SAO/NASA ADS Help Pages

ADS Team

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Chapter 1

Overview

The NASA Astrophysics Data System provides bibliographic information daily, or near daily, to the majority of astronomical researchers worldwide. It contains abstracts, full-text scans of journal articles, links to articles and data online at other data centers, and reference/citation information available for free to users all over the world. Multiple mirror sites help to provide improved access from other countries. The ADS contains bibliographic listings back to volume 1 of most major journals, many minor journals, and several conference proceedings, PhD theses, observatory reports, and other historical literature.

1.1 What is the ADS?

This service provides access to three databases containing more than 8 million abstracts: Astronomy and Astrophysics, Physics and Geophysics, and the arXiv.org preprints in Astronomy. Users can use one of the available query forms to submit queries by author, object name, date range, words in the title, and words in the abstract text. The resulting list of bibliographic records is ranked by how closely each record matched the query. From this list, users can obtain on a record by record basis all the information available about a particular bibliographic entry (including the bibliographic code, title, authors, author affiliations, journal reference, publication date, category, comments, origin, keywords, and abstract text when available).

1.1.1 Use of the ADS

Terms and Conditions for Use of the NASA Astrophysics Data System

Use of the NASA Astrophysics Data System (ADS) services implies that the User has read and agrees to the following terms and conditions:

- **Full-text articles and abstracts of papers available from the ADS databases are copyrighted by the respective publishers and are subject to all applicable copyright protection under the laws of the United States and other countries. The reproduction of full-text articles or abstracts requires express written permission from the publisher.**
- **Individual users may download, store and print copies of such abstracts and articles for personal use only and provided that such copies are not sold or redistributed.**
- **Users may not perform systematic downloads of articles, abstracts, or tables of contents for any purpose, whether commercial or not, without the written permission of the ADS. This includes indiscriminate, mass downloads of search results and the use of robots.**
- **The ADS makes reasonable efforts to ensure that the contents of its archives are accurate. However, the ADS does not guarantee the completeness, accuracy or usefulness of its databases and search interfaces. The ADS is not to be considered liable for any delay, downtime, or other failure of performance in providing its services.**

If you wish to acknowledge the services provided by the ADS in a publication, kindly use a phrase such as the following:

This research has made use of NASA's Astrophysics Data System Bibliographic Services.

1.1.2 User Privacy

The ADS respects the privacy of its users. The following describes our policy.

Server Logs

As you travel through the ADS web site, our server logs the following information about your session on the site:

- Your computer's IP address (an IP address is a number that is assigned to you by your internet service provider).
- The type of browser and operating system used to access our site.
- The date and time you access our site.
- The pages that you visit.
- If you came to our website using a link from a different web site, the address of that website.

- The cookie that the ADS may have set up for you (see below).

We use this information from our server logs to learn about our visitors as a group, not about you as an individual. We also use the information to generate important statistics required by our funding sources. These records are kept only for the purpose of maintaining and improving services on our site, and are never shared with any other entity.

Cookies

A "cookie" is a unique identifier that a Web site places in your computer's hard drive for future reference. The ADS uses cookies to allow customization of our site's features on a user-by-user bases. For instance, the implementation of the ADS preference settings makes use of cookies.

Additionally, cookies offer a mechanism allowing us to track the sequence of documents that a particular user retrieves from our site, without having any knowledge of the user's identity, and without requiring any form of user ID or password assignment. Again, this information is being collected only for the purpose of providing better service to our users. This permits, for instance, the creation of the "Also-read" article links, allowing users to see articles which were also read by people who read a given article.

Please note that our site does not **require** visitors to have cookies enabled in their web browsers. However, be reminded that some features of our system won't be available to you if you choose to configure your browser not to use cookies.

Future Changes

The ADS reserves the right to change this policy at any time. If we make material changes to our privacy policy, these changes will be posted on this page.

1.2 About the Data in the ADS

The main body of data in the ADS consists of bibliographic records, which are searchable through our Abstract Service query forms , and full-text scans of much of the astronomical literature which can be browsed though our Browse Service

1.2.1 Origin

The abstracts database contains data from many different sources. The initial dataset was from NASA's Scientific and Technical Information group (STI) and covered the years 1975-1995. After that, we began collecting data directly from the journals as agreements were reached with them individually. In addition, we have collected references from SIMBAD , NED , conference editors, and individual authors. We have created electronic records from table of contents of

most journals and conference series back to volume 1 as we have scanned them in order to provide complete bibliographic coverage.

All bibliographic records include an **Origin** field which details where a given abstract came from. In cases where we have the same paper from multiple sources, we currently list them in the order above, but will soon merge the information into one complete record. It should be noted that we no longer receive data from STI, but that those abstracts in the system from STI are rewritten versions of the original author abstract. Our list of origins includes information on where some of our data come from.

Click on our Journal Abbreviation List to see a full list of journals and their abbreviations.

The full-text scans available in the ADS can be browsed through the ADS Browse Service . The scans were created by digitizing printed issues of astronomical publications. For more information on the full-text archive, please see the Scanned Literature help page .

Many articles that are not scanned in the ADS may be ordered from the Center for Aerospace Information (CASI).

Many of the dissertation citations contained in the ADS are published with the permission of ProQuest LLC. Further reproduction is prohibited without permission. Copies of dissertations may be obtained by Telephone (800) 1-800-521-0600 Web page: http://www.proquest.com/en-US/products/dissertations/individuals.shtml

`\hypertarget{coverage}{}`

1.2.2 Coverage

The abstract databases contain records from hundreds of publications, colloquia, symposia, proceedings, and internal NASA reports. These sources cover diverse loosely astronomy-related subjects, ranging from Electrical Engineering through Optics to Particle Physics. They include the larger American astronomical journals: Astronomical Journal, Astrophysical Journal, Icarus, Publications of the Astronomical Society of the Pacific, etc, as well as many Non-American journals: Astronomy & Astrophysics, Monthly Notices of the Royal Astronomical Society, Publications of the Astronomical Societ of Japan / Australia / India, Astrophysical Journal of the Soviet Union / Australia / Ireland, etc., as well as more general interest journals such as Science, New Scientist, Nature, Mercury, Sky and Telescope, etc.. Complete coverage is only guaranteed for those journals we have scanned and placed online. That information is listed on our article service page .

1.2.3 Bibliographic Identifiers

Creating unique Bibliographic codes (*bibcodes* from here on) allows us to identify literature in our database. Using a standard bibliographic format, as explained below, we can easily identify different bibliographic records and users can efficiently search for them.

The bibliographic code is a 19 digit identifier which describes the journal article. The format was originally adopted by the SIMBAD and NED projects, and follows the syntax:

YYYYJJJJJVVVVMPPPPA

where:

- **YYYY**: Year of publication
- **JJJJJ**: A standard abbreviation for the journal (e.g. *ApJ*, *AJ*, *MNRAS*, *Sci*, *PASP*, etc.). A list of abbreviations is available.
- **VVVV**: The volume number (for a serial) or an abbreviation that specifies what type of publication it is (e.g. *conf* for conference proceedings, *meet* for Meeting proceedings, *book* for a book, *coll* for colloquium proceedings, *proc* for any other type of proceedings).
- **M**: Qualifier for publication:

  E: Electronic Abstract (usually a counter, not a page number)

  L: Letter

  P: Pink page

  Q-Z: Unduplicating character for identical codes
- **PPPP**: Page number. Note that for page numbers greater than 9999, the page number is continued in the **m** column.
- **A**: The first letter of the last name of the first author.

The fields are padded with periods (.) so that the code is always 19 characters long. The journal is left-justified within its 5 characters, and the volume and page are right-justified. New journal abbreviations should be unique, and follow existing naming conventions. As an example, the bibliographic code:

1992ApJ...400L...1W

corresponds to the article: *Astrophysical Journal Letters volume 400, page L1.*

A list of journal abbreviations already in use is available on-line. Here are some abbreviations for the most popular Journals:

```
ApJ:   Astrophysical Journal
ApJS:  Astrophysical Journal Supplements
ApJ:   Astrophysical Journal Letters (with an L in the Qualifier position).
AJ:    Astronomical Journal
A&A:   Astronomy & Astrophysics
```



```
A&AS:  Astronomy & Astrophysics Supplements
MNRAS: Monthly Notices of the Royal Astronomical Society
PASP:  Publications of the Astronomical Society of the Pacific
PASA:  Publications of the Astronomical Society of Australia
PASAu: Proceedings of the Astronomical Society of Australia
PASJ:  Publications of the Astronomical Society of Japan
```

In order to accommodate conference proceedings and technical reports, the ADS has modified the original bibliographic code definition in order to present identifiers which are easily recognizable to the user. Conference proceedings, books, colloquia, workshops, and reports in the ADS typically contain a four letter word in the volume field such as *conf*, *book*, *coll*, *work*, or *rept*; all other type of proceedings use the identifier *proc*. For these bibliographic codes, the journal field typically consists of the first letter from important words in the title (e.g. *ioda.book* for "Information and On-Line Data in Astronomy").

Several oddities exist for bibcodes which do not fit into this paradigm. PhD theses, for example, contain a counter in lieu of a page number to distinguish between those written during the same year by authors whose surnames start with the same letter.

Physical Review bibcodes began using an 6-digit id number in the late 1990's instead of a page number. For these articles, we have converted the first 2-digits of the id (which correspond to the issue number) into a lower-case letter in the 14th column. We then use the remaining 4 digits in the page number field.

For conference abstracts submitted by the editors of a proceedings prior to publication, we often do not have page numbers. In this case, we use a counter in lieu of a page number and use an "**E**" (for *Electronic*) in the fourteenth column, the qualifier for publication. If these conference abstracts are then published, their bibliographic codes are replaced by a bibliographic code complete with page number. If the conference abstracts are published only on-line, they retain their electronic bibliographic code with its "**E**" and counter number.

We have created two separate interfaces to assist our users and collaborators in searching and verifying the existence of records in our databases:

- The Journal/Volume/Page form allows users to enter either a journal citation (in the top part of the form) or a bibcode (in the bottom part of the form). If a partial citation or bibcode is entered, all records matching the input data will be returned.
- The bibcode verification utility is a simple interface allowing people to determine if a bibcode exists in the ADS.

1.3 Updates

Updates to our databases are performed approximately every week, then mirrored to all of our mirror sites. Therefore, any new information added or change made to the databases does not become available immediately; rather it may take up to a week to become active. Corrections are always welcome, for example misspellings, missing pages/scans, broken links, etc. We also encourage you to submit original author abstracts to us through our http://adsset.cfa.harvard.edu/adsfeedback/submit_abstr Abstract Submission Form.

1.4 Acknowledgments

We would like to thank the following publishers for their contributions and cooperation:

- American Geophysical Union
- American Institute of Physics
- American Physical Society
- Astronomical Society of the Pacific
- Copernicus Publications
- EDP Sciences
- Elsevier Science
- Institute of Physics Publishing
- Lunar and Planetary Institute
- Nature
- Science
- Springer
- Wiley InterScience Publishers
- World Scientific

In addition we would like to thank the following organizations whose contributions enhance the value of our data:

- ARI
- CrossRef
- JSTAGE
- Proquest
- SIMBAD

- NASA STI
- Wolbach Library

We are grateful to many individuals who have contributed or are contributing metadata records and updates to the ADS. Among them:

```
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* Will Graves, CfA
* Chris Erdmann, CfA
* Sergei Grebenev, Space Research Institute, Moscow
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* Jill Lagerstrom, SCScI
* Richard Mathar, Sterrewacht Universiteit Leiden
* Megan Nunemaker, NRAO
* Wayne Osborn, Central Michigan University
* Joe Tenn, Sonoma State University
* Lance Utley, NRAO
```

Additionally we thank those who have donated materials to be scanned .

Chapter 2

How to Search

The SAO/NASA Astrophysics Data System Abstract Service provides a gateway to the online Astronomy and Physics literature. You can navigate this content using a number of query interfaces, which allow you to search one or more of its databases: Astronomy and Astrophysics, Physics, and ArXiv e-prints.

2.1 Basic Query Form

The Basic Query Form provides a search interface for basic searches. Simply type in your search terms in the one field on this query form and click on the 'ADS Search' button. Your search items should describe the information you are looking for as accurately as possible. The better you are able to formulate your search items, the more relevant the results will be. The search field on this query form allows for certain formatting which will enable you to zoom in on the data and narrow down the results. Below we will explain the various ways in which you can use this basic query form.

2.1.1 General Search Hints

Unless you are looking for a term that is unique (like the name of an astronomical object, project or a uncommon last name), it is usually advisable to use multiple search terms or phrases. A search phrase consists of several search items enclosed in either single or double quotes. The more specific your search terms, the better the results. By default, we apply synonym replacement to queries (for more information please see the section Synonym Replacement below). This means that, for example, *accelerate*, *accelerated*, and *acceleration* are all equivalent. To exclude a word from synonym replacement, use the ”=” sign before that word. You can exclude words from queries by putting a ”-” sign before the word. For example

+contact +binaries -eclipsing

will search the database for entries that contain both words *contact* and *binary*, but not the word *eclipsing*.

If you want to query just article titles, you can prepend *intitle:* to a search term. For example

intitle:”yellow symbiotic”

looks for articles with titles that have both *yellow* and *symbiotic* in them.

When you enter multiple search terms, the default query will look for all terms.

The scoring for the Basic Search differs from the Advanced Search. The score is a complex function that depends on factors like paper age, citations and whether search terms occur in a title and/or abstract.

2.1.2 Year Range Searching

The search software recognizes a year when entered as YYYY in the search terms. You can use the following formats:

- YYYY (search a specific year)
- YYYY-YYYY (search a year range)
- -YYYY (search up to a certain year)
- YYYY- (search from a certain year on)

2.1.3 Author Search

You can enter an author name as either

<last name>, <first name>

or

<first name> <last name>

and the search will find papers by this author. A search of the form

^<last name>, <first name> or *^<first name> <last name>*

will find the papers where this author was the first author. For example, the query

^Kurtz, M. -Eichhorn, G. 2000

finds papers published in 2000, for which M. Kurtz was the first author and for which G. Eichhorn was not one of the co-authors.

You can explicitly specify that you are searching for an author by prepending ”author:”. For example

author:”A Einstein”

will search for the name *A. Einstein* in the author list, not in the text. With common last names you can narrow the results down if you know a midlle name or initial. For example

author:”^Peter H. Smith”

searches for all papers where the first author is *Peter H. Smith*, *P. H. Smith*, *Peter Smith* or *P. Smith*, but not *P. L. Smith* or *Patricia Smith*. The query

author:"M. J. Kurtz" author:"G. Eichhorn" 2004
searches for papers by *M.J. Kurtz* and *G. Eichhorn* in 2004, while the query
author:"M. J. Kurtz" -author:"G. Eichhorn" 2004
searches for papers by *M.J. Kurtz* and anybody but *G. Eichhorn* in 2004.

2.1.4 Phrase Search

In the Basic Search, searching for phrases can be specified by enclosing several words in either single or double quotes. All these accomplish the same goal of searching the database for references that contain specified sequences of words. The database is indexed for two-word phrases in addition to single words. Phrases with more than two words are treated as a search for sets of two-word phrases containing the first and second word in the first phrase, the second and third word in the second phrase, etc. For instance:
"galactic rotation"
searches for the words *galactic* and *rotation* next to each other, with all synonyms for both search terms (synonym replacement is always switched on for phrase searches).

2.1.5 Identifier Search

You can specify a bibcode, DOI or arXiv e-print identifier in the search field, and if the associated record exists in the ADS, this record will be returned. E-print indentifiers should be specified using the syntax recommended by arXiv, e.g. arXiv:astro-ph/0601223 or arXiv:0711.2886 .

2.1.6 Basic Search Plugin

The link *Install the ADS Basic Search plugin in your tool bar* on the Basic Query Form allows you to add the Basic Search to the box of popular search engines. This currently works for Firefox versions 1.x and 2.x as well as Internet Explorer version 7 and above.

Safari users should first install the add-on AcidSearch , then come back to the Basic Search page , click on the magnifying glass icon in the search bar, select "AcidSearch Preferences," and click on "New Channel." AcidSearch attempts to automatically create the channel based on the current web page. Double-click on the channel's name in the list to rename it, and press return to save your changes.

2.2 Abstract Query Form

The Abstract Query Form provides basic access into the ADS abstract databases. The query form is divided into 3 sections: The main search parameters, the filters, and the settings.

2.2.1 Introduction

The ADS search engine has a number of features which have been developed in order to improve searching our databases. These include the use of synonyms, stop words, and word translations.

Synonyms

By default, each search term specified in the title, abstract, or author query field triggers a search for all the term's synonyms as well as the term itself. The use of synonym searches for text words has been established to equate different tenses of the same verb, different genders of the same name, as well as different words with the same meaning. In addition, we use synonyms to perform foreign language translations, to equate foreign words with their English counterpart. This feature can be turned off by modifying the default settings (for more information please see the section Synonym Replacement below).

For authors, synonym replacement allows the user to search on an author's name and get back any alternative or incorrect spellings of which we are aware. For example, the author synonym pair **A'HEARN, M** and **AHEARN, M** allows users to search on either spelling and retrieve abstracts which contain either spelling. If you are aware of an author name, misspelling, or foreign word translation which does not seem to be working correctly, please inform us by email to ads@cfa.harvard.edu

Stop Words

The ADS search system recognizes certain words as being not important for searches and removes those words from a search. These are words commonly used in the English language with great frequency, as well as adverbs, prepositions and any other words not carrying a significant meaning when used in a scientific context. There are two types of stopwords, case insensitive stopwords and case sensitive stopwords. The former are words like **much** and **but**. They are ignored in a search. The latter are words that are stop words in some context, but are significant in other contexts. For instance **and** is a stopword, but **And** is significant. Since **and** does not occur at the beginning of a sentence, we assume that anytime **And** is in the text, it means **Andromeda**. The list of stop words is available on-line.

