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The Karlsruhe Tritium Neutrino Experiment KATRIN

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The KArlsruher TRItium Neutrino experiment KATRIN is going to search for the neutrino mass from the endpoint region of the tritium beta decay spectrum with one order of magnitude higher sensitivity of 0.2 eV/c2 compared to previous direct neutrino mass experiments. This sensitvity will allow to distinguish between hierarchical and quasi-degenerate neutrino mass scenarios as well as to investigate the whole cosmological relevant neutrino mass range.

The KATRIN experiment is currently being set up at Forschungszentrum Karlsruhe/Germany by an international collaboration. The key elements of KATRIN are a windowless gaseous molecular tritium source with an ultra-high luminosity and which minimizes systematic uncertainties, a very effective tritium retention and electron guiding system, the 23m long and 10m diameter main spectrometer of MAC-E-Filter type, and an electron detector. This setup allows to measure the tritium beta spectrum with unprecedented signal rate and energy resolution of 0.93eV. The scientific context, the present status of KATRIN, its technical challenges and a discussion on KATRIN`s systematics and sensitivity will be presented.

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