

Transient Phenomena and Physical Processes Around Supermassive Black Holes

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New physics out of the shadow

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Horizon-scale images of black holes (BHs) and their shadows have opened an unprecedented window onto tests of gravity and fundamental physics in the strong-field regime. I discuss the prospects for witnessing the presence of new physics out BH imaging, using an array of observables such as the time evolution of the shadow and the photon ring autocorrelation. I focus on the properties of new light scalar and vector fields, which can affect the dynamics of spinning BHs via superradiant instability. This talk is based on 2205.06238 and 2205.07787.

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