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.

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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

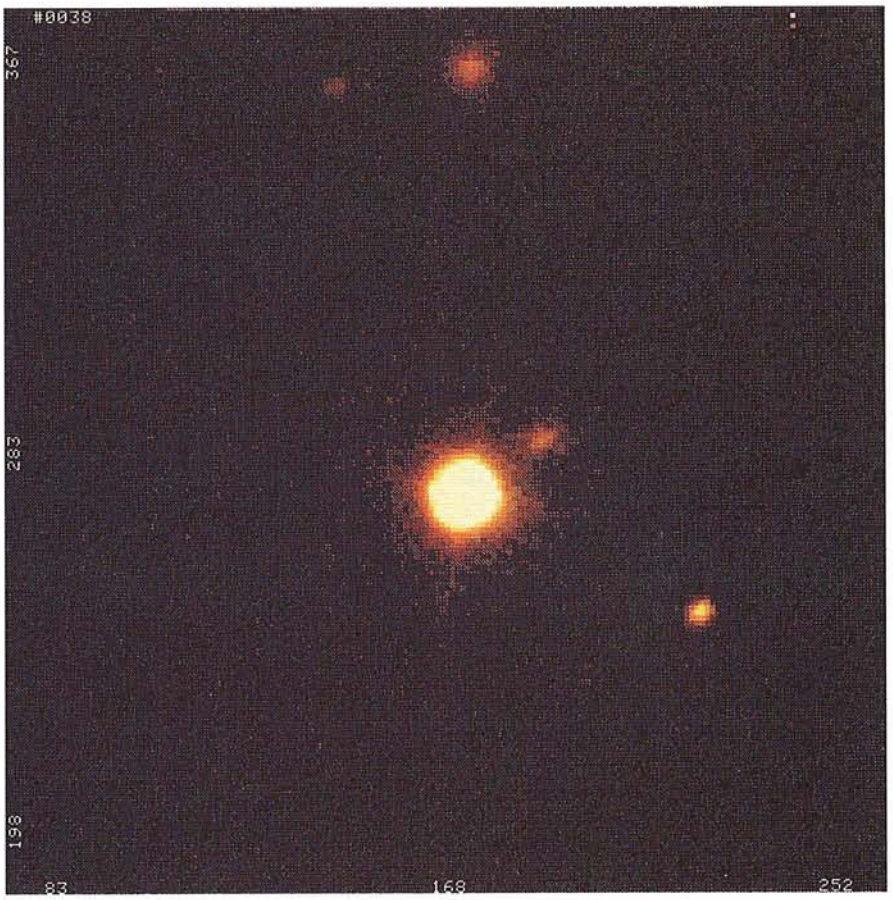

Figure 1: *An NTT (EFOSC 2 + CCD No. 5) 2-minute exposure behind an R filter showing the bright BL Lac object PKS 2155-30 (centre) together with the newly discovered extended object at an angular distance of 4.5 arcsec.*

exposures (30 sec and 2 min, R filter) of the source near minimum brightness (V = 13.8) on August 12, 1989. No evidence of nebulosity around PKS 2155-30, down to a surface brightness of $m_R \approx 23$ mag/sq. arcsec is present, but in both images, a relatively faint ($m_R \approx 19$) object, about 4.5 arcsec east of the nucleus, is clearly seen (Fig. 1). This object is marginally resolved with some elongation in the east-west direction.

Thus the redshift reported by Bowyer et al. (1984), according to the quoted slit position, is more likely attributable to the angularly close object, now seen in our CCD frames, rather then to the BLL itself. Spectroscopy of the newly discovered object around PKS 2155-30 is being obtained.

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Possible Transition Objects Discovered with the NTT

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The 3.5-m NTT with EFOSC2 has been used to make images of about 280 planetary nebulae (PN) in two narrow passbands centred on Hα and [OIII] 5007. These data will be published in the near future in the form of a pictorial atlas. Since both [OIII] and Hα images were taken, a map of the high excitation gas can be made by dividing the frames; an example has been presented by (1).

Previously unknown faint haloes around PN have also been found during our survey. These haloes are important for the "missing mass" problem in PN: the mass of an average AGB (Asymptotic Giant Branch) star is greater than the combined masses of the central star (white dwarf) and nebula of typical PN. Haloes can contain up to ten times more mass than the bright central nebula (2).

