

# Theoretical Physics Seminar

Monday, November 18, 2019 / Pupin Hall Theory Center, 8<sup>th</sup> Floor / 2:10 PM

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## **"Universal Interferometric Signatures of a Black Hole's Photon Ring"**



The Event Horizon Telescope Collaboration has recently published images of the supermassive black hole in M87. The images are dominated by a bright ring-like structure with an angular brightness asymmetry. While the diameter of this ring is resolved by the EHT, its thickness and detailed substructure are not. General relativity predicts that within this image lies a thin “photon ring,” composed of an infinite sequence of bright self-similar subrings. As the subrings approach the edge of the black hole “shadow,” they become exponentially narrower and weaker, with seemingly negligible contributions from high order subrings. I will argue that these subrings produce strong and universal signatures on long interferometric baselines. These signatures offer the possibility of precise measurements of black hole mass and spin, as well as tests of general relativity, using only a sparse interferometric array.