

NRAO/Socorro Colloquium Series**Frank Schinzel***UNM*

Relativistic outflows from active galactic nuclei in the Fermi-era and the puzzle surrounding gamma-ray objects of unknown origin

Abstract

With the launch of the Fermi satellite a new window was opened to the study of relativistic outflows. Blazars with their relativistic jets pointed close to our line of sight were found to make up most of the extragalactic point sources in the gamma-ray sky. This, together with multi-wavelength observations, allowed new insights into the internal workings of AGN jets and brought us closer to the understanding of high energy emission mechanisms at work. I will present a few highlights that have recently emerged from variability studies ranging from radio to gamma-rays, from monitoring of the spatial structure of jets using high-resolution imaging at radio frequencies, and variability of observed polarization at radio and optical bands. Altogether, these results provide insights into jet instabilities, high energy emission mechanisms, and magnetic field structures, which in turn will inform relativistic hydrodynamic simulations. Furthermore, I will present ongoing work and results using the VLA/ATCA and VLBA/LBA for a targeted all-sky survey with the goal to associate AGN with gamma-ray objects for which no counterpart has been identified. To date we found more than 1000 radio sources at arcsec scales as candidates for association and about 100 firm associations for previously unknown gamma-ray active galactic nuclei based on sub-arcsec scale detections. This work is leading to a reduction of gamma-ray objects of unknown origin and opens new possibilities for the study of the population of gamma-ray weak AGN. Additionally, the remaining unassociated gamma-ray objects bear great discovery potential. Among the remaining population are indications for a galactic population with two plausible candidates being pulsars and supernova remnants. At the end of my talk I will allude to the next possible steps to uncover the nature of these remaining unassociated gamma-ray sources using new and available sky surveys, as well as new low frequency observing capabilities. I will include a brief update on the status of the LWA project in New Mexico and a progress update on the second LWA station in New Mexico at Sevilleta Wildlife Refuge North of Socorro where I have been heavily involved since the early planning stages and throughout the entire construction process.

November 23, 2015**11:00 am****Array Operations Center Auditorium****All NRAO employees are invited to attend via video, available in Charlottesville Auditorium, Green Bank Auditorium, and VLA Video Conference Room.**

