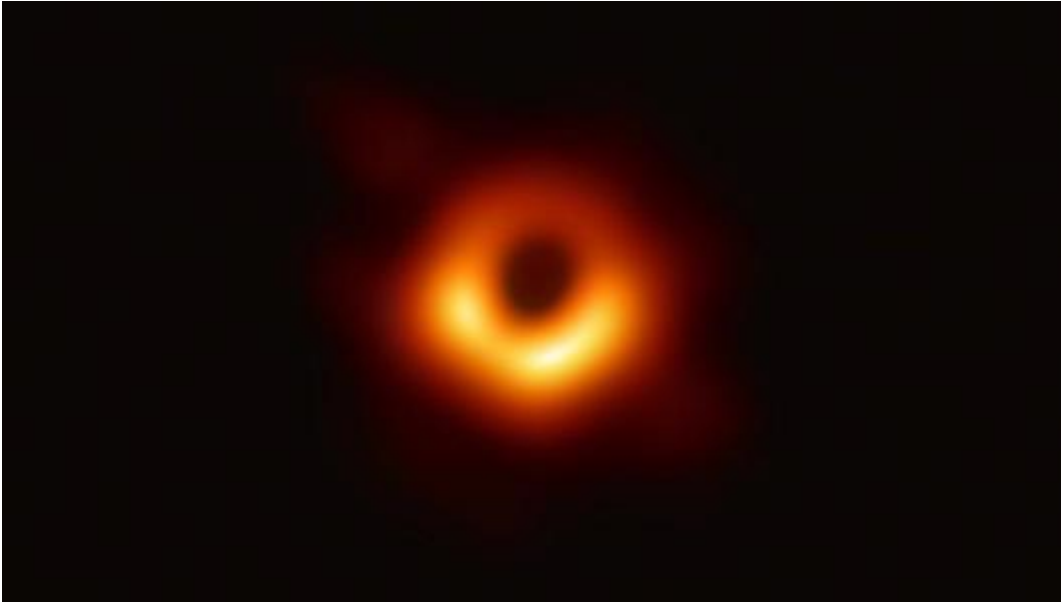


Astronomers discover what's inside a black hole for the 1st time ever

Story by Colin Martin • Feb 26, 2022

recent study published in the journal PRX Quantum attempted to find out what could be inside of a black hole and developed an interesting theory that sounds like it could be out of a science-fiction movie.



In this handout photo provided by the National Science Foundation, the Event Horizon Telescope captures a black hole at the center of galaxy M87, outlined by emission from hot gas swirling around it under the influence of strong gravity near its event horizon, in an image released on April 10, 2019. © Provided by KYW Radio Philadelphia

According to [their theory](#), black holes could just be holograms. The study took a closer look at the idea of holographic duality, which has become popular to better understand black holes by connecting theories of particles and their interactions and the theory of gravity.

Holographic duality says that the theory of gravity and the theory of particles are mathematically equivalent.

Enrico Rinaldi, a research scientist at the University of Michigan, hoped he could better understand what's actually inside of a black hole by using these two theories.

"In Einstein's General Relativity theory, there are no particles—there's just space-time. And in the Standard Model of particle physics, there's no gravity, there's just particles," Rinaldi [said](#). "Connecting the two different theories is a longstanding issue in physics—something people have been trying to do since the last century."

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Rinaldi and other members of the study used quantum matrix models and connected these two theories to discover new information about holographic duality in black holes. After using the matrix models, they were able to clarify what they believe the inside of a black hole looks like.

Rinaldi and the co-authors of the study said that when they refer to it as a hologram, they are pointing out the way the inside meets with the outside. The inside of a black hole is represented in 3D space as space-time moves through it because of the way it works with the theory of gravity.

Black holes appear two-dimensional, giving it a holographic appearance since people don't view it as a 3D object in space. The study said that this is because the theory of particles doesn't work in three-dimensions.

This could mean that the rest of the universe works in a similar way, even though there's no evidence to assume that.