



Contribution ID: 120

Type: **Contributed Talk**

The NEXT program and status of the NEXT-100 detector

Tuesday, September 30, 2025 6:00 PM (20 minutes)

The NEXT collaboration uses a high-pressure gaseous time projection chamber with electroluminescent amplification in order to search for the neutrinoless double beta decay in Xe-136. Observing such a decay would indicate that neutrinos are Majorana particles, having profound implications for Particle Physics and Cosmology. The NEXT program is built on solid and successful R&D, showing an excellent energy resolution ($<1\%$ in the energy region of interest) and remarkable topological discrimination.

The former stage of the experiment, NEXT-White, took data at the Laboratorio Subterráneo de Canfranc (LSC) from 2016 until 2021. It validated the design concept and goals in a large-scale dimension detector, assessed the background model, and provided a measurement of the two-neutrino double beta decay half-life, using a novel subtraction method.

NEXT-100 is the phase currently under operation, starting in 2024. Located also at the LSC, it is designed to hold 100kg of Xe at 15 bar. The detector's main aim is to perform a competitive search for the neutrinoless double beta decay in Xe-136, with a projected sensitivity exceeding 10^{25} y after 3 years of data taking. In addition, NEXT-100 will serve as a test-bench for tonne-scale technologies.

In this talk, we will review the technology proposed, the success of the program, and the current status and results. In addition, we will explore the prospects for future tonne-scale detectors.

Neutrino Properties

Neutrino Telescopes & Multi-messenger

Neutrino Theory & Cosmology

Data Science and Detector R&D

Presenter: PALMEIRO PAZOS, Brais (University of Manchester)

Session Classification: Neutrino Physics

Track Classification: Neutrino Properties