

Direct Search for Dark Matter



XENON

Discovering dark matter, better understanding and extending the Standard Model

© Collaboration XENON

- **Scientific leader:** Dominique Thers (Subatech)*
- **Laboratories involved:** LPNHE (Paris), Subatech (Nantes)
- **Nature:** research infrastructure
- **Status:** international collaboration involving 13 countries on 4 continents
- **Website:** <http://xenon1t.org/>

SCIENTIFIC OBJECTIVES

The experiments of the XENON collaboration, with today XENONnT, aim to find the first direct evidence for the existence of "dark matter" in the Universe, via the scattering of particles of this matter with target xenon nuclei. The XENONnT phase will also be able to investigate other important phenomena that open up new physics, such as the search for axion-like particles and the detection of double beta decays without neutrino emission. XENONnT started collecting data in 2021.

RESOURCES DEPLOYED

XENONnT is installed about 1 500 m underground at the Gran Sasso underground laboratory in Italy, so that it is protected from external radiation. The telescope is a 1.5-metre-high, 1.5-metre-diameter tank filled with 10 tonnes of very pure liquid xenon, cooled to -95°C and protected from radiation by an additional water shield. Its core is the quietest place on earth.

28 research institutions in **13** countries

190 scientists, including a dozen at IN2P3

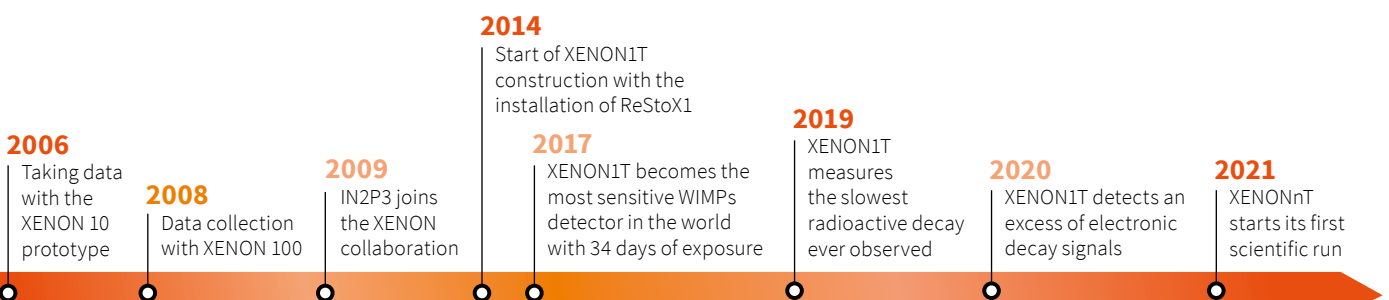
10t of liquid xenon

20 million euros (total cost)

4 generations of detectors since 2006: XENON 10, 100, 1T and nT

IN2P3 CONTRIBUTIONS

- Successive contributions since 2009 to the XENON100, XENON1T and XENONnT experiments.
- Construction, deployment and operation of the largest liquid xenon filling stations, the ReStoX1 and ReStoX2 units. These stations allow the storage, distribution and recovery of xenon from the XENON collaboration facilities.
- Contribution to the scientific activity of the collaboration.



* Since 2017