

THE
NOBEL
PRIZE

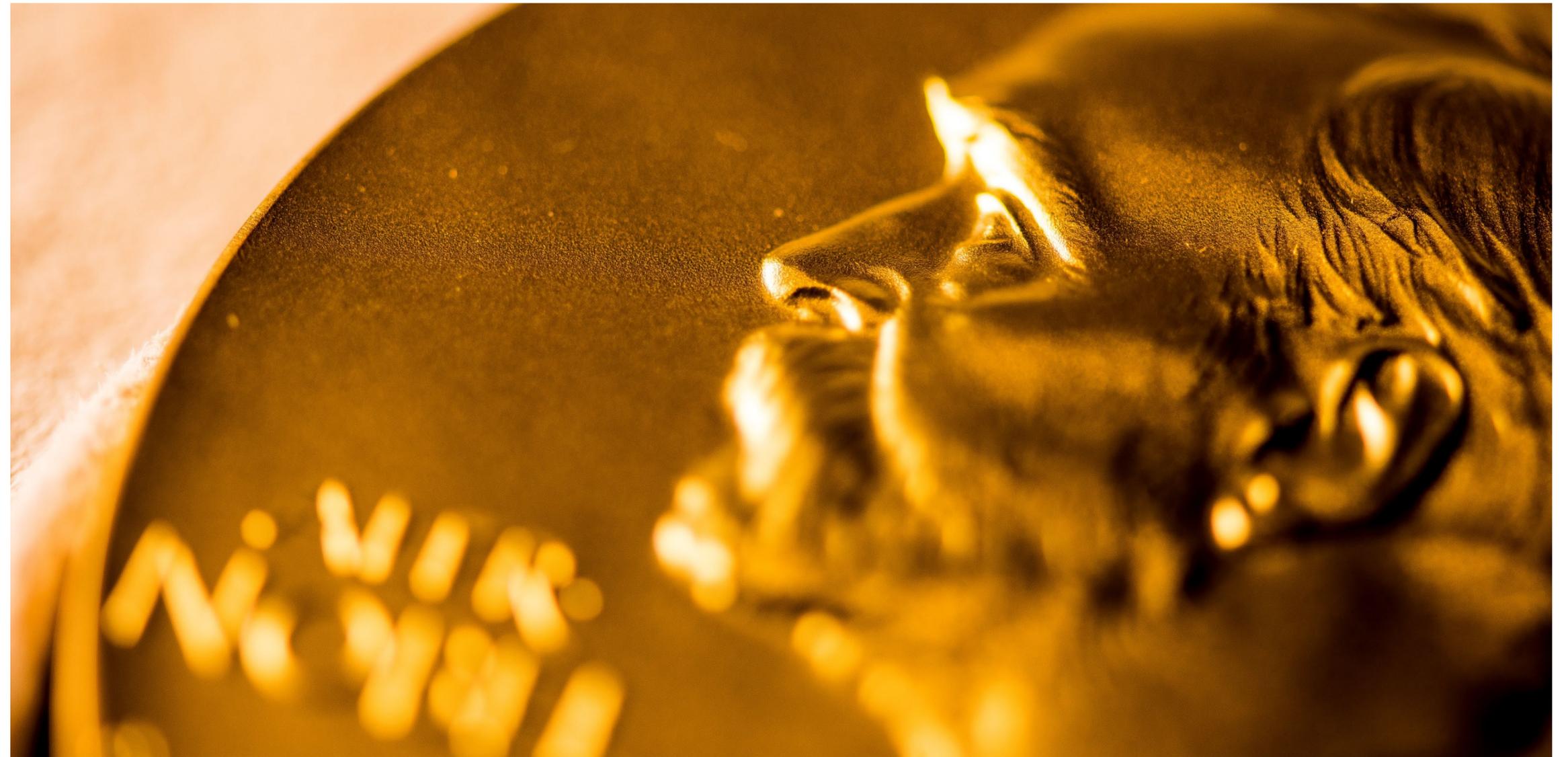
PHYSICS PRIZE 2020

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Black Holes and the Milky Way's
darkest secret

