

Editorial

Catherine Cesarsky
(ESO Director General)

The birth of the European ELT

At ESO, we will all remember 2006 as the year of the birth of the E-ELT (European Extremely Large Telescope). The gestation period has been quite long. Astronomers have been discussing for many years the wondrous scientific programmes they hoped to conduct with an ELT. I remember the enthusiasm of scientists who gathered in the first workshops organised by OPTICON, in Edinburgh in 2000, followed by the two-week-long Leiden meeting in 2001. These were followed by a number of meetings and workshops, one of them in conjunction with “Exploring the cosmic frontier”, in Berlin in May 2004, which prefigured the science vision discussions our community is now having in the framework of ASTRONET. An important point about these discussions is that many of them were shared with our colleagues from across the Atlantic. A worldwide meeting took place as an IAU Symposium, in Cape Town in November 2005. Also in 2005, under the leadership of Isobel Hook, the first European ELT science case appeared, in the form of a short and well-illustrated document geared to decision makers followed by a lengthy volume for astronomers.

In parallel, studies of telescope concepts were pursued. At ESO, it was all started in the second half of the 1990s by Roberto Gilmozzi challenging the engineers to create a concept for a 100-m telescope. This prompted work from our opticians to devise ways of sharpening the blurred images that would be obtained with a spherical primary mirror, as it appeared that this simple and relatively inexpensive shape would be a requisite for such a mammoth telescope to be feasible. The mechanical engineers looked into finding ways of constructing large structures with the required stiffness, yet still relatively light and inexpensive to be produced by using many similar pieces (the Lego model). Meanwhile, the ESO Adaptive Optics (AO) specialists, in collaboration with European colleagues, while still delivering all the devices necessary for VLT and VLTI, were methodically investigating more and

more advanced schemes, necessary for an ELT. The OWL studies at ESO were for a long time one of the lowest priorities in our programme, as at that time Council asked us to concentrate our efforts on completing the Paranal Observatory and on starting the ALMA construction.

The situation was completely changed when in December 2004, Council, adopting the recommendation by the Council Science Strategy WG chaired by Ralf Bender, announced the now famous resolution which, at last, gave ELT studies a high priority within the Organisation. In 2005, while the first complete Science Case was being completed, at ESO all the work performed on the OWL concept was written up. Another very important activity in 2005, organised by Sandro D’Odorico in a broad cooperation with the community, was to provide instrumentation concepts for OWL. Finally, the FP6 ELT Design Study was started by a European-wide consortium led by ESO, aimed at evaluating critical technologies needed to build a giant telescope.

By the end of 2005, following the OWL review, we decided at ESO to reorient the ELT effort towards the best affordable ELT facility, with a diameter from 30 to 60 m that could be built on a competitive timescale and with acceptable risks, with strong involvement of the community. I had great confidence in the ESO staff, which I knew was well prepared to design an ELT, and in the community, which had shown prowess in developing telescope concepts, various aspects of adaptive optics and in instrumentation design. In the last week of December 2005, I solicited 88 astronomers and engineers from the community and ESO, to participate in five working groups (Science, AO, Instruments, Telescope design and Site evaluation), to elaborate within two months a ‘toolbox’, a compendium of the relevant knowledge for designing an ELT, including trade-offs and prioritisation criteria. I was extremely pleased to see that almost all accepted readily. They rose to the challenge, and provided me with an excellent document that was a starting point towards the very ambitious goal I had set: to present the concept study of the E-ELT to Council for Phase B approval in December of 2006. Soon after, the chairs and co-chairs of the WG’s

came together in the ELT Science and Engineering WG (ESE), chaired by Daniel Enard, and provided the E-ELT basic requirements: a multipurpose telescope and instrumentation which was ‘laser guide star friendly’ and fast in switching. Adaptive Optics was to be integrated in the telescope. The diameter, 42 m, was considered by the committees as a good starting compromise between ambitious scientific goals and schedule, cost and risk.

The design principles are described in the article by Roberto Gilmozzi and Jason Spyromilio in this issue (page 11). I had high expectations, but these were much surpassed when I was presented with the novel five-mirror design, which corresponds to all ESE requirements and not only provides excellent image quality across the field of view but also improves performance and reduces risk by separating the functions of field stabilisation from those of AO. Other attractive features are that it is cheaper than a classical telescope, is faster to build and thus can be timely, and is upgradeable at a reasonable cost.

First our advisory committees (in this case, ESE and STC, and the Council ELT Advisory Committee ESRC), then our community, at a historic meeting at the end of November in Marseilles (see the meeting report on page 20), and finally Council on 6 December 2006, were convinced by this novel design, leaving it to the ESO E-ELT Project Office to undertake a Phase B study with the community and industry. The real work is starting now!

