

PRISMA+ Colloquium

June 28, 2023 at 1 p.m.
Lorentz-Raum, 05-127, Staudingerweg 7

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First WIMP Search Results from the XENONnT Experiment

A rich number of astrophysical and cosmological observations indicate the existence of a massive, non-luminous and non-baryonic matter component which is commonly referred to as dark matter (DM). One well motivated class of DM are weakly interacting massive particles (WIMPs) which arise naturally from several beyond-Standard-model theories.

The XENON dark matter project aims for the direct detection of WIMPs utilizing the concept of a dual-phase time projection chamber (TPC), currently operating the 4th generation of XENON experiment, XENONnT, at the INFN Laboratori Nazionali del Gran Sasso underground laboratory. XENONnT was designed as a fast upgrade of its predecessor XENON1T, augmented by many new subsystems -- among them the world's first water Cherenkov neutron veto. The XENONnT TPC features a sensitive liquid xenon mass of 5.9 t and an unprecedented low background of intrinsic ^{85}Kr and ^{222}Rn , leading to an electronic recoil background rate of (15.8 ± 1.3) events / t year keV in the region of interest.

In this seminar we will report on the first WIMP search results with the XENONnT experiment, conducted in a blind analysis in an energy range between 3.1 keV and 60.0 keV, and an exposure of approximately 1.1 tonne-year.