



• Paranal  
• La Silla  
• La Serena  
• Santiago

## TELESCOPES AND INSTRUMENTATION

### News from Council

The following is Section 1 (the section relevant for the VLT Project) of the resolution issued by Council during its meeting of December 2, 1993:

In its October 4 and 5, 1993 meeting Council expressed its approval of the revised VLT/VLTI project as referred in June 1993 Cou-483 for content, schedule and staff. Financial difficulties discussed in the Finance Committee meeting of November 8 and 9, 1993 and recent

expression of concern in a diplomatic note from the French Government have led to reconsideration of this plan.

Following the presentation and discussion of different alternatives for cost reduction, Council adopts further modifications to the VLT programme plan. This includes the postponement of the implementation of VLTI, VISA, Coudé Train and associated adaptive optics for all telescopes. In consultation with the

Scientific Technical Committee a solution will be sought to introduce adaptive optics at the Nasmyth foci at the earliest possible time.

Furthermore, the Executive will endeavour to reintroduce full Coudé and interferometric capabilities at the earliest possible date. This will include provisions for continuing technological research and development programmes devoted to this end.

### VLT News from the VLT Division

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The status of VLT activities is shifting more and more from the design to the construction phase. Major progress was achieved in the following areas:

#### Mechanical Structure

The detailed design of the structure is reaching completion. The calculated lowest locked rotor eigenfrequency is 8.1 Hz around the elevation axis and about 10 Hz around the azimuth axis. To obtain this and to optimize the manufacturing,

the mass has increased with respect to the original design. The maximum total moving mass is 450 tons which include 320 tons of structural steel.

A demonstration test of the encoder was carried out successfully. This encoder uses two laser interferometers and a number of flat mirrors fixed on the structure. Each mirror can cover a range of about 4 degrees and the two heads permit the transition from one mirror to another without the loss of information.

#### Enclosures

The design and construction of the enclosures were contracted to the SEBIS Consortium in Italy. The final design is near to completion (January 1994).

Wind tunnel tests have been performed for the assessment of wind loads on a single enclosure. Additional tests will be performed in November 1993 to study the interference between the enclosures.



## Mirrors and M1 Unit

The first primary mirror blank has been delivered to REOSC and the pads for the axial supports have been glued on the back. The manufacturing of other blanks by Schott proceeds as planned. Two parallel contracts were issued for the design of the mirror cell. The Preliminary Design Review will take place at the beginning of next year.

## M2 Unit

The call for tenders has been issued and the tenders are expected in mid-December. The requirements include a fast guiding mode (field stabilization) and a chopping mode for frequencies up to 5 Hz and amplitude of up to 1 arc-minute.

## Coating Plant

The technical specifications and statement of work for the Call for Tenders have been completed. The specifications are based on a sputtering process. The start of the contract is expected to be May 1994.

## Washing Unit and Cleanroom

The specifications and statement of work for the call for tenders is being prepared. The contract for the washing unit will include the pilot washing unit (for the 3.6-metre mirrors) for La Silla. Cleanroom specifications have been prepared. The cleanroom will comprise both the coating and washing unit for the 8-m mirrors.

## Cassegrain and Nasmyth Adapters

The conceptual design has been completed and the call for tenders will be sent out early in 1994 after analysis

of the results of a preliminary enquiry. A call for tenders is running for the procurement of CCD cameras for autoguiding and wavefront sensing applications.

## Coudé Station

The concept is based on a large turntable on which all the coudé station equipment is fixed. It is used to compensate the field rotation for coudé instruments and to position the collimating units to be used for the different types of beam combinations. The contract for the construction of turntables has been issued.

## Adaptive Optics

An optimization study has permitted the finalization of the essential parameters necessary for the establishment of specifications.

## Handling Aspects

A new concept for the M1 handling tool has been developed. The principle is a hydraulic whiffle tree. The geometry is identical to that of the REOSC tool. The M1 handling tool will include the lifting system and will form a self-standing unit in the Mirror Maintenance Building.

## VLTI System Level

A number of studies at system level are currently being carried out or have been completed. These studies are important for assessing the overall performance of the VLTI as well as for the specification of VLTI subsystems, such as the delay lines. Studies include:

- Control model of delay line/fringe sensor
- Structural deformation of unit telescopes under wind loads

- Study of acoustic noise inside UT enclosures
- Study of thermal environment in VLTI facilities
- Measurements of ground transfer functions on Paranal

## Auxiliary Telescopes

Calls for tenders for the design, manufacture, test in Europe, transport to and erection in Chile of three auxiliary telescopes and equipment for 11 stations were sent to industry in July 1993.

## Beam Combiner System

An in-house design study of the beam combiner is nearing completion. The main objective of the study is a conceptual design which allows the assessment of the interface to the civil engineering infrastructure and understanding of the tradeoffs between various concepts for the homothetic mapping.

## Instrumentation

The VLT Medium Resolution Spectrometer/Imager (ISAAC) reached the Final Design Review (FDR). The CONICA (High Resolution Near Infrared Camera) and FORS (Focal Reducer Spectrograph) are approaching the FDR stage. The UV-Visual Echelle Spectrograph (UVES) completed the Preliminary Design Review in October. The Multi-Fiber Area Spectrograph (FUEGOS) is being studied by a consortium composed of the Observatoire de Meudon, the Observatoire de Genève, the Observatoire de Toulouse and the Osservatorio di Bologna. The Phase A study ended in October and is being reviewed by ESO technical staff. The Mid-Infrared Image Spectrometer is being studied by the Service d'Astrophysique CEA/DAPNIA and is making progress in Phase A.

# First Light from the NTT Interferometer

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It is not obvious that placing a mask over a telescope and blocking most of the light will improve its imaging performance. Yet several groups have done just this in an effort to overcome the limits of atmospheric seeing and achieve the best angular resolution from large telescopes such as the 4.2-m WHT, the 3.9-m AAT, the Hale 5-m and the Mayall 4-m at Kitt Peak. Aperture

masking has mainly been used for bright sources having reasonably simple structure. Fortunately, there are some very interesting objects that satisfy these criteria: cool giant stars, whose large angular diameters (up to  $\sim 0.05''$ ) make them ideal targets for big telescopes. Aperture masking has so far allowed detection of convective hot spots on the red supergiant  $\alpha$  Ori and asymmetries in

the atmosphere of Mira (e.g., Wilson et al. 1992; Haniff et al. 1992).

This article describes aperture-masking observations of cool giants with the 3.5-m NTT in the near infrared ( $1.5 \mu\text{m}$ ). We chose the infrared because, although the angular resolution is somewhat poorer than at visible wavelengths, the stars are much brighter and the atmospheric seeing is more favourable.