




# INSTALLATION OF THE JUNO-TAO EXPERIMENT

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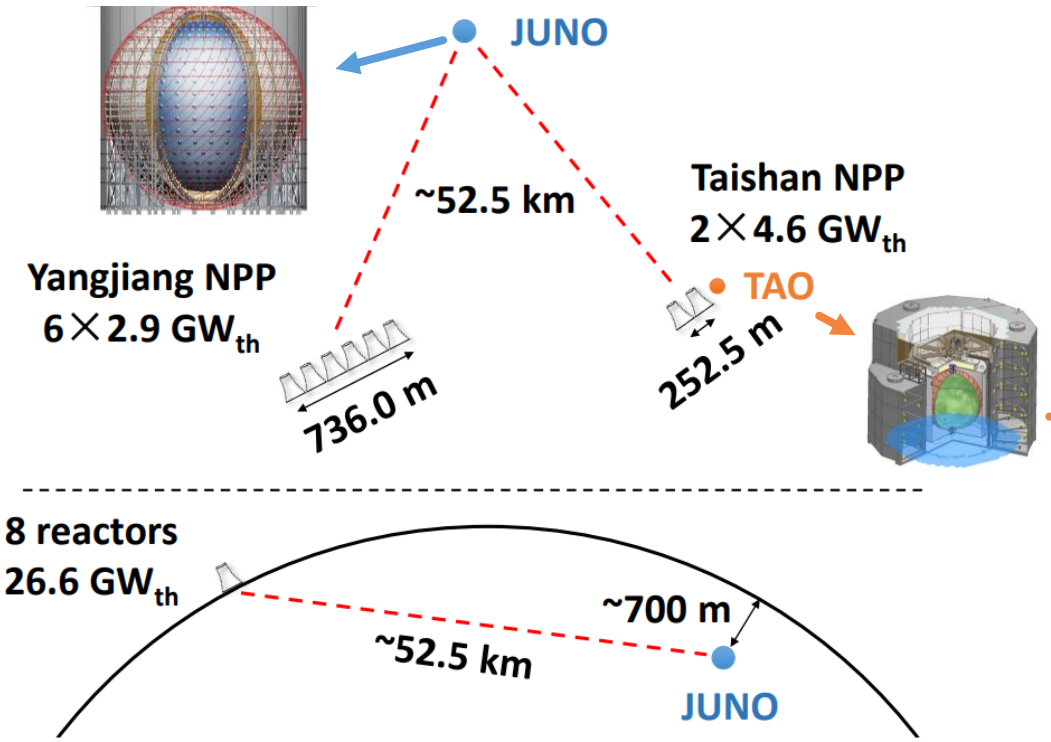
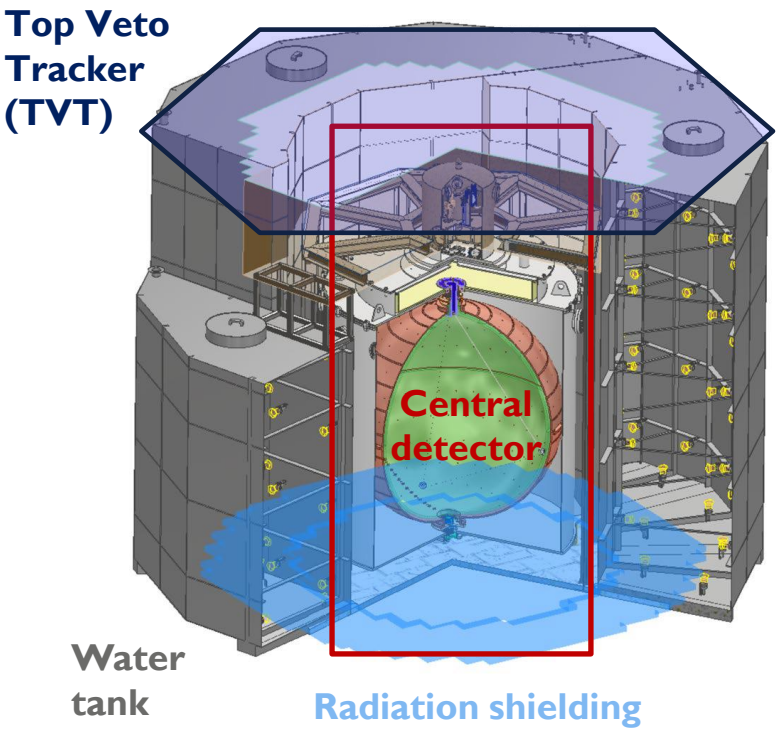
# THE JUNO-TAO EXPERIMENT

