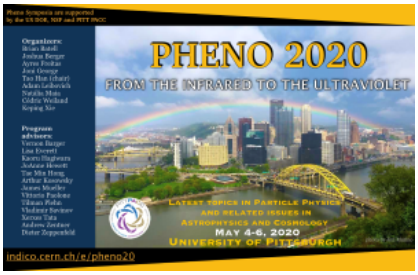

Contribution ID: **1029** Type: **Parallel Talk**

Minimal model of torsion mediated dark matter

Monday 4 May 2020 15:30 (15 minutes)

We present a minimal model of fermionic dark matter (DM), where a singlet Dirac fermion can interact with the Standard Model (SM) particles via the torsion field of gravitational origin. In general, torsion can be realized as an antisymmetric part of the affine connection associated with the spacetime diffeomorphism symmetry and thus can be thought of as a massive axial vector field. Because of its gravitational origin, the torsion field couples to all the fermion fields including the DM with equal strength, which makes the model quite predictive. The DM is naturally stable without any imposition of ad hoc symmetry, e.g., Z_2. Apart from producing the correct thermal abundance, a singlet fermion can easily evade the stringent bounds on the spin-independent DM-nucleon direct detection cross section due to its axial nature. However, in the allowed parameter space, strong bounds can be placed on the torsion mass and its couplings to fermions from the recent LHC searches. Assuming a nonuniversal torsion-DM and torsion-SM coupling, smaller values of torsion masses may become allowed. In both cases we also study the reach of spin-dependent direct detection searches of the DM.

Summary

Author: Dr DAS, Debottam (Institute of Physics, Bhubaneswar)

Presenter: Dr DAS, Debottam (Institute of Physics, Bhubaneswar)

Session Classification: BSM I

Track Classification: BSM