

TIME FLIES WHEN YOU'RE HAVING FUN – TWO DECADES IN AN ASTRONOMY LIBRARY ¹

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Abstract

In this chapter, I will explore how life and work has changed during the past 20 years in a specialized astronomy library. After a description of some major developments, I will describe where observatory libraries stand today, and where they might be going.

Introduction

Friday afternoon is my preferred time of the week. Not only because of the obvious reason that the weekend is about to begin. There's more to it. On Fridays around 5 pm, colleagues at my institute start to go home, the usual busy roaming around of people slowly settles down, and it is getting quiet all around. At that time I like to walk through our library. It is a nice moment to enjoy the peaceful atmosphere, walk through the aisles, and think about the potential the library holds for new features we might offer our library users in future. This moment also allows me to think back of how things were one or even two decades ago.

I started my work as Head Librarian of the ESO Libraries in April 1991. At that time, it was not very common for libraries to use computers, let alone have access to email. At ESO Garching, the library was equipped with exactly one vt100 terminal, located in a remote corner of the library. Still, the fact that there was access at all to what later turned out to be the internet was already quite an achievement. The ease with which electronic mail made it possible to contact colleagues abroad, especially in the US, fascinated me as it solved the problems of high telephone bills as well as long delays in getting responses via snail mail.

A first application of computers in libraries had been created a few years before by my predecessor, Edith Sachtschal: a relational database with entries for bibliographic data and order details to help the librarians handle journal subscriptions. At that time, and for some years to come, the database served mostly as a template from which necessary lists were printed and then filled-out manually, for instance with prices and durations of journal subscriptions. I remember well that one afternoon maybe half a year after I had started at ESO I was sitting at my

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desk, finishing the last entries in such lists. I looked around, found that everything was in order, and thought to myself: "There's nothing else to do for today." That was the last time such a thought even vaguely crossed my mind ever since.

Soon after, a development started that can without hesitation be described as an information revolution. Basically all work areas in libraries were affected, and even more importantly, the role and importance of research libraries at large. But let's go step by step.

The early and mid-90ies

Since the foundation of ESO, libraries had been established where the astronomers were, namely at the ESO headquarters (since 1980 in Garching) as well as at the observing site on top of the mountain La Silla in Chile. In 1994, the latter was moved to the ESO office in Vitacura, Santiago. The collections in both libraries were geared towards the astronomers and their needs for research and observations. Like in many other observatories, the concept of exact library opening hours was not applied as astronomers needed access to books and journals also during night hours, for instance for immediate consultation of star catalogues during their observations. The idea of making information resources easily accessible has traditionally been more important for us than the application of strict library rules.

Besides books and journals, preprints traditionally played a vital role in keeping astronomers informed about latest findings in their field of research. Many astronomers regularly checked the newest preprints that had arrived in our library from all over the world and were displayed on the library shelves. After a month, they were moved to the storage where we kept them for another year. After that time, it was assumed that they had been published in journals or conference proceedings.

Despite the focus on our own collections, it was also possible to provide documents to the library users which had not been purchased by us. However, the interlibrary loan of those years was organized in a different way, and it could take a few weeks before a requested article arrived. Of course, such a delay would be unacceptable today.

In the mid-90ies, services such as Archie, Gopher, and Veronica appeared – names that are basically forgotten today, but which can be described as very early versions of online search engines². Soon, the potential of these tools for libraries became obvious as they enabled us to search an increasing number of library catalogs and other databases that helped us to answer requests from library users. It was a logical consequence to take the initiative to convert also our own card catalog into

² See for instance Wikipedia: Web search engine, http://en.wikipedia.org/wiki/Web_search_engine

machine-readable format. The online catalog project started in 1992 and was made available to the public in November 1993. While access was first available through a telnet link, we moved to a web-based interface as soon as this technology became available. Indeed, the library pages were among the first ones on the newly established ESO web site. The oldest entry in the internet archive 'Wayback Machine'³ for the eso.org domain dates from Dec. 3, 1996, and it already includes a link to the library pages⁴.

The possibility of handling processes entirely online had not yet become available, but the internet started to emerge and play an increasingly important role in the daily work of librarians. In astronomy, the mid-90ies brought forward the first electronic journals, earlier than in most other subject areas. With them, one of the largest reengineering process in libraries began.

At first, publishers experimented with a variety of formats that complemented print journals. Microfiche, diskettes, tapes and the like were an attempt to port publications to an electronic format. However, they were all offline, non-connected containers of information and hardly provided advantages compared to paper, except in some cases a better index that allowed readers to find appropriate content easier.