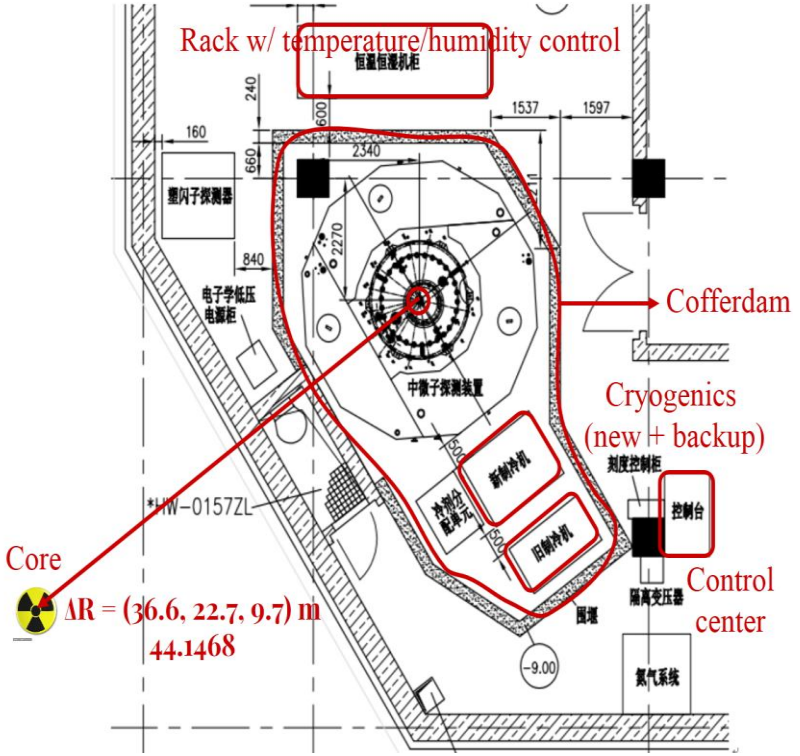


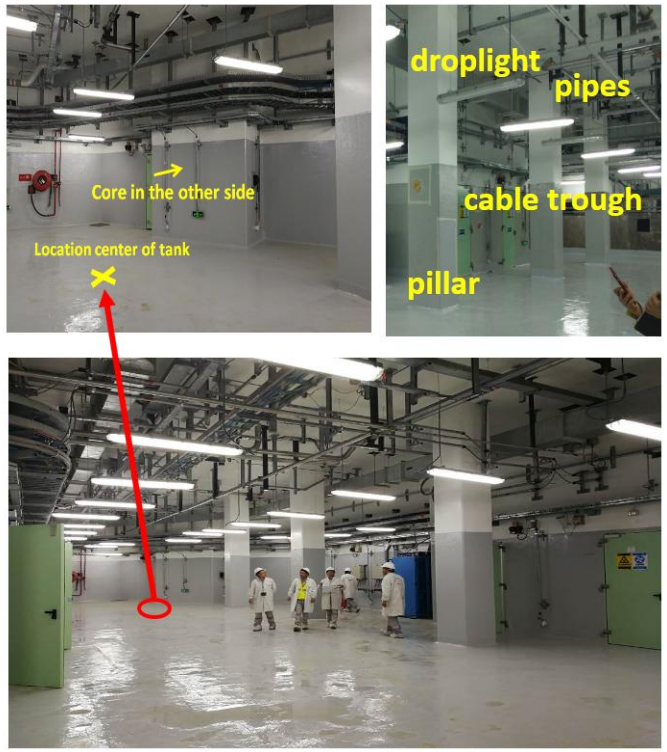


The Taishan Antineutrino Observatory (JUNO-TAO or TAO) is a satellite experiment of the Jiangmen Underground Neutrino Observatory (JUNO), located in Guangdong (China).

