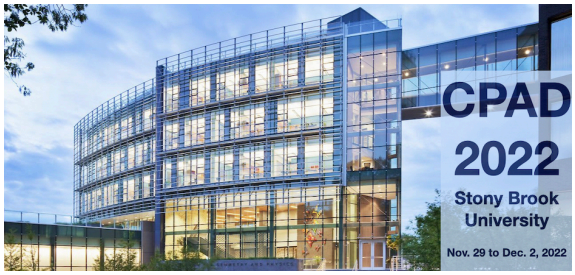

Contribution ID: **64** Type: **Contribution Talk**

Light detection in DarkSide-20k with Silicon Photomultipliers

Tuesday, 29 November 2022 17:00 (20 minutes)

The DarkSide program aims to a WIMP direct detection using a dual phase argon time projection chamber. The next generation experiment, DS-20k, will be a detector in excess of 20 tonnes of fiducial mass. A pivotal aspect to the sensitivity of the experiment is its light detection technology. The DarkSide collaboration decided to adopt a new family of photo-sensors called Silicon Photomultipliers (SiPMs). The talk will introduce the design of a DarkSide Photo Detector Module (PDM), a 25cm^2 array of SiPMs read-out as a single unit. The PDM's performances in terms of photon detection efficiency, dark count rate, and correlated noises will be outlined, including an overview of the detailed characterization of the detector's signal-to-noise ratio and its time resolution. Furthermore, the signal extraction strategy will be discussed. Finally, an overview of the silicon packaging techniques will be introduced, with updates on the status of the mass-production of the 13000 PDMs, to the material selection and to the high radio-purity result achieved.

Primary author: SAVARESE, Claudio (Princeton University)

Presenter: SAVARESE, Claudio (Princeton University)

Session Classification: WG7: Photon Detectors (incl. CCDs)

Track Classification: WG7: Photon Detectors (incl. CCDs)