NSSDC news
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NSSDC's Archive Moves to New Goddard Facility

In order to have its digital archive closer to the NSSDC Computer Facility and the NSSDC-used tape drives and computers of the NASA Center for Computational Sciences, NSSDC moved the entire Goddard-resident portion of its digital archive from its 25-year home in Goddard's Building 26 to Building 28 in April.

The move involved relocating over 22,000 magnetic tapes, 10,000 CD-ROMs, and smaller numbers of other media. Building 26 will remain NSSDC's home in that its management, civil service staff, Coordinated Request and User Support Office (CRUSO), film archive and photo lab, and other smaller groups will remain there.

In a space-constrained environment, the move enabled NSSDC to save 2000 square feet—half by using movable tape racks and half by using modular furniture to house the 19 people who moved with the data. In its new configuration, NSSDC now uses approximately 1000 square feet for the tape and CD-ROM archive and 2500 square feet for the support staff, documentation, and the shipping/receiving department.

The newly occupied Building 28 area is a wing built in the past year. Some improvements have been realized in both environmental and data security areas, over the levels that had already been achieved in Building 26. For instance, there is a locally controllable air conditioning unit within the archive area, and our CD-ROM supply is now within that secure area.

The move was somewhat complicated by the fact that the old tape rack system was retained and mounted onto movable carriages. This required the removal of all 22,000 tapes before any of the racks could be moved and installed in the new location. It took the current staff three work days to unload, disassemble, and move the racks.

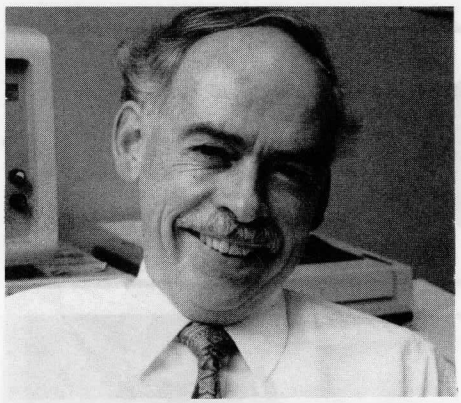
After the carriages were installed and the racks were mounted on the carriages, which required an additional 10 work days by the vendor, the process of moving the tapes was initiated. The reracking of the tapes, during which a complete tape-by-tape inventory was completed, required an additional four days. During the reracking procedure, the personnel and supporting documentation were relocated. Request activity during the move period was limited to processing of CD-ROM and photographic requests. Processing of CD-ROMs was only interrupted for three working days. Photographic requests were not affected.

With the move in full swing, NSSDC staff member Ron Buck reaches up to release tapes so that they can be boxed for transit.
—photo by NSSDC Photo Lab

As a result of very thorough planning and much hard work by the operations staff, the archives were only shut down for a total of three weeks, and there was only a minimal delay to requesters.

Ralph Post

inside:



Director's Message:

Scope of NSSDC's Science Support Unchanged by NASA Reorganization

In its ongoing quest to find the organizational structure that will maximize its potential value to our society, NASA has recently replaced the Office of Space Science and Applications (OSSA) with three new organizations: the Office of Space Science (OSS) – W. Huntress, Associate Administrator (AA); the Office of Mission to Planet Earth (OMTPE) – S. Tilford, Acting AA; and the Office of Microgravity Sciences and Applications (OMSA) – H. Holloway, AA. Of the six science discipline divisions previously in OSSA, the Astrophysics, Space Physics, and Solar System Exploration Divisions will reside in the new OSS, the Earth Science Division constitutes OMTPE, and the Life Sciences and Microgravity Divisions move to OMSA.

Prior to this reorganization, NSSDC was sponsored by the Information Systems Branch (J. Bredekamp, Head) of OSSA's multidisciplinary Flight Systems Division. This branch becomes the major element of the new Technology and Information Systems Office of OSS. Because NSSDC's charter was to support the NASA/OSSA data management and archiving endeavor across all six OSSA science divisions, there is potential for confusion about NSSDC's role in the new NASA organization. This article is intended to dispel any such confusion.

Let's first review NSSDC's recent activities. On the one hand, NSSDC provides services that have been equally relevant to the former OSSA science Divisions. These include the NASA Master Directory and other information services and the NASA/OSSA Office of Standards and Technologies (NOST), which is being renamed the NASA/Science Office of Standards and Technologies.

On the other hand, NSSDC provides for the management, archiving, and dissemination of data from spaceflight missions. NSSDC presently has much data relevant to the new OSS and OMTPE, but very little data relevant to OMSA. Further, while NSSDC provides a multifunction data management infrastructure available to the NASA science divisions to complement their Discipline Data Systems (DDS), the roles played by NSSDC and by each active DDS, concerning recent and future missions, had differed from one science division to the next and, in some cases, were still evolving.

The new associate administrators for the three new Offices agree that, while each of the six formerly OSSA science divisions will continue evolving and operating its DDS to most effectively meet division-specific needs, all three offices will continue looking to the multidisciplinary capabilities, including NSSDC, provided by the new OSS/Technology and Information Systems Office.

This means that NSSDC will see no significant change in its charter or scope. It will continue offering cross-cutting directory and standards support to the NASA/science endeavor (i.e., the science divisions now distributed across three new offices), and it will continue to provide a capable data management infrastructure equally available to all those divisions to be used, in division-specific ways, in concert with DDSs.

In the past, ISB's activities, including NSSDC, were guided by OSSA's Information Systems Management Board (ISMB). This ISMB was chaired by OSSA's Assistant AA for Science and Applications (J. Alexander), and had members from each science Division. It is presently planned that the ISMB will continue in this mode, with representatives from all the multi-office science divisions, and with its chairmanship rotating among the three participating offices.

NSSDC is very pleased to be asked to continue providing support across the full science domain of the former OSSA. We believe we can bring significant cost efficiencies and end-user benefits into the overall NASA science data management and archiving endeavor.

Joseph King

NSSDC news

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To subscribe, change your address, or request data, please contact the Coordinated Request and User Support Office by e-mail at REQUEST@nssdca.gsfc.nasa.gov or call (301) 286-6695.

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Unprecedented Quantity of Magellan Data Flow into NSSDC

Since the emergence of NASA's Discipline Data Systems (DDS), NSSDC has played a variety of roles in support of the NASA Data Management and Archiving (DMA) environment. In the case of the Planetary Data System (PDS), NSSDC provides both a deep archiving function and a routine data dissemination function. In an effort coordinated by PDS, NSSDC, and the Magellan Project Office at JPL, NSSDC is beginning the deep archiving of approximately 16,000 tapes holding low-processing-level data from the Magellan mission.

