

## SERVICES OF THE U.S. NSSDC AND THE ADC

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### RESUMEN

El *National Space Science Data Center* de los EE.UU. (NSSDC), proporciona diferentes servicios para uso de los astrónomos. El más importante de éstos es el *Astronomical Data Center* (ADC) que actualmente contiene alrededor de 700 catálogos astronómicos, principalmente sobre observaciones hechas desde la Tierra. La mayoría de éstos están disponibles electrónicamente y sin costo alguno a través de una conexión con Internet o Decnet. Estos también pueden obtenerse en otras formas al costo de preparación y distribución. El NSSDC además contiene la mayoría de los datos obtenidos con los satélites científicos de los Estados Unidos y muchos de los de otros países. A través del Servicio de Información de Datos de la NASA (NODIS), también se ofrece un directorio de otro grupo de datos y servicios tanto para datos espaciales como para los obtenidos desde la Tierra. El NSSDC distribuye un número de discos CD-ROM incluyendo uno con 114 de los catálogos astronómicos más solicitados. Otros contienen imágenes planetarias y observaciones de la campaña *Halley Watch*. Otros servicios están disponibles a través de NODIS o por referencia con NODIS. El ADC está también cooperando con la *American Astronomical Society* (AAS) para brindar acceso electrónico a la información de la AAS y resúmenes de publicaciones astronómicas.

### ABSTRACT

The U.S. National Space Science Data Center (NSSDC) provides several services which are of use to astronomers. The most important of these is the Astronomical Data Center (ADC) which currently contains about 700 astronomical catalogs, primarily from ground-based observations. Most of these are available electronically at no cost to anyone with a connection to Internet or Decnet. They can also be obtained in other forms at the cost of preparation and distribution. The NSSDC also contains most data from U.S. scientific satellites and many from other countries. Through its NASA On-line Data Information Services (NODIS), it also provides a directory of other data sets and services for both space and, for astronomy, ground-based data. The NSSDC distributes a number of CDROMs including one with 114 of the most requested astronomical catalogs. Others contain planetary images and Halley Watch observations. Other services are available through NODIS or by referral from NODIS. The ADC is also cooperating with the American Astronomical Society (AAS) to provide on-line access to AAS information and abstracts from astronomical publications.

*Key words:* CATALOGS

### 1. INTRODUCTION

Several years after its formation, the National Aeronautics and Space Administration (NASA) realized that the expensive scientific data being acquired by rockets and satellites should be archived in a form in which it would be available to and usable by scientists for many years. The National Space Science Data Center (NSSDC) was established to provide this archive. The investigator responsible for the acquisition of the data has sole rights to it for some time. Scientists within the NSSDC work with him or her to ensure not only that

the data are provided in a usable form but that sufficient documentation is available for another scientist to understand how it was calibrated and how to use it. The NSSDC archives most of the data from U.S. scientific satellites and much from satellites from other countries. Recently, very large data sets, such as the data from the Hubble Space Telescope (*HST*) are being archived elsewhere but the NSSDC maintains information on how to acquire these data.

Shortly after the organization of the NSSDC, Jaylee Burley (now Mead), following the lead of Carlos Jaschek in Strasbourg, France, proposed that the NSSDC should also archive machine-readable versions of astronomical catalogs compiled from ground-based observations. Thus, the Astronomical Data Center (ADC) was born. The ADC currently archives approximately 700 catalogs in eight categories. A world-wide network of eight data centers cooperates in the archiving and exchange of catalogs. The ADC works most closely with the Centre de Données Astronomiques de Strasbourg (CDS). The two centers are attempting to maintain duplicate archives so that each will serve as a back-up to the other. In addition to archiving existing machine-readable catalogs, the ADC corrects catalogs, reformats them for easier use by computer, and produces new catalogs, usually by combining data from several catalogs. A major undertaking of the ADC, CDS, and numerous astronomers was the preparation of a machine-readable version of the three *Durchmusterungs*. In the process, many errors were corrected. These have recently been printed and are available at no cost to astronomers and astronomical libraries.

## 2. OBTAINING ADC CATALOGS FROM NODIS

To access the NSSDC electronically, it is necessary to have at least a VT100 terminal. You can telnet to NSSDC.GSFC.NASA.GOV and login with the username NODIS. No password is required but you will be asked for your name, address and phone number (or, if you have dealt with the NSSDC before, if the information on file is correct). You will then be led through a menu-driven session to get the information you wish. The first screen will list a number of large science areas. If astronomy is chosen, you will be offered several choices including information on FITS and the ADC. On choosing ADC, you may request information on catalogs in one of three ways: by ADC number, by short title, or by keyword. The catalogs in the ADC are grouped in eight major categories (astrometric, photometric, spectroscopic, cross identifications, combined and derived data, miscellaneous, non-stellar, and radio). If you select by category, you will receive a list of all of the catalogs in that category. The short title may be something like FK5 or SAO or may be the last name of the first author. You can obtain a list of the available keywords by choosing that option without specifying any word. Whichever option you choose, you will be asked for the number of the catalog which you would like to know about. If you select one, you will be given the complete title, author, a reference, the number of files and the number of records in each, its status, and possibly, a more detailed description. You will then be asked if you wish to order the catalog. If you reply yes, you will be asked how you wish to receive it. If you select Internet or NSI/Decnet, you will be asked for your e-mail address (it can be different from the one you gave when you logged it). You will also be asked the purpose of your request (this will not affect the availability of the data). In a few minutes, you will receive an e-mail message telling you where your data is located and that you can get it by ftp. Normally, it will remain available for three days.

