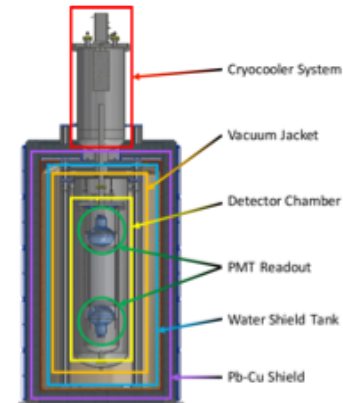
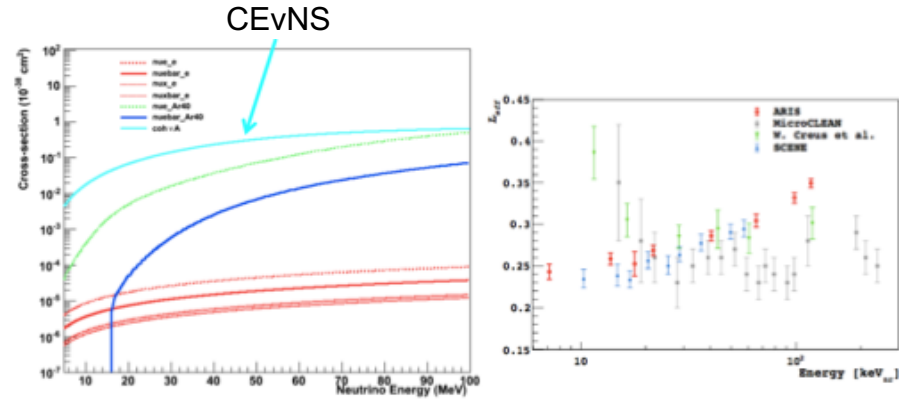


# Measuring Coherent Elastic Neutrino Nucleus Scattering in Liquid Argon with the CENNS-10 Detector

- Coherent Elastic Neutrino Nucleus Scattering (CEvNS) is dominant scattering channel at low energy in liquid argon (LAR)
- LAr is a good target for a CEvNS measurement
  - Low detection threshold and relatively high energy nuclear recoils
  - Measured quenching factor
  - Important for direct detection dark matter searches
- The COHERENT experiment uses the 22 kg CENNS-10 detector for a CEvNS measurement on LAr
  - Installed at the Spallation Neutron Source at Oak Ridge National Laboratory in late 2016
  - First run ended in May 2017 (“Run 0”) and upgraded for second run which ended December 2017 (“Run 1”)



# Measuring Coherent Elastic Neutrino Nucleus Scattering in Liquid Argon with the CENNS-10 Detector

- Run 0 data used to demonstrate detector performance
  - Good data/simulation agreement
  - Pulse shape discrimination between nuclear/electron recoils
- Run 1 data shows large improvement in detector light collection after upgrade
  - Additional  $^{83m}\text{Kr}$  calibration source for near threshold measurement
  - Expect  $\sim 50$  CEvNS events in Run 1 data
- Other COHERENT LAr activities include
  - Xe dopant tests at ITEP in Moscow, Russia
  - Design of a ton scale LAr detector for COHERENT
    - Test chambers for readout and wavelength shifting studies at IU, ORNL, and ITEP