In fact, there was a concern – mainly expressed by librarians – from the beginning, a problem that still has not fully been solved: how can we make sure that the content stored on electronic media will be accessible in decades or even centuries from now? Print material does not require any decoding except language skills; other than that, it can safely be assumed that our and future generations will be able to read text. On the other hand, the situation is very different for electronic publications. Without the appropriate reading devices the content is lost – and who would be able to guarantee that such devices will be available even after a few years? The fast emergence and disappearance of microfilm, floppy disks, and other storage devices seem to indicate that much of the technology that was introduced during these years was not really thought-through from an archival point of view.

After a few years of experimenting, the first generation of e-journals had stabilized. With better search capabilities built into electronic journals, it became possible to find an exact word, name or object that was mentioned somewhere in an article, but wouldn't have been indexed in the old days. Full-text searching quickly became and still is one of the major advantages of electronic over print publications.

Availability of online journals regardless of the time a researcher wanted to consult them as well as accessibility from anywhere were other intriguing features. In the early days user ID and password and later verification by IP address coupled with

³ Wayback Machine, <http://www.archive.org/web/web.php>

⁴ ESO homepage as of Dec. 3, 1996,

<http://web.archive.org/web/19961218231549/http://www.eso.org/>

VPN (virtual private network) connectivity enabled users to search, read, and download e-journals as if they were physically in the library even though they actually may have been attending a conference abroad or working from home.

From a librarian's point of view, the fact that we did not have to deal anymore with claiming journal issues that had not arrived or the need to locate misshelved or even stolen volumes was a nice facet of e-publications. Instead, we were now troubleshooting technical problems in case access was interrupted.

A major paradigm shift occurred because of the new acquisitions model of electronic publications. While we were used to obtain books and journals and make them available in our libraries to the users, publishers introduced new purchasing models for e-journals. Each journal now required a contract between the publisher and the library, and often access to the scientific content was granted by publishers for a limited time, namely only for the duration of the license. This idea was much closer to the concept of renting material than actually buying it. Librarians obtained specific legal knowledge in order to negotiate the best possible conditions for their users and to provide seamless and convenient access to publications. Publishers introduced an additional difficulty: in an attempt to deal with each library individually and prevent librarians from sharing best strategies, publishers would often prohibit open discussions of contract conditions and price quotes among colleagues. Nevertheless, librarians found ways and opportunities to discuss these matters and help each other, even without explicitly mentioning the exact subscription fee a publisher requested or confidential license clauses.

One of the main problems that came with electronic publications was the strain they put on library budgets. While print was still requested by our library users, e-journals were equally needed, so both formats had to be subscribed in parallel, of course at higher prices than one medium alone. To make things worse, the need to maintain double subscriptions for print as well as electronic versions came at a time when most library budgets were considerably shrinking due to worldwide economic problems.

Regarding contract negotiations with publishers, ESO's status as an intergovernmental organization created a very specific legal situation. Many libraries had teamed up with their neighbor institutions or other national organizations to form so-called consortia that gave them a stronger position during negotiations with vendors. As ESO does not fall under any specific national rules and regulations, we typically could not join such consortia, but were facing contract discussions on our own. Fortunately, advice and best practices were shared on librarians' mailing lists from where we could learn about effective strategies.

2000 and onwards

About 15 years after the advent of online journals, electronic format has basically replaced print. Non-electronically available information has become marginalized. In particular the capabilities of today's search engines have led to the assumption among users that online search results will be complete. Information resources that are not at least indexed, if not available in full-text, are often not taken into account, simply because users don't expect them to exist.

Over time, ESO has published many books, reports, and newsletters. In order to make these historic documents available to the wider community, the library started a digitization campaign in 2008. Documents for which ESO owns the copyright included back issues of ESO's magazine "*The Messenger*", the *Annual Report*, published since 1964, a large number of conference proceedings and some other publications that marked milestones in ESO's history. Also some technical reports were scanned and made available via the library catalog, on the library's "historical documents" page⁵ and through the web pages of the ESO Public Outreach Department⁶. Of special interest are those in-house reports that are by now out of print, but are still requested by scientists and engineers. For the conference proceedings, we started a project with the NASA ADS team: we provided spare copies of proceedings volumes, and ADS took care of the digitization. Today, the full-texts of most ESO conference proceedings published during 1983 and 2002 are available online to interested readers⁷.

The digitization project tied in very well with the concept of the Open Access (OA) movement in academia which promotes free online access to scientific literature⁸. In this context, the word "free" (of charge) typically refers only to the readers; most of the current OA business models have shifted the costs from readers (subscribers) to authors (institutions). Typically, publishers now provide authors with an option to pay a one-time fee in order to publish their article open access while the remainder of papers in the same issue may still be available only through a subscription or via pay-per-view. The advantage still is that all articles published under an open access model are available to the entire scientific community.

