

## WORLD CENTERS FOR ASTRONOMICAL DATA

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Over the years the role of Astronomical Data centres has become more and more important. The international, national, and local data centres are the repositories for thousands of catalogues of astronomical objects and for many data tables from journal articles. Major international data centres are the Centre de Donnees astronomiques de Strasbourg, France, the Astronomical Data Center, Maryland, USA, Beijing Astronomical Observatory, Chinese Academy of Sciences, the Japanese Astronomical Data Center, Tokyo, Japan, the Centre of Astronomical Data (INASAN), Moscow, Russia.

In the Centre de Donnees astronomiques de Strasbourg the references database SIMBAD for the identification and bibliography of astronomical objects outside the solar system is created. A major upgrade took place in 1999, with the transfer of the internal reference system to the HIPPARCOS International Celestial Reference System (ICRS). In October 1999, SIMBAD contains 2,735,893 objects, 7,524,044 identifiers, 108,785 bibliographical references, and 3,093,319 citations of objects in papers. Major future developments include in particular the development of links from the CDS services to observatory archives. The ALADIN interactive sky atlas was released in February 1999. ALADIN is a versatile cross-identification tool, which allows the user to overlay the data from SIMBAD, NED and VizieR catalogues and logs, on reference images of the sky, the DSS images provided by STScI, plus full resolution images scanned at the Paris MAMA machine for 'crowded' fields.

The Astronomical Data Center (ADC) at the NASA Goddard Space Flight Center currently holds more than 2700 catalogs in its archive. The ADC alone provides a collection of many of its largest and most requested catalogs in the form of a CD-ROM series (Volume 3 in early 1997, Volume 4 in early 1998). The CD-ROMs are especially useful for scientists in countries with poor network connectivity.

Local or national institutes hosting collections of catalogues or support data centres are of great importance regionally or even world-wide. Examples are the Inter-University Centre for Astronomy and Astrophysics, Ganeshkind, India, the centre at La Plata Observatory Argentina, and the Canadian Astronomical Data Centre (CADC) at the Dominion Astrophysical Observatory, Victoria, BC. The CADC is one of the world's distribution centres for data from the HST Archive with STScI and ST-ECF, and it holds the CFHT archive.

Some observatories have observations archives the major of which are: the High Energy Astrophysics Science Archive Research Center (HEASARC) for high energy

astrophysics, the Infrared Processing & Analysis Center (IPAC) for infrared astronomy programs, which also maintains the NED database of extragalactic objects, and the Multimission Archive at the Space Telescope Science Institute (MAST), which has primary focus on data sets in the optical, ultraviolet and near-infrared part of the spectrum.

Among the astronomical data itself a publication of new large all-sky astrometric catalogues (ACT and TRC), should be mentioned as an important event and continuation of the Hipparcos mission success. Catalogues ACT and TRC, containing about 1 million stars, have been constructed on the basis of two all-sky catalogues: Tycho Catalogue (ESA 1997) - an output of Tycho experiment in the frame of Hipparcos space mission, and Astrographic Catalogue (AC), an output of international program at the beginning of this century.

The ADS Article Service now has on-line from volume 1 the *Astronomical Journal*, the *Astrophysical Journal with Supplements and Letters*, and *Astronomy and Astrophysics*, as well as many smaller journals (e.g. national Astronomical Society publications of Japan, Australia, India, etc). Monthly Notices of the Royal Astronomical Society and Publications of the Astronomical Society of the Pacific will be on-line back to volume 1 by the end of 1999, and IAU Symposia soon afterwards. The usage of the ADS is steadily increasing, with currently about 30,000 users of the ADS Abstract Service per month who retrieve about 10 million references per month. The ADS Article Service has over 15,000 users per month who retrieve about 700,000 pages per month. To provide better access to ADS services world-wide we have established several mirror sites. Currently we have mirror sites in France, Germany (2), England, Japan, Chile, and India.