

# Hunt for new physics beyond general relativity with the black hole photon ring

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The image of supermassive black hole taken by the Event Horizon Telescope has evolved the photon ring from a theoretical concept into a possible observable of black holes. I will first review the technological and theoretical advances that make photon ring detectable and explain why photon ring is unique on testing general relativity. Based on the fact that the establishment of the equivalence principle is a benchmark for general relativity, I will introduce the phenomenological behaviors of the photon ring in violation of the equivalence principle to make a connection between various of new physics beyond general relativity and the features of photon ring. I will conclude with some specific tests of new physics through the photon ring.

**Presenter(s) :** LI, Chunlong