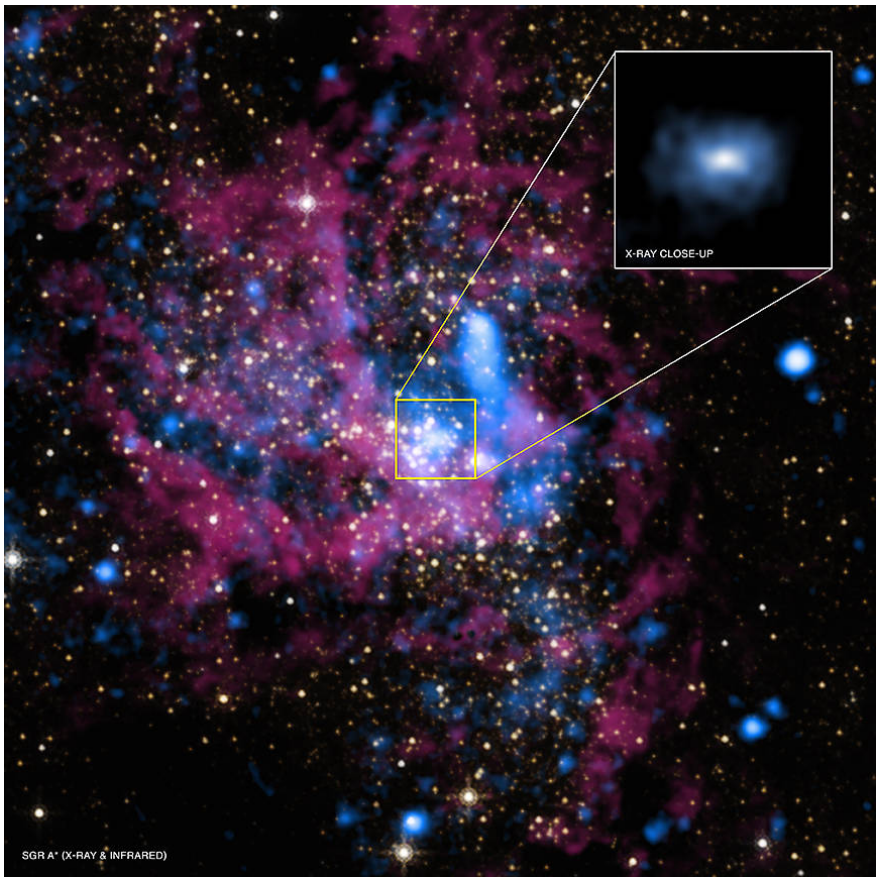
Science has discovered the fastest-flying star in the Milky Way, reaching 8% of the speed of light

This is just one of a cluster of stars orbiting the giant black hole Sagittarius A * located at the center of our galaxy.

At the center of our Milky Way, scientists have discovered a new star orbiting the giant black hole Sagittarius A *. The team named this star S4714 and they confirmed: this is the fastest flying star in our galaxy. At least S4714 will hold this record until we find another 'Usain Bolt' in the Milky Way.

In his orbit, the S4714 reaches speeds of about 8% of the speed of light, or about 24,000 km / s, but this is still not what surprised scientists the most. S4714 is only one member of a newly discovered star group, orbiting the giant black hole Sagittarius A * at an unprecedented close range.



Sagittarius A *.

This new discovery not only reveals that there are still 'reckless' stars flying near giant black holes, but also shows evidence of a new kind of star - a concept that emerged almost 20 years ago: that is Stars flying near the black hole will be suffocated by the star's enormous gravity; Scientifically named these planets 'squeezar'.

