

# Close-up Look at Black Hole Reveals Feeding Frenzy



SPACE.com Staff

## Close-up look at black hole

This super-massive black hole devours the mass of two Earths every hour. » [Same weight as 1 billion suns](#)

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Astronomers are getting a close-up look at a cosmic eating machine: a spinning black hole that devours the mass equivalent of two Earths per hour, verging on the limit of its feeding ability.

Supermassive black holes can weigh as much as [a billion suns or more](#) and are thought to reside at the centers of most, if not all, large galaxies. Their gravity is so powerful it traps even light, making [black holes](#) invisible. Their presence is inferred by watching the motions of stars and gas around them, along with the radiation that's generated in their frenzied vicinities.

The behemoth of interest in the new close-up study, which will be published in the May 28 issue of the journal *Nature*, lies at the center of a distant active galaxy known as 1H0707-495. Using data from the European Space Agency's XMM-Newton observatory, astronomers analyzed X-rays emitted during the black hole's [feeding frenzy](#).

As matter swirls in toward a black hole, gravity makes it travel at significant fractions of light-speed. That generates X-rays and other radiation that can give astronomers information about the spin of the black hole and its size, among other details.

In this case, the astronomers say they are tracking matter that's within twice the radius of the black hole itself.

Specifically, the XMM-Newton detections suggested the galaxy's core is much richer in iron than the rest of the galaxy. In addition, there was a time lag of 30 seconds between changes in the X-ray light observed directly and those seen in its reflection from the disk. From this delay, the astronomers estimate the black hole weighs about 3 million to 5 million solar masses – modest by supermassive black hole standards.

The team will continue to track the galaxy and map out the [accreting process](#) of this supermassive black hole. Far from being a steady process, like muddy water slipping down a plughole, a feeding black hole is a messy eater.

"Accretion is a very messy process because of the magnetic fields that are involved," said study scientist Andrew Fabian of the University of Cambridge.

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