

# STUDYING NEARBY SUPERMASSIVE BLACK HOLES AT THE EVENT HORIZON SCALE



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One of the most extreme and elusive consequences of Einstein's general theory of relativity (GR) is the existence of black holes. Last year, the EHT Collaboration unveiled the first image of the supermassive black hole at the center of our own Milky Way galaxy, Sgr A\*. The image comes three years after the first historical image of a black hole, the one at the center of the distant galaxy Messier 87 (named M87\*). Both images were produced using observations from a worldwide network of radio telescopes, comprising the Event Horizon Telescope. The two black holes look remarkably similar, despite residing in two completely different types of galaxies and having very different black hole masses (roughly 4 millions and 6.5 billion solar masses, respectively). Both images show a bright ring formed as light bends in the intense gravity around the black hole. The ring encloses a dark region at its center, the so-called black hole 'shadow', which is the signature of an event horizon, the defining feature of a black hole. Overall, the size and shape of the observed images are consistent with expectations for the shadow of a spinning (Kerr) black hole as predicted by GR. In the talk, I will describe the context, the meaning and the 'behind the scenes' of these breakthrough discoveries.

**7 de dezembro de 2023, às 15h**

Auditório Henrique Guilherme Thut (Prédio 5)