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The Large Enriched Germanium Experiment for Neutrinoless $\beta\beta$ Decay (LEGEND)

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The use of high-purity germanium (HPGe) detectors enriched in the isotope ^{76}Ge is one of the most promising techniques to search for neutrinoless double-beta decay, a process forbidden in the Standard Model of particle physics. A discovery of this lepton number violating process might answer the question of why the universe consists of matter (but not antimatter) and consequently, why matter exists at all.

The Large Enriched Germanium Experiment for Neutrinoless Double Beta Decay (LEGEND) Collaboration has been formed to pursue a tonne-scale ^{76}Ge experiment with the discovery potential at a half-life beyond 10^{28} years. To achieve this, increased detector mass, improved background rejection, as well as a further reduction in intrinsic radioactive backgrounds with respect to current-generation experiments, are required. The LEGEND Collaboration develops a phased neutrinoless double-beta decay experimental program based on the approaches pursued by Majorana Demonstrator and GERDA - the two ^{76}Ge experiments that lead the field in both the background level in the signal region of interest as well as energy resolution and spectroscopic performance achieved. A first phase - expected to start by 2020 - with ~ 200 kg of HPGe detectors will be operated at the Gran Sasso Underground Laboratory.

In this talk, I will discuss the plans and physics reach of LEGEND as well as the combination of R&D efforts and existing resources employed to expedite physics results.

Primary author: Dr WILLERS, Michael (Lawrence Berkeley National Laboratory)

Presenter: Dr WILLERS, Michael (Lawrence Berkeley National Laboratory)

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