Search Word Translations

Last, we perform word translations for certain terms or patterns which are conventionally written in a few different ways. This is most commonly done with astronomical object names (e.g. **M 31** and **M31**), as well as some composite words (e.g. **X RAY**, **X-RAY** and **XRAY**). The list of words which are currently translated is available. If you are aware of others which should be included, please inform us by email to ads@cfa.harvard.edu

Phrase Searches

In the title and text fields, searching for phrases can be specified by enclosing several words in either single or double quotes, or concatenating them with periods (".") or hyphens ("–"). All these accomplish the same goal of searching the database for references that contain specified sequences of words. The database is indexed for two-word phrases in addition to single words. Phrases with more than two words are treated as a search for sets of two-word phrases containing the first and second word in the first phrase, the second and third word in the second phrase, etc. For instance:

"black hole"

searches for the words *black* and *hole* next to each other.

Wildcard Searches

In order to be able to search for families of words, a limited wildcard capability is available. Two wildcard characters are defined: The question mark "**?**" is used to specify a single wildcard character and the asterisk "*****" is used to specify zero or more wildcard characters. The "**?**" can be used anywhere in a word. For instance a search for *M1?* will find all Messier objects between *M10* and *M19*. A search for *a?sorb* will find references with *absorb* as well as *adsorb*.

The asterisk can only be used at the beginning or at the end of a word. For instance *3C** searches for all 3C objects. **sorb* searches for words that end in *sorb* like *absorb*, *desorb*, etc. When synonym replacement is on, all their synonyms (e.g. absorption) will be found as well. The "**?**" and the "*****" can be combined in the same search string.

2.2.2 Search Fields

The Abstract Service Form allows users to enter keywords to be searched for in one or more of its search fields: Authors, Title, Abstract text, and Object Names (for Astronomy only). While author searches are case-insensitive, case does matter when searching the object name field and the title and abstract fields. Words that are entered in all uppercase are considered acronyms and will only match the same uppercase acronyms as found in the literature, while words entered in lowercase (or mixed case) will match words irregardless of what case was used in the original document. For example, compare the difference in results when searching for "FUSE" (an acronym for the Far Ultraviolet Spectroscopic Explorer) rather than "fuse."

Authors

Authors may be entered one per line, or on the same line separated by semicolons. Authors may be entered by last name only, by last name and first initial, by last name and first name, or by last name, first name and middle name. Any of the following will work (the space after the comma is optional):


```
smith, arthur james
smith, arthur j
smith, arthur
smith, a james
smith, a j
smith, a
smith
```

The search will return all author names that potentially match the query string. For instance:

smith, arthur james

will return articles with any of these author names:

```
Smith, Arthur James
Smith, Arthur J
Smith, A James
Smith, A J
Smith, Arthur
Smith, A
```

but not with these author names:

```
Smith, Arthur Joseph
Smith, Arthur M
Smith, Andrew James
Smith, Andrew
Smith, A M
Smith, C J
```

It is possible to disable this search behaviour and only search for a particular author string by checking the **Exact name matching** button above the author search box. This will cause the search engine to return only records for which the author has been entered as *smith, arthur james*.

To find author names with different spellings, use the ADS Author Name Query form capability which will display all the spellings matching a particular author name template.

You can search only for articles that contain the specified author as first author by specifying a "^" before the author name. For instance:

^*smith, a*

searches for all articles with A. Smith as the first author.

In addition, you can search only for articles that contain the specified author as last author by specifying a "**$**" after the author name. For instance:

smith, a$

searches for all articles with A. Smith as the last author.

A combination of these two specifications allows you to search for articles with just one author:

^smith, a$

searches for all articles with A. Smith as the only author.

The search:

smith, a #

smith, arthur #

finds only authors without middle initial or middle name.

Note: Authors whose last names contain an umlaut may be entered under both possible English spellings (e.g. *Boehm* and *Bohm*), as well as with the umlaut (*Böhm*).

SIMBAD/NED/ADS Object Names/Position

The Object Names/Position search field (available only in the Astronomy and Astrophysics Abstract search) allows users to search the literature for bibliographic records relevant to one or more astronomical objects or for a specified position on the sky.

Object names may be entered one per line, or on the same line separated by semi-colons. By default, an object name query searches the contents of the ADS abstract database as well as the SIMBAD and NED services, which are databases of galactic (SIMBAD) and extragalactic objects (SIMBAD and NED). The resulting list consists of papers which are relevant to the specified object(s). To get a list of object aliases, enter an object name in the appropriate window of the List Query

Alternatively, a position on the sky and an optional radius can be specified for the search. Position searches locate the papers dealing with celestial objects located within the specified radius of the specified position. They work through SIMBAD and NED databases, and can be combined with the other search criteria.

The syntax for position searches is:

RA ±Dec : radius

where RA and Dec are right ascention and declination J2000 positions, expressed in decimal degrees or in sexagesimal notation (hours minutes seconds and degrees arcmin and arcsec). The plus or minus sign before the declination is mandatory. The search radius may be given in decimal or sexagesimal degrees. For example, a 10' radius may be written as 0.1667 or 0 10 . The default search radius is 2' (0 2 = 0.033 deg)

Publication Date

The **Publication Date** should be entered as two integers in the form MM and YYYY (e.g. 12 and 1988). For those cases when there was no month available, the month is entered in the database as 00.

If no date is entered, the program will default to the full date range. If no **From** month is entered the program will enter a default value of 00. If no **To** month is entered the program will enter a default value of 12.

The limit by publication date is inclusive, meaning that an end date of 08 2000 will include all articles published before **and** in August 2000.

Title

This allows the user to search for words found in the title of the paper. The user can select 'OR' , 'AND' , Simple Logic , or Boolean Logic .

Abstract Text

This allows the user to enter any combination of words or sentences s/he chooses. The search will be done on individual words (except for some of the most common English words such as **the**, **a**, and **and**). This is extremely useful for entering the text of an abstract from a previous query to find all the papers most related to that paper. All title words and keywords are also indexed together with the abstract text words. The user can select 'OR' , 'AND' , Simple Logic , or Boolean Logic .

Number of Abstracts to Return

If you would like to see more than the first 100 references, change the appropriate number on the query form in the line **Return __ Items**. To retrieve the next set of references if the maximum count was exceeded, change the number in **starting with number __** to the number from which you want to resume retrieving abstracts. Please note that currently our system will not return more than 500 records at a time.

2.2.3 Filters

The filters section allows the user to select specific abstracts from the results of the search.

Entry Date

The **Entry Date** allows the user to select data which have been entered in the database since a given date. Entering *-31* in the **Day** field will select all new entries in the past month.

Minimum Score

The **Minimum Score** allows the user to select data which have a score greater than the entered minimum score. This is most useful when used in conjunction with the entry date. See the What's New Service described below.

Select References From

The default setting returns all abstracts which fit the query criteria. To select only those journals which are refereed (i.e. omit abstracts from publications such as conference proceedings, bulletins, newsletters), choose the "'Select References From: all refereed journals"' option.

The checkbox **Select only articles** removes entries that are not regular articles, for instance meeting abstracts, observing proposals, catalog descriptions, etc.

Users may select only from specific journals by choosing **Select References From: Allbibliographic sources:** and entering the journal(s) bibstems (separated by a comma or a semicolon). To use this field, you must know the abbreviation for the journal. These abbreviations are listed in the journal abbreviations file and are linked to **publications**. selecting one of the journals from that list will automatically put the abbreviation in this field. The journal abbreviation can be prepended with a "**-**". This will return only references that are *not* from the specified journal(s). Prepending a journal abbreviation with a "+" will add this journal to the selected category (either refereed or non-refereed). You can also use the "?" as a wildcard, for example, to include all books with "?????books", or to exclude proposals with "-?????prop".

Select References With

This allows users to select references which contain links to other information. You can select references that have either *all* selected links, *any one* or *none* of the selected links, such as full article text, original author abstracts, electronic versions, data tables, etc.

Select References From Group

The Abstract Service Astronomy and Astrophysics search form contains a **Group selection** section, which gives the user the ability to have the results of a query limited to a set of abstracts which we have designated as a bibliographic group. The groups currently in use by the Abstract Service include the following:

ARI This group contains papers written by researchers at the Astronomisches Rechen-Institut at the University of Heidelberg.

CfA This group contains papers written by researchers at the Center for Astrophysics (CfA) in Cambridge, MA.

CFHT This group contains papers written by researchers at the Canada-France-Hawaii Telescope (CFHT) on Mauna Kea, HI.

Chandra This group contains articles that are related to the Chandra X-ray Observatory , including articles on Chandra-related theory, software, calibration, instruments, etc. Those articles that present specific Chandra observations are linked to the data in the Chandra Data Archive on which they are based. The database is maintained by the Chandra Data Archive and can be queried in more detail with our search tool . For publication statistics, please visit the Chandra Bibliography Statistics page.

ESO/Lib This group contains approximately 10,000 books contained in the ESO Astronomy Library .

ESO/Telescopes This group contains refereed articles using ESO data. All papers using data from Paranal (VLT, VLTI, VISTA, VST) or Chajnantor facilities (ESO observing time of APEX or ALMA) as well as La Silla papers since publication year 2000 reference the program IDs from which the data originated. They are linked to the corresponding data products located in the ESO/ST-ECF Science Archive. The database is maintained by the ESO Library and can be queried in more detail at http://telbib.eso.org For further questions, please contact the ESO librarians at library@eso.org

NRAO/Telescopes This group includes articles using NRAO telescope data and comes from the NRAO publications bibliography

Gemini This group contains articles concerning observations made at the Gemini Observatory

GCT This group contains articles that are related to the Gran Telescopio CANARIAS including articles on software, calibration, instruments, etc. Those articles that present specific GTC observations are linked to the data in the Gran Telescopio CANARIAS Public Archive on which they are based. The database is maintained by the Spanish Virtual Observatory and can be queried in more detail with the search tool available at http://gtc.sdc.cab.inta-csic.es/gtc /

Herschel This group contains articles based on in-flight measurements and/or observations of the Herschel Infrared Space Telescope, as described in this document . The list is maintained by the Herschel Project Scientist.

HST This group contains refereed articles using Hubble Space Telescope data, generated by the Multimission Archive at STScI We note that matching HST proposal ID's to published papers is an on-going project and never completely up to date. All articles are linked to the data on which they are based.

ISO This group contains articles pertaining to the Infrared Space Observatory .

IUE This group contains refereed articles using International Ultraviolet Explorer data, generated by the Multimission Archive at STScI We note that matching IUE proposal ID's to published papers is an on-going project and never completely up to date. About 70% of the articles are linked to the data on which they are based.

JCMT This group contains papers published in refereed journals that contain data from observations at the James Clerk Maxwell Telescope (JCMT) on Mauna Kea, Hawaii. The JCMT is operated by the East Asian Observatory .

Keck This group contains the papers written about observations made at the W.M. Keck Observatory

Leiden This group contains papers written by researchers at the Leiden Observatory .

LPI This group includes the complete Lunar and Planetary Institute (LPI) bibliography, from approximately 1975 to 1994. These are typically papers about planetary astronomy.

Magellan This group contains papers using data from the Magellan telescopes . The list is maintained by the Magellan technical manager.

NOAO This group contains papers using National Optical Astronomy Observatory (KPNO and/or CTIO) observations. This list is maintained by the NOAO Librarian (library@noao.edu).

NRAO This group includes articles related to observations from the National Radio Astronomy Observato

PhysEd This group contains a list of articles from journals related to education in physics and engineering

ROSAT This group contains a list of articles about ROSAT experiments and/or ROSAT data.

SDO This group contains papers related to the Solar Dynamics Observatory project .

SMA This group contains papers about the Smithsonian Astrophysical Observatory's Submillimiter Array .

Spitzer This group contains articles about the Spitzer Space Telescope data, instruments, and articles that provide predictions or models of Spitzer results.

Subaru This group contains papers about data taken with the Subaru Telescope .

Swift This group contains selected papers using partly or exclusively data from the Swift Gamma-Ray Burst Mission These can be observations taken by the authors or data obtained from the Swift Archive or other sources, regardless of whether or not the observations have been published before. However, papers that merely quote results from the literature, that are derived from Swift data, are excluded. Likewise, papers that describe instrumentation, calibration or software, simply mention ongoing projects,

suggest future observations with Swift, develop models, theories, or run simulations are not included in the group. Also excluded are papers which show Swift images as a visual reference rather than using them to achieve scientific results. Note: this group currently includes only papers published in 2005-2013 (inclusive).

UKIRT This group contains papers published in refereed journals that contain data from observations at the United Kingdom Infrared Telescope (UKIRT) on Mauna Kea, Hawaii.

USNO This group contains papers written by researchers at the United States Naval Observatory .

VSGC This group contains papers about variable stars in globular clusters.

XMM This group contains papers about XMM-Newton Telescope observations.

If you have a set of data you would like to have us use as a group, please contact us at ads@cfa.harvard.edu

2.2.4 Sorting

The sorting section allows the user to sort the results list according to different criteria. The following sorting options are available.

Sort by Score

This option sorts the results list according to the score, the measure of how well each article matches the query. This is the default.

Sort by Normalized Score

This option sorts the results list according to the score, normalized to the number of authors in the article. This weighs articles with fewer authors higher.

Sort by Citation Count

This option sorts the results list according to the number of citations that each article has. It will return the most cited article in the list first.

Sort by Normalized Citation Count

This option sorts the results list according to the number of citations that each article has, normalized to the number of authors for the article. It weighs the citation count such that articles with fewer authors are deemed more important.

Sort by First Author Name

This option sorts the results list alphabetically according to the last name of the first author.

Sort by Date (most Recent First)

This option sorts the results list according to publication date, with the youngest articles returned first.

Sort by Date (oldest First)

This option sorts the results list according to publication date, with the oldest articles returned first.

Sort by Entry Date

This option sorts the results list according to the date at which the record was entered in the ADS database.

2.2.5 Settings

The settings section allows the user to change default query conditions such as the logic of the query. The following settings are available.

Require Field For Selection

This determines how results are combined when multiple fields are being searched. If **Require Field for Selection** is turned on for a specific search field, a bibliographic record will fulfill a query only if the search term(s) entered in the field are found in the record. For example, if you specify an author and a title word in the respective search fields and then check *YES* for **Require Field For Selection** under the **Authors** column, all abstracts which are retrieved must contain that author. When this is not turned on, abstracts which do not contain that author, but which contain the title word will also be returned (i.e. the default is to *OR* across fields).

Synonym Replacement

If this is turned on, the synonym list will be used to replace words. This corrects for misspellings in the abstract text or author names, and equates words such as *accelerate*, *accelerated*, and *acceleration* (see also Synonyms)

It is also possible to turn synonym replacement on or off for individual words within a query. By default, synonym replacement is done for all words. To exclude a word from synonym replacement, use the "=" sign before that word (to exactly match that word and no synonyms). If you have turned off synonym replacement but want it turned on for a given word, use the "#" sign before the word to turn synonym replacement on for this particular word.

Relative Weights

This is the relative weighting of the fields used in calculating the scores. If you want to give more weight to the authors than the title words, for example, these numbers would be changed. It is also possible to make one of these fields 0.0, in which case that item will not be considered when the relative scores of each abstract are calculated (the *scores* are descriptions of how well a given abstract matches the query conditions, normalized to 1.0). A negative weight will cause the result to return first all matching references that do **not** contain the field with the negative weight.

Use For Weighting

This determines if the field should be used in calculating the scores. If this is turned on, then this search field (authors, title, etc) will be included in the calculation for the total score of each abstract. If it is not turned on, the search field will be used for selection as specified in the other flags but will be ignored for the score calculation. This serves two main functions, to selectively turn off portions of a complex query without editing the query, and in conjunction with the **Require Field for Selection** flag to permit a Boolean search on a field to be combined with a relevancy ranking.

Weighted Scoring

This sets how the score for each abstract is calculated. If this is not turned on, the scoring is *straight*; each query condition that is met (a *hit*, e.g. if the abstract contains a word specified in the query) receives a score of 1 (before normalization). If this is turned on, the scoring is *weighted*; the score for a *hit* is the inverse log of the frequency of the specified condition (e.g. title word) in the total database. This gives a higher score to *hits* of rarely used words since they are presumably a stronger search criterion. The final score is then normalized so that a reference that fulfills every query input gets a score of 1.

Example

Assume there is a list of desired authors in the author field in the Abstract Query window. Assume that one wants papers where at least one of the desired names is an author, but does not want the paper to appear more relevant if more than one desired author is a co-author. In the Author Query Settings window, you would turn off **Use for Weighting** for the Author field and turn on **Require Field for Selection** for the author field. This would allow the rest of the query to determine the relevancy score, but return only abstracts with at least one of the authors.

2.2.6 Saving Queries

If you find yourself frequently modifying any of the default settings found on the Abstract Query Forms (for instance, if by default you want to only search for refereed papers), you may want to consider *customizing* the search form to fit your needs. If instead you find yourself frequently repeating the same type of query (for instance to see the updated list of papers published on a particular topic), you may want to save one or more of such queries so you can easily re-execute them.

