

**Academia Sinica, Institute of Physics
Physics Colloquium**

Date: Tuesday December 2, 2025.

Time: 14:00 – 15:30

Venue: 1F Lecture Hall, Institute of Physics,
Academia Sinica.

Speaker: Dr. Iwan Morton-Blake

<https://tdli.sjtu.edu.cn/en/people/41166/iwan-morton-blake>

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Title:

Bridging Energy Scales in Neutrino Physics: Progress and outlook of the JUNO and TRIDENT experiments

Abstract:

The next generation of neutrino experiments presents unprecedented opportunities to address key questions in particle physics and astrophysics. This talk will summarise recent contributions made in two flagship international experiments: JUNO, a 20,000-ton liquid scintillator detector that has recently entered full data-taking in China, and TRIDENT, a next-generation deep-sea Cherenkov telescope under development in the South China Sea, spanning several cubic kilometres.

On JUNO, I will discuss developments in the reactor neutrino oscillation analysis programme, where the experiment aims to have world-leading sensitivity to the neutrino mass ordering and make sub-percent precision measurements of oscillation parameters Δm_{31}^2 , Δm_{21}^2 , $\sin^2(\theta_{12})$. These goals hinge on precisely resolving the fine oscillation structure in the antineutrino energy spectrum of nuclear reactors ~ 52.5 km away. For this, a world-leading energy resolution is required, alongside low background rates. This talk will overview the detector's commissioning, highlighting recent results from early commissioning and physics data, along with the experiment's future physics prospects covering a broad physics programme.

I will also introduce TRIDENT, a next-generation deep-sea Cherenkov telescope under development in the South China Sea, including its recent status and prospects.