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Time: Wednesday 2:30 PM, Oct.28 Location: A601 NAOC

Geometry of X-ray sources in accreting black-hole binaries

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Prof. Andrzej A. Zdziarski obtained his Ph.D. in 1986 from Department of Astronomy of Harvard University. Then he worked as postdoctoral researcher at Caltech. He joined the Department of Physics and Astronomy of the Johns Hopkins University as assistant research professor from 1987 to 1990 and the Space Telescope Science Institute as Assistant Astronomer from 1987 to 1990. In 1991, he joined N. Copernicus Astronomical Center in Warsaw, Poland, initially as associate professor, later as the professor till present. His research interests include high energy astrophysics, active galactic nuclei, and close binary systems.

Abstract

The structure of the X-ray sources in the hard spectral state of accreting black-hole binaries has been a subject of intense debate. The paradigm dominant for many years postulated that the accretion disc in the hard state is truncated at some radius \gg the innermost stable orbit (ISCO) whereas the disc reaches the ISCO in the soft state. This paradigm explains a large body of observed phenomena, including the spectral and variability differences between the states and outbursts of transient sources, proceeding from quiescence (where no disc is present) through the hard state to the peak flux in the soft state. On the other hand, there have been numerous claims in recent years that the disc extends to the ISCO in the hard state. Also, the primary X-ray source has been postulated to consist of a compact source on-axis of the rotating black hole (a 'lamppost'). Those claims are based on observations of broad Fe K lines and of soft X-ray components interpreted as blackbody-emitting accretion discs. I will review arguments for and against the disc truncation and the lamppost geometry. I will then present new results of a study of the X-ray spectra of GX 339-4 from XMM-Newton.

All are welcome! Tea, coffee, biscuits will be served at 2:15 PM.