



Imaging Black Holes

Black holes mark the most exotic objects within the theory of general relativity. Their interior is shielded from observation by an event horizon, a virtual one-way membrane through which matter, light, and information can enter but never leave. For a long time the immediate surroundings of black-holes remained elusive and even their existence was doubted. In 2019, the Event Horizon Telescope (EHT) captured the first-ever image of a black hole, observing its dark shadow in the radio galaxy M87. In 2022, the black hole at the centre of our Milky Way was imaged. This *confirmed* the presence of supermassive black holes at the centre of galaxies and provided strong evidence for the presence of an event horizon. The talk will describe the road towards making these images and discusses future directions.

Biography

Heino Falcke received his PhD (summa cum laude) from the University of Bonn in 1994. He was Post-Doc at the University of Maryland, visiting professor at the University of Arizona, staff scientist at the Max-Planck-Institute for Radio Astronomy in Bonn, and at the Dutch National Radio Astronomy Institute (ASTRON) in Dwingeloo. Since 2007 he has been full professor of astroparticle physics and radio astronomy at the Radboud University in Nijmegen, the Netherlands. He co-founded the Event Horizon Telescope and was chairperson of its Scientific Council until 2019. Falcke is a member



Professor Heino Falcke (© Boris Breuer)

of the Royal Netherlands Academy of Arts and Sciences and a Knight in the Order of the Dutch Lion. His awards include the International Balzan Prize, the Dutch Spinoza Prize, the Henry Draper Medal of the US National Academy of Science, the Amaldi Medal of the Italian Society for General Relativity and Gravitation, and the Herschel Medal of the Royal Astronomical Society in the UK. He has received three European ERC grants to support his work. He wrote the bestselling book *Light in the Darkness: black holes, the universe and us*, about the first image of a black hole – which has been translated into ten languages