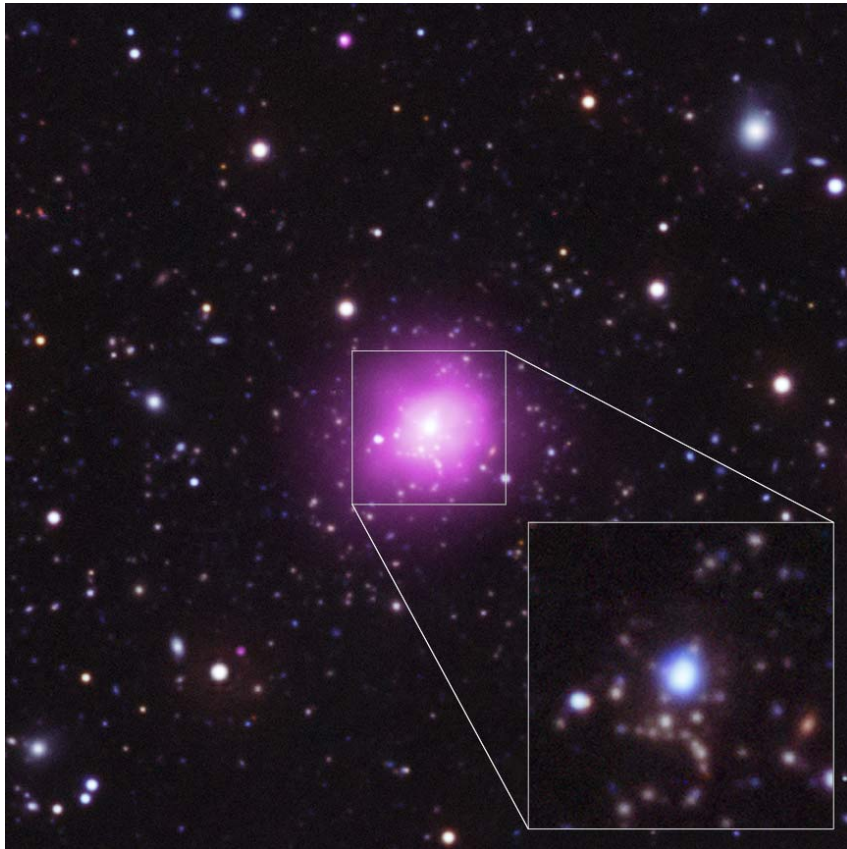




# Chandra Science Highlight

## The Phoenix Cluster: A Highly Luminous Galaxy Cluster with a Cooling-Flow Induced Starburst

Chandra ACIS Image



An X-ray/UV/optical composite of the Phoenix Cluster with a pull-out of the UV/optical composite showing the central part of the cluster. Color code: Data from NASA's Chandra X-ray Observatory is in purple, an ultraviolet (UV) image from NASA's Galaxy Evolution Explorer (GALEX) is in blue and an optical image from the 4m Blanco telescope is in red, green and blue.

- \* The pull-out shows that the central galaxy has much bluer colors than the nearby galaxies in the cluster, revealing the presence of large numbers of hot, young massive stars because of the enormous rate at which stars are forming.
- \* Stars are forming in the Phoenix Cluster at a rate of 740 solar masses/yr, the highest rate ever observed for the middle of a galaxy cluster.
- \* The data also indicated that the rate of hot gas cooling in the central regions of the cluster is  $\sim 4000$  solar masses/yr, the largest ever observed.
- \* The Phoenix Cluster has an X-ray luminosity of  $8 \times 10^{45}$  ergs/s, the highest of any known cluster, and a mass  $\sim 3 \times 10^{15}$  solar masses, making it among the most massive of clusters.

Distance Estimate: About 5.7 billion light years;  $z=0.596$

Credit: X-ray: NASA/CXC/MIT/M.McDonald; UV:  
NASA/JPL-Caltech/M.McDonald;  
Optical: AURA/NOAO/CTIO/MIT/M.McDonald;

Reference: McDonald, M. et al, 2012 Nature, 488, 349-52,  
arXiv:1208.2962

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