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Dark Matter from sterile-sterile neutrino mixing

Abstract –In my talk I will review a model of dark matter where a gauge singlet heavy neutral lepton couples to the visible sector thanks to Higgs induced mixing with a right-handed (RH) neutrino, the source RH neutrino, responsible for light neutrino masses via seesaw mechanism. The mixing can produce an abundance of the heavy neutral lepton that in this way can play the role of dark matter and can effectively be regarded as a dark RH neutrino. The interesting feature of the model is that the decays of the dark RH neutrino produce a high energy neutrino flux testable at neutrino telescopes. Moreover, the model can also be combined with leptogenesis for the explanation of the matter-antimatter asymmetry of the universe. In my talk I will also present new results showing that the inclusion of Higgs portal interactions for the source RH neutrino greatly enlarged the viable parameter space and in particular much heavier dark matter and source RH neutrino masses become viable. Such higher scales are indeed more easily embedded in popular flavour/grand-unified models.

Primary authors: MURPHY, Adam (University of Southampton); Prof. DI BARI, Pasquale (University of Southampton)

Presenter: MURPHY, Adam (University of Southampton)

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