Data received by NSSDC through March, 1993, represent a total of 9,599 tapes. They are:

- full-resolution basic image data records (F-BIDRs, 3,907 tapes, NSSDC data set ID 89-033B-01A)
- altimetry engineering data records (ALT EDRs, 713 tapes, data set ID 89-033B-01a)
- compressed basic image data records (C-BIDRs, 802 tapes, data set ID 89-033B-01b)
- synthetic aperture radar engineering data records (SAR EDRs, 4,086 tapes, data set ID 89-033B-01c)
- altimetry and radiometry composite data records (ARC DRs, 91 tapes, data set ID 89-033B-01d)

JPL is shipping these tapes in lots of 1000 to 2000 at a time. Because of space constraints at NSSDC, the tapes are being sent to the Tape Staging and Storage Facility (TSSF) managed by Goddard's Information Processing Division. NSSDC staff members Ron Buck, Vanessa Davis, and Ralph Post have been meeting incoming shipments at TSSF (about 10 miles from GSFC/NSSDC), verifying inventories, and reboxing tapes for permanent storage at the Washington National Records Center in Suitland, MD. During this transition process, excellent support has been received from TSSF staff, notably Isaac Wanser and his team.

These low-level data products are not intended for general distribution at this time. One PDS node or another also holds a copy of each of these tapes, and it is expected that any request activity for these tapes will be directed to the appropriate PDS node. Please contact PDS/Central at JPL (818-306-6295) or NSSDC's Coordinated Request User Support Office for further information.

Higher-level data products derived from these low-level data sets have already been produced through mid-mission and will continue to be produced on CD-ROM. These products have been discussed in this newsletter previously and are widely disseminated by NSSDC.

The archival of the low-level data products will ensure that more detailed studies of Magellan can take place and that future recalibrations of the data can be performed. Plans within PDS already exist for the migration of the F-BIDR tapes onto Write-Once CD-ROM disks at Washington University (Arvidson).

Ed Bell, Ralph Post

NSSDC To Display Systems at American Geophysical Union Meeting in Baltimore

NSSDC will be demonstrating several of its on-line data and information systems and some of its CD-ROMs at the May 1993 Baltimore meeting of the American Geophysical Union. These demonstrations will be in a double booth adjacent to AGU's own booth. The NSSDC booth will also be adjacent to those of the NASA Science Internet and the NASA Center for Computational Sciences.

Information systems to be demonstrated include the NASA Master Directory, the newly on-line RSIRS system with much spacecraft, experiment, and NSSDC-held data information, the Personnel Information Management System (PIMS), the Standards and Technologies Information System, and the STEP Bulletin Board.

Access to on-line and "near-line" data via NDADS/ARMS (NSSDC Data Archive & Distribution System/Automated Retrieval Mail System), NODIS (NSSDC Online Data and Information Service), and ANONYMOUS/FTP accounts also will be demonstrated.

Jointly with the Space Physics Data Facility, NSSDC will demonstrate on-line geophysical models, Satellite Situation Center tools for satellite ephemeris analysis and visualization, and tools for the visualization of data in ISTP-compliant Common Data Format (CDF).

Finally, NSSDC will demonstrate many of the CD-ROMs it disseminates, including **planetary imagery** from Voyager, Magellan, Galileo, and Viking Orbiter; **astrophysical data** from Einstein (HEAO-2), IRAS, and astronomical source catalogs; **Earth ozone data** from Nimbus 7; and **Voyager 2 particles and fields data** from Neptune.

If you expect to be at the Baltimore AGU meeting, please stop by NSSDC's booth to experience some of these systems and chat with data center staff members.

Joy Beier
Joseph King

Catalog Interoperability/Master Directory Project Receives '93 NASA Group Award

On March 30, NSSDC's Catalog Interoperability/Master Directory (CI/MD) Project received one of the NASA Group Achievement Awards for 1993 from the Goddard Space Flight Center Director, Dr. John Klineberg. The certificate reads: "In recognition of your outstanding achievement of significantly improving the availability and access to data and related information to the world science community."

As you perhaps know, the Master Directory offers brief overview information about available data sets in the Earth and space sciences. These data sets are not only NASA data but also include data from around the world. The directory of information is a service offered to the world free of charge through computer network and dial-in lines.

The Master Directory at Goddard is one of many directory nodes of the International Directory Network (IDN) that facilitatethe sharing of information about data throughout the world through the exchange of Directory Interchange Format (DIF) files. The IDN came about through the cooperation of the member agencies of the Committee on Earth Observations Satellites (CEOS), but the team at GSFC is the main coordinating body for the IDN.

CI/MD group members shown are (left to right) John Scialdone, Paul Kuin, Joy Beier, Lu Gan, David Irvine, Ted Johnson, Larry Shotland, Angelia Bland, Connie Li, Patty Bailey, Jim Thieman, Lorena Marsans, Janis Shipe, and Jon Mitchell.

The creation and the configuration controlof the DIF also was coordinated through the efforts of the project group at GSFC working together with many other organizations. As an indication of the fruit of all this labor, more than a thousand directory sessions are logged each month at GSFC, and the number has been growing continuously.

The IDN directories provide users with the opportunity to link to many other data information systems. From this capability, it became clear that it was important to make it easy for users to be able to use one system in conjunction with another, without having to go through a long period of learning how to use each individual system. This quality of interoperability is now the basis of numerous ongoing research projects in many communities. The CI/MD team has also done its part to promote, develop, implement, and encourage the adoption of interoperability methods wherever feasible and reasonable.

The photograph above includes most of the members of this team, but missing are Joseph King, Kathleen Moreland, Mary James, Erich Stocker, and Gail McConaughy. Every member, both past and present, has been an important influence on the way the project has evolved. Thus, the award truly captures the strength that has made the CI/MD effort successful. It recognizes the achievement of a closely knit, dedicated group that we hope will continue long into the future.

Jim Thieman

Interface Improves With Version MD-2

After some years of offering a simple menu-based interface to the Master Directory, NSSDC staff members recently have developed and made operational a windows-based interface. This interface was developed using JYACC Applications Manager (JAM) software with a client/server architecture. The new interface, along with some underlying changes also developed, is referred to as MD-2.

New functionalities of MD-2 include the ability to view valid values for many fields automatically, the ability to order the names of DIFs returned by a search in various ways, access to results via E-mail or FTP, and use of arrow keys. Entry to the NASA Master Directory through NODIS (NSSDC On-line Data & Information Service) is unchanged. At the start of an MD session, one is asked to choose between using MD-1 and MD-2 interfaces. An increasing fraction of MD users are opting for MD-2. Readers are reminded that, just as in the MD-1 interface, user comments are easy to make and are very much appreciated by NSSDC's Master Directory staff.

