

## Axial Support Prototypes for the VLT

Two prototypes of axial support for the primary mirror of the VLT are currently under evaluation tests in Garching. These actuators can produce push or pull forces in the range of  $\pm 1000$  Newtons with a sensitivity of 0.03 N. 150 similar actuators will support each of the primary mirrors and correct low frequency aberrations of the reflecting surface. In each support, an integrated force sensor measures the actual force applied to the mirror through a local electronic control loop receiving force commands from the telescope computer. A final prototype, taking advantage of the evaluation, will be developed at ESO in 1990. It represents one of the major elements of the active optics principle.

S. Prat (ESO)

## Visitor Facilities and User Support at ESO-Garching

D. BAADE, ESO

### 1. Introduction

Every year, nearly 200 Visiting Astronomers come to the ESO Headquarters in Garching in order to reduce their observations obtained at La Silla, to prepare such observations, or as of more recently also to do the observations under remote control. As this is a sizeable fraction of the total ESO users community, the equipment available for these purposes and the operational procedures followed perhaps do not require much of a description to the readers of the *Messenger*. On the other hand, a broad overview has not appeared before, and, more importantly, ESO's policy for the operation and usage of the visitor facilities has not

been comprehensively described elsewhere. The following therefore tries to be reasonably complete in the latter area and purposely pays only little attention to technical information which, however, is detailed in various dedicated operating manuals (cf. below).

### 2. Who is Supported?

The user facilities in Garching are offered for the preparation and reduction of observations at La Silla only and if applicable to the type of data. Other users may be considered, depending on the availability of resources.

The person coming to Garching should be one of the applicants named

on the proposal for the observing programme concerned. Experience has furthermore shown that, unless a meticulous log has been kept of the observations, much time can be wasted if the data reduction is not done by the observer. Likewise, the preparation of observations, e.g. for Optopus, is also best done by the observer. Normally, the number of people invited to Garching will be limited to one per observing programme, regardless of the task to be performed.

### 3. How Much Does it Cost?

To Visiting Astronomers who at the time of their visit to Garching are affili-

ated to an astronomical institute in one of the ESO member countries, the user facilities are made available free of charge (only in connection with an observing programme at La Silla). ESO will cover their travel expenses (round trip; first-class train or lowest air fare and transportation to and from the railway station or airport) between that institute and Garching and pay them a daily subsistence allowance (at present DM 50) in addition to providing free accommodation. This support is given only once per observing trip to La Silla (or Garching, in case of Remote Control observations).

In all other cases, ESO does not make any financial contributions. One of the guest rooms in the ESO building may be provided if available, for which there will be a nominal charge of presently DM 20 per night. The usage of computers, measuring machines, etc. normally is free.

Consumables (magnetic tapes, hardcopies, etc.) will always have to be paid for if their usage considerably exceeds the average level.

#### **4. For How Long are the Facilities Made Available?**

With the exception of Remote Control observations, the length of the stay in Garching will depend on the type and amount of data and the experience of the visitor. A typical duration is one week.

Whenever possible, the PDS and Optonics plate measuring engines are allocated to only one user per day in order to minimize the need for recalibrations. IHAP and MIDAS users can book as much time on the respective computers as they think they can stand in a 24-hour period. However, time in the afternoon may be reserved only one day in advance and for a maximum of two hours per day. This rule is the only way to ensure that users who may, e.g., wish only to look at an image can do so without having to wait unreasonably long for a work station with image display.

#### **5. When Can Visiting Astronomers Come?**

We aim at making our equipment available 365 days per year, 24 hours a day. However, technical support and scientific assistance are provided only during normal working hours (Remote Control observations are, of course, excepted from this rule).

If you have a strong preference for certain dates of your stay in Garching, it is important that you contact us 4–6 weeks in advance. This is particularly important if additionally you need an

**CNRS – Observatoire de Haute-Provence and  
European Southern Observatory**

**2nd ESO/OHP Summer School  
in Astrophysical Observations**

**Observatoire de Haute-Provence, France  
16–26 July 1990**

The rapid advances made in the area of astronomical instrumentation had the side effect that fewer students have ready access to up-to-date observing facilities. As a contribution to reducing this imbalance in the training of young astronomers, the ESO/OHP Summer School offers the opportunity to gain practical experience under realistic conditions.

In groups of three students, each guided by an experienced observer, the participants will use the equipment of the OHP to carry out a small observing programme with telescopes of 1.2–1.9 m aperture (direct imaging or spectroscopy, both with a CCD detector), to reduce the data with a modern image processing system (MIDAS or IHAP), to extract relevant additional information from the astronomical literature, and to describe the results in a brief summary which is to be presented to the other participants at the end of the school.