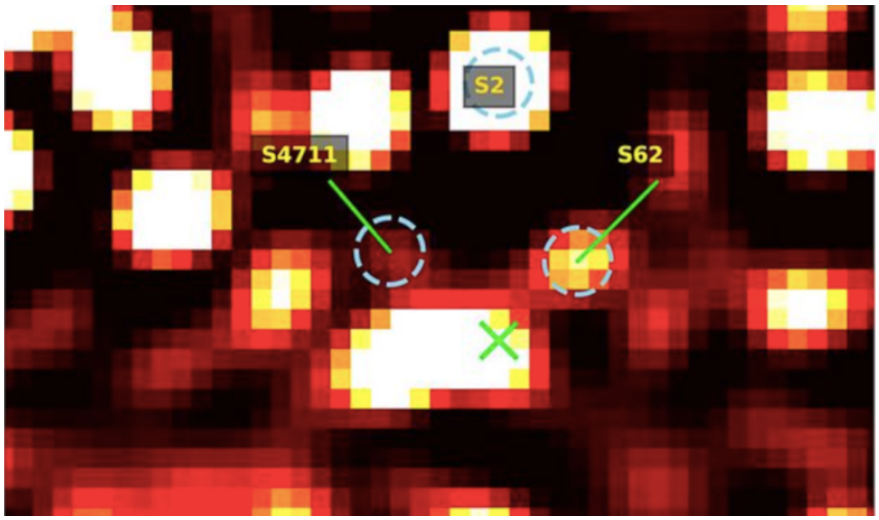
The center of our Milky Way is quite quiet compared to other similar places, but the environment around the black hole still contains activities that shock science. Astronomers observing this space have discovered a fair amount of stars orbiting the black hole Sagittarius A * with an elliptical orbit. Called 'S-S stars', they will be 'satellites' that allow us to deduce the features of giant black holes.

For many years a star named S2 was believed to be closest to the black hole. It took S2 16 years for S2 to complete a rotation of Sagittarius A * and when it was closest to the black hole, it was only 18 billion kilometers from Sagittarius A *, causing the S2 star to reach 3% of the speed of light.

But last year, a team of researchers led by the astrophysicist Florian Peissker from the University of Cologne discovered a less bright star, located closer to the black hole: S62. With an orbital completion time of 9.9 years and close to the black hole to a distance of 2.4 billion kilometers, S62 is closer to Sagittarius A * than from Uranus to the Sun. The speed of S62 reaches 20,000 km / s, about 6.7% of the speed of light.

But that's not all of the findings Peissker's team has: years of research data show that there are five other stars that are even closer to Sagittarius A *: S4711, S4712, S4713, S4714 and S4715.

Among them, S4711 and S4714 are two very remarkable celestial bodies.



The green X is Sagittarius A *.

S4711 is a 150-million-year-old B-class blue giant that orbits shorter than S62 when it completes a circle of Sagittarius A * every 7.6 years; The closest distance between it and the most central black hole is 21.5 billion kilometers.

Meanwhile, S4714 has a longer orbit - about 12 years, but the ellipse that S4714 draws is extremely elongated; in fact, it gets close to the maximum elongation that a stable trajectory can have. The orbital deviation is described from 0 to 1, with 0 being the perfect circle and 1 being when the celestial deviates out of orbit, S4714 has a deviation of 0.985.

When it was closest to Sagittarius A *, it was only 1.9 billion kilometers from the 'mere' black hole. And at this position, the star flies at 24,000 km / h, then ejects as far as 250 billion kilometers away from the black hole - the farthest it can reach in its orbit.

According to Professor Peissker, these are the brightest candidates for the concept of 'squeezar': In 2003, astrophysicists Tal Alexander and Mark Morris proposed that there is an eccentric layer of stars orbiting the black hole. For each turn, the tidal force - the tidal force converts a small portion of the energy generated from the star's orbit into heat. First, this amount of heat will make the star brighter and second, it will cause the star to decay gradually. In other words, squeezars are dead stars orbiting a large celestial body.

Tidal force - the tidal force, the force that pulls one object closer to and away from a center mass of another, resulting from the difference between the gravitational field between two bodies; examples of tidal force are tides or pasta - the object is stretched to a climax, for example, when being sucked into a black hole.

Description of spaghettification - spaghettification.

' *At least we have S4711 and S4714 as squeezar candidates* ,' says Peissker. ' *I can safely assume the S4711 will be a squeezar because its orbital factors correspond to what Tal Alexander said in 2003. If so, the S4711 would be the first human-discovered squeezar* .'

If this is true, the other stars will help us better understand the interactions between the black holes and the stars that fly around them - delicious 'prey' that will enter the belly of that hungry monster. Observing these activities is an opportunity for us to better understand the vast space.

For example, we used star S2 to test relativity. Both the way light is stretched as it approaches a black hole, and the way its orbit changes like a breath-measuring display, confirms Einstein's hypothesis.

Scientists have not had the opportunity to test new tests yet, but the SINFONI tool - the near infrared spectrometer has stopped working, so observing these squeezar candidate stars has not made much progress. . But for sure, this will be an interesting space for science to delve into.

Around Sagittarius A *, more stars are likely to fly faster, with orbits obscured for unknown reasons. With a more powerful telescope going to go into space in the near future, you will be able to look deeper into the space around the giant black hole.

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