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SPACE

# A RADIATION 'ECHO' FROM A SUPERMASSIVE BLACK HOLE IS SPREADING ACROSS THE GALAXY

The sleeping cosmological giant woke up around 200 years ago and devoured everything in the vicinity, releasing intense amounts of radiation in the process

**A**round 200 years ago, Sagittarius A\* (Sgr A\*), the black hole at the centre of the Milky Way, suddenly burst into life. It began consuming as much nearby cosmic material as it could, and released radiation a million times stronger than it releases today, before returning to a dormant state. That's according to a new discovery made by researchers at

the Strasbourg Astronomical Observatory in France, using measurements taken by NASA's Imaging X-ray Polarimetry Explorer (IXPE) satellite.

The researchers wanted to know why the energetic X-rays emitted by galactic molecular clouds located near Sgr A\* shine so brightly. The answer lies in the fact that Sgr A\*, which is four million times more massive than the Sun, emerged from a long period of dormancy in the early 19<sup>th</sup> century to begin a year-long feeding frenzy – causing it to emit massive amounts of radiation.

It's this radiation that's now being reflected by the galactic molecular clouds in the form of intense X-rays.

Although black holes suck in and trap all light that enters their event horizons, the enormous forces they generate cause nearby matter to heat up to millions of degrees. This results in the emission of radio waves and X-rays.

The researchers say the effect was so dramatic that it was comparable to a lone glow-worm buzzing around a forest at night, suddenly becoming as bright as the Sun.

"This is a unique observation, we've never seen such dramatic changes in other supermassive black holes," research leader Dr Frédéric Marin told *BBC Science Focus*.

"It can potentially tell us a lot about the accretion cycles of supermassive black holes and help us to understand how they can shape the galaxy that surrounds them by pushing gas around and suppressing star formation."

The team now plans to investigate the exact mechanisms that allowed Sgr A\* to switch from its dormant state into a temporarily voracious one. "Our next goal is to understand how the black hole woke up for just a year. Maybe a star, or a group of stars, passing by, caused the accretion of interstellar dust clouds," said Marin.



Data from NASA's IXPE (orange) and Chandra (purple) instruments has been combined to zoom in on and highlight the X-rays in the area around Sgr A\* (top)