Although the MD-2 interface has been built to be reasonably self-evident and it has much HELP functionality, a User's Guide has been prepared and is available upon request. Please ask by e-mail to: BLAND@nssdca.gsfc.nasa.gov.

Patty Bailey, Janis Shipe

NSSDC Participates in Information Systems Branch Program Review

NSSDC participated in the mid-year Program Review of its Headquarters sponsor, the Information Systems Branch (ISB) headed by Joe Bredekamp. Persons from HQ, JPL, Ames, and Goddard attended this review at Goddard on April 14-15.

Representatives of the six formerly HQ/OSSA science divisions, now distributed across three AA-level offices, also attended. By agreement of the three new Associate Administrators, the science discipline domain to be supported by the ISB program will remain the same.

The meeting was structured as a series of presentations on the first day, covering data management/ archiving, scientific computing, networking, and an information systems research and technology program. The principal part of the data management/archiving presentations was by NSSDC on its activities and plans.

Additional presentations addressed activities such as the High Performance Computing & Communication (HPCC) Initiative which are sponsored by organizations other than the Information Systems Branch. Approaches to leveraging these endeavors for the benefit of the NASA science endeavor was a theme of the review.

On the second day, the attendees divided into five separate groups to address various issues ranging from the program's vision, to technology infusion, to the relative roles of the ISB's data management and data archiving infrastructure (primarily NSSDC) and

(from previous column)

of the individual NASA science divisions. Preliminary findings and recommendations of these groups were made to the group in a closing plenary session. A final report is being assembled.

Joseph King

HEAO Data Brought On Line on NDADS

Data sets from NASA's High Energy Astronomy Observatory mission HEAO-2 (Einstein Observatory) have been archived on the NSSDC Data Archive and Distribution System (NDADS). These are in addition to HEAO-2 data sets that were released to the community by the Smithsonian Astrophysical Observatory on CD-ROMs prior to 1992, which have been available on NDADS since June, 1992. Plans are also underway to make data sets from HEAO-1 available through NDADS.

This work is carried out by NSSDC as part of the High Energy Astrophysics Science Archive Research Center (HEASARC) collaboration with the Goddard Space Flight Center (GSFC) Laboratory for High Energy Astrophysics. The HEASARC was urged by its User Group to bring a FITS-formatted version of the HEAO-2 Solid State Spectrometer (SSS) data and the HEAO-1 A2 all-sky X-ray scanning data to a state of easy accessibility.

The SSS was a cryogenically cooled non-dispersive X-ray spectrometer with GSFC as the Principal Investigator (PI) institution. The SSS data are significant because the SSS yielded high quantum efficiency moderate resolution (dE~160 ev) spectra in the energy range 0.6-4.5 keV. It made 632 distinct observations in ten months of operation. Recent discoveries using SSS archival data include significant excess absorption in clusters of galaxies that is indicative of cooling flow.

The HEAO-1 A2 experiment consisted of large-area proportional counters that spanned the energy range from 0.2-60 keV. GSFC was the PI institution. The primary goal of the experiment was to provide a complete survey of the X-ray sky and to give broadband spectra and time-resolved spectra of sources. It also provided spectra of maps of the diffuse X-ray background. It has been the most sensitive data base for performing all-sky studies. The HEAO-1 A2 data will be important in supporting observation planning for ASCA (ASTRO-D), a Japanese-US cooperative X-ray astronomy mission that was launched on February 20, 1993. The ASCA Guest Observer program will begin in September, 1993.

The data originally resided on the NCCS IBM system at GSFC. They were transferred via INTERLINK to the NSSDC VAX computer cluster and ingested into NDADS. The SSS data were written to approximately 2.5 12-inch WORM platters and comprised about 14.6 GB of data. Work was completed for SSS in February.

The HEAO-1 A2 data set is of comparable size and the ingest is scheduled to be completed later this year. HEASARC personnel will be able to access the SSS and HEAO-1 A2 data from NDADS via NSSDC's convenient Automated Retrieval Mail System (ARMS) interface, which will convert these data to the more user-friendly and software-supported FITS format. HEASARC plans to make the FITS-formatted version of the SSS and HEAO-1 A2 data accessible to the science community via NDADS by the end of 1993.

Cynthia Cheung

NSSDC Maintains Diverse Archive of Space Physics Models

Theoretical and empirical models for different parameters and regions of the Sun-Earth system are essential science tools in the quest to understand the multitude of processes that shape the solar-terrestrial environment. These models also provide much-needed forecast capabilities for the design, operation, and navigation of manned and unmanned vehicles in space. Other areas of model applications include telecommunication, radioastronomy, Earth observation from space (geodesy, altimetry, and gravimetry) and search and rescue from space.

In support of the space physics community and NASA scientists in particular, NASA's NSSDC has accepted as one of its responsibilities the archiving and distribution of model software. At present, NSSDC's model holdings encompasses about 50 - 60 software packages and is steadily growing. This article describes the unique models archive with special emphasis on the policies and procedures NSSDC has adopted for maintaining, distributing, and receiving software packages.

All of the software packages archived at NSSDC relate to empirical models. This restriction (no theoretical models) comes quite naturally, because use of theoretical models requires, in general, a very close collaboration between model user and model authors; thus, they are not as freely distributable as empirical models. In most cases, theoretical models apply a numerical scheme (linearization and differentiation) to "solve" a system of equations, e.g., Boltzman equations.

A potential user of these models needs to be familiar with the science background (e.g., assumptions, simplifications, cross-sections, etc.), as well as with the mathematics of the numerical approach (approximations, effect of starting conditions, boundary conditions, etc.). Empirical models are established by fitting suitable functions to data: The wider and the more homogeneous a data base, the better the resulting empirical representation.

The extent and content of NSSDC's model holdings are described the following publications:

Bilitza, D., Solar-Terrestrial Models and Application Software, National Space Science Data Center Report NSSDC 90-19, *Greenbelt, Maryland, July 1990.*

Bilitza, D., Solar-Terrestrial Models at the National Space Science Data Center, J. Atmos. Terr. Phys. 53, *1207-1211, 1991.*

Bilitza, D., Solar-Terrestrial Models and Application Software, Planet. Space Sci. 40, *541-579, 1992.*

The list of contents from the latest of these provides a good overview of what is available from NSSDC for different regions and parameters of the solar-terrestrial environment. The table below is based on this list.