To create customized form(s), fill in the fields that will be the basis of a customized search query. Then press the **Store Default Form** button on the query page and the form will be saved on the ADS server. It will return a URL that can be used to recall this filled-in query form. You can also download a filled-in query form by clicking on **Return Query Form**. You can then save this query form locally or simply bookmark it. Bookmarking such a filled-in form is the best way to save several different query forms: as all the necessary query parameters are specified in the URL of the document, there is no need to store this form anywhere. Note: if you do bookmark different query forms you will want to change their title so that you can distinguish them. Netscape users can do this by selecting "Bookmarks" -> "Edit Bookmarks" -> "Edit" -> "Bookmark Properties".

2.2.7 Query Logic

This section describes how to compose complex queries by using the different logic operators supported by the ADS search engine. To modify the default search logic, please use the appropriate check buttons which can be found right above the input search box for the field in question.

OR Queries

When **OR** is selected, abstracts are returned that contain *any* of the words specified in the search field. The score of the search depends on how many words are matched.

AND Queries

When **AND** is selected, abstracts are returned that contain *all* of the words specified in the search field. The score of the search is 1 (since all words have been matched).

Simple Logic Queries

The simple logic recognizes "+" and "-" before the search words. To require a word to be found in a search, it needs a "+" in front of it. A "-" before a word indicates that only references that do NOT contain that word should be

returned. "**and**", "**or**", and "**not**" are stop words and will be ignored in the simple logic.

Example: *+contact +binaries -eclipsing*

This will search for references that contain both words *contact* and *binary*, but not the word *eclipsing*.

Full Boolean Queries

This allows more complex queries than just combining all words with **OR** or **AND**. The allowed boolean operators are: **and**, **or**, **not**, **(**, and **)**. They can be used in any combination (as long as **(** and **)** match). For example the query:

(redshift or survey) and not galaxy

finds all references that contain either *redshift* or *survey*, but not *galaxy*. The order of precedence of the operators is **(...)**, **not**, **and**, **or**. For larger numbers of search terms, this type of search will be slower than regular searches, especially if the **not** operator is used. Regular scoring is done on any terms that are combined with **or**. **and** and **not** combinations are scored as 1.

Note that if you want to use **not**, it is best if it is not the first search argument, since this requires every abstract in the system to be selected and propagated through the following selection process.

2.3 The Experimental Topic Search Interface

The ADS Topic Search is an experimental interface allowing users more control in defining what it is that they are seeking. The search interface provides six different modes for searching the literature. Three of them (named "**Keyword Searches**") are based on the traditional approach of searching for the input keywords in the ADS database and then ranking the results based on one or more criteria specified by the user. The remaining three searches (named "**Subject Area Searches**") make use of the so-called second order relational operators to broaden a keyword-based search through collaborative filtering techniques.

2.3.1 Keyword Searches

Keyword Searches offered in our Topic Search interface simplify the task of selecting the different parameters otherwise required to obtain lists of papers ranked in a particular way. The functionality that they provide has long been available through the traditional ADS abstract search query form and the ADS basic search interfaces, but this interface tailors them in order to simplify their use.

The options offered for Keyword Searches are:

1. *Most Relevant*: returns a list of papers that best match the input keywords, ranked by a combined word-based, citation-weighted, age-normalized score.

2. *Most Recent*: returns a list of papers matching the input set of keywords, ranked by age (most recent first).

3. *Most Important*: returns a list of papers matching the input set of keywords, ranked by citation count.

2.3.2 Subject Area Searches

The logic employed to implement Subject Area searches is predicated on the assumption that we can make use of relationships between documents to characterize their relevance and usefulness with respect to a topic. Suppose you are interested in exploring a topic X and want to know what the most popular papers on the subject are. A keyword search can be used to first generate a list of recent papers on topic X. The (anonymous) users who have read papers on topic X will be, in the aggregate, people who are interested in topic X, and the papers they have read with the highest frequency will be the currently most popular papers on the subject. Using the original list of papers generated by a keyword search and the aggregate statistics about readership of these papers we can therefore create a secondary list of documents which can be interpreted as the most popular on a particular subject. Note that this is not just a re-ranking of the original list selected by a keyword match, but rather a selection of records related to the original list based on a set of shared attributes. As such, it is possible that a record returned by this secondary selection will not necessarily contain the keywords specified in the search. This has the effect of broadening the list of papers that would otherwise be returned by the original query, and can thus generate surprising results.

The Subject Area searches currently implemented are:

1. *Most Popular*: as described above, this returns the list of documents read by all users who read recent papers on a the topic of interest, ranked by the readership count within that community; they are most popular on the subject because are read more frequently by people interested in the subject.

2. *Most Useful*: returns the list of documents which are most cited by the set of recent papers on the topic of interest, ranked by the number of citations; they are most useful because they are cited most often by papers written on the subject.

3. *Most Instructive*: returns the list of documents which cite most frequently the set of recent papers on the topic of interest, ranked by their citations; they are most instructive because they contain discussions of papers written on the subject (these typically tend to be review articles on the topic of interest).

2.4 Searching by Reference Information

2.4.1 Searching by Journal/Volume/Page

The *Journal/Volume/Page* query page allows you to find articles from journal references by year, journal, volume, and/or page. Any of the fields is optional. The query will return all references that match the input parameters.

The journal name can be specified either as the full journal name (e.g. "**Astrophysical Journal Supplements**"), or by specifying the journal's bibliographic code abbreviation (e.g. "**ApJS**"). If the journal name as entered does not uniquely identify the publication, a menu listing close matches will be displayed.

The entries in any of the input fields can contain the wildcard character "**?**" (one wildcard character). For instance *2??1* in the page field finds pages 2001, 2011, 2101, etc.

2.4.2 Searching by Reference

The *Reference* query page allows you to find articles from journal references by author and year, and optionally journal, volume, and/or page. The query will return all references that match the input parameters. The input can have several formats:

```
1: author [author ...] year [journal abbreviation [volume]]
  (eg Smith Jones 1999 ApJ)
2: author [author ...] et al year [journal abbreviation [volume]]
  (eg Smith et al 2001 SPIE 4500)
3: author [author ...] and author year [journal abbreviation [volume]]
  (eg Smith Miller and Jone 1998)
4: full reference string from a journal citation
  (eg Smith et al 2000, A&A 362, pp. 333-341)
```

Versions 1 and 2 search for articles with the listed authors, with the first author in the list as the first author of the article, and all listed authors as co-authors. There may be other co-authors in the article, except for version 1 with one author, which searches for articles with a single author.

Version 3 searches for articles with the listed authors, with the first author in the list as the first author of the article, the last author in the list as the last author of the articles, all authors in the list as authors in the article, and the number of authors in the list as the number of authors in the article.

Versions 1, 2, and 3 may not contain any punctuation. They search for articles in the specified year, and optionally restrict the search to a specified journal.

Version 4 parses a complete reference string and returns the specified article if it can be found in the database.

2.4.3 Searching by Bibcode

The bottom of the form allows retrieval of abstracts by bibcode. This field also may contain the wildcard characters "*" (zero or more wildcard characters, at the beginning or end of the bibcode) and "?" (one wildcard character, anywhere in the bibcode). Whole or partial bibcodes may be entered. For example:

```
1984ApJ...276..233P  returns only that reference
1984ApJ              returns all 1984 ApJ entries
*ApJ...400           returns all entries from ApJ volume 400
198?ApJ..????L       returns all ApJ letter articles from the 1980's
```

Note: For page numbers greater than 9999, the page number is continued in the 14th column.

Note: The ADS treats all bibliographic codes as case-insensitive!

2.5 Current/Unread Journals

2.5.1 Current Journals

The ADS Table of Contents Query Page displays the latest volumes of selected journals. The selection of a table of contents will return all the articles within that journal volume. That results page is in the same format as when a main search query is sent. There are there are two versions of this page available: the Graphic Version or the ASCII Version .

2.5.2 Unread Journals

The customized Table of Contents Query Page will only show the latest volume of the journals that you have not yet read. You can select which journals should be included on this form through the Preference Settings Form through the following steps:

1. Select the **Preference Settings Form**
2. Select the **Abstract Service Preferences**
3. Scroll to the bottom of the Preferences page
4. In the section titled **Selection for Custom ToC page and last viewed journal volumes:** select or unselect the journals of choice
5. Press the **Save Settings** button and return to previous page

Note: After you have set the preferences, you need to Reload all pages that may be affected by the preferences (Query forms, all results pages, and in particular the Preferences Setting page itself) to reflect the new preference settings. Sometimes a *hard* reload is necessary (hold down the *SHIFT* key while clickin

on *Reload*). The customized Table of Contents Query Page is also available in two versions: Graphic Version or ASCII Version .

2.6 Searching for Scanned Journals/Proceedings

Page by page access to the images of scanned publications is possible through either the Article Query Page or the Proceedings Query Page . Please note that **these query pages only provide access to articles that have been scanned by the ADS**, and that more recent full-text articles for some of these journals may be available from their publishers. If you want to retrieve any article from a particular journal, please use the Journal/Volume/Page Query Page instead (see prior section).

If a page number is been specified, the article service will display a view of the scanned page in the browser. If a volume is entered but no page nor plate number is specified, the table of contents for the entire series and volume will be generated.

If you are looking for an article that falls outside the publication ranges listed in the journal or proceedings query forms, you may want to retrieve the full bibliographic information for the paper as listed in the ADS Abstract Service. From it, you will be able to see if a full-text version of the paper is available from the publisher.

2.7 Searching Lists of Terms and Authors

2.7.1 Exact Author Query Form

This form allows you to query for specific spellings of an author name by returning the exact spelling of a full author's name (including any middle initials) as found in the ADS databases. This is useful for cases in which a user wishes to check all the possible spellings of a particular author's name in the literature.

Each line in the input field is used as a search string. The result of this query is a form that contains all author names that contain the search string. Allowed wildcard characters are "?" for single characters, and "*" for multiple characters. The "*" is not allowed within a name, but can be used at the beginning or end of a pattern. For instance, if you specify **string*, the form will return any name that end with the string. You can then select from this list which names to use in the following abstract query. You can also retrieve an abstract query form with the selected names filled in to further refine the query.

2.7.2 Abstract Service List Query

The author template field in the List Query Form allows the user to find author names that are synonyms of a given name, search for names that match a specified wildcard pattern, or find author names that sound similar to a specified name. The resulting list can be used as the start for an author name query.

When a name without a wildcard character is specified, the search returns all names that are synonyms of the specified name. If the search name contains a wildcard character, the search returns all names that match the specified pattern. Valid wildcard characters are the asterisk "*****" for zero or more characters, and the question mark "**?**" for single characters. The "*****" is not allowed within a word. The returned list can be used as a search for some or all of the returned author names, if so requested from the List Query Form.

The text synonym field in the List Query Form allows the user to find words that are synonyms of a given word or search terms that match a specified wildcard pattern. The same rules apply as for the author list query, except that the returned list cannot be used for a search.

2.7.3 Object List Query

Another list query is the Object List Query page . This page allows you to browse through object names in the ADS. It also has links to the Object List Query Form . This form allows you to query object aliases to SIMBAD and NED and for object name templates to the LPI and IAUC objects.

LPI Object Searching This allows the user to search the list of planetary object names that the Lunar and Planetary Institute has associated with bibliographic records in our abstracts database. Partial object names may be entered (one per line) or enter a string with a wildcard to get objects which contain that string (e.g. "*ste*").

IAU Object Searching This allows the user to search the list of planetary object names given to us by the IAU Central Bureau for Astronomical Telegrams . Object names may be entered (one per line) or enter a string with a wildcard to get objects which contain that string (e.g. "*ste*").

SIMBAD and NED Object Name Aliases This allows the user to search for aliases of an object, using the SIMBAD and/or NED databases. A search for an object (e.g. "m31") will return all aliases for that object. Note that wildcard searches are not available on these requests.

2.8 Searching the ADS by Email

The ADS system can be queried by Email and results returned via Email. This service provides the capability to retrieve WWW forms and execute WWW forms queries through e-mail. The address of this service is:

adsquery@cfa.harvard.edu

There are two ways to execute a query through this system:

1. Through the command interface described below

2. By sending an HTML query page to the email server

2.8.1 Command Interface

Commands to the e-mail service are sent in the message body of an e-mail message. The subject line is only used to build the subject line for the reply. The subject line thus allows you to distinguish results from multiple ADS Email search requests.

There are currently two commands available in this service:

1. **Help:** The word *help* in the message body returns the help message.

2. **action=<URL>:** This executes a query to the specified URL and returns the result in an e-mail message. Three more lines can qualify this query:

   (a) **method=<method>:** <method> is either *get* or *post*. This determines what kind of query will be executed. To retrieve a form for further queries, use the *get* method. To execute a forms query you need to know what type of query the server can handle. If you execute a forms query after retrieving the form through this service, the correct method line will already be in place. The default method is *get*.

   (b) **return=<return-type>:** <return-type> is either *text*, *form*, or *raw*. If text return is requested, only the text of the query result is returned, formatted as if viewed by a WWW browser. If form return is requested, the text of the result is returned as well as a template of the form that can again be executed with this service. If raw return is requested, the original document is returned without any processing. The default return is *form*.

   (c) **address=<e-mail-address>:** <e-mail-address> specifies to which e-mail address the result should be sent. This line is optional. If no address is specified, the result is sent to the address from where the request came.

Additional help will be returned with every form.

2.8.2 HTML Forms Interface

You can execute a query by sending an HTML form directly to the email query service. You can for instance compose the query that you want to execute with the regular query form. Save this filled-out form by clicking on **Return Query Form**. This will ask you where to save the query form. You can then email that form to adsquery@cfa.harvard.edu and have the query executed.

The default type of return is:

```
return=text
```

You can change the return type to *form* (a form for further execution through this services), or to *raw* (the raw HTML file of the result) by inserting an HTML comment in the form with the following syntax:

```
<!-- EMAIL_PARAM: return=form -->
```

or

```
<!-- EMAIL_PARAM: return=raw -->
```

The *raw* return is especially interesting if you have an HTML-aware email system, since it will display the HTML page with hyperlinks in the email reader.

2.8.3 Email Article Retrieval

Articles from the ADS Article Service can also retrieved via Email. This interface is described in the Article Service .

2.9 What's New Service

The ADS Abstract Service has the capability to search the database for recent entries. This service allows the user to conduct searches of the abstract database for all new abstracts which fulfill his or her favorite query. The service can be used through the WWW or through email, and can be automated to return all new entries within a specified period (such as the last month).

To use this service follow the following steps:

1. **Build the query**:

Use the WWW interface to build a query by repeatedly executing it until the desired result is returned. If you do not have WWW access, you can request the query form by sending email to adsquery@cfa.harvard.edu . *help* in the message body will provide some assistance. To get a query form, the message body should include:

```
action=http://adsabs.harvard.edu/abstract_service.html
method=get
return=form
```

This returns the form with hyperlinks surrounded by "@" signs. To follow a hyperlink, uncomment the appropriate one in the section which begins **Start of hyperlinks**. To submit the form, fill out the form in the section which begins with **Begin of Form 1** by filling in search criteria after the "=" signs.

2. **Save the query form**:

Request that the query form be returned for this query by selecting **Return Form** in the Build Query Form section below the send button. A negative number in the **Entry Date** day field determines how far back the query goes. For example, to get any entries in the last month, use *-31*.

3. **Use the form**:

This form can be used either through the WWW by opening it in the browser (or saving it in your hotlist) with the syntax:

```
file:/directory/filename
```

or it can be used to execute an e-mail query by typing:

```
mail adsquery@cfa.harvard.edu < /directory/filename
```

If you are on a Unix machine, you can set up a crontab file which will automatically send this email message at specified intervals. To enable this feature, edit your crontab file by issuing the command **crontab -e** and entering the following:

```
0 24 1 * * mail adsquery@cfa.harvard.edu < /directory/filename >/dev/nul:
```

where /directory/filename is the name of your saved query file.

This will execute the query on the first of every month and query back for 31 days (if the day field contains *-31*).

Chapter 3

Understanding the Results

3.1 Short Reference Display

The list of references returned from a query is displayed in a tabular format. The returned references are sorted by score first. For equal scores, the references are sorted by publication date with the latest publications displayed first.

A typical reference display contains the following (from left to right):

- The Bibliographic Code
- The Score from the search
- The Publication Date of the reference
- The List of Links as a series of letters.

Below the bibliographic code is the List of Authors for the reference. The complete Title is displayed below the score, date and list of links.

At the top of the Short Reference Display, the number of retrieved abstracts is displayed, along with the total number of references that were found for the query. The maximum number of references returned can be selected on the Main Query Page.

At the bottom of the Short Reference Display, there are more options (e.g. Formatting Options, Second Order Operators, and Get Next Set of References) that the user can use with the list of results, as well as the list of the query parameters. The available options are further explained in the following sections of the Help Pages.

3.1.1 Bibliographic Code

The Bibliographic Code (or *bibcode* for short) is a unique identifier for each reference in the ADS. Its structure is described in the section **bibliographic identifiers** . The bibcode has a hyperlink to the full abstract with a checkbox to its left allowing the user to select that reference.

3.1.2 Score

The Score is determined during the search according to how well each reference matches the query. The scoring is described in the section Weighted Scoring

3.1.3 Date

The Date is the publication date of the reference in the form **mm/yyyy**. If the publication month is unknown, it is displayed as 00.

3.1.4 List of Links

The list of Links is displayed as a series of letters, each standing for an option to access information related to the article. These links vary for each reference, since not all possible links are available for each reference. A roll-over display shows a box with the name of each link. The color of that box alerts the user if that particular link connects inside or outside of the ADS. Yellow links connect within the ADS, while pink links connect to outside resources.

