The ESO Libraries: State of the Art 2001

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The main task of the ESO libraries is to provide ESO scientists and engineers with access to all information resources they need for their work. In order to do so, physical libraries are maintained in Garching, Santiago, La Silla and (in future) Paranal as well as an electronic library on the world wide web (Fig.1).[1]

In the era of electronic information dissemination, astronomers expect to find all important resources online, ready for use from their desktops. Scholarly communication is changing, and to stay informed about recent findings two services seem to be sufficient: the NASA ADS abstract service for searches of published articles including access to electronic journals, and the LANL astro-ph preprint server. Relatively unnoticed by scientists, librarians contribute to the efficiency of these and other services in a number of ways. The traditional librarian's tasks retrieving, obtaining, making available and archiving publications are evolving as print literature is complemented, if not replaced, by electronic publications. Enhancing electronic library services, monitoring and evaluating new information retrieval technologies, reviewing and negotiating licenses for electronic journals and books, maintaining content-rich web pages and guiding local and distant users to appropriate search tools are some of the more recent services provided by libraries.

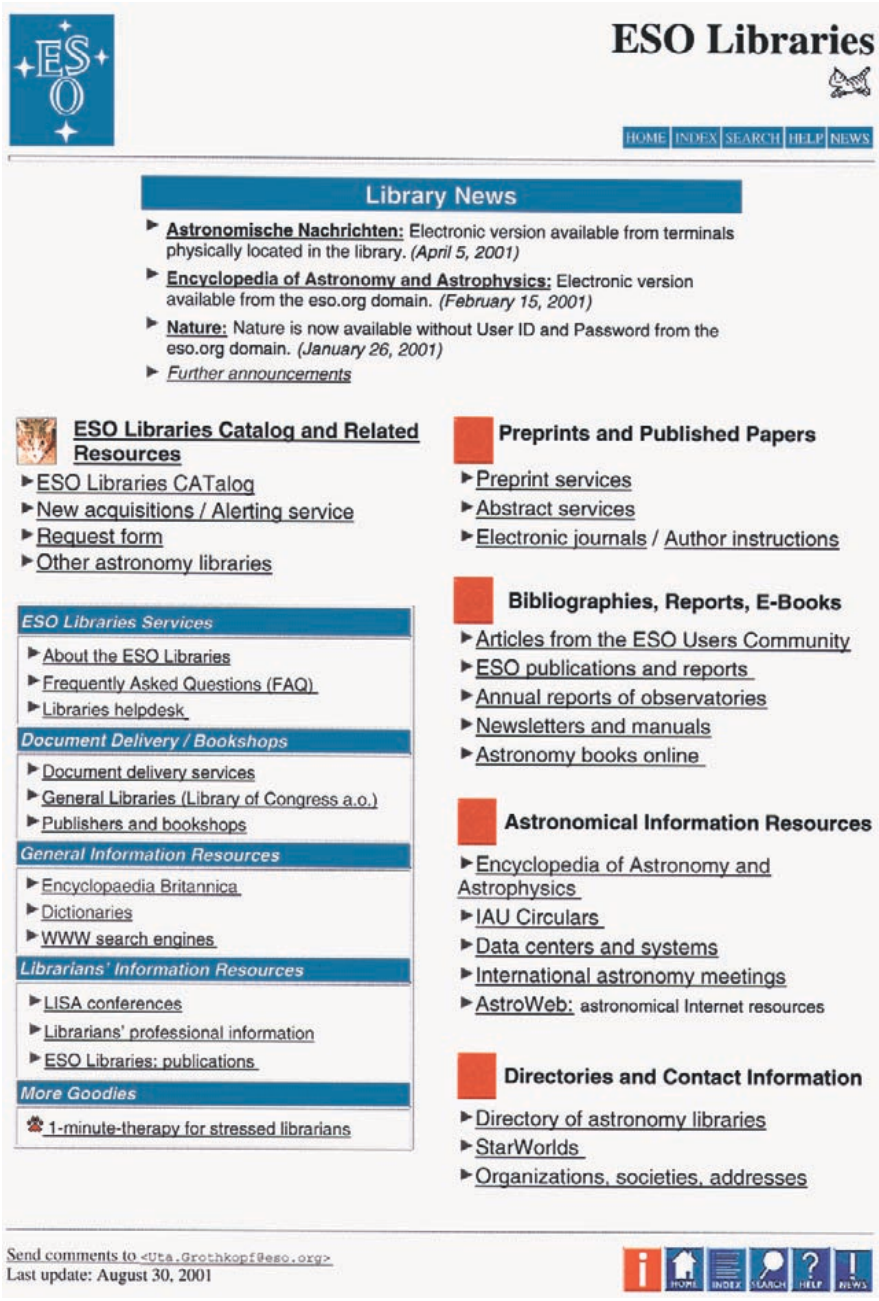

Figure 1: The ESO libraries web homepage.

