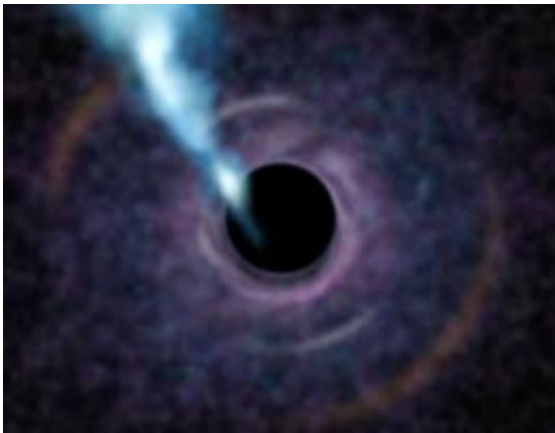


Astronomers calculate mass of largest black hole yet

January 14 2011, by Lisa Zyga



An artist's rendering of the M87 black hole. Image credit: Gemini Observatory/AURA/Lynette Cook.

(PhysOrg.com) -- Weighing 6.6 billion solar masses, the black hole at the center of galaxy M87 is the most massive black hole for which a precise mass has been measured. Using the Frederick C. Gillett Gemini Telescope on Mauna Kea, Hawaii, a team of astronomers calculated the black hole's mass, which is vastly larger than the black hole in the center of the Milky Way, which is about 4 million solar masses.

Astronomer Karl Gebhardt of the University of Texas, Austin, presented the results of the team's research on Wednesday, January 12, at the 217th meeting of the American Astronomical Society. He said that the black hole's event horizon, which is 20 billion km across, is four times

larger than Neptune's orbit and three times larger than Pluto's orbit. In other words, the black hole "could swallow our solar system whole."

Previously, [astronomers](#) had estimated the black hole's mass at about 3 billion solar masses, so their results were somewhat surprising. In order to calculate the black hole's mass, the astronomers measured how fast surrounding stars orbit the black hole. They found that, on average, the stars orbit at speeds of nearly 500 km/s (for comparison, the sun orbits the black hole at the center of the Milky Way at about 220 km/s). From these observations, the astronomers could come up with what they say is the most accurate estimate for the mass of a supermassive black hole.

The astronomers think that the M87 black hole grew to its massive size by merging with several other [black holes](#). M87 is the largest, most massive galaxy in the nearby universe, and is thought to have been formed by the merging of 100 or so smaller galaxies.

Although the black hole is located about 50 million light-years away, it's considered our neighbor from a cosmological perspective. Due to the black hole's large size and relative proximity, the astronomers think that it could be the first black hole that they could actually "see." So far, no one has ever found any direct observational evidence for black holes. Their existence is inferred from indirect evidence, particularly how they affect their surroundings.

The M87 black hole may not retain its title for long, since astronomers plan to continue looking for and calculating the sizes of many more black holes. One planned project involves connecting telescopes from around the world to observe the universe at wavelengths shorter than 1 millimeter. This set-up might enable the scientists to detect a silhouette of the M87 black hole's event horizon. It might also enable them to calculate the size of another black hole with a roughly estimated mass of 18 billion solar masses, which is located in a galaxy about 3.5 billion

light-years away.

More information: via: [Cosmic Log](#) and [Science Now](#)

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