Letters that are green mean that this article is "Open Access", meaning that there is no subscription necessary to access the full text through this link

IMPORTANT: Once outside the ADS, the user may be prompted for a username/password to access a particular document such as an electronic paper. Managing and granting access to resources outside the ADS is not under our control. Please see the section below for more information on access control.

The current list of links that may be available for particular bibliographic record are:

The list of "Also Read" papers is generated by extracting from our logs the list of users (cookies) that have read a particular record in the last 90 days and then collating the list of other papers that those users have also read. The list therefore offers a way for a user to find papers that are likely to be relevant to the original record.

Please note that the list of "Also Read" papers includes, for e-print records, readership statistics from both the ADS and the arXiv itself, which in some cases boosts the total number by a factor of 10 or so. The reason we add records from their logs is because this gives much better results when computing article co-readership lists.

3.1.5 Accessing External Links

This section describes how to access some on-line documents which are linked through the ADS, but maintained at other sites. Some documents linked through the ADS may require a username and password, in which case details on who to contact for more information is provided below. Many users working for a research institution may have access granted to these resources through their own library's servers, which will handle authentication on their behalf. Please see the help section on library links for more information.

American Astronomical Society Journals

HTML and PDF versions of articles appearing in the Astrophysical Journal , Astrophysical Journal Letters , and Astrophysical Journal Supplement Series since the beginning of 1997 are provided by the Institute of Physics Publishing (IOP) . HTML and PDF versions of the Astronomical Journal articles published since 1998 are available from the Institute of Physics Publishing (IOP) .

All versions of articles older than one year are freely accessible to the public, while the more recent content is only available to subscribers. If you are experiencing problems accessing this content, please contact custserv@iop.org for additional information and help.

Scanned versions of ApJ articles prior to 1997 and AJ articles prior to 1998 are freely available from the ADS, by following the "**G**" link to our online version.

Astronomy & Astrophysics

Starting in 2001, HTML and PDF versions of Astronomy & Astrophysics (A&A) articles are available from EDP Sciences .

All versions of articles older than one year are freely accessible to the public, while the more recent content is only available to subscribers. For more information, contact web@edpsciences.org

Scanned versions of A&A and A&AS articles prior to 2001 are freely available from the ADS, by following the "**G**" link to our online version.

Elsevier Journals

All journals listed on the URL above are currently indexed in the ADS holdings. Specific examples are: New Astronomy , Icarus , and Astronomy & Computing are available electronically from https://www.elsevier.com/physical-sciences/physics Elsevier Science B.V., Amsterdam and require subscriptions.

For more information on electronic access, please https://www.elsevier.com/books-and-journals/journal-pricing see Elsevier's journal pricing page.

Publications of the Astronomical Society of the Pacific

HTML and PDF versions of PASP articles since the beginning of 1998 are provided by the Institute of Physics Publishing (IOP) . All versions of articles older than one year are freely accessible to the public, while the more recent content is only available to subscribers. If you are experiencing problems accessing this content, please contact custserv@iop.org for additional information and help.

Scanned versions of PASP articles prior to 1998 are freely available from the ADS, by following the "**G**" link to our online version.

Monthly Notices of the Royal Astronomical Society

HTML and PDF versions of MNRAS articles from late 1998 are provided by Oxford University Press to institutional and individual subscribers of the MNRAS. Articles older than three years are freely accessible to the public. For more information and help please contact OUP's customer service .

Scanned versions of MNRAS which are more than two years old are freely available from the ADS, by following the "**G**" link to our online version.

SIMBAD

Links to the Simbad references are indicated by the presence of "**S**" links which when followed generate lists of objects available for free from the SIMBAD project at CDS. Hyperlinks available in these documents may take you to pages which are accessible only by SIMBAD users. For more information on getting a SIMBAD username, please check the SIMBAD user account information pages or contact question@simbad.u-strasbg.fr

NED

Links to the NED objects provided with the "**N**" links give object lists which are available for free from the NED project at Caltech. For more information, please contact ned@ipac.caltech.edu

3.1.6 Authors

Below the bibliographic code is the List of Authors for the reference. Generally these lists are complete. For some of the older references the lists were truncated at 5 or 10 authors, but every effort has been made to correct these abbreviated author lists. If you should find a reference whose author list is truncated, please use the Abstract Submission Form to help us correct the information.

3.1.7 Title

The complete Title is displayed below the score, date and list of links.

3.1.8 Results Formatting Options

These options are the first set of options below the Short Results Display. Each pull-down menu is a group of options for how to format the returned list, what you want to do with that list, and how to sort the list. This section allows the specification of a custom format according to our custom format specifications . Another option in this section is the capability to email the references in the selected format to an email address.

You can retrieve references that were selected with the checkbox next to the bibliographic code. In order to select all references in the list, click on the buttom "Select All Records".

Formatting Options

This pulldown menu allows the selection of the returned reference format. The following formats are available:

- HTML, for viewing on your browser (default).
- Plain text, for printing or saving to a file (PLAINTEXT).
- Tagged format, for use with database programs (PORTABLE).
- BibTeX, for use with the BibTeX package in LaTeX documents (BibTeX) (more information on this) .
- EndNote, for loading into EndNote (ENDNOTE).
- ProCite, for loading into ProCite (PROCITE).
- RefMan, for loading into RefMan (REFMAN).
- RefWorks, for loading into RefWorks (REFWORKS).
- Medlars, for loading into Medlars (MEDLARS).
- Dublin Core XML, for use with database programs (DUBLINCORE)
- XML Abstracts, for use with database programs (XML)
- XML References, for use with database programs (SHORT_XML)
- AASTeX, for use in LaTeX articles formatted with the AAS macro package (AASTeX).
- Icarus TeX, for use in LaTeX articles formatted with the Icarus macros (Icarus).
- MNRAS TeX, for use in LaTeX articles formatted with the MNRAS macros (MNRAS).
- HTML, for including links to the ADS abstracts in HTML pages (Link).
- Custom format , for creating your own customized output (Custom).

Destination

This pulldown menu allows to set the destination of the returned reference list. The following destinations are available:

- Display on Screen: This displays the selected reference list in the browser.
- Send to Printer: This directly prints the selected reference list.
- Save to File: This allows the user to specify a filename for local storage of the data

- Load into EndNote: This will directly start EndNote and load the data into EndNote.
- Load into ProCite: This will directly start ProCite and load the data into ProCite.
- Load into RefMan: This will directly start RefMan and load the data into RefMan.
- Load into RefWorks: This will bring up a form that allows uploading the data into RefWorks.
- Load into Medlars: This allows you to load the data into Medlars.

Sort Options

This pulldown menu allows to select different sort options. The available options are:

- Sort by citation count: This sorts by how many times an article is cited.
- Sort by normalized citation count: This sorts by how many times an article is cited, normalized to the number of authors for that article.
- Sort by inverse author count: This sorts the inverse number of authors for that article.
- Sort by first author name
- Sort by date (most recent first): This sorts by publication date.
- Sort by date (oldest first): This sorts by publication date.
- Sort by entry date: This sorts by the date at which a reference was entered in the database.

3.1.9 Adding Articles to Private Library

The buttons named **Add Selected Articles to Private Library** and **Remove selected articles from Private Library** can be used to save a list of records in the user's Private library

3.1.10 Second Order Operators

The section found at the bottom of a list of results is named **Find papers related to the above articles**. The options in this section allow you to find articles that are related to selected articles from the current list, according to the criteria specified below. In order to select all articles in the list, click on the button "Select All Records".

The first selection, **Find papers similar to selected articles** uses the selected items from the references in the current list and executes a query with these items. This ranks the database against the records used for the feedback and sorts it according to how relevant each reference is to the search record.

The second selection, **Get Query Form for selected articles** returns a query form that searches the list of current records instead of searching the whole database. This option uses all records in the list, regardless of selection.

The third selection, **Get reference lists for selected articles** retrieves the reference lists in all the selected articles and returns it, sorted according to how often each article was referenced.

The fourth selection, **Get citation lists for selected articles** retrieves the articles that cited any of the selected articles and returns them sorted according to how many articles each reference cited.

The fifth selection, **Get refereed citation lists for selected articles** is like the above selection except that non-refereed articles are removed from the results.

The sixth selection, **Get also-read lists for selected articles** retrieves the articles that were also read by the readers of the selected articles in the current list, sorted by how many readers read the articles.

The seventh selection, **Get form to query selected articles only** returns a query form that can be used to further select results from the list of articles selected by specifying additional search options. This allows additional refinement of the results displayed.

The last selection, **Get Author-Affiliation form for selected articles** returns a list of authors and affiliations found in the selected papers which can be further manipulated and then saved to a comma-separated or spreadsheet table. This provides a useful way for users to create lists of collaborators and their affiliations which is useful for submitting proposals.

As an option, users can opt to exclude self-citations when requesting citations from a list of selected papers. Two types of self-citation removal are supported: **Exclude self-citations from list** will return the list of all papers citing the selected list but exclude papers from the list itself. If the original query included an author search component then a second self-citation removal option will be available: **Exclude self-citations from author in query** will return the list of all papers citing the selected list but exclude all papers for which the original authors are contributors.

3.1.11 RSS Feeds

The bottom of the page displaying search results contains an icon next to link named *Get RSS feed for this query.* Following this link returns a document that, when used with a proper reader, allows you to receive updates when new results from the given query become available. The RSS protocol, described fully in this wikipedia entry , is typically used by news sites to broadcast the latest news as they break. While the ADS displays an RSS feed link at the bottom of any search result page, it only makes sense to use this link when the

results of the input query are expected to change rapidly. For instance, a query on the preprint database for the word *galaxy* in the abstract is likely to generate new results daily, while a query for the papers published by Edwin Hubble is not. Therefore, while it makes sense to set up an RSS reader to monitor the feed for the first query, it does not make sense to do so in the latter case.

In order to take advantage of this capability you need to have an RSS capable reader (a.k.a news aggregator), for instance Google reader .

3.2 Full Record (Abstract Display)

In addition to the information in the short reference list, the individual Full Record for a reference can be seen by clicking on the Bibliographic Code itself or on the **A**-link.

The full record includes, where available, the publication information, author affiliations, language, objects, keywords, abstract category, comments, origin of the reference, copyright notices, and the full abstract. It also includes all the links described previously , located at the top of the page.

Most records will also include a link to the readership history for the particular paper, which displays a histogram of the times the corresponding paper has been read according to our user logs. This "ADS read" count corresponds to the number of times a user has viewed the article on our website (after removing duplicate view by the same user and accesses generated by web robots).

For abstracts that are displayed as a result of a search, the system will highlight all search terms that are present in the returned abstract. This makes it easy to locate the relevant parts in an abstract. Since the highlighting is somewhat resource intensive, it can be turned off in the user Preference Settings
.

For convenience, the returned abstract contains links that allow the user to directly retrieve the BibTeX or the custom formatted version of the abstract.

If the article for the current reference has been scanned and is available through the ADS Article Service (see below), printing options are available in the abstract display as well. These printing options allow the printing of the article without having to retrieve the article in the viewer first.

3.2.1 Find Similar Abstracts

The Full Abstract display includes a form located at the bottom of the page which is named **Find Similar Abstracts**. The form provides the capability to use selected information from the reference being displayed in order to execute a new abstract service query. This technique is known as *query feedback*, and makes in-depth literature searches simple to perform. It is one of the features that distinguishes the ADS system from most other search systems. A query feedback ranks the database against the record used for the feedback and sorts the results according to how relevant each reference is to the input record.

In the form the user can select which parts of the reference to use for the feedback query (for instance authors, title, or abstract). The feedback query can be executed directly by selecting **Query Results** as what is to be returned. This will display the Short Reference List of all matching bibliographic records. The other option is to return a **Query Form**, filled in with the selected parts of the current reference. This feedback query form can then be further modified before executing it, for instance to change the publication date range or limit the search to specific journals.

The query feedback can be done across databases by selecting one or more of the databases in the Database section of the form. For instance a reference from the Astronomy database can be used as query feedback in the preprint database to see the latest work in press which is related to the current article.

3.3 References and Citations Completeness

Reference and citation lists in the ADS are not complete. There are several sources of incompleteness of citation lists:

- The ADS doesn't have the cited article in the database. This happens for instance for most papers appearing in mathematics, chemistry, and geophysics journals.
- Our reference resolver program couldn't interpret the reference. This may be due to errors or incompleteness in the reference, unusual formatting of it, or simply limitations in our program's abilities.
- We do not have the reference list for the citing paper. This happens for older articles and for articles in journals and conference proceedings that do not supply us with reference lists.

We are constantly adding to our references by extracting reference lists from scanned articles, trying to improve reference recognition capabilities, and adding new records to our databases, so this work is an ongoing effort which will cause reference and citation lists to change over time.

We currently get reference lists from the journals published by APS, IoP, Springer, Elsevier, and Nature as well as A&A, and MNRAS. The APS and IoP reference lists go back to volume 1 for their journals, while coverage for other journals is not complete.

Another additional source of citation information is the metadata feed that we receive from CrossRef as of 2008.

If you would like to submit missing citations, we do accept user-submitted citations, but ask that you follow the instructions given in our FAQ: http://doc.adsabs.harvard.edu/abs_doc/f

3.4 References and Citations From ArXiv Preprints

As of March 2005, references the from arXiv preprints are integrated in the ADS. When we retrieve the metadata for the nightly update of arXiv preprints, we

also process the source data to retrieve the references contained in it, either from the (La)TeX source or the PDF version of the preprints. Next, the retrieved references are parsed to resolve them into a match with an existing record in the ADS. This may not succeed for various reasons. Since there is no unformity in how the reference sections are formatted and since the coverage of journal articles outside of Astronomy and Physics in ADS is incomplete, there is always the possibility that a preprint reference section is partially or completely missing. But assuming the procedure is successfull, references found in the fulltext of a preprint are extraced, parsed, and identified as a list of ADS records.

An obvious concern is whether references now contribute twice to the ADS citation lists after the associated journal article gets added to the ADS. This should not be the case, since we perform extensive matching between the preprints and published articles in order to identify them as unique records. All preprints for which we find a matching journal article with associated references will not contribute to the citation count. Whenever a (journal) article is published for which we have the preprint in our system, we will replace the preprint references with the references from the paper, if they are available. If they are not, we continue to use the references from the preprint but attribute them to the published paper.

This should minimize instances of double counting of citations. However, in the case that we can not find the match accurately, we would appreciate feedback from users informing us of the match so that we can eliminate any double counting. The best way to do this is to properly update the published information for the preprint in question in the arXiv database. The ADS will then automatically be notified of the change with our daily update from them.

We have given this a lot of thought and these are the main reasons why we decided to go ahead with this addition:

- The arXiv preprints have been an integral part of the ADS for quite some time now. Besides indexing the astracts, author and title information, we now also attempt to extract the references from the preprints and resolve them. This way, the preprints will participate fully in the ADS's reference/citation system.
- For the ADS, the links between articles are the primary purpose of the reference/citation system. The actual citation count, while interesting, is a fully secondary by-product of the primary goal, which is to allow scientists to easily find and access those articles that will aid their research.
- With about 75% of all refereed astronomy papers appearing first in the arXiv, and well over 90% of the highly cited ones (99 out of the top 100 2003 ApJ papers were preprinted, according to our recent study), the preprints have become an integral part of astronomy (and physics) research.

- The use of the preprints has a major, positive effect on research. The effective latency between publication and citation has shortened by about six months, without taking the citations to the preprints themselves into account. This has the effect of increasing the rate of discovery; we believe we have an obligation to support this change. For more information on this subject, please see http://adsabs.harvard.edu/abs/2005IPM....41.1395K our own study on the effect of use and access on citations.

Abbrev.	**Link Type**	**Explanation**
A	Abstract	Full abstract of the article. (These abstracts come from different sources)
C	Citations	A list of articles that cite the current article. (This list is not necessarily complete)
D	On-line Data	Links to on-line data at other data centers.
E	Electronic Article	Links to the on-line version of the article. These on-line versions are in HTML format for viewing on-screen, **not** for printing.
F	Printable Article	Links to on-line articles in PDF or Postscript format for printing.
G	Gif Images	Links to the images of scanned articles in the ADS Article Service.
H	HEP/Spires Information	Links to on-line articles at the HEP/Spires database.
I	Author Comments	Links to author supplied additional information (e.g. corrections, additional references, links to data, etc.)
L	Library Entries	Links to entries in the Library of Congress and other on-line library system.
M	Multimedia	Links to on-line presentations related to bibliographic record.
N	NED Objects	Access to the lists of objects for the current article in the NED database.
O	Associated Articles	A list of articles that are associated with the current article. These can be errata or other articles in a series.
P	Planetary Data System	Links to datasets at the Planetary Data System.
R	References	A list of articles referred to in the current article. For older articles these lists are not necessarily complete, they contain only references to articles that are in the ADS database. For some articles that are on-line in electronic form, the "**R**" link points to the on-line reference list, and therefore the complete list of references in that article.
S	SIMBAD Objects	Access to the lists of objects for the current article in the SIMBAD database.
T	Table of Contents	Links to the list of all articles in a books or proceedings volume.
U	Also Read	Links to the list of articles also read by users who have read this article.
X	arXiv e-print	Links to on-line articles in the arXiv database.
Z	Abstract	If you have specified a custom format for abstracts, this link will retrieve abstracts in your custom format

Chapter 4

User Accounts and Preferences

The ADS provides a login system that enables a user to create a unique account based on the user's email address. This allows users to access their account from any computer, retrieve and modify preferences, saved lists, and query settings. If you have in the past entered your email address when accessing ADS, this login environment was created for you, and is available for you to use immediately. If not, you can create it by clicking on the "Sign in" button found on the upper right corner of our home page. Once signed in, a user has access to his or her account settings, User Preferences, Library Link settings, Private Libraries, and myADS.

