XeSAT 2027 - International Workshop on Applications of Noble Gas Xenon to Science and Technology

22 June 2027 - 25 June 2027

The University of Melbourne

Scientific Programme

XeSAT 2027 brings together the broad community working on the application of noble gas xenon, from fundamental physics to medicine and industry. The programme consists of plenary talks (invited and contributed) and a poster session, organised around the topics below.

Abstracts may be submitted to any of these topics through the Call for Abstracts.

Dark Matter

Direct searches for dark matter with liquid and gaseous xenon detectors: results and status of current and next-generation experiments, backgrounds, calibration, analysis techniques and sensitivity projections, including complementary noble-liquid and other target technologies.

Neutrinoless double beta decay

Searches for neutrinoless double beta decay in xenon-136 with liquid- and high-pressure-gas time projection chambers and xenon-loaded scintillators: detector concepts, energy resolution, background control, barium tagging and future large-scale experiments.

Precision experiments

Xenon in precision and rare-event physics beyond dark matter and double beta decay, such as charged lepton flavour violation, tests of fundamental symmetries and electric dipole moments, neutrino interactions and coherent scattering, nuclear-physics measurements, and applications in astrophysics and space science.

Medical applications

Use of xenon in medicine and biology: xenon-based medical imaging (e.g. Compton and three-gamma imaging, PET), hyperpolarised xenon MRI, xenon in anaesthesia and therapy, and dosimetry.

Technology

Detector physics and enabling technologies for xenon and other noble-gas detectors: ionisation and scintillation processes, electron and ion transport, photosensors (PMTs, SiPMs, CMOS), micro-pattern gaseous detectors, cryogenics, gas purification, recycling and radon mitigation, low-background materials and shielding, electronics, calibration and simulation.

Industry

Industrial aspects of xenon: production, supply and isotopic enrichment, gas handling and storage, industrial and commercial applications, and collaboration between industry and the research community.

Theory

Theoretical and phenomenological work related to xenon-based experiments: dark matter models and interaction rates, nuclear matrix elements and structure, neutrino physics, and modelling of the microphysics of xenon.