Multi-Wavelength Observations of Active Galactic Nuclei

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The black holes at the centers of some galaxies serve as the sites of the strangest physics known today from plasma physics to general relativity, high energy particles to thermodynamics. A small subset of these galactic centers, known as Active Galactic Nuclei (AGN), show a remarkable amount of full-spectrum activity over very short astronomical time scales. In this project, the Antipodal Transient Observatory (ATO) is used to make continued optical observations of Markarian 421, Markarian 501, and W Comae; three such AGN. These observations, in conjunction with observations made by the Very Energetic Radiation Imaging Telescope Array System (VERI-TAS), the Fermi Large Area Telescope (LAT), the Swift Ultra Violet and Optical Telescope (UVOT), and the Swift Burst Alert Telescope (BAT) permit the creation and analysis of multi-wavelength light curves as well as full spectrum analysis. The light curves produced by the multiple sets of observations between February and June 2012 show some correlations, though are low in variability. Due to the approximation methods required to produce the spectra of these two sources, only a qualitative confirmation of previous models of radiation mechanisms can be given. However, an anomaly in the X-ray range of W Comae brings into question the accuracy of the SSC model for W Comae. This work also emphasizes the basic research methods of astronomy including image reduction aperture photometry, and a background of the interplay between astronomy and radiation theory.