National Space Science Data Center

NSSDCNEWS

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Process Started To Improve Data Usability

By Donald Sawyer and Joseph King

Significant benefit has accrued to various science communities from the use of standard formats within those communities. One adverse effect, however, of this situation is the extra effort required to understand and analyze data from multiple disciplines or subdisciplines that use different standards. Another adverse effect is that the commercial software sector cannot perceive what formats and structures it should support so that developers and/or users of the many available "standard" formats must develop, maintain, and evolve tools the commercial sector might otherwise do more cost-effectively.

To address this as it impacts in particular the NASA/OSS (See the Commonly Used Acronyms list on page 4.) domain, NOST at NSSDC is planning to coordinate a Formats Evolution Process (FEP). This process, to be guided by the SSDS Technical Working Group and by a technically-oriented Process Working Group, initially has two time horizons.

From the effort at the scale of a year or so, the objectives are (1) more coordinated and complementary development work from groups responsible for the various formats in the near term and (2) a consensus set of recommendations to new projects needing to make formats selections for various object types and for data at various levels of processing in the time frame of one to three years hence. The objective at the scale of a few years is a coordinated evolution of then-current format standards and associated data management and analysis tools. The scope for this effort includes the NASA/OSS and related space science communities, the commercial sector, and possibly non-NASA scientific communities. The emergence of a concurrence on formats and software requirements may stimulate commercial-vendor development activities that should decrease government sponsors' cost of providing customers' needed functionalities.

The FEP is beginning with the development of WWW pages to serve as a discussion medium for interested parties. As issues firm up and primary impediments to usability and interoperability become clear, discussions will be abstracted into draft comparative-overview statements by NSSDC/NOST staff.

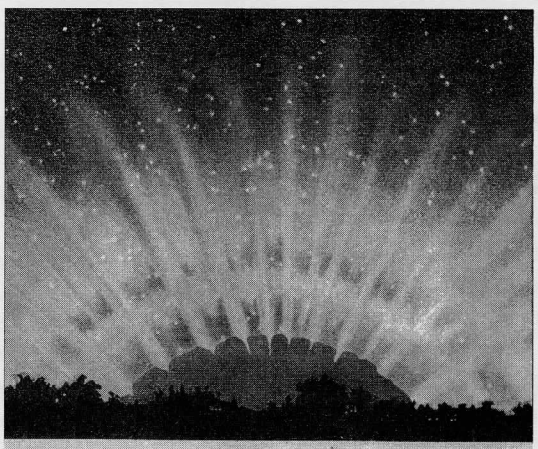
A workshop will be held in 1999 to reach consensus on the best next steps to take relative to formats/functionalities evolution and adoption that will best promote data interoperability and usability within the OSS/SSDS science data environment. This workshop will involve format users, both OSS and non-OSS format developers, and relevant vendors. Following the workshop, the Process Working Group will assess the progress obtained and the prospects for achieving increased cost-effectiveness in defining additional FEP activity.

NAIP: The FEP WWW address is http://ssdoo.gsfc.nasa.gov/nost/fepc

NSSDC Acquires Records of Ancient Auroral Observations

By H. Kent Hills

Samuel Silverman, now retired from the Physics Department, Boston College, has provided NSSDC with several data sets of pre-computer-era auroral observation records and is in the process of providing additional such data. These data collections go back two millennia, and their organizing and archiving result, at least in part, from NASA Office of Space Science (OSS) funding based on peer review and determination of the value of the data.



AURORA BOREALIS.
OBSERVED MARCH 1, 1872, AT 9:25 P. M.

The Sun is known to change on a wide range of time scales, at least as large as the multihundred-years scale as evidenced by the Maunder minimum, etc. Society has increasingly sparse relevant data available as they go back further in time. With modern data and analyses space physicists have been coming to understand relations between solar output and auroral occurrence, so old auroral data have the potential for helping the understanding of solar variability on relatively long time scales.

See Commonly Used Acronym list on page 4.

SEC/SPA Education in San Francisco

By James Thieman

A contingent of Space Science Data Operations Office (SSDOO) personnel took advantage of the location of the fall American Geophysical Union (AGU) meeting in San Francisco, California, to also attend a team meeting of the Sun-Earth Connection Education Forum (SECEF) at the University of California Berkeley (UCB) campus. SECEF is a NASA-Headquarters-sponsored education and outreach organization that is a partnership between Goddard Space Flight Center (GSFC) and UCB. The GSFC portion of the team has many SSDOO personnel involved on a part-time basis. SECEF has the responsibility of promoting the theme of Sun-Earth Connection science (space plasma physics, etc.) on a national level in education and outreach to schools and the general public.