In order to prepare and supplement the practical work, there will be one 90-minute lecture per day by invited specialists. The subjects foreseen include (a) modern telescope layout, (b) high-sensitivity detectors, (c) design of high-throughput optical instruments, photometry with (d) photomultipliers and (e) CCD's, high-resolution (f) spectroscopy and (g) imaging, (h) fiber applications in low-resolution spectroscopy, (i) infrared observations, and (k) data reduction techniques. All courses, etc. will be given in the English language. (A report on the 1st ESO/OHP Summer School appeared in the *Messenger* No. 53, p. 11.)

Applications are invited from graduate students working on an astronomical Ph.D. thesis at an institute in one of the ESO member countries. Application forms are available from the organizers and have to be returned by March 31st, 1990. A letter of recommendation by a senior scientist who is familiar with the applicant's work is additionally required. Up to eighteen participants will be selected and have their travel and living expenses fully covered by ESO or OHP.

**The Organizers:**

M.P. Véron	D. Baade
Observatoire de Haute-Provence	European Southern Observatory
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introduction or have special requirements. Requests communicated to us with less than 10 days notice will be considered only in exceptional cases.

If known in advance, Visiting Astronomers may arrive at any time on any day of the week. However, unless you are very familiar with the tools you intend to use and have also handled them relatively recently, we strongly advise you against coming to Garching shortly before a weekend or public holiday. If there is a problem in getting started, it would take the whole weekend before a solution can be attempted.

#### **6. Where will Visiting Astronomers be Accommodated?**

Together with some other research institutes, the ESO building is situated about 2 kilometres outside Garching, a town of 15,000 inhabitants and 15 kilometres from Munich. To the extent possible, we therefore try to accommodate Visiting Astronomers in one of the four guest rooms in the ESO building. For Remote Control observers, special arrangements have been made with a guest house in Garching for a room that offers a maximum of quiescence also

during the day. Remote Control observers will always be offered a car for transportation between the guest house and ESO whereas all others may use an ESO car only after office hours and if it is not needed otherwise.

## 7. What Kind of Work is Possible?

We aim at supporting the reduction of data obtained with all major observing modes of the standard instruments used at La Silla (take the latest call for proposals to see how long the list has grown). Only sub-mm observations, polarimetry and photoelectric photometry (optical and infrared) are currently excluded because there are no adequate high-level command procedures available in either IHAP or MIDAS. This is not to say that the reduction of such data is not possible in principle. But it is not very efficient in practice, and ESO does not provide any recipes as to how to proceed. For the full 2-D reduction of long-slit spectra and the calibration of slitless spectra only limited means exist at the moment. The handling of IR data is particularly intimately connected with the advances made in the understanding of the often delicate instrumentation; optimization of observing, calibration, and reduction procedures are still going on.

Photographic plates (direct images or spectra) can be digitized with the PDS and the Optronics measuring machines. Astrometry – also in preparation of Optopus observations – is possible with the Optronics; the reduction software is currently being ported to the MIDAS environment.

The instruments which can be used under remote control from Garching are presently the Boller & Chivens spectrograph with CCD and the direct CCD camera at the 2.2-m telescope and both Short and Long Camera (with CCD only!) at the CAT/CES.

Computers are made available for the usage of ESO software only, i.e. Visiting Astronomers wishing to run their own software first have to seek ESO's approval.

Whenever you are not sure if your requirements are satisfied by standard procedures, contact us as early in advance as possible so that we can think about alternatives.

## 8. How is the Work Done?

Remote Control observers are assisted during their entire observing run by a Remote Control Operator whose task it is to ensure the smooth functioning of the system in general and the link to La Silla in particular. The observer will, as on La Silla, command

the instrument and is also in charge of the on-line data reduction with IHAP for quality control, etc.

With this partial exception of the Remote Control Facility, it is expected that all equipment whose usage has been authorized is operated by the visitors themselves.

Instruction manuals are available for all standard tasks. However, anyone who has ever been alone with a new piece of software or hardware and its user guide knows that often this is not sufficient to get quickly started. Therefore, we offer a personal introduction to everyone who asks for it. The introducing astronomer will stay with you until at least one cycle of operations has been completed and will also be available to answer questions during (most of) the rest of your stay.

