

Fundamental physics in the cosmos: The early, the large and the dark Universe



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Sterile neutrinos with secret interactions

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The motivation for new non-standard interactions in the sterile neutrino sector arises from the tension between oscillation experiments and cosmological results. Indeed the former point towards the existence of one (or more) sterile neutrino in the eV mass range, while the latter disfavor additional thermalized light particles with high statistical significance. However a partial thermalization induced by secret interactions can solve this tension, making eV sterile neutrinos fully consistent with big bang nucleosynthesis, cosmic microwave background and large scale structure constraints.

In this talk I will present a pseudoscalar model of secret interactions which provides a simple and elegant way of reconciling eV sterile neutrinos with precision cosmology. I will also mention how the hidden interactions can be extended to the dark matter sector and might mitigate the small scale problems of the standard cold dark matter paradigm.

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