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DarkSide-20k Photo Detection Unit production in NOA

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DarkSide-20k is the next future experimental project, that combines the special technique for the procurement and purification of underground Argon with the light detection technology based on large arrays of customized cryogenic photosensors. Together with an accurate selection of radiopure materials DS-20k experiment is expected to hunt for WIMPs in a free background mode for an exposure $> 100 \text{ tonne} \times \text{year}$. A large dual phase Time Projection Chamber surrounded by an active neutron veto based on a Gd-loaded acrylic shell will be installed inside a cryostat membrane under construction in the LNGS underground site and containing more than 700 t of liquid Argon. The two TPC optical planes will be instrumented with more than 21 m² of Silicon Photomultipliers arranged in 528 Photo Detection Units that will be massively assembled in the Nuova Officina Assergi (NOA) a large clean room of 420 m² deserving cutting edge technology equipments and in operation since the beginning of 2023. After a short introduction on Darkside-20k and the PDU concept design, the main features of NOA clean room packaging site and all the steps of the PDU production workflow will be presented.

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