

# QUEST-DMC: detection of sub-GeV dark matter with nanowires in a superfluid He-3 calorimeter

*Friday 19 July 2024 11:39 (18 minutes)*

Dark matter is a hypothetical new form of matter that does not interact with the electromagnetic field and has a very weak interaction with ordinary matter. WIMPs are prime dark matter candidates, but most experiments are constrained to spin-independent interactions in the 10-100 GeV/ $c^2$  mass range.

QUEST-DMC (Quantum Enhanced Superfluid Technologies for Dark Matter and Cosmology) is a collaboration, between Lancaster, Oxford, Royal Holloway University of London, and Sussex Universities, supported through the Quantum Technologies for Fundamental Physics UK programme.

QUEST-DMC will use superfluid He-3 as a dark matter collision target, aiming to reach the world-leading sensitivity to spin-dependent interactions of 0.1-1 GeV/ $c^2$  mass dark matter candidates.

Here we discuss the development of superfluid He-3 bolometers, arguing that recoil energy of <10 eV can be detected using nanomechanical resonators, controlling the dominant sources of background and using quantum sensors.

## Alternate track

1. Detectors for Future Facilities, R&D, Novel Techniques

## I read the instructions above

Yes

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**Session Classification:** Dark Matter

**Track Classification:** 09. Dark Matter Detection