

Scientists watch black hole feast on unlucky star

May 2 2012, by Mariette le Roux

Scientists have witnessed the rare spectacle of a supermassive black hole devouring a star that had ventured too close -- an event that occurs about once in 10,000 years, they reported on Wednesday.

Matter-sucking black holes normally lurk dormant and undetected at the centre of galaxies, but can occasionally be tracked by the scraps left over from their stellar feasts.

"Black holes, like sharks, suffer from a popular misconception that they are perpetual killing machines," said researcher Ryan Chornock from the Harvard-Smithsonian Center for Astrophysics in Massachusetts.

"Actually, they're quiet for most of their lives. Occasionally a star wanders too close, and that's when a feeding frenzy begins."

If a star passes too close, the black hole's [gravitational pull](#) can rip it apart before sucking in its gases, which are heated by the friction and start to glow -- giving away the silent killer's hiding place.

Chornock and his colleagues observed such a glow in May 2010 through a telescope mounted on Mount Haleakala in Hawaii, as well as a NASA satellite.

The flare brightened to a peak that July, before fading away over the course of a year, the scientists said.

"Initially we didn't know exactly what this flare was because it was so bright that when we looked at the galaxy we couldn't see the stars to determine how far away the galaxy was," study co-leader Suvi Gezari of John Hopkins University in Baltimore, Maryland, told AFP.

Observations over several months allowed the team to conclude that the black hole was at the centre of a galaxy 2.7 billion light-years away, and about three million times the mass of our Sun -- similar in size to the Milky Way's central black hole.

Its victim was probably a star in its late, red giant phase which had tempted fate by wandering to within a third of an astronomical unit (150 million kilometres/ 90 million miles) of the black hole -- about the distance of Earth from the Sun.

"This is the first time where we actually have enough detailed information that we can actually determine what kind of star was torn apart by a black hole and how big the black hole was that did it," said Gezari.

She said this was the first such space feast observed from beginning to end, and "that is very exciting because that time scale is how we determine how big the black hole is".

The scientists concluded that the eaten star had lost its hydrogen outer shell in a previous pass by the black hole, leaving just its helium core to be consumed in round two.

"It was really spectacular to have so much info and have all the pieces of evidence come together to form a consistent picture of what happened," said Gezari.

[Black holes](#) are very dense regions in spacetime with a gravitational

force so strong that even light cannot escape. Scientists who study them hope to learn more about the evolution of galaxies.

Stars in our own Milky Way galaxy, including the Sun, are too far away to be at risk of being consumed, said Gezari.

"We would have to wait at least 10,000 years before we would be able to see a star being gobbled by our own black hole," she said.

"So the best way to find these events is not to wait around for our own Milky Way galaxy to gobble a star, we actually have to look at hundreds of thousands of galaxies in the sky to catch one in the act of shredding up a star."

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