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## LEGEND-1000

The observation of neutrinoless double-beta decay ( $0\nu\beta\beta$ ) would show that lepton number is violated, reveal that neutrinos are Majorana particles, and provide information on the neutrino mass. The LEGEND collaboration, founded in 2016, is developing a phased,  $^{76}\text{Ge}$  based double-beta decay experimental program located at the Italian Underground Laboratori Nazionali del Gran Sasso (LNGS). The international LEGEND collaboration consists of approximately 300 scientists from 56 institutions from North America and Europe. In its first phase, LEGEND-200, up to 200 kg of high-purity germanium detectors enriched in the isotope  $^{76}\text{Ge}$  are operated in liquid argon, which serves as both a coolant and an instrumented shield. LEGEND-200 started data taking in 2023 and strives for a discovery potential at a half-life beyond  $10^{27}$  years. In its second phase, LEGEND-1000, a new research infrastructure will be built in Hall C at LNGS, and one ton of high-purity germanium detectors enriched in the isotope  $^{76}\text{Ge}$  with typical masses around 3 kg are operated in underground sourced liquid argon serving depleted in the isotope  $^{42}\text{Ar}$ . With a five-fold increased target mass with respect to LEGEND-200 and a background index reduced by one order of magnitude to  $\leq 10^{-5}$  cts/(keV · kg · yr), LEGEND-1000 will achieve a discovery potential at a half-life beyond  $10^{28}$  years. It builds on the successful LEGEND-200 experiment and its European GERDA and U.S. Majorana Demonstrator precursor experiments.

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