Institut Spatial de McGill

McGill Space Institute

SEMINAR SERIES

Outbursts Around Dead Stars:

How Dwarf Novae Are Testing Our Fundamental Fluid Dynamics Theory of Accretion Disks

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Dwarf novae are transient optical outbursts observed from close binary systems containing a white dwarf that is accreting material from a companion star. This accreting material takes the form of a differentially rotating disk around the white dwarf, a structure that is of wide-ranging importance in astrophysics, from protoplanetary disks around young stars to quasars and gamma-ray bursts.

Understanding how angular momentum is transported and gravitational binding energy is dissipated is of fundamental importance to all these systems. Dwarf novae are somewhat special, however, in that their observed outbursts are caused by a thermodynamic instability in the disk with short recurrence times, allowing for exquisitely detailed and extensive observations of their variability. This variability has challenged our fundamental theories of angular momentum transport in accretion disks, and I will discuss recent progress in reconciling this theory with observations. This, in turn, has generated deeper appreciation of the complex nonlinear dynamics of these flows, with interesting physics puzzles that remain to be solved.

Tuesday Jan 19, 3:30 pm

MSI Conference Room, 3550 University