

Physics Colloquium

Michigan Technological University

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4:00 pm

Room 139 Fisher Hall



Our Universe Seen With TeV Eyes

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Abstract: Gamma ray observations with ground-based atmospheric Cherenkov telescopes (MAGIC, HESS & VERITAS) have expanded the energy range of astronomical observations well into the multi-TeV regime. TeV photons offer the potential to provide the missing link required to identify the particle populations (electrons, nuclei and putative WIMP dark matter) responsible for wide-band non-thermal emission spectra from astrophysical environments, as observed from our galactic center, pulsar wind nebulae, the Crab pulsar, supernova remnants, binary star systems, a satellite galaxy, starburst galaxies and a substantial number of active galactic nuclei.

The field of VHE gamma-ray astronomy has entered a new phase starting to probe astrophysical environments with already providing moderate-size sample for a few source classes. The main topic of this talk is concerned with measuring the opacity of the universe to gamma rays using blazars. I will provide a brief review of the status of the attempts and recent successes to identify evidence for gamma-ray absorption by soft photons from the cosmic infrared background leading to pairproduction in intergalactic space.

Biography: Frank Krennrich is Professor and Chair at the Physics and Astronomy Department of Iowa State University. In 2000, he received the Outstanding Junior Investigator Award by the Department of Energy and in 2008, he was named a Fellow of the American Physical Society. His research focus is in gamma-ray astrophysics. He is involved in the VERITAS Observatory, a TeV gamma-ray telescope currently operated in Arizona, and in the preparation of the Cherenkov Telescope Array (CTA), the next generation ground-based very high energy gamma-ray instrument which will be built and operated by a consortium of over 1000 members working in 27 countries.

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