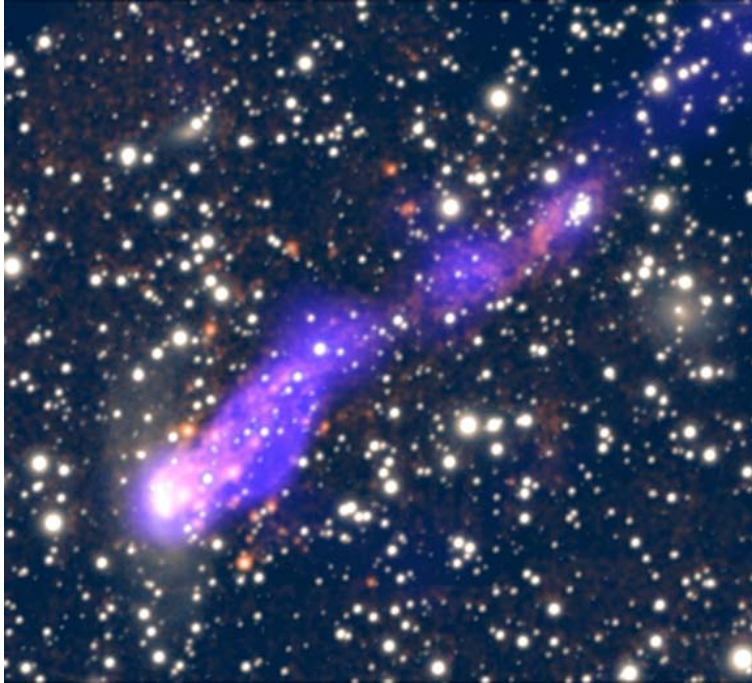




# Chandra Science Highlight

## THE GALAXY ESO 137-001 IN THE GALAXY CLUSTER ABELL 3627 – EVIDENCE FOR FORMATION OF ORPHAN STARS IN A LONG GASEOUS TAIL



Chandra X-ray Observatory ACIS image.

Scale: The image is 3 x 2.8 arc minutes across

Estimated distance: 220 million light years

Credit: X-ray: NASA/CXC/MSU/M.Sun et al, ESA/MSU/M.Sun et al; H-alpha/Optical: SOAR (MSU/NOAO/UNC/CNPq-Brazil)M.Sun et al.

This x-ray (blue) and optical (red and white) composite image shows a comet-like tail extending for more than 200,000 light years outside its parent galaxy. The feature was created by stripping of gas from the galaxy ESO 137-001 as it moves at a high speed through the 70 MK gas that pervades the galaxy cluster Abell 3627. The X-ray emission is from a mixture of hot interstellar matter pulled from the galaxy and the hot intracluster gas. Hydrogen-alpha line emission, shown in red, is from relatively cooler, 10,000 K gas stripped from the galaxy. The white sources are mostly foreground stars in our Milky Way galaxy.

- The observations indicate that millions of stars have formed from the gas in the tail in the last ten million years or so.
- Because the large amounts of gas and dust needed to form stars are typically found only within galaxies, astronomers have previously thought it unlikely that large numbers of stars would form outside their parent galaxy.
- This discovery suggests that such “orphan” stars may be much more prevalent than previously thought.
- The process that produced this galactic tail is an important but short-lived stage in the transformation of a galaxy. After a few hundred million years, most of the gas will be scoured from the galaxy, depleting the source of material for the tail and for star formation in the galaxy as well.

Reference: Sun, M. et al 2007, ApJ, accepted; Sun, M. et al, 2006, ApJ, 637 L81