# UNDERGROUND NEUTRINO LABORATORY IN TAISHAN NPP

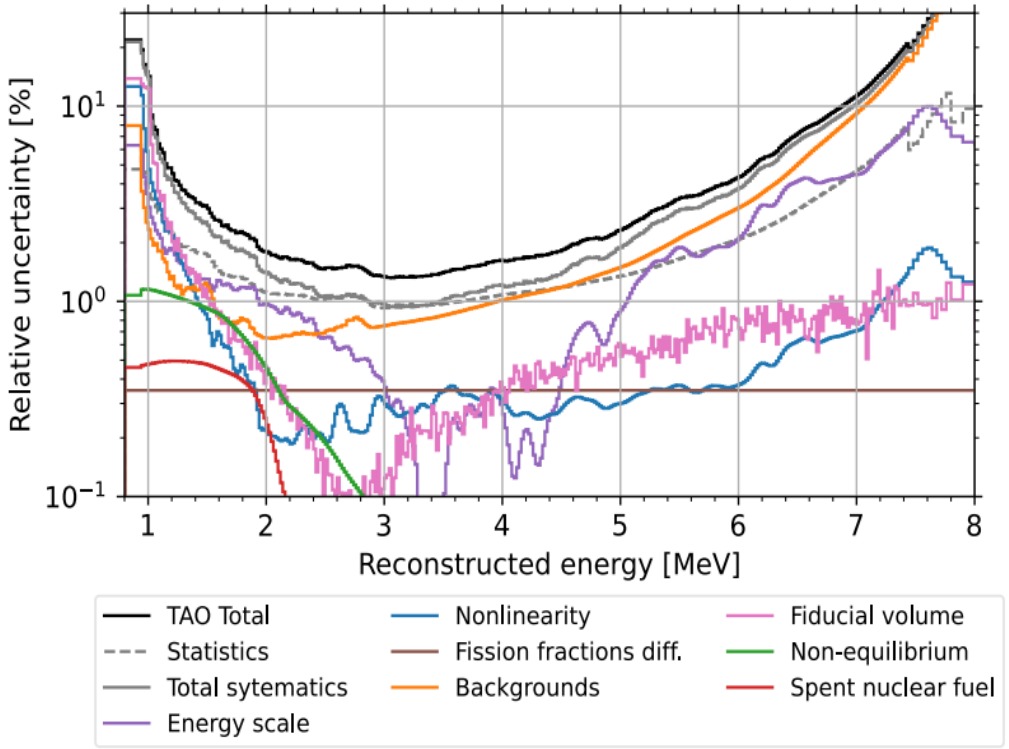



The detector is located at 44 m from Unit 1 and 217 m from Unit 2 of Taishan Nuclear Power Plant, in a basement at 9.6 m underground, outside of the concrete containment shell of Unit 1 reactor core.