The Library Sites

Compared to former times, the importance of local library holdings is diminishing. We notice a smaller number of scientists coming to the physical sites, and many of these walk-in users are not staff members, but scientific visitors who stay at ESO only a limited time. Often they need public computer facilities as much as the books and journals provided by the library. Despite this trend, most publications are not yet available in electronic format, and ESO puts emphasis on maintaining ample paper-based collections. The library system comprises currently three, in future four sites. The present three libraries provide a total of approximately 15,000 book titles, covering the main subject areas of astronomy and related physical sciences as well as engineering, mathematics and computer sciences. Current journal subscriptions amount to about 150 titles. The majority of books and journals are available in Garching as well as Santiago, only a selection is purchased for La Silla as this library is designed to support astronomers and engineers at the telescopes in their specific needs.

In addition to current publications, three historical collections are available in Garching: the library of Prof. G. Franke which was donated to ESO after his death, a collection of Prof. J.H. Oort, one of ESO's founding fathers, and the ESO Historical Archive, compiled and classified by Prof. A. Blaauw. The latter is physically not located in the library, but descriptions of all items pertaining to the Archive are included in the catalogue. The number of library staff are 1.5 FTE (full time equivalent) in Garching and 1 FTE in Chile. Central services like journal subscriptions, license negotiations, book purchases, cataloguing and co-ordination of activites are taken care of in the main library Garching. Here, also the telescope bibliographies are compiled which are of increasing importance to

[1] http://www.eso.org/libraries/

Table 1: Media provided at ESO sites.

Media provided	Garching	Santiago	La Silla	Paranal
Print journals	large variety	large variety	only most important	selected donations
Print books	large variety	large variety	only most important	few
Electronic publications	yes	yes	yes	yes

observatories (see Bergeron & Grothkopf 1999).[2]

A fourth library will become available on Paranal, located in the Residencia. For this new site, a different collection management policy will be applied (Table 1). As all major astronomy journals can be accessed online, most of them even back to volume 1, current issues will only be provided in electronic format. Only some back volumes of journals (mainly *A&A* and *ApJ*), donated by ESO scientists, will be available on paper. This electronic-only approach is new to astronomers, and whether or not this solution is feasible will have to be evaluated during the coming years.

All sites used to be visited frequently by astronomers who appreciated among other things the display of latest preprints, but the impact of paper preprints is going down. The ESO libraries received a substantially lower number during the past five years, with a parallel dramatic increase in preprints submitted to the LANL server (Fig. 2). As a consequence, we decided to discontinue our preprint database as of June 2001 and keep paper copies for one year without trace in our catalogues. However, only a certain percentage actually appears in both electronic and print format; snapshots taken at NRAO and STScI during recent years show that approx. 50% of the preprints received in their libraries is available only in hard copy.

In 1992, we started to build an electronically accessible library catalogue. The software selection was determined by some essential requirements: we wanted an integrated, modular system based on client/server architecture and running on Unix with an easy-to-use, yet powerful user interface. After comparison of various software packages, the Unicorn Library Management System was selected. The system performed well from the beginning; it has evolved considerably in the course of time, incorporating innovative technologies and features that keep the system up-to-date. The public user interface[3] provides access to all records of the library holdings as well as hyperlinks to electronic publications.

When the automated library catalogue was opened to the public, we issued two print user guides to introduce it. Since then, no further information material on paper was produced as it usually becomes obsolete within a short time. All necessary information is made available on our web pages. This is inexpensive, less time-consuming and available to users whenever needed. A page with frequently asked questions (and answers) gives basic information about services and procedures. Library news are provided on the homepage as well as on a dedicated page. In addition, we send alerts regarding new services and resources by e-mail. Monthly lists of book purchases are distributed electronically to subscribers and are also available on the web.

