extension. The observations of the asteroid Ceres were exciting and allowed to deduce the rotation axis of that famous small member of our planetary system (see Fig. 1).

Eta Carinae was observed with a CVF and a polarizer. In the K-band, one can recognize hints of the objects observed in the visible range by speckle interferometry, which have a distance of about 0.15 arcsec from the central star. All the scientific observations require a careful data reduction and analysis. The results will be published in the near future.

Immediately after the run the COME-ON system was shipped back to Europe for a major upgrade (COME-ON +). This work will be done at Observatoire de Paris-Meudon under the direction of ONERA. The upgrades include a new deformable mirror from LASERDOT with 52 actuators (see Fig. 2), an improved wavefront sensor and EBCCD provided by LEP (Philips), a faster and more powerful control computer, and some improvements of the passive optical and mechanical components. The upgraded system is scheduled to be back at La Silla in July 1992.

F. MERKLE, N. HUBIN and G. GEHRING, ESO
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A Report on the SEST Users Meeting and Workshop on Millimetre-Wave Interferometry

22–23 May 1991

The second SEST Users Meeting was held at ESO Garching on Wednesday, 22 May, the first having been held last year at Onsala. In view of the decision to develop the Paranal area for the VLT, it was felt timely to discuss the possibility of a millimetre-wave array in the southern hemisphere, and a workshop on this subject was held on the day following the Users meeting. The combination of these two meetings was obviously popular, as over 60 persons attended.

The SEST Users Meeting

The Users meeting commenced with a number of short reviews illustrating some of the recent scientific results from SEST: The Magellanic Clouds Key Programme (F. Israel and J. Lequeux), CO Rotation Curves of Galaxies (R. Wielebinski), CO in Centaurus A (A. Eckart), Spectral Scans of Sgr B2 (A. Hjalmarsson), Observations of Planetary Nebulae (R. Sahai), and A CO Survey of IRAS Stars (L.-A. Nyman).

These were followed by talks and discussion covering all aspects of the operation and performance of SEST. R. Booth summarized recent developments and future plans, and L.-A. Nyman, N. Whyborn, E. Kreysa, and M. Olberg reviewed specific technical areas, including pointing, holography, receivers (heterodyne and bolometer), spectrometers, observations, calibration, and data reduction. Some of the main discussion points are summarized below.

Telescope pointing remains a matter of concern, and efforts to improve it were outlined. Inclinometers placed on the horizontal part of the fork above the azimuth bearing showed a temperature dependent tilt of the telescope axis amounting to a daily variation of about 6″. First attempts to improve the pointing by including the inclinometer data in the pointing solution are disappointing, giving an improvement in the rms error of only 0.7″. However, these results are very preliminary. The overall pointing rms is still about 3″ in both coordinates. The interferometer telescopes at IRAM show similar axis tilts, so the problem is apparently inherent in the design.

The surface accuracy is another area of concern. Holographic measurements of the SEST reflector surface and its subsequent adjustment led to a significant improvement in the profile (rms 60 micron). However, a subsequent readjustment has increased the error again to around 75 micron. Unfortunately the satellite which has been used as a beacon for the holography measure-

Snow on La Silla!

Heavy snowfall on June 18, 1991 transformed the La Silla Observatory for a few days into a winter landscape. The above photographs were taken on June 20 by Erich Schumann.

ments is no longer available to us, so other measurement techniques are being investigated.

As for receivers, SEST continues to operate with the Schottky systems for both the 100 GHz and 200 GHz bands. The 230 GHz receiver will soon (August) be replaced by an SIS mixer on loan from Smithsonian Astrophysical Observatory. Intermediate frequency amplifiers in both receivers have been replaced by wide (1 GHz) band HEMT amplifiers in an attempt to reduce the noise at the band edges. Another 1 GHz AOS is on order from the University of Köln. This and the purchase of a new frequency synthesizer will facilitate simultaneous observations in both the 100 and 200 GHz bands.

The 350 GHz SIS receiver constructed at Onsala was completed in January and installed on the telescope for tests in April. Unfortunately it has so far proved to be impossible to fabricate SIS junctions of sufficiently small area and hence the noise temperature of the receiver is about 3000K SSB. It is hoped that better junctions will be built in collaboration with the University of Cambridge Metallurgy Department and that the receiver will be installed next year.

The 1-mm bolometer receiver being built in collaboration with the Max-Planck-Institut für Radioastronomie, Bonn, is virtually complete and will be installed on the telescope in late August. This system should then be routinely available and, because of its high sensitivity, should make more pointing sources available.

