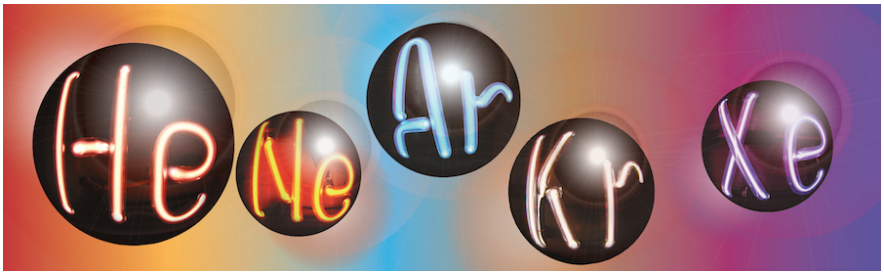

Contribution ID: **47** Type: **Oral Presentation**

PE Activities for DS-20k at NOA: Production, Tile-Testing, and Assembly

Wednesday, 22 October 2025 14:50 (20 minutes)

Darkside-20k is designed as a dual phase Time Projection Chamber (TPC), relying on light + charge signal readout, to explore the parameter space of WIMP candidates of Dark Matter with an unprecedented sensitivity down to the neutrino fog. The experiment will deploy a total of > 26 m^2 area of Silicon Photo-multiplier (SiPMs) as the photon sensitive surface, integrated on the TPC top-bottom as optical planes and in the inner neutron veto. While SiPMs provide advantages over PMTs, their deployment on this scale at cryogenics conditions has never been done before.

The talk intends to highlight the efforts devoted to the development of a large area, low noise, cryogenic readout system for SiPMs, the production & testing the performance of Tiles (an array of 24 SiPMs) and their integration in form of Photo-detector Units(PDUs) at Nuova Officina Assergi (NOA) in LNGS. A strong QA/QC evaluation at the level of Tiles is done before qualifying them for PDUs. A discussion on the impact of some QA/QC parameters on the data acquisition system and physics potential of the experiment. Furthermore, we shall discuss the challenges related to device deployment on the optical planes for the TPC at NOA, once the PDUs pass the cold test and are qualified for final assembly.

Primary author: GAHAN, Devidutta (INFN-LNGS)

Presenter: GAHAN, Devidutta (INFN-LNGS)

Session Classification: Light/charge readout

Track Classification: Light/charge readout (PMT, SiPM, WLS, electronics etc.)