

## The New Data Management Division at ESO

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At its last meeting in December, the ESO Council approved the proposal by the Director General for the constitution of a new Data Management Division. The purpose and scope of this new division are not totally new to ESO: it will have under its responsibility the support of those activities which produce, process, store and distribute scientific data and information, all tasks which are already carried out by different groups in ESO. The rationale for the reorganization of these activities within a division is based on the recognition of their growing importance in the operation of an observatory and on the consequent need for a better coordination among them and for a more rigorous link between them and the requirements of the users of complex modern telescopes, in the case of ESO of the refurbished NTT and of the VLT.

It is becoming evident, particularly from the experience of operating space observatories, that the various tasks and services which an observatory has to perform and offer in support of its users community, cannot anymore be considered in isolation, rather they must be seen in the context of an end-to-end model of operation. According to this model, which is schematically shown below, the information and the science data should flow transparently from the preparation of an observing proposal, through the observation, calibration and reduction up to the storage of the data into the archive.

The user should be able to access this information at any time, possibly remotely via computer: for example, when retrieving a set of public data from the archive, she or he should be able to access at the same time the abstract of the proposal to which the data belong, as well as the performance of the instrument at the time of the observation, the relevant calibration data and procedures and any other related information which can be useful for a scientific exploitation of the archive. Similarly, a user who intends to submit an observing proposal should be able to obtain up-to-date information about all the ESO telescopes and instruments and possibly perform realistic simulations of her/his observations, or retrieve similar relevant data from the archive. These latter requirements will become essen-

tial if, as it is planned for the refurbished NTT and for the VLT, part of the observations will have to be performed in service mode. In this case the observatory should also have available tools for real-time scheduling of observations according to their priority and to the prevailing meteorological and seeing conditions, even if they belong to different proposals.

The new Data Management Division will have to provide the support for the implementation of this end-to-end scheme of operation, with the noticeable exception of the data acquisition processes and telescope control which is the task of a specific group in the VLT Division and with which the Data Management Division has an important interface.

The high-level requirements which will be used as a guide for planning the Division activity can be summarized as follows:

- Users shall have access to complete and up-to-date information on all ESO facilities. This information shall be offered using state-of-the-art technology and, if network capacity permits, shall be accessible remotely.
- There shall exist software simulators for the major ESO observing facilities.
- Tools for remote proposal entry shall exist. These tools shall be designed to include service observing mode.
- A flexible scheduling system, which is capable of quasi real-time rescheduling, shall exist.
- Quick-look tools shall be available to the users of the telescope and of the archive for real-time evaluation of the scientific quality of the observations. The user shall be able to compare, in real time, her/his observations with simulations and with existing data extracted from the archive.
- Reduction and calibration procedures and their software implementation shall exist for each observing mode of the ESO facilities. ESO shall define the standards for the development and implementation of this software and coordinate and monitor its development when this is done by third parties.
- Calibration plans and calibration databases shall exist for each observing mode.
- ESO shall maintain knowledge and expertise on the state-of-the-art data

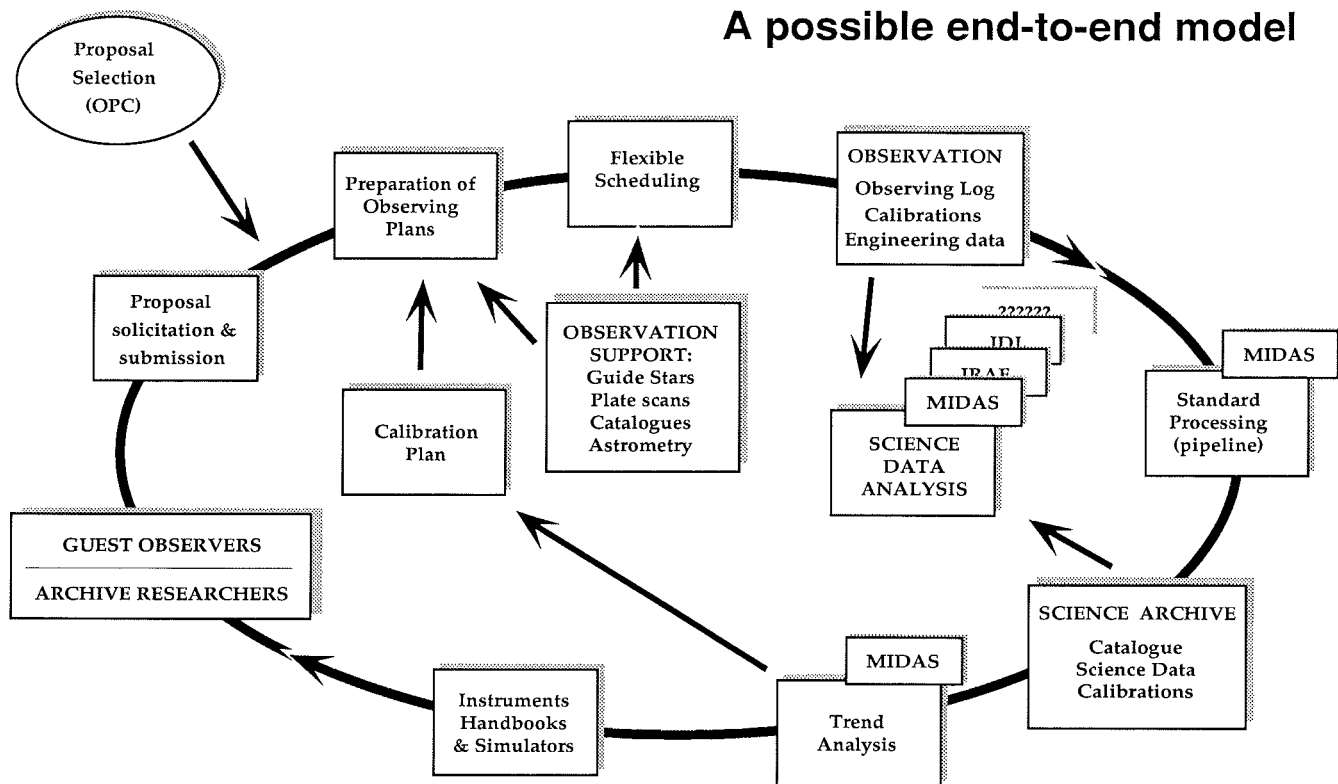
analysis systems and offer limited support to the users on their utilization in the analysis of astronomical data.

