National Space Science Data Center

NSSDCNEWS

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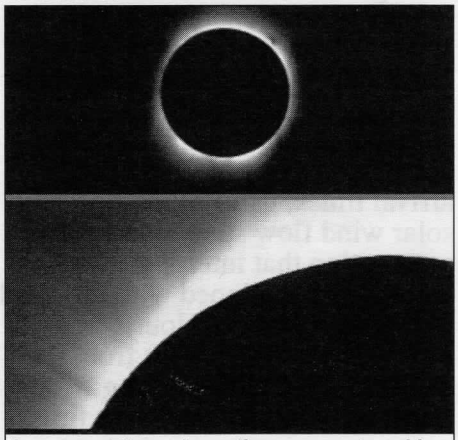
Total Eclipse Brings SECEF to Wide Audience

By James Thieman

On February 26, 1998, the San Francisco Exploratorium allowed people all over the world to experience a total solar eclipse as it happened through the medium of WWW. The event was initiated through and supported by NASA's Sun-Earth Connection Education Forum (SECEF) in partnership with the Exploratorium as a high visibility public event emphasizing the science of studying the Sun. GSFC also supported the event by providing several engineers and much of the necessary equipment to enable the Webcast from the island of Aruba through the TDRSS satellite. The Webcast was widely advertised. As a result the Exploratorium Web site and two mirror sites set up for the event were completely saturated with millions of accesses. A page set up on the SECEF Web site at GSFC to provide eclipse information and direct people to the Exploratorium Web site received hundreds of thousands of hits and was by far the single largest referral site to the Exploratorium pages. Likewise, an eclipse page set up by NSSDC for its electronic visitors also supported a great number of hits. The forum is now looking to other possibilities for high visibility public events to educate the community better in Sun-Earth Connection science. SECEF is one of four forums set up by the NASA OSS as a part of the education strategic plan to promote science education and outreach. A partnership between GSFC and the University of California, Berkeley, Space Sciences Laboratory, NSSDC has a central role in SECEF management at GSFC.



Images of the solar eclipse as captured by Exploratorium's Caribbean expedition.

New High Resolution Martian Data Available: NSSDC Seeks Interest Level

By David Williams

The Astrogeology Branch of the United States Geological Survey and the PDS have created a new set of Mars high-resolution image mosaics. The new mosaics have a resolution of 1,024 pixels/degree, or about 58 meters/pixel, four times better than the 264 pixels/degree resolution of the MDIM set. The new mosaics are also created from Viking images and cover selected areas (8%) of the planet's surface, unlike the MDIMs that had complete coverage. The mosaics are in PDS digital format on eight CDs but have not been mastered into CD-ROMs. NSSDC is determining if enough interest exists to justify mastering and creating an eight-volume CD-ROM set to be sold at $80.00 per set. If a CD-ROM set is not created, the volumes will be available only as CD-Recordables that can be produced upon request for $56.00 per volume. NSSDC encourages anyone interested in purchasing these high-resolution mosaics as CD-ROMs to let the center know by sending E-mail to request@nssdc.gsfc.nasa.gov stating the planned number of sets that might be purchased. If enough interest is shown, NSSDC will produce the CD-ROM of the eight-volume set.

See Commonly Used Acronyms List on Page 4.

Wind and Other Data Added to OMNI

By Joseph King and Natalia Papitashvili

NSSDC's 34-year multispacecraft hourly compilation of nearby solar wind magnetic field and plasma parameters has mostly consisted of IMP 8 data since the 1983 departure of ISEE 3 (ICE) from the Earth's vicinity. The November 1994 launch of the Wind spacecraft as part of the ISTP program enables a much more complete OMNI solar wind record.

NSSDC has just added its first Wind data to OMNI, definitive magnetic field data for May 1995 through June 1996. Because Wind is sometimes an hour or so upstream of the Earth and up to 50 Earth radii transverse to the Earth-Sun line, NSSDC staff had to time shift 1-min data from Wind observation times to expected Earth arrival times, using Wind-observed solar wind flow speeds and the assumption that interplanetary variations are aligned with the ideal Parker spiral angle. Hourly Wind averages were then built from the shifted 1-min values falling within Earth-arrival hour-boundary times.

For the 14 months of available overlapping Wind and IMP IMF data, there are 4,331 common hours. The mean values of Wind and IMP differences (IMP minus Wind) Bx, By, Bz, and Bt (t = total; GSE coordinates) are -0.06+/-1.03, 0.00+/-0.96, -0.01+/-0.92, -0.05+/-0.44. For hours when both IMP and Wind data were available, IMP data were retained in OMNI if IMP coverage was continuous for at least four hours; otherwise, Wind data were added to OMNI. This addition yielded 4,354 IMP hours, 5,660 Wind hours, and 234 no-coverage hours for the 14-month interval.

Definitive Wind magnetic field data will be added to OMNI for the first six months of the Wind mission and for the period after June 1996 as they become available from the GSFC magnetometer team. Definitive Wind solar wind plasma parameters from the GSFC/MIT SWE experiment will also be added as they become available. Additions are expected on the time scale of a small number of months. At the same time the IMP magnetic field, plasma, and energetic particle data on OMNI have also been updated to late 1997.