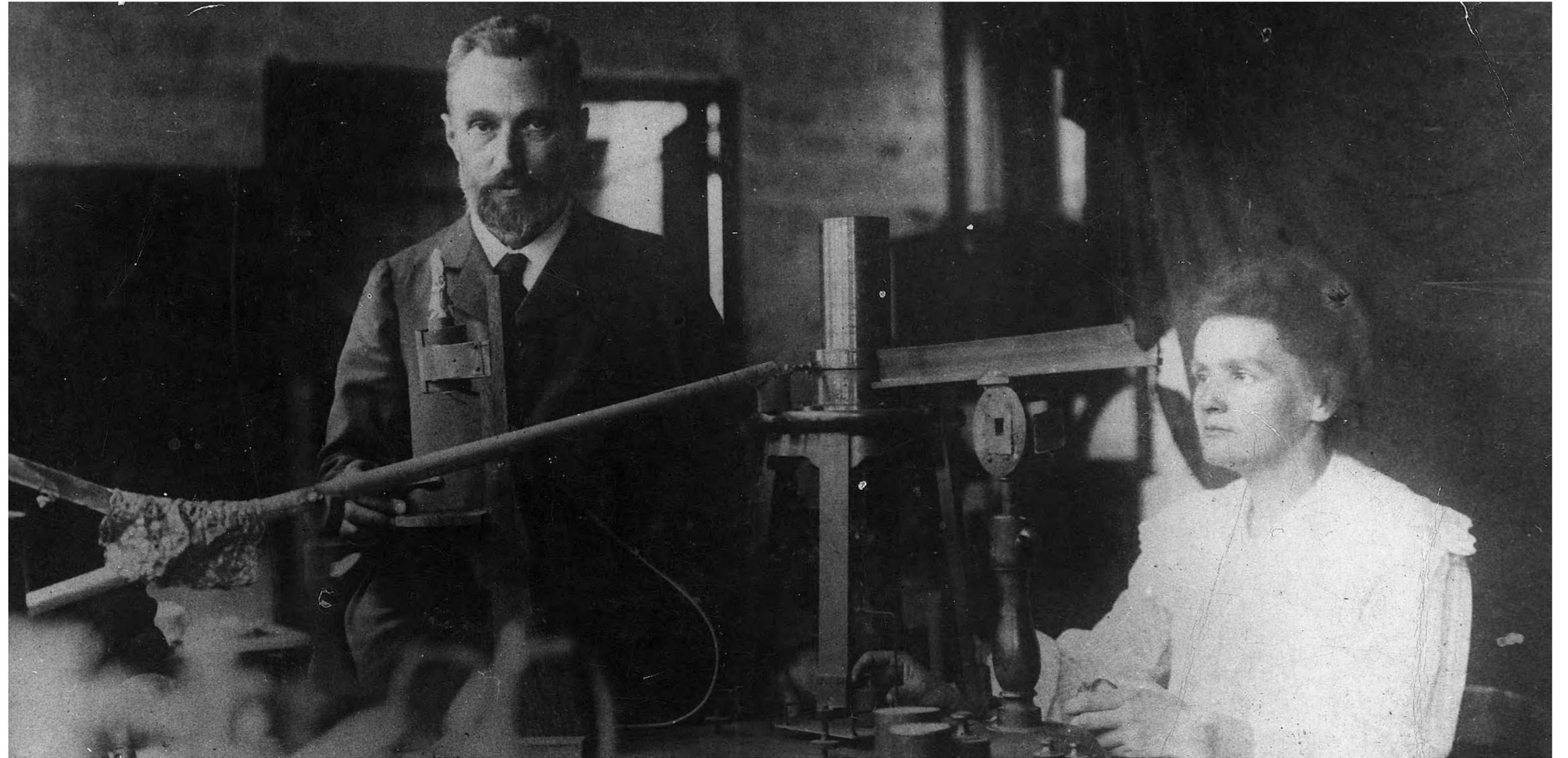
The Nobel Prize in Physics

“to the person who made the most important discovery or invention in the field of physics”



Who is rewarded with the Physics Prize?

This prize rewards important discoveries or inventions in the field of physics.