Table of Models

model name	status
Ionosphere	
General Models	
International Reference Ionosphere	F
Electron Density Models	
Chiu Ionospheric Model	E
Bent Ionospheric Model	A
F2-Peak Models and Applications	
CCIR foF2 and M(3000) F2 Model Maps	C
URSI foF2 Model Maps	E
ISS-b foF2 Maps	E
Electron Temperature Models	
AEROS Electron Temperature Model	F
AE/ISIS Electron Temperature Models	F
Ion Composition and Drift Models	
DY Ion Composition Model	F
ISR Ion Drift Model	E
Electric Field	
IZMIR Electric Field Model	E
Miscellaneous Auroral Models	
Auroral Oval Representation	A
Auroral Absorption Model	A
Atmosphere	
Density and Temperature Models	
U.S. Standard Atmosphere	A
Jacchia Reference Atmosphere	A
Atmospheric Handbook	A
COSPAR International Reference Atomsphere: 0–120 km	B
COSPAR International Reference Atmosphere: Thermosphere	F
MET Model	E
MSIS Model	F

Table of Models, *continued*

model name	status
MSISE Model	E
Wind Models (Thermosphere)	
Horizontal Wind Model (HWM)	F
Magnetosphere	
Magnetic Field Models (Main Field Only)	
Jensen-Cain Model Coefficients	C
GSFC (9/65) Model Coefficients	C
GSFC (12/66) Model Coefficients	C
POGO (3/68) Model Coefficients	C
POGO (10/68) Model Coefficients	C
POGO (8/69) Model Coefficients	C
POGO (8/71) Model Coefficients	C
AWC (75) Model Coefficients	C
IGS (75) Model Coefficients	C
MGST (6/80) Model Coefficients	C
MGST (4/81) Model Coefficients	C
GSFC (9/80) Field Model	C
GSFC (12/83) Field Model	C
IGRF 1945–1980 Model Coefficients	C
GSFC (11/87) Model Coefficients	C
Magnetic Field Models (with External Sources)	
MDTILT Magnetic Field Model	E
Olson-Pfitzer Field Model	E
Mead-Fairfield Field Model	E
Geotail Field Model	E
Tsyganenko Magnetic Field Model (Related Software)	E,G
Magnetic Field Models (Related Software)	
FIELD/FIELDG	D
INVAR/NEWMAG	D,G
ALLMAG/INVARA/LINTRA	D,E,G
FELDG/SHELLG/INTELG	D,G
NEWBL	D,G
TRAJLST	D,E,G
BILCAL/IGRF	D,F,G
Trapped Particle Models and Related Software	
AE/AP Trapped Particle Flux Maps	B
MODEL Program	D
RADBELT	F
FLOUT Transformation	A
SOFIP	G
SHIELDOSE	G
Sun and Interplanetary Space	
Solar Reference Spectra	
Revised SERF2 Solar EUV Flux Model	F
EUV Reference Spectrum 74113	B
Solar Flare Protons	
SOLPRO Model	E
Planets	
Venus	
PV Thermospheric Model	E
PV Ionospheric Model	E
Venus International Reference Atmosphere	A

Space Physics Models, *from p. 6*

Most importantly, NSSDC's model archive includes international standard models: the COSPAR International Reference Atmosphere (CIRA) of the Committee on Space Research (COSPAR), the International Reference Ionosphere (IRI) of COSPAR, the International Union of Radio Science (URSI), and the International Geomagnetic Reference Field (IGRF) of the International Association of Geomagnetism and Aeronomy (IAGA). These models are established and regularly improved by special working groups set up by the responsible scientific unions. NSSDC's international arm, the World Data Center A for Rockets and Satellites, is one of the centers that receives the newest editions of these international standard models for distribution to interested users. The latest versions of these models, CIRA-86, IRI-92, IGRF/91 are all available from NSSDC.

Noteworthy also are a few other often-requested models: the Mass Spectrometer-Incoherent-Scatter (MSIS) thermosphere model and the Horizontal Wind Model (HWM) developed by A.E. Hedin and colleagues, the AE/AP radiation belt models developed by J. Vette and colleagues, the Tsyganenko Models of the Earth magnetic field (including external sources developed by N.A. Tsyganenko and colleagues), and the SERF-EUV model of the solar EUV fluxes developed by W.K. Tobiska and colleagues. NSSDC archives and distributes the MSIS-86, MSISE-90, HWM-90, AE-8/AP-8 and earlier versions, Tsyganenko 1982, 1987, 1989, and the April 1992 version of SERF-EUV.

In most cases, an empirical model consists of a set of mathematical functions and of the matrix of coefficients that were obtained by fitting the system of functions to the underlying data base (examples are MSIS, IGRF). Some models are provided simply as tables of parameter values (e.g., CIRA, AE-8/AP-8), other more complex models include internal optimization and merging procedures (e.g., IRI). Only the simple tabular models can be used directly in printed form, all others require some form of access software to obtain model parameters for specific conditions. In addition to the actual model software, NSSDC also archives a limited number of supplementary programs that use models for application that are of interest to a wider circle of users. Examples are programs that, for a given geomagnetic field, calculate L-values or do field-line tracing. In summary, the model packages archived and distributed by NSSDC (listed in the table, left) can be grouped in the following categories:

A - Model available only in printed form (book, report, microfiche), these are mostly models consisting of set of tables of model parameters
B - Tabular model in the form of computer data files with software for parameter access and interpolation
C - Model coefficients
D - Software to calculate model parameters from model coefficients
E - Model software packages including coefficients, programs, and subroutines
F - Model software packages including coefficients, programs, subroutines, and interactive driver (source code and executables; can be used directly on PCs)
G - Application programs that can be used in conjunction with the models

Each month NSSDC's Request Coordination Office receives about 10 - 20 requests for models or related software. In most cases the program and/or coefficients and read_me-files are sent out on PC diskette (5 1/4, 3 1/2 inch) or are transferred on line on computer networks (COPY or FTP). A small number of requests, mostly from overseas, require the software on 9-track magnetic tape. The master copy of each software set is held in a special account from which it is copied onto diskette, tape, or to a remote requester account as required to fulfill the request. As new versions become available, the master copy is updated or replaced as necessary and the changes are documented in an UPDATE text-file.

An important aspect of NSSDC's activities related to models is effort to improve the accessibility and availability of model software. Guidebooks and catalogs are published to provide users with a good overview of what models and software are available for a specific region and parameter and how best to access those models. Interactive "frontends" were developed for several of the most frequently requested models, including IRI, CIRA, MSIS, HWM, IGRF, and AE-8/AP-8. These driver programs prompt the user for the required input parameters/choices and then calculate and display tables of model parameters. Driver and model software (including executables) are made available on diskette and can be readily executed on PCs (MS-DOS, IBM compatible systems). Users simply load the diskette and type the model name.

