

COMMISSION 5: DOCUMENTATION AND ASTRONOMICAL DATA
DOCUMENTATION ET DONNEES ASTRONOMIQUES

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REPORT BY THE PRESIDENT FOR THE PERIOD 1 NOVEMBER 1987 TO 30 JUNE 1990

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INTRODUCTION

The aims of this report are, firstly, to review the activities of Commission 5 since the previous report and, secondly, to draw attention to other relevant activities. It is based mainly on contributions (shortened in some cases) from the chairmen of Working Groups and Task Groups, but other items of general interest have been included.

The report on the meetings of the Commission at the IAU General Assembly in Baltimore in August 1988 was published in *Trans. IAU 20B*, 109-118, while the membership is listed on page M10 and the *IAU Style Manual* is printed as Chapter 8 on pages S111-Sx11 and S1-S50. The proceedings of Joint Discussion No. 1 on *New developments in documentation and data services for astronomers* were reported in *Highlights of Astronomy 8*, 67-100. The proceedings of IAU Colloquium No. 110 on *Library and information services in astronomy*, which was held in Washington, DC, just before the General Assembly, were published by the U.S. Naval Observatory in 1989. The Newsletter of the Commission was issued in June 1988 and July 1989.

ASTRONOMICAL DATA (G. Westerhout)

The Centre des Donnees Stellaires (CDS) at Strasbourg, France, continued to provide a regular source of information about a wide range of astronomical-data activities through the bi-annual publication of its *Bulletin d'Information*; its other activities are reported below with the reports of the other principal astronomical data centres. Examples of the proceedings of international conferences and workshops concerned with the compilation and handling of astronomical data that have been (or are to be) published by CDS are: *Digitised optical sky surveys*, Geneva, May 1989; *CDS/ESIS Workshop on The ESIS query environment*, Strasbourg, September 1989 (ESIS = European Space Information System); *Large structures in the universe*, Lyon, May 1990; and *SINBAD Workshop*, Strasbourg, June 1990.

Carlos Jaschek, the former director of CDS, has written a valuable book on *Data in astronomy*; it was published by Cambridge University Press in 1989.

CODATA. Only four astronomers attended the 11th International CODATA Conference, which was held in Karlsruhe, Germany, in September 1988, and the 12th Conference, which was held in Columbus, Ohio, USA, in July 1990, was similarly largely ignored by astronomers. This is unfortunate since CODATA is a very active organisation dealing with the acquisition, validation, management and distribution of data and with the development and use of database systems and new software and hardware tools. The 1990 meeting was partially devoted to information management for the

worldwide Global Change programme, which has been initiated by the International Council of Scientific Unions; many aspects of database management that are closely related to astronomy and space-science endeavours were discussed. (The special issue no. 41 of *Science International*, the ICSU Newsletter, is devoted exclusively to the activities of the ICSU family and its partners relative to the environment and global change.)

The archiving of observational data. The astronomical community is facing a very rapid growth in the volume of digital data that are obtained directly at the time of observation by both ground-based and space-based instruments, and in addition the information on many thousands of sky-survey photographic plates is being digitised. The volume of such data is several orders of magnitude greater than that of the catalogues of reduced and evaluated data that are now held and made available by the data centres whose reports follow. Many questions arise about the extent to which such data should be archived and made available to the community at large, and in addition decisions are needed about the hardware and software formats that should be used for the archiving and the distribution of the data. These matters will be discussed at a Joint Commission Meeting to be held at the next General Assembly.

Stellar Data Centre at Strasbourg (CDS). The Stellar Data Centre at Strasbourg has been integrated with the Observatory, and Dr M. Creze is the director of the combined organisation. The Commission is greatly indebted to Dr Carlos Jaschek, who has been the Director of CDS for the past 18 years, for all that he has done to develop the CDS facilities and to make them available throughout the world.

The acquisition of new data, the updating of the bibliography and other activities have continued satisfactorily, and version 3 of the SIMBAD database became operational on 30 June 1990. SIMBAD is now accessible by more than 250 institutes throughout the world; access by the U.S. community was greatly improved by a special access facility provided in 1989 through NASA sponsorship. More than 500 catalogues are available for distribution on magnetic tape. The CDS assisted in the establishment of data centres in China, India and Argentina.

