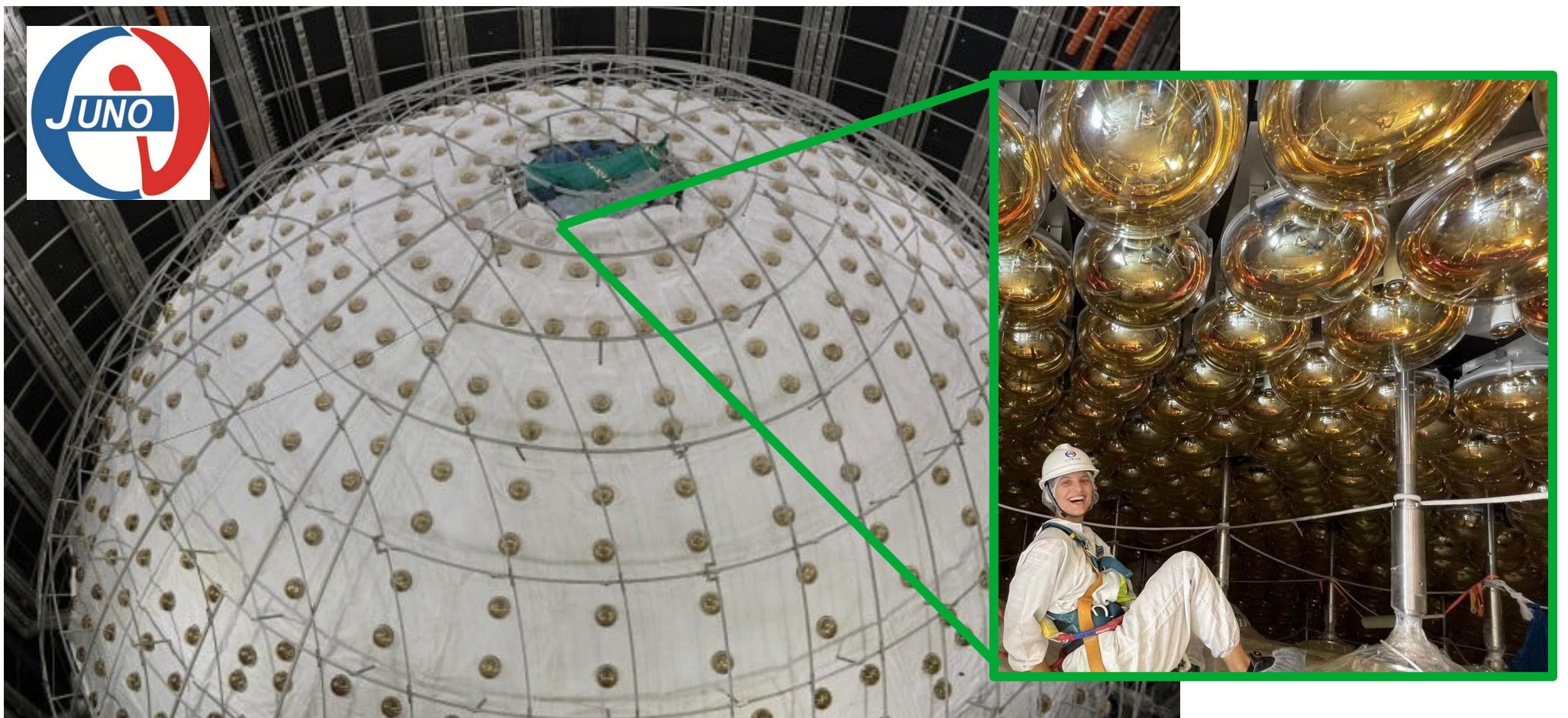


# Open Theses in Prof. Caren Hagner's Neutrino Group with **JUNO**

## Experiment Overview:

The Jiangmen Underground Neutrino Observatory (JUNO) is a 20-kiloton liquid scintillator detector, aiming to start data taking in late 2025. Its primary scientific goal is to determine the neutrino mass ordering with a confidence level of  $3\sigma$  within the first six years of data taking. This will be achieved by observing the oscillation spectrum of reactor anti-neutrinos at a baseline of  $\sim 53$  km. One of JUNO's key features is its outstanding energy resolution of 3 % at 1 MeV, realized by more than 43000 PMTs in a double calorimetry system. Low backgrounds are ensured by monitoring the scintillator's radiopurity during filling with the OSIRIS pre-detector.



Our research group currently focuses on applying the tracking of particles with **Topological Track Reconstruction (TTR)** to first real data, the reconstruction of atmospheric neutrinos and calibration of the OSIRIS pre-detector.

## Topics:

- Machine Learning in Neutrino Physics
- Software Development for JUNO Data
- Cosmic Rays and Dark Matter Sensitivity Studies
- Atmospheric Neutrinos/Muons Reconstruction

**For the most up-to-date topics please contact:**

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