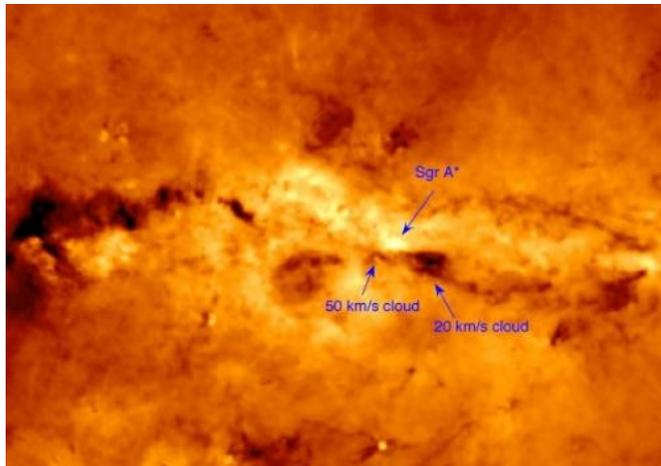


Twisted ring of gas orbits galactic center

1 June 2011, By Steve Nerlich



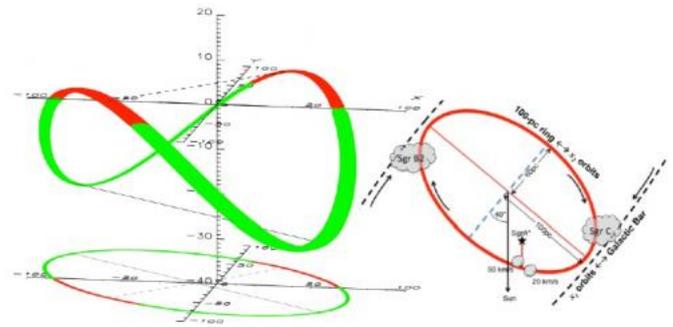
A Herschel PACS (Photodetector Array Camera and Spectrometer) image of a dark line of cool gas which is thought to be an elliptical ring surrounding the galactic center. The galaxy's central supermassive black hole Sagittarius A (Sgr A) is labelled. The differential velocity of clouds in the ring may result from interaction with Sgr A. Credit: ESA/Herschel/NASA/Molinari et al.

The Herschel Space Observatory scanned the center of the galaxy in far-infrared and found a cool (in all senses of the word) twisting ring of rapidly orbiting gas clouds. The ring is estimated to have dimensions of 100 parsecs by 60 parsecs (or 326 by 196 light years) - with a composite mass of 30 million solar masses.

The ring is proposed to oscillate twice about the galactic mid-plane for each orbit it makes of the galactic center - giving it the apparent shape of an infinite symbol when viewed from the side.

The research team speculate that the ring may be conforming to the shape of a standing wave - perhaps caused by the spin of the central galactic bulge and the lateral movement of gas across the galaxy's large central bar. The researchers suggest that the combination of these forces may produce some kind of gravitational 'sloshing' effect, which would account for the unusual movement of

the ring.



The estimated shape of the 100 by 60 parsec ring. Note the oscillating shape from a lateral perspective - and from above, note the ring encircles the supermassive black hole Sagittarius A*, but the black hole is not at its center. Credit: Molinari et al.

Although the ring is estimated to have an average orbital velocity of 10 to 20 kilometers a second, an area of dense cloud coming in close to the galaxy's central supermassive black hole, Sagittarius A*, was clocked at 50 kilometers a second - perhaps due to its close proximity to [Sagittarius A*](#).

However, the researchers also estimate that Sagittarius A* is well off-centre of the gas ring. Thus, the movement of the ring is dominated by the dynamics of the galactic bulge - rather than Sagittarius A, which would only exert a significant gravitational influence within a few parsecs of itself.

More information: Molinari et al [A 100 parsec elliptical and twisted ring of cold and dense molecular clouds revealed by Herschel around the galactic center.](#)

Source: [Universe Today](#)

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