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The XENON Dark Matter Search Experiment

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To date, dark matter (DM) has only been observed through its gravitational interaction. Detection of a DM signal in an ultra-low background terrestrial detector will represent a ground-breaking discovery in physics and cosmology. The XENON collaboration has pioneered the development of liquid xenon time projection chambers and built a series of such detectors to lead the search for DM particles. As the first tonne scale experiment with the lowest electronic recoil background of its kind, the XENON1T detector sets the world-leading upper limit on DM-nucleon cross-section with DM masses above 0.1 GeV. The XENON1T experiment is also leading the search for other rare processes such as signals from solar axion and the coherent elastic scattering of solar Boron-8 neutrinos. The XENONnT experiment is running at the INFN Gran Sasso National Laboratory in Italy, featuring a 6-tonne liquid xenon target and approximately 6 times lower background than its predecessor XENON1T. In this talk, I will review the world-leading results achieved with XENON1T, and discuss the status and discovery potential of XENONnT.

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Dark matter

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