With the help of the interactive frontends, it is also possible to provide network users with the option to access and run the model programs online as part of the NSSDC Online Data and Information Service (NODIS) account. Online capabilities include reading and copying information about a specific model, obtaining the source code, running the model program, and transferring model output to the user's home node. To get to NODIS from a NSI-DECnet node, first SET HOST NSSDCA and then designate username: NODIS. Next, select menu-option GEOPHYSICAL MODELS, and from there follow the prompts and menus.

The IRI, MSIS, IGRF, and AE-8/AP-8 models are now available on NODIS. Several other models are in preparation for loading onto NODIS. Typically, about 250 accesses are recorded each month for the GEOPHYSICAL MODELS option on NODIS.

Software developers are encouraged to contact NSSDC to discuss the possible archiving of models and related software. Software should be of wide potential interest and must be well documented to enable its correct and independent use. An ideal documentation package would include the following:

- addresses of model author(s) and contact (including e-mail)
- list of subroutines/functions with brief description of their purpose
- main program inputs and outputs
- brief description of the model or application program
  - data bases used in developing the model
  - mathematical background and theoretical assumptions
  - potential applications
  - error estimates and uncertainties
  - plans for updates
- references

see Space Physics Models, *p. 8*

Welcome Aboard:

Two Scientists Join the Space Physics Data Facility

We would like to welcome two new additions to the Space Physics Data Facility, NSSDC's sister organization, which provides a range of "value-added support" services for the NASA space physics endeavor.

Ramona (Mona) Kessel joins us as a physical scientist with responsibility for supporting the international ISTP community in its use of the Common Data Format (CDF) and the Standard Formatted Data Unit (SFDU). Robert (Bob) Candey joins us as a computer scientist with much space science analysis background. The proximity of both scientists to NSSDC will be beneficial to NSSDC; for instance, in addition to her other duties, Mona will assist NSSDC in the acquisition of ISTP information and data.

From 1991 until she joined NASA this year, Mona worked as a senior data acquisition scientist in support of the NSSDC. Before coming to Goddard in 1991, she taught general physics and astronomy at DeKalb College, Atlanta, GA. Mona also spent some time abroad, working as a research scientist at Mullard Space Science Laboratory, England, from 1986 to 1990. She says, "My research has relied heavily on computer modeling and data analysis."

Mona earned her Ph.D. in physics in 1986 and her M.S. in physics in 1984, both from the University of Kansas, Lawrence. Her doctoral thesis dealt with energization of protons at interplanetary shock waves. Mona earned her B.S. in physics from Baker University, Baldwin, KS, in 1978. While at Baker, she was a presidential scholar and a member of the National Physics Honor Society.

Computer scientist John Candey and physical scientist Mona Kessel take a break outside NSSDC's Building 26 at Goddard.
—photo by NSSDC Photo Lab

Bob Candey will do long-term technology planning, support correlative data analysis, and assist in the archiving of space physics data sets. "I am helping define more effective systems for the archiving, access, display, and analysis of space physics data as part of the Space Physics Data System (SPDS)," Bob says.

Before coming to work for NASA this year, Bob had worked as a contractor at Goddard since 1983. "During the past year," he says, " I continued Dynamics Explorer data analysis and data archiving, and I worked with Jim Green, Shing Fung, Jim Thieman, and others on radio astronomy and ray tracing." Prior to working on the aforementioned projects, Bob spent much of his time on the Dynamics Explorer project, the GOES weather spacecraft design, and the Search and Rescue (SARSAT) project. He also served as principal engineer for an art professional services group.

In addition to writing numerous publications, Bob earned an M.S. in computer science from Johns Hopkins University in 1990 and a B.S. in optics engineering from the University of Rochester in 1981. He also studied systems simulation at The Catholic University of America in 1984 and aerial photo interpretation and analysis at George Washington University in 1986.

Although Mona and Bob have been here for only a short time, they have already become important members of the staff. Both the NSSDC and the scientific community are well served by their presence.

Kenneth Silberman

Space Physics Models, *from p. 7*

Source code must be provided and must adhere to vendor-nonspecific standards (e.g., Fortran 77), since NSSDC cannot commit to maintaining such software against operating system changes.

Publication of a paper describing the model in a peer reviewed journal is highly desirable and would enhance the acceptability of the model software into NSSDC's archive. It is NSSDC policy to ask software requesters to acknowledge the software source (e.g. , model authors) in any publication resulting from the use of the software product. Special arrangements can be made if software authors foresee a more active role and involvement in the usage of their program and would like coauthorship on resulting papers.

New software can be submitted to the NSSDC archive online or on diskette or tape. For more details please contact:

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NSI-DECnet: NCF::BILITZA

Dieter Bilitza, Joseph King

NSSDC/ADC Reissues Major Star Catalogs in Hardcopy Form

Nearly a century and a half ago, a German astronomer, Argelander, decided that an accurate map of the sky would be useful. The aim was to determine the position and approximate brightness for every star visible in the 78-inch telescope at the Bonn observatory. The faintest stars were approximately 50 times fainter than the stars visible to the naked eye.

The procedure was simple. The telescope was kept fixed at a particular declination (the astronomical coordinate, which is a reflection on the sky of terrestrial latitude) and the stars were allowed to drift through the field as Earth rotated. The telescope eyepiece contained fine hairs (cross hairs) parallel and perpendicular to the stellar drift. The observer called out or stamped his foot when a star crossed the vertical cross hair and an assistant noted the time. The observer also called out the brightness of the star and how far north or south of the horizontal cross hair the star passed. From this information, the exact position of the star could be determined.

Four large volumes of star positions and magnitudes for more than 325,000 stars were published between 1859 and 1862. The stars also were plotted carefully on maps of the sky, with the brightness of each star indicated by the size of the dot used to indicate its position.

The original catalog was limited to stars north of the celestial equator, which could be observed easily from Germany. Twenty-five years later, an extension to 22 degrees south of the celestial equator was published. It was produced in the same way and both the catalog and maps were also published. This still left a need for positions in the southern sky. Cordoba Observatory, in Argentina, undertook to provide these. Between 1892 and 1932, that observatory published four volumes of positions and maps produced in the same way as the northern maps. Although these catalogs cover the entire sky south of 21 degrees, they contain relatively few stars near the South Pole. Farther north, the faintest stars are about three times fainter than those cataloged by the Germans.