SECEF has been in existence for one year, and the team meeting reviewed the results of the first year and made plans for the second. Among the accomplishments were an eclipse Webcast to hundreds of thousands of people, teacher and scientist education workshops, initialization of a project to create a Sun-Earth Connection education resource directory, exhibit booths at many major education meetings, and education and outreach sessions at the spring and fall AGU meetings. Each of these activities will be continued in the new year, and others will be added.

At the AGU meeting a Space Physics and Aeronomy (SPA) Education and Outreach Oral and Poster Session was held that attracted 26 presenters and was co-chaired by James Thieman. Abstracts of the presentations are available at http://www.agu.org/cgi-bin/sessions. (Look at the 1998 fall meeting in the SPA Magnetospheric Physics area for Sunday afternoon and Monday morning, specifically the SM72B and SM11B sessions.)

Roberta Johnson, University of Michigan professor, also gave a talk in one session. She is also the new chair of the AGU Space Physics and Aeronomy Education and Outreach Committee. James Thieman is a new member of this committee. Plans for the committee include theme-oriented education and outreach sessions at future AGU meetings as well as the creation of "SPA Online, 1999-2000: A Community-Wide Web-Based Open House for Education and Public Outreach."

Reorganizing NSSDC's ANON/FTP Sites

By Joseph King and Nathan James

NSSDC has over the years provided FTP-based network access to many data sets and other services. Most but not all anonymous directories originally created on NSSDCA (a VMS machine) have been moved to or mirrored on NSSDC (a UNIX machine). The FTP environment was less uniform than it might have been.

Therefore, NSSDC has undertaken to cast the UNIX anonymous environment as the definitive environment and to regroup and rename many of the anonymous directories and subdirectories there. Remaining VMS-resident directories will be pointed to from logical places in the definitive UNIX anonymous environment. While NSSDC would aim to have a set of top-level UNIX anonymous directories that provided brevity and easy user comprehensibility (on executing a "list" command or on reaching the directory listing from a WWW page), staff will also maximally preserve present directories that are significantly used. While not finalized at the time of this writing, the expectation for the top level directories can be found in the full electronic article.

NDADS Milestone: Two Millionth Data File Retrieved

By Joseph King

In the second half of the 1980s, NSSDC made its most widely desired data network-accessible from its magnetic disks with the vast majority of its data remaining off line owing to magnetic disk costs. As the 1990s dawned, NSSDC undertook to make a much larger fraction of its archived data network-accessible and to provide network-accessibility to newly inflowing data. This accessibility was enabled by NDADS, a VAX-hosted pair of Cygnet jukeboxes capable of holding about 1.6 TB of data on 12-inch Sony/WORM platters.

Initial NDADS data management software and user interface software were built at NSSDC by a team led by Michael Van Steenberg. The initial interface, ARMS, was E-mail-based. Subsequent WWW-based interfaces, WISARD for astrophysics data and SPyCAT for space physics data, were built later and now are the primary pathways to NDADS data. In October of 1998, the two millionth data file was retrieved and downloaded by a member of NSSDC's science user community.

NOST Hosts Archiving Workshop

By Donald Sawyer and Jerry Winkler

NSSDC's NASA Office of Standards and Technology (NOST) led NASA's delegation to the Consultative Committee for Space Data Systems (CCSDS) Panel 2 international workshop at CNES in Toulouse, France, from October 22 through November 1, 1998. It also provided the lead in two Panel 2 technical areas: Data Administration and Archiving. The full article (See URL at bottom of page.) addresses highlights from the work packages for Management, Requirements, Data Administration, Languages, Implementor's Workshop, and Archiving. Significant progress was made in advancing the Data Entity Dictionary Specification Language (DEDSL) and the Reference Model for an Open Archival Information System. It was also reported that the role of the EAST data description language in CNES was growing rapidly and that software support was ramping up to meet the demands.

Outsourcing Desktop Initiative Started at NASA

By Nancy Laubenthal

The Outsourcing Desktop Initiative for NASA (ODIN) model states that "ODIN is intended to develop a long-term outsourcing arrangement with the commercial sector which transfers to it the responsibility and risk for providing and managing the vast majority of NASA's desktop, server and intra-Center communication assets and services as the agency downsizes and refocuses IT personnel to Agency core missions."

NASA-wide, ODIN means that one vendor at each field center, Intellisource Information Systems, Inc., (formerly RMS) in the case of Goddard, is responsible for the total support of the involved desktop computer, including hardware, software, and maintenance. The vendor maintains the hardware, refreshes the hardware after a number of years (depending on the option chosen), upgrades the

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SSDOO Staffers Win New Data, Education, and Science Grants

By Joseph King

Several proposals have been submitted by the Space Science Data Operations Office (SSDOO) to HQ and to GSFC in response to recent proposal calls. These calls include the HQ-administered Advanced Information, Systems Research Program, the Jovian System Data Analysis Program, and the GSFC-administered ISTP Guest Investigator Program and Director's Discretionary Fund. See Table 1 at right for list of successful proposals.

