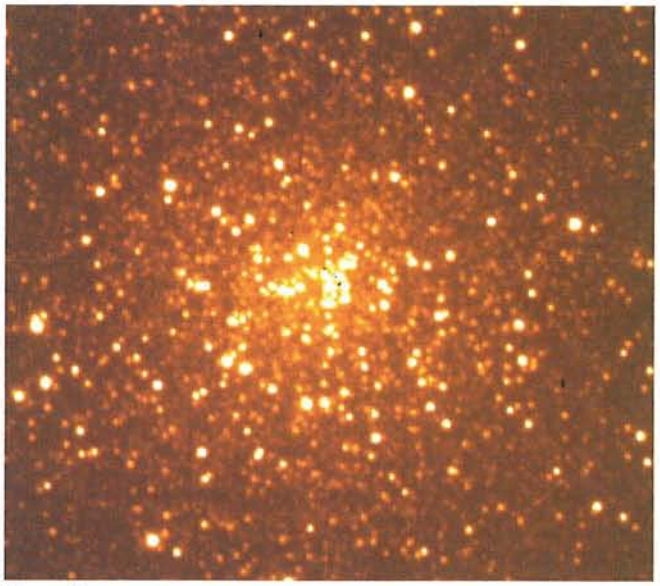

Figure 3.

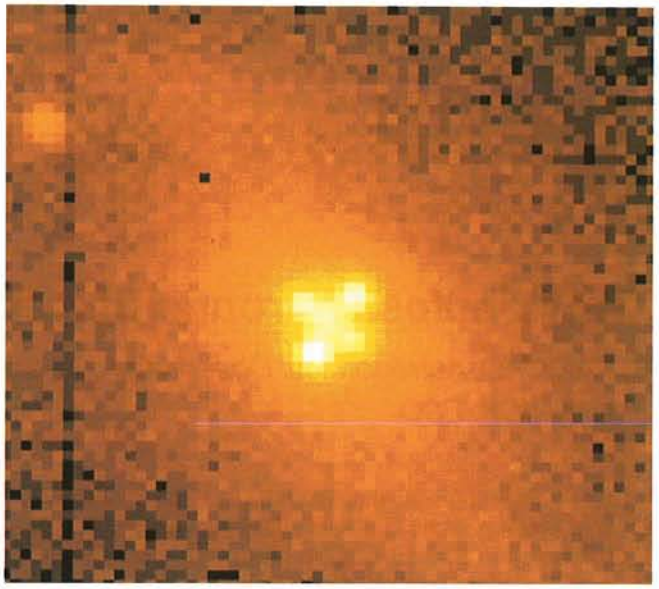

Figure 4.

ate the telescope. In particular we would like to thank Mr. Gaetano Andreoni for his help with the software and with the active optics system.

Special thanks are due to the night assistants, Messrs. Jorge Miranda and Manuel Pizarro for their skill and patience to master the still unfinished telescope and building control system. They performed a large fraction of the observations very efficiently, and their work was instrumental in allowing us to compile large catalogues of planetary nebulae, QSOs, and galaxies observed with unprecedented spatial resolution.

Spatially Resolved Images of the Optical Counterpart to Circinus X-1

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We have obtained high resolution images in which the optical counterpart to the X-ray binary Circinus X-1 is resolved. The images were obtained on 16 and 18 August 1989 using EFOSC2 in direct imaging mode on the ESO New Technology Telescope (NTT). A 30″ × 30″ portion of each image, centred on Cir X-1, is shown in Figure 1. The V and R images obtained on 16 August are reproduced in panels a and b, while the R and I images obtained on 18 August are reproduced in panels c and d. The integration time was 60 sec for all images; and all images have been bias corrected and flat fielded. The FWHM of the stellar profiles was 0″.5 on 16 August and 0″.9 on 18 August.

