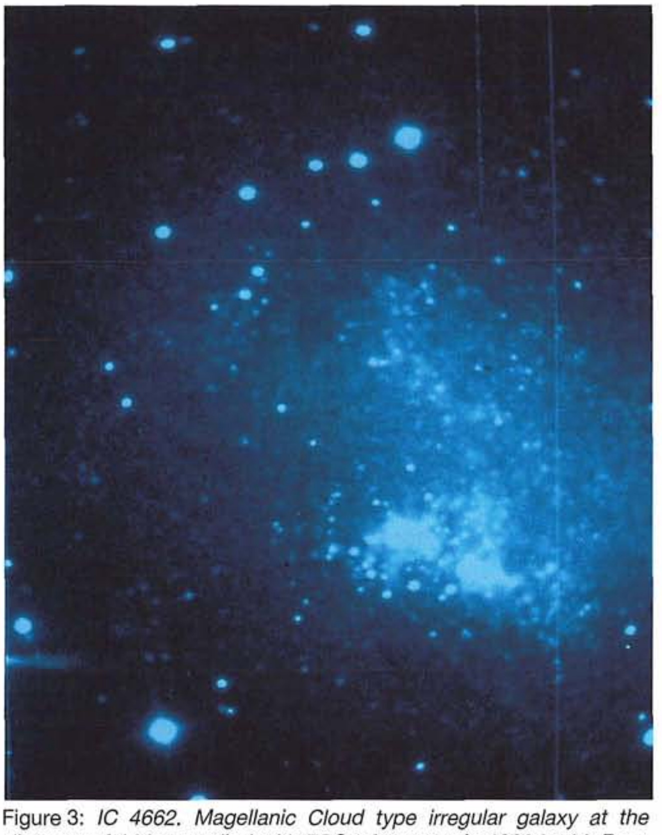

Figure 3: *IC 4662. Magellanic Cloud type irregular galaxy at the distance of 4 Mpc studied with ESO telescopes in 1983 by M. Rosa and G. Schnur. Evidence of violent star formation activities was detected. The galaxy is resolved in this NTT image which shows very clearly the two giant H II regions embedded in a super association. Seeing 0.65 arcsec.*

Figure 4: *NGC 613. The spectacular bar spiral SBb in which – thanks to the high resolution in this NTT picture – one can detect the detailed structure of dust filaments. Two major dust lanes extend along the bar into the nuclear region.*

All images were obtained without the adapter/rotator, therefore without the on-line active optics system. Moreover the modifications of the support system with the activation of the three fixed points was not implemented. Except for the region around the zenith, the optical quality was not optimal and we expect to be able to guarantee perfect images all over the sky only with the full implementation of the adapter/rotator and its image analyzer.

In the course of the last months many experiments have been performed on the seeing of the NTT. Studies of the behaviour of the rotating building, its flaps and windscreen, clearly indicate the advantages of this new design and the importance of the flaps to the point that the observer will be discouraged to operate the NTT with the flaps closed.

The commissioning work is proceeding actively and the adapter/rotator No. 1 was mechanically and electronically installed on the NTT in October. During the month of November the modifications of the fixed points were started and the implementation of the image analyser and guiding system initiated. For the second half of December the NTT will perform in its complete configuration with EFOSC 2 at the Nasmyth focus.

The 9 months from the first light obtained on 23 March to the first deep exposure seems at first sight to be very long but the complexity of the NTT and the need to cope with a seeing better than that forecast required greater tuning.

The first visiting astronomer is expected mid-January and we are impatient to receive constructive criticism to make even greater improvements on the NTT. In April 1990 the second adapter/rotator will be implemented and May/June will see the integration of EMMI. It will be commissioned during the European summer.

I would not like to complete this report without taking the opportunity to thank all those who have observed with the NTT in this critical period, for their unrelenting passion and understanding for the inevitable number of difficulties and conflicts between technical necessity and astronomical dreams.

The First Observations With the NTT

J. MELNICK, ESO

1. Introduction

The NTT was used for astronomical observations during two runs in May and August 1989. Both the telescope and the instrument (EFOSC2) worked remarkably well during both runs, so there was ample time for astronomical observations.

EFOSC2 was bolted onto the telescope without the instrument rotator/adapter and this meant that for most positions on the sky the exposure times could not exceed a few minutes.

