

# LNGS SEMINAR SERIES

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## Direct Search for the Neutrino Mass and the KATRIN experiment

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Since the discovery of neutrino oscillation we know that neutrinos have non-zero masses, but we do not know the absolute neutrino mass scale, which is very important for cosmology as well as for particle physics. The direct search for a non-zero neutrino mass from endpoint spectra of weak decays is complementary to the search for neutrinoless double beta-decay and analyses of cosmological data and does not request further assumptions. It only requires energy and momentum conservation and applies the relativistic energy-momentum relationship. The most stringent limits on the neutrino mass originate from investigations of the electron energy spectra of tritium beta-decay.

Currently the Karlsruhe Tritium Neutrino experiment KATRIN is under construction and commissioning. It will improve the best limit from the tritium beta decay experiments at Mainz and Troitsk of 2 eV by one order of magnitude probing the region relevant for structure formation in the universe. KATRIN uses a strong windowless gaseous molecular tritium source combined with a huge MAC-E-Filter as electron spectrometer. The status of the commissioning of the whole experiment will be reported and data from the commissioning phases of the spectrometer and detector section will be presented.

In addition to a report on the KATRIN experiment an outlook on up-coming new approaches to the neutrino mass, like bolometric experiments using the electron capture of Ho-163, will be given.

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