Contribution ID: **1108** Type: **Talk**

Current Status of TAMBO: Realizing PeV Neutrino Astronomy with a Cost-Effective Observatory

Wednesday 16 July 2025 16:35 (15 minutes)

The detection of high-energy astrophysical neutrinos by IceCube has opened a new window on our Universe. While IceCube has measured the flux of these neutrinos at energies up to several PeV, much remains to be discovered regarding their origin and nature. Currently, the discovery of point sources of neutrinos is hindered by atmospheric neutrino backgrounds; likewise, astrophysical neutrino flavor ratio measurements are limited by the difficulty of discriminating between electron and tau neutrinos.

TAMBO is a next-generation neutrino telescope specifically designed to detect tau neutrinos in the 100 TeV to 1 EeV energy range at a fraction of the cost of traditional neutrino telescopes. The tau neutrino specificity enables the low-background identification of astrophysical neutrino sources, as well as tests of the flavor ratio of astrophysical neutrinos. Additionally, the high-energy reach of TAMBO will allow us to probe models of cosmogenic neutrino production. TAMBO will comprise an array of water Cherenkov and plastic scintillator detectors deployed on the face of a deep valley, with its unique geometry facilitating the high-purity measurement of astrophysical tau neutrinos. In this talk, I will present the particle physics and astrophysics that TAMBO will study in the context of next-generation neutrino observatories. I will also provide an update on the status of detector construction.

Collaboration(s)

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Session Classification: NU

Track Classification: Neutrino Astronomy & Physics