Intro

- 2023 P5 sends a **positive signal** by fully endorsing construction of FD3
  - DOE project support takes time, expect a budget similar to FD2
  - University grants and lab awards critical for R&D and prototyping
  - Please reach out if you are interested to contribute, we have ideas!

- Biggest challenge: building a system with 10 times FD2 optical coverage at a similar budget
  - Not a simple FD2 copy: improve detector design & readout
  - Reduce cost: simplify detector design & assembly, optimize management cost …

2024 goals

- Mechanical realization of 50cm unit APEX module(s) (HV+PD) + mechanical/HV/cryogenic tests
- Improve photodetector design, prototyping, and simulation
- Ramp up APEX cold readout (+SiPM) development
- Improve APEX simulation and physics studies
- Start a full design of FD3 APEX + charge readout (several possible options)
- …

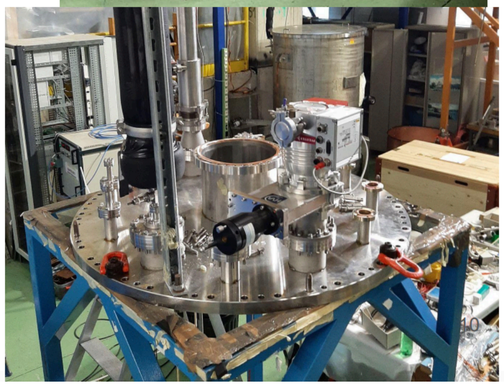
Prototype in 2T cryostat

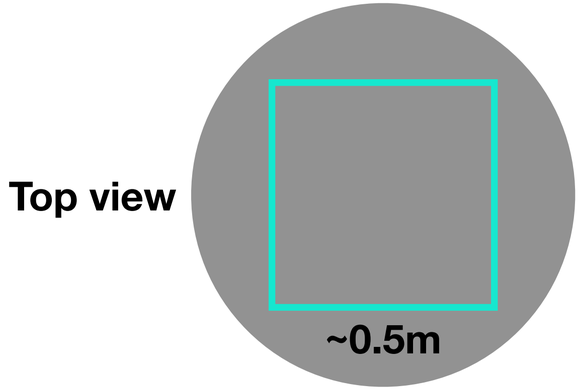
2T cryostat setup

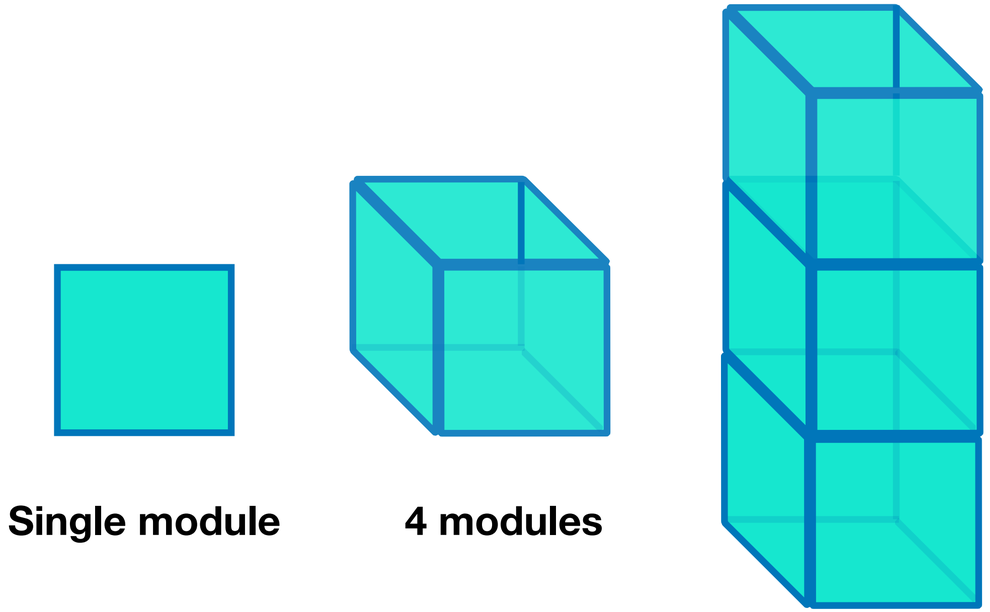
- Vacuum insulated large dewar with 1m diameter, 1.8m depth. 3D model of the setup can be found in the following link: https://cernbox.cern.ch/s/9EeZBitw2vHfse6

- Current setup has:
  - A vacuum insulated large dewar
  - Filtering system for the initial LAr filling
  - Pumping systems
  - Auxiliary instrumentation for cryogenic operations and monitoring
  - (possibility to implement recirculation system)

- Setup is suitable for larger prototype tests







News

- A new breakout meeting starting 2024
  - **FD3 APEX physics (Sim/Reco) meeting**
    - Led by Franciole Marinho, Chao Zhang, Eric Church (meeting time/frequency TBA)
    - Focus: discuss light simulation, reconstruction, GeV-MeV physics and background study
    - Encourage to use our main mailing list: DUNE-FD-PHASE2-APEX@fnal.gov

- A general Slack workspace to talk about anything APEX related
  - FD3-APEX: https://join.slack.com/t/fd3-apex/shared_invite/zt-2acupzfgz-RNfv5EcmKATsL7uknF_3Eg