

Small Projects Experience from Neutrino Alley

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P5 virtual Town Hall

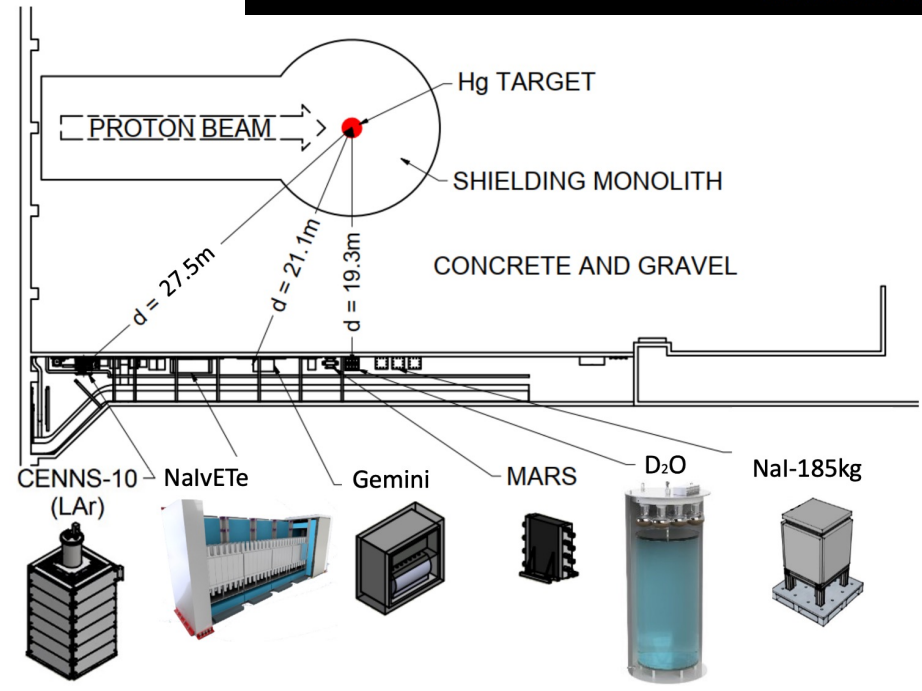
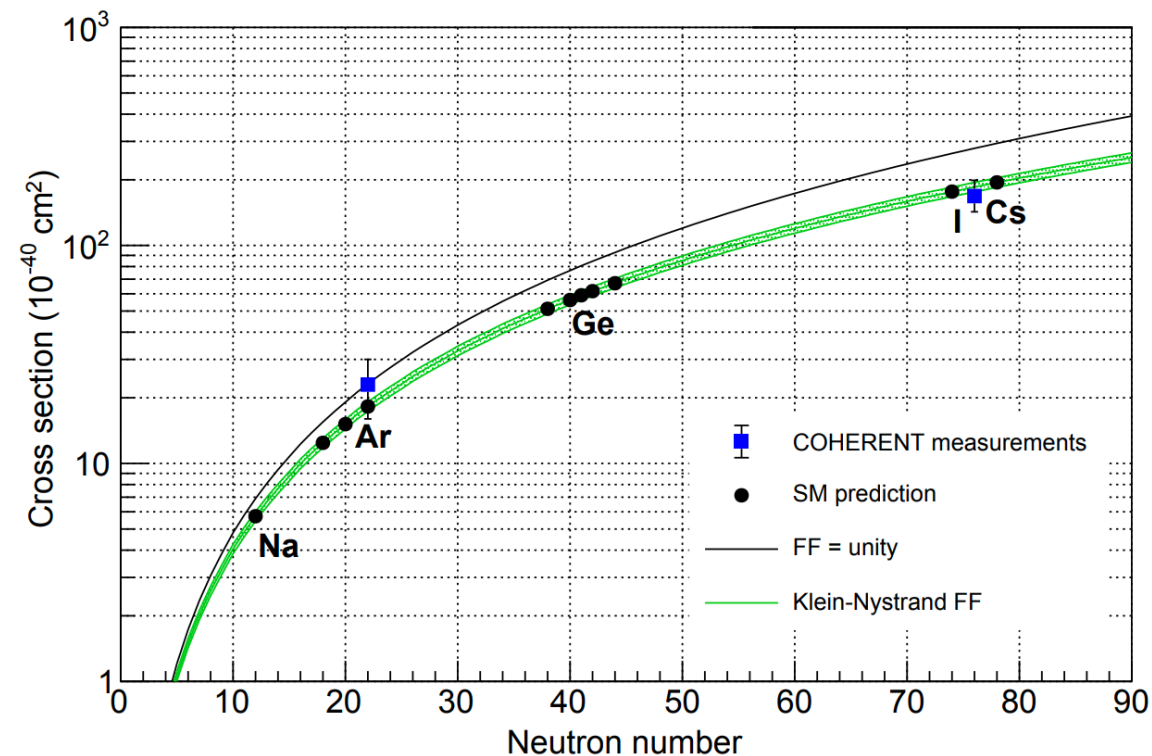
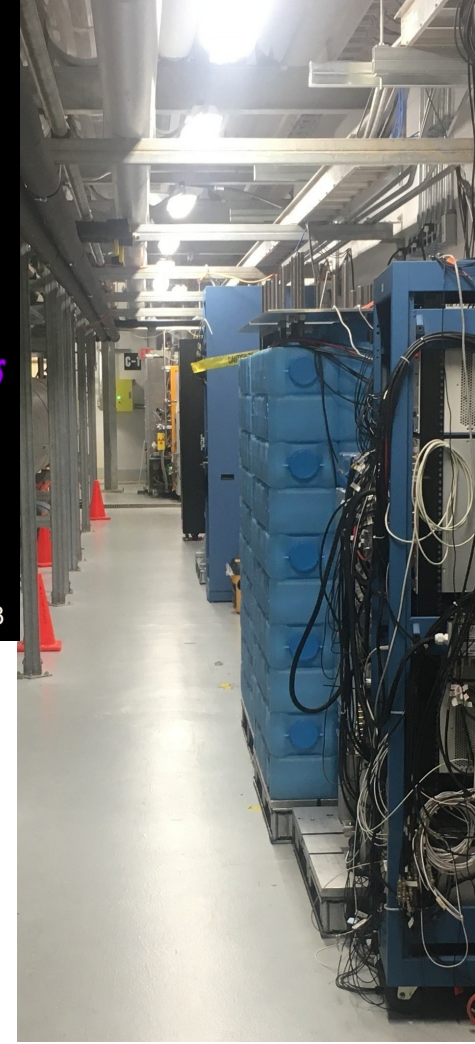
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**WASHINGTON
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COHERENT: Overview