This still left a need for a more complete catalog near the south pole. This was fulfilled by the Cape Observatory, which was published in 1895-1900. By this time, the use of photography was becoming common in astronomy and the final set of catalogs was produced photographically. (This means that the magnitudes in the Cape catalog are in a bluer color than those in the other catalogs because the photographic plates common at that time were much more sensitive to blue light than are human eyes.) Although the catalog contains stars as far north as 19 degrees south of the equator, it is most complete in the far south and, therefore, complements the Cordoba catalog. In addition to the maps, produced photographically but not published, the plates were measured and a catalog of positions and magnitudes was produced which parallels that from the earlier efforts.

About 15 years ago, under the direction of Jaylee Mead, Teresa Nagy, and Wayne Warren, the Astronomical Data Center (ADC) undertook to provide these catalogs in electronic form. The undertaking was immense because 13 large volumes of numbers had to be key-punched and verified. A large number of people participated in the project. The Centre de Donnees Stellaires, in Strasbourg, France, did a substantial share of the key-punching.

Much of it was done by Barry Rappaport, then at the Jet Propulsion Laboratory, and by several people at the ADC. Various people worked on the verification. Those at the NSSDC included Beth Alexander, Carol Bergstrom, Margy Goodwin, Fran Barnes, Charleen Perry VanSteenburg, Ralph Post, Eugene Scarzafava, Paula Feldman, Kimberly Kniffen, and Rajendra Nigam. Dr. Warren, who continued to supervise the effort, also acknowledged the support of James Green and Joseph King. At least as many non-NSSDC persons also participated in the activity. These electronically accessible versions of the three catalogs have been available to the community for several years.

Although the Bonn catalogs have been reprinted several times, they have been out of print for some time. Moreover, the last reprinting of the Bonn catalog was in microfiche format, which required most people to read it with a magnifying glass. Therefore, the ADC surveyed a small section of the astronomical community to determine whether it was worth reprinting the catalogs from the computer tapes. Although the response was mixed, enough astronomers were enthusiastic that NASA is now doing so. In addition to being available in easily readable form, all of the known errors in the earlier versions have been corrected. In addition, several tests were run to discover other errors that also were corrected. Numerous stars that were added in footnotes in a 1903 version of the main Bonn catalog have now been interleaved in their proper places in the listing, and each star number has been included with its individual entry.

The printed catalogs should be available in May. They will be sent automatically to those institutions on a NASA mailing list for astronomical publications. Other astronomical libraries and professional astronomers who wish to use them in research or teaching may order them from the NSSDC Coordinated Request and User Support Office (CRUSO).

For requesters in the U.S., the address is:
NASA/Goddard Space Flight Center
Code 633.4
Greenbelt, MD 20071

Outside of the U.S., the address is:
World Data Center-A
for Rockets and Satellites
Code 633
NASA/Goddard Space Flight Center
Greenbelt, MD 20771 U.S.A

The set of 10 volumes also will be available at cost ($150) to people who do not qualify for a free copy.