Usually, the introduction is given by one of the ESO students or postdoctoral fellows. They stay for only two, at most three, years at ESO. On the other hand, the spectrum of possible applications of the facilities available is both very broad and dense, and nearly every set of observations is different from the others. Therefore, it is hardly avoidable that almost all introductions include a learning phase also for the introducing astronomer. We do have to ask for your patience.

Kindly note that an introduction can be arranged for only if we know about your needs at least 10 days in advance.

The importance of careful preparations also on the part of the visitor cannot be overemphasized. This already applies to observations under local control on La Silla. Under remote control, the bandwidth of the data link

imposes limitations which are not very important in every single case. However, if one starts random experiments, the time lost will rapidly accumulate. For data reduction, although (unlike observing) not tied to a rigid external clock, a detailed work plan is perhaps even more critical because it must be realized that for most observations their proper processing is much more complex a task than their acquisition. It is important that you come with a clear idea of what shall be extracted from the data and what steps are, therefore, needed. Our introduction aims at helping you to use efficiently the software pertaining to your problem. It cannot, however, serve as a substitute for your carefully studying the relevant parts of the MIDAS (or IHAP) manual.

Another point that should be given consideration in advance (in most cases that is: prior to the observations) is the need for calibration data such as standard star fluxes, laboratory wavelengths, etc. For standard La Silla instrument configurations the necessary data are available in Garching, but it is the responsibility of the user to verify that they satisfy his needs and to be able to find alternatives if necessary.

## 9. What Technical Information is Available?

As stated in the Introduction, this summary has attempted to stay clear of technical details. This type of information is collected in a fair number of user guides. The ones most relevant for the work of Visiting Astronomers in Garching are:

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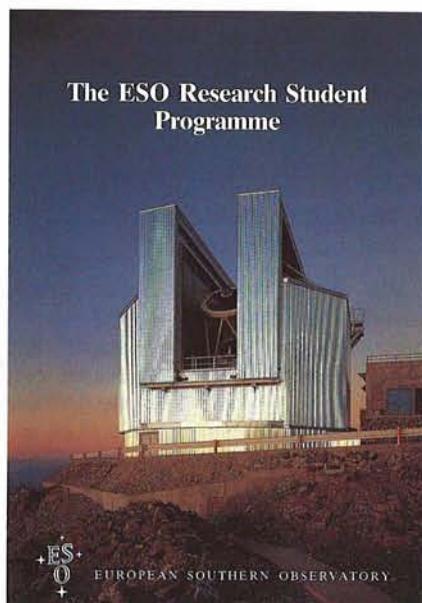
## The ESO Research Student Programme:

### Change of Deadline

This new programme was described in some detail in an earlier issue of the *Messenger* (55, p. 12). The corresponding brochure was announced in the last issue (57, p. 38), but for various reasons the printing was delayed until late October.

The brochure has in the meantime been sent to all institutes in the ESO member countries. Since the next-following application deadline stated therein (December 1, 1989) would be too short, it has been decided to extend it to **January 15, 1990**.

Thereafter, the normal deadlines will be as indicated, that is on May 1 and December 1.



● A short guide to *ESO-Garching for Visiting Astronomers* tries to set pointers to possible answers for most of the practical questions which Visiting Astronomers may foreseeably have. It is automatically sent to every new visitor prior to his/her travel to Garching.

● The *Remote Control User Guide* describes the design and performance of the RC system. It assumes that the reader is already familiar with the instrument to be used. For the time being, ESO's policy is to offer RC observations only to observers who have already obtained some experience on La Silla with comparable equipment although this is in no way necessitated by the functionality of the RC system. The document is mailed to new users at the time when they are informed that Remote Control observations will be offered to them.

● User guides for remotely controllable La Silla instruments (see Sect. 7).

● The *Local Guide for New VAX/VMS Users* tries to get people started who on the ESO VAX computers wish to use functions of the VMS operating system that are not covered by MIDAS.

● Similarly, three documents (i) *Introduction to Portable MIDAS*, (ii) *Getting started with UNIX*, and (iii) *Introduction to the X11 Window System* have been prepared in order to provide the necessary ancillary information to users of the Portable MIDAS on one of the workstations with the UNIX operating system. (The first of the three documents is of course useful with any installation of the Portable MIDAS.)

● Updates to the *MIDAS User Guide* are released twice a year by the ESO Image Processing Group. Appendix D of Vol. A also describes the peripheral devices that are available to MIDAS users in Garching. Sending the full two-volume user guide to Visiting Astronomers who will reduce only one type of data is not a very efficient use of our resources. We are, therefore, studying how best to compile instrument-specific MIDAS documentation kits.