Many of those efforts will enable SSDOO to develop data products and data management, access, and display tools that will complement the basic data services provided by the NSSDC and by the Astrophysics and Space Physics Data Facilities within the SSDOO.

Table 1: Funded Proposals

Type	Proposal	Investigators
Data-Management-Oriented	Applications of XML to Documentation and Content-Based Searching of Astronomical Catalogs	E. Shaya et al.
	Satellite Ion/Electron Density/Temperature Data on CD-ROM and WWW	D. Bilitza & N. N. Papitashvili
	Automated Processing of ISIS Topside Ionograms into Electron Density Profiles	B. Reinishch (U. Mass./Lowell) D. Bilitza
	Sun-Earth Connections Campaign Data Coordination	R. Kessel
	ISAIA: Interoperable Systems for Archival Information Access	R. Hanisch (STScI), R. White, J. King et al.
Science Education	Energetic Ion Interactions with the Galilean Satellites	J. Cooper et al.
Education	Radio JOVE-Teens Listening to an All-Natural Radio Station	J. Thieman et al.
	Radio Jove On-Line Observatory	J. Thieman et al.
	INSPIRE	W. Taylor
	GSFC Career Connection Model	N. James et al.
Straight Science	The Redshift Dependence of the Interaction-Activity Connection Among Ultraluminous Starbursting Galaxies	K. Borne
	Snapshot Survey of Dynamically Close Galaxy Pairs from z = 0.1 to z = 0.5	D. Patton (U. Victoria) & K. Borne
	Identification of M Supergiant +B Star Binaries in the Magellanic Clouds	D. Massa
	FUV Diagnostics of Structure in Hot-Star Winds	A. Fullerton (U. Victoria) & D. Massa
	Wind/SOHO Guest Observer Program for the Study of Solar Energetic Particles and Galactic Cosmic Rays	F. McDonald (U. MD), R. McGuire, & N. Lal

CDF Office Sets Goals To Promote CDF Usage

By David Han

To facilitate and promote the usage of the Common Data Format (CDF), NSSDC's CDF Office has set near-term goals that include the conversion of the current command-line-based CDF tools to Graphical-User-Interface (GUI)-based tools in Java and the development of Java Application Programming Interfaces (APIs) to coexist with the existing C and Fortran APIs. These changes will allow CDF users to develop platform-independent CDF applications.

The CDF Office has set as a long-term goal working with NSSDC's NASA Science Office of Standards and Technology in facilitating a process for reviewing community requirements for science data formats and associated software and working with such format groups as HDF, netCDF, and Flexible Image Transport System (FITS) to establish interoperability across and mutually complementary evolution paths for these and related formats.

The current status of the evolution of CDF tools and APIs may be found at the CDF Web page at http://nssdc.gsfc.nasa.gov/cdf/cdf_home.html. A more detailed article on the planned process is given as the lead article in this newsletter.

NSSDC Archives Data from Many Soviet Missions

By Joseph King and Natalia Papitashvili

Dr. Nikolai Pavlov of Moscow State University (MSU) visited NSSDC in early November 1998 to discuss the now-completed preparation and archiving at NSSDC of energetic particle data from a series of Soviet spacecraft of the 1960s through 1980s.

Data have been prepared and archived from the following missions: ZOND-1, -3 (lunar missions); MARS-2, -4, -5, -7; LUNA-17, -19, -21, -22; VENERA-2-11, -13, -14, -16; VEGA-1, -2 (Comet Halley missions); PHOBOS-2 (Mars mission); GRANAT (high altitude geocentric); and COSMOS-900 (low-altitude geocentric, polar).

The data consist mainly of energetic proton count rates plus a limited amount of energetic electron data. These data will be most useful in studies of solar energetic particle events, interplanetary particle acceleration processes, and the like. COSMOS-900 data will be additionally useful in magnetospheric particle studies. The data have been provided as flat ASCII data tables with accompanying spacecraft location information files and documentation files.

The initial data submission consisted of Venera-13 count rates of 1-3 MeV protons moving in solar and anti-solar directions and omnidirectional fluxes of protons above 30 MeV. These data cover the period November 1981 through February 1983. Note that the Venera-13 mission put a lander on the Venus surface in March 1982 after which the main spacecraft carrying the particle detectors proceeded in a heliocentric orbit.

