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## Unveiling Neutrinoless Double Beta Decay with the NEXT Detectors: Advances, Achievements, and Future Prospects

Wednesday 28 August 2024 16:40 (20 minutes)

The NEXT collaboration aims to discover neutrinoless double beta decays in Xe-136 using a high-pressure gas time projection chamber using electroluminescence (HPGTPC-EL). This cutting-edge technology leverages the remarkable energy resolution (FWHM  $<1\%$ ) and topological event classification capabilities of electroluminescent HPGTPCs. Building on the success of its predecessor, NEXT-White, the NEXT-100 detector was successfully constructed and assembled in 2023. With commissioning underway, data collection is set to begin in July 2024. The detector, holding approximately 80 kg of Xenon at 15 bar, boasts a projected sensitivity of  $6 \cdot 10^{25}$  years after three effective years of data acquisition.

In this presentation, we will highlight the unique advantages of HPGTPC-EL detectors, provide a detailed overview of the NEXT-100 detector, and discuss its scientific objectives. We will also share the latest updates on the experiment's status, including commissioning outcomes. Looking ahead, we will explore the future goals of the NEXT collaboration, including plans for a ton-scale NEXT detector capable of achieving a half-life sensitivity exceeding  $10^{27}$  years within five years of operation.

### Internet talk

No

### Is this an abstract from experimental collaboration?

Yes

### Name of experiment and experimental site

NEXT Experiment (LSC)

### Is the speaker for that presentation defined?

Yes

### Details

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