Astronomer gets grant to better measure mysterious black holes

EurekAlert!

Black holes, the high-gravity phenomena of galaxies from which no light can escape, will be better measured thanks to a $862,769 National Science Foundation (NSF) grant to a Georgia State University astronomer.

Misty Bentz, assistant professor of astronomy at Georgia State, received the five-year grant to help untangle the uncertainties that exist when trying to measure black holes.

Black holes, which have a force of gravity from which not even light can escape, exist throughout galaxies. They form when stars reach the end of their life, explode and the center collapses in on itself.

A supermassive black hole – which has a mass of one million to one billion times the mass of our Sun -- exists at the centers of galaxies, including our own Milky Way Galaxy.

"Astronomers rely on scaling relationships to determine the masses of most supermassive black holes -- scaling the black holes to other parameters that are easier to measure," Bentz said. "What we want to look at is whether we can predict the black hole masses in other galaxies. We want a shortcut to predict the black hole mass, and what it should be in any given galaxy in a few simple, cheap observations."

With the NSF grant, Bentz will work on measuring distances to galaxies where astronomers already have masses of the galaxies' black holes.

"That's a big issue because distances are some of the hardest things to measure in astronomy," she said.

The grant will also allow Bentz to obtain near-infrared images of galaxies that will provide clear, smoother images that lessen problems of dust getting in the way of observations, and to measure the brightness of different parts of the galaxies, a parameter that can potentially predict the black hole mass.

Bentz will also explore measuring the total masses of galaxies as another parameter that could potentially predict the masses of black holes.

As a part of educational outreach that is a component of grants issued by the NSF, Bentz is also working in partnership with the Girl Scouts of Greater Atlanta on astronomy education to encourage their interest in science and observations of the natural world.

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