Progetto	XENONnT Neutron Veto DAQ
Esperimento / sigla proponente	XENON
Laboratorio ospitante	LNGS
Contact person presso il laboratorio	M. Iacovacci
Periodo previsto:	Giugno 2022 - Marzo 2023
Sezioni e tutor proponenti :	Napoli – M. Iacovacci / F. Marignetti / S. Mastroianni
Descrizione attività (max 1000 caratteri)	The XENONnT detector (at the INFN Laboratori Nazionali del Gran Sasso) aims at the direct detection of Dark Matter particles with an increased sensitivity (at least an order of magnitude) with respect to the previous XENON1t. This goal will be achieved by means of important improvements of the detector, among others we have the implementation of a neutron Veto (nVeto) sub-detector to tag neutrons able to mimic the WIMP signals. The nVeto is built on an octagonal structure (3 m-high and 4 m-wide) inside the water tank surrounding the cryostat. In order to improve the neutron detection efficiency, the water will be loaded with Gadolinium salt. A total of 120 Hamamatsu 8" high-QE PMTs with low-radioactivity are placed along the lateral walls of the octagonal steel structure in order to detect the Cherenkov photons produced in the neutron capture by the Gadolinium. New generation waveform digitizers V1730, developed by CAEN, are in charge of the PMT signal digitization with a time resolution of 2 ns. The DAQ system has already been operated in the first Science Run (SR0) of XENONnT. The activity foreseen for the student will envisage studies of: 1) performance of the digitizers V1730; 2) physics background and electronic noise measurements; 3) timing and synchronization with the other sub-detectors.
Altre indicazioni: (max 500 caratteri)	
Facility che il laboratorio ospitante mette a disposizione	Mensa
Note:	