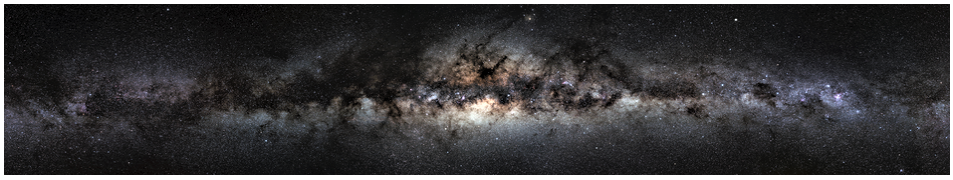

Contribution ID: **138** Type: **Poster**

Indirect Detection of Long-lived Particles via a Less-simplified Dark Higgs Portal

Tuesday 7 December 2021 08:20 (30 minutes)

Simplified models of light new physics provide an important theoretical and experimental benchmark. Models that extend such minimal scenarios by introducing other degrees of freedom are popular and well motivated ways to go beyond the Standard Model (SM). In this talk, I will focus on the light dark Higgs portal that connects the dark sector consisting of, among others, heavy, TeV-scale secluded scalar dark matter (DM) with the SM. I will illustrate the phenomenology of this model, focusing on the signatures of DM and long-lived particles (LLPs) in complementary experimental searches. These include i) the intensity frontier searches for light new physics, ii) indirect detection (ID) of secluded WIMPs, and iii) future CMB radiation surveys. Finally, I will highlight the important role of non-local effects present in the ID of LLP particles, which significantly affects the corresponding detection strategies, usually tailored to WIMPs. These effects include a) an additional contribution to the photon flux due to the "GC diffusion" effect, b) a linear flux decrease in the long-lived regime due to finite DM density support, and c) a faster flux decrease with LLP decay length for observations focused on small regions of interest, such as dwarf galaxies, compared to large ones, such as regions near the Galactic Center.

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Session Classification: Break and Poster Session