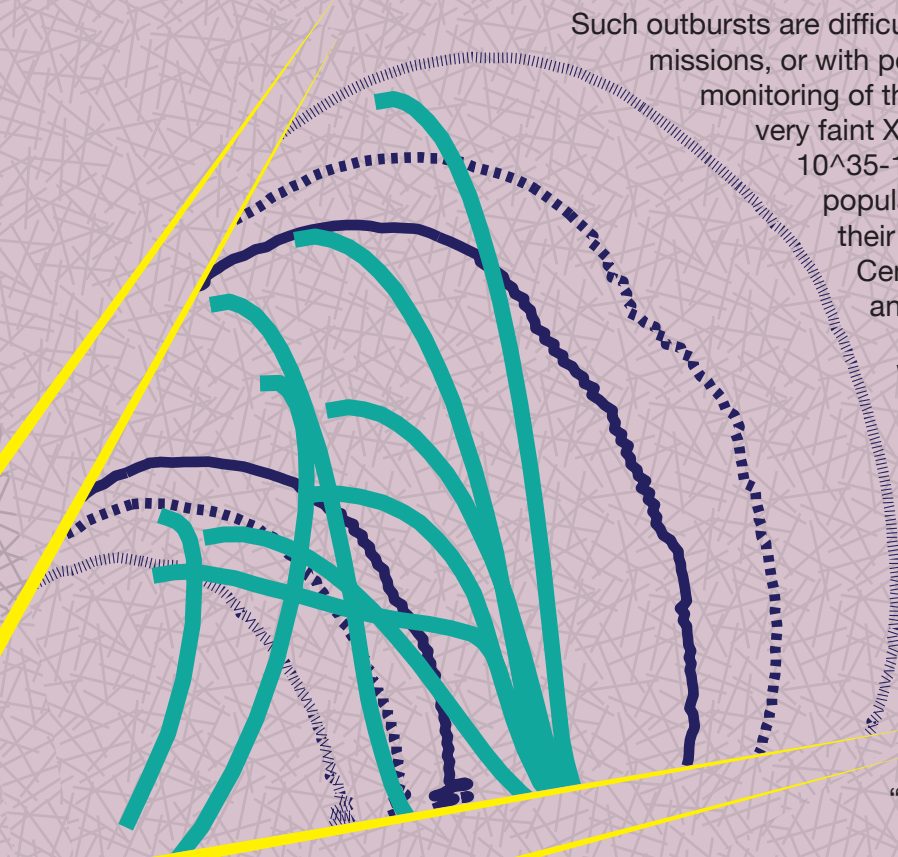


Astrophysics Seminar Series

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The Puzzles of Very Faint X-ray Transients

The evolution and final fate of low-mass X-ray binaries (LMXBs) are difficult to model, due to the wide range of physics that must be included. Simple calculations indicate that the majority of LMXBs should have short orbital periods ($< \sim 3$ hours) and low mass-transfer rates, which suggest they should have infrequent, short, low-luminosity outbursts.



Such outbursts are difficult to observe with current X-ray monitoring missions, or with pointed X-ray telescopes. However, long-term monitoring of the Galactic Center has revealed a population of very faint X-ray transients with peak luminosities of 10^{35} - 10^{36} ergs/s. This suggests that the expected population of old LMXBs may have been found, though their location in the crowded, heavily extinguished Galactic Center prevents follow-up to identify the donor stars and characterize the systems.

We have just been awarded a large Swift proposal, the Swift Galactic Bulge Survey, to survey 16 square degrees of the Galactic Bulge every two weeks for ~ 8 months, which should find ~ 15 new very faint X-ray transients. Through multiwavelength follow-up, we should be able to identify their natures. This will help resolve key questions about how the LMXB population ages, including the transition of NS LMXBs to millisecond pulsars, and whether black hole LMXBs become more radiatively inefficient at short orbital periods, enabling them to “disappear”.

14 February 3:30 pm
Bell Room (103), Rutherford Building

For more information: msi.mcgill.ca/Seminars.html