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A Minimal Seesaw-Scotogenic Model for Neutrino Physics

Tuesday, 1 December 2026 15:20 (20 minutes)

In this talk, I will present the smallest discrete flavor symmetry and the minimal field content that can explain both neutrino masses and the dark sector at the same time, within the context of discrete dark matter. I will show how this is achieved using a D_4 symmetry by adding three right-handed neutrinos and three scalar doublets. During the presentation, I will explain how tree-level and one-loop contributions successfully reproduce the solar and atmospheric mass splittings, as well as the observed mixings. In addition, I will detail how adding CP-violating phases allows the model to fit both normal and inverted ordering. Finally, I will explore the spontaneous breaking of D_4 that leaves a residual $\mathbb{Z}_2$ symmetry. This symmetry stabilizes the dark matter candidate, predicting a mass in the 50 to 200 GeV range, which completely agrees with current LUX-ZEPLIN limits.

Academic position of the presenting author

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