

LDMX: The Light Dark Matter eXperiment

Thursday, 4 August 2022 17:10 (30 minutes)

The constituents of dark matter are still unknown, and the viable possibilities span a very large mass range. The scenario where dark matter originates from thermal contact with familiar matter in the early Universe requires the DM mass to lie within about an MeV to 100 TeV. Considerable experimental attention has been given to exploring Weakly Interacting Massive Particles in the upper end of this range (few GeV – ~TeV), while the region ~MeV to ~GeV is largely unexplored. If there is an interaction between light DM and ordinary matter, as there must be in the case of a thermal origin, then there necessarily is a production mechanism in accelerator-based experiments. The Light Dark Matter eXperiment (LDMX) is a planned electron-beam fixed-target missing-momentum experiment that has unique sensitivity to light DM in the sub-GeV range. Relevant to the NuFact muon working group is a proposal for a muon LDMX that would use a muon beam to probe the electron-phobic scenario. This contribution will give an overview of the theoretical motivation, the main experimental challenges and how they are addressed, the status of the LDMX experiment, as well as projected sensitivities in comparison to other experiments.

Attendance type

In-person presentation

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