

3/01/2023, 10:30am--11:00am

Jure Zupan (U Cincinnati)

Dark matter effective field theory for any spin

Using a heavy mass expansion we build an EFT for nonrelativistic DM of any spin, coupling to quarks, gluons and photons. We find the relations imposed by the reparametrization invariance, and provide the matching onto the interaction basis by Haxton et al. of nonrelativistic DM interacting with nonrelativistic nucleons. The construction retains the attractive features of the Haxton et al approach (i.e. it works for any DM spin), and the relativistic DM-EFTs that were written for specific spins (i.e. that the EFT is in terms of the interactions with quarks and gluons, making the connection with LHC and indirect detection more immediate, and that one does not have to limit the discussion to momenta well below the pion pole for an EFT description).