The classification system used at ESO originates from the time when the organisation was founded and has undergone only minor changes since then. It consists of five broad subject groups – astronomy, physics, engineering, mathematics, and handbooks/dictionaries – each divided into several sub-groups. Initially, the classification system had merit in locating books by subject; now it is mainly used to order books on the shelves. To provide specific keywords for scientific literature searches, IAU Astronomy Thesaurus terms (Shobbrook & Shobbrook 1993) are added to records for astronomy books. ESO employees can borrow all library items except journals and selected reference material. We do not adhere to strict loan periods, but expect users to return borrowed items in case these are requested by somebody else. Traditionally, the ESO libraries are open 24 hours per day, 365 days a year. Therefore, emphasis always has been put on a self-issue circulation system, i.e., users can check out items without assistance from librarians.

The Electronic Library

Maintaining sophisticated electronic libraries has become an essential task of librarians. Many scientists visit our library for the first time on the web; therefore our homepage is like a business card. Here we can introduce our services, invite users to contact us with requests and provide starting points for their information search. As users typically don't spend much time at pages that require a lot of reading to be understood, we try to design our site as clearly and attractive as possible. From discussions with astronomers we learned that many of them appreciate the library web pages and use the provided links. With an ever increasing range of electronically available resources, we face (almost) no limitations to what we can offer our users; the border between local resources and those that reside elsewhere is hardly noticed anymore. The concept of "virtual libraries" will become even more evident in future as information resources become more and more interconnected, offering researchers a single entry point from where all relevant data can be reached.

In order to measure usage of the library pages, the most reliable indication will be feedback from users. It will reveal which resources are appreciated and may also prompt suggestions for additional ones. Another way of evaluation is to look at the access statistics although the numbers may be misleading, for instance because of hits originating from automated crawlers. Not surprisingly, our statistics show that the web catalogue is among the most frequently visited resources, followed by pages with links to electronic journals, abstract services and preprint databases. Two resources are particularly popular among astronomy librarians: the Directory of Astronomy Librarians and Libraries, a compilation of contact persons, addresses and web pages of astronomy libraries around the world[4], and a listing of annual reports of observatories that is maintained in co-operation with the CFHT librarian[5].

Collection Development

The number of print publications purchased at ESO has decreased only slightly during recent years. Several book series, typically for conference proceedings, are obtained automatically upon publication through standing orders; other publications are selected mainly based on staff recommendations, pre-publication information received from book vendors and publishers, and astronomy libraries' new acquisitions lists.

At ESO, no effort is made to create a collection of digital media that are not networked, e.g., CD-ROMs stored offline. Electronic (online) books, however, are among the topics we will investigate in detail in the near future. Like electronic journals, e-books provide en-

[2]Query form at http://archive.eso.org/wdb/wdb/eso/publications/form

[3]http://www.eso.org/libraries/webcat.html

[4]http://www.eso.org/libraries/astro-addresses.html

[5] http://www.eso.org/libraries/reports.html

hanced searching and indexing capabilities, and they can be accessed (almost) from anywhere and at any time. Access technology is evolving rapidly, but the usage terms and conditions currently cater for large university libraries rather than small specialised libraries; for instance, customers often are obliged to purchase complete collections regardless of their actual requirements and budgets. The main subject areas covered at present are computer technology, business and management; other disciplines certainly will follow shortly.

Since the 1970s, we have seen steep increases in the prices of scientific journals, and the "serials crisis" still is one of the most discussed topics among librarians. By now, three quarters of the ESO libraries' media budget are spent on subscriptions. Whenever feasible, paper and online versions of journals are subscribed in parallel. Electronic versions do not come for free though but confront libraries with additional expenditures which are not compensated by corresponding increases in our budgets.

ESO employees can access electronic journals in a variety of ways. Most frequently, astronomers would carry out searches at ADS from where they can click through to full texts of articles. In addition, the library's e-journals web page[6] provides links to the most important journals. Hyperlinks to journals' homepages are also available from catalogue records. Typically, access to electronic publications is managed by IP address so that they can be used without user ID and password from all computers pertaining to the eso.org domain. While it is fairly easy to evaluate use of print library items, tracing page views and downloads from electronic publications can be difficult. Access statistics have to be analysed, but these reside on the publishers' servers. Some publishers are reluctant to reveal these figures because they fear subscription cancellations of electronic as well as print versions. Librarians often try to ensure access to statistics through special clauses in the license agreements.

