中央大學物理學系

Department of Physics, National Central University

# Colloquium

# Exploring the Universe with Neutrinos: From IceCube to IceCube-Gen2


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**Date: 2025/06/03(Tue)**

**Venue: S4-625**

**Time: 14:00-16:00**


Abstract :

Neutrinos offer a unique window into some of the most energetic and distant phenomena in the universe. The IceCube Neutrino Observatory at the South Pole is currently the world's largest neutrino detector, utilizing a cubic kilometer of Antarctic ice instrumented with thousands of optical sensors to detect Cherenkov radiation from neutrino interactions. In this colloquium, I will introduce the science behind IceCube, explain how neutrino detection and reconstruction work in ice, and highlight key discoveries — including the identification of astrophysical neutrino sources and constraints on fundamental particle physics. I will also share insights and experiences from my recent expedition to the South Pole, contributing to the IceCube Upgrade project to enhance the observatory's low-energy sensitivity and calibration capabilities. Finally, I will present an outlook on IceCube-Gen2, the next-generation neutrino observatory, aiming to significantly expand IceCube's scientific reach and open new frontiers in astroparticle physics.