RXTE/ASM observations of and the nature of the gamma-ray source LSI+61 303

Denis A. Leahy(*Department of Physics and Astronomy, University of Calgary*)

Abstract

An analysis of RXTE/ASM observations of the unusual binary system LSI+61 303 is presented. The x-ray light curve gives a binary period of 26.42±.05 days, and an eccentricity of 0.275±.035, which are the best determinations to date. Previous works reported the radio period which is variable, due to the radio outburst peak not being phase locked to the binary period, or optical period and eccentricity which have larger uncertainties. The multi-wavelength spectrum of LSI+61 303 is summarized and described in terms of a physical emission model. X-rays through gamma-rays are due to inverse Compton emission from relativistic electrons around the pulsar. Thus the X-ray peak gives the time of periastron passage, reported for the first time here. The radio emission is due to synchrotron emission of varying optical depth, which can explain the varying spectral index. The peak of radio emission is near apastron, which is due to reduced confining pressure on the relativistic electron cloud and subsequent rapid expansion of the electron cloud.

CATEGORY: BLACK HOLE AND NEUTRON STAR BINARIES