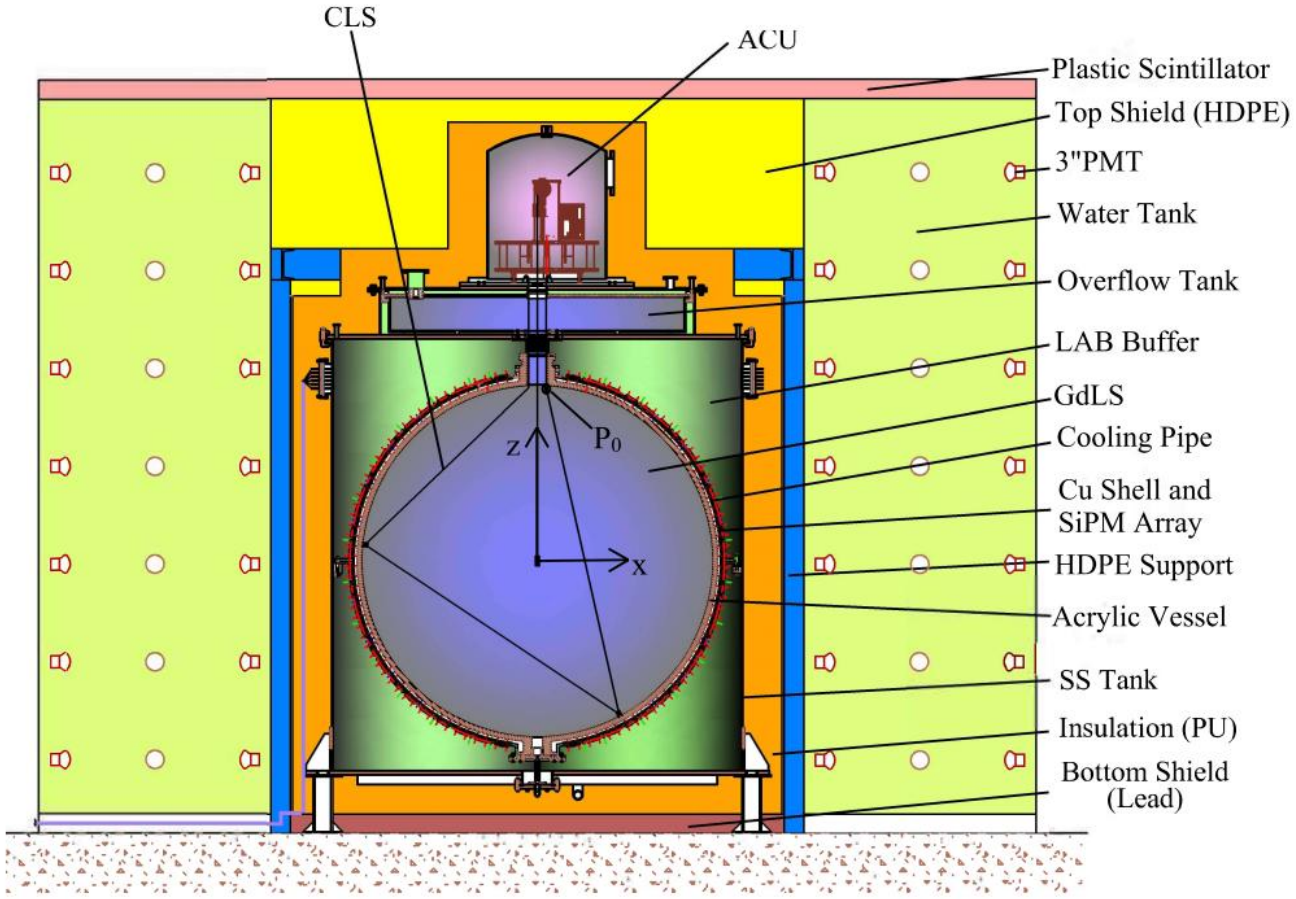
# TAO PHYSICS GOALS




Expected energy spectral uncertainty of TAO detector

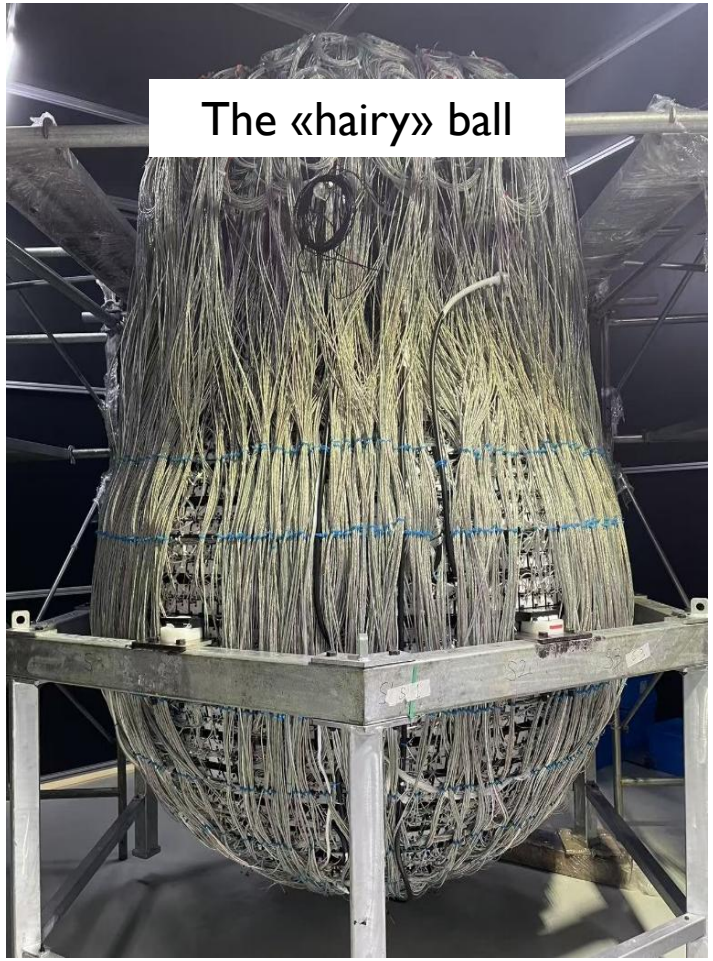
- TAO will measure the reactor $\bar{\nu}_e$ spectrum with **sub-percent energy resolution**: $< 2\%/\sqrt{E}\,(\mathrm{MeV})$.
- Among its main scopes:
  - provide a model-independent reference spectrum for JUNO;
  - provide a benchmark measurement to test nuclear databases;
  - spectrum fine structure observation, shape anomaly study;
  - increase reliability in isotopic IBD yields;
  - reactor monitoring: status/fuel;
  - new physics: light sterile neutrino.