The user account and preference system make use of browser cookies, so in order to take advantage of it you must ensure that cookies are enabled in your browser. (Mozilla Firefox users can verify their settings by selecting "Edit" -> "Preferences" -> "Privacy" from the top menu bar.) User Logins and reference settings are not shared between ADS mirror sites. You will have to establish your settings separately if you intend to use any of our mirror sites.

The ADS preference setting system allows us to store user-selected preferences on our servers and then look them up automatically when you come back to visit our site. This allows you to conveniently customize settings that are appropriate for your personal interests and computer setup. For instance, you can select how full-text articles should be formatted and sent back to you, or what journals you want to monitor for their latest table of contents.

4.1 Changing Your Preferences

You can review or change your preference settings, by going to the ADS preference settings page . There are two forms for preference settings. The first form sets preferences for the abstract service, the second form sets preferences for the article service. Some of the settings may be in both forms as they pertain to both services. You

can set them differently for the different services if you wish.

You can change the preferences by simply modifying the settings displayed in the forms, and then click on **Save Settings**. In order for the new settings to take effect, please remember to **Reload** any pages that make use of the these settings once the preferences have been modified.

4.2 Abstract Service Preferences

This form can be used to customize settings which affect the ADS Abstract Service .

4.2.1 General Preferences

The top section of the preference setting form deals with some general settings for the Abstract Service:

Name if you enter your name in this field, it will be displayed at the top of the Abstract search forms .

Select Database(s) check the list of databases that you want to query by default.

Use tables this setting controls whether HTML tables are to be used when formatting results or whether preformatted text should be used instead. Preformatted text transfers much faster than tables, but it does not provide all the Retrieval Options .

Use multiple windows check *Yes* to have full bibliographic records displayed in a separate window.

Preferred article format when following a link to a full-text article available from a third party, you can specify whether you prefer to retrieve the article as a PDF or PostScript file (when the option is available)

Preferred language when viewing full bibliographic records in the ADS, this is the language that the document will be translated to when you follow the link **Translate Abstract**

4.2.2 Specifying A Proxy Server

Users working at institutes which provide access to external databases and publishers via URL-rewriting proxy services can specify the URL of the proxied ADS abstract service in their preferences so that all links that they follow to resources outside of the ADS website will be properly proxied. In order for this to work you have to know your library or IT department must have set up a proxied host for the main ADS server name (or the equivalent mirror site) . If this is the case, specify the corresponding URL in the proxy server field and all your queries outside of the ADS will be properly handled by it. A similar approach can be accomplished through the use of a Library Link server .

4.2.3 Selecting Mirror Sites

Records in the ADS databases link to millions of related datasets available from several providers. In some cases, the providers may make these datasets available from different sites. The ADS provides users with the option to select which mirror site should be used when linking to a resource available from several sites. In order to do this, simply use the proper pull-down menus to select the appropriate site. For faster service, we recommend you select a mirror site that is closest in location.

4.2.4 Selecting the Look of Returned Pages

This section allows users to change the default colors in the generated pages which are used for background, foreground, text, links, and highlighting. You can also choose to modify the default font size. A Color Table can help you in selecting color values for these preferences.

4.2.5 Reference Formatting

The reference formatting capability allows the user to specify a format in which a bibliographic reference is returned. Users can either select one of the predefined formats that we provide, or create their own. The predefined formats are:

- AASTeX – Used to prepare papers for all AAS journals
- Icarus – Used to prepare papers to be submitted to Icarus
- MNRAS – Used to prepare papers for Monthly Notices of the Royal Astronomical Society
- Link – used to create hyperlinks to be included in HTML documents

If you desire to specify your own format for bibliographic references, you may do so by selecting the **Custom format** entry and entering the proper format. The format is described in the section ADS Custom Format .

4.2.6 Customizing the Table of Contents Page

The Customized Table of Contents Query Page provides access to the latest volumes of selected journals. The page shows only the journals for which the user has not yet read the latest volume.

The user can select which journals should be included on this form from the bottom of the Preference Settings Form . The user can specify the ones to be listed or excluded on the ToC Page by checking or unchecking the box associated with the corresponding journal abbreviation.

4.3 Printing/Article Service Preferences

The ADS Preference Settings Form allows the user to customize certain settings used in the selection of the output format and resolution when viewing and printing full-text articles **which are available from the ADS Article Service.** Please note that the ADS also links to the full-text of articles available from third parties such as journal publishers or research institutions. The article preference settings discussed in this section do not apply to full-text articles in this category.

The customizable options are:

Article display by default, article pages are displayed one at a time in your browser (**Single Page** mode); check the **Thumbnails** button if you wish to view the article as a collection of thumbnail images instead.

Display quality the number of bits used to represent each pixel in the image. The higher the number, the more readable the scanned page will be (but the longer it will take to load in your browser).

Thumbnail quality same as Display quality above, but for thumbnails.

Display resolution the number of dots per inch to be displayed on your monitor. The higher the number, the larger the page will look on your screen (but the longer it will take to load in your browser).

Article return through users may choose to download full-text articles either through their web browser (which is the most straightforward and immediate delivery method), or by having the document e-mailed to them.

Return article as selection of what document format should be used to retrieve the article or page; for detailed information please see the Article service printing page .

Page size specifies what media the article will be printed on, allowing proper formatting of the full-text pages.

Article destination selection of what the destination of the article should be.

Compress for transfer enables compression of the article to minimize the document size during transfer; two compressions are supported: GNU gzip and UNIX compress.

Duplex printing if enabled, postscript printers capable of printing both front and back of pages will do so.

Propagate Preferences Propagate the settings for these preferences from this site to the main ADS article mirror when forwarding requests that cannot be fulfilled on the current site and need to be forwarded to the main ADS mirror (this only matters if a partial mirror site is in use). If you do not set this preference, you can select different default resolutions on the different mirror sites, depending on well you are connected with the different mirror sites.

Dexter Java version Select the appropriate Java AWT library for your platform to be used by the Dexter data extraction applet .

Name you may choose to optionally enter your name if you are interested in being on our mailing list (see **Email Address**).

Email address if you use email as a delivery method for receiving full-text articles or if you wish to be on our mailing list, please complete this field. If you do **not** wish to be on our mailing list, make sure to check the button **Do not use for announcements**.

Split Email in pages check *Yes* if you want each article page to be emailed as a separate document, rather than bundled in the article.

Maximum Email size enter the maximum file size to be e-mailed to you; if the document to be sent is larger, it will be split in multiple e-mail messages. This avoids problems with some mailer systems that enforce maximum sizes for messages being sent or received.

The bottom part of the article preference page contains settings allowing users to change the default colors in the generated browser pages used for background, foreground, text, links, and highlighting. You can also choose to modify the default font size.

4.4 Library Links Settings

Users who have access to electronic resources through their library subscriptions can configure their ADS preferences so that the appropriate links to the fulltext will be provided when viewing a record in the ADS. If your library provides online linking services, all you have to do is tell the ADS what library you are a member of by going to the your account page and clicking on "Library Links settings." The ADS does its best in trying to find the most appropriate library link server available to you automatically, but in general it is up to you to review the settings and make any modifications as necessary. If you need to modify your settings, you should first see if your institute's library is listed in the pull-down menu at the bottom of the form. If you find an entry for your institute, select it and click on the "Save" button. If not, and if you know what your library's OpenURL server is, you can fill the information in the appropriate input fields, or (even better!) you can ask the person responsible for the electronic resources at your library to provide the relevant information to the ADS so we can include it in our system (see below for more information on this).

Once you have saved your Library server information, you can go back and search the ADS as usual. Whenever viewing a record for a paper which has

fulltext available online, you will notice that a new link with your library's icon on it will appear. Following the link will take you to your library's link resolver, which will give you a list of options available to you for obtaining the fulltext. Please note that the availability of a library link in the ADS does not necessarily mean that the fulltext paper will be available to you, as this determination is done by your library link server. In general, however, the library server will have the most relevant and complete information about a document's availability to you as a patron.

4.4.1 Library Link Server Detection and Customization

This section provides some background and technical details about the implementation of the library links in the ADS, and may be of interest to librarians and other information providers. The creation of Library Links in the ADS makes use of the OpenURL standard. OpenURL is a technology designed to support mediated linking from information resources providers to fulltext content via library services. By knowing a user's particular OpenURL settings, an information provider (in this case the ADS) can create well-defined links to the user's OpenURL server, which then in turn directs the user to the fulltext contents that his or her library subscribes to. More information on OpenURL is available on Wikipedia . The ADS supports both the OpenURL 0.1 and 1.0 specifications.

Users are encouraged to take advantage of this technology by customizing their preferences to let the ADS know that they have access to an OpenURL server so that the appropriate links can be created to the user's OpenURL resolver. OpenURL parameters can be specified using the ADS's Library Links settings page . After a user specifies his or her server in this page, the ADS will remember them during future interactions with our system (as long as cookies are enabled in the user's browser).

We realize that individual users may not know what the correct server settings for their OpenURL server may be. Therefore the ADS maintains a list of library OpenURL servers that users can select from in the Library Links settings page , once they have created an account and have logged into the system. If you are a librarian and would like to have your institute's OpenURL server listed in the ADS's menu, please send us the location of the OpenURL server, icon, and the text to be displayed in the menu and we will add it to our settings. This will allow your users to easily customize their setup to use your library's links server. This setting becomes tied to the user's account, so that every time they log into ADS using their account credentials, we will enable links to the fulltext through the user's library link server. Please note that we do not maintain a list of IP addresses for your institution.

For more information on this or to submit your OpenURL server settings, please send email to ads@cfa.harvard.edu

Chapter 5

Scanned Literature

This service provides access to the scanned images of astronomical publications. Thanks to several agreements between the ADS and the copyright holders of astronomical journals, we have received permission to digitize most of the past astronomical literature and make it available on-line free of charge. We currently have more than 3.7 million scanned pages available.

Please note that all abstracts and articles in the ADS are copyrighted by the publisher, and their use is free for personal use only. For more information, please read our page detailing the Terms and Conditions regulating the use of our resources.

5.1 Full-text Data Holdings

The ADS article service provides access to the full-text of over 500,000 scientific papers published in astronomical journals, conference proceedings, newsletters, bulletins and books, for a total of over 3.7 million pages. All these pages have been scanned as bitonal images at the optical resolution of 600 dots per inch (dpi) and are stored as compressed TIFF images at two different resolutions (200dpi and 600dpi). All the different output formats supported by the article service software are created on demand (and optionally cached on disk) from the original TIFF images by a number of format translator programs.

We are continuously adding new full-text scans and correcting problems or coverage gaps with existing online publications. To have an accurate idea of the current data holdings, please see the following pages:

- Article Service Page
- Online Books Page
- Historical Literature Page

As we attempt to complete our coverage of full text for all astronomical journals, we are looking for donations of some missing titles . If you can help, please let us know.

Please note that most of the recent journal articles are available electronically from their publishers, and therefore have **not** been scanned by the ADS. In this case, the ADS will still have a bibliographic record corresponding to the paper and will have a link to the electronic version available from the publisher. However, access to the full-text is controlled by the publisher, which usually requires a current subscription. More information on this is available in the Access Control help page .

5.2 Browsing Full-text Articles

The most common access to the scanned articles is from the ADS Abstract Service results page via the "G" or "F" links. The "G" link displays a document containing images of the scanned article pages, while the "F" link returns a Postscript or PDF file containing the entire article. Links to images of the scanned pages or to the full-text article in Postscript or PDF format are also available from the page displaying the full bibliographic information for a record in the ADS abstract system.

The scanned pages and articles can also be accessed directly through the Article Service by volume and page at:

- http://adsabs.harvard.edu/article_service.html

The forms listed in this page allow users to specify a volume and page to be displayed in the browser. If a volume but no page number is entered, the entire table of contents for the volume in question is returned instead.

The default viewing mode for scanned pages displays a screen divided in three panes, with the requested page occupying the main one. On top of the scanned page, a separate pane displays the basic bibliographic information for the article, with a link named "Other article options" that takes the user to a simpler page-by-page view of the article (called "classic" view mode) which contains additional viewing options, including the capability to extract data from the image using Dexter . Also available in the top pane are links to retrieve a fulltext document for the article and to see its full bibliographic record in the ADS. If the page to be displayed is part of an article (as most are), thumbails of the other pages within the article are displayed in the left navigation bar. Clicking on a thumbnail will display the corresponding image at full resolution.

In the "classic" view mode, additional pages within the article or section can be viewed by using the navigation links, forward/back, located on the top of the Article Page or the links to any individual page of the article listed below the scan. As an alternative to this single-page browsing mode, users may choose to view the set of low-resolution images for all pages composing the article by selecting the "Thumbnails" link at the top of the Article Page. When viewing thumbnails, a high-resolution image of each page can be displayed by clicking on the corresponding thumbnail.

Other options available from this screen include the ability to retrieve the full bibliographic record and abstract for the article being viewed and in some cases the ability to retrieve a particular plate number. If the article being viewed appeared in a publication that printed the plates at the end of a volume and the plates have not been assigned to the article they belong to, then an option to display a given plate number will be available. The plate number discussed here refers to the sequential number assigned to a plate within a journal volume, and is typically referred to in the full text of the paper. Users must read the article to decide if there is a plate associated with a given paper, and can then use this option to retrieve the plate itself.

The **Print** button listed at the bottom of the screen should be used to retrieve a copy of the full-text article (or page) suitable for printing. The format and resolution of the document created for printing are controlled by each user's Default Settings, which can be set via the Article Service Preference Settings . **You should never use your browser's *Print* button to create a hardcopy of the page currently viewed** as it will produce poor quality output. Please see the Document Formats section for more information.

5.3 Retrieving Full-text Articles

Documents are available from the ADS article server in different formats and at different resolutions to accomodate our users' needs. The high resolution documents (600 dpi) are considerably slower to print than the low resolution versions (200 dpi), but will give superior results, especially on plots and plates. In addition, the high resolution files are larger than the corresponding low resolution ones, and some display programs or printers may not have a large enough spooling area or physical memory to handle them. In order to decide which version of the article you should select for viewing and printing, you need to take into account the capabilities of your system and the network bandwidth available to you.

The Printing Options are located at the bottom of the scanned article page. If your browser works with HTTP persistent cookies, a single printing option will be displayed, with a selection to print either the whole paper or individual pages. Clicking on this print button will return the article in the format that the user has specified in the article service user preferences . If the browser does not handle cookies, several of the more commonly used print options are made available here.

All possible printing options can be accessed through the next link called "More Article Retrieval Options" (see for example this link). This page allows the user to select among all available document formats and retrieval options.

5.3.1 Document Formats

The two most popular formats available for downloading full-text articles from the ADS are:

- **Postscript:** Postscript level 2 files can be printed on any modern postscript printer, or displayed by a postscript viewer such as Ghostview or GSview . For compatibility with older printers, there is also an option to retrieve a low-resolution version of the document in Postscript Level 1 format, but please avoid this format if at all possible, since these files are very large and often require large resources of printer memory and spooling space to successfully print.

  The PostScript page description language was also developed by Adobe Systems , and can be considered a precursor to PDF in many respects. The advantage that Postscript files have over PDF is that most department-size printers today are capable of printing postscript files quite efficiently, so there is no need for an external viewer or printer drivers when hardcopy output is desired. These files should successfully print on any of the modern printers supporting the Adobe PostScript level 2 language features, but some problems have been observed with print engines that don't use the Adobe PostScript interpreter. Postscript level 2 supports the same compression schemes that are used in PDF files, but since it requires ASCII rather than binary encoding of the image data, these files are approximately 20% bigger than their corresponding PDF files.

- **PDF** (Portable Document Format): PDF can be viewed using freely available applications such as Adobe Acrobat Reader , GSview , or Ghostview . The document can then be printed using the "Print" menu from any of the above applications. Because of the advanced compression schemes and binary support built into PDF, documents in this format will yield the highest compression.

Please note: if you use Adobe Acrobat Reader on a UNIX machine to view your PDF files and your printer supports PostScript level 2 (most modern printers do), then you should make sure that you select the following Postscript options in Acrobat's printing menu (which pops up when you click on the "Print" button):

- Download Fonts Once
- Use Printer's Halftone Screen
- Level 2 only

When in doubt about Postscript level 2 support for your printer, please ask your system administrator or just try and print to see if the file makes it through the printer. Enabling this feature when printing ADS articles can reduce the file size by an order of magnitude or more.

Two other formats for full-text documents are currently available, although we strongly reccommend avoiding them if at all possible:

- **PCL** (Printer Control Language): This printer language is used by printers such as HP deskjets and compatibles. Printing documents in this format may actually be difficult since you need to make sure that the entire document is sent to the printer device as a binary file, bypassing any formatting that the driver may want to perform. Also, the maximum resolution provided for PCL files is 300dpi, so you won't get the same sharpness that you would get from printing a high-resolution Postscript or PDF file.
- **TIFF** (Tagged Image File Format): The original TIFF images can be retrieved for local processing or display. This format may be appropriate to further process a scanned page image in order to extract sub-images or to perform Optical Character Recognition (OCR) on it. Please note that only single-page TIFF documents are returned by our system.

