

Project Goals (SNL)

- Started with simulation work to understand background in energy region relevant to reactor antineutrinos, and specify shielding for deployment at the SONGS tendon gallery.
- The permanent shutdown of SONGS forces us to search for other feasible reactors and neutrino sources.
- The Spallation Neutron Source (SNS) at ORNL produces a neutrinos of greater energies (10x) that would allow a deployment with *existing* Ge technology.
- SNL and LBNL are part of multi-institutional COHERENT collaboration to measure CNNS at SNS.
- SNS can provide first-time confirmation of the existence of CNNS, which is of extraordinary relevance to the continued pursuit of its application for reactor monitoring.



SNS background for CNNS

- Measured neutron fluxes at the candidate SNS locations are used as input for shield design simulations.
- Use of Sandia's Neutron Scatter Camera to measure neutron spectrum and image at SNS available locations.
- In the 3 locations measured so far, beam-related neutrons, coincident with the neutrino signal, exceed the local cosmic neutron background.
- Next candidate location is only 12 m from the SNS target: stronger neutrino signal necessary for system with $\sim 10\text{kg}$ of Ge.
- See poster 13 by B. Cabrera-Palmer for more.

