DARK MATTER *'LIGHTING UP'* THE NEUTRON STAR

SEMINAR

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PAMU SEMINAR ROOM

05 AUGUST 2026, 03:00 PM

Abstract

Neutron star (NS) being rich in baryons can act as a natural laboratory to test dark matter (DM)-baryon interactions with the advent of new telescopes like JWST as well as gravitational waves detector facility at LVK collaboration. In this talk, I shall discuss how astrophysical evidences indicate dark matter intervention in resolving mysteries regarding NSs. In particular, I shall show bosonic DM capture in NSs has a rich phenomenology in deciding various NS observables. If bosonic DM forms condensate and annihilates inside the NS, old neutron stars glow brighter than usual, in turn, become detectable by the JWST. On the other hand, if DM is non-annihilating, the gravitational collapse of the dark core can initiate transmutation of a neutron star into a solar mass black hole, which warrants dedicated GW searches at LVK facility. All these phenomena can be realized in a realistic DM model, especially in freeze-in DM scenarios.

Everyone is invited to attend