Nancy Roman

Table of New Data Arrivals at NSSDC

NSSDC ID	PLATFORM	INSTRUMENT	CONTACT	MEASUREMENT	TIME SPAN	MEDIUM	STATUS
84-108B-02A	ERBS	SAGE II	McCormick	"Solar radiance, ephemeris & meteorologic"	11/1/84-1/31/93	mag tape	continued
84-108B-02C	ERBS	SAGE II	McCormick	stratospheric ozone extinction profiles	10/5/84-1/31/93	mag tape	continued
89-084B-10A	Galileo	SSI	Rudnyk	"press release photos, black & white"		4x5 bw negs.	new
89-084B-10B	Galileo	SSI	Rudnyk	"press release photos, color"		4x5 color negs.	new
74-040A-01A	Hawkeye 1	Magnetometer	Green	master science file (unreduced data)	3/19/77-4/1/78	4mm tape	new
74-040A-02A	Hawkeye 1	LEPEDEA	Green	master science file (unreduced data)	3/19/77-4/29/78	4mm tape	new
74-040A-03A	Hawkeye 1	ELF-VLF	Green	master science file (unreduced data)	3/19/77-4/29/78	4mm tape	new
73-078A-07A	IMP-J	Cosmic Ray Comp.	Murphy	"charged parts., count rate & pulse height"	10/30/73-10/28/89	mag tape	continued
73-078A-07B	IMP-J	Cosmic Ray Comp.	Murphy	5.46 ave. experiment-mode count rates	10/30/73-10/4/89	mag tape	continued
83-004A-01q	IRAS	IR telescope	Wehrle	Sky Survey Atlas (20 degree)	1/26/83-11/22/83	mag tape	new
83-004A-01r	IRAS	IR telescope	Moshir	Faint Source Catalog	1/26/83-11/22/83	mag tape	new
83-004A-01s	IRAS	IR telescope	Moshir	Faint Source Reject File	1/26/83-11/22/83	mag tape	new
83-004A-01t	IRAS	IR telescope	Rice	Near-By Galaxy Hi-Resolution Image Atlas	1/26/83-11/22/83	mag tape	new
77-102A-00L	ISEE-1		Elphic	"ephem. data, perigee times & spin axis orient."	10/22/77-10/25/77	mag tape	new
77-102A-03G	ISEE-1	LEPEDEA	Huang	"LEPEDEA, 128/512 sec 3-D distribution func."	11/1/77-6/14/78	mag tape	continued
77-102A-08F	ISEE-1	Plasma Density	Harvey	plasma 3-hour summary spectrograms	10/22/77-8/5/83	microfiche	continued
77-102A-09H	ISEE-1	MEPI	Mitchell	36-sec energetic particle flux (WAPS)	11/9/77-9/10/79	mag tape	new
77-102A-13B	ISEE-1	VLF Wave Prop.	Bell	"selected spectrograms, VLF wave data"	7/12/83-7/31/83	35mm microfilm	continued
77-102B-00J	ISEE-2		Elphic	"ephem. data, perigee times & spin axis orient."	10/22/77-10/25/77	mag tape	new
78-079A-01R	ISEE-3/ICE	Solar Wind Plasma	Gosling	"24-sec electron parameters, G-Z enctr."	9/10/85-9/14/85	mag tape	new
78-079A-07D	ISEE-3/ICE	Plasma Waves	Greenstad	"plasma wave, elec. & mag. fields, G-Z enctr."	9/10/85-9/14/85	mag tape	new
78-079A-08F	ISEE-3/ICE	EPAS	Richardson	"3-D, 32-sec energetic ions, G-Z encctr."	9/10/85-9/14/85	mag tape	new
78-079A-10D	ISEE-3/ICE	Radio Mapping	Steinberg	"54-sec electron parameters, G-Z tail traversal"	9/11/85-9/11/85	mag tape	new
78-012A-01B	IUE	UV Spectrograph	Van Steenberg	spectral images	4/1/78-5/15/91	mag tape	continued
78-012A-01C	IUE	UV Spectrograph	Van Steenberg	European spectral images	4/1/78-5/15/91	mag tape	continued
89-033B-01A	Magellan	SAR	PDS	full resolution Basic Image Data Records		mag tape	new
89-033B-01B	Magellan	SAR	PDS	altimetry & radiometry composite data records		CD-ROM	continued
89-033B-01N	Magellan	SAR	Arvidson	compressed once image data		8x10 bw negs.	continued
89-033B-01O	Magellan	SAR	Arvidson	compressed twice image data		8x10 bw negs.	continued
89-033B-01P	Magellan	SAR	Arvidson	compressed thrice image data		8x10 bw negs.	continued
89-033B-01Q	Magellan	SAR	Arvidson	full resolution image data		8x10 bw negs.	continued
89-033B-01R	Magellan	SAR	PDS	global emissivity data		4x5 color negs.	continued
89-033B-01U	Magellan	SAR	PDS	global topographic data		4x5 color negs.	continued
89-033B-01a	Magellan	SAR	PDS	altimetry engineering records		mag tape	new
89-033B-01b	Magellan	SAR	PDS	compressed Basic Image Data Records		mag tape	new
89-033B-01c	Magellan	SAR	PDS	engineering data records		mag tape	new
89-033B-01d	Magellan	SAR	PDS	altimetry & radiometry data records		mag tape	new
78-098A-06B	Nimbus 7	SAM II	McCormick	aerosol extinction profiles	11/1/78-10/31/91	mag tape	continued
78-098A-07A	Nimbus 7	ERB	Jacobowitz	solar radiation flux data	11/16/78-2/5/93	mag tape	continued
78-098A-07B	Nimbus 7	ERB	Stowe	solar radiation flux data	11/1/78-1/31/93	mag tape	continued
78-098A-09C	Nimbus 7	TOMS	Krueger	total ozone data	10/31/78-12/11/92	mag tape	continued
78-098A-09D	Nimbus 7	SBUV	Heath	total ozone & mixing ratios	10/31/78-3/1/88	mag tape	continued
78-098A-09E	Nimbus 7	TOMS	Krueger	UV radiance data	10/31/78-10/31/92	mag tape	continued
78-098A-09F	Nimbus 7	SBUV	Heath	UV radiance data	10/31/78-1/31/93	mag tape	continued
78-098A-09R	Nimbus 7	TOMS	Krueger	daily ave. gridded total ozone data	11/1/78-12/31/92	mag tape	continued
88-059A-02A	Phobos 2	MAGMA	Feldstein	45-sec mag field vectors in solar ecliptic coord.	7/22/88-1/20/89	floppy disk	new
72-012A-11D	Pioneer 10	Charged Particle	Randall	15-min cruise-phase data in SFDU format	3/3/72-6/3/91	mag tape	new
73-019A-11E	Pioneer 11	Charged Particle	Randall	15-min cruise-phase data in SFDU format	4/6/73-6/6/91	mag tape	new
78-051A-00D	Pioneer Venus 1		Russell	"ephemeris, orbital plots"	12/5/78-4/12/91	microfiche	continued
78-051A-00E	Pioneer Venus 1		Russell	"ephemeris, attitude-orbit listings"	12/5/78-3/7/92	microfiche	continued
78-051A-12H	Pioneer Venus 1	OMAG	Russell	"hi-resolution periapsis, elect. & mag. fields"	12/5/78-2/26/90	mag tape	continued
78-051A-13F	Pioneer Venus 1	OEFD	Russell	"hi-resolution periapsis, elect. & mag. fields"	12/5/78-2/26/90	mag tape	continued
78-051A-15C	Pioneer Venus 1	OUVS	Stewart	F-channel UV spectra averaged data		mag tape	new
88-026A-01A	San Marco	Drag Balance Exp.	Ardvini	DBI neutral density data		mag tape	new
73-027A-05H	Skylab	X-ray Spect. Telesc.	Batchelor	image processing s/w for solar X-ray data		floppy disk	new
73-027A-05I	Skylab	X-ray Spect. Telesc.	Batchelor	sample solar X-ray data		floppy disk	new
73-027A-05J	Skylab	X-ray Spect. Telesc.	Batchelor	image samples on Macintosh disk		floppy disk	new
80-014A-05C	SMM	HXIS	Batchelor	unprocessed Hard X-ray Imaging Spectrmtr.data	2/14/80-11/24/80	8mm tape	new
75-075A-01c	Viking 1 Orbiter	Imaging	PDS	Mars Images		CD-ROM	continued
75-075A-01f	Viking 1 Orbiter	Imaging	Eliason	Mars Digital Image & Terrain Models	6/22/76-7/30/80	CD-ROM	continued
75-083A-01c	Viking 2 Orbiter	Imaging	Eliason	Mars Digital Image & Terrain Models	6/22/76-7/30/80	CD-ROM	continued
77-076A-02I	Voyager 2	Radio Science	Anderson	Uranus celestial mechanics data		mag tape	new

New Data Arrive

NSSDC has received several new space physics data sets, including ISEE-3 data (24-sec electron parameters, plasma wave electric and magnetic fields, and 32-sec energetic ion counts) collected during an encounter with the comet Giacobini-Zinner in September, 1985. From the Austrian-Russian magnetometer on the Soviet Mars-bound Phobos 2 spacecraft, NSSDC has received 45-sec resolution cruise phase field data.

Other new space physics data sets received were ISEE-1 and ISEE-2 ephemeris data, Hawkeye 1 low-level data from the magnetometer, LEPEDEA and ELF-VLF instruments, and Pioneer 10 and 11 cruise phase data from the Charged Particle experiment. Additional data were received for ISEE-1 plasma data sets and IMP-J charged particle data from the Cosmic Ray Nuclear Composition (University of Chicago) experiment.

Solar/Terrestrial data arrivals include new San Marco data and Skylab solar X-ray image data and processing software on floppy disks for both PC and Macintosh. In addition, a new data set of unprocessed hard X-ray data from SMM was received.

Planetary data arrivals include additional Magellan altimetry and radiometry data on CD-ROM from the Planetary Data System (PDS) and several new photo products. The article on page 3 by Ed Bell and Ralph Post in this issue describes the arrival of several thousand Magellan data tapes for deep archival at NSSDC. Other new planetary data include Galileo press release photographs from Earth and Venus and additional Mars digital images and terrain models from the Viking 1 and 2 Orbiters on CD-ROM via PDS.