Up to now, no print subscription has been cancelled because of electronic availability. The two main reasons to continue paper editions are that (a) several scientists still appreciate the opportunity to browse and read print journals and (b) paper still is the only reliable medium for archiving. The latter reason diminishes in importance though as electronic editions provide features that cannot be reproduced on paper; electronic versions therefore increasingly are regarded as the reference or master copy of journals.

In 1999, several journal subscriptions were discontinued. These titles were of minor interest to ESO scientists and engineers and the money spent on them was needed to cover rising costs of more important publications. An additional argument to cancel subscriptions was the fact that requests for journal articles not owned by the ESO libraries usually can be fulfilled rapidly and at reasonable prices through document delivery services. However, document delivery, in particular from electronic publications, is severely affected by changes in copyright regulations. Many publishers as well as governments consider current copyright laws unsuitable for the digital environment; they fear misuse of electronic publications through uncontrolled dissemination of articles. Existing copyright regulations of many countries therefore are being amended by clauses that restrict traditional user rights, e.g., free use of publications for research and personal information. Librarians are negotiating intensely with publishers in order to achieve more favourable usage conditions.

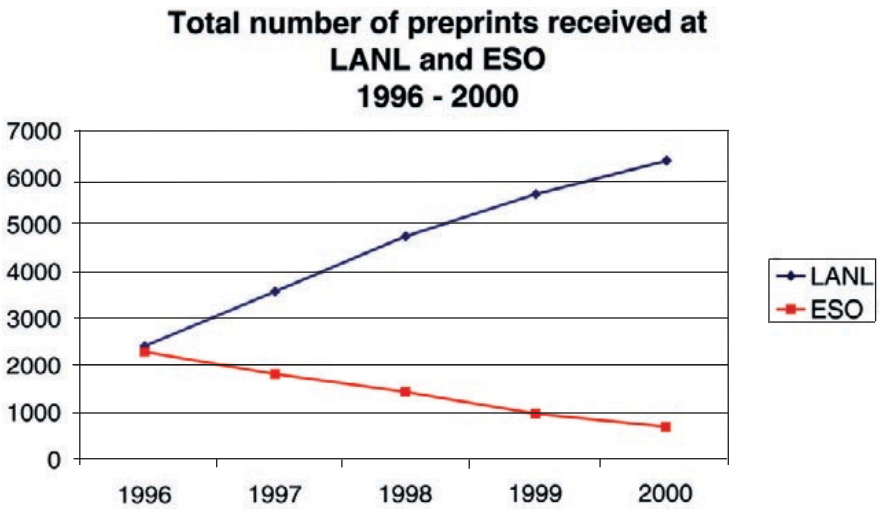

Figure 2: Total number of preprints received at LANL and ESO 1996–2000.

Archiving

With respect to paper-based publications, archiving is one of the central library functions. Even small specialised libraries can provide highly valuable repositories. In order to integrate them in the electronic knowledge base, many historical print documents are now converted into digital format.

In the electronic environment, archiving is undergoing vast changes. Preserving digital publications requires thoughtfulness, vision, long-term commitment and a lot of money for equipment as well as manpower. In order to guarantee future access, physical storage of electronic media is not sufficient; the danger of unexpected or unbridgeable gaps in the availability of hardware and software required to use them is too large. Instead, electronic publications should be encoded in system- and vendor-independent formats like SGML or XML and be transferred in regular intervals to storage devices that comply with current technological standards. The integrity of publications has to be ensured at any time. No data must be lost, and in addition to the content, all relevant accompanying information regarding provenance (a document's origin and chain of custody) and context (links within as well as from and to documents) must be preserved.

At present, archives of electronic journals, if they exist at all, mostly are kept by publishers. Future access to scientific literature depends on their good-will and position in the market; they determine who can use the archives and at which costs. In the interest of the scientific and the general public, better solutions are sought and discussed heatedly among experts. Some models favour large non-profit organisations like national libraries, national archives or the Public Library of Science[7] as archiving institutions. Centralised solutions bear some risks though as they tend to be inflexible and any failure in meeting the challenges of the digital age can have fatal implications. Other solutions like the Open Archives Initiative[8], having its roots in dissemination of content through e-print servers, promote distributed archiving based on interoperability standards. In any case, mature and standardised solutions for preserving, retrieving and accessing electronic publications have to be implemented soon, otherwise data may be lost. Small specialised libraries probably will be mainly responsible for providing access to archived publications rather than for preservation itself, and they will continue to mediate between authors/readers, publishers and archives.

