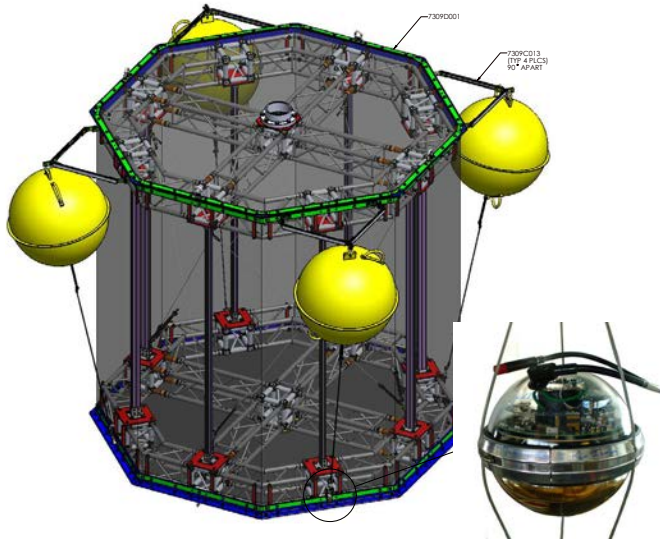


Cherenkov Detectors In Mine Pits (CHIPS)

NEUTRINO2014

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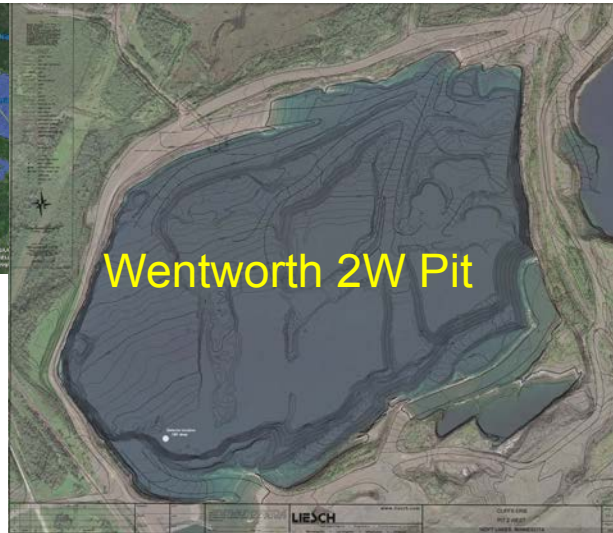
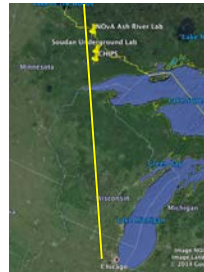


What is CHIPS?

The cost per kiloton of currently planned neutrino detectors significantly limits the fiducial masses of future detectors. CHIPS is an initiative to substantially reduce the unit cost of neutrino detectors by reusing existing infrastructure—an existing mine pit, an existing water mass and an existing NuMI Neutrino Beam. CHIPS includes three main sub-systems—a fabric bag on an aluminum frame to contain treated water, a water filtration system to increase transparency and IceCube Digital Optical Modules (DOMs) to detect and measure Cherenkov light. The CHIPS initiative is an international collaboration with substantial personnel and financial support from both Europe and the United States.

Where is CHIPS?

CHIPS is located in northeastern Minnesota at the intersection of the NuMI Neutrino Beam and the Mesabi Iron Ore Range. The current location is the Wentworth 2W pit (about 1.25 km by 0.75 km by 60 m deep) just north of Hoyt Lakes MN. The 2W pit is ~710 km from Fermilab and is ~7 m off-axis. A possible future location for CHIPS is a dam reservoir in the Missouri River at the second oscillation maximum of the planned LBNE neutrino beam.



When is CHIPS?

Initial studies of water properties in the Wentworth 2W Pit were done in Summer 2013. Installation of the CHIPS-M Prototype (~50 m³) with 5 Digital Optical Modules is planned for Summer 2014. CHIPS-M will be deployed ~50 m under water near the bottom of the pit and will be connected with an umbilical cable to an on-shore counting house. CHIPS-M will remain in place for approximately one year to assess the feasibility of all-weather operation through the Winter.

CHIPS Collaboration: California Institute of Technology, University of Cincinnati, Fermi National Accelerator Laboratory, Iowa State University, University College London, University of Manchester, University of Minnesota—Twin Cities, University of Minnesota—Duluth, University of Pittsburgh, Stanford University, University of Sussex, University of Texas at Austin, Tufts University, College of William and Mary and University of Wisconsin—Madison