LNGS SEMINAR SERIES

Giovanni Benato

Zürich University

Status and perspectives of the GERDA experiment

The validity of total lepton number conservation, the neutrino nature in terms of Majorana or Dirac mass components and the absolute neutrino mass scale are presently topics of interest in neutrino physics. Neutrinoless double beta decay might contribute to shed light on these open questions.

The GERmanium Detector Array (GERDA) is currently one of the most sensitive experiments in the field. In GERDA, germanium crystals enriched to ~86% in ^{76}Ge are operated in liquid argon (LAr) both as source and detector for the process.

In GERDA Phase I, a background index (BI) of 10^{-2} cts/(keV kg yr) was achieved, yielding a 2.1×10^{25} yr 90% CL limit on the half life of the decay process within 1.5 yr of data collection.

A major upgrade of the experimental setup is ongoing, with the aim of reducing the BI by one order of magnitude and reaching a sensitivity higher than 10^{26} yr within 3 years of data collection. This is possible with the deployment of additional 20 kg of enriched germanium in a form of Broad Energy Germanium detectors (BEGe), featuring higher energy resolution and enhanced pulse shape discrimination capabilities, and with the installation of photo-sensors for the detection of LAr scintillation light induced by external background radiation.

SEPTEMBER 30, 2015 - 2:30 PM

LNGS - "B. PONTECORVO" ROOM