The 1990 editions of the *International Directory of Professional Astronomical Institutions (IDPAI)* and of the *International Directory of Astronomical Associations and Societies (IDAAS)* have been published as *CDS Special Publication No. 13* and *No. 14*, respectively. Each contains more than 3000 entries from about 90 countries. Other directories in preparation are *Acronyms and Abbreviations in Astronomy and Space Sciences* (as *CDS SP 15*) and *Astronomy, Space Sciences and Related Organisations of the World* (as *CDS SP 16*).

Soviet Centre for Astronomical Data, in Moscow, USSR. (Director: Dr O. B. Duzhnevskaya) The Soviet data centre maintains the CDS database on magnetic tape and provides a network link to the SIMBAD database. The general catalogue of variable stars, including cross-identifications, is being continuously updated in cooperation with the Sternberg Institute. The first two volumes are available on magnetic tape and two more volumes (on extragalactic objects and the reference catalogue) should be available on magnetic tape by the middle of 1991. The information from about 500 000 hand-written cards is being transcribed onto magnetic tape.

New catalogues have been prepared on: star-formation regions in the Galaxy (about 1000 regions from about 1000 papers); stars exciting diffuse nebulae (nearly 300 objects); and masses and ages of stars (1030) in clusters (12). A database on stars belonging to associations is being constructed. The bibliographic catalogue of star clusters and associations, which is being prepared jointly with scientists from Czechoslovakia, Hungary and eastern Germany, now contains information for about

1500 objects. Over 30 catalogues that were produced by Soviet astronomers were sent to the CDS at Strasbourg.

A draft agreement on direct cooperation between the Soviet Centre and the Astronomical Data Center of the Goddard Space Flight Center is under consideration.

Astronomical Data Analysis Centre, Tokyo, Japan. (Director: Dr S. Nishimura) This new data centre was established at the National Astronomical Observatory in Tokyo on 1 January 1989 as a result of the transfer of the data previously held at the Kanazawa Institute of Technology. Catalogues are obtained by exchange with other countries and are distributed on request. Some validation work is carried out. The archive includes IRAS data.

NASA/GSFC Astronomical Data Center (ADC) at Greenbelt, MD, USA (Director: W. H. Warren Jr) The ADC is part of the very much larger National Space Science Data Center, which covers the Earth and planetary sciences as well as astrophysics and space plasmas. The ADC cooperates closely with CDS and holds over 500 catalogues, many of which are available on-line as well as on magnetic tape. The ADC also provides an on-line information system for catalogues with sophisticated capabilities for searching by title, author, and keywords; it includes an interactive ordering service. The system is being heavily utilised by the astronomical community and is available via SPAN and the Internet.

The ADC has produced, in collaboration with the U.S. Naval Observatory, a new machine-readable version of the *SAO Catalog* that contains positions and proper motions on the J2000.0/FK5 system. Other new products include: an integrated uniform version of the Yale Zone Catalogues; corrected versions of the complete Durchmusterung (DM) catalogues; and a complete cross-index between the designations of the Cordoba and Cape photographic Durchmusterung catalogues.

An experimental CD-ROM disc containing 34 catalogues was distributed to 202 requestors, and the ADC plans to distribute a CD-ROM disc containing over 100 catalogues at the General Assembly in Buenos Aires.

The NASA/IPAC Extragalactic Database (NED) is now available to the world-wide astronomical community for use on an experimental basis. It covers a broad range of data, which are available via electronic networks, such as SPAN. NED has been developed at the Jet Propulsion Laboratory, California, USA.

Other data centres. Other data centres that are based on the CDS catalogues on magnetic tape are at the Zentralinstitut für Astrophysik, Potsdam, Germany, the Beijing Observatory, China, the La Plata Observatory, Argentina, and the Inter-University Centre for Astrophysics, India. There are also numerous centres that specialize in particular objects or wavelength regions, and there are other major centres that hold the data from particular space missions, but there is at present no comprehensive up-to-date list of such centres.

The enormous growth in the rate of acquisition of astronomical data and in the number of objects that are observed by both ground-based and space-based telescopes (the Hubble Space Telescope is expected to transmit up to 2 gigabytes per day) makes it all the more important that both the catalogues of reduced data and the scientific papers that describe and use them should conform to the appropriate recommended standards in respect of such matters as formats, units, designations and bibliographic references.

It is expected that there will be a Joint Commission Meeting at Buenos Aires to examine the practicability of establishing a database on CD-ROM discs for material objects in the Solar System.