The open access concept also comprises author self-archiving, be it on the researchers' web pages or in an institutional or subject-related repository like *astro-ph*/*arXiv*⁹. By now, most publishers allow authors to deposit their manuscripts on the web, provided that they mention where the article has been published. However, self-archiving by individual authors neglects two crucial topics: retrievability (i.e., papers will not be found through central search engines) and preservation (because

⁵ <http://www.eso.org/sci/libraries/historicalbooks.html>

⁶ see for instance <http://www.eso.org/sci/publications/messenger/>

⁷ http://adsabs.harvard.edu/cgi-bin/nph-abs_connect?version=1&warnings=YES&partial_bibcd=YES&sort=BIBCODE&db_key=ALL&bibstem=ESOC.&year=&volume=&page=&nr_to_return=3000&start_nr=1

⁸ [http://en.wikipedia.org/wiki/Open_access_\(publishing\)](http://en.wikipedia.org/wiki/Open_access_(publishing))

⁹ <http://www.arxiv.org>

manuscripts are much more prone to be lost over time unless researchers migrate them regularly to newer technologies).

In comparison with other subject areas, the OA situation in astronomy is relatively favorable, even though still not perfect. Besides an estimated 80% submission rate of manuscripts to the arXiv eprint server, the core journals (*A&A*, *AJ*, *ApJ*/*ApJS*, *MNRAS*, *PASP*) apply so-called delayed open access. Full-texts are currently made available two to three years after publication. National and institutional mandates requiring that scientists deposit final peer-reviewed manuscripts in digital archives will probably bring the delay down to only one year soon.

The acquisitions policy for journals at ESO has now practically been changed from print plus electronic to e-only. Whenever possible, we only subscribe to the electronic version, especially for those journals from which individual articles are easy to obtain through document delivery or specific purchases directly at the publishers' sites. There are some exceptions from this rule though. For instance, we will obtain the core astronomy journals (i.e., *A&A*, *ApJ*, *ApJS*, *AJ*, *MNRAS*) on paper for as long as they are published. Being a library specialized in astronomy, we regard it as our mission to purchase and archive these journals also on paper. Let the publishers and the astronomy community decide when the end of the paper era has come!¹⁰

The situation is a bit different for books. For a few years, we have been trying to promote the use of electronic books. A major book publisher in astronomy, Springer, has marketed their e-books platform to which we have been subscribing since 2005. At the same time, we reduced the purchases of print books by Springer to basically zero. At least almost, as we still buy specific books if the requesters really prefer print. Needless to say that our book vendors were not amused to see our acquisitions drop from about 600 new titles (by Springer and other publishers) per year, typically obtained for the library in Garching as well as our branch library in Santiago de Chile, to approx. 250 purchases. But many library users are happy with the easy search and retrieval mechanisms (including Google Books where Springer titles can be found) and the exemplary download, print, and storage capabilities provided by Springer.

On the other hand, the current reading devices, i.e., reading on screen or ebook readers with which we also experiment at ESO, do not seem to convince the majority of readers. At present, electronic format is still best suited for content that is not read cover-to-cover, for instance conference proceedings from which users typically select one or a few chapters, but hardly read the entire volume. With regard to textbooks, the search options are convincing in order to locate specific sections, but users typically still prefer the print edition for reading. It will be

¹⁰ As a side note it should be mentioned that as of mid-2011, the *MNRAS Letters*, *ApJ Letters* as well as certain parts of *A&A* are exclusively available in electronic format. For some time, paper has already been phased out for these sections.

interesting to see how ebook readers will evolve in the near future and whether perhaps five years from now we will hardly remember why we considered books on paper useful. The user experience will also largely be shaped by better and more user-friendly Digital Rights Management (DRM) systems as those currently embedded in digital content often limit the use and efficiency of ebooks for readers to such an extent that they are prevented from normal use of electronic books. In the long run, it can be hoped that such restrictive DRM software will not survive in the e-books market.

Space

Space is a critical issue for practically all libraries these days. With fewer users visiting the physical collections and an increasing number of publications being available online, management might erroneously think that the need for library space diminishes – despite the large amount of paper that still arrives every day in our library offices. At ESO, we are in the lucky position to occupy central places in the institutes, even on two levels, both in Garching and Santiago. While the site collection at La Silla was closed in August 2009 to become an “e-only library”, so far we had to fight only moderately for the space allocated to us in the two main locations. On the other hand, an extension to the existing square meters of course is out of the question.

In Garching, we tried to confront the problem of limited storage by reducing the amount of bound journal volumes that we store. For many years, we enjoyed the luxury of subscribing to, and archiving, journals outside of our core subject areas astronomy and optics, for instance titles in computer technology and high-energy physics. As such journals are held by many university and state libraries, it is fairly easy to obtain specific articles through document delivery services, typically even within only a few hours. This situation prompted us to donate many of our journal volumes to interested libraries or, in some cases, to discard them.

