



Joshua Truchon

Masters of Science-Research
Mechanical Engineering

Office: ERB 1337

Email: Jtruchon@wisc.edu

Hometown: Barksdale, Wi

Project: **Frictional Effects of Various materials in Cryogens**

Advisor(s): Prof. Miller, and Prof. Nellis

Sponsor: Fermilab (DUNE)



Background



The Deep Underground Neutrino Experiment (DUNE) uses a particle accelerator at Fermilab to send a neutrino to a liquid argon detection system in South Dakota. Detecting these neutrinos will allow scientists to study the nature of neutrinos.

The DUNE requires large neutrino sensors to be submerged in liquid argon. This significant temperature change will cause a relatively large thermal contraction. Special supports have been designed to relieve excessive stress, protecting the sensor and the fragile cryostat from potential damage.

Understanding and testing various materials' coefficient of friction at 77k allows the support designers to ensure all the sensors contract predictably.



Project Goals



1. Design, build and test a lifting device for placing the neutrino sensors.
2. Create a testing apparatus that simulates the movement of the neutrino sensor when thermally contracting.
3. Test and identify a material that can be utilized in the neutrino sensor support.