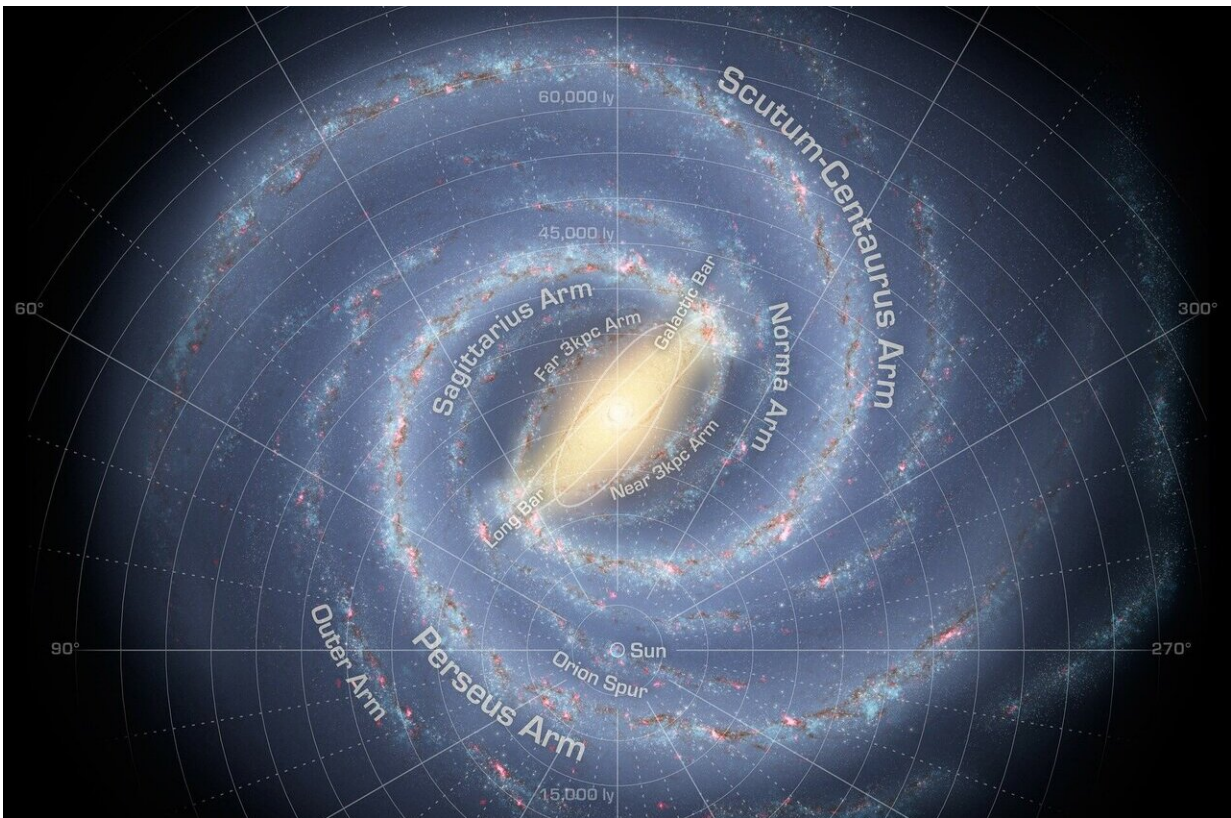


# What if the black hole at the center of the Milky Way is actually a mass of dark matter?

June 2 2021, by Bob Yirka



Credit: CC0 Public Domain

A team of researchers at the International Center for Relativistic Astrophysics has found evidence that suggests Sagittarius A\* is not a massive black hole but is instead a mass of dark matter. In their paper

published in the journal *Monthly Notices of the Royal Astronomical Society: Letters*, the group describes the evidence they found and how it has stood up to testing.

For several years the [scientific community](#) has agreed that there is a mass at the center of the Milky Way galaxy and that the mass is a [supermassive black hole](#)—it has been named Sagittarius A\*. Its presence has never been verified directly, however, instead it has been inferred by noting the behavior of bodies around it. In this new effort, the researchers suggest that another type of mass could produce the same reactions by other bodies and in fact could help explain some anomalies that have been seen.

Back in 2014, astrophysicists were confronted with a problem they could not explain—a gas cloud that had been named G2 moved to a position close enough to Sagittarius A\* that it should have been destroyed and pulled in by the black hole. Instead, the gas cloud continued on its way, unharmed.

The researchers in this new effort suggest the reason G2 was able to survive its journey past Sagittarius A\*, was because Sagittarius A\* is not a black hole—it is a mass of dark matter. To come to this conclusion, they created a simulation of the Milky Way, where Sagittarius A\* was replaced by a mass of dark matter and then let it run. In so doing, they found the Milky Way could run pretty much the same way it would if there were a black hole at its center—nearby S-stars would behave the same, for example, as would the rotational curve of the Milky Way's outer halo. The researchers went even further, suggesting that such a mass would be composed of darkinos, which would belong to the same group as fermions. If they were to clump together, the simulation showed, they would have characteristics very similar to a black hole—the exceptions being its most extreme features.

**More information:** E A Becerra-Vergara et al, Hinting a dark matter nature of Sgr A\* via the S-stars, *Monthly Notices of the Royal Astronomical Society: Letters* (2021). [DOI: 10.1093/mnrasl/slab051](https://doi.org/10.1093/mnrasl/slab051) . On *Arxiv*: [arxiv.org/abs/2105.06301](https://arxiv.org/abs/2105.06301)

© 2021 Science X Network

Citation: What if the black hole at the center of the Milky Way is actually a mass of dark matter? (2021, June 2) retrieved 25 April 2024 from <https://phys.org/news/2021-06-black-hole-center-milky-mass.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.