The 2020 Physics Prize

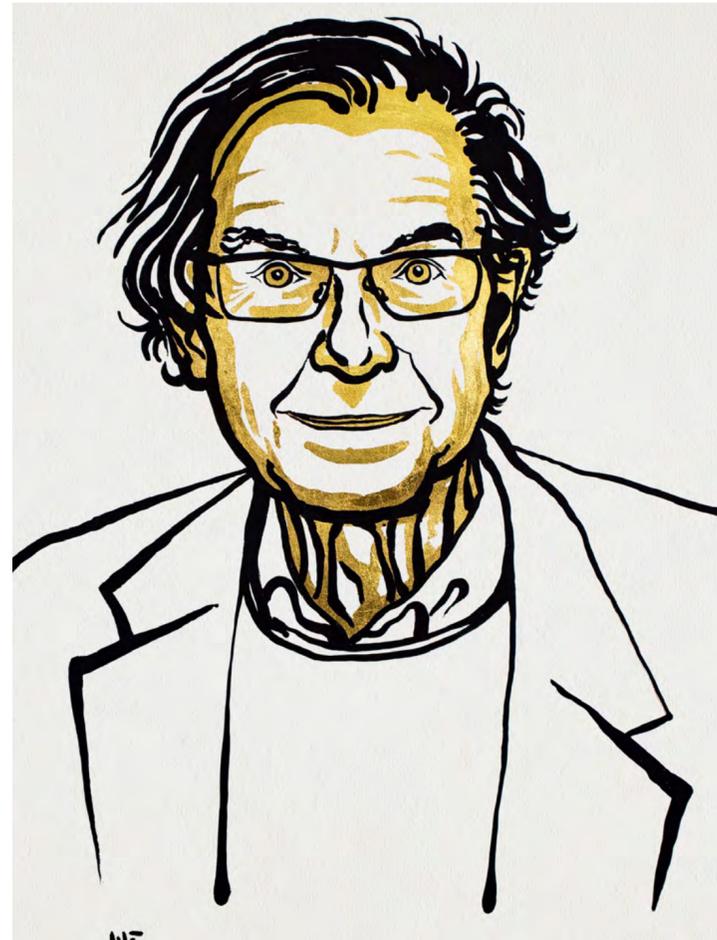
The prize rewards researchers for their discoveries about one of the strangest phenomena in the universe: black holes.



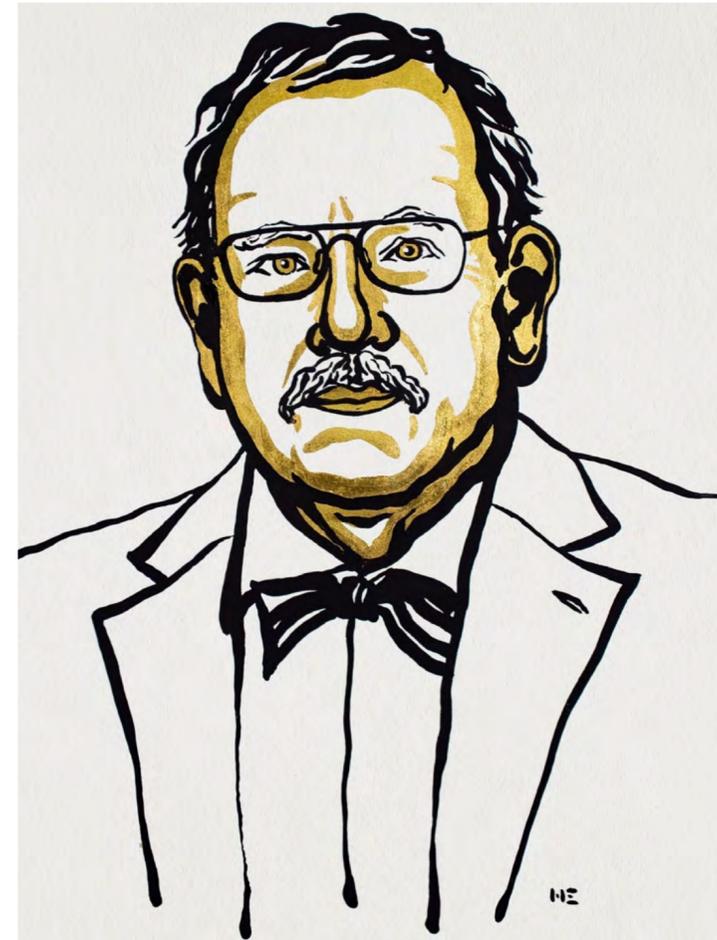
The 2020 Physics Laureates

Roger Penrose
“for the discovery that black hole formation is a robust prediction of the general theory of relativity”

Reinhard Genzel and Andrea Ghez
“for the discovery of a supermassive compact object at the centre of our galaxy”



Roger Penrose
Born: 1931, United Kingdom



Reinhard Genzel
Born: 1952, Germany



Andrea Ghez
Born: 1965, USA

Black holes

Black holes are incredibly heavy and compact objects.

