

letters

Discovery and optical identification of 2S0921-630

THE discovery of a faint X-ray source with the X-ray detectors on SAS 3 at a location with galactic coordinates $l^{\text{II}} \sim 282^\circ$, $b^{\text{II}} \sim -9^\circ$ is reported here. A subsequent optical search has revealed a likely optical counterpart in the form of a 17th magnitude star with He II 4686 and H β in emission. It is, therefore, likely to be a low-luminosity galactic X-ray source.

From 10 to 14 February 1978, the rotation modulation collimator X-ray detectors¹ on SAS 3 were used to search for X-ray emission from a region centred at $\alpha \sim 135^\circ$, $\delta \sim -67^\circ$. Data were accumulated from a total exposure of 130,000 s. The correlation maps show a previously unreported X-ray source, which we designate 2S0921-630 at $\alpha = 09 \text{ h } 21 \text{ min } 25.4 \text{ s}$, $\delta = -63^\circ 04' 27''$ (1950 Equinox) with an error circle of radius $30''$ (90% confidence). Figure 1 is an enlarged reproduction from the ESO (B) survey print with the error circle superposed. The average flux density of the source during the observation was $2.3 \pm 0.3 \mu\text{Jy}$ at 5.2 keV ($1 \mu\text{Jy} = 0.242 \times 10^{-11} \text{ erg cm}^{-2} \text{ s}^{-1} \text{ keV}^{-1}$).

Optical observations of stars in the above error circle were made with the 3.6 m telescope of the European Southern Observatory (ESO). To search for a candidate counterpart with possible strong H α emission, one of us (S.L.) took a direct prime-focus plate, through a 30 \AA wide H α filter, of the region of the sky centred on the error box. Star No. 5 in Fig. 1 is remarkably bright on this plate. We estimate from the ESO survey print that its photographic magnitude is approximately 17.

Spectrograms (60 \AA mm^{-1}) were taken (by J.v.P.) of this star with the Carnegie image tube attached to the Boller and Chivens Cassegrain spectrograph. The plates were taken on 13 March 1978, 03.33 UT and 04.07 UT and have exposure times of 40 and 20 min, respectively. IIa-O (baked) plates were used and

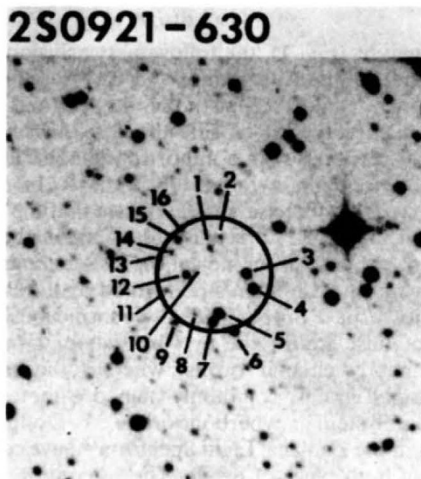


Fig. 1 Error box of 2S0921-630 superposed on the ESO survey print. Star No. 5 is the proposed optical counterpart.

the spectra have a widening of 0.2 mm. They cover the wavelength range from $\sim 3,700$ to $\sim 5,000 \text{ \AA}$. Density tracings of the spectra were made with the Faul-Coradi microphotometer of the Observatory of Utrecht. The only features clearly visible in the spectrum are a strong He II 4686 and a weak H β line, both in emission. Strong He II emission lines are generally present in the spectra of the counterparts of X-ray sources (see refs 2 and 3) but not usually in those of normal stars; on the basis of the above characteristics we consider star No. 5 a likely candidate for the optical counterpart of 2S0921-630.

The optical spectrum of this object is similar to the spectra of the optical counterparts of Sco X-1 and the similar galactic X-ray sources that have been discussed by McClintock *et al.*². It is interesting, however, that the ratio of X-ray to optical luminosity for 2S0921-630 is ~ 10 which is much smaller than the ratios for other members of this class of counterparts which are typically of the order of 1,000. The X-ray luminosity of the sources is $\sim 6 \times 10^{35} (D/10 \text{ kpc})^2 \text{ erg s}^{-1}$. It may belong to the class of low luminosity galactic X-ray binaries.

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Simultaneous radio and X-ray observations of MXB1837+05 (Ser X-1)

DURING a continuing program of radio observations of X-ray sources carried out with the NRAO very large array (VLA), we have made high sensitivity searches for radio emission from MXB1837+05 = Ser X-1 (ref. 1), particularly during the SAS 3 MIT world-wide X-ray burster watch in June 1977². Observations of MXB1837+05 were carried out on 26 April, 12 and