Chandra - VLA-FIRST Ultraluminous X-ray sources

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We have searched the VLA-FIRST catalog for potential radio counterparts to Ultraluminous X-ray source (ULX) candidates. Five radio sources (two in NGC 4490 and one each in NGC 4631, NGC 5194 and NGC 5775) with offsets between 0.4 and 4 arcsec from their Chandra positions were identified. Analysis of new and archival radio, infrared, optical, and X-ray observations of these sources are presented. We conclude the object in NGC 5775 and one of the objects in NGC 4490 are likely recent supernovae while the remaining three objects lack distinct optical counterparts and their nature remains uncertain.

Circinus galaxy X-2

Top right is an HST image of CG X-2, a ULX in the Circinus galaxy, which coincides with an m_v = 22.2 object located in an H_2 halo.

The middle panel shows the XMM-Newton EPIC-PN and Chandra spectra of CG X-2. The higher sensitivity XMM-Newton spectrum clearly shows the presence of strong Fe Kα and other emission lines. The XMM-Newton EPIC-PN light curve in the bottom panel displays no short-term variations of this source. In the ROSAT HRI observations of the Circinus galaxy between 1995 and 1997, CG X-2 was undetected.

A ULX in NGC 4631

The 2MASS image of NGC 4945 shows an object near the position of the ULX (left, top). This ULX is located in a starforming region and is close to a star cluster. The optical counterpart to the ULX is not clearly detected in the HST image of the galaxy (left, bottom).