There are many other interesting problems which can be addressed using these images, especially when combined with other data. Here I will discuss one application: the study of transition objects or proto-PN. Transition objects or TOBs are those rare objects that are in the rapid evolutionary phase between upper AGB and PN. They have started to produce a fast, tenuous wind which interacts with the old, slow and dense wind to form shocked ansae and bubbles. The importance that the study of these TOBs has, lies in the possible impact on our ideas about PN formation and, more generally, on the poorly understood final evolutionary stages of all intermediate mass stars. Observationally, these objects are characterized by a bipolar shape, usually with ansae formed by shocked gas, a strong far IR, and a smaller optical or near IR excess and emission lines at very high velocities.

Several such objects have been found using the NTT/EFOSC2 combination, mainly due to the superb seeing at this telescope. Figure 1 shows an Hα image of He2-1312, a PN which was previously classified as stellar. The seeing was

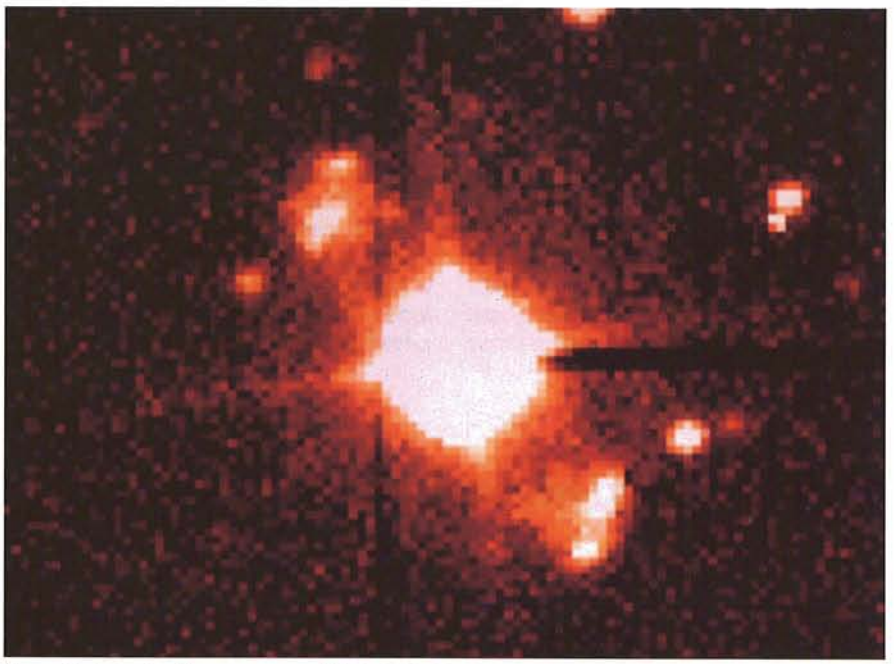

Figure 1: *A 2-min Hα exposure of He2-1312. Seeing is about 0.75 arcsec FWHM. This object was previously classified as a point source.*

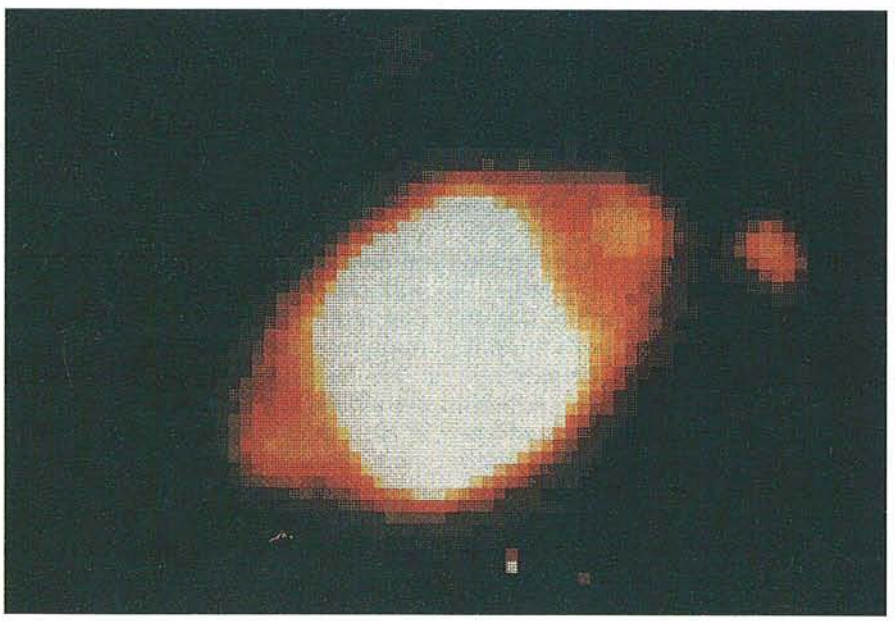

Figure 2: *A 10-min Hα exposure of 19+5° 1. Seeing is 0.8 arcsec FWHM. Note the faint, high excitation blobs.*