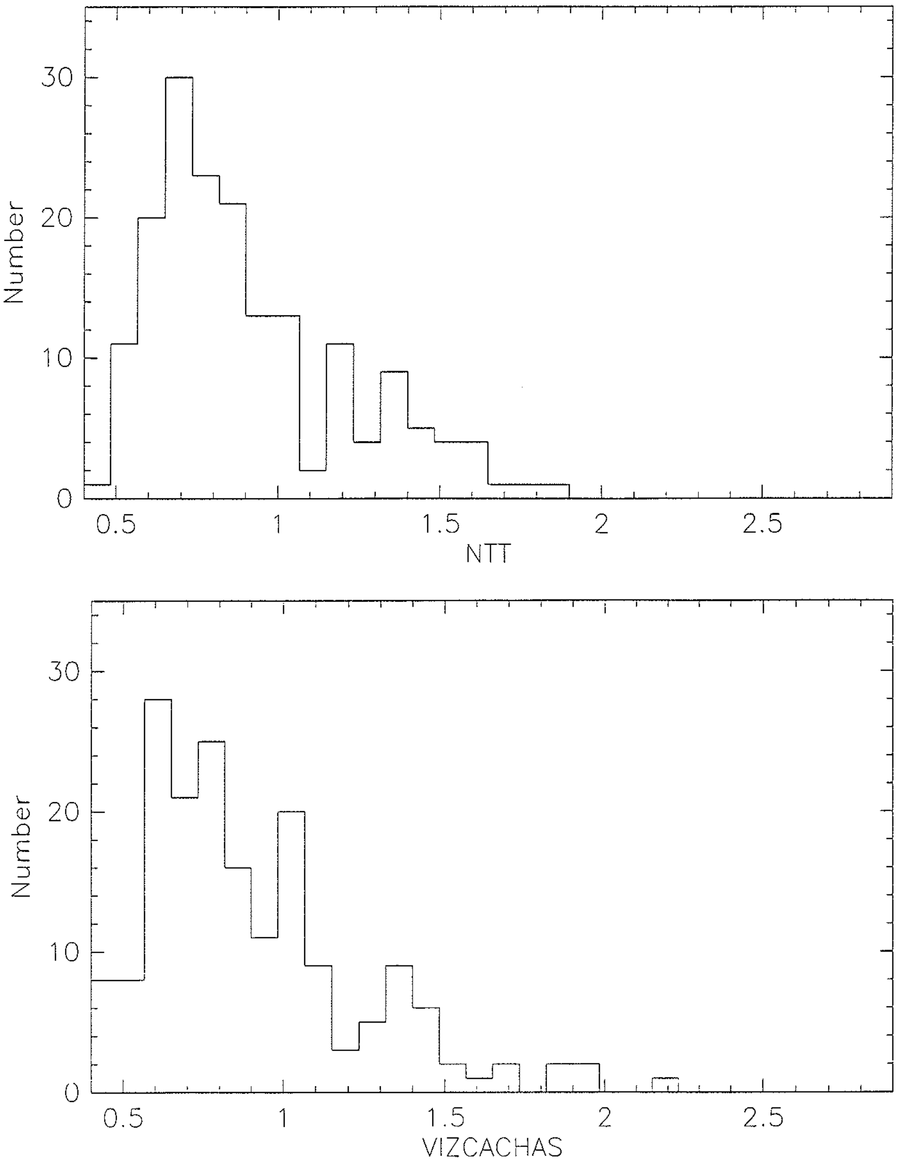

Figure 1: *Distribution of seeing at the NTT (top). Seeing measured at Vizcachas during the NTT run (bottom).*