Argue et al. (1984) presented B and R images obtained in ~1″.5 seeing in which the position of Cir X-1, accurately determined by the authors from radio VLBI during a flare, is shown to be located at the southern end of an extended structure. In the NTT images, that extended structure is resolved into three separate stars, and the position of Cir X-1 coincides with the southernmost of these stars. Accurate photometric

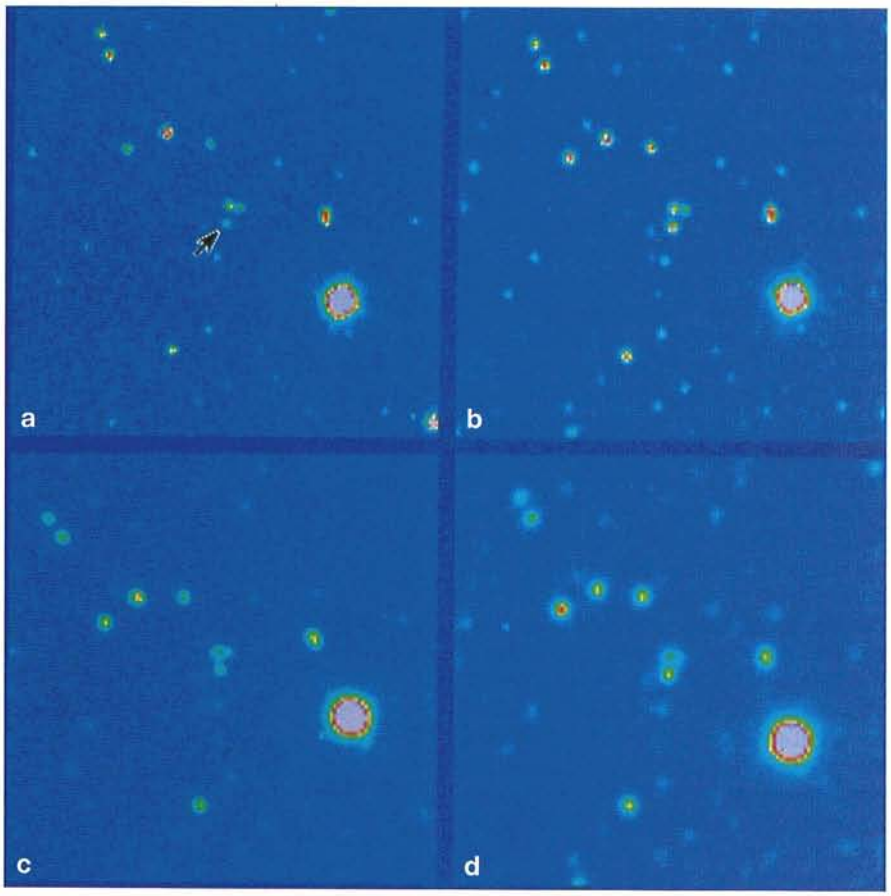

Figure 1: *Images of Cir X-1 in V, R (upper panels), and R, I (lower panels). North is up and East is to the left. Cir X-1 is identified with the southernmost of the three stars in the centre of the field. The FWHM of the stellar profiles is 0″.5 in the top panels, and 0″.9 in the lower panels.*

measurements are in progress, but a comparison of our V, R, and I images shows that this star is quite red. This is a well-known property of Cir X-1 (Whelan et al. 1977), and corroborates our identification of this star with Cir X-1. For further confirmation, we will attempt to monitor the optical source during a flare. The detection of such a flare in the visible will further secure the identification of the aforementioned source with the X-ray source.

References

Argue, A.N., Jauncey, D.L., Morabito, D.L., and Preston, R.A., 1984: *Mon. Not. R.A.S.*, **209,** 11p.

Whelan, J.A.J., et al., 1977: *Mon. Not. R.A.S.*, **181,** 259.

The Nebulosity Around BL Lac Objects

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BL Lac objects (hereinafter BLL) are a class of active galactic nuclei which exhibit strong non thermal emission from radio to X-ray frequencies. Strong and rapid variability, together with optical polarization and very weak or absent emission/absorption features, are defining properties of the class.

In several cases BLL are surrounded by a nebulosity; however, for only 7 objects, out of the ~100 currently attributed to this class, the nebulosity has been studied in detail and has been shown to be consistent with an elliptical galaxy. In a dozen other cases, only indirect evidence of the presence of a galaxy, either from the detection of so-called *fuzz* or marginal detection of stellar absorption lines in the spectra, has been reported. Moreover, in some cases the shape of the nebulosity does not conform with that of a normal elliptical: asymmetries and/or complex structures are visible.

The detailed study of these nebulosities (and of the close environment of BLL), a key tool for understanding the nature of this intriguing class of objects, requires the ability to detect faint features very close to bright point-like sources. This is not an easy task.

