
Black Hole Horizon & Physics

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Abstract

Orbiting hot gas around the supermassive black hole Sgr A* in the Galactic Center is an excellent probe for the mass of the black hole and the physics in its environment. With baselines of 130 m and the NIR beam combiner GRAVITY, we have successfully observed flares in both astrometry and polarimetry, revealing a repeatedly similar behavior. This consistency allows us to analyze the flares together and measure the mass and radius of the black hole, as well as the inclination and position angle of the accretion flow. While we have made significant progress in understanding black hole accretion, much still needs to be understood. That is where km-long baselines come into play. With an angular resolution of 0.1 milli-arcseconds and an astrometry of 1 micro-arcsecond, we can resolve the accretion disk and precisely measure the flare orbit geometry. We will be able to investigate whether the energy source of flares is magnetic reconnection or shock heating and whether we are indeed in a MAD state. In this talk, I will present how NIR interferometry with km-long baselines will transform our understanding of accretion physics onto supermassive black holes.

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