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High-Pressure Gaseous Argon TPC for the DUNE Near Detector

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The DUNE Near Detector design consists of multiple components, each designed to produce complimentary constraints on the flux and neutrino interaction systematic uncertainties for the oscillation analysis. One of these subdetectors is a magnetized high-pressure gaseous-argon TPC (HPgTPC), which will provide fine-grained tracking in a low-density detector, using the same target nucleus as the DUNE far detector. With its low detection threshold, the HPgTPC will be able to constrain one of the most crucial – and least-well understood – uncertainties for the oscillation analysis: nuclear effects in neutrino-argon interactions. This talk will describe the current design, physics goals, and projected performance of the HPgTPC, as well as the ongoing R&D work at Fermilab, in which a test-stand TPC is being built and will be operated at up to 10 atm pressure.

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