Seminar, Department of Physical Sciences, Bose Institute, Kolkata

Exploring the High Energy Universe through Radio Observations

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Abstract: Radio observations offer a powerful window into the high-energy Universe, as radio signals can travel across cosmological distances with minimal attenuation. The Askaryan Radio Array (ARA) at the South Pole and the balloon-borne NASA Payload for Ultrahigh Energy Observations (PUEO) are designed to detect impulsive radio signatures from ultra-high-energy (UHE; >1016 eV) neutrinos. Complementing these efforts, a proposed radio extension of the GRAPES-3 experiment in Ooty, India, aims to measure radio emission from extensive air showers produced by high-energy cosmic rays. Across these experiments, advanced machine-learning frameworks are enhancing event classification and improving sensitivity to rare signals. Analysis pipelines originally developed for UHE neutrino searches are now being adapted to broader radio-based studies in high-energy astrophysics.

In this talk, I will present recent and upcoming searches with ARA, PUEO, and GRAPES-3, and discuss how emerging technologies are advancing our ability to explore the high-energy Universe through radio techniques.

Date/time: December 10, 2025 (Wednesday) at 12:00 Noon

Venue: Room 204, Physics Seminar Room, (Second floor, UAC, BI)