● A cookbook which only describes *how to operate* the MIDAS Echelle Package and the relevant devices (the first version pertains only to the VAX) is in preparation.

● Copies of the *IHAP* manual are available on request. A new (and presumably also the last) edition is in preparation.

● The *Atlas of the Thorium-Argon Spectrum for the ESO Echelle Spectrograph in the  $\lambda\lambda$  3400–9000 Å Region* (ESO Scientific Report No. 6) is useful not only for CASPEC but also for ECHELEC data and CES spectra. An identification of the He-Ar spectrum at low resolution is given in an appendix of the IHAP manual.

## First Announcement of the 2<sup>nd</sup> ESO/ST-ECF

# Data Analysis Workshop

ESO, Karl-Schwarzschild-Str. 2

D-8046 Garching, FRG

April 24–26, 1990

The aim of the Workshop is to provide a forum for discussions of astronomical software techniques and algorithms. It is held annually during the spring (April/May) and centres on a different astronomical area each time. Due to available space, participation will be limited to 80 people. Last year it was necessary to reject some people and we therefore recommend that you send in the corresponding participation and accommodation forms well before the deadline.

The topic for the 1990 Data Analysis Workshop is the analysis of spectral data. The scientific section of the meeting will consist of three sessions, each starting with a main talk after which papers of 5–10 minutes duration can be presented. The last day is reserved for general user meetings for MIDAS and ST-ECF.

The tentative agenda is:

### Analysis of Spectral Data

April 24: 14:00–18:00: Standard Spectra

April 25: 09:00–12:30: Long Slit Spectra

14:00–17:30: Echelle Spectra

April 26: 09:00–12:00: MIDAS users' meeting

12:00–12:30: European FITS Committee

14:00–17:30: ST-ECF users' meeting

We especially welcome contributions on algorithms and techniques for: extraction of spectral data, analysis of line profiles, estimates of the continuum, rebinning and instrumental response. We encourage people to present their work in these areas even if it is only ideas. After each introductory talk, we will have a more informal discussion where such contributions can be made. We also plan to have a poster session where people can present short contributions. Proceedings of the scientific sessions will be published.

The scientific organizing committee includes:

P. Grosbøl (Chairman) P. Benvenuti

D. Baade S. D'Odorico

M. Rosa J. Wampler

Contact address: Ms. Susan Lively, Image Processing Group, European Southern Observatory, Karl-Schwarzschild-Str. 2, D-8046 Garching, FRG.

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● The user guide for the *Measuring Machine Facility* (MMF) will soon have to be re-written when the central HP computer has been replaced by a *Stellar* machine. It is applicable anyway only to the PDS as the Grant machine has been taken out of service and the Optronics has already undergone some changes (cf. below). New users of the MMF will automatically receive this manual and the one of the measuring machine concerned (see below).

● The user guide for the PDS probably is one of the oldest ones in the organization that continue to be valid.

● Of the manual for the Optronics machine, only a draft version is available at the moment. In this machine, the

photo-multiplier tube has been replaced by a linear multi-channel Reticon array in order to enable faster scans of larger fields.

● The *Optopus* user guide not only describes this instrument and its operation but it also details how to prepare the input data required for the drilling of the star plates. Some modifications of this chapter will become necessary once the software has been ported to the MIDAS environment. New users of *Optopus* will receive this manual automatically prior to their visit to Garching.

● STARCAT will eventually hold all observations obtained with ESO telescopes or the Hubble Space telescope. Currently, a fair number of all kinds of

astronomical catalogues have been loaded and can be accessed by everyone. There are a STARGAT user guide and a regularly updated documentation of the on-line available data bases.

● For the future, off-prints of the article will be prepared and updated as the need arises.

Please note that the above list only comprises ESO documents for facilities that can be used at or from Garching; there is also an extensive set of user guides for La Silla equipment. The compilation of a completely revised all-ESO manual is in progress. Finally, all Visiting Astronomers have access to ESO's library.

