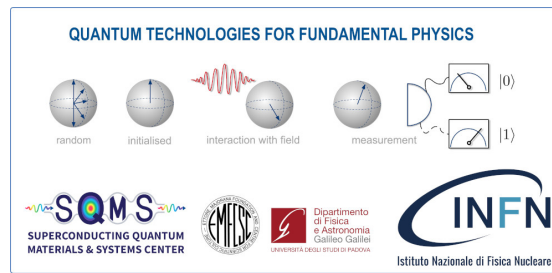


## Quantum Technologies for Fundamental Physics



Contribution ID: 32

Type: **not specified**

### Search for sub-GeV Dark Matter using superfluid $^3\text{He}$ at ultralow temperatures

*Sunday, 3 September 2023 10:15 (20 minutes)*

At ultra-low temperatures (ULT) macroscopic quantum states form, such as superfluids, that have unique potential as quantum sensors for rare interactions. The QUEST-DMC QTFP project is deploying this technology at two sites capable of reaching ULT, Royal Holloway (RHUL) and Lancaster University (ULANC), both members of the European Microkelvin Platform, EMP (<https://emplatform.eu/>). QUEST-DMC employs a superfluid helium-3 target for “laboratory cosmology”, studying phase transitions relevant for understanding inflation and searching for light Dark Matter candidates. The Dark Matter search will be based on a small  $^3\text{He}$  target constructed as a bolometer. A nanowire sensor will be used to detect the quasi-particles produced when a Dark Matter interaction breaks the fragile  $^3\text{He}$  Cooper pairs.

**Presenter:** CASEY, Andrew (Royal Holloway, University of London)

**Session Classification:** Superconducting cavities, materials, and quantum technology for detection of weakly-coupled particles