Unveiling Black Hole Accretion with the Event Horizon Telescope--and Beyond

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Abstract: Using a global very long baseline interferometry (VLBI) network, the Event Horizon Telescope (EHT) collaboration has produced the first spatially resolved images of black holes on horizon scales. This has given us an opportunity to test models of black hole accretion flows on these scales for the first time, constraining parameters such as black hole spin, magnetic field state, and the electron temperature. Polarized data of M87* prefer a magnetically arrested disk with strong poloidal fields, and the same may be true for Sgr A* as well. Moving forward, the next-generation Event Horizon Telescope (ngEHT) aims to make polarized, multi-frequency movies with improved dynamic range that can simultaneously image disk and jet. Future data products will hopefully include circular polarization, spectral index maps, and rotation measure maps, each of which provides new insights into aspects of the accretion flow. These data provide important insights into the astrophysics black hole accretion and jets, which we can use to improve sub-grid models in galaxy-scale simulations.

Biography: Dr. Angelo Ricarte is a Black Hole Initiative (BHI) Fellow and theoretical astrophysicist at the Black Hole Initiative at Harvard University. He received his B.A. in astrophysics and applied mathematics from U.C. Berkeley in 2013, and his Ph.D. in astronomy from Yale in 2019. From semi-analytic modeling, to cosmological simulations, to general relativistic magnetohydrodynamics, Angelo has studied supermassive black holes and their interactions with their hosts from cosmological to event horizon scales. He is an active member of the Event Horizon Telescope collaboration, wherein he contributes to the theoretical interpretation of resolved black hole images.