



UNIVERSITY of
DENVER

PHYSICS AND ASTRONOMY

Presents

A Dissertation Defense Colloquium

**Identification of High Energy Cosmic Ray Electrons
using Advanced Techniques in Fermi LAT and
CALET**

Wednesday, October 28, 2015

2:00 PM

F.W. Olin Hall, Room 205

2190 E. Iliff Ave.

Presented by

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(Research Advisor: Dr. Jonathan Ormes)

University of Denver

Department of Physics & Astronomy

Measurements of the cosmic ray electron spectrum have received much attention over the last decade as anomalies in both electron and positron observations have been detected independently by several experiments. The profound possible implications in the fields of high energy astrophysics and particle physics have allowed for many interpretations of the origin of these inconsistencies in the spectra. This research focuses on two space-borne cosmic radiation experiments at different stages in their mission lifetimes: The Fermi Large Area Telescope (LAT) and the Calorimetric Electron Telescope (CALET). We present our efforts in electron identification using dedicated information of the tracking region of the LAT, exploiting calibration data from the beam test campaign. Additionally, we explore the proton-electron discriminating capabilities of the CALET instrument through Monte Carlo simulations. Within both studies, we employ multivariate techniques to improve the identification of cosmic ray electrons from the vast background.

HOST: Dr. John Krizmanic, USRA, for Dr. Jonathan Ormes (in absentia)