Contribution ID: **324** Type: **not specified**

Neutrino and Gamma-ray Signatures from Inelastic Dark Matter Annihilation around Neutron Stars

Tuesday, 12 September 2023 15:00 (15 minutes)

Heavy inelastic dark matter can substantially annihilate outside neutron stars for inelastic inter-state mass splittings ∼MeV and produce standard model particles. Such inelastic dark matter annihilations can happen during the long timescale of the dark matter thermalization, i.e. losing enough kinetic energy to enter an orbit fully contained inside the neutron star. In this talk, I will present a study on this effect along with the constraints and detection prospects with current and future high-energy neutrino and gamma-ray experiments.

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Session Classification: IDM: Indirect DM searches

Track Classification: Indirect DM searches