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Images and photon rings of accretion disks surrounding compact objects

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The planet-size network of millimeter antennas Event Horizon Telescope (EHT) has recently delivered images of the surroundings of the supermassive compact object M87* at the center of the galaxy Messier 87. Such images are crucial to better understand the physics at play in a strong gravitational field environment. They might also allow to probe the extreme relativistic effects on the radiation emitted close to the compact object.

In this talk, I will present a simple semi-analytic model of the accretion flow surrounding M87* and discuss images of this flow. In particular, I will focus on the highly-lensed part of the image generally referred to as the « photon ring ». After providing a definition of this feature, I will discuss the prospect of using it as a probe of the underlying spacetime. I will also discuss how the highly-lensed part of the image changes when the compact object is not a black hole but a more exotic alternative object.

The final goal of my talk is to discuss to what extent can EHT-like images help constrain the nature of the compact objects at the center of M87 or our Milky Way.

Primary author: Dr VINCENT, Frederic (Paris Observatory / LESIA)

Presenter: Dr VINCENT, Frederic (Paris Observatory / LESIA)

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