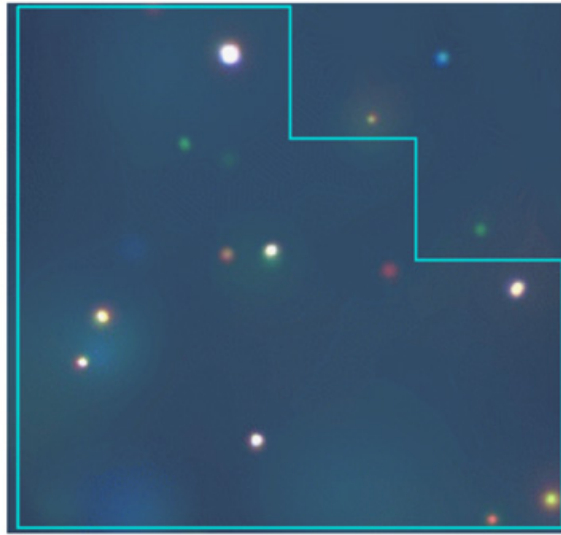
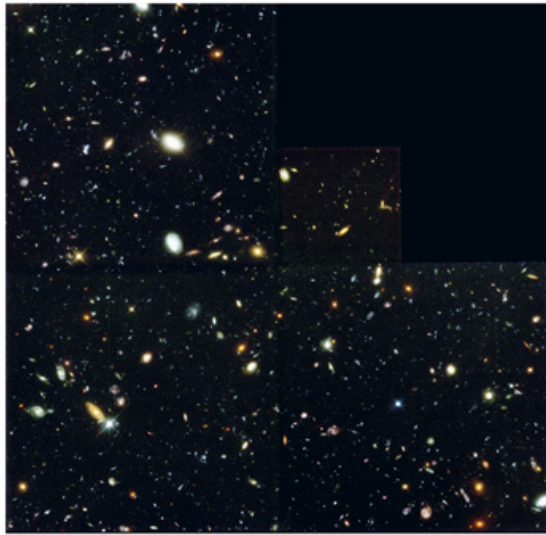




Chandra Science Highlights

Hubble Deep Field North. A 500,000 second Chandra image of an area in the sky known as the Hubble Deep Field North



Scale: Image is 2.5 arcmin on a side

Chandra's image provides a deep X-ray exposure of one of the most intensively studied patches of the night sky -- the Hubble Deep Field North: This area has been examined at all wavelengths, from radio through optical and now X-ray. About half the X-ray sources in this image are due to supermassive black holes in the centers of active galaxies and quasars. Other sources include galaxies that are much like our own Milky Way galaxy, but several billion years younger. The X-rays are color coded with shades of red representing lower energies and blue representing the highest energies.

Credit: NASA/PSU/G.Garmire, N.Brandt et al.
Chandra X-ray Observatory ACIS Image

- **12 X-ray sources are detected in the Hubble Deep Field North**
- **Optical redshifts of the X-ray sources range from $z=0.089$ to 3.479**
- **9 of the 12 X-ray sources have a redshift less than 1**
- **3 of the sources are normal galaxies at redshifts less than 0.2; this shows that Chandra can study the X-ray evolution of normal galaxies such as our own a billion or more years into the past.**
- **10 of the 12 X-ray sources are also detected at infrared wavelengths, and 9 at radio wavelengths.**
- **One source just outside the field has not been detected optically. It may be an extremely distant quasar or galaxy undergoing a burst of star formation.**