

THE ESO TELESCOPE BIBLIOGRAPHY WEB INTERFACE – LINKING PUBLICATIONS AND OBSERVATIONS

THE ESO TELESCOPE BIBLIOGRAPHY LINKS SCIENTIFIC PAPERS BASED ON VLT OBSERVATIONS WITH UNDERLYING OBSERVING PROPOSALS AND ARCHIVAL DATA. IT CAN BE QUERIED THROUGH A WEB INTERFACE AT ESO AS WELL AS THROUGH A FILTER AT THE NASA ASTROPHYSICS DATA SYSTEM (ADS) FROM WHICH ACTIVE LINKS LEAD TO THE ESO ARCHIVE. THESE SERVICES ARE PREREQUISITES OF THE VIRTUAL OBSERVATORY AS THEY ALLOW USERS TO KEEP TRACK OF THE ENTIRE LIFETIME OF SCIENTIFIC PROPOSALS, FROM SCHEDULING TO OBSERVATIONS AND PUBLICATIONS.

NAUSICAA DELMOTTE¹, ANGELIKA TREUMANN¹, UTA GROTHKOPF¹,
ALBERTO MICOL², ALBERTO ACCOMAZZI³

¹EUROPEAN SOUTHERN OBSERVATORY, GARCHING, GERMANY

²SPACE TELESCOPE EUROPEAN COORDINATING FACILITY, GARCHING, GERMANY

³HARVARD-SMITHSONIAN CENTER FOR ASTROPHYSICS, CAMBRIDGE, MA, USA

THE ESO TELESCOPE bibliography started out in the late seventies as a compilation of papers authored by ESO staff and visiting astronomers at the ESO telescopes in Chile. These lists, published in the ESO Annual Report, provide today the only record of papers based on ESO observations arising from those early years.

In the early nineties, ESO began to store bibliographic information of relevant papers in a database which is now maintained by the library. Later, the focus shifted from bibliographic details to observing facilities. In 1996, we started to associate telescope information to all papers based on data from ESO La Silla. Instrument information has been added to La Silla papers since 2002, and to papers using VLT data from First Light onwards.

Furthermore, all VLT-based papers reference the programmes from which the data originated through programme identification codes (programme IDs), the unique identifiers of ESO observing proposals. Programme IDs are the vital link between archive and pre-observing (proposal and phase II) information and will become a key component in joining the various ESO databases in preparation for the Virtual Observatory.

HARVESTING DATA

Today, the ESO telescope bibliography is a relational database that contains refereed papers based on new or archived ESO data. Papers that merely cite results published in previous papers are not included. We also exclude conference proceedings, even if published in refereed journals. The compilation process was described in detail in a recent

Messenger article (Leibundgut, Grothkopf & Treumann 2003) as well as in Grothkopf et al. (this issue, page 45).

THE WEB INTERFACE

As of July 2004, public access to the database became available through a web interface, located at <http://www.eso.org/libraries/telbib.html> (see Figure 1). This is the result of a collaboration between the ESO library staff and the DMD/DFO Database Content Management team within the ESO Archive. New entries in the database as well as potential updates of already present records are made available to the community via an automatic process that runs every night.

The general layout of the web interface is a query form that offers search options by bibliographic and observational criteria. Like most ESO/ST-ECF Science Archive Facility query forms, it is based on WDB, a software dedicated to building interfaces between the World Wide Web and SQL databases (Rasmussen 1995). One of the main advantages of WDB is the possibility to convert data from and to the database. Data retrieved can be converted for instance into hypertext links, which provide an easy mechanism for joining databases. Thus, the telescope bibliography is now linked to the ESO observing programme and scheduling interface of the ESO/ST-ECF Science Archive Facility.

QUERY PARAMETERS

The query form is divided into three areas: *Bibliographic Information*, *Observation Information* and *Display Options*. The *Bibliographic Information* section offers searches based on authors, title, journal and volume as well as by uniform bibliographic code (Bib-

Code¹). In the *Observation Information* section, queries can be limited by specific observing facilities on three hierarchical levels: site/archive, telescopes and instruments. The *Program ID(s)* field allows one to retrieve papers based on ESO programme identification codes.

For each area, various query parameters are available, either as text fields, checkboxes or pull-down menus. A checkbox in front of each parameter defines whether or not it will be displayed on the result page. By default, all bibliographic information as well as the instruments and programme IDs will be shown, while the observing sites and telescopes will not. These settings can be changed according to the users' preferences. Detailed search instructions are located at <http://archive.eso.org/eso/publications.html> and can be accessed by following the hyperlinked search option labels. Further online help on how to specify queries and use operators is available through the "query Help" button on the main search screen.

