

STATUS AND SCIENCE PROGRAM OF THE XENON EXPERIMENTS

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Since 2001 the XENON collaboration has designed and built a series of gradually more sensitive detectors with the aim of detecting Dark Matter particles in the form of Weakly Interacting Massive Particles (WIMPs). All the XENON detectors built so far have been at the frontier of this search and set progressively more stringent limit to the WIMP interaction with ordinary matter, thanks to the gradual increase in mass and correspondingly decrease in background. The latest running detector of the XENON family is XENON1T, now decommissioned, that is the most sensitive direct WIMP search experiment to date.

The unprecedented low electronic background (76 events per (tonne \times year \times keV) in the 1 – 30 keV energy range) achieved with XENON1T made it highly sensitive to many other rare processes. The latest analysis showed, for instance, an unexpected excess of low energy electronic recoil events above background, with a maximum deviation between 2 and 3 keV. The talk will cover the rare event searches performed with XENON1T. The experiment is being upgraded to XENONnT with a target volume of 6 tons, a fiducial mass of 3 tons and a designed 6 times lower electronic recoil background. The talk will also present the current status of the experiment and its sensitivity.