Dr. Pavlov and his colleagues are preparing a system and interface for worldwide networked-based access to these data from MSU. The data are FTP-accessible from NSSDC from ftp://nssdc.gsfc.nasa.gov/public/spacecraft_data/russian_msu/. Data preparation work at MSU has been supported in part by a data restoration grant from NASA's OSS.

GSFC Selects Raytheon/ITSS for SSDOO/NSSDC Support Contract

By Joseph King

NASA Goddard Space Flight Center has announced the selection of Raytheon Information Technology and Systems Services (RITSS) to provide support at Goddard for the Space Science Data Operations Office, including NSSDC. The new contract was awarded after an extended competition. It covers the period December 1998 through November 2000 and has three one-year options after that. RITSS was the incumbent contractor.

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SSDOO Y2K Compliance Update

By Nancy Laubenthal and Joseph King

The NSSDC and its host organization at Goddard, the Space Science Data Operations Office, have been actively working to update computer software and systems to be ready for correct operations well before the year 2000 arrives.

In keeping with NASA guidelines, all currently used software and systems had to be characterized as being intended for use or not past January 1, 2000. All software and systems intended for use across the millennial boundary then had to be declared as mission-critical (MC) or otherwise. Staff had to do repairs for and testing and certification of MC software for Y2K compliance at an accelerated pace relative to non-mission-critical (NMC) software.

The testing was to ensure Y2K compliance of NSSDC/SSDOO's computers and operating systems, its various purchased and shareware COTS software, and its inhouse-developed applications. Testing was done on the one hand with extra copies of data and information having their time tags artificially shifted to the year 2000 and on the other hand by shifting the actual computer system clocks so that they would cross critical time boundaries (12/31/1999 to 01/01/2000; 02/28/2000 to 02/29/2000).

The Y2K testing revealed a few minor problems that were fixed immediately and a few additional problems that were noted for subsequent fixing. These problems are being addressed and fixed as this article is being written. Virtually all of SSDOO's mission-critical software and systems and many of its non-mission-critical systems have now been certified as being Y2K-compliant. Detailed identification of these systems as well as lessons-learned is given in the full electronic version of this article.

Outsourcing Desktop Initiative Started at NASA

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standard suite of software (Microsoft Office, Netscape, Eudora, McAfee Viruscan) regularly, provides a help desk for support, installs security patches regularly, etc. Under ODIN the user calls the ODIN Help Desk at a 1-800 number for support rather than calling the local organization's staff for that support. Users can order many different options from the ODIN catalog to tailor their seat services. (A "seat" is one computer supported.) Users are allowed to install on their machines any needed software that they purchase or download elsewhere. The ODIN vendor is evaluated based on performance metrics, some of which are determined by a customer survey. The SSDOO has signed up for a number of "seats" or desktops for users who have more or less "standard" requirements for computing.

GSFC Selects Raytheon/ITSS for SSDOO/NSSDC Support Contract

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All prior NSSDC/SSDOO contracts have been level-of-effort, support services contracts wherein the contractor works against a series of periodically updated task statements and has part of its fee determined by government judgment on the quality of work delivered. The new RITSS contract will have tasks addressing SSDOO's more advanced technical and scientific activities and an evaluation process for the work performed under these tasks similar to the process of past contracts.

The novel feature, however, of the new contract is that routine SSDOO activities, mainly related to NSSDC data operations and to pipeline processing of astrophysics mission data in SSDOO's Astrophysics Data Facility, will be covered under a performance-based contracting (PBC) part of the contract. This PBC part involves a fixed set of metrics, such as turnaround times for data ingests and requests. The contractor's fee for this work will be determined by the extent to which it meets, exceeds, or falls short of the metrics written into the contract.

NSSDCNEWS

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http://nssdc.gsfc.nasa.gov/

To access NSSDC's education home page, enter this URL:
http://www.gsfc.nasa.gov/education/education_home.html

Commonly Used Acronyms

ARMS Automated Retrieval Mail System
COTS Commercial Off-the-Shelf
FITS Flexible Image Transport System
FTP File Transfer Protocol
GSFC Goddard Space Flight Center
HQ (NASA) Headquarters
ISAIA Interoperable Systems for Archival Information Access
ISIS International Satellite for Ionosphere Studies
ISTP International Solar-Terrestrial Physics
NAID Note Added in Proof
NASA National Aeronautics and Space Administration
NDADS NSSDC Data Archive Distribution System
NOST NASA Office of Standards and Technology
OSS Office of Space Sciences
SPyCAT Space Physics Catalog
SSDOO Space Science Data Operations Office
SSDS Space Science Data Systems
WISARD Web Interface for Searching Archival Research Data
XML eXtended Markup Language