Result lists can be arranged in a number of ways by using the *Display Options*. The output format is either HTML or plain text. If more than one record is retrieved, information will be displayed in tabular format, one paper per line (Figure 2).

The *Paper ID* takes users to the full record display. By following that hyperlink, all available information will be displayed in a single HTML frame (Figure 3), regardless of the parameters selected on the query page.

¹ For information on BibCodes see http://cdsweb.u-strasbg.fr/simbad/refcode/section3_2.html



Figure 1 (above): ESO telescope bibliography web interface at <http://www.eso.org/libraries/telbib.html>.

Unless the default display settings were changed, the query results page will provide further hyperlinks that point towards external databases:

ADS links to the abstract at the ADS Abstract Service (mirror located at ESO, http://esoads.eso.org/abstract_service.html). From there, the full refereed article can be retrieved (provided the library subscribes to the journal), typically either in HTML or in PDF format. BibCodes (see above) play a major role here in joining the data repositories of ESO and ADS. Linking scattered information among multiple databases and systems is part of information integration and will ultimately enable data discovery among heterogeneous datasets. This is possible thanks to the development of interoperability standards and tools for which the BibCode usage is a first example.

Program IDs provide access to observing programme information and to the underlying observations (Figure 4). As of October 2004, abstracts of proposals are made available once the proprietary period of the associated data has expired. In addition, links to raw and possibly reduced data as well as to other publications related to the same programme are provided.

The reverse link has also been implemented. Starting at the ESO observation schedule query form at http://archive.eso.org/wdb/wdb/eso/sched_rep_arcform, observing programme information can be retrieved by various qualifiers. From the results pages, users can reach the list of publications associated with a given VLT programme ID.

Title	Author(s)	Year	Pages	Abstract	BibCode	Program ID
RACE identifies differential imaging of the Sun. A full list is available at...	Amis, B., ...	2002	477-488	Yes	2002ApJ...566..477A	NAO1
The Sun Quiescent Phase Mode: Frequency of Flares through the Solar Cycle	Wang, Y., ...	2002	1201-1214	Yes	2002ApJ...566..1201W	NAO1
Photometrically derived differential rotation of the Sun	Wang, Y., ...	2002	1215-1224	Yes	2002ApJ...566..1215W	NAO1
VLBA radio emission originating in the FFA region of the radio jet of the quasar 3C 303	Chen, C., ...	2002	1225-1234	Yes	2002ApJ...566..1225C	NAO1
A jet from a radio galaxy using VLBA observations of the jet core	Chen, C., ...	2002	1235-1244	Yes	2002ApJ...566..1235C	NAO1
The kinematics of the primary jet of the radio galaxy 3C 303	Chen, C., ...	2002	1245-1254	Yes	2002ApJ...566..1245C	NAO1
A differential rotation of the Sun	Wang, Y., ...	2002	1255-1264	Yes	2002ApJ...566..1255W	NAO1
The latest 1.4 GHz data of the Galactic Center with VLBA-CPDCA-VLBA	Chen, C., ...	2002	1265-1274	Yes	2002ApJ...566..1265C	NAO1
Properties of the jet core of the radio galaxy 3C 303	Chen, C., ...	2002	1275-1284	Yes	2002ApJ...566..1275C	NAO1
Multi-resolution VLBA observations of the jet core of the radio galaxy 3C 303	Chen, C., ...	2002	1285-1294	Yes	2002ApJ...566..1285C	NAO1

Figure 2: Sample results page.

ACCESS THROUGH ADS

Another way of retrieving papers using ESO telescope data is via the ADS Abstract Service. On the main ADS search screen, users can scroll down to the Filters section and choose *Select References In / All of the following groups: ESO/Telescopes*. In addition, at least one other search criterion must be entered, for instance a publication year or an author's name.

ADS harvests new entries in our database at least once per week from an ESO web page. Unlike the ESO interface, however, ADS does not cater for queries limited to specific telescopes and instruments; only the entire database can be searched.

Linking datasets and publications is currently a much discussed issue and procedures are being designed for future papers to refer back to the datasets related to them (Accomazzi & Eichhorn 2004). In this context, ADS has already implemented an option to access accompanying online data stored in data centers. This option can be activated by following the letter D hyperlink ("On-line Data") provided on ADS query result pages. For instance, if ESO data are associated with a paper, the D link takes users into the ESO

Bibliographic Information	
Author(s)	Rosati, P.; Tozzi, P.; Giacconi, R. et al.
Title	The Chandra Deep Field-South: The 1 Million Second Exposure
Journal	ApJ Vol. 566 Pages 667-674
Publication year	2002
Abstract	ADS
BibCode	2002ApJ...566..667R
Observation Information	
Site / Archive	La Silla, Paranal, Staff-Instr., Survey-FollowUp
Telescope(s)	NTT, VLT, E2.2, EIS-FollowUp
Instrument(s)	WFI, SOFI, FORS1
Program Id(s)	66.A-0270 67.A-0418

Figure 3: Full record display (excerpt).

