



Physics & Astronomy Colloquium

Fall 2021



Tuesday, Nov 2nd at 3:30 pm

(Zoom colloquia: Please find the meeting information below)

Dr. Alex Tetarenko

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Unraveling how black holes power explosive outflows: the time-domain, astro-chemistry, and micro-arcsecond imaging

One of the key open questions in high energy astrophysics is understanding how black holes act as powerful cosmic engines, consuming large amounts of material and expelling matter in the form of relativistic jets. Determining how these jets arise and quantifying the energy they carry are important multi-faceted problems in astronomy, with implications for other fields of physics too. For instance, black holes and their jets can influence large-scale astrophysical processes such as star formation and galaxy evolution, produce exotic particles such as neutrinos, and represent unique testbeds for gravitational physics. While great progress has been made studying super-massive black holes, stellar-mass black holes in our Galaxy are ideal test-beds for jet phenomena as they vary on human timescales, in turn providing a real-time view of how black hole jets evolve and interact with their environment. In this talk, I will highlight new techniques that I am developing to measure fundamental jet properties (e.g., size scales, geometry, jet speeds, the sequence of events leading to jet launching) in these stellar-mass systems, and better understand the complex relationship between the mass plunging into a black hole and the material that is jettisoned away via these jets. Additionally, I will discuss the key role that next-generation instruments (e.g., ngVLA, SKA, JWST, ngEHT) will play in driving new discoveries through this science.

Zoom meeting ID: 995 291 7599 Passcode: PHAS

(Find more information at Department Colloquia Webpage)