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Status of the XENONnT dark matter experiment

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XENONnT is a dark matter direct detection experiment located at the INFN Laboratori Nazionali del Gran Sasso. The core detector is a dual-phase *time projection chamber* (TPC) filled with 5.9 t of liquid xenon and instrumented with a total of 494 photomultiplier tubes (PMTs).

The TPC is installed in the center of a stainless steel tank filled with 700 t of water, which provides effective passive shielding but it is also instrumented with 84 PMTs and operated as an active water Cherenkov *Muon Veto*. A novel sub-detector, called *Neutron Veto*, is contained within the Muon Veto and surrounds the TPC in order to suppress the neutron background. The highly-reflective Neutron Veto volume is optically separated from the Muon Veto and instrumented with 120 high-QE low-radioactivity PMTs. The water will be eventually doped with gadolinium to maximize the neutron detection efficiency.

In 2020 XENONnT replaced the successful XENON1T experiment, which was the world's most sensitive detector for direct dark matter searches.

After a few months of commissioning, since mid 2021 XENONnT started its science data acquisition.

In this talk we will review the most relevant achievements of XENON1T, and describe the concept, the performances and the scientific program of the XENONnT experiment.

In-person participation

Yes

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