the UV scale, three sterile neutrinos couple with SM fermions and gauge bosons via the SM gauge symmetric four-fermion interactions. Upon the spontaneous symmetry breaking, sterile neutrinos become massive and possess effective couplings to SM particles. We will show that the sterile neutrinos with masses around 90 keV and specific effective coupling can explain the XENON1T anomaly preserving DM astrophysical and cosmological constraints. We point out that the presence of three right-handed sterile neutrino allows to obtain correct dark matter relic density by the late entropy production due to late decay of heavier right-handed neutrinos. Moreover, four sterile neutrinos interaction can form composite scalar and pseudo scalar particles, the latter plays the role of axion, while the former the role of massive WIMP particles. Some phenomenological consequences of these new states as dark matter are discussed.
Besides, with possible sterile neutrino spectra and new effective coupling to SM particles, we try to explain the anomalies in other experiments such as muon g-2 and MiniBooNe experiment. Our scenario also offers some new distinctive features which may potentially produce observable signals in the sensitivity range of the next generation of XENON detectors such as XENONnT, LZ and DARWIN.

Primary authors: SHAKERI, Soroush (Department of Physics, Isfahan University of Technology (IUT), Iran, ICRANet-Isfahan); XUE, She-Sheng (ICRANet, Physics Department, Sapienza University of Rome)

Presenters: SHAKERI, Soroush (Department of Physics, Isfahan University of Technology (IUT), Iran, ICRANet--Isfahan); XUE, She-Sheng (ICRANet, Physics Department, Sapienza University of Rome)

Session Classification: Dark Matter Searches with Liquid Xenon and Argon Detectors and Self Gravitating Systems and Dark Matter

Track Classification: Dark Matter: Dark Matter Searches with Liquid Xenon and Argon Detectors and Self Gravitating Systems and Dark Matter