EXPANDED CITATION DATABASE IN THE NASA ADS ABSTRACT SERVICE. G. Eichhorn, A. Accomazzi, C. S. Grant, M. J. Kurtz, E. A. Henneken, S. S. Murray, Harvard-Smithsonian Center for Astrophysics, Cambridge, MA 02138, USA (gei@cfa.harvard.edu).

Introduction: The NASA-ADS Abstract Service provides a sophisticated search capability for the literature in Astronomy, Planetary Sciences, Physics/ Geophysics, and Space Instrumentation. The ADS is funded by NASA and access to the ADS services is free to anybody worldwide without restrictions. It allows the user to search the literature by author, title, and abstract text.

Data Holdings: The ADS bibliographic databases contain over 3.2 million references, with 855,000 in the Astronomy/Planetary Sciences database, and 1.3 million in the Physics/Geophysics database. 60% of the records have full abstracts; the rest are table of contents entries (titles and author lists only). The coverage for the Astronomy literature is better than 95% from 1975. Most of the journal literature is covered back to volume 1. We now get abstracts on a regular basis from most journals. We recently came to an agreement with the AGU and are now receiving their abstracts on a regular basis. For the Physics/ Geophysics database we have agreements with the American Physical Society and the Institute of Physics to receive all their records, including reference lists, back to volume 1 for all their publications. We also receive new abstracts from most commercial publishers for all their Physics journals. The ADS now also covers the complete ArXiv Preprints. We download new records from the ArXiv every night and index all the preprints. They can be searched either together with the other databases or separately. There are currently about 220,000 preprints in that database, which go back to 1991.

An increasingly requested part of the abstract service is the database of references and citations. We have over eight million reference-citation pairs in the database and are continually increasing the number of citations in the system. We expect to reach over 10 million in the near future. This database allows the user to get a list of citations to an article as well as the list references in an article. We are currently expanding the reference/citation database by converting reference lists in scanned articles into electronic text. This will allow us to include reference lists for many older articles that so far have not been available in electronic form at all. The citation data now allow our users to easily find highly cited articles, which makes it very easy to find important literature in any field.

The second major part of the ADS is the Article Service. We have scanned over 2.1 million pages in almost 300,000 articles from 35 journals, 14 conference proceedings series and 40 individual conference proceedings. Most of the astronomical societies have

given the ADS permission to scan their publications. This includes for instance Meteoritics and Planetary Sciences, the Minor Planet Bulletins, most of the LPI Special Publications, all the LPSC conference abstracts, several books published by the LPI, the Antarctic Meteorite Research proceedings series, and the DPS Meeting abstracts, published in the Bulletins of the AAS. Other scanned publications include the Astrophysical Journal, Astronomical Journal, Astronomy and Astrophysics, Monthly Notices of the Royal Astronomical Society and the Publications of the Astronomical Society of the Pacific, all back to volume 1. We have recently scanned Astrophysics and Space Science (with permission from Kluwer), Journal of Astrophysics and Astronomy, LPSC Proceedings 18 — 22, LPI Technical Reports and Contributions, Journal des Observateurs, The Observatory, the Quarterly Journal of the Royal Astronomical Society, and many IAU Symposia. We are by now almost complete with scanning IAU Symposia. All the scanned literature is available without restrictions through the ADS.

We would like to increase our coverage of the book and proceedings literature. If you have a published book that is relevant to Astronomy and that is either not copyrighted (e.g. all NASA publications), or for which you can obtain permission from the copyright holder for ADS to scan the book, please contact the first author. If you can provide us with an extra copy of the book (it needs to be cut in order to be scanned), we will be happy to scan it. Some books can be rebound after scanning. In that case we will rebind the book and return it after scanning.

Output Formats: We have recently implemented several new output formats. Records can now be retrieved in Bibtex format, several formats used by commercial reference handling systems (eg Endnote, Procite, etc), in several XML formats, including the Dublin Core format, and several LaTeX macro formats, including the Icarus format. Together with the capability to directly export the references to Endnote for instance, this new system makes it very easy to use the ADS as the search system and then to handle the resulting records with other software packages.

Mirror Sites: In order to provide better access to the ADS from different countries we have eleven mirror sites of the ADS, located in France, Japan, Chile, Germany, the United Kingdom, China, India, Russia, Brazil, Argentina, and Korea. Of these mirror sites five host a complete mirror with all scanned articles (France, Japan, China, India, and Argentina, (low resolution scans only)), one (the UK) has a partial arti-

cle mirror, the others mirror the abstract service. Russia and Korea are in the process of loading a full article archive. We would welcome suggestions for other mirror sites.

Access Statistics: Figures 1 and 2 show some of the access statistics of the ADS.

