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## **(I) Search for Majorana Neutrinos in the LEGEND Experiment**

*Wednesday 21 June 2023 15:45 (30 minutes)*

The discovery of the lepton-number-violating neutrinoless double-beta decay process will prove that neutrinos are Majorana fermions. The Large Enriched Germanium Experiment for Neutrinoless double-beta Decay (LEGEND) project will search for this decay in  $^{76}\text{Ge}$ . In its first phase —LEGEND-200 —200 kg of  $^{76}\text{Ge}$ -enriched high-purity germanium detectors will be deployed in a liquid-argon cryostat. It is under construction at the Laboratori Nazionali del Gran Sasso (LNGS) in Italy. The first phase has a background goal of  $<0.6$  counts/(FWHM t y), which yields a  $3\sigma$  half-life discovery sensitivity beyond  $10^{27}$  years. The second phase —LEGEND-1000 —will comprise 1000 kg of enriched germanium detectors. It will be sited deep underground with SNOLAB as the baseline host. LEGEND-1000 will have a discovery sensitivity beyond  $10^{28}$  years. In this talk, I will give an overview of the LEGEND project.

### **Keyword-1**

neutrino

### **Keyword-2**

majorana

### **Keyword-3**

germanium

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