Particular problems identified at the meeting were pointing jumps (possibly associated with the axis tilt), the need for better receivers at the "work horse" frequencies, and a local oscillator instability which had caused spurious low level wings on narrow lines. The last problem has been fixed but it is important that observers are aware of it. It was suggested that a SEST Bulletin Board should be established in the Garching computer system so that users can be informed about changes and problems.

Suggestions for possible future developments which were discussed included receivers at lower frequencies (<100 GHz), the 150 GHz band, and higher frequencies (410, 460 GHz) VLBI, focal plane imaging arrays, the development of a wobbling secondary, and the (eventual) move of SEST to the Paranal area.

However, for the immediate future it was generally agreed that we should concentrate on improving the pointing and surface of the telescope, and equipping SEST with "state-of-the-art" receivers at 100 and 200 GHz.

Workshop on Millimetre Interferometry

In order to provide suitable background for this subject and bring all participants up to date on relevant developments around the world, this workshop began with reviews on existing millimetre-wave interferometers: The IRAM Interferometer on Plateau de Bure (S. Guilloteau), the Berkeley Interferometer (C. Masson kindly presented a review prepared by J. Welch), the Caltech Millimetre Interferometer (N. Scoville), the Nobeyama Interferometer (K.-I. Morita), and Millimetre VLBI (L.B. Bååth). Planned and proposed developments were then summarized: the Australia Telescope at Millimetre Wavelenghts (L. Staveley-Smith), the Smithsonian Sub-Millimetre Array (C. Masson), plans for interferometry between the JCMT and CSO telescopes (R. Hills), and the NRAO Millimetre Array (R. Brown).

The subject of a possible millimetre array near Paranal was then introduced with three talks on the site and atmospheric conditions. M. Sarazin described the site, and summarized relevant measurements made in the ESO site testing campaign. He showed in particular that the wind, an important parameter for exposed antennas working at high frequencies, appears to be lower in the valleys than on Paranal itself. A. Ardeberg and R. Martin presented results from independent measurements of the water vapour content. While there are differences still to be understood, these two studies both show that the Paranal area is suitable for observations at least to 1 mm.

A lively discussion then followed on the idea of a millimetre-wave interferometer at Paranal, introduced and stimulated by a talk by R. Booth which outlined a possible concept consisting of 10×8 m antennas arranged in an optimum configuration with regard to the equivalent interferometer beam. He considered that such an array could be built for about DM 50M and suggested that we in Europe should consider ways of raising money in order to achieve a useful millimetre array on Paranal as soon as possible.

Various views were expressed by the participants. These ranged from the political through the practical to the ideal scientific concept. A case was made for greater sensitivity, more like that of the proposed US millimetre array which would consist of 40×80 m antennas but will cost at least $ 120M. It was pointed out, however, that none of the existing millimetre arrays is as sensitive as that proposed by Booth and that the southern hemisphere is virgin territory for such an instrument.

There was clear enthusiasm for a southern array. But how could funding be achieved? Could we approach the EEC, or could a consortium from individual countries be put together? In this context, the Japanese plans for a new millimetre array possibly in the southern hemisphere raised the interesting possibility of collaboration with the Japanese astronomers. While no clear answers were forthcoming, the idea that a working group should be set up to consider funding as well as an optimum array design was thought to be a reasonable conclusion of this first meeting on the subject.

P.A. SHAVER, ESO, and
R. BOOTH, Onsala Space Observatory

STAFF MOVEMENTS

Arrivals

Europe

BASBILIR, Mustafa (D), Project Control Manager
ENG, Willem (NL), Administrative Assistant/Invoice Control
GÜNTHER, Peter (DK), Accounting Assistant
HANSEN, Karin (DK), Administrative Clerk (Personnel)
KOEHLER, Bertrand (F), Project Engineer (VLT Interferometry)
PELETIER, Reynier (NL), Fellow
SCHWEMMER, Erika (D), Administrative Clerk (Personnel)
ZIGMANN, François (F), Student

Departures

Europe

BROCATO, Enzo (I), Fellow
DUMOULIN, Bernard (F), Head, Photographic Laboratory
JANSSENS, Lucas (B), Building Project Engineer
LUCY, Leon (GB), Astronomer
OOSTERLOO, Thomas (NL), Fellow
THEUNS, Tom (B), Student

Chile

JARVIS, Brian (AUS), Fellow
SCHUSTER, Hans-Emil (D), Astronomer

Transfers from ESO Headquarters in Garching to VLT Observatory Site in Chile

DE JONGE, Peter (NL), Construction Site Manager
ESCHWEY, Jörg (D), VLT Project Civil Engineer