The La Silla News Page

The editors of the La Silla News Page would like to welcome readers of the eleventh edition of a page devoted to reporting on technical updates and observational achievements at La Silla. We would like this page to inform the astronomical community of changes made to telescopes, instruments, operations, and of instrumental performances that cannot be reported conveniently elsewhere. Contributions and inquiries to this page from the community are most welcome. (J. Brewer, O. Hainaut, M. Kürster)

News from the NTT

O.R. HAINAUT, ESO, La Silla

As the reader will notice, the "News from the NTT" are back in the La Silla News Page, marking the end of the "Big Bang" era (this major upgrade has been described in *The Messenger* Nos. 75–91). The NTT is now fully returned to the La Silla Observatory. With this, another era is finishing too: Gautier Mathys has left the Team. After 5 years at the NTT (i.e. since the beginning of the team itself), many of these as local representative of the Team Leader, and the last year as Team Leader, Gautier is now preparing the scientific operation of the VLT UT1 at Paranal. His excellent leadership, and his extensive, boundless and all-encompassing knowledge of the NTT systems will be missed by the Team. Since the 1st of August, the author has taken over the duties of NTT Team Leader; he will aim at continuing Gautier's work to improve the reliability and user-friendliness of the Telescope, while maintaining the full compatibility with the VLT environments.

During the past months, SOFI, the NTT infrared spectro-imager, has received its first visiting astronomers. The instrument proved to be extremely efficient, as illustrated by the paper by Chris Lidman in this issue of *The Messenger*. Its "second generation" observation templates, which make full usage of the interactive capabilities of the "Real Time Display", constitute an intuitive and effective interface that allows the observer to efficiently master all the modes of this instrument.

After its commissioning in January, SUSI2 experienced a series of problems, including loss of vacuum, sometimes accompanied by sudden warming up. These were caused by the rapid contraction of the O-ring sealing the dewar, which happens when some LN2 is spilled over them, e.g. when re-filling the instrument, or when moving it when it is still full. This problem should be solved by the end of August, with the installation of a dewar with improved O-rings and equipped with a device limiting the LN2 spilling. We should then be able to take full advantage of this new-generation dewar, capable of keeping the instrument cold for 48 hours.

A series of improvements of the system have also been implemented; a few examples and highlights follow:

• The CCD monitoring, which had received no new developments since the departure of Griet van de Steene in January 1998, has been taken over by Vanessa Doublier. Our three CCDs are now monitored weekly, and the results of these tests, including bias level, read-out noise, shutter delay and sensitivity, are presented on our instrument Web pages. We plan to continue implementing more tests into this monitoring of the detectors, as well as adapt it to the SOFI IR array.

• The focus offsets between the Image Analysis cameras and the scientific detectors has been measured. These offsets have been found extremely stable for SUSI2, while for EMMI and SOFI they show some slight variations with the rotator angle. It reflects the greater complexity of these instruments, which are subject to minor internal flexures. The Active Optics system is now calibrated to take these focus differences into account. As a consequence, the telescope is automatically focused while performing an image analysis.

• Various monitoring and technical templates are being developed to perform operation and maintenance tasks in a more efficient way.

Finally, a point that will be of interest for the observers: the new versions of the EMMI and SOFI manuals are undergoing their final revision and should be available on the NTT Web pages by the time these lines are printed.

SOFI Receives its First Users

C. LIDMAN, ESO, La Silla

SOFI, the recently commissioned IR imager and spectrograph on the NTT, started regular service on June 6 this year. Since then, about a dozen visiting astronomers have successfully used the instrument.

All modes of the instrument, which includes broad- and narrow-band imaging, low-resolution spectroscopy and imaging polarimetry, have since been used.

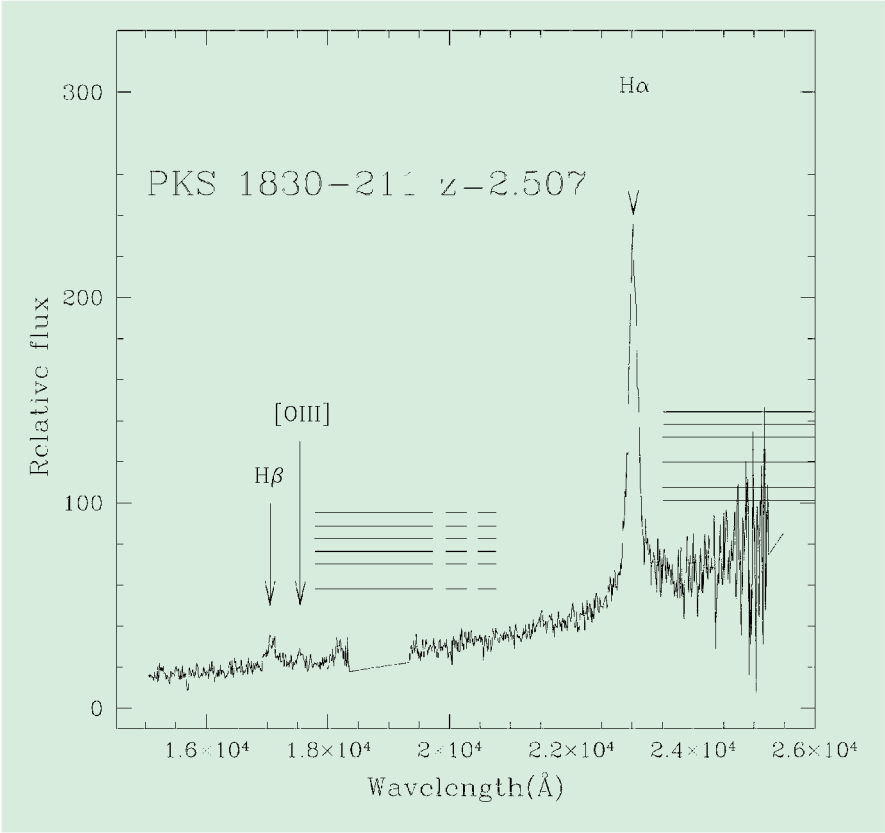
To date, the instrument has been used to study objects as varied as supernovae, proto-planetary nebulae, embedded stars, dwarf galaxies, gravitational lenses, high-redshift clusters and the star-formation rate at high redshifts.

