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TRISTAN: a novel detector for keV sterile neutrino search with KATRIN

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The KATRIN (Karlsruhe Tritium Neutrino) experiment investigates the energetic endpoint of the tritium beta-decay spectrum to determine the effective mass of the electron anti-neutrino. The collaboration reported its first result in fall 2019, publishing the best limit up-to-date on neutrino mass from direct measurement.

The TRISTAN project aims at detecting a keV-sterile neutrino signature by measuring the entire tritium beta-decay spectrum with an upgraded KATRIN system. One of the greatest challenges is to handle the high signal rates generated by the strong activity of the KATRIN tritium source while keeping a good energy resolution. Therefore, a novel multi-pixels silicon drift detector and read-out are being designed to handle rates up to 100 Mcps with an energy resolution of 200 eV (FWHM) at 10 keV.

This talk will present the first KATRIN results and future perspectives to search for sterile neutrinos with KATRIN.

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