Contribution ID: **35** Type: **Talk**

Q-Array: R&D towards superconducting targets for Cevns detection with Ricochet

Thursday 13 June 2024 17:45 (15 minutes)

Ricochet is an experiment based at the Institut Laue-Langevin (ILL) reactor in Grenoble aimed at detecting coherent elastic neutrino-nucleus scattering. Ricochet is designed to be a milliKelvin platform supporting multiple technologies, each differentiating between electronic recoils, nuclear recoils, and heat-only events. One such technology —CryoCube—uses an array of germanium crystals, while the other —Q-Array—uses superconducting metallic absorbers. Three CryoCube detectors have been deployed at ILL and started taking reactor data earlier this year.

This talk will give an overview of the recent progress of Ricochet's Q-Array concept.
Q-array pursues neutrino detection inside centimetre-scale superconducting crystals. Interactions inside the crystal create Bogoliubov quasi-particles and phonons that can be collected and converted into a heat signal within a trapping layer.

Currently, detector prototypes are measuring pulses at MIT and in the shallow underground NEXUS facility at Fermilab. The crystals are read out using Manganese-doped Aluminium transition-edge sensors (TES) fabricated at Argonne National Lab. The TES current signal is amplified using commercial DC-SQUID readout or multiplexed and upconverted using custom-designed RF-SQUID multiplexers fabricated at Lincoln Laboratories.

Author: Dr VAN DE PONTSEELE, Wouter (Massachusetts Institute of Technology)

Co-author: YANG, Jiatong (Massachusetts Institute of Technology)

Presenter: Dr VAN DE PONTSEELE, Wouter (Massachusetts Institute of Technology)

Session Classification: Talks