

FAKULTÄT für PHYSIK
LUDWIG-MAXIMILIANS-UNIVERSITÄT
MÜNCHEN/GARCHING

PHYSIK-DEPARTMENT
TECHNISCHE UNIVERSITÄT MÜNCHEN
MÜNCHEN/GARCHING

Garching Maier-Leibnitz-Kolloquium

Donnerstag, 24.06.2021, 16¹⁵ Uhr

Online via ZOOM:

<https://lmu-munich.zoom.us/j/98457332925?pwd=TWc3V1JkSHpyOTBPQVlMelhuNnZ1dz09>

Meeting ID: 984 5733 2925

Passcode: 979953

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The Large Enriched Germanium Experiment for Neutrinoless Double-Beta Decay

The question of whether the neutrino is identical to its anti-particle, i.e., a Majorana particle, is one of the most fundamental challenges in particle physics. This basic property is connected to the origin of the neutrino mass and could help explain the predominance of matter over antimatter in our Universe. Neutrinoless double-beta ($0\nu\beta\beta$) decay - a so-far unobserved radioactive transition - is the only known, feasible method to probe the Majorana nature of the neutrino in the laboratory. A discovery of $0\nu\beta\beta$ decay would unambiguously demonstrate that new lepton-number-violating physics exists and connect it to the origin of the neutrino mass.

The Large Enriched Germanium Experiment for Neutrinoless Double-Beta Decay (LEGEND) is an envisioned ton-scale, ^{76}Ge based, experimental program with discovery potential at half-lives beyond 10^{28} years. In this colloquium I will present the current status of LEGEND-200, the first 200 kg phase of the experiment currently under construction at the Gran Sasso underground laboratory (Laboratori Nazionale del Gran Sasso, LNGS, Italy), and provide an outlook on the prospects and physics goals of the proposed ton-scale phase of the experiment (LEGEND-1000).

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