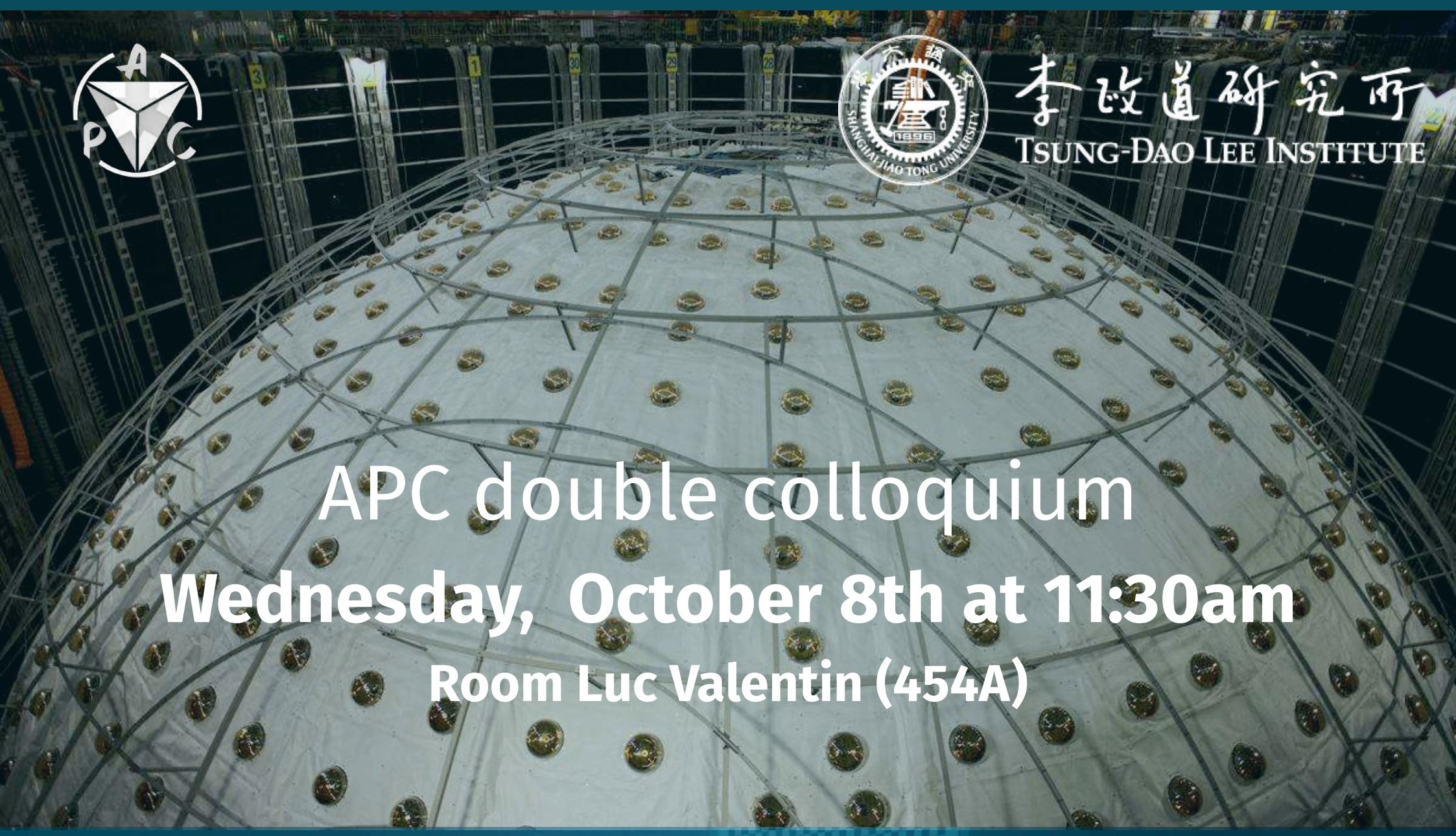

APC double colloquium

Wednesday, October 8th at 11:30am

Room Luc Valentin (454A)

Donglian Xu

Tsung-Dao Lee Institute

Status and Prospects of TRIDENT

IceCube has been observing a diffuse high-energy astrophysical neutrino flux since 2012. While two compelling sources TXS 0506+056 and NGC 1068 have been identified to date, the origin of this flux remains largely unknown. In 2021, the partially completed KM3NeT detector detected a 200 PeV neutrino event with no explicit source pinpointed as of yet. These thrilling sightings have opened a new era for neutrino astronomy, urging for next-generation neutrino telescopes with significantly improved pointing capability and flavor discrimination power. Future detectors expect to resolve this diffuse flux and offer novel, significant insight into neutrino oscillation over astronomical baselines. TRIDENT is a proposed next-gen neutrino telescope, aiming to rapidly discover multiple astrophysical neutrino sources with optimal all-flavor detection efficiency. In this talk, we will discuss the design principles, point source and flavor sensitivities, the detector development status and future prospects of TRIDENT.

Iwan Morton-Blake

Tsung-Dao Lee Institute

Progress and outlook of the JUNO experiment

The Jiangmen Underground Neutrino Observatory (JUNO) is a multi-purpose 20-kiloton liquid scintillator detector which has begun data-taking this year. The experiment aims to have world-leading sensitivity to the neutrino mass ordering and make sub-percent precision measurements of oscillation parameters Δm31^2, Δm_21^2, sin^2(θ_12). These goals hinge on precisely resolving the fine oscillation structure in the antineutrino energy spectrum of nuclear reactors ~52.5km away. For this, a world-leading energy resolution is required, alongside low background rates. This talk will overview the detector's commissioning, highlighting key procedures and preliminary performance evaluations made during its pure water and liquid scintillator filling phases, along with the experiment's future physics prospects covering a broad physics programme.