



Yannis Pandiscas

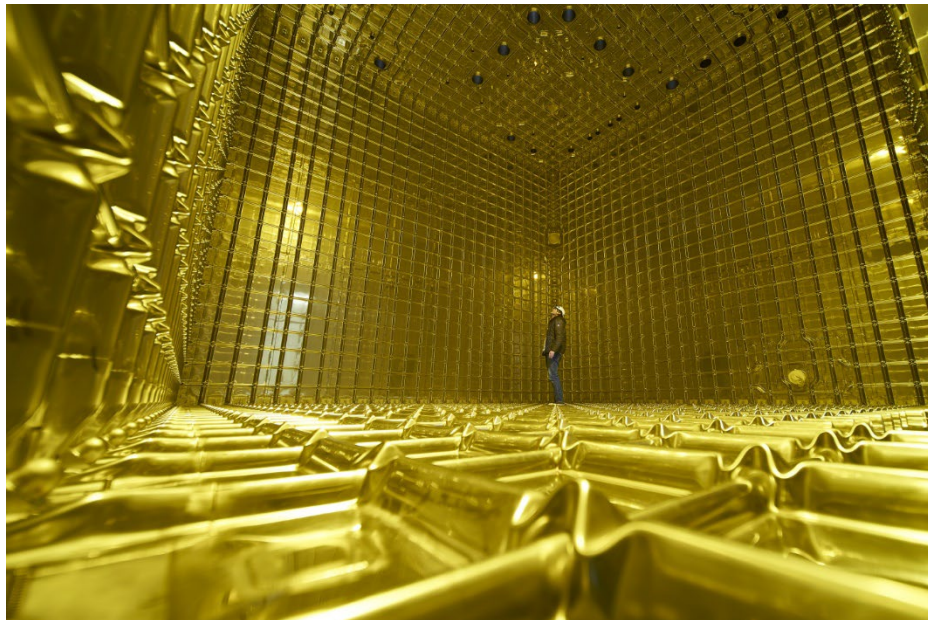
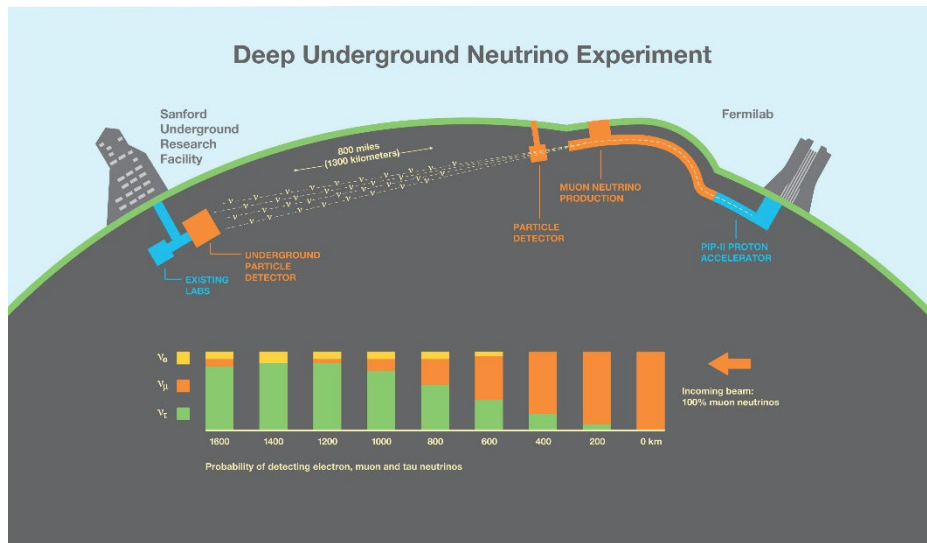
Master of Science
Mechanical Engineering

Office: 1338A Engineering Research Building (ERB)
Email: pandiscas@wisc.edu
Hometown: Aurora, IL

Project: Deep Underground Neutrino Experiment
(DUNE) Installation Truss System
Advisor(s): Prof. Franklin Miller



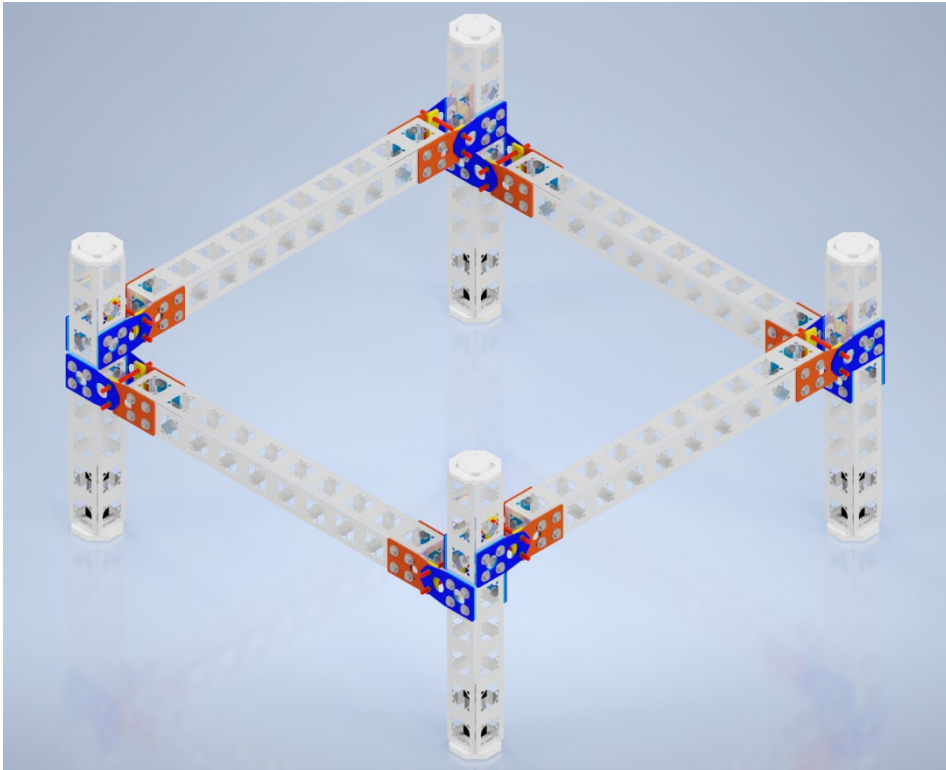
Background



- The purpose of DUNE is to investigate neutrino oscillations to test CP violation and to generally gain a better understanding of neutrinos.
 - Neutrinos have 3 flavors: Muon, Tau, and Electron
 - They oscillate between these flavors.
- Neutrinos being uncharged particles do not interact with most matter, and only interact with the nuclear weak force, making detection difficult.
 - Detectors are 3m x 3m with mass of 255kg
- For the experiment, a beam neutrinos will be generated at Fermilab in Batavia, IL which will then travel through the earth to the Sanford Underground Research Facility in South Dakota, where there will be a cryostat filled with liquid Argon with detectors.
 - Cryostat is made of membrane floor like in the left image.
 - There will be 160 detectors in the cryostat with gaps between detectors being less than 5mm.



Project Goals



- Design a system to safely work underneath the detector, called a Charge Readout Plane (CRP).
- The support structure should be modular so that various installation locations can be accommodated with a single system.
- The structure should be toolless to assemble and disassemble to minimize damage to the membrane floor or CRP
- The structure should be removable without a person working underneath a lifted, otherwise unsupported, load.
 - Designing a pneumatic lift system onto tracks that the structure can roll on back to operators.