

MILKY WAY'S BLACK HOLE IS MORE ACTIVE!

The black hole at the Milky Way's heart recently blasted out 10 times its normal rate of X-ray flares. Is it due to the close passage of a mysterious, dusty object?

The 4-million-solar-mass black hole at the centre of our Milky Way – Sagittarius A* – is usually pretty quiet.

Over the past few years, astronomers have watched a mysterious, dusty object that they call G2 sweep near the hole. They hoped for fireworks when G2 fell into the hole, but, as it passed closest, there was no big effect. Now it appears that G2 survived mostly intact. But perhaps now they are seeing an effect. Scientists using combined data from three orbiting X-ray space telescopes report a recent tenfold increase in the rate of X-ray flares from the Milky Way's black hole within the past year. They're trying to determine whether these flares are normal behavior – unnoticed due to limited monitoring – or whether G2's passage triggered the flares.

The three space telescopes are NASA's Chandra X-ray Observatory, ESA's XMM-Newton, and the Swift satellite.

By combining data from these three, astronomers traced the activity of the Milky Way's supermassive black hole over a 15-year period. The study reveals that, until recently, the Milky Way's black hole has been producing one bright X-ray flare about every 10 days. **Within the past year, the rate has increased to about one every day. This increase happened soon after the closest approach to Sgr A* by G2.**

Annotated composite image showing the motion of G2 as it closed in, and then passed, the supermassive black hole at the center of the Milky Way. These observations came from ESO's Very Large Telescope and agreed with others around the world that G2 survived its close encounter with Sgr A*. The blobs have been colorized to show G2's motion, with red indicating that the object was receding and blue approaching. The cross marks the position of the supermassive black hole. Astronomers at Keck Observatory also agreed that G2 survived its closest approach to the black hole, and they released this infrared image. The green circle just to the right of G2 depicts the location of the invisible supermassive black hole. It's logical to assume that G2's close passage to the black hole might cause an increase in X-ray flares. X-rays are known to be produced by hot gas flowing toward a black hole.

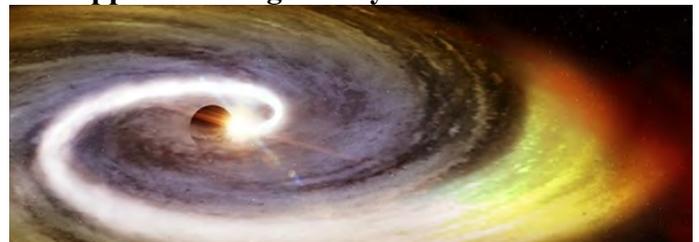
What is G2, and did it bump up the rate of X-ray flares in our Milky Way's central black hole?

Originally, astronomers thought G2 was an extended cloud of gas and dust. After it passed closest to Sgr A*, though, in late 2013 and early 2014, its appearance didn't change much, apart from being slightly stretched by the gravity of the black hole. This led to new theories that G2 was a star swathed in an extended dusty cocoon.

So astronomers aren't sure what G2 is. They also aren't sure if the recent increase in X-rays comes from G2's passage near the hole. A year or so ago, it was thought it had absolutely no effect on Sgr A*, but new data raise the possibility that this might not be the case. That's because astronomers see other black holes with similar behaviour. They say it's possible that what they call increased chatter from Sgr A* might be a common trait among supermassive black holes. It might be unrelated to G2. In that case, the increase in X-ray flares could, for example, represent a change in the strength of stellar winds from nearby massive stars that are feeding the black hole.



The black hole at the centre of our home galaxy, the Milky Way. Image via Chandra X-Ray Observatory



Artist's concept of the Milky Way's central black hole.

