

Physics Colloquium
Monday October 9th, 2006
4:15 PM 428 Pupin Hall
Professor Stefan Westerhoff of
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“The Origin Of The Highest Energy Cosmic Rays”

Abstract: Ultrahigh energy cosmic ray physics is undergoing a rapid development. Triggered by new data of unprecedented quantity and quality that has been collected over the last few years, our view of cosmic rays in the universe has changed in many aspects.

This summer, the question of anomalous ultrahigh energy cosmic rays was resolved. Crucial to this was the spectrum measurement of HiRes, an air fluorescence detector which operated in Utah. HiRes stereo data has also recently revealed the remarkable isotropy of the cosmic ray sky, which so far shows no apparent "hot spots." The cosmic ray uniformity needs to be confirmed by better, more inclusive coverage, which is now becoming available with the Pierre Auger Observatory, a large hybrid detector under construction in Argentina.

The HiRes and Auger measurements will be critical in addressing several important questions: Why is the arrival direction distribution so isotropic even at the highest energies? What is the chemical composition of the primary cosmic ray flux, and what does it reveal about the sources? What is the exact shape of the spectrum at the highest energies?

This talk presents recent results from the HiRes and Auger experiments, and summarizes future strategies to solve the longstanding problem of the origin of ultrahigh energy cosmic rays.