Spain has joined ESO

On 14 February 2007, I was notified by the French Council delegate, Mr. Julien Galabru, that Spain had deposited the instrument of accession to ESO in the archives of the French Ministry of Foreign Affairs. This was the last formal step required for Spain to become the 12th ESO Member State, and it appropriately happened on Valentine’s day, a good omen for the future.

In fact, Council and the Spanish negotiating team, then headed by Carlos Alejaldre

Losilla, Director General for Technological Policy, had agreed on all the conditions for Spain's accession on 7 December 2005. In February 2006, the then Spanish minister of Education, Mrs. María Jesús San Segundo, and I signed an agreement towards the entrance of Spain in ESO as of 1 July 2006. The entrance of

Spain into ESO had been agreed by both parties to be retroactive to mid-2006, even if the required approvals and administrative steps dragged on beyond that date. Thus, in the second part of last year, we already treated our Spanish astronomer colleagues as members, and immediately we could see their enthusiasm,

effectiveness and commitment in the various events, work groups and committees in which they took part. I am truly delighted that we have accreted this vibrant community, with which we were already very familiar.

Tim de Zeeuw to Become the Next Director General of ESO

The ESO Council has appointed Tim de Zeeuw, as the next Director General of ESO effective as of 1 September 2007, when the current Director General, Catherine Cesarsky, will complete her mandate.

Tim de Zeeuw has an excellent record, both as a highly respected scientist and as a leader of an internationally recognised science institute in the Netherlands. He is Scientific Director of the Leiden Observatory, a research institute in the College of Mathematics and Natural Sciences of Leiden University. Tim de Zeeuw also has considerable experience as regards science policy issues. "The ESO Council is very pleased that Professor de Zeeuw has accepted the task as its next Director General. He has played a key role over the last few years in developing a strategic vision for ESO, and I have every confidence that he will now lead the organisation in the realisation of that exciting vision" announced Richard Wade, the President of the ESO Council.

Catherine Cesarsky, ESO's current Director General, commented: "Over the recent years, ESO has developed considerably with more activities and new member states, and with its ambitious project portfolio, ESO is clearly facing an exciting future. I shall be delighted to pass the baton to Tim de Zeeuw, who as a recent Council member is very familiar with our Organisation."

"It is a great honour and an exciting challenge to lead this world-class organisation in the years to come in support of one of the most dynamic areas of science today" said de Zeeuw. "I look forward

to overseeing the continued upgrading of the Very Large Telescope with the second-generation instrumentation and the completion of the ALMA project, and in particular to help developing the future European Extremely Large Telescope."

Tim de Zeeuw's main research interests embrace the formation, structure and dynamics of galaxies, including our own Milky Way galaxy. A second area of research is the study of the origin, structure, and evolution of associations of young, massive stars in the Solar Neighbourhood. He obtained his PhD from the University of Leiden in 1980, moving on to work at the Institute for Advanced Study in Princeton, and subsequently at Caltech in Pasadena before returning to the Netherlands. He has received several honours and awards and is the author of a large number of research papers.

In 1993, he became the founding director of NOVA, the Netherlands Research School for Astronomy, which coordinates the graduate education and astronomical research at the five university astronomy institutes in the Netherlands. NOVA has contributed to strongly increasing the international visibility of Dutch astronomy and has enabled intensified Dutch participation in ESO activities. He is also the co-founder of the Lorentz Center, an international centre for Astronomy, Mathematics and Physics in Leiden.

Tim de Zeeuw regularly advises NWO, the Netherlands Organisation for Scientific Research. He has served on many committees including the Time Allocation Committee for the NASA/ESA Hubble Space Telescope, and, since 2003, as

the Chairman of the Space Telescope Institute Council in Baltimore. He also serves on the AURA Board of Directors, and on the ESA Space Science Advisory Committee, and leads the development of a Science Vision for European Astronomy as part of the EU ASTRONET initiative.

For three years Tim de Zeeuw served as the Dutch national astronomy delegate to the ESO Council. As a member of the ESO Council he participated in the work of the Council Scientific Strategy Working Group, which resulted in the Council resolution of December 2004 outlining ESO's strategic goals. More recently, as Chair of this Working Group, he has been elaborating various scenarios for ESO's future role in European astronomy.

Tim de Zeeuw, who is 50, is married to Dutch astronomer Ewine van Dishoeck.

(Based on ESO Press Release 03/07)



Prof. Tim de Zeeuw, ESO's next Director General.

Photo: C. Oerman