



THE CHINESE UNIVERSITY OF HONG KONG
Department of Physics
SEMINAR

The XENONnT Experiment: Dark Matter and Beyond

by

Professor Jingqiang YE (葉靖强教授)
School of Science and Engineering
The Chinese University of Hong Kong Shenzhen, China

Date: May 23, 2024 (Thursday)

Time: 2:30 - 3:15 p.m.

Place: L4, Science Centre, CUHK

ALL INTERESTED ARE WELCOME

Abstract

The XENONnT experiment, located in Laboratori Nazionali del Gran Sasso, is a direct detection experiment designed to search for Weakly Interacting Massive Particles (WIMPs) using a dual-phase time projection chamber with 8.5 tonnes of xenon. The experiment began collecting science data in 2021 and is currently under operation. In its first science run (SR0), the experiment achieved an electronic recoil background of 15.8 events/(tonne-year-keV) below 30 keVee, establishing a new benchmark as the lowest background ever recorded in a dark matter detector. This achievement was made possible by reducing the amounts of radioactive Kr-85 and Rn-222 to an unprecedented low level. The SR0 data has excluded new physics interpretations of the XENON1T excess thanks to the ultra-low background level and large target mass in XENONnT. Moreover, XENONnT released the first WIMP search results using the same data last year, where no excess was found. In this talk, I will present the first two results from XENONnT as well as future plans for the experiment.