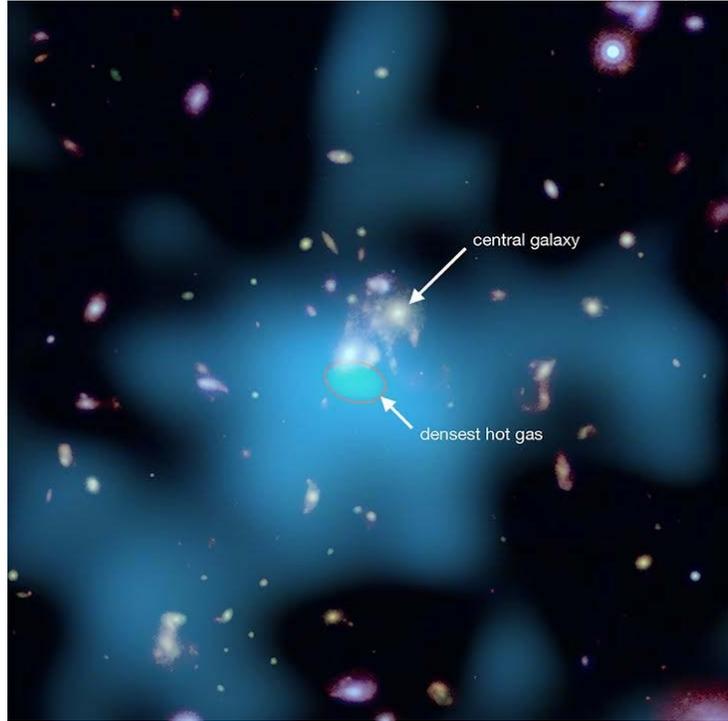




Chandra Science Highlight

Evidence of runaway gas cooling in the absence of supermassive black hole feedback at the epoch of cluster formation



Caption: This composite image of X-rays from Chandra (light blue) and optical and infrared data from Hubble (light yellow and pink) shows a galaxy cluster containing a central supermassive black hole that has stopped being active. The X-rays show hot gas in the cluster and the Hubble data shows the galaxies. The largest galaxy in the cluster and the host of the black hole is labeled, as is the location of the densest hot gas seen with Chandra. The coolest gas detected by Chandra and the site of the most rapid star formation is located about halfway between the densest gas and the central galaxy.

- A new study reveals what happens when a supermassive black hole in the center of a galaxy cluster stops being active.
- By combining data from Chandra, Hubble, and Spitzer data, astronomers found prodigious star formation in the cluster known as SpARCS1049. The cluster is producing stars at a rate about 300 times that seen in the Milky Way galaxy.
- The Chandra data show that a large amount of X-ray emitting gas near the center of the cluster has cooled enough to trigger this rapid star formation.
- The result is in contrast with many other clusters that show activity from supermassive black holes keeping gas too hot to form many stars.

Distance estimate: About 9.9 billion light years
($z=1.709$)

Scale: Image is about 50 arcsec (1.4 million light years)
across

Credit: X-ray: NASA/CXO/Univ. of Montreal/J.
Hlavacek-Larrondo et al; Optical/IR: NASA/STScI

Instrument: ACIS

Reference: Hlavacek-Larrondo, J., et al, 2020 ApJL,
898, 50; [arXiv:2007.15660](https://arxiv.org/abs/2007.15660)

**CXC Operated for NASA by the Smithsonian
Astrophysical Observatory**



August 2020