We preferred this seemingly drastic measure to off-site storage which would have been possible under certain conditions. Retrieving a specific volume from a storage located away from our library would take in the best possible case one day – too long compared to the two to three hours it takes to receive a document through interlibrary loan or document delivery. In addition, it has to be taken into consideration that also off-site storage is expensive and should only be used for items that are precious and worth the expenditure. Hence, we decided to dispose of many volumes. This is a sign of the paradigm shift that is going on in many libraries from purchasing books and journals “just in case” someone might ask for them towards a “just in time” approach whereby documents are obtained and provided in a timely manner when they are actually requested.

After the non-core journal volumes had been removed, we started to rearrange books and journals on shelves in order to store them in a more compact way. We

freed several meters of shelf space and finally were even able to completely dismantle a large shelf. The space we gained has been transformed into a meeting area that invites astronomers to meet for their regular coffee meetings, discussion groups, or presentations. We experienced considerable demand for this enhanced work area and actually encountered situation where two “competing” groups would have liked to hold their meetings at the same time.

A nice side-effect of these meetings is that once participants are in the library, it is easy for them to stop by our office for a moment to request a document, comment on a book they read, or ask for advice regarding the use of retrieval tools. All this can also be done by email, but a face-to-face conversation once in a while still is much more personal and efficient.

Productivity measures

During the past decade, an increasing number of astronomy librarians have become involved in productivity measures at their institutes, in particular bibliometric studies that can help to evaluate the productivity and impact of telescopes and instruments or of specific observing programs. In addition, such studies hold important information regarding the acceptance of instruments by the user community and can provide guidelines for future observing facilities.

For many years, Angelika Treumann, my colleague for more than 15 years in the ESO Library Garching, has visually inspected printed journal articles in order to spot any mentioning of ESO facilities as well as authors affiliated with ESO. Initially, the lists she compiled were printed in the ESO Annual Report in order to create a record of the scientific output from ESO’s observing facilities and staff. Later, this compilation of bibliographic records developed into a specialized database. After Angelika’s retirement, her successor, Christopher Erdmann, skillfully used contemporary programming tools and techniques (PHP, Javascript, XML, SQL, etc.) to convert the existing database into a tailored, complex system. Today, this system comprises a semi-automated full-text search tool (FUSE) and a content management system (the ESO Telescope Bibliography, or telbib) (Erdmann & Grothkopf 2010). FUSE allows us to retrieve selected papers (i.e., those published in approx. a dozen refereed astronomy journals) via the NASA ADS Abstract Service¹¹, convert the PDFs to text, and scan the texts for ESO-defined keywords. If keywords are detected, FUSE shows them in context in a list which is then inspected by the librarians to determine whether the paper indeed should be included in our telescope bibliography, or whether it was a false hit (Fig. 1).

¹¹ <http://adswww.harvard.edu/>

The screenshot displays the FUSE search tool interface. On the left, there are navigation menus for 'Search' (Insert, Queue), 'Admin' (Journals, Displays, Stop Words, Keywords, Searches, Help), and 'Last Resort' (Insert, Manual). The main area shows search results for the query '2011A&A...529A.160M...'. The results table has the following structure:

ID#	Status	Search	Record/Keyword(s)	LookInside	Online	Delete	Debug
66195	Not Included		2011A&A...529A.160M Makaganiuk, V. Chemical spots in the absence of magnetic field in the binary HgMn star 66 Eridani Astronomy & Astrophysics, Volume 529, id.A160	66195.txt	PDF/HTML	<input type="checkbox"/>	debug

The abstract text for the selected record is highlighted in yellow:

"program 084.D-0338). stud"
 "rresponds to the average pixel scale of HARPS pol spectra.
 The errors of LSD profiles were calcu"
 "d by Piskunov & Valenti (2002). The HARPS spectrometer is
 well-known for its stability, whj"
 "N is 200300 at 5200 Å. The HARPS detector is a mosaic of
 two 2K x 4K CCDs, a"
 "Snik et al. 2008, 2010) attached to the HARPS
 spectrometer (Mayor et al. 2003) at the ESO 3.6-m"
 "ction Using the newly built polarimeter HARPS pol (Snik et
 al. 2008, 2010) attached to the HARPS "
 "d during 10 consecutive nights with the HARPS pol
 instrument at the ESO 3.6-m telescope. To incr"
 " observations collected at the European Southern
 Observatory , Chile (ESO program 084.D-0338). s"
 " Based on observations collected at the European
 Southern Observatory, Chile (ESO program 084.D"
 "epending on the weather conditions. The ESO reduction
 pipeline was not available at that time, "
 "spectrometer (Mayor et al. 2003) at the ESO 3.6-m

Fig. 1: Screenshot of FUSE, the ESO Full-text Search tool. ESO-defined keywords are highlighted in context.