Of particular note was the observation of the well-known Einstein ring

PKS1830-211 carried out by a team of astronomers headed by Frederic Courbin (Université de Liège). This team includes George Meylan from ESO Garching, Tom Broadhurst and Brenda Frye from the University of California at Berkeley and the author of these lines.

The optical identification and the redshift of PKS1830-211 has been long sought by astronomers. The optical-IR counterpart of PKS1830-211 was discovered last year through images taken with IRAC2b. The optical-IR colours suggested a significant amount of extinction. This was the impetus to take a spectrum with SOFI.

The following plot shows a spectrum of PKS1830-211 spanning the wavelength range 1.5 to 2.5 microns. It was taken with the red grism of SOFI. The exposure time was 24 minutes and the source is near 15th magnitude at K. In the plot, redshifted Hα and Hβ are clearly detected at $z = 2.507$. Other lines, such as [OIII] may also be visible. The horizontal lines mark regions where atmospheric absorption is strong: the region near 1.9 microns and the region beyond 2.5 microns are almost totally opaque, so the data in these regions have been deleted.



This new result, together with the known redshift of the lens (measured by molecular absorption at mm wavelengths – F. Combes and T. Wicklind 1998, *The Messenger* 91, p. 29) and continuing efforts to get a secure time delay, means that we are a step closer to the goal of determining H_0 from this lens.

3.6-m Telescope Passes Major Upgrade Milestones

M. STERZIK, ESO

During two months of technical time in July and August, major steps in the 3.6-m telescope upgrade plan were successfully passed. I shortly recall the objectives for the 3.6-m upgrade project (see *The Messenger* 85, 1996, p. 9): (i) optimisation of the mechanical and optical performance to improve the image quality (IQ), (ii) operational stability and efficiency to minimise downtime and maximise scientific return, and (iii) offer competitive instrumentation. After the upgrade, the 3.6-m telescope will return to the forefront of 4-m-class telescopes in the beginning of the next century.

All the work done during the last months was in that direction. Thanks to the careful project planning of Ueli Weilenmann, all milestones foreseen in the technical time could be passed. A major **opto-mechanical improvement** was the successful installation of an active pressure control system for the M1 lateral pad support. M1 movements in the mirror cell are now practically eliminated. Tests demonstrate that already in open loop the force distribution onto the lateral mirror support can be controlled at a level of, typically, 20 kg difference between theoretical and measured forces, and further reduced to 2 kg in closed-loop configuration. (With the old REOSC system, force differences of 300 kg were typical.) This control is of crucial importance for the IQ at larger zenith distances. For the presentation of impressive IQ results, please refer to the ongoing series by Stephane Guisard in *The Messenger*. At this moment, I rather wish to stress that already now sub-arcsec IQ is routinely possible at the 3.6-m telescope for scientific work (as long as the external seeing conditions allow). Considerable progress was also made in increasing the mechanical stability of the guide probe, now allowing reproducible movements with an accuracy below 0.2 arcsec. Here, thanks go to the La Silla mechanics and optical support teams, who solve many problems promptly and thoroughly.

Another central issue related to **telescope control software** (TCS) was the installation and commissioning of the TCS under NOV97 VLT-Common Control Software. This includes the workstation part of the telescope interface, and the part related to the local control units of adapter functions. The conceptual complexity of the VLT software is well known, and it is obvious that adapting this software to the specific requirements of the 3.6-m telescope is not straightforward, and sometimes leads to hiccups. For example, a reliable interface of the front-end VLT-software with the still operating HP1000-based TCS (which still controls the telescope in the back-end, i.e. “moves” the telescope), is a demanding task and a potential source of problems. It is the price to pay in the approach taken for the 3.6-m upgrade: to offer the telescope to the community largely in parallel with the upgrade. And here, I would like to express my gratitude to the highly committed software team at La Silla who successfully accomplished this challenging task with limited resources.

A part of the software upgrade is the implementation of a fully VLT-compliant **instrument control software** (ICS) for EFOSC2. This is the most striking change that observers will experience when