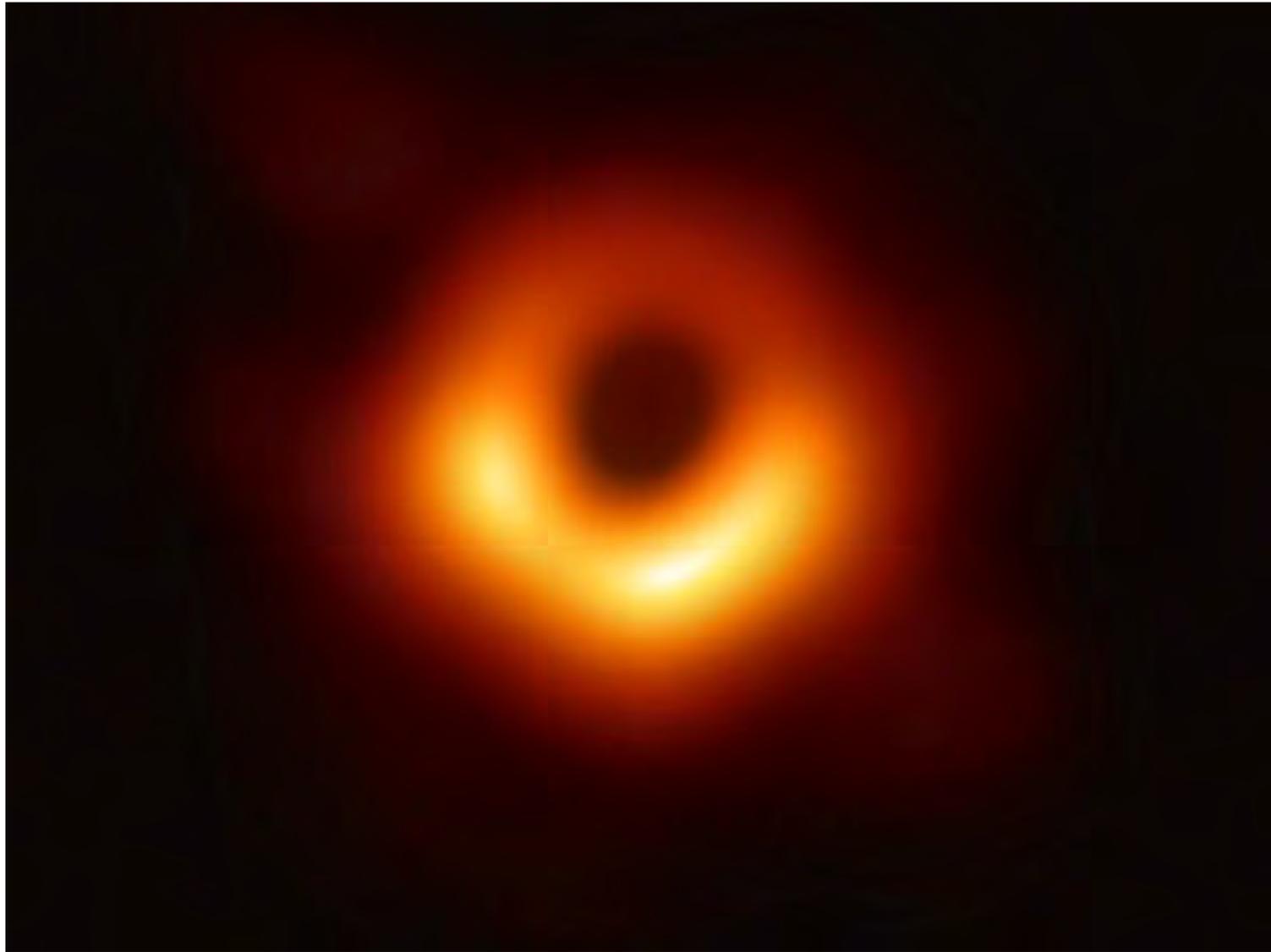