# DETECTOR DESIGN



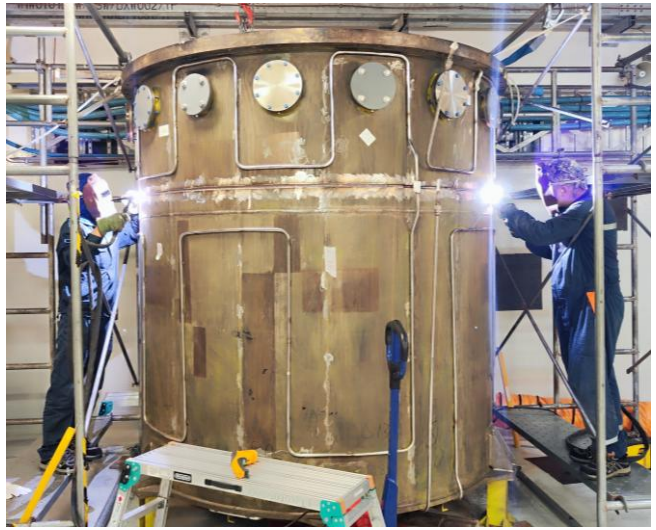

- 2.8 ton Gd-doped liquid scintillator (1-ton fiducial volume).
- ~4000 SiPMs with >50% photon detection efficiency and and ~95% optical coverage, operated at −50°C to lower dark noise.
  - Expected IBD event rate: 2000 events/day (>99.99% signal from Unit 1 + Unit 2).
- Main sub-systems and components:
  - Central detector (CD)
  - Calibration system
  - Shielding and veto system
  - SiPMs and readout electronics
  - TDAQ and DCS

# SOME PICS FROM THE INSTALLATION SITE

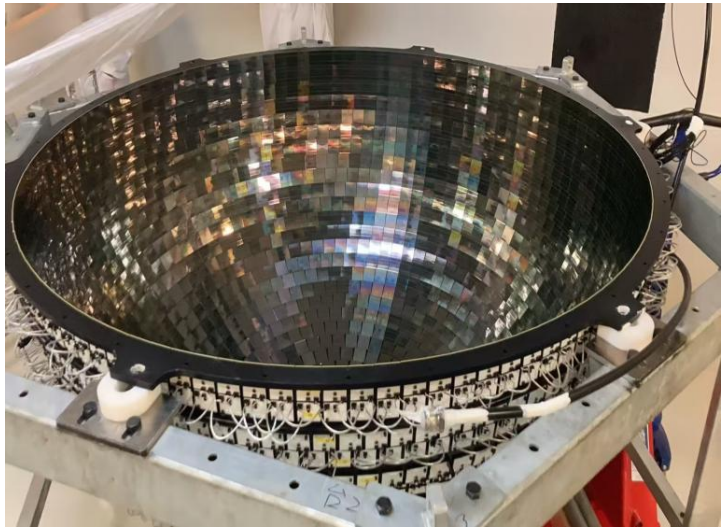




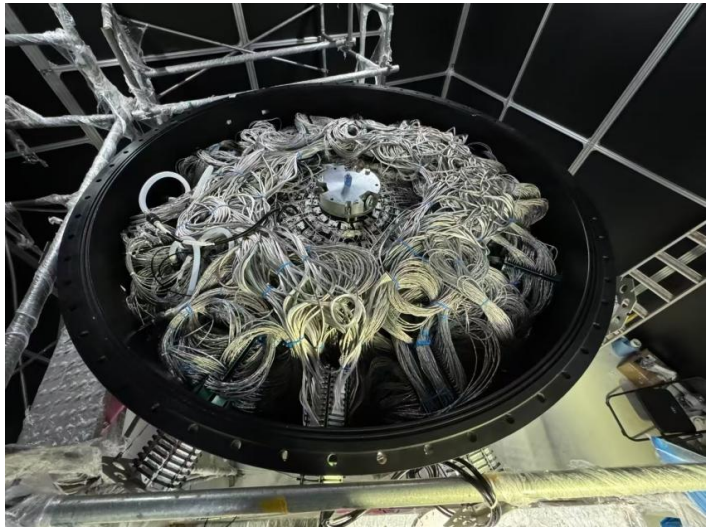
# FINAL STEPS BEFORE COMMISSIONING



Welding of the cryostat



SiPMs in the central detector



Top view of the open cryostat

- The installation is scheduled to be completed this month (June 2025).
- Commissioning is expected to begin at the end of the month, marking the final step towards full detector operation and routine data-taking.

# THANK YOU FOR YOUR ATTENTION!