



Department of Physics Colloquium

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3:00 PM

Recent results from the High Altitude Water Cherenkov Observatory

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High energy γ -ray observations are an essential probe of cosmic-ray acceleration mechanisms. The detection of the highest energy γ rays and the shortest timescales of variability are the key to improve our understanding of the acceleration processes and the environment of the cosmic accelerators. The High Altitude Water Cherenkov (HAWC) experiment is a large field-of-view, multi-TeV, γ -ray observatory continuously operating at 4100 m a.s.l. since March, 2015. The HAWC observatory has an order of magnitude better sensitivity, angular resolution, and background rejection than the previous generation of water-Cherenkov arrays. The improved performance allows us to discover new TeV sources, to detect transient events, to study the Galactic diffuse emission at TeV energies, to measure or constrain the TeV spectra of GeV γ -ray sources, to search for Galactic Pevatrons, and to improve the upper limits on indirect searches for dark matter and the constraints on Lorentz invariance violation. In this colloquium I present the most recent results from the HAWC observatory and I discuss their implications for cosmic-ray acceleration and propagation.

This colloquium will be held in-person, in SERC 116