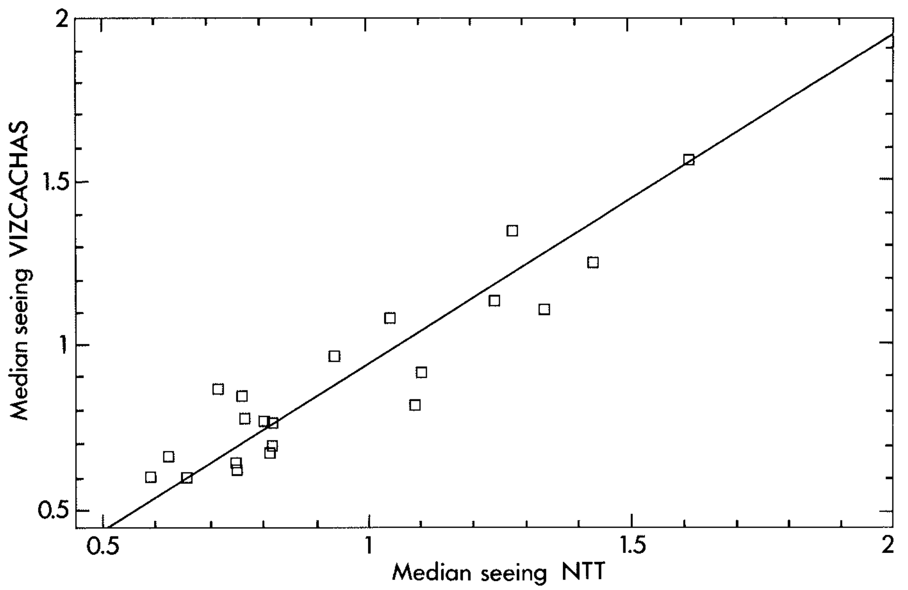

Figure 2: *Night to night comparison between the seeing recorded at the NTT and Vizcachas.*

2. Seeing

The superb optical quality of the telescope and the careful design of the dome allow the NTT to fully exploit the excellent quality of the La Silla sky.

During the second test run (August 4 to September 9), an effort was made to record the seeing systematically, every thirty minutes whenever possible. In this way, 345 seeing measurements were accumulated. For 224 of these observations, simultaneous measurements from the seeing monitor on Vizcachas were also recorded. The results are presented in Figure 1. The median seeing values are 0″.76 at Vizcachas and 0″.80 at the NTT (FWHM of stellar images referred to the zenith at 500 nm). The difference is not significant if one considers that the active optics system was not operational during the run, and the loads on the actuators were adjusted for positions close to the zenith.

3. First Scientific Results

The good seeing conditions which prevailed during the tests allowed us to tackle several interesting scientific problems in spite of the limitations imposed by field rotation. A "flexible scheduling" scheme was implemented where the telescope was allocated according to seeing. In fact, an important fraction of the observations were done by the telescope operators who selected the observing programmes according to the seeing conditions.

Figures 3 and 4 illustrate two results from these observations. Figure 3 shows a V frame of the compact globular cluster M80. The FWHM of the stellar images is about 0″.5 in this image. Images of a number of compact clusters were obtained under very good seeing conditions aimed at investigating the colour-magnitude diagrams in the central regions of very compact clusters.

Figure 4 shows an R frame of the gravitationally lensed quasar Q 2237 + 0305 (Einstein's cross). The four images of the QSO plus a fifth faint one, located near the centre of the cross (possibly the nucleus of the lensing galaxy), can be clearly seen in this image taken with 0″.65 seeing. The QSO was systematically monitored during the run to search for microlensing effects.

A number of early type spirals were imaged under very good seeing conditions in order to investigate the structure of their central regions.

Acknowledgements

It is a pleasure to thank all the TRS people who participated in the NTT project for helping us to learn how to oper-

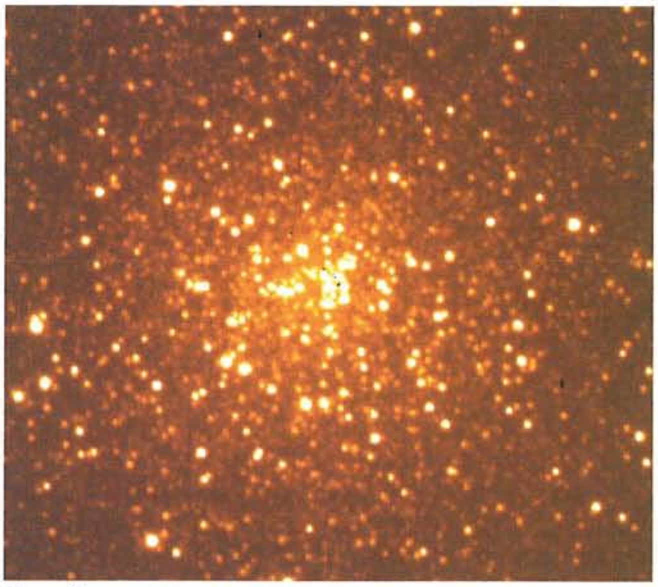

Figure 3.

