Gravitational Geometry and Dynamics (GGD) Group Seminar

Separating Astrophysics and Geometry in Black Hole Images

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The observation of the shadow of the supermassive black hole M87$*$ by the Event Horizon Telescope (EHT) is sensitive to the spacetime geometry near the circular photon orbit and beyond, and it thus has the potential to test general relativity in the strong field regime. Obstacles to this program, however, include degeneracies between putative deviations from general relativity and both the description of the accretion flow and the mass and spin of the black hole. In this talk I describe a formalism, based on a principal component analysis, capable of reconstructing the black hole metric (i.e. the "signal") in an agnostic way, while subtracting the "foreground" due to the uncertainties in the accretion flow and the black hole mass and spin. This technique is applied to simulated mock data for spherically symmetric black holes surrounded by a thick accretion disk. In the future, the separation of signal and foreground may be possible with next generation EHT-like experiments.

(based on arXiv:2110.00026)

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Zoom Meeting ID: 852 8915 0495 || https://videoconf-colibri.zoom.us/j/85289150495
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