

ESO Conference on Optical Telescopes of the Future

This conference took place in Geneva between 12 and 15 December 1977.

The time seemed ripe for a conference on this subject, for many ideas are in the air and certain projects in the United States which deviate markedly from the conventional telescope are already completed or in active study.

The conference opened with a review of the astronomical case for large telescopes, an overview of the technological possibilities and the possibilities from space.

A session followed on conventional large telescopes in which technical aspects of a number of existing large telescopes and the possible extension of conventional telescopes to larger sizes were presented.

The following day was devoted entirely to Incoherent Arrays and Multi-Mirror Telescopes. In the sense that most effort deviating from the conventional large telescope has so far gone in this direction, the neutral observer had the feeling that this represented the centre of gravity of the conference. A wide variety of interesting solutions were presented with a collecting area up to the equivalent of a 25 m telescope and arrays with up to 100 telescopes.

A session on special techniques fitting into no clear group was followed by sessions on Coherent Arrays and Interferometers. This gave a broad review of current techniques and future possibilities and a comparison of optical and radio techniques.

The last morning of the conference, concerned with image processing and live optics, showed clearly the tremendous gain to be obtained in overcoming the effects of seeing even without increase in instrumental size. A clear distinction emerged at this conference between the terms "active optics" and "active structure". The latter implies, for example, the active control of tilt or position of several mirrors to combine images; the former the control of the form of, say, a thin mirror. The importance of both possibilities became increasingly clear throughout the conference.

The final session included a review of trends in detector developments. (Detectors were considered too vast a subject to be dealt with in detail but an overview was necessary to underline the essentially complementary nature of progress in telescope design and detectors.) The rest of the session was devoted to a review of the astronomical implications of the contributions and discussions, followed by a panel discussion. The latter developed into a most lively general discussion with numerous participants representing very many (often healthily conflicting!) viewpoints. While the consensus viewpoint seemed to support the view that the emphasis for post-conventional telescopes should lie in the

incoherent addition of more photons from bigger systems, a strongly vocal minority was clearly convinced that techniques using phase information should not be neglected. The discussion also inevitably brought up the vexed question of how an astronomer should or would like (not necessarily the same thing) to work with future instruments—the visit to the CERN installations had provoked considerable thought on this subject!

Thus ended a conference which seemed to have largely fulfilled its purpose: to encourage the debate on how instrumental funds in the future should be spent to best effect. The organizers thank all participants for making it such a stimulating event. Our thanks are due particularly to all the speakers who have enabled us to produce a virtually complete volume of Proceedings within two months of the Conference—see the notice.

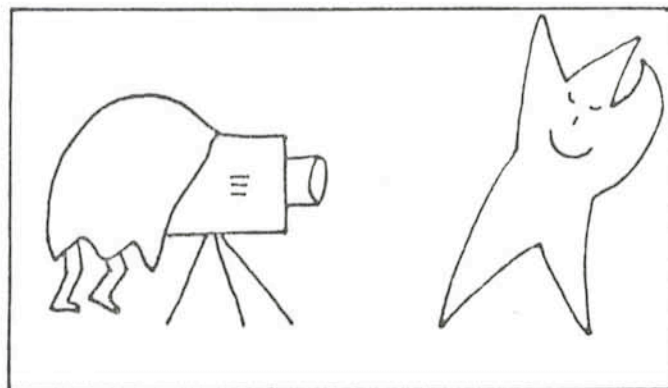
R.N. Wilson

Forthcoming ESO Workshops

Two ESO workshops have been planned during 1978 on the subjects of astronomical photography and infrared astronomy. As in the case of earlier ESO workshops, attendance is limited and by invitation only.

"Modern Techniques in Astronomical Photography"

This workshop will take place in Geneva on the CERN premises during May 16–18, 1978. About 50 participants are expected, mostly from European countries, but also from North and South America and Asia. The two principal sub-



jects to be discussed are sensitization and calibration of photographic plates. There will also be a discussion about the copying of plates and use of colour photography in astronomy. Several participants will talk about the photographic work at their observatories and a number of new techniques will be reported.

The proceedings will appear shortly after the conference. Further information may be obtained from R.M. West, ESO, c/o CERN, CH-1211 Geneva 23, Switzerland.

"Infrared Astronomy"

By invitation of the Stockholm Observatory, the ESO workshop on infrared astronomy will be held on the island of Utö

Proceedings of Conference Optical Telescopes of the Future

The Proceedings of this conference which contain nearly all the papers presented and the essential part of the discussions are now available.