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References:
[1] Accomazzi, A., Eichhorn, G., Kurtz, M. J., Grant, C. S., & Murray, S. S. (2000), *A&AS, 143*, 85-110; [2] Eichhorn, G., Kurtz, M. J., Accomazzi, A., Grant, C. S., & Murray, S. S. (2000), *A&AS, 143*, 61-84; [3] Grant, C. S., Accomazzi, A., Eichhorn, G., Kurtz, M. J., & Murray, S. S. (2000), *A&AS, 143*, 111-136; [4] Kurtz, M. J., Eichhorn, G., Accomazzi, A., Grant, C. S., Murray, S. S., & Watson, J. M. (2000), *A&AS, 143*, 41-60
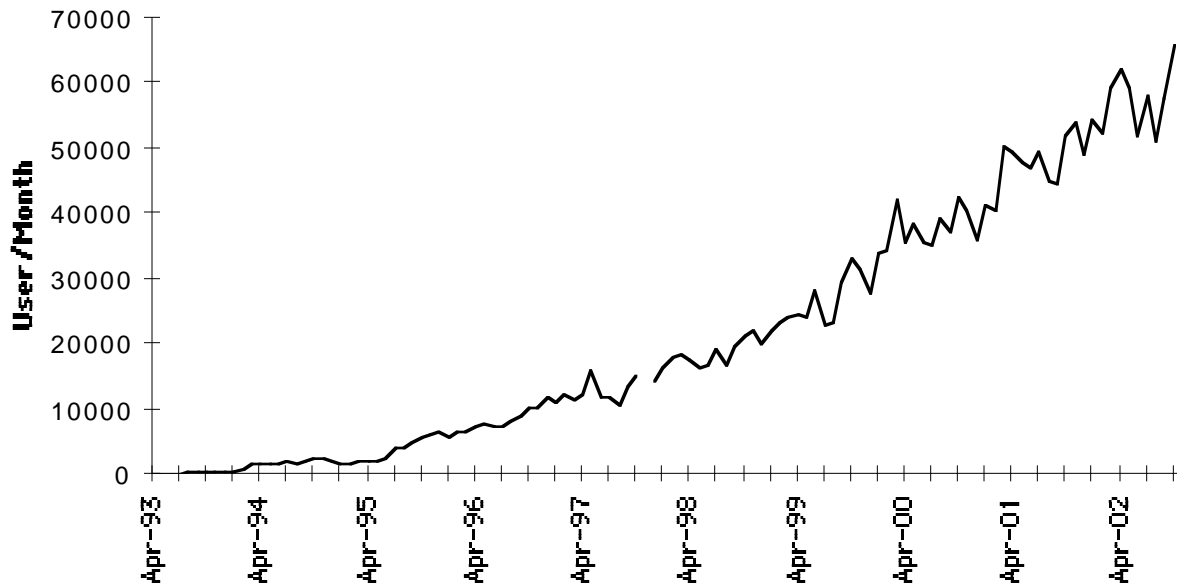

Fig. 1: Number of unique users per month since the beginning of the ADS Abstract Service in 1993.
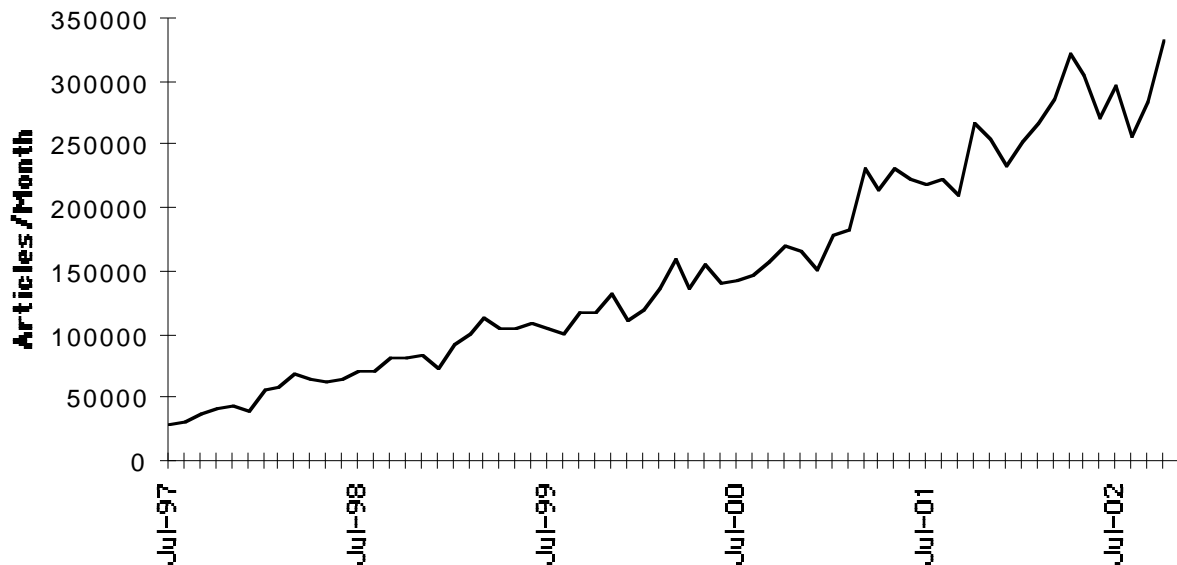

Fig. 2: Number of articles retrieved per month through the ADS since the beginning of the ADS Article Service.