



Contribution ID: 108

Type: not specified

TALK: Probing Neutrinophilic Dark Matter: From Colliders to Supernovae

Friday, June 21, 2024 10:00 AM (45 minutes)

Author: Douglas Tuckler

New beyond-the-Standard Model mediators that couple predominantly to neutrinos are not yet probed by existing experimental searches. Such a neutrinophilic mediator is well motivated for addressing the origin of several neutrino-portal dark matter candidates, including thermal freeze-out and sterile-neutrino dark matter scenarios. In this talk, we explore the sensitivity to this scenario from two different approaches. In the first part of the talk we will explore the potential of the Forward Physics Facility (FPF) using the so-called “mono-neutrino signature”: neutrino charged-current scattering events associated with large missing transverse momentum, and excessive apparent tau-neutrino events. We will show that with this smoking-gun signature, the FPF has excellent sensitivity to probe this model in new regions of parameter space. In the second part of the talk we focus on astrophysical constraints on sterile neutrino DM, namely from core-collapse supernovae. Production and emission of DM can result in excessive energy loss of the supernova, leading to additional cooling. We will show that supernova cooling can constrain new regions of parameter space that complements terrestrial and cosmological probes. The results of this work present a nice complementarity among the collider and astrophysical frontiers.

Presenter: TUCKLER, Douglas (TRIUMF and Simon Fraser University)