Kristi Engel – HEP Seminar – December 2, 2025
University of Maryland

Title: ”Searching for Very-High-Energy Transients with Ground-based Gamma-Ray Observatories”

Gamma-ray bursts, gravitational waves, neutrino events, and other transient phenomena are prime targets for multi-wavelength and multi-messenger follows ups within the high-energy astrophysics community. However, observation of such short-lived sources are not always feasible for many instruments. Ground-based survey instruments, such as the High-Altitude Water Cherenkov (HAWC) Observatory, boast large instantaneous fields of view and observe 2/3rds of the sky daily with near continuous uptime, allowing them not only ideal conditions to catch these targets of opportunity as they occur, but also to analyze archival data after the fact. The HAWC Observatory, detecting gamma rays with energies from hundreds of GeV to over 100 TeV, can immediately begin analysis of a transient source in its field of view (~2 sr) for both external and self triggers. Additionally, with ten years of archival data, HAWC performs offline analyses of transients such as Gamma-Ray Bursts, Primordial Black Holes, and Fast Radio Busts. We present here an overview of current survey observatories, HAWC’s transient detection framework, results from searches for such transients, and highlight the future of survey instruments with the proposed Southern Wide-field Gamma-ray Observatory (SWGO).