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Black hole observed devouring a star

Telescopes captured the rare light flash of a dying star as it ripped apart by a supermassive black hole. It has rarely seen tidal disruption event - which creates spaghettification in stars as they stretch and stretch - is the closest such known event to happen, at only 215 million light-years from Earth. (For comparison, the closest star system to Earth - Alpha Centauri - is about 4 light years away, and the Milky Way is about 200,000 light-years in diameter.) One light year is the distance light journey in a year, about 6 trillion miles (10 trillion kilometers). The idea of a black hole 'sucking in' a nearby star sounds like science fiction. But that's exactly what's happening in a tidal disruption event, the new study's lead author Matt Nicholl, a lecturer and Royal Astronomical Society research fellow at the University of Birmingham in the UK, said in a European Southern Observatory statement. Researchers captured the event in action using numerous telescopes, including ESO's Very Large Telescope and New Technology Telescope. Related: The Weirdest Black Holes in the Universe An artist's illustration of a star's death by spaghettification as it ripped to shreds through a supermassive black hole. Scientists using the European Southern Observatory's Very Large Telescope have spotted such an event. (Image credit: ESO/M. Kornmesser) When an unfortunate star wanders too close to a supermassive black hole in the middle of a galaxy, the extreme gravitational pull of the black hole shredded the star in thin streams of material, co-author Thomas Wevers said in the same statement. Wevers is an ESO fellow in Santiago, Chile and was at the Institute of Astronomy at the UK's University of Cambridge when he did the job. It's been hard to see these events in the past because the black hole the star is eating up has a tendency to shoot out material from the dying star, such as substance, obscuring the view. ESO officials said. Fortunately, the newly studied event was studied shortly after the star ripped to shreds. Related: Black Holes: There's no escaping (infographic) Researchers studied the event, known as AT 2019qiz, about six months as the flame turned bright and then disappeared. Sightings took place in ultraviolet, optical, X-ray and radio wavebands. Looking at the event in this comprehensive way showed how the material leaves the star and the flame the star sends as its dying gasp, researchers said. The team also estimated the size of the doomed star at about the same mass as our own sun. It didn't have a chance against the black hole, which has a mass of more than 1 million times that of the sun. AT 2019qiz also serves as a bellwether to learn about how matter behaves in the extreme environment around supermassive black holes, the team said. A study on the research was published in the Monthly Notices of the Royal Astronomical Society. Follow Elizabeth Howell on Twitter @howellspace. Follow us on Twitter Twitter and on Facebook. This illustration depicts a star (in the foreground) experiencing spaghettification as it is sucked... [+] in by a supermassive black hole (in the background) during a tidal disruption event. In a new study, conducted with the help of ESO's Very Large Telescope and ESO's New Technology Telescope, a team of astronomers found that when a black hole devours a star, it can launch a powerful explosion of material outwards. ESO/M. Kornmesser A star in the act of being devoured by a supermassive black hole. It is the latest incredible cosmic phenomenon detected and detected by astronomers using giant telescopes. This iconic tidal disruption event—called AT2019qiz—has occurred 215 million light-years away, which makes it the closest observed so far. The idea of a black hole sucking in a nearby star sounds like science fiction, but that's exactly what's happening in a tidal disruption event, said Dr Matt Nicholl, a lecturer and Royal Astronomical Society research fellow at the University of Birmingham in the UK, and lead author of the paper today in Monthly Notices of the Royal Astronomical Society. We were able to examine in detail what happens when a star is eaten by such a monster, he added. MORE FROM FORBES Stop Looking for an 'Earth 2.0.' Say scientists as they detect an even better 'Transmitted' World By Jamie Carter That's when a star gets too close to a black hole and thus pulled apart by the black hole's extreme gravitational pull. An unfortunate star at the core of a galaxy may find itself on an orbit that crosses the tidal node of the central supermassive black hole, the paper states. This devastation can drive a very bright flare. That's exactly what the researchers saw. What happened to the star? It is carved into a tube of material. The astronomical term used to describe it is spaghettification. Under the extreme tidal forces of a black hole, stars can be stretched vertically and horizontally compressed into long thin streams of material. The observations showed that the star had roughly the same mass as our own Sun, and that it lost about half of it to the black hole, which is more than a million times more massive, said Nicholl, who is also a visiting researcher at the University of Edinburgh in the UK. MORE FROM FORBES What is that very bright planet to the east? How to see Mars this week at best until 2052 By Jamie Carter Why is this such a rare sight for astronomers? During the star's spaghettification, some of the material fell into the black hole and released a bright flare of energy. Astronomers detected that rare explosion of light. This is a sight described by the researchers as faint and fast; such events are usually obscured by a curtain from debris, and it was only because it was detected just after the star had been ripped apart that the flare could be detected. When a black hole devours a star, it can launch a powerful explosion of material outwards that obstructs our view, Samantha says. Samantha, at the University of Birmingham. This happens because the energy released as the black hole eats up stellar material drives the star's debris outwards. MORE FROM FORBES If you loved Hubble's images You'll Have This 'Star Birth' photo taken from a Chilean Mountain By Jamie Carter How do astronomers find this 'tidal disruption event'? Several aerial surveys discovered emission from the new twintwinkling event very quickly after the star ripped apart, said Thomas Wevers, an ESO fellow in Santiago, Chile, who was at the Institute of Astronomy, University of Cambridge, the UK, when he did the job. We immediately showed a suite of ground-based and space telescopes in that direction to see how the light was produced, he added. ESO's Paranal Observatory in Chile's Atacama desert, home to the Very Large Telescope (VLT). dailulk.com How do astronomers capture this rare event? An international team of scientists led by the University of Birmingham uses the European Southern Observatory's Very Large Telescope and New Technology Telescope, the Las Cumbres Observatory global telescope network, and the Neil Gehrels Swift Satellite to make fast and extensive optical, ultra-violet and X-ray sightings of the flame for six months as it grew brighter and then disappeared. That light became for the first time a direct link between the material flowing from the star and the bright flame emitted as it was exiled by the black hole. Because we caught it early, we could actually see the curtain of dust and debris being set up when the black hole launched a powerful outflow of materials with velocities up to 10,000 km/s, said Kate Alexander, NASA Einstein Fellow at Northwestern University in the U.S. This unique look behind the curtain provided the first opportunity to pinpoint the origins of the obscuring material and follow in real time how it engulfs the black hole, she added. This chart shows the location of AT2019qiz, a tidal disruption event, in the constellation of... [+] Eridanus. The map includes most of the stars visible to the unaided eye under good conditions, and the location of AT2019qiz is indicated by a red circle. ESO, IAU and Sky & Telescope Where in the night sky did the tidal disruption event happen? The incredible event happens in a face-on spiral galaxy toward the constellation Eridanus, the river, though that area of the night sky is also very close to the bright blue star Rigel in the constellation Orion. What happens next? Given the proximity to AT2019qiz, this galaxy is an ideal candidate for the Hubble Space Telescope or adaptive optics imaging to resolve the structure of the core, the paper states. Adaptive optics use lasers to correct for the Earth's atmosphere and so it makes possible for ground-based telescopes to produce images as sharp and as clear as space-based telescopes. It is also hoped that the ESO's extremely large telescope (ELT)—whose Mirroring will make it the world's largest optical/near-infrared telescope—will enable researchers to detect increasingly faint and fast tidal disruption events as they evolve. It is planned to start work before 2030. It's thought that AT2019qiz could act as a Rosetta Stone for interpreting observations of tidal disruption events in the future. Wish your clear skies and wide eyes. Eyes.

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