SSDOO Interacts with Cluster Project

By Ramona Kessel

The four-spacecraft Cluster mission of the ESA was intended to study microphysical plasma processes especially at magnetospheric boundaries, as a component of the overall ISTP program. Unfortunately, it was lost because of a launch failure on June 4, 1996. ESA now expects to launch a replacement set of four spacecraft called Cluster II. Ramona Kessel of the SSDOO attended a Cluster II PEACE team meeting held at Mullard Space Science Laboratory on January 29-30, 1998. Among the topics for discussion were the dissemination and archiving of the new Cluster II data.

The old CSDS-UI, provided by ESA for viewing and working with Prime and Summary Parameter data and for exchanging data between data centers, is not going to be used for Cluster II because ESA has minimal funds for such tools and may, therefore, replace it with either a Web-based version or a new Web-based system proposed by (among others) RAL QMW of England. The new system will be chosen soon and called CDMS, maintained by JSOC located at RAL, an ESA-funded group. It is proposed that in the U.S. the Prime and Summary Parameter data be made available through the CDAWeb system, built and supported by the SPDF and NSSDC. The Summary Parameters, from just one spacecraft, will be publicly available immediately, while the Prime Parameters, from each of the four spacecraft, will initially be available to the U.S. co-investigators or guest investigators and will at some time in the future become publicly available. There was also discussion on making some kind of summary data immediately available, most likely via WWW. There is an inherent delay associated with data validation activities in the current plan for the production of the Prime and Summary Parameter data.

The Cluster Archiving Task Group recently received a mandate from the Cluster Science Working Team. The mandate reads, "Identify and explore issues associated with the long-term preservation, accessibility, and exploitation of data from the Cluster mission, recommend to the SWT a Cluster archiving policy, and, with the PIs, develop an implementation plan."

A book will shortly be published by ESA under the title *Analysis Methods for Multispacecraft Data* and should provide useful information for all interested in Cluster science.

Dr. Juan Starts Fellowship at NSSDC

By Dieter Bilitza

In mid-January 1998 Dr. Miguel Juan from the Polytechnical University of Catalonia in Barcelona, Spain, arrived at GSFC to begin his half-year fellowship at NSSDC. He and his colleague Dr. Manuel Hernandez-Pajares have both received a half-year Senior Scientist Fellowship from the Spanish government to work with Dr. Dieter Bilitza at NSSDC on incorporating Global Positioning System

(GPS) data into the International Reference Ionosphere (IRI).

The two Spanish scientists have developed their own method for deducing global maps of ionospheric electron content from the measurements of the 23 satellites that are part of the U.S. Air Force's GPS. During their stay at NSSDC, they will explore ways in which the GPS data and the IRI predictions could benefit each other. On one hand the IRI a priori information about the global density distribution can help to optimize the GPS data analysis algorithm. GPS-derived electron content data, on the other hand, can be used to update the full IRI electron density profile and thus contribute to a more reliable and accurate prediction of ionospheric space weather.

With his arrival Dr. Juan is taking over from Dr. Hernandez, who will be back for the last part of his fellowship in July 1998. Before returning to Spain Dr. Hernandez presented the first resutls of the GPS/IRI project at the JPL Workshop on Ionospheric Determination and Specification for Ocean Altimetry at the AGU fall meeting and at the U.S. National URSI Meeting. First comparisons with incoherent scatter data and possibly also TOPEX data will be presented at the European Geophysical Meeting this April.

NSSDC Updates Building 26's Network Connectivity

By Gregory Goucher

Over the last several the years the changes in technology, the onslaught of computer equipment migrating to Building 26, NSSDC's primary building at GSFC, and the changes in how staff currently and in the future do business (i.e., Web-based technologies, large volume data transfers, etc.) have significantly impacted the building's networking throughput. Many users have experienced poor performance and interrupted services caused by a variety of networking problems. The Code 630 networking team along with CNE are currently in the process of redesigning the Building 26 networking infrastructure. It is expected that by mid-summer 1998 the new network will be in place, providing greater bandwidth, flexibility, and scalability and eliminating many of the existing networking problems of today.

The newly designed network will consist of a combination of switched and shared technologies. This configuration will be easier to maintain and manage, help to eliminate all of the existing network problems, and provide the flexibility and scalability needed for future growth. The Ethernet segments will be upgraded to 10/100 mb/s infrastructure. The Ethernet communications links from the CNE router in Building 1 to the switches in the communications closets will all be upgraded to 100 mb/s (E 100) communication lines. Building 26 will be completely recabled with the new 10/100 mb/s Category 5 cabling from the communications closets on each floor to the desktops. The switch in the main communications closet will be upgraded to a 100 mb/s switch, and the hubs in each of the other communications closets will be replaced with 100 mb/s switches. These switches will connect back to the main closet via 100 mb/s communication links as well as connect to a variety of stackable 10 mb/s shared hubs and 10/100 mb/s (E 10/100) switches that connect the users at the desktop. The users will be attached from their desktops to either a shared hub or switch based on their networking requirements and utilization. The switching technology along with the larger communication pipes (100 mb/s links) will enable the network administrators to isolate easily and segment the network intensive users and devices from the average user without significantly impacting the overall network performance. The 10 mb/s communications link between the router and the switch in Building 26's main communications closets will remain as a backup, and the preferred path of communications between the Building 26 Ethernet and FDDI ring will be through the CNE router because of the larger and faster (100 mb/s) communications link.

