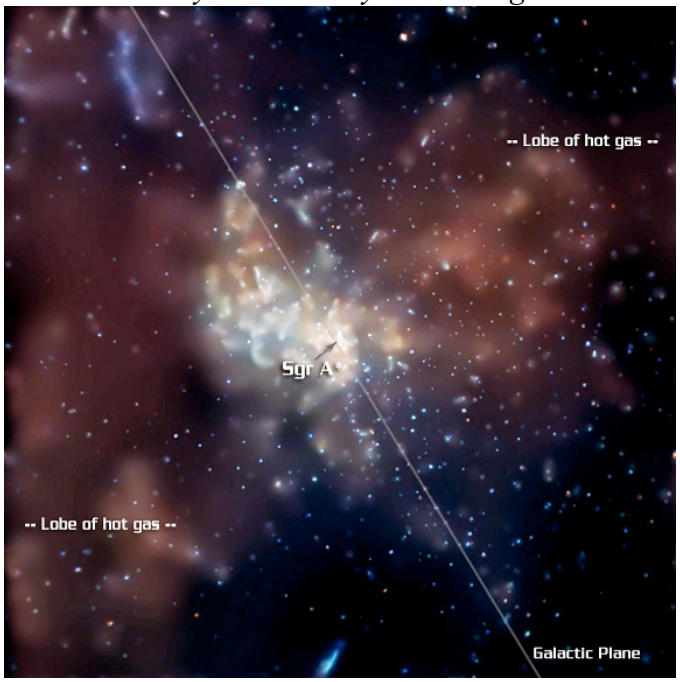
Chandra Science Highlight

Sagittarius A* (Sgr A*): The Supermassive Black Hole at the Center of the Milky Way Galaxy

Chandra X-ray Observatory ACIS Image.



Scale: Image is 8.4 arcmin per side

This Chandra image of Sgr A* was made from 164 hours of observation time over a two-week period. In addition to the location of Sgr A*, annotations indicate the plane of the galaxy (line extending from upper left to lower right) and the newly discovered large lobes of multimillion-degree gas that extend for dozens of light years on either side of the black hole.

- During the 2-week observation period, the black hole flared up in X-ray intensity half a dozen or more times. The cause of these outbursts is not understood, but the rapidity with which they rise and fall indicates that they are occurring near the event horizon around the black hole.
- Even during the flares the luminosity of the X-ray emission from the vicinity of the black hole is relatively weak, ~3 x 10^{34} erg/s.
- The huge lobes of 20 million K gas indicate that enormous explosions occurred near the black hole several times over the last ten thousand years. These explosions may have cleared out the gas around the black hole and explain why the black hole is a faint X-ray source.
- More than two thousand other X-ray sources were discovered. These are probably binary star systems containing a normal star and a collapsed white dwarf, neutron star or black hole companion.

Credit: NASA/CXC/MIT/F.K. Baganoff et al.