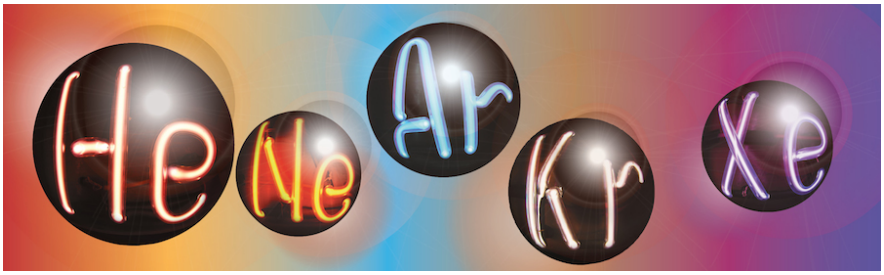

Contribution ID: **50** Type: **Presentation**

Present status of the LEGEND experiment

Thursday 22 September 2022 14:00 (15 minutes)

The Large Enriched Germanium Experiment for Neutrinoless Double Beta (0vbb) Decay (LEGEND) is designed to answer one of the highest priority questions in fundamental physics: is the neutrino Majorana or Dirac particle, is the lepton number conserved, and what is the neutrino mass ?
In the first phase of the project the LEGEND-200 detector is under construction at the Laboratori Nazionali del Gran Sasso (LNGS) in Italy. Up to 200 kg of bare high purity germanium (HPGe) detectors enriched in Ge-76 up to about 90 % will be deployed in liquid argon (LAr). The LAr will serve as cooling medium for the detectors as well as a passive and active shield. The LAr instrumentation will be composed of light guiding fibers connected to silicon photomultipliers detecting scintillation light of argon. It has been already shown in the GERDA experiment that the LAr veto was a very powerful tool for background rejection and minimization. By combining the lowest background levels with the best energy resolution in the field, LEGEND-200 will perform a quasi-background-free search for 0vbb decay and after collecting of about 1 ton*year of data it can make a discovery of neutrinoless double-beta decay with just a handful of counts for the Ge-76 half-life of about 10^(27) years.
In the presentation the present status of LEGEND-200 will be discussed, as well as the perspectives for construction of the full-scale detector based on 1000 kg of Ge-76. LEGEND-1000 is designed to probe Neutrinoless Double Beta Decay with a discovery sensitivity in the Ge-76 half-life of about 10^(28) years, corresponding to an effective Majorana mass upper limit in the range of 9-21 meV to cover the inverted-ordering neutrino mass scale with 10 years of live time.

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Session Classification: Applications

Track Classification: Applications (dark matter, neutrino, medical physics etc.)