



Contribution ID: 43

Type: **Talk**

## **Light readout in DarkSide-20k: from Silicon Photo Multiplier dies to the Photo Detection Units integration in the NOA packaging facility.**

*Wednesday 28 August 2024 17:20 (20 minutes)*

DarkSide-20k is the next generation multi-ton dark matter experiment in construction at Gran Sasso underground Laboratory (LNGS). Designed upon the successful operations of DS-50 detector, it exploits new key technologies for large scale experiments: the low radioactive underground Ar subsequently depleted of  $^{39}\text{Ar}$ ; the large area cryogenic SiPMs integrated with a custom and compact electronics for light detection, an intense radio-purity assay program with several facilities worldwide to select materials with the lowest background contamination.

The detector is based on a large dual phase LAr Time Projection Chamber (TPC) that will be installed inside a cryostat membrane under construction in the LNGS cavern. Both the TPC optical planes will be equipped with more than 20 m<sup>2</sup> of SiPM arrays integrated in 528 Photo Detection Units (PDU). The massive production of these optical units will be performed in the Nuova Officina Assergi (NOA), a large clean room of 420 m<sup>2</sup> that has been active since 2023. The facility hosts cutting edge packaging machines and dedicated equipments and set ups for cryogenic test of SiPM arrays and the related electronics. After a brief introduction of DarkSide-20k detector and the construction progress, this contribution will be focusing on the activities on the SiPM arrays, their packaging, test and the performance of the first PDUs assembled in NOA to validate the entire production capability workflow.

### **Internet talk**

No

### **Is this an abstract from experimental collaboration?**

Yes

### **Name of experiment and experimental site**

DarkSide-20k

### **Is the speaker for that presentation defined?**

Yes

### **Details**

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