MULTI-WAVELENGTH STUDY OF ROSAT CLUSTERS OF GALAXIES

A. D. REID AND R. W. HUNSTEAD
School of Physics, University of Sydney
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AND

M. M. PIERRE
CEA/DSM/DAPNIA CE Saclay, France

We are engaged in a radio–IR–optical–X-ray study of two flux-limited samples of ROSAT clusters of galaxies south of declination $-20°$ (Pierre *et al.*, 1994a). One sample covers an area of 1750 deg^2 in Hydra (Pierre *et al.*, 1994b) and includes some distant ($z \approx 0.3$) and X-ray luminous ($L_X \approx 10^{45}$ erg s^{-1}) clusters. The other sample derives from a volume-limited subset (nominally $z \leq 0.1$) of southern X-ray clusters, which are the focus of an ESO Key Program (Guzzo *et al.*, 1995).

An observing program with the Molonglo Observatory Synthesis Telescope (MOST) at 843 MHz and the Australia Telescope Compact Array (ATCA) at 1.4 and 2.4 GHz has been undertaken to complement existing optical spectroscopy and photometry (ESO and CFHT), pointed X-ray (ROSAT PSPC and HRI) images, and scheduled FIR (ISO) observations.

Our radio observations, together with data at other wavelengths, are helping to give a more comprehensive picture of the cluster environment. As an example, we have chosen a cluster in the Hydra region, ROSAT RXJ 12 54.4 −29 01, part of the A3528 complex at $z = 0.0535$ and located in an important region of the sky, the Shapley 8 supercluster. In Figure 1 we show a preliminary montage of images for this cluster (Pierre *et al.*, 1995, in prep.). There is a strong radio source (A: 0.59 Jy total at 843 MHz) coincident with the X-ray centroid, suggesting that non-thermal emission from an active nucleus may be contaminating the extended thermal X-ray emission from the intracluster medium. MOST detects an additional source (B: 0.52 Jy total) south of the X-ray centroid but still within the X-ray envelope.

R. Ekers et al. (eds.), Extragalactic Radio Sources, 353–354.

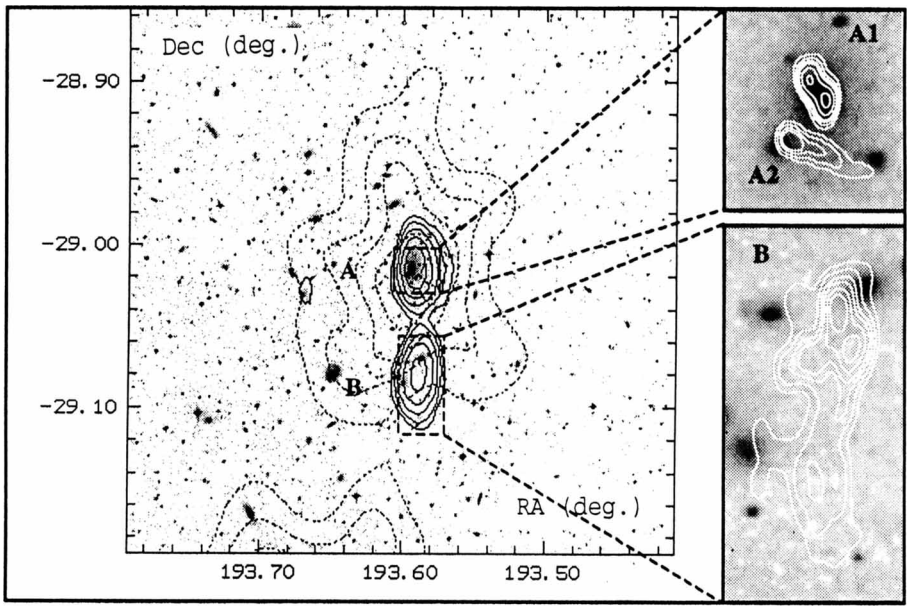

Figure 1. Multi-wavelength overlay in the region of A3528; coordinates are for equinox J2000. *Left:* X-ray contours of RXJ 12 54.4 −29 01 are shown dotted and MOST contours as continuous, against a background of the NASA/STScI digitized sky survey. *Right:* ATCA contour images of source A at 2.4 GHz and B at 1.4 GHz are shown in white, superposed on smoothed greyscale images from the DSS.

The ATCA images reveal considerable structure in both these sources. At 2.4 GHz A is clearly resolved into two separate sources. The northern component A1 is a close double, possibly a wide-angled tail source, coincident with the cD galaxy. The southern component A2 has a head-tail morphology and is most likely identified with the bright galaxy lying close to the radio peak. These identifications are supported by lower-resolution 4.8 GHz VLA images (Gregorini *et al.*, 1994). Source B, which is relatively diffuse, appears to have a narrow-angled tail structure associated with the bright galaxy just to the NW of the two emission peaks. The implied direction of motion is towards the X-ray centre and source A.

References

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