

The GERDA experiment

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Neutrinoless double-beta-decay could be the key to understanding the nature of the neutrino: if observed it would prove its Majorana-nature and the half-life of the decay would be a direct measure of the yet unknown absolute scale of the neutrino mass.

The GERmanium Detector Array (GERDA) experiment at the INFN, Gran Sasso Laboratory, Italy, is designed to investigate the double-beta-decay of the isotope Ge-76. Germanium crystals enriched in Ge-76, acting as source and detector simultaneously, will be submerged directly into their ultra pure cooling medium (liquid argon) that also serves as a radiation shield. A further reduction of the external background is achieved by means of a 2m-thick water buffer, which is operated as a Cherenkov detector to veto cosmic-ray muons.

This concept will allow for a background reduction of up to two orders of magnitudes with respect to earlier experiments - a key requirement for further improvement of sensitivity. The design of the GERDA experiment will be introduced and the current status of the experiment will be discussed.

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