

# IMAGING SUPERMASSIVE BLACK HOLES WITH THE EVENT HORIZON TELESCOPE

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The Event Horizon Telescope (EHT) has captured the first image of a black hole. The central compact radio source in the radio galaxy M87 has been resolved out into an asymmetric bright emission ring with a diameter of 42  $\mu$ as, which is circular and encompasses a central depression in brightness with a flux ratio  $>10:1$ . The emission ring is recovered using different calibration and imaging schemes, and remains stable over four different observations carried out in different days. We compare our images to an extensive library of ray-traced GRMHD simulations showing that they are consistent in size and shape with the lensed photon orbit encircling a dark shadow caused by photon capture at the event horizon of a 6.5 billion solar masses black hole, as predicted by general relativity. Our EHT observations thus provide confirmation for the presence of supermassive black holes powering active galaxies, and present a new tool to explore gravity in its most extreme limit via repeated astronomical observations.

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