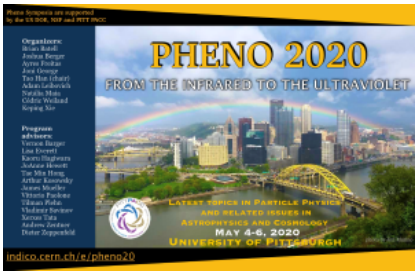

Contribution ID: **950** Type: **Parallel Talk**

A testable hidden-sector model for Dark Matter and neutrino masses

Tuesday 5 May 2020 14:45 (15 minutes)

We consider a minimal extension of the Standard Model with a hidden sector charged under a dark local U(1)′ gauge group, accounting simultaneously for light neutrino masses and the observed Dark Matter relic abundance. The model contains two copies of right-handed neutrinos which give rise to light neutrino-masses via an extended seesaw mechanism. The presence of a stable Dark-Matter candidate and a massless state naturally arise by requiring the simplest anomaly-free particle content without introducing any extra symmetries. We investigate the phenomenology of the hidden sector considering the U(1)′ breaking scale of the order of the electroweak scale. Confronting the thermal history of this hidden-sector model with existing and future constraints from collider, direct and indirect detection experiments provides various possibilities of probing the model in complementary ways as every particle of the dark sector plays a specific cosmological role. Across the identified viable parameter space, a large region predicts a sizable contribution to the effective relativistic degrees-of-freedom in the early Universe that allows to alleviate the recently reported tension between late and early measurements of the Hubble constant.

Summary

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Session Classification: DM III

Track Classification: Dark Matter