

Particle Acceleration and Multi Messengers from Accreting Black Holes

Thursday, October 17, 2024 9:00 AM (25 minutes)

Accreting black holes are highly dynamic systems, where particles are efficiently accelerated during the complex inflow/outflow processes, producing multi-messenger emissions. In this talk, I will focus on particle acceleration in jets and their corresponding multi-wavelength emissions, while also touching on the potential roles of inner accretion flows and the possible origin of neutrinos. The discussion will center on Fermi-type acceleration mechanisms, such as stochastic shear acceleration and shock acceleration, and their relevance to the jets of radio galaxies like M87 and Centaurus A. Our simulations, using relativistic magnetohydrodynamics and test-particle approaches, demonstrate that jets from supermassive black holes are capable of accelerating ultra-high-energy cosmic rays.

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