5.3.2 Retrieval Options

The retrieval options described below are available from both the article service preferences and from the "More Article Retrieval Options" page found at the bottom of a scanned page. The first set of options control the destination of the full text document. The possible choices are:

- **Send data to viewer:** the full-text article will be sent back directly to the browser which will delegate the display to the appropriate program. For instance, a PDF file will be handed off to the PDF viewer available on the local system (usually Acrobat Reader).
- **Send data direct to printer:** the full-text article will be sent back with a signature indicating that it is destined for printing (see section below "Automatic Printing of Articles " for more information). If the browser has been configured to properly handle this media type, the article will be sent directly to the printer, otherwise the user will be prompted for what should be done with the document.
- **Save file on local disk:** the browser will prompt the user for a filename to save the document to.

Other retrieval options are:

- **Email:** articles can be retrieved through email instead of through a WWW browser. If this option is selected, the document will be sent to the specified email address as a MIME (Multipurpose Internet Mail Extension) document. MIME-aware email systems should be able to send the retrieved images directly to the printer, to a file, or to a viewer, depending on what destination option was selected by the user.

- **Compression:** for most of the retrieval options, the data can optionally be compressed before they are sent to the user. Unix compress and GNU gzip are the supported compression algorithms.

Please **note** that the high resolution version of an article may be considerably slower to print than the low resolution version but will give superior results, especially on plots and plates. In additon, the high resolution files are larger than the corresponding low resolution pages, and some printers may not have a large enough spooling area or physical memory required during the printing process.

5.3.3 Advanced Features

If you find yourself retrieving, viewing and printing full-text documents from the ADS all the time, you may consider setting up your browser so that downloading an article and saving it to disk or printing it take place automatically and efficiently.

Enabling Document Compression

To make efficient use of disk space and network bandwidth, we give our users the option to retrieve articles in a compressed format. The two compression schemes supported are UNIX compress and the superior GNU gzip format . Well-behaved browsers will recognize the compressed data stream (without confusing it with the content-type of the data being transmitted) and will uncompress it before launching the appropriate helper application.

Unfortunately, many MS-Windows based Web browsers (including Netscape Navigator 3.x and Microsoft Explorer 3.x) ignore the compression information when retrieving these files, requiring the user to uncompress the files by hand before launching a viewer or printing them. Recent versions of both browsers are rumored to have fixed this problem. In case you are still plagued by this problem, you may want to consider installing GSview as your Postscript and PDF viewer.

Please note that all the full-text documents retrieved from our site are already internally compressed, so further compression of the data with an application such as *gzip* usually only yields a marginal decrease in file size. For PDF and Postscript level 2 files we typically see an reduction in size of 5-6%.

Automatic Printing of Articles

In order to automatically print a full-text document you will need to make sure that the article destination specified in article service preferences is set to "Send data direct to printer" (or that you select that option by hand when using the "More Article Retrieval Options" form).

Next you should configure your browser to map the MIME type of the data returned by our server to the local printing program on your system. This sounds more complicated than it really is: most browsers (including Netscape Navigator and MicroSoft Internet Explorer) provide menus that allow the user to define the application to be run for each given MIME type. For Netscape 4.x, the menu is available under "Edit" -> "Preferences" -> "Navigator" -> "Applications." Once you have found the proper menu for your browser you can create (or modify) the following entry for the MIME content type *application/remote-printing:*

```
Description:    Remote Printing
MIME Type:      application/remote-printing
File extension: .prn
Application:    (select "Save to File" or enter OS-specific application)
```

Selecting the *Save to file* option in the menu above will cause all article documents dowloaded from our site to be saved to disk first. You can then view them or print them using the appropriate program depending on the document format as explained in the section "Document Formats" above. Alternatively, you may choose to have a helper application execute automatically when a document of this MIME type is downloaded. In this case, you should select *Application* from the above menu and then fill in the proper command depending on the computer platform you are using. This command typically is a procedure that feeds the data downloaded from our server to your local printing command, and in general depends on the operating system of your computer. Some examples of popular operating systems and relative printing applications are:

- System V-based UNIX systems (e.g. Solaris):

  ```
  lp -c %s
  ```

- BSD-based UNIX (e.g. Linux):

  ```
  lpr %s
  ```

- Microsoft Windows (9x, 2K, NT): download and install one of the shareware printing packages gsprint or prfile and then use this entry in as your helper application:

  ```
  gsprint %s    (or prfile32 %s)
  ```

```
\hypertarget{print_trouble}{}
```


5.3.4 Troubleshooting

If you are having trouble printing articles, please make sure you have checked the following:

- If you have downloaded an article into a file and can't decipher what kind of data is contained in it, it is probably a gzipped postscript or PDF file, but gunzip or winzip won't uncompress it unless the file name extension is *.gz*. Try renaming the file to *whatever.gz*, then uncompress it, and then view/print the resulting file.
- If Acrobat Reader complains about a PDF file being corrupted, it may be that the file did not download completely because of lack of local disk space or a timeout from the server. In the first case, please check and make sure you do have enough local disk space to handle full-text articles. In the second case, please attempt to download smaller documents by selecting only a small range of pages at a time for download.
- If you have just changed your article preference settings but your changes don't seem to have had any effect on the full-text articles, you probably need to force a reload of the pages in the web browser in order for it to pick up the new settings. This can be done by clicking on SHIFT + "Reload*(Netscape) or "Refresh* (Internet Explorer).

You may also want to read our Frequently Asked Questions .

5.4 Dexter

Dexter is a tool to extract data from figures on scanned pages from our article service. In order to use it, you need a browser that can execute Java Applets and has that feature enabled. Firefox users can verify this by selecting "Edit" -> "Preferences" -> "Content" from the top-bar menu and making sure that the button "Enable Java" is checked.

Dexter can be quite useful in generating data points from published figures containing images, plots, graphs, and histograms, whenever the original datasets used by the authors to produce figures in the papers are not available electronically.

5.4.1 Basic Usage

In order to run Dexter on a scanned page you need to be viewing the corresponding article in the "classic" view mode, rather than the standard view in which the screen is split in three panels with the thumbnails on the right and the bibliographic information for the article at the top. To view a page in the "classic" mode, simply scroll to the bottom of the top pane containing the article's bibliographic information, and select "Other article options."

In order to run Dexter on the full-text image currently displayed in your browser, click on the link named "Start DEXTER java applet" towards the bottom of the page. The Dexter Figure Selection Page will appear. Please wait until the image is entirely downloaded.

To select the figure to be further processed, click on one corner of the figure, hold the mouse button and adjust the rubber band to encompass the entire area of interest. If the figure is larger than the applet area, the visible portion of the page will scroll and follow your mouse pointer. Release the mouse button after you have boxed the selected figure and the Data Extraction Window will automatically pop up, with the selected figure displayed inside. Again, you should wait until the image is fully downloaded, at which point the window will resize to show as much of the image as is possible on your screen. If you make an error during the figure selection and the wrong image area is displayed instead, just close the window and start over.

Once the Dexter Extraction window is displayed and the selected image area is completely loaded in it, you are ready to set the figure axis, scale, and start marking data points using the following steps:

1. **Set the horizontal axis**: click-and-drag a gauge along the horizontal axis; a red line will be drawn. If you need to extend or modify the line click on either one of its ends and drag again.

2. **Set the vertical axis**: click-and-drag a gauge along the vertical axis; a blue line will be drawn. If you need to extend or modify the line click on either one of its ends and drag again.

3. **Set the scale**: fill in the boxes marked **'x0'**, **'x1'** and **'y0'**, **'y1'** (located along their respective axis) with the lower and upper values marked by the horizontal and vertical gauges. If the plot has logarithmic axes, make sure to check the "log" check button. Note that you should **not** check this button if the logarithm of a quantity is plotted on a linear scale.

4. **Mark data points**: left click on the points in the diagram to mark the location of a data point. A green cross will appear in the current mouse location. To *remove* a point move the cursor on top of it and shift-click or use the middle mouse button.

Note: as an alternative to manually marking the gauges, marking data points or tracing lines in the plot, you can attempt to use the "Recognize" menu described below under **Advanced Features.**

The Dexter Extraction window contains three different buttons that can be used to view or save the data points marked in the plot. They are located in the upper left of the window as well as under the "File" top-bar menu. You can use any of these buttons as many times as you need during your Dexter session. The buttons are:

1. **Show Data**: this option will cause the data points you have extracted so far to be displayed in the text box at the bottom of your screen for your review.

2. **Send Data**: this option will cause a new browser window containing your data points to be opened. This will trigger popup blockers. To use this button to retrieve your data, you will need to disable these for our site.

3. **Save Data**: this option will send the data points back to your browser so that they can be saved in a file. The output filename that by default will appear in the "Save As" menu can be set ahead of time by modifying the string that appears in the input box labelled "File name" in the lower right corner of the data extraction window.

5.4.2 Advanced Features

Dexter has a number of additional features available to facilitate the data extraction process and improve the accuracy of the results generated.

Pointer Coordinates

The coordinates of the mouse pointer are shown in the last line of the data extraction window. The coordinates will be in pixels as long as you have not defined both axes, and in graph coordinates otherwise. If you change one of the text fields, you may have to force a loss of keyboard focus on that text field for the change to become effective for the mouse tracking, e.g. by clicking into the output field, pressing the tab key, setting a data point, or the like. Unfortunately, this behavior is platform dependent, and you will have to try for yourself to see what works on your machine.

Zoom

The Zoom feature, located in the pull down menu, allows you to change the size of the displayed images by selecting display resolution from 75dpi to 600dpi. (The default resolution is 200dpi; we recommend changing this to 100dpi for large figures and 300dpi for smaller figures.) Use these buttons if your screen is too small for the entire image or the figure is so small that you cannot mark points with sufficient accuracy. Please note that your Java virtual machine may not have enough memory for high resolution renderings of large images.

Magnifying Glass

Located to the left of the display area, under the vertical axis input boxes you will see a magnifying glass icon. Clicking on the icon will turn on the magnifying glass window (replacing the icon), which displays a magnified image area located around your pointer. Clicking over the window a second time will turn the magnifying glass off. The magnifying glass is very useful when marking axis or data points since it allows you to view the local image area with great detail, and therefore increases the accuracy of your marks.

By default the magnifying glass window is turned off because some (faulty) Java run-time libraries cause the applet to slow to a crawl when it is turned on or cause other funny side-effects. The magnifying glass currently does not immediately show *temporary* features (axes and error bars during their creation). You may have to move the mouse to update the display after you set a point in order to see the point displayed in the magnifying glass window.

Error Bars

After you have defined the axes and marked your data points, you can set error bars by clicking and dragging on an existing data point. Error bars are always parallel to the axes at the time of their creation. On output, the error bars are shown in up to four additional columns, with horizontal error bars appearing first if both vertical and horizontal ones were marked; *plus* and *minus* errors are indicated by the applicable sign. If you miss the data point, Dexter starts to draw another axis gauge. To avoid clobbering your previous gauge, drop the new gauge when its length is below Dexter's lower limit on gauge length (about 30 pixels). To entirely remove (as opposed to resize) the error bars, delete the data point and set a new one.

Recognizers

You can ask Dexter to do some of the marking of data points automatically. Currently, three operations are supported: axis finding, line tracing, and point marking. In general, teaching a computer to recognize features is a highly nontrivial task, so you should not expect miracles. For many plots, though, Dexter's recognizers might save you some time.

All recognizers run in separate threads, so that you can continue working with Dexter. While they are running, certain operations are not allowed (e.g., changing resolution, sending data), and the respective buttons or menu entries are greyed out. As long as a recognizer is running, there will be a notice *Recog. running* in Dexter's status line.

Some parameters used by the recognizers can be changed using the "Recognize" -> "Settings" dialog. The settings become effective as you change them.

Because the recognizers may set a large number of points, there is a menu entry named "Delete all Points" in the "Recognize" pull-down menu. Selecting this really deletes **all** points set, not only those set by a recognizer. You may want to use that feature while experimenting with various parameters for the recognizers.

The run time of recognizers with current Java implementations is mainly a function of the image size, since they spend most of their time transforming the image into something that is accessible by the program. Also, this conversion requires significant amounts of memory. If a recognizer runs out of memory, it may just stop working (though in general we try to catch these cases and warn the user). Reducing the resolution might help. To stop a running recognizer, select "Stop Recognizer" in the "Recognize" pull-down menu.

The recognizers currently available are:

Axis Finding to make Dexter identify the gauges on the axes, select "Recognize" -> "Automatic Axes" or type *Control-A*. Note that no gauge will be set if Dexter cannot find any ticks on an axis.

Line Tracing this recognizer follows a line and leaves points along it where it thinks something "interesting" happens or at invervals configurable in the Settings dialog. When you start the line tracer either by selecting "Recognize" -> "Trace a line" or hitting *Control-T*, the mouse pointer will change to a pointing finger. Click on the line you want Dexter to trace, and after a little time you should see points marked along the line. At junctions of lines, the tracer may become confused and take the wrong way, or it may lose the line at certain extreme points. In these cases is may help to give the line tracer a different start point or to let it run more than once.

Point Finding this recognizer tries to register points similar to a user-defined template within a graph. After you start it by either selecting "Recognize" -> "Find Points" or typing *Control-B*, the recognizer will ask you to click on a template point. If there are error bars in the graph, either select a template without error bars or one with large error bars (i.e., error bars larger than the marker itself), or Dexter will add the error bars into the template and will have a hard time finding anything similar to the template. The distance measure used by the point finder is the number of matching points normalized by the total number of points in the template area, where two points match if they are both black or both white after thresholding. You can change the maximal acceptable difference between a template and an acceptable data point in the settings dialog. For poor scans, it may be necessary to raise this value. The point finder will not accept templates smaller than 4x4 pixels. If you run into this limitation, Dexter will complain that it cannot find the start object; try increasing the resolution of the displayed image (via the *Zoom* menu) and rerun the recognizer.

Additional Information

Dexter has shown itself to be a very useful tool to people interested in obtaining numerical data from scanned scientific papers. The applet has been developed to be used within the ADS article service, can easily be adapted to work in other services. In early 2008 it was integrated in the HTML version of fulltext articles appearing in the journal Astronomy & Astrophysics . A standalone version of the applet capable of working on both individual images and PDF files has recently become available on the German VO (GAVO) Data Center web site . Dexter's source code is available under the GNU General Public License at http://dexter.sourceforge.net

A paper describing Dexter's software architecture and showing some of it screenshots is available online .

Modern browsers usually have java implementations that are good enough for

Dexter. If in doubt, we recommend Sun's Java plugin, available at for many popular platforms
.

One known failure is that you cannot use the "Save data" button on many versions of Internet Explorer without trusting our site. The symptom is that IE asks you if you want to allow the download. Even if you answer yes, you will not get the data, which is because IE has already consumed it. We do not store your data on our machine, so we cannot deliver it a second time. To work around this problem, use the "Send data" button and IE's save or use a different browser.

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Chapter 6

Other ADS Features

6.1 Private Library

We have implemented the capability of saving abstracts in a "private library," enabling users quick access to articles they commonly use or reference. To add abstracts to your private library, click on the **Add this article to private library** button at the bottom of any abstract page, or to add multiple abstracts at a time, select the abstracts in a results list and click on **Add selected articles to private library** at the bottom of the list.

Your private library is directly linked to your account, so this feature will not be available if you are not logged in. Please make sure to log into your account before using this feature. Since your user account is site-specific, so is your private library, which means that if you start using a different ADS mirror, your private library will not be available there.

6.2 User Feedback

The Feedback Page provides links to various forms of user feedback. Please make sure you let us know of any critiques, requests for improvements, etc. The following list provides some information about the various forms of user feedback.

6.2.1 User Comments

You can help improve our service! If you have comments for us, please submit them through our Feedback Form . We always welcome comments and suggestions for improvements. Please note that a specific correction will take about two weeks to be updated, as mentioned above. Pages that need to be scanned or rescanned by hand will take longer.

6.2.2 Abstract Submission

We provide a form for authors to supply papers which are missing from the abstract service. Please use the submission form and include as much information as possible.

6.2.3 Abstract Correction

If you find incorrect information in one of our bibliographic records, please let us know by using the Error Correction Form This form lets you retrieve the current data in the database and allows you to modify that information. One we recieve such a change request, we will review it and then change the main database accordingly.

6.2.4 Associated References

We provide a form letting users supply us with bibliographic codes for publications that are related. Such associated references are connected with **O**-links in the ADS database. If you know of any correlated references (errata, series of articles, etc.) that do not have **O**-links, please let us know about them by filling in the codes in the Associated References Form .

6.2.5 Author Comments

You can supply author comments about papers for which you are an author. This comment will be linked to the abstract so that it will be displayed whenever the paper in question is retrieved by a user. This is a useful way to incorporate errata or make additional information available. The author comments should be submitted through our forms interface .

These comments can be plain text or fully formatted html documents. The submission nsystem will try to help with formatting the comment. Author comments can include information about the abstract, clarifications or more extended descriptions, and links to other abstracts and documents. We reserve the right to edit or reject any author comments that are inappropriate. For an example of an author comment, see Mike Kurtz's PhD Thesis .

6.2.6 Missing Journals

The ADS is looking for donations of missing publications for scanning. Please check the list of volumes that we are missing to see if you can help. These journals will be destroyed since we need to cut the volumes for automatic feeding through the scanner.

6.3 Direct Access to ADS Data Holdings

6.3.1 Generating and Verifying Bibcodes

The bibcodes (see Bibcodes) required for direct linking to ADS data can easily be built from a regular reference in a paper. For instance the reference:

Rester, C. et. al, 1989, ApJ, 342, L71

translates into the bibcode **1989ApJ...342L..71R**

To verify that a bibcode is correct, you can use the Bibcode Verification Utility It is a simple interface allowing you to determine if a bibcode exists in the ADS and what other information is available for that bibcode.

