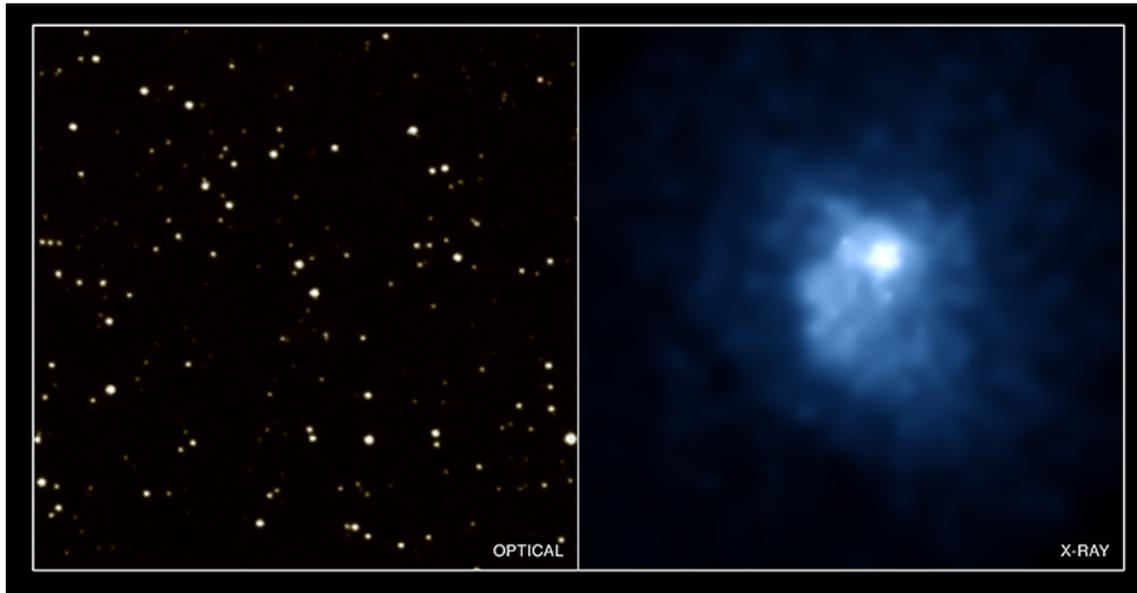




Chandra Science Highlight

3C438: Galaxy Cluster Takes it to the Extreme



This side-by-side comparison illustrates the dramatic differences between optical (left) and X-ray (right) images of the galaxy cluster associated with the powerful radio source 3C438. The optical image shows the starlight from the billions of stars contained in each of the individual galaxies in the cluster, whereas the X-ray image reveals an enormous cloud of hot gas that contains more mass than all the stars in all the galaxies in the cluster.

Chandra X-ray Observatory ACIS image.

- The temperature of the gas in the cluster is about 170 million Kelvins, making it one of the hottest clusters ever detected.
- Chandra's image reveals evidence of an arc-like discontinuity in surface brightness extending 2 million light years from the upper left to the lower right of the image.
- An enormous amount of energy ($\sim 3 \times 10^{62}$ ergs) would be required to produce such a large structure.
- One plausible scenario is that two massive clusters collided at high velocity and later merged. This would have created a shock front in the hot gas that could account for the ridge seen in the Chandra data.

Reference: Kraft, R.P. et al., 2007, *Astrophys.J.* Submitted