

LEGEND: Towards a Tonne-Scale Germanium Neutrinoless Double-Beta Decay Experiment

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Neutrinoless double-beta decay ($0\nu\beta\beta$) poses an exciting way of probing the absolute neutrino mass and the Majorana nature of the neutrino. Regardless of the mechanism involved in its production, the observation of $0\nu\beta\beta$ implies new physics, exhibiting lepton number violation, and providing insight into the matter-antimatter asymmetry in the universe. Ge detector technology is extremely well suited for this challenge. The Large Enriched Experiment for Neutrinoless Double-beta Decay (LEGEND), is making use of this technology to search for $0\nu\beta\beta$ in ^{76}Ge -enriched detectors in the first phase of its experimental program, LEGEND-200. The LEGEND collaboration is pushing Ge detector technology to new scales. Detectors up to four times more massive than those originally deployed in previous ^{76}Ge experiments are currently operated in LEGEND-200. Such large detectors –up to 4 kg –contribute to the isotopic mass of the experiment while retaining excellent energy resolution and background rejection capabilities. With advances in Ge crystal production, even larger detectors are envisioned, which would lead to lower backgrounds in the proposed $0\nu\beta\beta$ tonne-scale experiment, LEGEND-1000.

Collaboration

LEGEND

Role of Submitter

I am the presenter

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