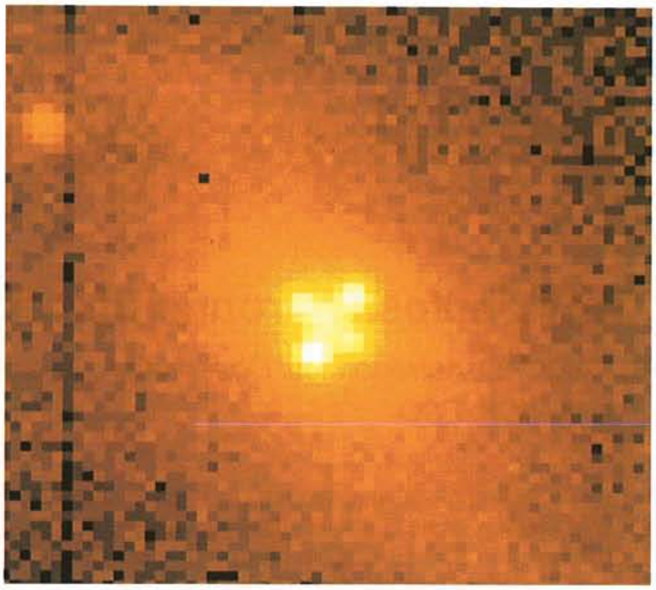

Figure 4.

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

A. MONETI, ESO

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

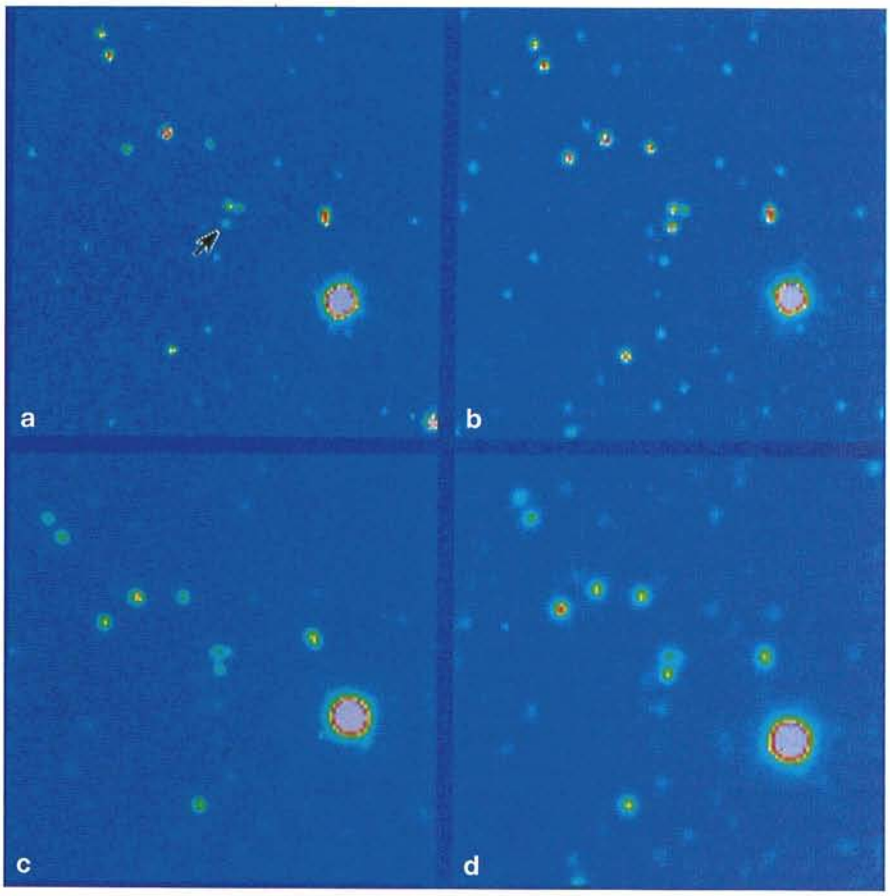

Figure 1: *Images of Cir X-1 in V, R (upper panels), and R, I (lower panels). North is up and East is to the left. Cir X-1 is identified with the southernmost of the three stars in the centre of the field. The FWHM of the stellar profiles is 0″.5 in the top panels, and 0″.9 in the lower panels.*