

The XENON1T Dark Matter Experiment

The XENON1T experiment is the first tonne-scale double phase (liquid-gas) time projection chamber for direct search of dark matter, currently operational at the underground National Laboratory of Gran Sasso in Italy. XENON1T utilizes about 2000 kg of liquid xenon as target mass for interactions of weakly interacting massive particles (WIMPs), candidate dark matter particles, with xenon nuclei. The XENON1T experiment demonstrated the lowest electronic recoil background at low energies ever achieved in dark matter experiments, at the level of $(1.9 \pm 0.3) \cdot 10^{-4}$ events per kg·day·keV_{ee}. The first scientific results, based on a short data taking run of 34.2 live-days, set one of the most stringent exclusion limits for the spin-independent WIMP-nucleon interaction, reaching the lowest cross section value ever probed at $7.7 \cdot 10^{-47}$ cm² for 35 GeV/c² WIMP mass. Since then, XENON1T kept acquiring data with a second scientific run ended in early February 2018, during which ~250 days of data were collected. The dark matter search results from the combined analysis of the two scientific runs, for a total exposure of ~1 tonne-year, will be released soon and will allow to probe a range of WIMP-nucleon cross sections never explored before.

Subject

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Abstract Title

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