Telbib and FUSE are essential tools in coping with the ever increasing number of refereed papers that have to be scanned every year¹². After Chris Erdmann had left ESO in 2010 to take up his new position as the Head Librarian at the Harvard-Smithsonian Center for Astrophysics (CfA), Silvia Meakins has become the new technology expert in the ESO Library. Together we continue to enhance both systems and implement new features, tailored to the specific needs which allow us to improve our workflow and derive new metrics from the telbib knowledge base (see for instance Grothkopf & Lagerstrom 2011). For an overview of currently available information in telbib as well as tags assigned by the librarians, see the screenshot of the "Edit Paper" feature in telbib (Fig. 2).

¹² The number of refereed papers checked has increased from approx. 7,800 in 2007 to approx. 9,400 in 2010.

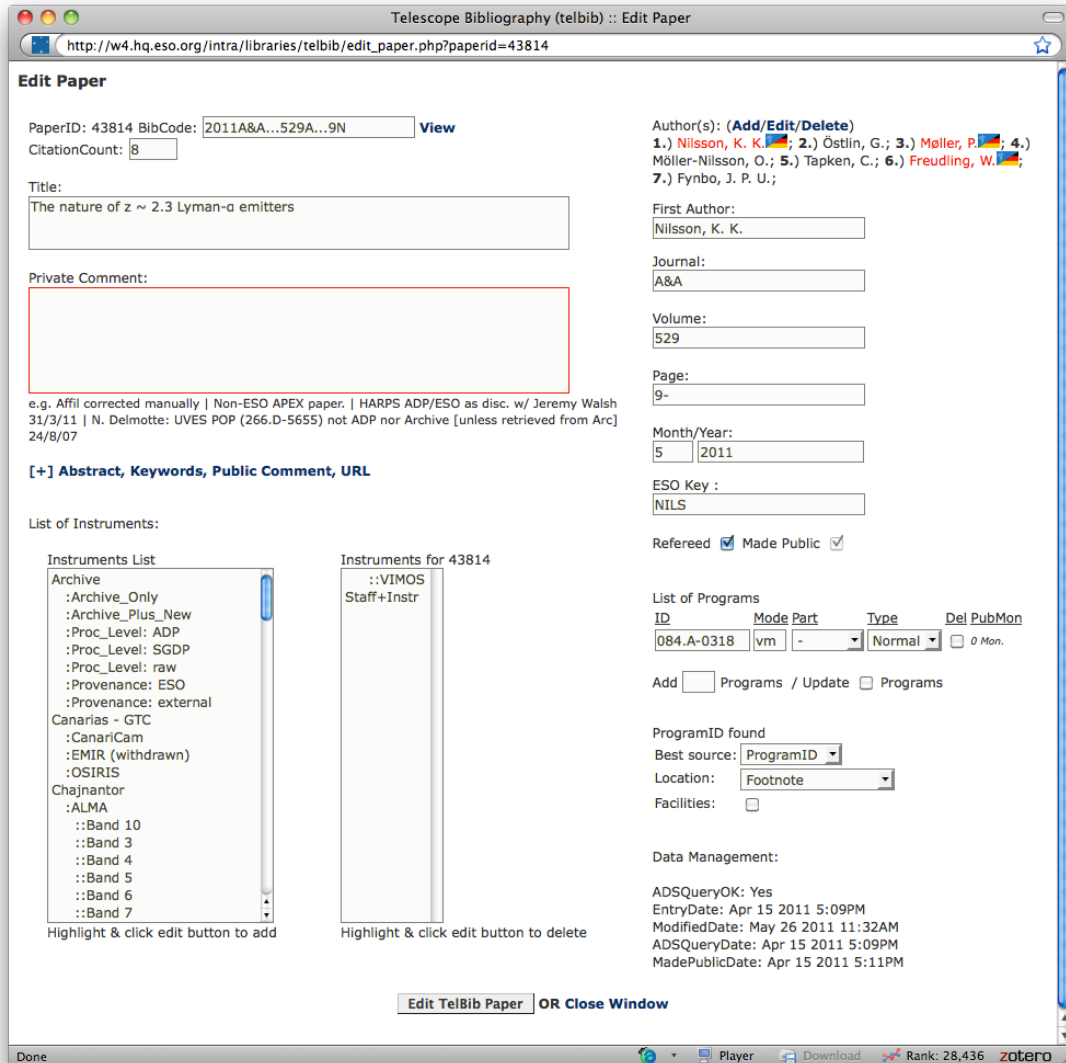


Fig. 2: Screenshot of the “Edit Paper” interface of the ESO Telescope Bibliography (telbib). Bibliographic information, citations, keywords and abstracts are imported from the ADS; program IDs, observing mode, program type and tags describing the astronomical instruments used as well as other information like authors affiliated with ESO are assigned by the librarians.

