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ASTRONOMY

Evidence grows that center of Milky Way is a black hole

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By Tom Statler



New observations were announced last week strengthening the evidence that a supermassive black hole is at the center of our galaxy, the Milky Way.

This is sure to upset Stephen Colbert, who last year officially put the black hole "on notice."

Nonetheless, many lines of evidence now point to a dark object whose gravity dominates the stars and interstellar gas in the region. The speeds of orbiting stars tell us its mass is 4 million times the mass of the sun.

Many things could have the mass of 4 million suns. Like, say, 4 million stars.

But 4 million stars would be bright. And they would not fit into the tiny volume that the dark mass has to occupy.

In telling a genuine black hole from an imposter, size matters. Previous observations have set only upper limits on size. But as these limits grew tighter, alternatives to black holes were squeezed out.

The new observations by an international team of astronomers are the first to measure a true size. Not the size of the black hole itself, but of the stuff around the black hole that is emitting intense radio waves.

These are the same waves we use for TV broadcasting, only much higher in frequency. Like all electromagnetic radiation, these waves travel through space at the speed of light, so the black hole might receive the news that Mr. Colbert put it "on notice" 26,000 years from now.

The Milky Way's black hole isn't all that large, by galactic standards, and its influence is limited. The rest of our galaxy outweighs it by a thousand times, at least. But supermassive black holes and galaxies go together in a way that we are only starting to understand.

These latest observations are technological steps toward the day, probably in the next decade, when we'll join the rest of the world in being the first humans to really see a black hole.

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