



Contribution ID: 84

Type: **Poster**

Cosmic-ray Physics with IceCube-Gen2

Wednesday, October 16, 2024 5:27 PM (2 minutes)

The IceCube Neutrino Observatory, located at the geographic South Pole, consists of a cubic-kilometer in-ice neutrino detector and a square-kilometer array of ice-Cherenkov detectors. It is designed for neutrino astronomy, cosmic ray physics, multi-messenger astronomy, and particle physics. The next-generation expansion, IceCube-Gen2, is currently in development with enhanced detection sensitivities to advance these scientific goals. IceCube-Gen2 is planned to include: (1) an in-ice neutrino detector spanning approximately 8 km³, increasing neutrino detection sensitivity nearly five times compared to IceCube; (2) in-ice radio antennas covering around 400 km² to extend the sensitivity to neutrino sources beyond EeV energies; (3) a surface array of scintillator detectors and radio antennas for detecting cosmic-ray air showers in the energy range of several hundred TeV to a few EeV; and (4) the original IceCube detector. The proposed surface array, in correlation with in-ice muons with energies exceeding 300 GeV, will enhance the study of cosmic-ray and hadronic physics. This contribution will highlight the cosmic-ray physics potential of IceCube-Gen2.

Summary

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Session Classification: Poster session leading into social dinner buffet