- ESO shall develop advanced methods for the analysis and interpretation of astronomical data.
- All scientific data shall be archived together with the information which is needed for their scientific use.
- Users shall be able to browse through the archive and retrieve public data.
- ESO shall be a European focal point for astronomical applications of advanced software techniques.

It is quite clear that these requirements are very demanding and that their implementation, given the limited manpower currently available, should be carefully planned in a staggered schedule according to priority. At the time of writing, this prioritization analysis has just started and it will be presented in detail in a forthcoming issue of the *Messenger*. We can however indicate here the guidelines along which the main activities of the division will unroll. In order to obtain a better coordination and control, four groups have been formed within the new division: Observation Support and Data Management, Science Data Analysis, Computer Management and Operations, Advanced Systems and Planning.

The long-term goals of the first group, led by Miguel Albrecht, is to implement an environment, based on advanced information handling techniques, which allows a user to efficiently prepare an observing proposal. Within this environment the user, starting from a scientific idea, should be able to consult the literature on the subject, extract the fields containing the objects of interest, identify guide stars and pointing strategies, browse through existing data and observations of the same type of objects, identify the ESO instrument which is best suited for the specific science, experiment with the instrument simulator in order to optimize the exposure time and the observing procedures, fill and submit the observing proposal. Currently, the highest priority is given, in close collaboration with the NTT Group, to the definition and implementation of a calibration plan for the EMMI and SUSI instruments and of the procedures for monitoring their performance. Another

## A possible end-to-end model



important activity of the group is the re-definition of the tools for the submission and handling of observing proposals, following the requirements of the NTT refurbishment plan and of the new Observing Programmes Committee.

The Science Data Analysis Group is led by Preben Grosbøl, who is also the Deputy Head of the Division, and it is essentially the previous Image Processing Group which has a long and successful tradition in the development of Data Analysis Systems. One of its tasks will continue to be the maintenance of the MIDAS system. However, its activity is now focussed on the definition and implementation of reduction and calibration procedures for all ESO instruments, both for those in operation and those under development for the VLT. Similarly, in collaboration with the VLT Software Group and the Operation Group at La Silla, the tools and procedures for a quick-look analysis of the observations will have to be defined

and implemented for each instrument.

The tasks of the Computer Management and Operations Group, led by Peter Dierckx, are rather obvious and certainly not new. The change is rather in scope, since the group will take under its responsibility the management of all the different local area networks in ESO with the exclusion of that used by the Administration. A number of rationalizations and standardizations are planned which should result in an overall improvement of the service.

The last group, Advanced Systems and Planning, is led by Joseph Schwarz and has the broad (and ambitious!) task of keeping ESO on the forefront of computers and software evolution. It should monitor the development of systems in different areas and propose their application to specific ESO activities. The first output of this group, the manpower of which is drawn from all groups in the division and also elsewhere in ESO, will be a medium long term plan for the

evolution of hardware and software at ESO.

The main problem which is affecting all groups is the severe shortage of manpower when compared with the tasks which should be fulfilled: as mentioned before, we will try to cope with this difficulty by proper prioritization and rationalization of our activities. In particular we could foresee a more effective integration of similar ESO and ST-ECF tasks, following the successful example of the development and operation of the archive. Also, several astronomical projects are currently tackling problems which are similar, if not equal, to those faced by ESO for the operation of NTT and VLT: whenever possible we will try to establish effective collaborations which, as it was shown in the case of the archive joint development with the ST Science Institute and with the Canadian Astronomical Data Centre, can save resources and avoid unnecessary duplication of effort.

## The ESO Library Information System

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Since November 1993, the automated ESO Library Information System is available to the public. At present, it provides access to three components: The *Library Catalogue* can be searched, the

so-called *Information Desk* offers lists of new acquisitions, and users can enquire about their *User Status*, i.e. view the items they have on loan.

Two user guides are available: The

brief *ESO Libraries Online Catalogue in a Nutshell* and the more detailed *ESO User Guide to the Online Catalogue*.

Following is a short introduction to the system. If you are interested in further