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Development of the New Optical Sensor for IceCube-Gen2

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A new digital optical module (DOM) has been developed for the proposed expansion to the IceCube detector at the South Pole, IceCube-Gen2. The "Gen2-DOM"has 4 times the integrated photon sensitivity of the current IceCube DOMs and has built off the design features of the IceCube Upgrade modules. The Gen2-DOM has up to 18 4" photomultiplier tubes (PMTs) in a borosilicate glass pressure vessel, arranged in a uniform 4π angular distribution. The mechanical design has been optimized to fit into a reduced borehole diameter which, in turn, will reduce drilling costs during installation. Each PMT has a fully digitized readout, designed to increase sensitivity to high energy events aligned with the science goals of IceCube-Gen2. Internal storage enables multi-level triggering schemes with reduced overall flow of data on the long cables. Twelve prototypes of the Gen2-DOM will be deployed in the IceCube Upgrade in the 2025/2026 Austral summer. This poster will focus on the current status of design development and initial performance testing results.

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