In the meantime, several other observatories have asked us for permission to use FUSE for their own bibliographies. We have provided the software to libraries in the U.S. (including STScI, Gemini, Subaru, CFHT, and the Carnegie Observatories), South Africa, India, and Argentina. A large user base is desirable as all libraries can add further modules if they wish and thus make the system even better in a joint effort. Last year, a Google Group has been set up, initiated by the compilers of telescope bibliographies at the Chandra Archive, STScI, and ESO, to provide a forum to

exchange best practices for maintaining bibliographies, to develop recommendations for using cross-facility bibliometrics, and to share solutions to common problems¹³.

Building a librarians' network: LISA

Astronomy libraries worldwide can be characterized in a variety of ways. Often they are very specialized and rather small and have only one or two librarians. They are geographically dispersed and not rarely located in remote areas. The total number of astronomy libraries worldwide is below 300, so it is a relatively small community. And, most importantly: the community of astronomy librarians is extremely well connected.

Before I joined ESO, I worked at a biology institute at the University of Hamburg. Work methods and processes vary from one subject area to another, and I had not been familiar with the tools and techniques used in astronomy. Soon I found out that in astronomy getting acquainted with the procedures is easy thanks to a large network of colleagues who are always willing to answer questions, provide help and advice, and share experiences. I owe a big *Thank You* to Sarah Stevens-Rayburn, Ellen Bouton, Brenda Corbin, Marlene Cummins, and Robyn Shobbrook, who were at that time the librarians at STScI, NRAO, the U.S. Naval Observatory, the Astronomy Library of the University of Toronto, and the Anglo-Australian Observatory (now Australian Astronomical Observatory). Without their guidance, I would not have been able to understand the mechanisms of astronomy libraries so fast.

Astronomy is an excellent example to show how cooperation across borders leads to better service. While our own libraries may be located remotely and be limited in number of books and journal subscriptions, help regarding finding a specific article, learning about best practices, or sharing experience about new information retrieval tools is only an email away (if sent to an astronomy librarians' mailing list).

Even better than communication through email is to meet personally. In 1988, astronomy librarians held their first international meeting which was initiated, promoted and implemented most notably by Brenda, Ellen, and Sarah. At that time, nobody was expecting that such a conference, called *Library and Information Services in Astronomy (LISA)*, would be repeated. However, LISA developed into a series of meetings and is now held every three to four years. Librarians, astronomers, computer specialists and publishers get together to discuss the state of the art in information maintenance and retrieval, latest techniques and technologies, and the future of librarianship. An overview of past LISA conferences, conference logistics and topics and how they have changed over time can be found

¹³ <http://groups.google.com/group/astrobib/>

in Corbin & Grothkopf (2006) and on the LISA homepage¹⁴. Jill Lagerstrom gives an excellent summary of the most recent conference, LISA VI which was held in Pune, India, in 2010. In her article “Astronomy Librarian – Quo Vadis?” Jill describes important themes from LISA VI in the context of the overall situation of astronomy librarianship (Lagerstrom & Grothkopf 2011).

Marketing libraries and their services

In times when most of the content is available online, it is obvious that fewer users enter the physical library to find the information they need. During recent years, marketing and advertising services has become an important topic among librarians. How can we catch the attention of researchers so that they notice us as a service entity? How can we position ourselves in our institutes as the information department?

One option is to talk to potential users early on. For some time, ESO has been conducting so-called induction classes. These are half-day sessions for newly hired staff during which the main departments of the organization are introduced. The library routinely takes part in these classes. We present the library staff in Garching and Santiago (where our colleague Maria Eugenia Gómez has been taking care of the library for more than 25 years), explain the most important research tools and resources, and emphasize our availability for questions and advice. Participation in the induction courses allows us to meet all new staff personally and, very importantly, immediately gather (and answer) the first questions they may have. From their first day at ESO, our new colleagues will this way have an idea who to turn to when they have questions or need information.

Within the organization, a strong web appearance is a necessity as we need to be present where our users are, and that often means in the virtual world. In addition, we are implementing collaborations with the outreach department in order to include the libraries in ESO-related information displayed in the entrance area as well as in the context of the ESOcast, ESO's series of video podcasts.