With the ESO New Technology Telescope in operation, this requirement is met. In fact, several images of selected BLL (in all ten objects) have now been obtained with the NTT (+ EFOSC2 + CCD No. 5 with R filter) in good seeing conditions (0.6 to 0.8 arcsec) during the commissioning time. A wealth of information about the nebulosity surrounding the observed objects is present in the frames and is now subject to detailed analysis. We can anticipate that for a substantial fraction of the objects the presence of previously undetected nebulosities or faint structures or companions, only a few arcseconds apart, can be clearly demonstrated. A full report on these results will be presented in a forthcoming paper (Falomo and Melnick, in preparation).

As an example of the results obtained so far, we here mention the case of the well studied BL Lac object PKS 2155-30, one of the brightest of its class. The V-magnitude varies from 12.8 to 14.0, and it was discovered as the counterpart of the X-ray source H2155-30 by Griffiths et al. (1979). These authors reported the presence of an east-west asymmetric nebulosity around the object (slightly extended to the east) on a red plate which was exposed for 30 minutes. By analogy with other BLL, they concluded that *the nebulosity is very likely the image of an elliptical galaxy.* Five years later Bowyer et al. (1984) obtained spectra of the nebulosity through a 2 arcsec slit centred 3 and 4 arcsec east of the nucleus (on the side of the reported diffuse elongation). In the latter position, absorption features due to a stellar population were detected at redshift z = 0.117. This redshift is however difficult to reconcile with absorption features observed in the X-ray (Canizares and Kruper, 1984; Treves et al. 1989) and UV spectra (Maraschi et al. 1988).

In order to verify the presence of the nebulosity around this object and investigate its nature we obtained two short

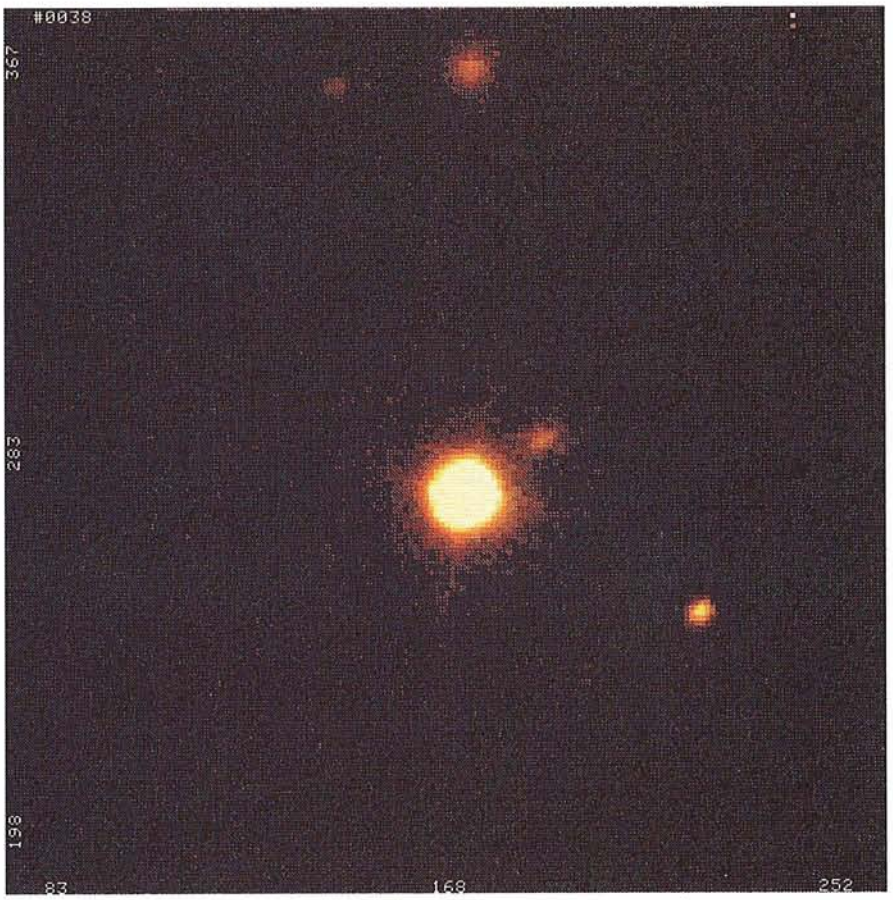

Figure 1: *An NTT (EFOSC 2 + CCD No. 5) 2-minute exposure behind an R filter showing the bright BL Lac object PKS 2155-30 (centre) together with the newly discovered extended object at an angular distance of 4.5 arcsec.*