



Physics Colloquium

Flaring Activity of the Supermassive Black Hole at the Center of the Galaxy



April 1, 2026 (Wednesday)



11:15 a.m.



CYCP1, LG1/F, Chong Yuet Ming
Chemistry Building
Main Campus, HKU



Prof. Farhad YUSEF-ZADEH
Northwestern University

Abstract:

Over the past two decades, precise measurements have established that a 4.2-million-solar-mass black hole, Sgr A*, resides at the center of our Galaxy, in agreement with predictions from Einstein's general theory of relativity. Current flaring activity from Sgr A* offers a unique probe of accretion processes near the event horizon, within a few Schwarzschild radii, and is considered a fundamental property of emission from the accretion disk. While the origin of these flares, spanning radio to X-ray wavelengths, remains debated, recent simulations suggest that magnetic reconnection events may drive them.

I will present highlights from recent multi-wavelength observations of Sgr A* with JWST, NuSTAR, and VLA (2023–2024) and propose a unified physical framework for variable emission across infrared, X-ray and radio bands.

Biography:

Professor Zadeh attended SUNY at Stony Brook for his undergraduate studies in Physics, then attended Columbia University for his PhD in Astronomy. He spent two years at NASA's Goddard Space Flight Center working as a National Research Council postdoctoral fellow before joining the faculty of the Department of Physics and Astronomy at Northwestern University in 1988. Farhad's main interest is to understand the physical processes that take place in the nucleus of our galaxy.

Professor Zadeh uses radio, infrared and X-ray telescopes to study a variety of topics related to the center of the Milky Way Galaxy. In particular, he uses the VLA, JWST and ALMA to monitor flaring activity of the supermassive black hole, known as Sgr A*, and the consequences of cosmic rays interacting with the gas in the nucleus of our galaxy. In addition, he studies how star formation occurs near Sgr A* where it is generally presumed to be suppressed by strong tidal forces in the vicinity of the supermassive black holes.