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Measuring the Spin of the Accreting Black Hole Cygnus X-1

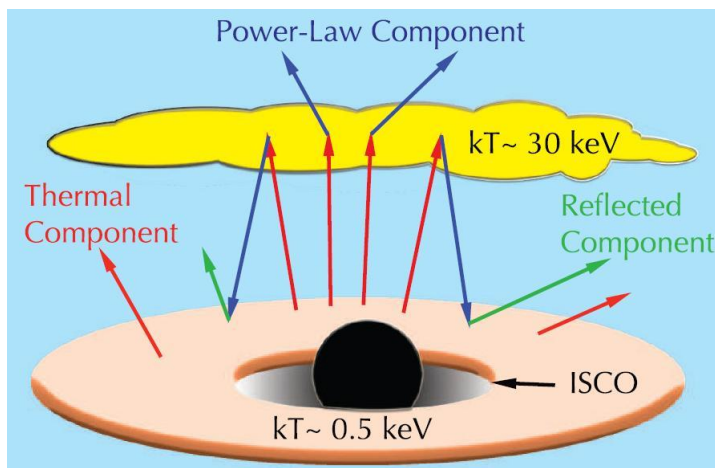
Dr. Gou Lijun

Harvard-Smithsonian Center for Astrophysics

Dr. Gou is currently an ITC fellow at Harvard-Smithsonian Center for Astrophysics. He graduated from Astronomy Department, Nanjing University, and did his PhD studies in the Department of Astronomy and Astrophysics at Penn State University. His main research subject is to measure the spin values for the smallest (i.e., stellar-mass) black holes in our Universe with Jeffrey McClintock.



Abstract



Measuring the spin value of stellar-mass black holes is always a challenge. In this talk, I will start with an overview of our most reliable spin-measurement method, X-ray Continuum Fitting, and then talk about one of the applications to Cygnus X-1. Cygnus X-1 is one of the brightest and most persistent celestial X-ray sources, and its compact primary was the first object to be established as a black hole via dynamical observations. We have recently determined accurate values for its mass and distance, and for the orbital inclination angle of the binary. Building on these results, we have measured the radius of the inner edge of the black hole’s accretion disk by fitting

its thermal continuum spectrum to a fully relativistic model of a thin accretion disk, and determined that Cygnus X-1 contains a near-extreme Kerr black hole with a spin parameter $a^* > 0.95$ at 3 sigma level of confidence.

All are welcome! Tea, coffee, biscuits will be served at 2:45

You are welcome to nominate speakers to Shude Mao (shude.mao@gmail.com), Licai Deng (licai@bao.ac.cn), Xuelei Chen (xuelei@cosmology.bao.ac.cn).