



PHYSICS AND ASTRONOMY

CAP LECTURE/ COLLOQUIUM

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“Winds of Change around Black Holes”

Abstract

Accretion disks, where matter with angular momentum spirals down through a disk, occur around objects ranging from the youngest stars to supermassive black holes. But not all of this material reaches the center of the disk. Instead, some material is accelerated away from the disk. These outflows can be ejected in a narrow opening angle (what astronomers call “jets”) or can be relatively unfocused (what astronomers call “winds”). While we do not know the precise processes that accelerate and collimate winds and jets, magnetic fields almost certainly play a key role. My team and I study black hole X-ray binaries, stellar-mass black holes accreting from a nearby star. We combine observations across the electromagnetic spectrum to learn about the physics of accretion and jets. In this talk, I will discuss how we have revealed two new windows onto the physics of inflows and outflows in X-ray binaries: fast variability measured across the electromagnetic spectrum (which provides the potential to accurately identify the accretion physics that launch relativistic jets) and the modelling of changes in the X-ray brightness of black hole X-ray binaries (which implies that strong winds from the accretion disk are universal). With the advent of new and upcoming facilities, we have a huge potential to take advantage of these winds of change in the next decade.

Wednesday, March 4, 2020

3:30 p.m.

Bob Wright Centre A104