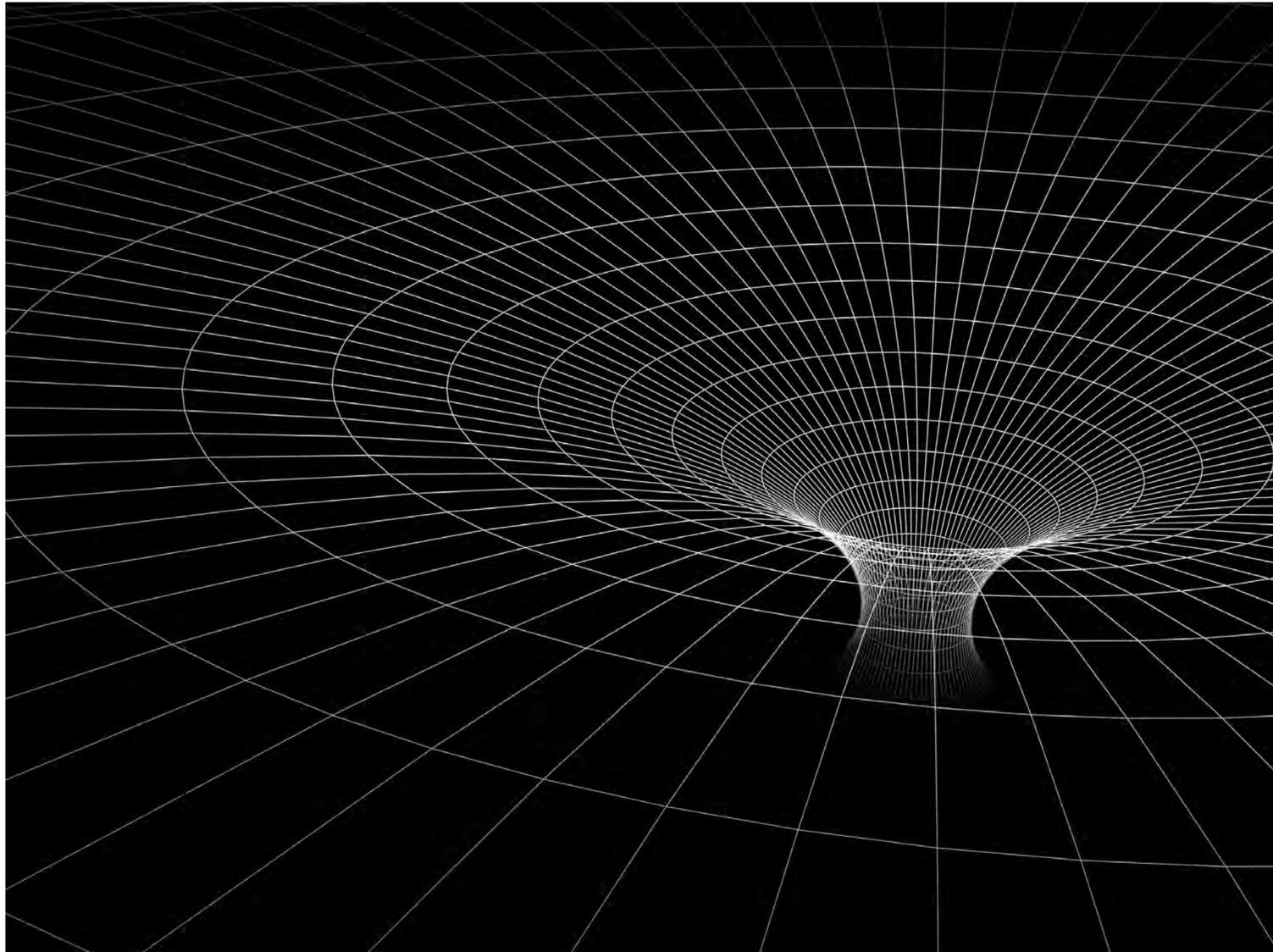