## 10. How Can a Visit to Garching be Organized?

If you need more information, e.g. one of the documents listed above, or wish to arrange your stay and work in Garching, kindly contact Ms. Elisabeth Hoppe. She will also try to help you with all practical aspects of your stay in Garching. Inquiries concerning observations on and travel to and from La Silla will as

before be handled by Mrs. Christa Euler. They can be reached

- by phone:
  - +40-89-32006-223 (Euler)
  - 473 (Hoppe)
- by ordinary mail:
  - European Southern Observatory
  - Karl-Schwarzschild-Str. 2
  - D-8046 Garching
  - Fed. Rep. Germany
- by electronic mail:
  - ESOMC1::VISAS (SPAN)
  - VISAS@GAESO51 (EARN/Bitnet)
  - PSI%0262458900924::VISAS (X25)
- by telex:
  - 52828220 eo d
- by telefax:
  - +49-89-3202362
- in person:
  - office No. 222 (Euler)
  - 225 (Hoppe)

For the preparation of your stay in Garching we need to know:

- the name of the person who will come and, if different, the name of the Principal Investigator of the programme;
- the intended dates of your visit;
- the equipment to be used;
- the identification number that has

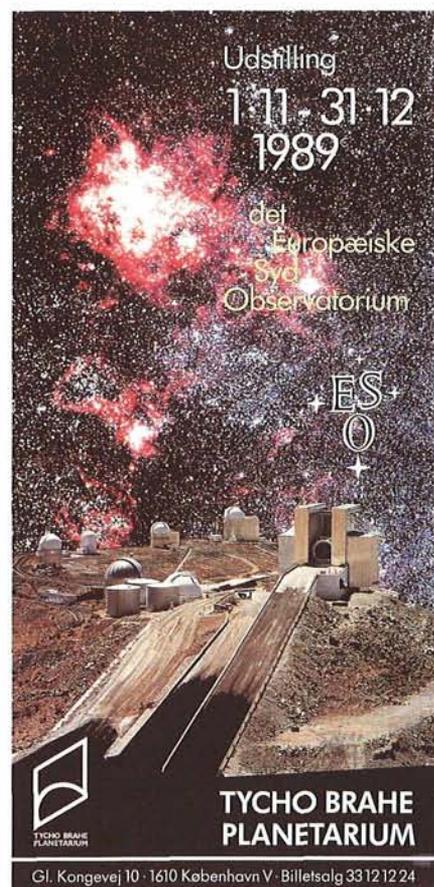
been assigned to the observing programme concerned and the number of the period when the observations were carried out;

- a precise description of the data type (e.g., EFOSC slit spectra, not just EFOSC);
- any special requirements;
- if you already have the operating manual(s) which are necessary for the preparation of your visit (check the document list given above);
- if you need an introduction by an ESO astronomer.

## 11. Can Things be Improved?

We try to expose you to a minimum of bureaucracy, to be flexible in the application of the rules outlined above, and to be efficient in the scientific-technical support we provide. Nevertheless, there will always be situations where you think we could have done better. Please bring such cases to our attention. Either we succeed in convincing you that there were no practical alternatives or we will have to improve our standards so that we can serve you better next time.

# ESO Exhibition Opens in Copenhagen's New Tycho Brahe Planetarium



After more than five years' hard work of preparations and construction, one of the largest and most modern planetaria in Europe has now opened its doors to the public. On October 31, 1989, the new "Tycho Brahe Planetarium" was inaugurated in Copenhagen, in the presence of the Danish head of state, H.M. Queen Margrethe II, and nearly 300 other distinguished guests, comfortably seated in reclining chairs under the tilted 23-metre dome. An ESO Exhibition had been set up in the new planetarium and was officially opened at the same time.

The Queen, who was accompanied by her husband, Prince Henrik of Denmark, and the Danish Minister of Education, Mr. Bertil Haarder, activated the new Zeiss VI TD projector with a well-placed shot from a laser pistol. Not unexpectedly, the first programme was devoted to her famous countryman of the 16th century. The title is "Tycho's Star", referring to the supernova that deeply impressed young Tycho in November 1572 and which led him to the construction of more accurate instruments. The ESO people present at the inauguration were pleased to witness the projection of a magnificent

panorama of La Silla under the southern sky in connection with the presentation of the more recent SN 1987A.

The Queen then visited the exhibition area, where she was shown the ESO photos and models by the Director General, Professor Harry van der Laan, assisted by some Danish members of his staff. The Queen was particularly interested in the Very Large Telescope project and its astronomical possibilities. The Minister of Education was pleased to learn about the associated prospects for Danish science and industry.

The realization of the first large planetarium in Scandinavia is the fulfillment of an old dream by a Copenhagen amateur astronomer, Helge Pedersen and his equally energetic wife, Bodil Pedersen. Now in their eighties, the handsome couple created in 1984 the "Urania-foundation" with an initial donation of 50 million DKK. Helge Pedersen was on a trip to Indonesia to watch the solar eclipse the year before when the idea first came to his mind. The naming reflects his life-long admiration of the famous Danish astronomer and his wish to contribute to the "rehabilitation" of Tycho Brahe in the country which the