67.A-0418(A) on 17 Sep 2001, VLT-Antu

Field	67	Mode	Viewer
Telescope	VLT-Antu		
Nights	2		
Programme	Normal		
Instrument	FOR51		
Observer	Hasinger/ Bergeron/ Giacconi/ Gilmozzi/ Cilli/ Nonino/ Rosati/ Norrmann/ Tareghli/ Tozzi/ Zbrag		
Remarks	4R2		
Title	FOR51 spectroscopy of the <i>Chandra</i> /DDF-Newton Deep Field South		
Abstract	Abstract of Proposal		
Raw Products	File List		
Reduced Products	File List		
Publication	Publication List		

Figure 4: Observing Programme query result page (excerpt). Entries provide access to the proposal abstract, raw and possibly reduced products as well as further publications resulting from the same proposal.

telescope bibliography from which proposal and observation information can be accessed as described above.

NEW CHALLENGE FOR THE VIRTUAL OBSERVATORY

Online data in astronomy are increasing dramatically. The major astronomical journals are available in electronic format. New methodologies for information retrieval have to be applied in order to exploit these data repositories in the context of the Virtual Observatory. Implementing interoperable archives and communication protocols is a major task in order to enable knowledge discovery. Web-

based technologies and new user interfaces are part of this approach for which the ESO telescope bibliography is one example.

It serves several purposes:

- Bibliometrics and measuring scientific success by deriving statistics on the number of papers published per hierarchical level, e.g. observatory, telescope, instrument or programme ID.
- Access to proposal information, scheduling and archived raw data based on bibliographical references.
- Setting the pace towards the ongoing Virtual Observatory through the development of inter-connected databases.

The ESO telescope bibliography also endows maximum return of science benefits from observing proposals as it fulfils the basic requirement of providing access to each point of their life cycle.

REFERENCES

Accomazzi, A. & Eichhorn G. 2004, ADASS XIII, ASP Conference Series, vol. 314, 181
 Grothkopf, U., Leibundgut, B., Macchetto, D. et al. 2005, The Messenger, 119, 45
 Leibundgut, B., Grothkopf, U. & Treumann A. 2003, The Messenger, 114, 46
 Rasmussen, B. F. 1995, ADASS IV, ASP Conference Series, vol. 77, 72
 Schmitz, M., Helou, G., Lague, C. et al. 1995, *Vistas in Astronomy*, vol. 39, issue 2, 272

ESO EXHIBITIONS IN GRANADA AND NAPLES

ED JANSSEN, EUROPEAN SOUTHERN OBSERVATORY

From September 13–17 2004, the annual JENAM (Joint European and National Astronomical Meeting) conference was held at the Palacio de Congresos in Granada, Spain under the title ‘The many scales of the Universe’. At the conference, ESO maintained a 65 sqm exhibition stand showing the most recent scientific and technical achievements at the organisation. The conference was attended by over 450 participants, but also media and local politicians visited the event. The ESO stand drew great attention both from the conference participants and the media, resulting in several articles and television broadcasts in Spain.

Given Spain’s participation in the ALMA project and its interest in joining ESO, it is hardly surprising that among Spanish visitors and conference participants there was a strong interest in the presentation of ALMA and the OWL project, as well as in ESO in general. Many questions were asked and the attending ESO staff was busy with providing additional information material about our organization.

Jorge Melnick giving one of many interviews at the JENAM conference in Granada.

From November 10, 2004 to January 30, 2005, ESO took part in the ‘Futuro Remoto’ exhibition, held at the Città della Scienza in Naples, Italy. Città della Scienza is the first Italian science centre, an innovative museum where visitors can learn about science in an interactive way. Every year more than 150 000 guests, especially school pupils, visit the museum.

‘Futuro Remoto’ is a yearly multimedia event for the advancement of scientific and technological culture. In the past 17 years it has strongly contributed to bring the students and the citizens closer to scientific research and technological innovations. This is testified by an ever increasing flux of public, richness of programmes and media coverage.



ESO at the ‘Futuro Remoto’ exhibition.

The event consisted of exhibitions covering about 3 000 sqm as well as a series of public lectures by well-known scientists from Italy and abroad, including Seth Shostak, Margherita Hack, Paolo Nespoli and Massimo Capaccioli. Shows, workshops, interactive demonstrations, etc. completed this successful event. With about 31 000 visitors in the short period between 10th and 28th November, the organisers decided to extend the period of opening by a week. The success of ‘Futuro Remoto’ clearly demonstrated the strong interest in science by the Italian public and ESO was pleased to play a role in this public outreach activity.