NOST News

By John Garrett, Donald Sawyer, and Robert Stephens

The development of ISO 11179 has been led by individuals from various organizations and agencies in the Washington, D.C., area who have developed a formally specified model designated ANSI X3-285 and the titled metamodel for the Management of Shareable Data. One of the issues is the lack of a standard concrete syntax for the exchange of data element definitions. The emerging XML and RDF standards have been proposed as candidates for this function.

From the CCSDS perspective the current objective is to produce a DEDSL standard that is harmonized with ISO 11179 and ANSI X3-285 and that will be understandable and usable to agency science and operations disciplines in the near term. Its concrete syntax is PVL-based.

Development of the Reference Model OAIS will soon be completed and plans for a Future Archiving Standards Symposium to prioritize future archiving standards activities are underway. This model would provide a framework for understanding significant relationships among the entities of an archival environment and for the development of consistent standards or specifications supporting that environment. Perhaps the most

basic concept of the OAIS RM is encompassed in AIP that contains the primary data to be stored, the descriptions of those data, and the accompanying Preservation Description Information. Current plans are to hold a second U.S./International Archiving Workshop on June 22-26, 1998. Readers interested in participating may contact one of the authors for further information: John Garrett at John.Garrett@gsfc.nasa.gov, Donald Sawyer at Donald.Sawyer@gsfc.nasa.gov, and Robert Stephens at stephens@us.net.

Comet Grigg-Skjellerup Data From Giotto Available on CD-ROM

By David Williams

A CD-ROM containing the data taken by the Giotto spacecraft during its July 10, 1992, encounter with Comet 26P/Grigg-Skjellerup is now available from NSSDC. The CD, produced by the ESA and the Small Bodies Node of NASA's PDS, contains data from the Dust Impact Detector, Energetic Particle Analyzer, Radio Science Experiment, Ion Mass Spectrometer, Johnstone Plasma Analyzer, Magnetometer, and Optical Probe Experiment. The Giotto camera was not working, so no images were taken, but a collection of 35 Earth-based CCD images of the comet are included. All files are in FITS format, and documentation on the encounter, instruments, and data sets is also on the CD.

Java-Based Graphics Software Available for Space Physics Models

By Natalia Papitashvili

In recent years NSSDC has provided users the capability to execute several important models available from NSSDC via the Web. There is now newly developed Java-based software able to provide graphic presentation of the results of model calculations. This new approach utilizes Java applets that can run directly on users' computers. That is, when users connect with NSSDC's Space Physics Model home page, run a specific model, and then browse the model results in a tabular form, they can select another option for a graphic presentation of these results.

In this case the platform-independent Java applet will first be downloaded to users' computers. The applet will then reach back into the server to pull down the tabular data. After this, the requested graphical display is built on users' computers. Subsequently, users can modify the parameters of their graphics and generate additional plots without having to reach back to the NSSDC server.

This approach provides greater flexibility for the user and simultaneously reduces the demand on the NSSDC server. This approach is complementary to NSSDC's primary current approach in which users run the IDL graphic program on NSSDC's server, building the GIF files that are then delivered to users' computers (e.g., CDAWeb, OMNIWeb, etc.). At present, NSSDC is capable of providing Java-based graphic support for IGRF and IRI models.

Commonly Used Acronyms

CCD	Charged-coupled device	ISTP	International Solar-Terrestrial Physics
CNE	Center Network Environment	JPL	Jet Propulsion Laboratory
CSDS-UI	Cluster Science Data System-User Interface	JSOC	Joint Science Operations Center
		MDIM	Mosaicked Digital Image Model
ESA	European Space Agency	OSS	Office of Space Sciences
GPS	Global Positioning System	PDS	Planetary Data System
GSFC	Goddard Space Flight Center	PEACE	Plasma Electron and Current Experiment
FDDI	Fiber distributed data interface	QMW	Queen Mary and Westfield College
ICE	International Cometary Explorer	RAL	Rutherford-Appleton Laboratory
IDL	Interactive Data Language	SPDF	Space Physics Data Facility
IGRF	International Geomagnetic Reference Field	SSDOO	Space Science Data Operations Office
		SWT	Science Working Team
IMF	Interplanetary magnetic field	TDRSS	Tracking and Data Relay Satellite System
IRI	International Reference Ionosphere	TOPEX	Ocean Topography Experiment
ISEE	International Sun-Earth Explorer	URSI	Union of Radio Science

NSSDCNEWS

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