FITS STANDARDS (P. J. Grosbol)

The FITS Working Group was confirmed by a resolution of the IAU General Assembly at Baltimore (*Trans. IAU 20B*, 51-2), which also adopted extensions to the FITS standard for formats for the encoding of astronomical images and associated data. (FITS = Flexible Image Transport System; the new extensions are described in *Astron. Astrophys. Suppl.* **73** (1988), 359-364 & 365-372.) The Group acts as the authority for the standard, and will review, approve and maintain any future extensions. A FITS Support Office was created by NASA at the Goddard Space Flight Center in 1989; it will assist the Group and individual users. One of its first tasks is to prepare a Users Manual for FITS.

The Group has held two meetings (at Charlottesville in January 1988 and at Green Bank in November 1989) and has also carried out its activities by correspondence. The topics considered include: the representation of non-linear coordinate systems; the encoding of single-dish radio data; the adoption of the IEEE floating-point agreement; a proposal for hierarchical keywords; the physical recording standard for FITS files on new high-density devices; and a new extension that would allow the highly-efficient storage of arrays and numbers in binary format. Further details may be obtained from the chairman (at ESO, Garching) or from the vice-chairman, D. Wells (at NRAO, Charlottesville).

DESIGNATIONS (F. M. Spite)

After the meeting of the Group in Baltimore, H. Jenkner and W. S. de Boer prepared a summary of the 'Guidelines' on designations that were issued after the General Assembly in New Delhi. This summary is included in the *IAU Style Manual* as Appendix D. The editors of the principal astronomical journals have been requested to include this summary with their instructions to authors; many editors have responded positively, although some minor revisions have been suggested. The summary has the title 'Specifications concerning names, designations and nomenclature for astronomical radiation sources outside the Solar System'; it includes short lists of references and of astronomers who are prepared to give advice about the choice of new designations. It is hoped that the widespread diffusion of these specifications will lead to a reduction in the number of confusions, ambiguities and errors in the literature.

Correct and unambiguous designations are essential to the efficient storage, exchange and retrieval of astronomical data, and so data centres are being encouraged to ensure that the guidelines for designations, as well as the standards for bibliographic references, are followed in databases, such as SIMBAD (CDS, Strasbourg) and NED (JPL, Pasadena). M.-C. Lortet and P. Dubois are preparing a list for on-line consultation of the acronyms that are already in use. A Second Supplement to the 'First Dictionary of the Nomenclature of Celestial Objects' has been prepared by S. Borde and M.-C. Lortet and is to be published in *Bull. d'Inf. CDS*.

The Working Group of Commission 34 on the designations of extended sources has prepared a report that is being circulated for comment. It is clear that the present Guidelines must be extended since they are not adequate to cope with the designation of complicated sources that are observed in different wavelengths.

EDITORIAL POLICY (P. A. Wayman)

The first concern of the new Working Group on Editorial Policy has been the adoption by astronomical journals of the specifications on designations referred to in the previous section. The major task facing the Group is to encourage the

general adoption of the other recommendations of resolution A3 of the last IAU General Assembly concerning the use of SI units and of standard forms for bibliographic references (see *Trans. IAU* 20B, 42-3). These and other aspects of the preparation and publication of astronomical papers are discussed in the *IAU Style Manual*, which is printed in the same volume and which is also available as a reprint from the IAU Office in Paris. The principal recommendations of the Manual are summarised on pages Six-Sxii. The Group will also consider what changes should be made for the next edition of the Manual.

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INFORMATION RETRIEVAL (L. D. Schmadel)

The Working Group on Information Retrieval set itself five tasks in addition to those of the Task Groups on the thesaurus of astronomical terms and on the revision of UDC 52. Progress has been made on some, but not all, of these tasks.

The IAU Vocabulary of astronomical terms was revised again in the light of comments received from astronomers and librarians, and it was then submitted for publication in *Bull. d'Inf. CDS*.

The Group is cooperating with the Group on Designations and with CDS on the standardization of the designations of objects for retrieval purposes. There is also cooperation between the principal abstracting services, which try to maintain a common list.

A concordance showing the relationships between the classifications used by the physics abstracting services (in PACS) and in *Astronomy and Astrophysics Abstracts* (AAA) was finished in 1989. This enables the automatic conversion of AAA chapter numbers into PACS codes.

