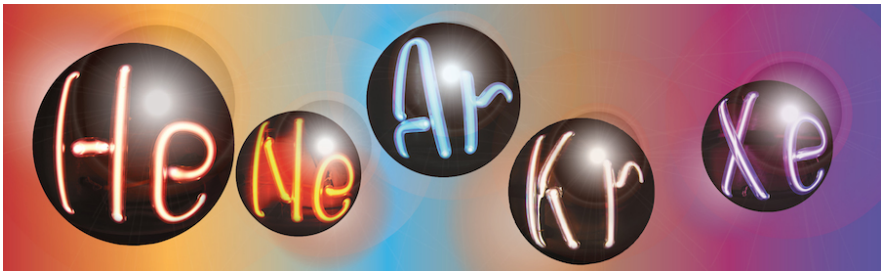

Contribution ID: **48** Type: **Oral Presentation**

Characterization of DarkSide-20k Photodetector Units

Wednesday, 22 October 2025 09:30 (20 minutes)

DarkSide-20k is a next-generation experiment designed to search for dark matter using a dual-phase liquid-argon time projection chamber (TPC). In DarkSide-20k, more than 500 SiPM-based Photodetector Units (PDUs) will instrument the TPC and its active veto. This talk will focus on the cryogenic validation of those modules, carried out in the dedicated Photodetector Test Facility (PTF) and in the separate veto-PDU testing facilities. The PTF accommodates 16 PDUs at a time, immersing them in liquid nitrogen and providing pulsed-laser calibration, continuous stability monitoring, and diagnostics of the possible problems. Key figures of merit, including gain stability, signal-to-noise ratio, resolution, and their uniformity, will be presented for the first ˜10% of detector-grade PDUs produced and tested to date. Complementary measurements on the veto-PDU assemblies will be reported. The talk will conclude with a summary of lessons learned, current throughput, and the path to full-scale qualification of the remaining PDUs before detector integration.

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Session Classification: Light/charge readout

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