IMAGE: EVENT HORIZON TELESCOPE

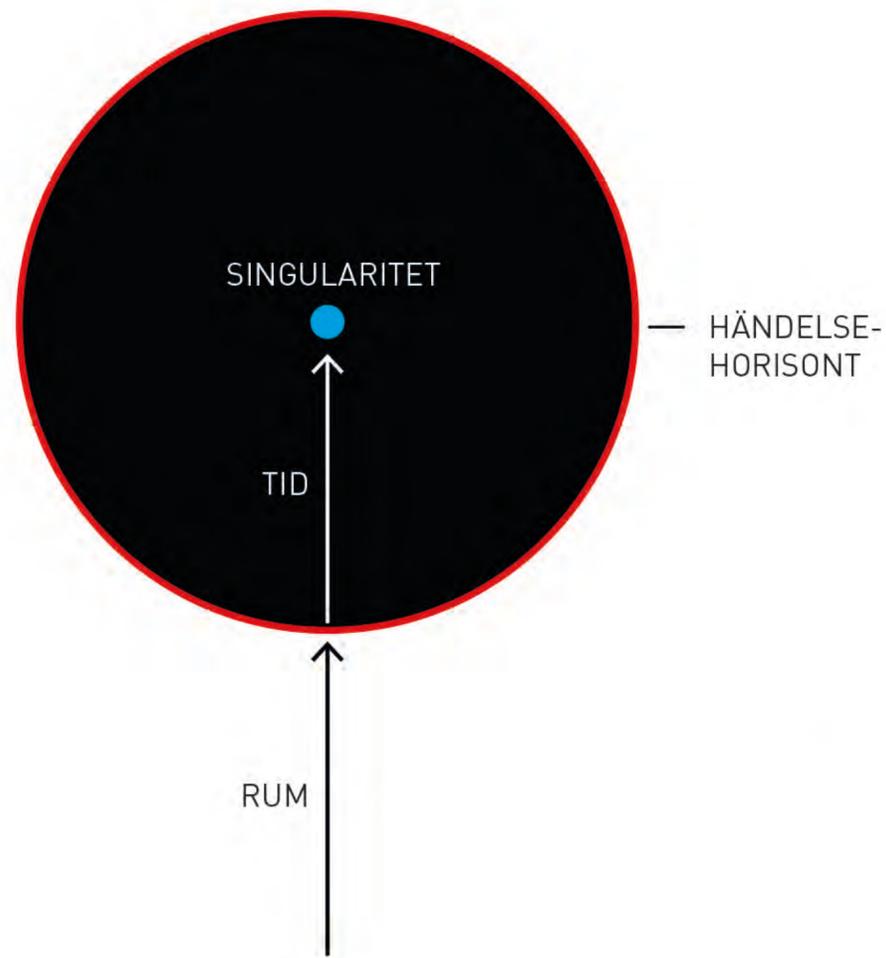
Einstein's theory of relativity



Einstein's general theory of relativity suggests that black holes are theoretically possible.

New mathematical tools for black holes

Roger Penrose used mathematical methods to demonstrate that the general theory of relativity leads to the formation of black holes.



Observing a black hole

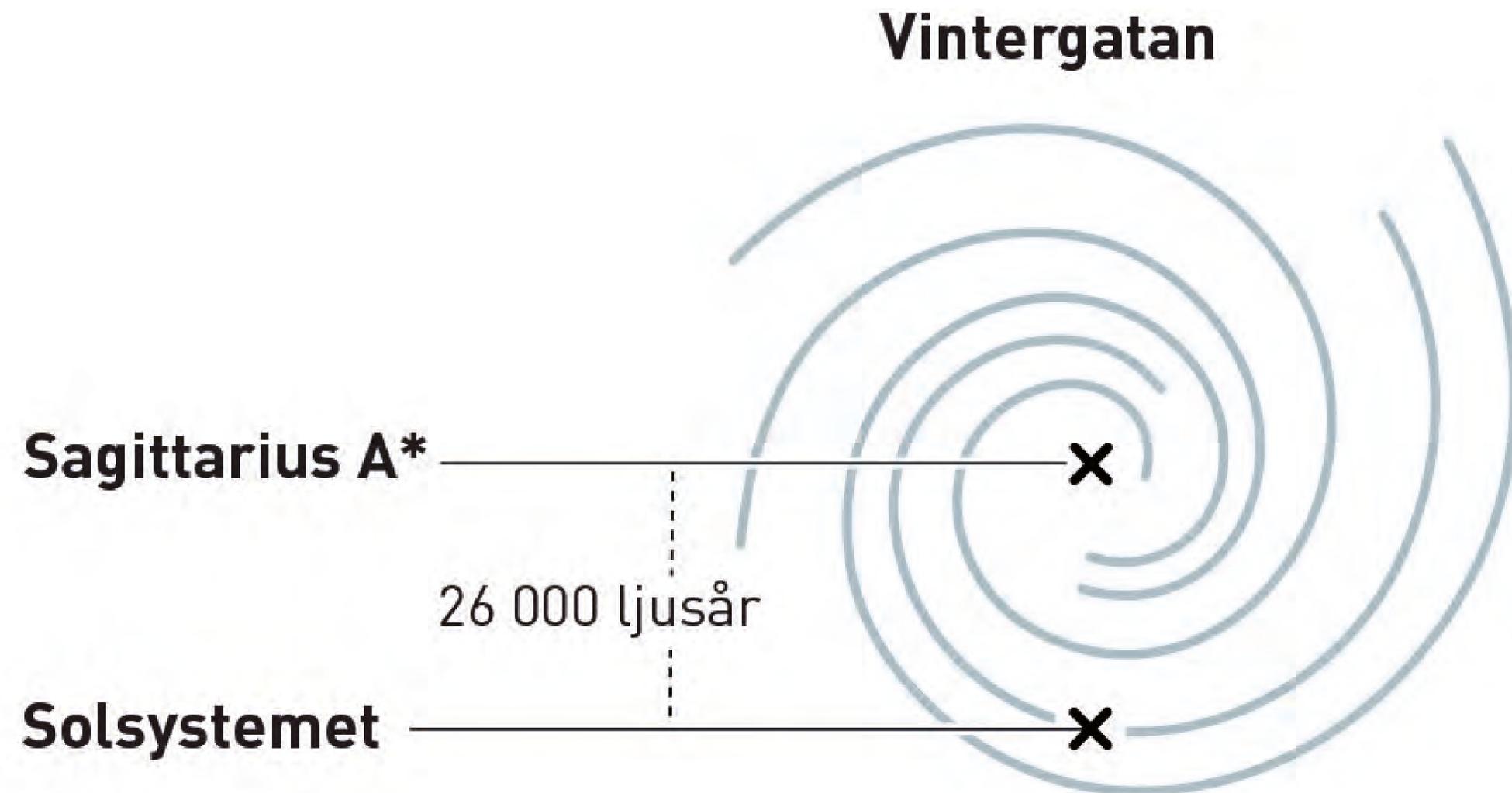
Using powerful telescopes scientists are making observations that increase our understanding of black holes.



