Astronomers were able to map an entire orbit of less than 16 years for one of the stars, S2 (or S-O2). The closest it came to Sagittarius A* was about 17 light hours (more than 1000 million kilometres).

Stars closest to the centre of the Milky Way

The stars’ orbits are the most convincing evidence yet that a supermassive black hole is hiding in Sagittarius A*. This black hole is estimated to weigh about 4 million solar masses, squeezed into a region no bigger than our solar system.

Stars closest to the centre of the Milky Way

The S2 star’s radial velocity increases as it approaches Sagittarius A* and decreases as it moves away along its elliptical orbit. Radial velocity is the component of the star’s velocity that is in our line of sight.

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