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A bright future for black hole shadows: developments in the Event Horizon Telescope

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The Event Horizon Telescope is renowned for presenting the first observations of the black hole shadows in M87 (2019) and our own Galaxy (2022). Since then, the project has continued to observe, model, calibrate and publish new results, including work on other targets. Recently a new image of the M87 black hole was published, using observations from 2018, a year after the observations of the original image. The ring shape is firmly established, and there are clear differences in the brightness distribution, indicative of orbital motions of the gas.

The scientific exploration of the EHT collaboration is organised through projects and working groups, ranging from technical improvements through new imaging techniques and theories of gravity. Each project has significant innovative value. Some highlights here are the work on producing time-resolved images of the SgrA* observations (dynamic imaging), and explorations of new imaging techniques.

In this talk I will present an overview of the current ongoing research with focus on the short- to mid-term goals of EHT. I will describe the calibration and imaging challenges faced by a very sparse VLBI array such as EHT and how these are currently dealt with in the data processing. Lastly, I will touch upon the technical improvements that are envisioned, such as moving to higher frequencies and expanding the EHT with existing and new telescopes to improve the image quality.