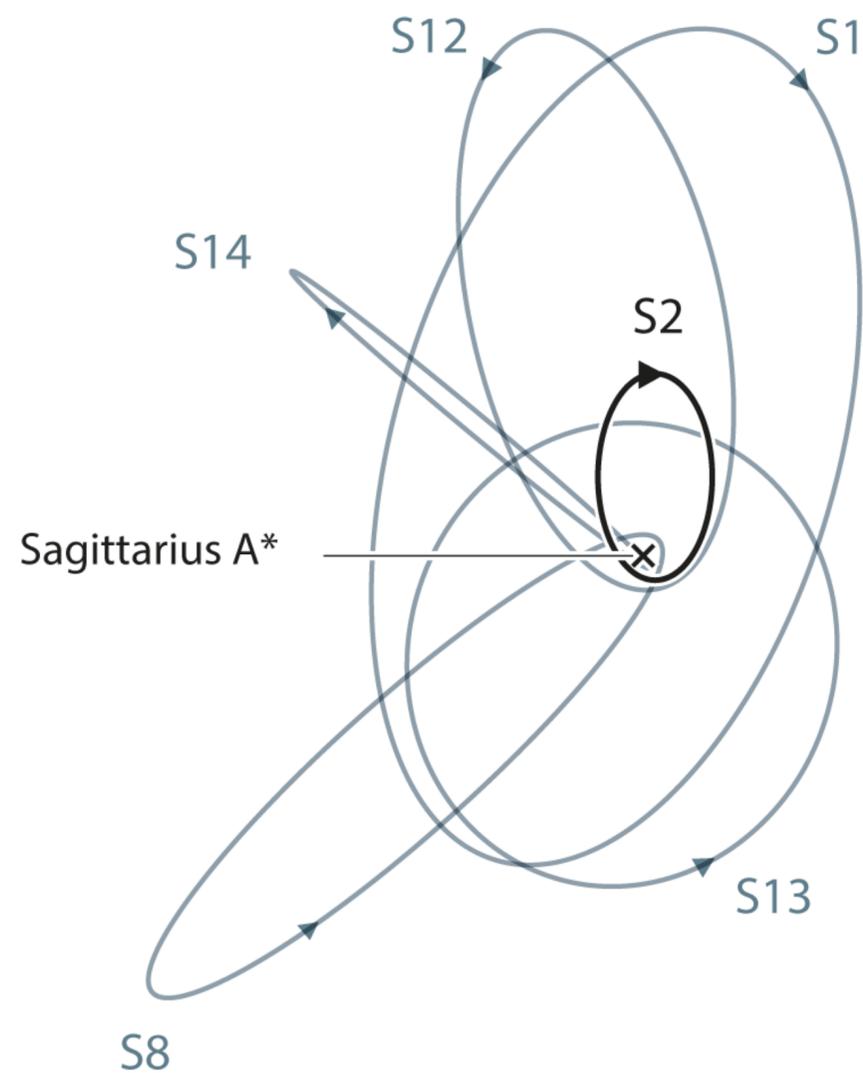
PHOTO: SUBARU, KECK AND NASA TELESCOPES. MAUNA KEA SUMMIT

Searching the galaxy

Reinhard Genzel and Andrea Ghez have searched for a black hole at the centre of our galaxy, the Milky Way.



