



Contribution ID: 284

Type: Talk

Large N -ightmare Dark Matter

Thursday 1 October 2020 18:40 (25 minutes)

A dark QCD sector is a relatively minimal extension of the Standard Model that admits Dark Matter (DM) candidates, but requires no portal to the SM sector beyond gravitational interactions:

A “nightmare scenario” for DM detection.

We consider a minimal dark sector gauged under $SU(N)$ with a single flavor of light, vector-like dark quark. In the large- N limit, this single-flavor theory becomes highly predictive, generating two DM candidates whose masses and dynamics are described by relatively few parameters:

A light quark-antiquark bound state, the dark analog of the η' meson, and a heavy bound state of N quarks, the dark analog of the Δ^{++} baryon.

We show that the latter may freeze-in with an abundance independent of the confinement scale, forming DM-like relics for $N \leq 10$, while the former may generate DM via cannibalization and freeze-out.

We study the interplay of this two-component DM system,

and determine the characteristic range of confinement scales,

dark-visible sector temperature ratios, and N that admit non-excluded DM,

once effects of self-interaction constraints and bounds on effective degrees of freedom at the BBN and CMB epochs are included.

Is this abstract from experiment?

Internet talk

Name of experiment and experimental site

Is the speaker for that presentation defined?

Details

Primary authors: ROBINSON, Dean (Lawrence Berkeley National Laboratory (LBL)); MORRISON, Logan (University of California, Santa Cruz); PROFUMO, Stefano (University of California, Santa Cruz)

Presenter: MORRISON, Logan (University of California, Santa Cruz)

Session Classification: Workshop on New physics paradigms after Higgs and gravitational wave discoveries