Contribution ID: **38** Type: **Invited talk**

Upgrade of the XENONnT experiment with new electrodes

Tuesday, 19 May 2026 17:00 (30 minutes)

The XENONnT experiment, operating at the INFN Gran Sasso Laboratory, continues its search for rare events using a dual-phase xenon time projection chamber (TPC) containing 5.9 t of xenon inside the detector cryostat. Recent results include new limits on WIMP dark matter based on a 3.1 tonne-year exposure, as well as the first indication of solar ^{8}B neutrino interactions via coherent elastic neutrino–nucleus scattering.

After several years of stable operation, XENONnT underwent in 2025 a major hardware upgrade campaign focused on replacing the TPC's electrodes. The former wire-grid cathode was substituted with a photochemical etched hexagonal mesh, while the anode design was modified to sustain higher wire tension. These new electrodes aim to enable significantly higher drift and extraction fields within the TPC, enhancing the experiment's sensitivity. Extensive electrode development and testing, including operation in liquid xenon, preceded the installation. Alongside this major intervention, additional infrastructure upgrades were carried out, most notably the commissioning of a gadolinium recovery plant for the experiment's water-Cherenkov neutron veto.

This contribution will introduce key features of the experiment's instrumentation. Furthermore, we will cover the new electrodes'design, production and testing, their expected impact on detector performance, and the integration schedule toward XENONnT's next data taking campaign.

Primary author: DEISTING, Alexander (Johannes Gutenberg-Universität Mainz)

Presenter: DEISTING, Alexander (Johannes Gutenberg-Universität Mainz)

Session Classification: Technology and R&D

Track Classification: Overview