The maintenance of the guidelines for the preparation of abstracts is largely covered by that of the *IAU Style Manual* and by the above tasks. There is as yet no progress to report on the preparation of user aids for information retrieval in astronomy.

IAU THESAURUS (R. M. Shobbrook)

The preparation of an IAU Thesaurus of astronomical terms has proved to be even more difficult and time-consuming than was expected. The project has received the active cooperation of many librarians but of only a small number of astronomers who are required to provide feedback on the current usage of terms. A meeting was held during the conference of the Special Libraries Association in Pittsburgh, PA, USA, in June 1990 to review progress and to decide on further action. The comments that had been received on Version 2 of the thesaurus were discussed, and it was agreed that the chairman should proceed with the preparation of Version 3 using a software package called LEXICON. It is hoped that this will be ready for presentation at the General Assembly in 1991. This thesaurus is seen as a valuable reference tool for librarians and as a standard for use in the indexing and abstracting of astronomical papers and other publications. The thesaurus may be translated into other languages.

REVISION OF UDC 52 (G. A. Wilkins)

The chairmanship of the FID committee for the revision of UDC 52 (Astronomy and Geodesy) has passed from G. A. Wilkins to Dr I. S. Shcherbina-Samoilova at VINITI in Moscow. (FID = International Federation for Information and Documentation, which is responsible for the maintenance of the schedules of the Universal Decimal

Classification.) Astronomical users of UDC are invited to send their suggestions for the revision of UDC 52 to Wilkins or to A. R. Macdonald at the Royal Observatory, Edinburgh, UK.

COMPUTER SOFTWARE AND COMMUNICATIONS (C. R. Benn)

The aims of the new Working Group on Computer Software and Communications are: the promotion of international cooperation in astronomy through the use of direct communications between computers; the representation of astronomers' needs to the developers of software; the encouragement of the adoption and use of software standards (but not the definition of new standards); and the facilitation of the exchange of software. The Group has a nucleus of 7 members and a mailing list of over 100 astronomers at over 90 institutions. The electronic-mail addresses of a much larger number of astronomers are given in a directory that is available from the Royal Greenwich Observatory at Cambridge, UK.

ASTRONOMICAL LIBRARIES (W. H. Warren Jr and H. Z. Knudsen)

The primary aim of the new Working Group on Astronomical Libraries is to encourage greater understanding and cooperation between astronomers and librarians in the libraries that the astronomers use; for example, many librarians would welcome more advice, support and feedback from astronomers about the wide range of services that are, or could be, provided. The Commission notes, with pleasure, the increase in the cooperation between astronomy librarians that has developed since IAU Colloquium 110. In addition to the Physics-Mathematics-Astronomy Section of the Special Libraries Association, which has primarily, but not exclusively, American members, there is now a European Group of Astronomy Librarians (EGAL). This Group was formed as a result of the initiative of S. Laloe (Paris) and A. Fishburn (MPI, Munich), and distributes the *EGAL Bulletin* and the *EGAL Directory* to its members.

One example of the cooperation between librarians is the preparation of the second edition of the *Union List of Astronomy Serials*; it will include the holdings of 39 libraries. It is being compiled and edited by J. Bausch (Yerkes). In addition, Huang Bi-Kun of the Purple Mountain Observatory at Nanjing, China, is endeavouring to prepare a catalogue of the astronomy serials of the world, and she would be glad to receive information about serials that are not listed in *Astronomy and Astrophysics Abstracts*. Another example is the pairing (or twinning) programme organised by M. Cummins (Astronomical Library of the University of Toronto) to put librarians from institutions that have great difficulties in obtaining publications from other countries into contact with librarians from major institutions with greater resources. So far six such pairs have been set up, and worthwhile exchanges of information and publications have been reported.

A PERSONAL POSTSCRIPT

My retirement from the Royal Greenwich Observatory in July 1989, the move of the RGO to Cambridge in April 1990, and the stagnation of the UK housing market, which has led to my splitting my life between Eastbourne and Sidmouth, have made it more difficult for me to respond quickly to incoming letters and to prepare and distribute circular letters in good time. It is, however, clear from the above reports that several members of the Commission have been very active and I hope that others will assist them to carry through to successful conclusions the tasks that were identified at Baltimore. Finally, I would like to thank all who have contributed to this report and to the activities of the Commission during this period.