

# Large Programmes

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**A report is presented of the workshop on the progress of ESO Large Programmes completed between the last workshop in May 2003 and September 2007.**

Five years after the first workshop on ESO Large Programmes (see the summary by Wagner & Leibundgut, 2004), about 50 participants, including the PIs of the second round of Large Programmes (LPs), as well as several members of the Observing Programmes Committee (OPC) and the Science and Technical Committee (STC) together with some Council members, gathered in Garching from 13–15 October 2008. The VLT has been in operation for nearly ten years and a large fraction (15%) of the observing time has been devoted to the execution of Large Programmes. At the request of the OPC, ESO organised this second workshop to obtain a new overview of the scientific results achieved through the Large Programmes conducted at the La Silla Paranal Observatory. The workshop featured scientific presentations of all LPs that were completed between the May 2003 LP workshop and end of ESO Period 79 (30 September 2007). The teams of investigators leading these LPs were invited to present their scientific results and the impact of their project on its field. The presentations were followed by a discussion session on the general scientific impact of ESO facilities.

One of the outcomes of the May 2003 workshop was a suggestion that ESO should archive the legacy data products of Large Programmes. This suggestion was implemented with the requirement that Large Programmes that started after 1 April 2005 deliver Advanced Data Products (ADPs) to the ESO science archive by the time of publication of their results in a refereed journal. The workshop featured a presentation of the ADP submission process and a discussion of its value for the ESO scientific community.

The first two days were devoted to the presentation of 20 LPs with topics ranging from the distant Universe and the determination of cosmological parameters to the characterisation of the population of nearby galaxies and the search for habitable exoplanets. Most fields in astrophysics were represented by an LP. The morning of the third day was dedicated to a discussion of the special scheduling constraints and challenges presented by LPs, a bibliometric assessment of the scientific impact of LPs and a presentation on how to submit the reduced data products to the ESO archive. After a brilliant summary by Willy Benz on the scientific value of LPs and how they can succeed (or fail), a discussion, led by the STC chair, Linda Tacconi, on the various aspects of LPs took place. The workshop programme and the presentations can be found online<sup>1</sup>.

A number of the projects presented actually encompassed more than one LP, among them the public surveys (the ESO Imaging Survey [EIS] and the Great Observatory Origins Deep Survey [GOODS]). There were projects requiring large data samples or deep searches for extremely rare objects and, in some cases, a long time span was essential for the observations to record a light curve or to measure proper motions or radial velocities. Several LPs complemented other large efforts by space- or ground-based consortia. Very few LPs could be considered failures: most of these cases had to cope with instrumental problems, with the result that the final data quality was not sufficiently high to achieve their goals.

It was stated several times that LPs have changed some of the culture of astronomical observations. The need for large data samples and complex data analyses requires teams with a wide range of expertise. This leads to large collaborations. Consequently, most LPs were granted to large collaborations. Nevertheless, there are specific experiments, which can be run by a dedicated small team concentrating on a specific problem. In most cases the scientific returns of the LPs have been very good, some even spectacular. The chance to obtain

enough observing time to approach a major astrophysical problem over four semesters was generally appreciated.

The bibliometric analysis of LPs compared to other programmes shows a good publication record. While 15% of the observing time was devoted to LPs they returned 18% of the refereed publications. This may be partly due to the fact that LPs do receive a high priority for observations. Papers based on LPs appear to have a slightly higher impact — as measured by the number of citations per paper — than all other types of programmes (Normal, Target of Opportunity, Guaranteed Time Observations and Director Discretionary Time). The effect is significant, but not dramatic. It is remarkable that LPs have requested time on all instruments, with ISAAC, FORS2, VIMOS and WFI being the most used. The distribution over the different scientific categories further reveals a predominance of cosmological projects (OPC category A), requesting and being allocated about half the time. The other three categories share the remaining fraction equally. With the extension of LPs on La Silla to four years (compared to the two years so far on all ESO telescopes) a marked increase in the time requests for HARPS for Period 83 can be noted. The demand for LPs remains high and the OPC has seen a significant increase in the number of LP proposals in the past two semesters.