If you wish to receive the data in some other form, you can send a message to: Request@nssdc.gsfc.nasa.gov or write to the following address (note that the first line differs for correspondents within and outside the U.S.): NSSDC Coordinated Request and User Support Office (CRUSO) (for requests from within the U.S.) or World Data Center-A for Rockets and Satellites (for all other requests): Code 633, NASA/Goddard Space Flight Center, Greenbelt, MD 20771 U.S.A.

## 3. OTHER NODIS OPTIONS

Several other NODIS Options are likely to be of interest. These include information on other NSSDC services and the Master Directory as well as information in other fields of space science. Some scientific data are available through NODIS directly including data from the *IUE*, *IRAS*, *Skylab*, and *HEAO 2* and *3*. The early release data from the *HST* are also available although other *HST* data must be obtained through the ST Science Institute.

The Master Directory is particularly useful as it provides directions for accessing data which may not be archived at the NSSDC but may be relevant to the needs of an astronomer. These include large data bases such as the U. Minnesota Schmidt survey and the Astronomical Data System.

Also of interest is a list of the CDROMs available from the NSSDC. These include the Einstein CDROMs, the *IRAS* Sky Survey Atlas, and a substantial amount of planetary data in addition to the ADC CDROM. A list of other CDROMs of interest to the space science community but not distributed by NASA is also available.

#### 4. COBE

Very recently, the early *COBE* data have been placed on-line in the NSSDC. To acquire them, ftp to NSSDC or NDADSA and logon with the username anonymous. You should use your e-mail address as a password. (This is not required but will be appreciated). Then, cd *COBE* and download AAREADME.DOC for further information. The data are presented in FITS binary tables.

#### 5. ARMS AND XRAY

The data on NODIS and some additional data are available on-line more directly through the Automated Retrieval Mail System (ARMS). With this system, as for data such as that from the *IUE* on NODIS, the user must know specifically which data is wanted. For most astronomical data, this can be learned through another system, the High Energy Astrophysics Science Archive Research Center (HEASARC) which is a collaboration between the NASA Goddard Space Flight Center Laboratory for High Energy Astrophysics and the NSSDC. Again, telnet or set host to NSSDC or NDADSA and login with the username XRAY. You will be asked for your HEASARC id, which is your first initial and last name (e.g., nroman). After typing BROWSE, you select the catalog you wish and then search for observations either by SN, for the name, or SC, for a coordinate search. IP CLASS can be used to search for a given class of objects but the numerical values for the class must be known. To obtain the classes, type CLASS without the sp. These classes and much other information about the HEASARC system, which has a great deal of capability, can be obtained from publications about the Online service. These can be obtained from: High Energy Astrophysics Science Archive Research Center, Office for Guest Investigator Programs, Code 668, Goddard Space Flight Center, Greenbelt, MD 20771 U.S.A.

#### 6. ADC NEWSLETTER

The ADC issues an electronic newsletter four times a year. This is a free distribution which provides various items of information about the ADC and its holdings. Each issue contains a list of newly acquired catalogs and errata in older catalogs of which we have been informed in addition to news items which vary from issue to issue. To subscribe, send an e-mail message to: [LISTSERV@HYPATIA.GSFC.NASA.GOV](mailto:LISTSERV@HYPATIA.GSFC.NASA.GOV) and put in the BODY of the message (not the command line): SUBSCRIBE ADCNEWS followed by your real name (not the computer name). The computer will get your e-mail address from the header.

To obtain an index of previous issues, send a message to the same computer with the message: INDEX ADCNEWS. A particular issue can be retrieved with the command: GET ADCNEWS VOLUME<sub>x</sub>.ISSUE<sub>y</sub> where x and y are the numbers of the volume and issue, respectively.

#### 7. STELLAR

The Astronomical Data Facility, a sister organization to the NSSDC is cooperating with the American Astronomical Society (AAS) to develop an on-line information source for astronomy. At present, it has the AAS job register, programs and abstracts for AAS meetings and abstracts from a number of astronomical publications. The latter are produced for the NASA supported publication, STAR, and cover the period from 1965 to nearly the present. WAIS or World Wide Web (WWW) must be installed on your computer to access these. The necessary files for WAIS are available by ftp from either [cnidr.org](http://cnidr.org) or [hypatia.gsfc.nasa.gov](http://hypatia.gsfc.nasa.gov). WWW is also readily available.

#### 8. THE FUTURE

Recently, both the CDS and the ADC have started to archive tables from astronomical publications which are shorter than classical catalogs but long enough to make machine-readable versions useful. The CDS is archiving all of the tables from *Astronomy and Astrophysics* and, hopefully, other European publications. The ADC is requesting such tables from North American authors except for those published in the AAS journals. The AAS has plans to place all of these data on CDROMs, starting with the 1992 issues. However, the ADC

will request data from these publications if we receive requests for the data. We also welcome any suitable data which the author wishes to submit for our archiving and distribution wherever they are published.

### DISCUSSION

**Garrison:** How do we deposit data in the ADC? I have a couple of large catalogues to share.

**Roman:** Send me an e-mail message, to [roman@hypatia.gsfc.nasa.gov](mailto:roman@hypatia.gsfc.nasa.gov) or [roman@nssdc.gsfc.nasa.gov](mailto:roman@nssdc.gsfc.nasa.gov). I will send you a form later telling how to submit your data.

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