

Study of photon rings in the images of black holes

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The Event Horizon Telescope (EHT) collaboration released in 2019 the first horizon-scale images of the supermassive black hole M87*, dominated by a bright, unresolved ring. General relativity (GR) predicts that embedded within this images lie observable, thin, ring-shaped features produced by photons on extremely bent orbits: the "photon rings".

In a parametric framework of GR, the idea of this study is to consider these predicted photon rings and to analyse their dependence on the choice of the metric and on the emission process of the matter orbiting around the black hole.

The images are produced using numerical simulations of the electromagnetic radiation, and the features of interest are then retrieved via an additional data analysis code.

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