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A *CHANDRA* SURVEY OF THE 'BAR' REGION OF THE SMC

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We present the first results from a *Chandra* survey of the central region of the Small Magellanic Cloud. We detect a total of 122 sources down to a limiting luminosity of $\sim 4.3\times10^{33}$erg s^{-1}, including 4 pulsars, 5 SNRs and two new transient sources. We also identify 18 more transient candidates based on comparison with ROSAT and ASCA surveys.

In order to study in detail the faint end of the X-ray source population in the young part of the SMC we initiated a *Chandra* survey of the 'Bar' region (Fig 1).

We detect 122 sources down to a limiting luminosity of $\sim 4.3 \times 10^{33}$ erg s^{-1}, which is ~ 10 times lower than in any previous survey of the SMC. The spectral parameters of the brightest sources indicate that they are X-ray binary pulsars (Taylor *et al.* 2004, in prep). This is confirmed in 4 cases where we detect pulsations with periods of $\sim 10-500$ sec (Taylor *et al.* 2004; see also Edge, *et al.* 2004a,b,c).

Based on theit soft colours and spatial extent we identify at least 5 supernova remnants (SNRs) (3 of which were previously known). In two thermal SNRs we find weak ($\sim 10^{34}$ erg s^{-1}) off-center hard point-like sources (possibly associated with pulsars detected in the same regions by the ASCA survey; Yokogawa *et al.* 2003)

The high spatial resolution of *Chandra* allows us to initially identify optical counterparts for 35 sources, 13 of which are new identifications. Comparison with previous ROSAT (Kahabka *et al.* 1999; Haberl *et al.* 2000; Sasaki *et al.* 2000) and ASCA (Yokogawa *et al.* 2003) osbervations indicate that at least two of the detected sources are transients. Eighteen sources previously detected by ROSAT and/or ASCA were not detected in our survey despite the 10-fold increase in sensitivity sensitivity, indicating that they may also be transients.

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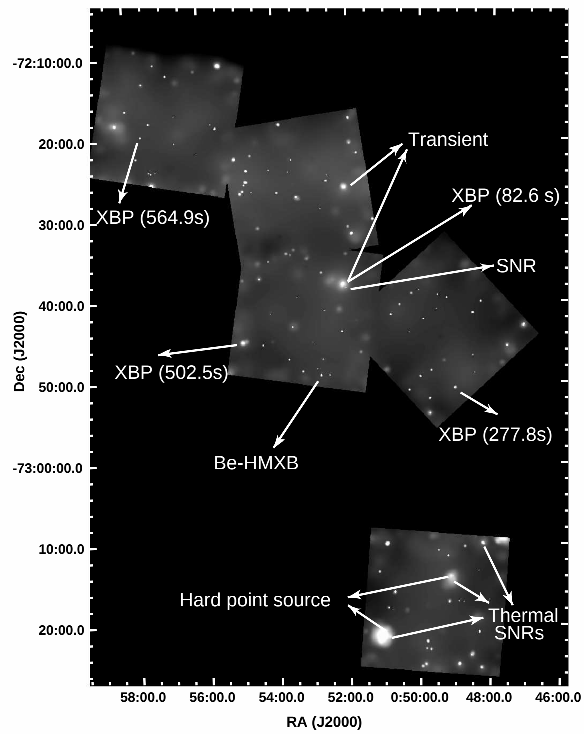

Fig. 1. A full band (0.5-7.5 keV) adaptively smoothed, exposure corrected image of the 5 *Chandra* fields showing a few examples of identified pulsars, transient sources and SNRs.

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