A fantastic experience was the participation in the SWYA (Scientific Writing for Young Astronomers) schools which were organized by Christiaan Sterken and the publisher of the journal *Astronomy & Astrophysics (A&A)*, EDP Sciences. SWYA-1 and 2 were held in 2008 and 2009, respectively, and were each attended mostly by students who had just started their Ph.D. thesis¹⁵. At both schools, I was invited to give presentations on library services, impact measures, and literature management systems. I enormously enjoyed the opportunity to show the students how libraries may help them with tricks and tips regarding the use of search engines beyond the

¹⁴ <http://www.eso.org/sci/libraries/lisa.html>

¹⁵ For a more detailed description of the SWYA schools see the chapter by C. Sterken in this volume.

obvious one-line query or assist them in finding literature and information relevant for their thesis. More important than teaching were the conversations and informal talks that took place before and after lectures. Because of the particular set-up of the hotel in Blankenberge, Belgium, where the schools took place, lecturers and students spent three days together during which many professional and also some personal questions were discussed, maybe even solved. Presenting librarians as the human interface to information retrieval early in the careers of astronomers has been very fulfilling; I am sure that some of the students who attended the schools went away with a changed impression of libraries, knowing that librarians are their allies in their quest of turning information into knowledge.

At the other end of the spectrum, librarian consultants have become relatively common on publishers' boards. They play a crucial role in mediating between readers/authors, publishers, and librarians in order to make publications better readable, accessible, and in general more worthwhile for all partners involved in the publishing process¹⁶. In astronomy, basically all publishers have invited librarians onto their boards which in many cases has led to close collaboration and much better understanding of the various viewpoints.

The role of the ESO Library

So, where do small, specialized research libraries like the ESO Libraries stand today? What is our role in a scientific world that focuses on direct, immediate access to information, where the users of information resources increasingly bypass the physical library, and where the librarians' role is in danger of becoming invisible?

“Todo cambia” – everything changes – is one of my favorite songs by Mercedes Sosa. The lyrics, written by Julio Numhauser when he was in exile in Sweden, are melancholic, yet the music is so joyful that it invites us to sing along or even get up and dance, just as “La Negra” did so many times during her concerts¹⁷. The political meaning of the song aside, I often feel that we librarians should do the same: recognize the changes that are happening, understand what they mean to us, and then dance along.

Perhaps this is easier said than done, but every adaptation to change starts with a look at what *was*, what *is*, and what we hope *will be*. We all know well how our work procedures looked like in the past. But where are we now? Who are our allies? What can we offer, and to who?

¹⁶ For more information, see the section on Publishers Relations of the Special Libraries Association/Physics-Astronomy-Math division (SLA/PAM) at <http://pam.sla.org/bulletin/publishers-relations/>

¹⁷ Videos of Mercedes Sosa performing can be found on YouTube, see for instance <http://www.youtube.com/watch?v=In5TjoaYMRs>

At ESO, library users come from a large variety of groups. First and foremost, scientists, students, post-docs, and scientific visitors come to mind. We make sure they have access to all information sources they need for their work, and we continuously amend library services in response to changing requirements. In the context of bibliometric studies, we often cross-check our findings regarding specific papers in the telescope bibliography with instrument scientists and other astronomers interested in this topic in order to make sure that the tags we assign and decisions on inclusion or exclusion of papers are correct.

The second largest group of library users are the ESO engineers and technical specialists who need specific standards and technical documents, especially during times of telescope planning and construction. Other user groups include the ESO outreach department, administration, the legal office as well as ESO employees in general for whom we sometimes purchase amateur astronomy books. Last not least, we provide help and advice to (mostly European) astronomy libraries through interlibrary loan, suggestions regarding library services and procedures, or exchange of ideas and procedures.

All these groups can be our allies and collaborators for whom we offer a variety of services and with whom we cooperate on a number of projects. These can be characterized as follows:

- Astronomers and engineers: librarians provide an information center with rapid and seamless access to historical and current collections, both locally and networked. Many libraries have initiated and maintain digital repositories for papers and data produced at their respective institutes
- Instrument scientists and management: we collaborate on policies for telescope bibliographies and extend current activities to future (perhaps international) projects. Librarians develop and maintain productivity measures for staff, projects, and facilities and build digital systems to provide access to statistics
- Data archivists and virtual observatory specialists: librarians who are in charge of telescope bibliographies close the loop from observations and archived data to published results in order to obtain the highest scientific return from observations; they work with data archive specialists to assure that the research output is tracked as completely and comprehensively as possible and as needed
- Outreach and public relations: there is a noticeable increase in the involvement of librarians in outreach activities, e.g., through conference preparation, maintenance of meeting-related web pages, linking of press releases with corresponding papers in telescope bibliographies, and preparation and realization of exhibitions, to name just a few

- Other information specialists worldwide: through involvement in professional organizations, we foster collaboration among observatory librarians and telescope bibliographers on regional, national, and international levels. Active exchange of expertise through mailing lists, conferences, and other means of communication leads to a tight network of professional contacts that ultimately result in even better service for library users
- Astronomers from the wider community: we establish contacts among librarians and astronomers in our own institutes and observatories as well as in the wider community through events and collaborations, e.g., the IAU Working Group Libraries¹⁸
- Consultancy and training: librarians play an important role in their institutes to increase the information literacy of Ph.D. students and young researchers. They are external consultants for journal publishers and lecturers at writing schools for astronomy students and as such mediate between scientists, publishers, and information providers.