- Suite of detectors at the Spallation Neutron Source (ORNL) measuring low-energy neutrino-nucleus cross-sections
- “Neutrino Alley” at 8 m.w.e., ~20m shielding
 - Constrained detector footprints



See arXiv:2204.04575 for more details!



Our small scale

- COHERENT formed 2013; first CEvNS measurement 2017
 - Recently celebrated our 10-year anniversary!
- 23 institutions from US, Canada, Korea, Russia
 - 3 non-PhD institutions!
 - Approx. 100 members
- 18 total publications, Science cover, many invited talks
- 14 PhD theses, including 2 APS dissertation awards!
- Many undergrad projects, including students from "outside" collab.
- 2 DOE ECAs, 1 NSF MRI



Early Career Benefits

Given a typical PhD, possible to complete:

- Literature Review
- Experimental Conception
- Simulation & Design
- Detector Construction
- DAQ Commissioning
- Calibration
- Data Collection & Analysis
- Publication
- Data sharing

Meaningful mentoring opportunities!

Opportunity to innovate & lead projects!

Limitations instill flexibility and creativity!

Attractive short- and long-term projects!

Accessible network of invested scientists!



COHERENT is just getting started!

- Proton Power Upgrade in progress
 - Beam energy: 1 -> 1.3 GeV
 - Beam power: 1.4 MW -> 2.0 MW
- Second Target Station start date in 2030s
 - FTS receives 3 of 4 pulses (45 Hz)
 - STS receives 1 of 4 pulses (15 Hz)
 - SNS (FTS + STS) will operate at 2.8 MW
 - Space to explore 10-ton-scale detectors

- BES funding supports the accelerator operations / development
- HEP small-project funding supports detector operations, personnel, and R&D for a phenomenal source of “free” neutrinos
- Small projects support massive ones; we should invest in cost-effective science!

It is important to continue to support small projects leveraging existing facilities and resources to do impactful short-timescale measurements!