Checking the bibcode generated above with the Bibcode Verification Utility results in:

```
ADS Astronomy Database Bibcode Verification

YES, 1989ApJ...342L..71R is a valid bibcode
Abstract available
SIMBAD Objects available
NED Objects available
References available
Citations available
```

This indicates that the abstract is available through the ADS, together with other links.

Note that if the bibliographic code contains an ampersand (&), it should be escaped with the html sequence "%26" in order to be properly translated. While this is not necessary with all browsers, it is certainly a good idea.

To automate the generation of bibcodes from references we provide a Bibliographic Reference Resolver

The Reference Resolver allows users and information providers to query the ADS databases to verify the existence and availability of a particular bibliographic reference. The resolver attempts to be as flexible as possible in parsing reference strings and identifying the respective records, so that different citation formats are supported. This resolver can be used either through a webform or as a script.

6.3.2 Abstract Links

The URL **abs** is available for users to directly access full records in the ADS Abstract Service by bibliographic code (see Building Bibcodes above). **abs** may be used to link directly to our abstracts from outside of the Abstract Service. For example, authors may wish to use this on home pages, curriculum vitae, or on-line reprints.

abs queries the datasets for the requested record. Full journal information, including abstract, authors, keywords, etc. is returned for the bibliographic code if it is in the system. If there is no entry in the database specified for the entered bibliographic code, an error message is returned.

The URL for such links is:

http://adsabs.harvard.edu/abs/bibcode

where **bibcode** represents the unique bibliographic code identifier for the paper in question. This technique can be used to provide links to the ADS from HTML documents which include lists of references, such as:

Rester, C., et al., ApJ, 342, L71 [ADS Abstract]

Linking to online ADS records rather than creating your own pages containing bibliographic information downloaded from the ADS ensures that you will always get the most up-to-date information for the records in question, including links to relevant resources such as data tables, astronomical object databases, reference and citation links, etc.

Similarly, the URL **doi** is avaliable for users to directly link to full records by DOI (Digital Object Identifier). The URL for such links is:

http://adsabs.harvard.edu/doi/DOI

where **DOI** represents the unique identifier, assigned by the publisher. For instance the above link using DOI is:

Rester, C., et al., ApJ, 342, L71 [ADS Abstract]

6.3.3 Scanned Article Links

Links are available for users to directly access scanned articles from the ADS Scanned Literature by bibliographic code (see Building Bibcodes above). These links may be used to link directly to our scanned articles from outside of the Abstract Service. For example, authors may wish to use this on home pages, curriculum vitae, or on-line reprints.

The first page of the article is returned with links for printing the article. If there is no scanned article in the database for the entered bibliographic code, an error message is returned.

The URL for such links is:

http://adsabs.harvard.edu/full/bibcode

It requires a bibliographic code as an argument.

6.3.4 Embedded Queries

This section describes how the abstract service can be accessed from embedded forms. The URL for submitting embedded forms is:

http://adsabs.harvard.edu/cgi-bin/abs_connect

The syntax is:

...

where param$i$ are the names of the parameters and val$i$ are their values. There are no spaces allowed in a URL. Any blanks need to be encoded as a '+' (e.g. between author last and first names). The list of the possible parameters and their possible values is available to build queries. It is advisable to use only the more basic parameters for such queries since the more complicated parameters are more likely to change with future versions of the search system.

One use of this is for including a link to the bibliography for a particular author in a document.

To do so, use the following syntax:

http://adsabs.harvard.edu/cgi-bin/abs_connect?author=last,+f.&return_req=no_params

This sets the author=last, f, and prevents the listing of parameters at the bottom of the page (return_req=no_params).

If you want to specify the author middle initial in addition to the first initial, use exact author matching (&aut_xct=YES).

To build a search for two different formats of author names, enter the two author arguments separated with a semicolon.

http://adsabs.harvard.edu/cgi-bin/abs_connect?author=last,+f.m.;last,+first+m.&aut_xct=

Such a link will always provide access to the latest bibliography of an author without the need to update anything.

Sometimes such a list includes articles by somebody else with the same name. You can exclude specific articles from the results list with the command

exclude=bibcode1,bibcode2,...

You can also include specific articles with the command

include=bibcode1,bibcode2,...

This allows for finely customized bibliographies.

6.3.5 Perl Script Access

There are two PERL libraries currently available which provide direct access to the ADS search engine through a suite of PERL functions and scripts.

The reccommended library, which is available as a PERL 5 module, is Astro::ADS , written and maintained by Alasdair Allan. An older library, which was originally written for PERL 4 but which does work for later versions is also available .

6.3.6 Z39.50 Access

The ADS can be accessed through a Z39.50 interface . The Z39.50 protocol is well-known and used by library systems and software.

6.4 Instructions to Conference Proceedings Editors

This section is intended to be a guideline for editors and authors wishing to submit conference proceedings for inclusion in the ADS Abstract and Scanned Literature Services. Any questions about the procedure should be directed to ads@cfa.harvard.edu

The ADS is pleased to include any conference proceedings volume, as well as individual conference proceedings abstracts. This includes both electronic and printed conference proceedings. We have a set of naming conventions detailed below, but are flexible if there is a different naming scheme which is more appropriate for your particular conference. If you would like to have your conference proceedings included in our database before your conference, we request that you submit them to us one month in advance of the start of your conference.

6.4.1 Submitting Bibliographic Records for the ADS Abstract Service

You can use the Proceedings Entry Form to submit the information to make a conference entry in the ADS.

In addition a file containing the following should be sent to the ADS: Individual Article Entries should include the following tags (*items are required.)

```
* %T Title
* %A Author List
  %F Author Affiliation
* %P First Page of Article
  %L Last Page of Article
  %I Links to online resources See Below.
  %B Abstract Text
  %Z References
  %K Keywords
```

Please note that there are many more details that you can add but these are the required minimum tags. A complete list of ADS tagged fields can be found http://doc.adsabs.harvard.edu/abs_doc/help_pages/taggedformat.html#taggedformat Please note that references containing TeX/LaTeX formatting, AASTeX macros and HTML entities are acceptable.

A long entry should continue on the next line(s) with no repetition of the percent sign and keying letter. All entries should be in ascii and there should be no tabs or control characters. Blank lines can delimit paragraphs in the abstract, but should not otherwise be present within a record. A title, author list and page number are required. Other information such as author affiliation, links to online full-text, abstract text and references are strongly recommended as well. The more information that you can provide for each article, the better. This additional information will aid in searching and using advanced features in the ADS.

This information can be submitted via email to ads@cfa.harvard.edu or placed on our anonymous ftp site, under ftp://adsftp.harvard.edu/pub/Conf . Please send us an email indicating when you have transferred things to us, so that we can include it in our database as soon as possible.

6.4.2 Including Full-text Papers in the ADS

It is possible for us to make the full-text of articles published in conference proceedings available via the ADS Article Service. This section describes the requirements and procedures to be followed in order to do that.

Note: We do **not** publish original material that is not published elsewhere, since we are not a publisher.

1. Provide written permission from the copyright holder allowing the ADS to publish electronically the papers in the conference proceedings. The relevant letter should state something along the following lines:

   The <full description of the copyright holder> grants permission to the NASA Astrophysics Data System at the Smithsonian Astrophysical Observatory to:

   1. Convert postscript files to tiff files for <name of conference>
   2. Add a note at the bottom of each page with the following content:
      (©) <name of copyright holder> - Provided by the NASA Astrophysics Data System
   3. Make the images of the articles electronically available, free of charge, for all volumes starting 1 year after publication.

   Feel free to modify as you see fit, especially item three, then send a copy of a signed copy of the permission letter to:

   ```
   Donna Thompson
   NASA Astrophysics Data System
   Harvard-Smithsonian Center for Astrophysics
   60 Garden Street, M.S. 83
   ```



   ```
   Cambridge, MA 02138
   USA
   ```

2. Send us either a printed copy of the conference proceedings book or (if available) the set of full-text files used to create the proceedings. If only a printed book is available, please send it to Alberto Accomazzi at the address listed above along with the permission letter. If full-text PostScript or PDF files are available for all papers, please read on.

3. To submit the full-text files with the necessary information for us to process them, you will need to create a **tar** or **zip** archive and transfer it to our ftp server. This is what must be included in the archive file:

   - All the files containing the full-text, including front-matter (introductory) and back-matter (index) pages if available. You should make sure that these files are either in PostScript or PDF format, and that they have been created using 600dpi or higher resolution fonts. (Note: if you are using *dvips* to create the postscript file, you can specify the options *-D600 -Z* on the command-line to have 600dpi fonts included).
   - A file named README, containing general information concerning this publication, the name and email address of the person submitting the full-text papers to us, and any additional information we should be aware of.
   - A file named PUBLICATION, containing the full name of the conference or book (you should use the same name given in the journal field above).
   - A file named COPYRIGHT, containing the copyright string that needs to be displayed at the bottom of each page that the ADS creates and places online in its article service (please do not try to include the copyright symboly © since we already do this for you).
   - A file named BIBSTEM, containing the bibliographic abbreviation for the publication (e.g. *ASPC..117* or *2000immm.proc*). This should be the same abbreviation that has been used to create the bibliographic entries described above.
   - Optionally, a PAGEMAP file containing mapping of full-text file names to page numbers, if these cannot be determined from the full-text files themselves. Whether or not this is needed is a function of how the files were originally created; usually if you used LaTeX and dvips to create the postscript files then the page numbering displayed on each page is carried into the postscript files and can be automatically extracted at least for "regular" pages. Pages which are part of the front-matter may need to have entries associated with them.

The format of the PAGEMAP file is the following:

```
# This is a comment
file1.ps    C1-C4        # first file has cover pages 1-4
file2.ps    C6           # second file has cover page 6
file3.ps    1-8 8A 9-15  # third file has pages 1-8, insert 8A, 9-1
file4.pdf   16-          # fourth file has pages 16 and up
```

When in doubt, please contact us for help.

4. Create a compressed **tar** or **zip** archive containing of all the full-text files, the README file, and name the file using (if possible) the standard acronym adopted by the ADS in naming bibliographic entries for the conference. For example, the archive file containing papers submitted to the ASP Conference Proceedings n.117 should be named *ASPC117.tar.gz* or *ASPC..117.tar.gz*. The archive for files containing the conference *2000immm.proc* should be named *2000immm.proc.tar.gz*.

5. Deposit the tar archive on our anonymous ftp server under the URL ftp://adsftp.harvard.edu/pub/Conf and notify us. We will contact you with any questions regarding the full-text processing of the files.

6.4.3 Archiving Conference Proceedings in the ADS

As more conferences are published electronically, editors are turning to the ADS for long-term archiving of their full text proceedings. We can agree to this under the following conditions:

- The conference is originally published elswhere (e.g. through a university or observatory publication, or through another publisher).
- We receive the pdf or postscript files as described above.
- The data have been published at least three years ago.

6.5 The ADS Tagged Format

We welcome the submission of Bibliographic Records from librarians and researchers willing to provide this information to the ADS. To facilitate the insertion of this data into our databases, we request that the records be submitted in electronic form and adhere to the following format:

```
%R Bibliographic Code (required)
%A Author List
%a Review Authors
%b Book Authors
%F Author Affiliation
```



```
%J Journal Name
%V Journal Volume
%D Publication Date
%P First Page of Article
%L Last Page of Article
%T Title (required)
%t Original Language Title
%C Abstract Copyright
%O Object Name
%Q Subject Category
%G Origin
%S Score from the ADS query (output only)
%E Electronic Data Table
%I Links to other information (output only)
%U for Electronic Document
%K Keywords
%M Language (if not English)
%X Comment
%W Database (if submitting for more than one)
%Y DOI
%B Abstract Text
%Z References
```

A long entry should continue on the next line(s) with no repetition of the percent sign and keying letter. All entries should be in ascii and there should be no tabs or control characters. Blank lines can delimit paragraphs in the abstract, but should not otherwise be present within a record. The bibliographic code is the only field which is required for all records, but author list, journal name, publication date, and title are strongly recommended as well. Additional records should be separated by a blank line.

Fields in the Tagged Format

Detailed descriptions of each field follow:

Bibliographic Code: The bibliographic code is a 19 digit code (see Bibcodes)

Author List The author list should contain semi-colon separated authors listed with last name first, followed by first name or initials. A paper with one author would be listed as Minkowski, R. A paper with multiple authors would be listed as

```
Neubauer, F. J.; Burwell, C. G.; Miller, W. C.
```

Authors whose names contain "Jr" or "III" should be entered as

```
Roberts, L. C., Jr.
```

\hypertarget{autr}{}

Review Authors The contains the review authors in the same format as the regular authors.

Book Authors The contains the book authors in the same format as the regular authors.

Author Affiliation The institution with which the author is affiliated. If more than one author affiliation is to be listed, here is the suggested format:

```
AA(first author's institution) AB(second author's institution) ...
```

Email addresses can be specified in the author affiliations. Please mark them as follows:

```
$<$EMAIL$>$email address$<$/EMAIL$>$
```

\hypertarget{jnl}{}

Journal Name This entry contains the reference information, including the journal name, volume, and page range. Also include here any editors of books or conference proceedings.

Journal Volume This contains the journal volume.

Publication Date This contains the publication month and year of the article in the format **MM/YYYY** (i.e. *02/1995*). If no publication month is known, please use a month of *00*.

First Page of Article This contains the first page number of the article.

Last Page of Article This contains the last page number of the article.

Title %T contains the title of the article. If there is also an original language title, it can be submitted with a %t and the language included in the %M tag.

Object Name This contains the name of Objects described in the paper. These are normally handled through SIMBAD and are therefore not part of the user input except in special circumstances.

Subject Category This contains the subject category of the article.

Origin of the Article in the ADS. This contains the source of the record in the ADS.

Score From the ADS Query This contains the score resulting from the ADS query that produced the result.

Abstract Copyright This contains a copyright statement of the abstract, such as

```
    (C) 1990: American Astromomical Society
\hypertarget{url}{}
```

URL for Electronic Document This field provides a place to put the URL which links to an electronic version of an associated document, where one exists.

Electronic Data Table This field provides a place to point to an electronic version of associated data tables, where they exist.

Links to Other Information This contains the available links to other information.

Keywords This contains keywords related to the article, separated by a comma.

Language This contains the original language of the article.

Comment This contains author comments.

Database This contains the database key if you are submitting abstracts for multiple databases (*AST, PHY*).

DOI This contains the DOI.

Abstract This contains the abstract text. Any line beginning with at least one blank space will be assumed to be a new paragraph. New paragraphs may also be delimited with blank lines. Abstracts should not contain tables, and will appear best in the system if they contain only ascii characters.

References This field should contain the list of references cited by the current paper. They should be formatted so that there is just one reference per line, e.g.:

```
%Z Bechtold,~J., \etal 1994, \aj, 108, 374
   Massa, D. L., & Savage, B. D. 1984, ApJ, 279, 310
   Savage, B. D., & Mathis, J. S. 1979, ARA&A, 17, 73
```

Please note that references containing TeX/LaTeX formatting, AASTeX macros and HTML entities are acceptable.