According to the summary by Willy Benz, LPs need to be bottom-up, i.e., tailored to the user's needs. This is guaranteed first through the selection by the OPC, and then by the regular status reports provided to the OPC, that enable a judgement whether the continued investment in telescope resources is still warranted. Also, LPs should not be regarded in isolation, but should be seen as a complement to other types of observing programmes. They should enable projects, which otherwise would not be possible at a public observatory. The results from this workshop as well as the first workshop in 2003 show that LPs have enabled European astronomers to compete on a par with some of the private large facilities in the US. At the same time, it has to be realised

that LPs make use of an expensive resource and that they have to provide additional benefits for the community. This has led to the requirement that reduced data from LPs, once published, should be returned to the ESO Archive so that they can be used by other astronomers, possibly for different purposes. The large investment by the community into LPs should justify this modest return. There was a lively discussion on how this return should be achieved and whether it would put astronomers using ESO facilities at a disadvantage compared to users of private observatories.

The workshop overall was very successful and clarified the need for, and the competitive edge of, Large Programmes at ESO facilities. The increased demand for the 3.6-metre telescope after the time limit for LPs was raised to four years speaks for itself. There are some very substantial programmes in progress, which will keep this telescope busy for years to come.

Beyond the Large Programmes, the Public Surveys with VISTA and VST will start during this year and next year. These will be truly massive projects, which

complement the current arsenal of programme types undertaken with ESO facilities at the upper end. It is planned to monitor their success in another workshop in a few years time.

#### References

Wagner, S. & Leibundgut, B. 2004, *The Messenger*, 115, 41

#### Notes

<sup>1</sup> <http://www.eso.org/sci/meetings/LP2008/program.html>

## ESO and the International Year of Astronomy 2009 Opening Ceremony

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The ESO contributions to the International Year of Astronomy 2009 and the Opening Ceremony, held in Paris in January 2009, are summarised.

“The International Year of Astronomy 2009 is an important step in furthering the interest of the public in what is arguably the oldest of all sciences: astronomy.” ESO Director General, Tim de Zeeuw, on the United Nations proclaiming 2009 as the International Year of Astronomy.

Few areas of science touch on as many topics of interest for the general public as astronomy. For countless thousands of years, eyes have gazed up at the heavens and wondered; it could be argued that everyone is born an astronomer. Modern astronomy is a highly professional field, but is not exclusively the domain of specialised scientists. The sky is a shared resource and intense public



Credit: IAU/José Francisco Salgado

Figure 1. Catherine Cesarky, IAU President, addressing the audience during the IYA2009 Opening Ceremony

interest means that many organisations, such as ESO, invest in outreach initiatives.

The year 2009 has been launched by the International Astronomical Union (IAU) and the United Nations Educational, Scientific and Cultural Organization (UNESCO) as the International Year of Astronomy 2009 (IYA2009) under the theme “The Universe,

Yours to Discover”. The IYA2009 marks the 400th anniversary of the first astronomical observation through a telescope by Galileo Galilei. Proclaimed by the United Nations (UN) and endorsed by the International Council for Science, the IYA2009 has already captured the imagination of countless individuals. The aim of the IYA2009 is to stimulate worldwide interest, especially among young people, in astronomy and science. Events and activities will promote a greater appreciation of the inspirational aspects of astronomy that ESO is keen to foster.

The opening ceremony of IYA2009 was held in Paris, on 15–16 January, 2009, under the aegis of the UN, UNESCO and the IAU. The ceremony itself featured keynote speeches, research findings, an exhibition and also social aspects. About 900 people attended, among them eminent scientists, including Nobel Laureates, and also around 100 young students from individual countries. The ceremony was very well received, and the quality of talks highly praised. The enthusiasm of all involved shone through, and proved that