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Recent results and current status of the XENONnT Dark Matter experiment

The XENONnT experiment is designed for the direct detection of dark matter through elastic WIMP-nucleus scattering, employing a 5.9-tonne liquid xenon target in a dual-phase time projection chamber. Located at the Laboratori Nazionali del Gran Sasso in Italy, XENONnT has collected a total of more than 600 live-days of data during its first three science runs.

Thanks to its high discrimination power, low energy threshold, and record-low background rate and impurity levels, XENONnT achieves world-leading sensitivity to low-energy dark matter interactions, as well as other rare processes such as neutrino scattering.

In this talk, I will present the latest results from physics searches in XENONnT, including the most recent WIMP dark matter search results over a broad mass range (few GeV/c^2 to TeV/c^2), and the measurement of coherent elastic neutrino–nucleus scattering (CEvNS) from solar 8-B neutrinos.

I will also provide an overview of the XENONnT detector upgrade carried out in summer 2025 and present the status and first results of the subsequent commissioning campaign.

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