



PHYSICS AND ASTRONOMY COLLOQUIUM

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“Very High Energy Astrophysics and the Cherenkov Telescope Array”

Abstract

Our understanding of the very high energy (VHE) universe has progressed rapidly during the last several years as a result of new instruments and exciting discoveries. In particular, ground-based telescopes, such as VERITAS in southern Arizona, and the space-based Fermi telescope have discovered many astrophysical sources of VHE gamma rays, including pulsars, supernova remnants, binary star systems, blazars and radio galaxies. The key science topics addressed by these discoveries include understanding cosmic particle acceleration in our Galaxy and beyond and probing extreme environments close to neutron stars and black holes.

Another important area of inquiry relates to physics frontiers, such as the search for WIMP dark matter and axion-like particles.

The progress in the field motivates a follow-up instrument that can greatly expand the scientific reach of the ground-based gamma-ray technique. A worldwide consortium of scientists has formed to develop the Cherenkov Telescope Array (CTA). CTA is envisioned to consist of two large arrays of atmospheric Cherenkov telescopes, in both the southern and northern hemispheres. Compared to existing instruments, CTA will have substantially better angular resolution, will cover a much wider energy range, and will have up to an order of magnitude better sensitivity.

Planning for CTA is well underway and initial construction is expected to start in 2016.

This talk will review the status and scientific outlook for the field of VHE astrophysics, provide an overview of the capabilities and technical design of CTA, and summarize the current status of the project.

Wednesday, December 2, 2015

3:00 p.m.

Elliott Building

Room 167