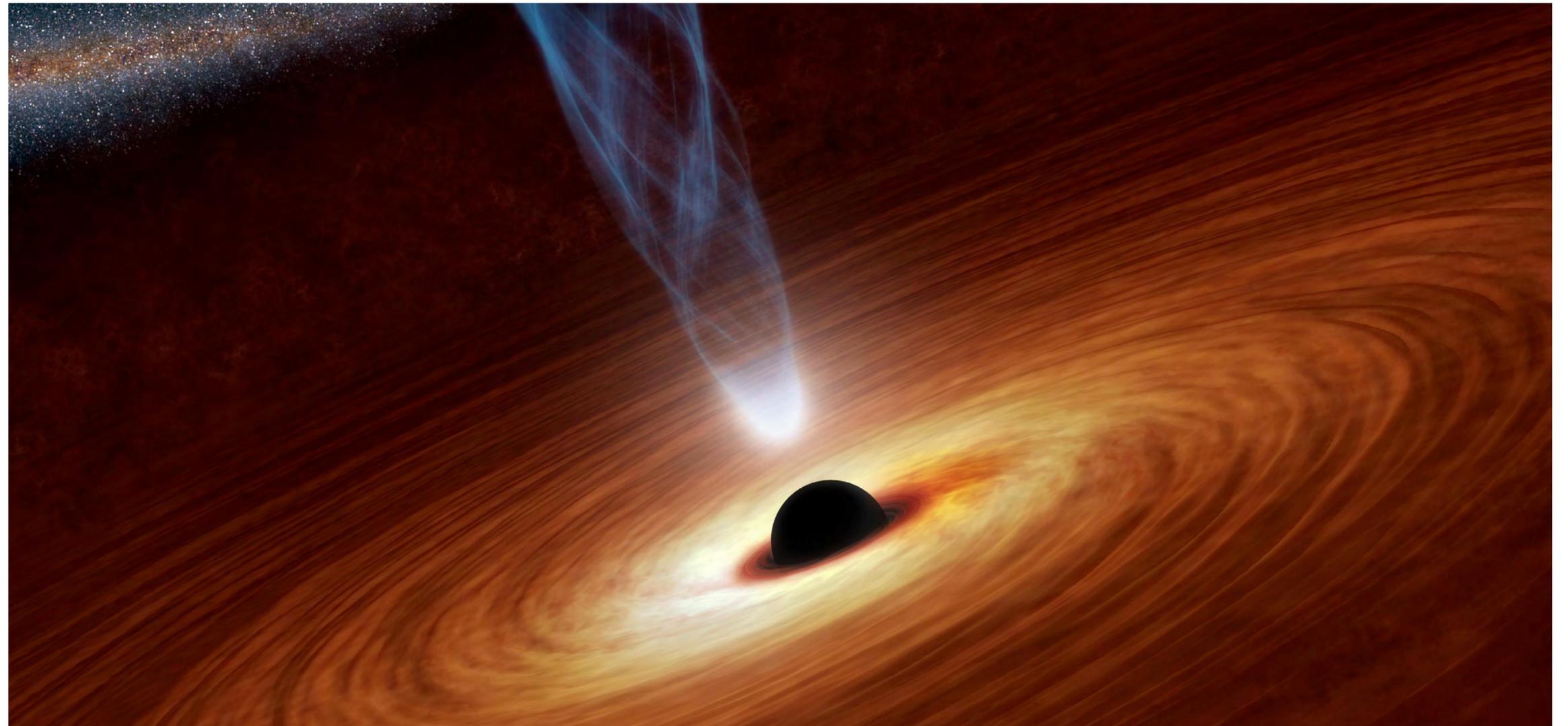
Star orbits provide evidence



The orbital paths of stars make it possible to calculate whether or not they are moving around a black hole.

Expected surprises?

Inside the “singularity” of the black hole, the currently accepted laws of physics do not work.





“It amazes me
every time I go to
the telescope.”

Andrea Ghez, 2020 Physics Laureate

THE
NOBEL
PRIZE

FOR THE GREATEST
BENEFIT TO
HUMANKIND

Nobel Prize Lessons