

New Technologies for Discovery IV: The 2018 CPAD Instrumentation Frontier Workshop

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ArgonCube: Novel R&D for LArTPCs

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ArgonCube is an international collaboration for LArTPC Detector R&D, with a focus on the technical needs for the DUNE physics program. The ArgonCube R&D program is currently aimed on detector modularization, pixelated charge readout, and innovative light detection for large LArTPCs. Modularization addresses a number of technical issues for large LArTPCs, including drift field stability, stored energy, and liquid argon purity. Pixelated readout has proven to deliver true 3D imaging of particle interactions, removing the ambiguities present for existing readout techniques. New approaches to light detection enable increased photon yields and provide improved localization of scintillation signals. The ArgonCube design has been adopted as the baseline LAr system for the DUNE Near Detector. The ArgonCube 2x2 Demonstrator, a 3-ton-active modular pixelated LArTPC, will serve as an engineering prototype for DUNE. It is currently under construction and will operate in the Fermilab NuMI neutrino beam in 2020.

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