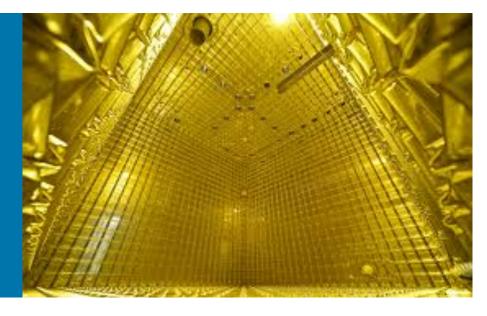


# PIXELATED READOUT INTEREST AT ARGONNE



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### ANL Approach

- ➤ ANL would like to contribute in a meaningful way to development of DUNE pixelated readout
  - -Can contribute to critical items
  - -Capabilities and expertise in multiple areas
- ➤ At high level we would like to support the ArgonCube development and testing for ND, with the goals to develop novel pixelated readout for DUNE Far Detector
  - -Support the development of ND
  - -Looking for a leadership roles in DUNE science, FD R&D, design, testing, fabrication, installation, operation
- ➤ ANL phlosophy is to couple expertise in neutrino science, DAQ systems, electronics and mechanical design with detector R&D and computing resources to support these goals

## For collaboration on ArgonCube/ND, we have expertise and capabilities in the following technical areas:

- System engineering (our primary choice to contribute to technical aspects of pixelated R&D)
  - Define interfaces
  - Define specifications & protocols
  - Oversee system tests, vertical slice tests
  - Production readiness reviews
  - Grounding plans
- > ASIC testing
  - bench testing
  - identify changes for production
- Front end board/mixed signal design
- ➤ DAQ/timing/control
- ➤ Power system design
- ➤ Mechanical Design of Anode and other components
  - Fabricate anode frames
  - Tile support
  - Cable support



### On DUNE FD, we are interested in the following areas

- ➤ Study physics reach of pixelated APA with respect to CP-violation, SN, proton-decay physics -Demonstrate pixelated readout solution with respect to physics goals
- > Study alternate readout technologies compared with LArPIX
  - -"Combine" Q-Pix and LArPIX?
  - -Compare/contrast cost vs. performance.
- System Engineering of pixelated readout
- Mechanical design of anode structure
  -mechanical and electrical tests, fabrication
- Demonstrate LArPIX or alternate readout architectures in test setups
  -ProtoDUNE-SP phase 2 is an option
- Characterize reliability/robustness of pixelated readout -electrical and mechanical
- ➤ HV distribution system design
- ➤ Photo-detector design
  - -Dielectric light readout in E-field?
  - -"Same" readout for pixels?
- > FELIX-based DAQ system development for pixelated readout

### On DUNE FD, we are interested in the following areas

- List of ANL capabilities could be further expanded by addition of HPC, considerations of new materials for detectors, hi-bay areas, particle beams
  - -Above listed resources to be shared with collaborators
- ➤ We would like to receive a feedback from collaborators on how to get involved