Please send your order together with a cheque payable to ESO for Sfr. 40.— (price of copy including postage) to:

European Southern Observatory
c/o CERN
Attn. Miss M. Carvalho
CH-1211 Geneva 23

on June 20–22, 1978. About 40 European astronomers active in infrared astronomy will be invited in order to discuss the scientific framework, the research planning and the instrumental development which ESO should foster in this area.

The programme of the workshop includes:

- Review talks on astrophysical problems where infrared observations are of particular value,
- Review talks on the present status of various instrumental techniques in the field of IR spectroscopy and photometry,
- Reports on IR space project and on other European plans.

More detailed information may be obtained from P. Salinari, ESO, c/o CERN, CH–1211 Geneva 23, Switzerland.

The ESO Council

The ESO Council held its 31st meeting in Munich on December 1, 1977. The present members of the Council are:

Belgium:	M. Deloz P. Ledoux L. Poulaert
Denmark:	K. Gyldenkerne P. A. Koch B. Strömberg
France:	J.-F. Denisse (Chairman) S. Filliol
Fed. Rep. of Germany:	I. Appenzeller C. Zelle
The Netherlands:	B. Okkerse H. G. van Bueren
Sweden:	M. Fehrm P. O. Lindblad

The Sculptor Dwarf Spheroidal Galaxy

S. van Agt

The first visiting astronomer to use the 3.6 m telescope in October 1977 was Dr. Steven van Agt from the Astronomical Institute of the Nijmegen University, the Netherlands. At that time the object for his study, the Sculptor dwarf galaxy, passed close to the zenith of La Silla at midnight. He obtained prime-focus photographic plates for the study of variable stars in this nearby galaxy. A very large reduction work is connected with this kind of astronomical research, and it is therefore not yet possible to give detailed results, but Dr. van Agt here discusses the reasons for investigating the Sculptor dwarf galaxy.

Forty years ago Harlow Shapley announced in the Harvard Bulletin No. 908 the exciting discovery of "A Stellar System of a New Type" in Sculptor. The new system showed up as an assembly of hazy images on an exposure with the 24-inch Bruce telescope of the Boyden station in South Africa. The first confirmation of the reality of the object came from a plate obtained by S.I. Bailey in 1908, on which a faint patch of light was seen at the position of the Sculptor system. Bailey obtained this plate during a site-testing expedition with a 1-inch telescope and a total exposure over five nights of 23^h16^m! Additional observations with the 60-inch telescope resolved the individual stars and ruled out the possibility that the Sculptor system could be an extended cluster of galaxies.

Dwarf spheroidal galaxies are generally known by the name of the constellation in which they appear. Within approximately 250 kpc, seven Sculptor-type systems are now known including the recently-discovered dwarf in Carina. In addition, three dwarf spheroidal galaxies have been discovered by S. van den Bergh close to the Andromeda nebula. Within the Local Group there are now ten Sculptor-type systems known. Since these objects are difficult to detect

behind the stellar foreground of our Galaxy it is not likely that this number is free from selection effects.

At the time of the first discovery the interest of astronomers was focussed strongly on the significance of the shapes of galaxies. Nowadays the dwarf spheroidal galaxies, and especially the nearest, offer a unique possibility to study the evolution of isolated stellar agglomerates.

The low surface density of the stars permits inspection of the individual stars, also in the centre region of the systems. It gives a unique possibility to trace, in a complete survey, all the variables, of which there are many, through the whole system.

The Sculptor dwarf spheroidal galaxy is located at a distance of 78 kpc (250,000 light-years). This is derived from a mean, apparent luminosity of 20.13 magnitude in B for the RR-Lyrae variable stars. On the sky the Sculptor system has a considerable size. The more than 600 variables which have now been discovered cover an elliptical area with a major axis of about two degrees, corresponding to a linear dimension of 2.7 kpc. The positions and identifications of the variables are now in press (Publ. of the David Dunlap Observatory).

New photographic observations have been obtained by the author at the prime focus of the ESO 3.6 metre telescope at La Silla in October 1977. The Ila-O plates reach beyond magnitude 21.5 in 40 minutes. The aim of the programme is the determination of the periods and the luminosities for a selection of the variables in the 16 arcminute field of the 3.6 metre telescope. The field on which the plates are exposed in this part of the programme contains a photoelectric sequence as well as a secondary photographic standard sequence.

At present the plates are being reduced at the Department of Astronomy of the University at Nijmegen, where a semi-automatic iris-photometer and a unique projecting Blink-comparator are available.

Although many characteristics of the stars in dwarf spheroidal galaxies are very similar to those of the stars in globular clusters, there are also significant differences. One is the occurrence of bright cepheids which do not follow the Period-Luminosity relation of population II cepheids. In the