Examples of Records in Tagged Format

This section shows a few examples of our tagged format.

```
%R 1993ApJ...415...50C
%A Cavaliere, A.; Colafrancesco, S.; Menci, N.
%J Astrophysical Journal, Part 1, vol.415, no. 1, p. 50-57.
%D 09/1993
%L 57
%T Distant clusters of galaxies detected by X-rays
%K Cosmic Plasma, Dark Matter, Galactic Clusters, X-ray Astronomy, Baryons,
   Luminosity, Redshift
%B The dynamical masses of groups and clusters of galaxies decrease on average
with increasing redshift, after the hierarchical cosmogonies dominated by
direct collapses of dark matter overdensities. We show that the masses of
intracluster plasma emitting in the X-ray band are to decrease more rapidly. We
also show that consideration of the intrinsic spread in the dynamical formation
times leads us to predict more numerous faint sources at given dynamical mass.
The model we compute yields steeper luminosity functions in the X-ray band with
a specific change in lookback time: the bright end shifts back. Such negative
evolution is fast even at modest redshifts z less than about 0.5 if the
external gas infalling into groups of clusters was preheated and has cooled
down after z of about 1.5-2. If so, the evolution is considerably faster in the
X-ray than in the optical band, comparing interestingly with data from the
existing surveys.
%Z Abell, Ci. 0. 1958, ApJS, 3, 211
Barcons, X., Fabian, A. C., & Rees, M. J. 1991, Nature, 350, 685
Bardeen, J. M., Bond, J. R., Kaiser, N., & Szalay, A. 5. 1986, ApJ, 403, 15
Blumenthal, Ci., Faber, S. M., Primack, J. R., & Rees, M. J. 1984, Nature, 311, 517
Bohringer, H., et al. 1991, in Proc. NATO ASI "Clusters and
%Superclusters of Galaxies," ed. A. C. Fabian (Dordrecht: Kluwer), 71
Burg, R., Cavaliere, A., & Menci, N. 1993, ApJ, 404, L55
Cavaliere, A., Gursky, H., & Tucker, W. H. 1971, Nature, 231, 437
Cavaliere, A., & Colafrancesco, 5. 1988, ApJ, 331, 660
---. 1990, in Clusters of Galaxies (Cambridge: Cambridge Univ. Press), 43
```



```
Cavaliere, A., Burg, R., & Giacconi, R. 1991, ApJ, 366, L61

%T Adsorption behavior of a textile dye of Reactive Blue 19 from
aqueous solutions onto modified bentonite
%A G&ouml;k, &Ouml;zer; Safa &Ouml;zcan, A.;&Ouml;zcan, Adnan
%P 5439

%T Seeing Red: Extremely Red Objects from the Cadis K' Survey
%A Thompson, D.; Beckwith, S. V. W.
%F Max-Planck-Institut fuer Astronomie, Koenigstuhl 17, D-69117
Heidelberg, Germany
%P 13
%B We discuss various interpretations of the nature of extremely red
objects (EROs), discovered in the first of 7 deep, wide-field K'
images in the CADIS survey. Point sources with K' = 20.5 mag are
detected at the 5 sigma level over an area of 125 arcmin^2. A total
of 20 EROs meeting the selection criteria (R-K') >= 6^{m} and K' <=
19.75 mag were selected from the data, giving a surface density of
0.16 +/- 0.04 arcmin^{-2} for all EROs and 0.016 +/- 0.011
arcmin^{-2} for bright (K' < 19^{m}) EROs.}

%T Chandra observations of M31 and their implications for its ISM
%A Primini, F., Garcia, M., Murray, S., Forman, W., Jones, C., and McClintock, J.
%F AA(Harvard-Smithsonian Center for Astrophysics, Cambridge, USA),
%AB(Harvard-Smithsonian Center for Astrophysics, Cambridge, USA),
%AC(Harvard-Smithsonian Center for Astrophysics, Cambridge, USA),
%AD(Harvard-Smithsonian Center for Astrophysics, Cambridge, USA),
%AE(Harvard-Smithsonian Center for Astrophysics, Cambridge, USA),
%AF(Harvard-Smithsonian Center for Astrophysics, Cambridge, USA)
%B We have been regularly observing the bulge and inner disk of M31
for nearly one year, using both the HRC-I and ACIS-I instruments on
the Chandra X-Ray Observatory. We present results from our program
that are of interest to the study of the ISM in M31. In particular,
we find that the unresolved emission within 3' of the center of M31
has a distinctly softer spectrum than that of most of the resolved
X-ray sources in the region. Preliminary spectral analysis of bright
point sources in the bulge shows no evidence (within the poor
statistics) for soft spectral components, but does reveal significant
extra-galactic X-ray extinction (NH ~ 1021 cm-2). We find no new
X-ray counterparts to supernova remnants to date.

%T We Do Not Forget Johannes Kepler
%A Wszo&lstrok;ek, B
%B Year 2009 was announced as the International Year of
Astronomy. This was to mark 400th anniversary of the first
astronomical observation through a telescope by Galileo. From the
```

```
other hand, this year marks 400th anniversary of Astronomia Nova, the
famous work of Kepler published in Prague in 1609. Two laws of
planetary motions opened human efforts to understand gravitational
force; so the overall cosmic space conquest, with its great
importance not only for astronomy, was developed thankful to Kepler's
work. This contribution is thought to show the most inspiring ideas
of Johannes Kepler, published in Astronomia Nova and in other his
books.
%I PDF: FILE:proc16_02.pdf
```

6.6 Miscellaneous Items

This section contains information of various kind which may be useful to both ADS users and collaborators.

6.6.1 A Few Helpful Hints

- Accented letters: We currently indicate accented letters by enclosing the following between "**&**" and "**;**":

```
&eacute; == eacute
&uuml; == uuml
&agrave; == agrave
&ntilde; == ntilde
etc.
```

```
We can also convert the latex equivalent to the html format above:
```

```
&eacute; == \'e
&uuml; == \"u
&agrave; == \`a
&ntilde; == \~n
etc.
```

- Bibliographic Codes: Bibliographic codes are in the form: **YYYYJJJJJVVVVPPPPPA**, where **YYYY** is the year of publication, **JJJJJVVVV** is the abbreviation of the conference proceeding, **PPPPP** is the page number, and **A** is the first letter of the first author's surname (see Bibcodes)

For a conference proceeding such as an ASPC conference proceeding or an IAU Symposium, the abbreviation of the conference proceeding is straight-forward (*ASPC..117* or *IAUS..120*). To create the abbreviation for other conference proceedings, we typically take the first letter from the first four words in the title

(omitting words like *the*, *a*,*and*, etc). For the volume number, we use *conf* for abstracts from the conference and *proc* for the proceedings abstracts. We then end up with an abbreviation such as *hgrb.conf* for the conference abstracts from "The Huntsville Gamma-Ray Burst Symposium". For the **Table of Contents** entry, the page number will be ".....". Here is a sample **Table of Contents** entry:

```
%R 1996eds..proc.....L
%T The Extragalactic Distance Scale, Proceedings of the ST ScI May Symposium
%A Livio, M.; Donahue, M.; Panagi, N.
%J The Extragalactic Distance Scale, Proceedings of the ST ScI
   May Symposium, held in Baltimore, MD,
   May 7 - 10, 1996, Eds.: M. Livio, M. Donahue, and N. Panagia,
   Cambridge University Press.
%D 00/1996
```

6.7 The ADS Custom Format

The custom format feature allows you to output ADS data in a completely user-defined format. This allows you for instance to adapt your reference format to the requirements of a specific journal, or to build other types of output like HTML formatted references. Please see the bottom of this page for some useful examples.

The format can be specified as a string using a syntax similar to the one used by the C-programming *printf* statement. The format string is composed of zero or more directives: ordinary characters (not %), which are copied unchanged to the output; and conversion specifications, for any of the fields found in the bibliographic record to be formatted (e.g. authors, title). The "\" character is used to specify special characters, as in a printf format ("**n**" is a newline, "**t**" is a tab, "\" is a backslash). Each conversion specification is introduced by the character "**%**", and it takes the following form:

```
%[s][c][n.m]f[e]
```

where:

s: Starting character (optional). This character will be printed before the string specified by the format character is printed. If the starting character is one of [, . ; :] it will be followed by a space. If it is necessary to include more than one characters as a starting string, the syntax is **%\(string)[c][n.m]f[e]**. If **string** needs to contain a ")", it needs to be escaped with a backslash. Using a string as starting value is for instance usefull to output a bold volume like {*bf 23*}, . The format for this would be **%\({\bf)V\(},)**

This character is only printed if the field itself is available. This can be any non-alphanumeric character except =, *&*, /, and \ (the encoding characters). If this field contains a character that is not a valid starting character, it is assumed to be an encoding character.

c: Encoding (optional). This character specifies what encoding scheme to use. Options are:

&: SGML encoding.

This encoding converts the characters *&*, <, >, and " to &, <, >, and ", respectively.

>: HTML encoding.

This encoding converts characters in URLs to hex notation, and *&* to &. Outside URLs, the characters *&*, <, >, and " are converted to &, <, >, and ", respectively.

/: URL encoding.

This encoding converts the characters *&*, *?*, and + to the hex encoded values.

=: Hex encoding.

This encoding converts all characters with hex values less than 0x20 and all characters with hex values greater or equal to 0x7F into the form %XX where XX are the two hex digits.

\: Tex/Latex encoding.

This encoding converts all special Tex characters into their Tex escape sequences. For instance '\' is converted to '$\backslash $', '$' is converted into '$', '^' is converted into '\^{}', etc.

n.m: Maximum number of entries in field (optional). This is implemented for the author field. If the number of authors in the list is larger than n, the list will be truncated and returned as "author1, author2, ..., authorm, et al.". If .m is not specified, n.1 is assumed.

f: Output field specifier. This character specifies which field is to be printed with this format specification. The valid field specifiers are described below.

e: Ending character (optional).: This character will be printed after the string specified by the format character is printed. If the ending character is one of [**, . ; :**], it will be followed by a space. This character is only printed if the field itself is available. This can be any non-alphanumeric character except "**%**" and "\". If it is necessary to include more than one characters as an ending string, the syntax is **%[c][n.m]f\(string)**. If **string** needs to contain a "**)**", it needs to be escaped with a backslash. Otherwise, if a character is in this field that is not a valid ending character, the format ends here and the character is interpreted as a regular format character. A "\" is used if the following character would be a valid ending character but should not be considered part of the format (meaning it should be printed regardless of whether the format is printed). It also prevents the addition of a space after **, . ; :** .

6.8 Output Field Specifiers

The output field specifiers can be grouped in one of the following categories: the special format characters, author formatting characters, and other characters. All of them are described below.

Special formats

z: Extended formats

Since we were running out of format letters, formats starting with a **z** are multi-letter formatting options (see below for some examples)

zn: Enumeration

This format outputs the sequence number of the record in the output

Z: Command format

This is a special format directive. It *must* be the first command specified in a format string, and there can be multiple *%Z* directives at the beginning of the string. While the Z tag produces no output, it allows you to specify the value of certain variables with corresponding parameters. It has the following syntax: **%Zcommand:parameter**. Parameter can be a number, a word, or a string, depending on the command. If it is a string, it *must* to be enclosed in double quotes. The available **command** are:

Encoding:word This specifies the encoding of the output. Available encoding parameters are:

- **UTF-8**: UTF-8 encoding of all unicode characters.
- **ISO-8859-1**: ISO-8859-1 (Latin-1) encoding of all unicode characters.
- **ISO-8859-2**: ISO-8859-2 (Latin-2) encoding of all unicode characters.
- **TeX**: TeX encoding of all unicode characters.
- **hex**: Hex encoding of all unicode characters.
- **Unicode**: Unicode encoding of all unicode characters. This outputs the html entities instead of binary characters.

Markup:word This specifies how to process HTML markup found in input fields (such as ≤SUB>) Available options are:

- **keep**: keep the markup (default)

strip: remove the markup

Linelength:number This specifies the output line length (default is 80 characters). Use a line length of 0 to avoid line breaks.

Header:"string" This specifies a header that will be output once before the data records.

Footer:"string" This specifies a footer that will be output once after all the data records are output.

EOL:"string" This specifies the character to be printed at the end of a record (newline by default)

AuthorSep:"string" This specifies the string to be used when concatenating the names of authors (", " by default)

Author formats

A: Authors

This field prints out the author list as it is in the database. If the maximum number of entries in the field is specified, the output will be truncated to first author, et al. if there are more than n authors. The last author is separated by 'and'.

a: Authors

This field prints out the author list as it is in the database. If the maximum number of entries in the field is specified, the output will be truncated to first author, et al. if there are more than n authors. The last author is separated by '&'.

G: Authors (last names first)

This field prints out the author list. The author first names are truncated to first initials. The authors are written as 'lastname f. i.' (no comma separator for f. i.). If the maximum number of entries in the field is specified, the output will be truncated to author1 f. i., author2 f. i., author3 f. i., et al. if there are more than n authors. The last author has no special separator.

g: Authors (last names first)

This field prints out the author list. The author first names are truncated to first initials. The authors are written as 'lastname f. i.' (no comma separator for f. i.). If the maximum number of entries in the field is specified, the output will be truncated to author1 f. i., et al. if there are more than n authors. The last author has no special separator.

H: Reference Name

This field prints out the reference author name if available. It consists of either "Lastname" (for one-author articles), or "Lastname1 and Lastname2" (for 2 author articles), "Lastname1 Lastname2 and Lastname3" (for 3 to n-1 author articles), or "Lastname1" (for articles with more than n authors). Default for n is 3. It can be changed for instance to 1 with %1H.

h: Reference Name

This field prints out the reference author name if available. It consists of either "Lastname" (for one-author articles), or "Lastname1 & Lastname2" (for 2 author articles), "Lastname1 Lastname2 & Lastname3" (for 3 to n-1 author articles), or "Lastname1" (for articles with more than n authors). Default for n is 3. It can be changed for instance to 1 with %1h.

I: Authors (initials first)

This field prints out the author list. The author first names are truncated to first initials. The first author is written as 'lastname, f. i.', subsequent authors are written as 'f. i. lastname'. If the maximum number of entries in the field is specified, the output will be truncated to "first author, and xx colleagues" if there are more than n authors. The last author is separated by 'and'.

i: Authors (initials first)

This field prints out the author list. The author first names are truncated to first initials. The first author is written as 'lastname, f. i.', subsequent authors are written as 'f. i. lastname'. If the maximum number of entries in the field is specified, the output will be truncated to first author, et al. if there are more than n authors. The last author is separated by '&'.

L: Authors (last names first)

This field prints out the author list. The author first names are truncated to first initials. The authors are written as 'lastname, f. i.'. If the maximum number of entries in the field is specified, the output will be truncated to "first author, and xx colleagues" if there are more than n authors. The last author is separated by 'and'.

N: Authors (last names first)

Same as L, except the last author is is not treated differently form the others.

l: Authors (last names first)

This field prints out the author list. The author first names are truncated to first initials. The authors are written as 'lastname, f. i.'. If the maximum number of entries in the field is specified, the output will be truncated to first author, et al. if there are more than n authors. The last author is separated by '&'.

M: Author list (last names only)

This field prints out the last names of the authors if available. The reference name is the citation that is used in the article text. It consists of either "Lastname" (for one-author articles), or "Lastname1 and Lastname2" (for 2 author articles), "Lastname1, Lastname2 and Lastname3" (for 3 to n-1 author articles), or "Lastname1 et al." (for articles with more than n authors). Default for n is 0, meaning no truncation. It can be changed for instance to 5 with %5M.

m: Author list (last names only)

Same as M, except it uses '&' before the last author instead of 'and'.

n: Author list (last names only)

This field prints the last name of the first author. If there is more than one author, it appends a '+'.

za1: Author last name only

This format prints the last name of the first author.

za2: Authors (last names first) : Like **L**, but no space between initials.

za3: Authors (last names only) : Like **M** with \emph around et al

Other formats

B: Abstract

This field prints out the abstract if it is available.

b: Abstract

Same as B.

C: Copyright

This field prints out the copyright statement if available.

c: Citation count

This outputs the number of citations to the article.

D: Publication Date

This field prints out the Publication date if available.

d: DOI

The Digital Object Identifier of the article if available.

E: Electronic Data Table Address

This field prints out the electronic data table address if available.

e: Electronic Data Table Address

Same as E.

F: Author Affiliation

This field prints out the Author affiliation if available.

f: Author Affiliation

Same as F.

J: Journal

This field prints out the journal name.

j: Journal

This field prints out the journal name if available. If an AASTeX macro for the journal is available, this macro is printed instead.

Q: Journal

This field prints out the full journal information if available.

q: Journal

This field prints out the journal abbreviation.

K: Keywords

This field prints out the keywords if available.

k: Keywords

Same as K.

O: Object Names

This field prints out the object names if available.

o: Object Names

Same as O.

P: Last Page

This field prints out the last page number of the article if available.

p: First Page

This field prints out the first page number of the article if available.

R: Bibliographic Code

This field prints out the bibliographic code if available.

r: Bibliographic Code

Same as R.

S: Reference Source

This field prints out the reference source if available.

s: Reference Source

Same as S.

T: Title

This field prints out the title if available.

t: Title

Same as T.

U: URL

This field prints out the URL of the abstract as a complete hyperlink with the bibcode as the anchor in the form: *bibcode*

u: URL

This field prints out the URL of the abstract in the form: *http://adsabs.harvard.edu/abs/bibcode*

V: Volume

This field prints out the volume if available.

v: Volume

Same as V.

W: Publication Category

This field prints the publication category. Currently available categories are:

```
MISC
BOOK
INBOOK
PROCEEDINGS
INPROCEEDINGS
ARTICLE
PHDTHESIS
MASTERSTHESIS
TECHREPORT
```


w: Publication Category

Same as W.

X: arXiv e-print number

This fields prints the identifier corresponding to the paper's e-print, as assigned by the arXiv .

x: Comments

This field prints any of the comments available for the record.

Y: Publication Year

This field prints out the publication year if available.

y: Publication Year

Same as Y.

Examples:
The default format is the AASTeX format:

```
\\bibitem[%\4m%(y)]%{R} %\5.3l %\Y,%\j,%\V,%\p\n
```

This format produces a reference of the form:

```
\bibitem[Rester et al.(1989)]{1989ApJ...342L..71R} Rester, A.~C.,
      Coldwell, R.~L., Dunnam, F.~E., Eichhorn, G., Trombka, J.~I.,
      Starr, R., \& Lasche, G.~P.\ 1989, \apjl, 342, L71
```

The format for Icarus is:

```
\\bibitem[%\2M%(y)]%{R} %\10I %\Y.%\t.%\j %\V,%\p%-\P\.\n
```

The format for MNRAS is:

```
\\bibitem[\\protect\\citename%{\1h} %y]%{R} %\8.3g,%\Y,%\q, %\V,%\p\n
```

The "Link" format is:

```
<P>%&a %&Y, %&J <A href=%"u">%&T</A>\n
```

A format to create a list of records with hyperlinked bibcode, authors, title, journal, volume, page, year for use in latex:

```
\\item \href{%u}{%\R} %\A: \textit{%\T,} %\j,%\V,%\p %(y)
```

The same format as above but encoded for use as a rich text document (rtf) which can be edited in textedit, word, etc.

```
%ZHeader:"{\\rtf1\n\n" %ZFooter:"}" %ZEncoding:UTF-8 %ZMarkup:strip %zn. {\\field{\\
```

Notes:

If you are generating a format such as Rich Text which is to be used in third party applications, it is best to select the option "Save to file" rather than having the content displayed on the screen, since this adds an ASCII header to the page. This will save you the effort of cutting and pasting the output into a file and then renaming the file to something sensible.

The reason for including the starting and ending character within the format specification is to handle cases where the output field is not available. For instance to print the year followed by the comment in parenthesis you can specify:

```
%Y (%x)
```

or

```
%Y %(x)
```

If there is no comment field available, the first format will print:

```
1998 ()
```

whereas the second format will print:

```
1998
```