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Shadowgraphy: the art of producing images of compact objects

Thursday 15 September 2022 11:00 (1h 30m)

The optical appearance of a compact object illuminated by its accretion disk is determined by a delicate - and hard to simulate - interaction between the background geometry and the geometrical, optical, and emission properties of the disk. In this talk I will discuss the images generated in optically and geometrically thin disks with several choices for the emission profiles, acting over (spherically symmetric) compact objects of different types: (modified) black holes, wormholes, and boson stars. Our discussion places a fundamental role to the notion of critical curve(s), namely, the locus of unstable bound null geodesics, and how (when present) they affect the balance between the main emission of the disk and the higher-order structure created by those light rays turning more than one (half-)orbit around the compact object. We finally reflect upon the simplifications and caveats of our analysis, and on the change of testing these objects using very-long baseline interferometry.

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