6 http://www.eso.org/libraries/ejournals.html
7 http://www.publiclibraryofscience.org/
8 http://www.openarchives.org/

Communicating with Library Users and Other Librarians

Communicating with library users is an essential part of our work; only if we know their requirements, we will be able to provide good service. As many astronomers visit the physical libraries less frequently than before, communication increasingly is through electronic means rather than face-to-face (see Grothkopf & Cummins, in press). We consider it essential that users can contact us easily. A variety of access points for electronic submission of enquiries is provided: several e-mail addresses (esolib@eso.org, library@eso.org, libchile@eso.org and accounts under the names of the librarians); links to the main e-mail account on all library web pages; two web pages for requests and suggestions[9, 10]. During introductory library tours, our e-mail addresses are mentioned repeatedly, acknowledging the fact that it will be impossible for new users to memorise everything we tell them – and hoping that they do remember our e-mail address. Thus, they will always know where to send any questions they may have.

There are various types of users. A large number of scientists don't visit the (physical or virtual) sites regularly. They do not bypass the library entirely though; often they use our services without noticing it, for instance by using electronic journals which are paid for and made accessible by the library. These users hardly seek direct communication with us, except for "troubleshooting" when problems arise. Librarians, in turn, often don't dare to interrupt them in their work to talk to them. Other users appreciate and frequently use the information resources provided by the library, and often they take the time to tell us about further services which they consider worthwhile adding. Their suggestions are most helpful in order to identify users' needs. A third group of users appreciate our assistance for all kinds of requests from access instructions to special enquiries. Actually, these requests sometimes are so specialised that we enjoy the challenge.

A way to ensure communication with astronomers on a regular basis would be to set up a library committee, but for various reasons this idea was never pursued at ESO. Likewise, distributing questionnaires among faculty members to get feedback has been avoided in the past as answering them is too time-intensive. Occasionally, we do send short questions on specific topics by e-mail though. Our experience with these informal surveys is very good; usually we receive a large number of replies. During recent years, communication with astronomers beyond the immediate user community at ESO was through the IAU. Becoming a consulting member of the Commission 5 Working Group on Libraries has provided the opportunity to inform scientists about ongoing projects in astronomy libraries, as well as get feedback on library services in general.

Communication among astronomy librarians world-wide is excellent. A reliable network of mailing lists, professional organisations and personal contacts is in place that ensures exchange of information and expertise among colleagues. This is particularly important for small specialised libraries which are not part of university systems or library consortia and therefore lack assistance for reference questions and material requests. Given the high prices of some information retrieval products, it is obvious that special libraries cannot afford all of them either and sometimes require help to answer user enquiries. Networking also allows us to take a coordinated position towards publishers and vendors in license negotiations and requests for product enhancements.

Because of its international status, ESO is in an excellent position to foster international co-operation and projects among librarians. Information exchange is mainly by e-mail as well as during occasional personal visits. Through publication of articles in journals and books, postings on mailing lists and presentations at conferences or during visits to other libraries we help to stimulate discussion with colleagues around the world. Participation in national and international professional organisations like the Special Libraries Association[11] and an active role in the LISA conferences (Libraries and Information Services in Astronomy)[12] has always been very rewarding with regard to exchange of ideas and insight into new trends and standards in information technologies.

[9] http://www.eso.org/libraries/request.html
[10] http://www.eso.org/libraries/lib-helpdesk.html
[11] http://www.sla.org/
[12] http://www.eso.org/libraries/lisa.html

Conclusion

We are witnessing vast changes in information search and retrieval. End-user searching has become the standard in astronomy, and scientists increasingly expect all resources including publications, astronomical catalogues, databases and software tools to analyse and use data to be interlinked. Resources and services that are not tied into the network are becoming marginal.

As scholarly communication changes, the publication paradigm is evolving too. While the underlying structure of journals certainly will continue to exist for some time, knowledge may no longer be tied to physical containers like books and journals in future. Rather than self-contained articles, scientists probably will request specific information from interconnected resources, assembled on demand in information clusters (Boyce 2001). Libraries will be integrated in this system by providing access to knowledge bases and mediating between researchers and information providers.

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