

Direct Dark Matter Detection with XENON1T

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Abstract content

Observations at cosmological and astronomical scales indicate that the majority of matter in our Universe is in the form of non-relativistic and long-lived dark matter. Its observed relic abundance is consistent with the existence of a neutral, massive particle with little or no self-interaction. A dark matter candidate favoured by extensions of the Standard Model is a Weakly Interacting Massive Particle (WIMP) whose interaction with normal matter can be probed directly via elastic scattering of target nuclei, thus motivating searches through direct detection. XENON1T, a dual-phase time projection chamber using 2-ton liquid xenon as target mass, was constructed in the Laboratori Nazionali del Gran Sasso and is in operation since summer 2016. It aims to observe primarily low-energy nuclear recoils of WIMPs with unprecedented sensitivity. This presentation will cover the design and operation of the detector, as well as the data analysis that led to the currently most sensitive direct dark matter detection experiment in the world.

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