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The XENONnT Experiment: Dark Matter and Beyond

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Located at the Gran Sasso underground laboratories, the XENONnT experiment is a dark matter direct detection experiment that employs a dual-phase liquid xenon time projection chamber with a 5.9-tonne liquid xenon target. Building on the infrastructure developed for XENON1T with several upgrades, the XENONnT experiment is currently acquiring data and pushing the frontiers of astroparticle physics research. This talk will provide an overview of the experiment's key features, including enhanced sensitivity and unprecedented background reduction capabilities, while showcasing its latest results, such as the WIMP dark matter search with a minimum upper limit of $2.58 \times 10^{-47} \text{ cm}^2$ for a WIMP mass of $28 \text{ GeV}/c^2$, as well as the analysis of electronic recoil data, which benefited from the lowest background rate ever achieved in a dark matter detector.

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