Involvement in many different projects and collaboration with a variety of other departments will without doubt increase the library's visibility and emphasize its role as an information and technology center. This is not meant to say that libraries should embark on all kinds of activities regardless of their aim and purpose. One should always keep an eye on the mission of the library as well as the organization as a whole to make sure all efforts are in line with these overall goals.

With these guidelines in mind, we will monitor upcoming information retrieval tools, evaluate them to understand whether they might be of use to our library patrons, and implement those that provide new functionalities or easier access. This requires not only knowledge of the technologies, but also the vision to understand how new tools might fit into a changing work environment of astronomers and engineers. Last, but certainly not least, it is essential to talk to our users (and also those who currently *do not* use the library) to learn about their wishes and suggestions. The result of such communication can then be used to enhance library services, to mediate between astronomers and publishers or service providers, and in general to establish an information, learning and knowledge center that our users like to consult whenever they need advice.

“I like books” – a mixed blessing

If we were to ask library users which item symbolizes libraries, a large fraction of them would probably say “books”, thinking of large hardcover volumes. During

¹⁸ <http://www.eso.org/sci/libraries/IAU-WGLib/index.html>

recent years, it happened often that library users and visitors came into our office to talk about scientific information and libraries. On such occasions, sooner or later the paradigm shift from print to electronic resources becomes a topic. "I like libraries" the visitor would typically say, "the smell of books is so nice, and I love to feel the paper when I turn pages." Politely, I would smile and nod in agreement – but only for a short moment. While librarians are of course happy about everybody who appreciates the print collection, this is only part of the story. The library of today is so much more than just a book repository. Libraries should not only be seen in their function as archives where tons of (increasingly old) paper are stored, or as a refuge for those who regret that the days are gone when scientists would find latest information in the paper preprints displayed in the library. Libraries have made a quiet, but constant transition to become information centers that handle all kinds of knowledge containers, from paper (which without doubt is still around) to electronic media (like CDs or DVDs), to networked resources. In many institutes, libraries are the information hub and the first contact point for scientists and engineers when they look for information needed for their work.

Please don't misunderstand me – I *do like* books. At home, the walls of my apartment are lined with book shelves. There's nothing better than books to create a cozy, relaxed atmosphere. Yet, for libraries printed information is only one part of what characterizes them. Rather than being mentally affiliated with archival tasks, I would prefer library users to see us as the information and media center that provides whatever information is necessary, in whatever format. The concept of "making accessible" has become more important than storing printed items, and a complete in-house collection has evolved into information retrieval on servers located around the world.

Finally: a confession

Finally, I have a confession to make. I remember the moment 20 years ago when I learned that ESO had selected me as the new Head Librarian. I was thrilled and happy, but at the same time also shocked. Shocked by the fact that of all possible subject areas, I should from now on work in an *astronomy* library. With a father who had been a physics school teacher and a brother who is a mathematician, it seems that all the genes in our family that are responsible for the capability to understand sciences and technology had happily bypassed me and settled with another family member. I always had been much more interested in literature, languages, and social sciences. In high school, I dropped chemistry from the curriculum as soon as this was an option. Even worse, I had started my studies in library school with the idea of working in a public library where I would provide fiction and non-fiction literature to adults and children, organize readings, and be able to reach out to the community with offers for special user groups. In short, my professional plans had been quite the opposite of where I ended up.

Little did I know! Shortly after I took up work at ESO, I began to understand that science libraries in general, and observatories in particular, are far from being boring and dull. Librarians in small science libraries are fortunate to be in close contact with their user community which are typically scientists and engineers, and therefore also in close contact with research and technical developments. Especially in observatories, where scientists are engaged in the quest for the origin and the destiny of the universe it is easy to be intrigued – after all, the big questions of where we come from and where we are going are nowhere closer to a scientific response than in astronomy.

We astronomy librarians are also very fortunate because we work in a technologically advanced environment where many developments like access to databases, availability of e-journals, extensive text-mining, and others have been implemented much earlier than in other subject areas. Sometimes I am asked whether I would like to change job now that I have spent 20 years in the same institution. My answer has been and always will be the same: if the environment around you and the technologies you apply in your daily work evolve constantly, there is no need to change job, because you are changing *with* the job. I can honestly say that the ESO Libraries provide a work environment more fulfilling, challenging and even entertaining than I could have ever imagined.

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