



# Chandra Science Highlight

## X-ray Image of the Central Region of the Andromeda Galaxy M31



*Chandra X-ray Observatory ACIS image.*

Credit: NASA/UMass/Z.Li & Q.D. Wang

This color-coded Chandra image (red/low energy, green/medium energy, and blue/high energy X-rays) shows the central region of the Andromeda Galaxy, a.k.a. M31 where a diffuse, X-ray emitting cloud of hot gas was discovered in the midst of a collection of point-like sources.

- Analysis of the X-ray data shows that the point sources are associated with binary star systems that contain a neutron star or black hole that is accreting gas from a normal star.
- The diffuse X-ray cloud is due to gas that has accumulated in the central region and been heated to millions of degrees, probably by shock waves from supernova explosions.
- The energy input from supernova shock waves could also be driving gas out of the central region, a process that may affect both the shape and evolution of the galaxy by depleting the raw material for the formation of new stars and preventing more gas from accumulating there.

### References:

Z.Li and D.Wang 2006, 208<sup>th</sup> Meeting of the American Astronomical Society, Calgary, Alberta, Canada.

See also H. Takahashi et al., 2004, *Astrophys.J.* 615:242, and A.Dosaj et al. 2002, *The High Energy Universe at Sharp Focus: Chandra Science*, ASP Conference Proceedings, Vol. 262, Edited by E. Schlegel and S. Vrtilik