

General relativistic, multi-wavelength and multi-messenger study on black hole accretion flows and outflows

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The Event Horizon Telescope (EHT) detected the black hole shadow in the elliptical galaxy M87*. This provided powerful evidence of the presence of supermassive black holes and the mass of the black hole was estimated to be ~ 6.5 billion solar mass.

For reveal the magnitude of the black hole spin and the dynamics of relativistic jets and accretion flows near the event horizon by future EHT with multi-wavelength observations from radio to gamma-ray band, we developed a multi-wavelength general relativistic radiative transfer code RAIKOU. We calculated the images and multi-wavelength spectra of accretion flows and relativistic jets of supermassive black holes to reveal the black hole spacetime and the dynamics of accretion flows and relativistic jets. We also briefly report our recent numerical work on the high-energy neutrino emission induced by p-p collision process of accelerated proton in accretion flows around spinning black holes.

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