Contribution ID: **304** Type: **Oral Presentation**

Emerging quantum sensing technology for new physics searches

The advent of novel cryogenic sensors is opening up new paths in the search for Beyond Standard Model physics, promising to shed light on open questions such as the neutrino mass scale and even fundamental aspects of quantum mechanics. Searches in nuclear beta decays are at the forefront of new physics searches in the electroweak sector, and several efforts are currently ongoing to take advantage of new detection capabilities. Recently, the BeEST experiment demonstrated direct spectroscopy of recoiling 7Li nucleus after electron capture in 7Be with eV-scale resolution using superconducting tunnel junction detectors, constraining sterile neutrino searches [1] and the wave packet size of the emitted neutrino [2]. We will present these results and highlight current efforts to significantly expand the reach of these emerging technologies, focusing on their deployment at radioactive ion beam facilities with the SALER (FRIB) and ASGARD (GANIL) experiments.

[1] S. Friedrich et al., Phys. Rev. Lett. 126, 021803; S. Fretwell et al., Phys. Rev. Lett. 125, 032701
[2] J. Smolsky et al., Nature 638, 640–644 (2025)

Author: HAYEN, Leendert (LPC Caen)

Co-authors: LEACH, Kyle (Colorado School of Mines); Dr FRIEDRICH, Stephan (LLNL)

Presenter: HAYEN, Leendert (LPC Caen)

Session Classification: Parallel session

Track Classification: Fundamental Symmetries and Interactions