Astrophysics Seminar

Monday, September 19, 2016

Exploring the Extreme Universe with Gamma-ray Observatories

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Very-high-energy (VHE) gamma-ray astrophysics has emerged as an exciting and vital field, with major discoveries made through experiments in space and on the ground. In space, at energies above 100 MeV, the Fermi satellite studies some of the most violent processes in the Universe, and explores nature's highest energy accelerators. At energies greater than about 100 GeV, gamma-ray astronomy can be carried out using ground-based telescopes, which detect the Cherenkov light from air-showers caused by gamma rays impacting the upper atmosphere. Some of the most exciting sources detected at TeV energies are blazars, with highly variable fluxes. The combination of high luminosities and time variations seen in the data indicates that gamma-rays are an important component of the relativistic jet thought to characterize blazars. Galactic sources at TeV energies include supernova remnants, pulsar wind nebulae, and binary systems, and TeV emission is a key diagnostic of highly energetic particles in these objects. This talk will outline the scientific motivation for VHE gamma-ray astronomy, describe the techniques involved, and survey the astrophysics of the extreme Universe, as revealed by observations made with gamma rays. Finally, we will look to the future and give a brief update on efforts to develop a prototype of an innovative, Schwarzschild-Couder telescope (SCT) that is proposed to enhance and optimize the science performance of the Cherenkov Telescope Array (CTA), an international project of next generation in ground-based astronomy.

3:30pm in CAS 502. *Refreshments served at 3:15pm in CAS 500.*

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Next Week

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