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## **MAJORANA, LEGEND, and the future of the search for Neutrinoless Double-Beta Decay in Ge-76**

*Monday, 24 February 2020 12:30 (30 minutes)*

The MAJORANA collaboration is searching for neutrinoless double-beta ( $0\nu\beta\beta$ ) decay in  $^{76}\text{Ge}$  using modular arrays of enriched, high-purity Ge detectors. The MAJORANA DEMONSTRATOR consists of an array of 44 kg of high-purity Ge detectors with a p-type point contact geometry currently operating in the Sanford Underground Research Facility in Lead, South Dakota. The ultra-low background and world-leading energy resolution achieved by the MAJORANA DEMONSTRATOR enable a sensitive  $0\nu\beta\beta$  decay search, as well as additional searches for physics beyond the Standard Model. The Large Enriched Germanium Experiment for Neutrinoless Double-Beta Decay (LEGEND) will combine the best techniques from the DEMONSTRATOR and the Germanium Detector Array (GERDA) to reach even higher sensitivities to  $0\nu\beta\beta$  decay. The LEGEND collaboration is pursuing a phased approach to a tonne-scale  $^{76}\text{Ge}$  experiment, with ultimate discovery potential at a half-life beyond  $10^{28}$  years. The first phase, LEGEND-200, is the deployment of 200 kg of enriched  $^{76}\text{Ge}$  detectors in the existing GERDA cryostat at the LNGS underground lab in Italy. LEGEND-200, scheduled to start operation in 2021, will use GERDA and MAJORANA enriched detectors and newly developed inverted coax point contact detectors. The MAJORANA DEMONSTRATOR's latest results will be presented as well as the construction status of LEGEND-200, ongoing LEGEND tonne-scale R&D, and the physics outlook of the LEGEND experimental program.

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