New astronomical data at NSSDC include several IRAS data sets from the IR telescope: Sky Survey Atlas, Faint Source Catalog, and Nearby Galaxy Atlas. Additional IUE image data from the UV spectrograph also were received.

NSSDC continues to receive Nimbus-7 data. Additional data were received from the SAM II, TOMS, ERB, and SBUV instruments.

Joy Beier

NOST News is Good News for FITS Users

Continued efforts of the FITS Support Office and of the NOST FITS Technical Panel have resulted in the completion of the "NOST Standard FITS Definition" during the past two months. However, this specification will not become an approved NOST standard until the NOST Accreditation Panel has reviewed the process. To this end, the NOST Executive Board will meet soon to inaugurate the FITS NOST Accreditation Panel (AP), whose task will be to examine the process used to develop the "NOST Standard FITS Definition" and to ensure that all comments and critiques of the document are handled appropriately. If the AP determines that all interested parties were given a reasonable chance to comment on the standard and that all comments were fairly addressed, then the definition will become an approved NOST standard. After this approval, NOST intends to submit it to the IAU for approval as the standard definition of FITS recognized at the international level.

The completion of the proposed FITS definition is only part of the good news. Also, Version 3 of the *FITS User's Guide* has been released! This guide's availability is receiving wide-range publicity through such mechanisms as the USENET sci.astro.fits newsgroup and the WGAS electronic mailing list. The document has already proved to be popular as the NOST Librarian has distributed well over 100 copies, and many other copies have been picked up electronically from the FITS directory on anonymous FTP.

NOST Standards Library Overflows with New Information

Since the last issue of *NSSDC News*, the NOST Standards Library has acquired and shelved more than 50 new documents. The facility's holdings are approaching 900 documents, and the current location is filled almost to capacity. Besides ingesting new documents and identifying them in the on-line Standards and Technology Information System (STIS), the NOST Librarian is also available to help any users obtain standards documents. Please stop by, either in person or electronically (NCF::NOST), or call (301) 286-3575, to find the standards information that will help make NASA data systems and products more widely accessible and cost effective. STIS is available through NODIS.

Review of SFDU Control Authority Procedures Underway

NASA has completed its review of the "Control Authority Procedures, Red Book." This book describes procedures for registering, revising, and obtaining data descriptions with a control organization that is part of a permanent, globally coordinated infrastructure. Data producers can ensure that their users have access to the descriptions needed to understand their data by simply incorporating a Standard Formatted Data Units (SFDU) label containing the unique identifier for the description as assigned by the control authority organization.

Other space agencies have also been reviewing this document. NOST personnel and other NASA representatives will be meeting with representatives from the other space agencies this spring in Frascati, Italy, to complete the review of this document. When approved, the document will become a Blue Book, which indicates that all member agencies agree that when they generate internal agency standards covering the same area, the standards will be in accordance with this international agreement.

Don Sawyer

newsbriefs newsbriefs

International Video Conference Supports Standards Meetings

NASA participants in the standards effort under the Consultative Committee for Space Data Systems (CCSDS) Panel 2 held a Technical Interchange Meeting at GSFC during February 16-18, 1993. The primary purpose of this meeting was to review and critique the progress made by the NASA participants on their CCSDS Panel 2 workplan items and on their NASA-specific items.

The rather unique logistics of the meeting are credited with significantly contributing to the meeting success. This included the direct participation of individuals from JPL and the University of Colorado at Boulder, a teleconference with other JPL members on the new requirements for Standard Formatted Data Units software, a one-hour video conference with our European colleagues' meeting in Paris to address issues on the Control Authority Data Structures draft standard, and a follow-on teleconference with these same colleagues to address issues on the Data Entity Dictionary draft standard and planning for the Spring CCSDS Panel 2 Workshop.

Although there is no substitute for extended person-to-person interactions when negotiating technical issue resolution, the international video conference was almost as effective as past video conferences with our JPL colleagues, despite some color and brightness problems with the U.S. signal as received in Paris. Significant progress was made in advancing the state of our draft standards, both within NASA and internationally.

Don Sawyer

Don't forget the SPDS Community Workshop on June 1-3!

Questions? Call Dr. Rikhi Sharma, (202) 479-0750 or rsharma@hq.nasa.gov

First Annual PHIGS Users Group Convenes

Approximately 100 implementors and users of PHIGS gathered to share their ideas, problems, and successes at the 1st Annual PHIGS Users Group in Orlando, FL on March 21-24. PHIGS, Programmer's Hierarchical Interactive Graphics System, is an ANSI and ISO standard for 3D graphics. As a standard, it offers portability to many different computers using various operating systems and window systems. This is important for the NSSDC and SPDF, because they need to provide graphics tools for data browse and analysis to a scientific community with a wide variety of hardware and software needs.

The conference consisted of tutorials, a showcase of new PHIGS-based products by different vendors, exhibits of different vendors' PHIGS implementations and associated products, and paper/panel sessions. These sessions focused on the following topics: PHIGS and X, Application Toolkits, Application Issues, Texture Mapping/NURBS, PHIGS Extensions, Object Oriented Libraries, PHIGS and PEX, PHIGS Non-Retained Data, CAD Applications, and Portability Issues. The conference concluded with a talk by Andries van Dam, coauthor of *Fundamentals of Interactive Computer Graphics*.

This conference was a grassroots effort to provide a forum where users and implementors could talk about their experiences with PHIGS. In that respect, it was a huge success. It generated heated debate, interest, excitement, and exchange of information. The PHIGS Users Group is now an official entity, and it will have a larger presence in the future.

For more information on PHIGS or the PHIGS Users Group, contact Lara Aist-Sagara at AIST@nssdca.gsfc.nasa.gov.

Lara Aist-Sagara

NASA Plans Life Science Data Archive Workshop

The NASA Life Science community is planning a Life Science Data Archive (LSDA) to catalog, archive, and distribute life science data. These data are derived mostly from Shuttle experiments dealing with physiology and related subjects. The effort is centered at NASA Johnson Space Center for human life science data and at NASA Ames Research Center for non-human life science data. The two groups are working together to develop a centralized catalog/inventory system.

LSDA prototype development will include production of a CD-ROM containing data from the SLS-1 mission. LSDA developers met at a workshop on April 19-21 at NASA Ames Research Center. The meeting was attended by Joy Beier of NSSDC, who gave a presentation on the possible roles of NSSDC in the LSDA effort. NSSDC is currently planning to include information on NASA life science data and experiments in its Master Directory and RSIRS information systems. It is also likely that NSSDC will be called on to archive and disseminate selected data from Life Sciences missions, not including physical samples.

Joy Beier

NSSDC staff members hope to see you at the May AGU/Baltimore meeting!

Please see the article on page 3.