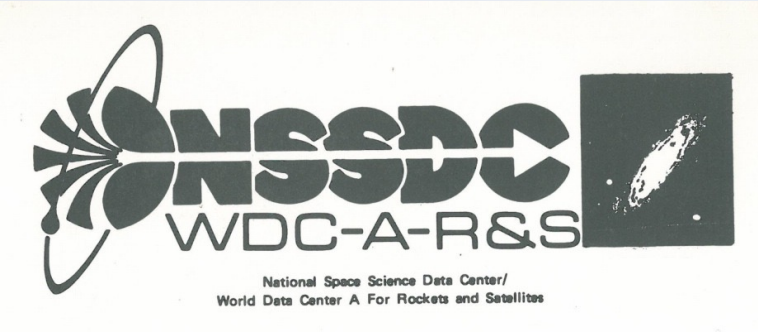
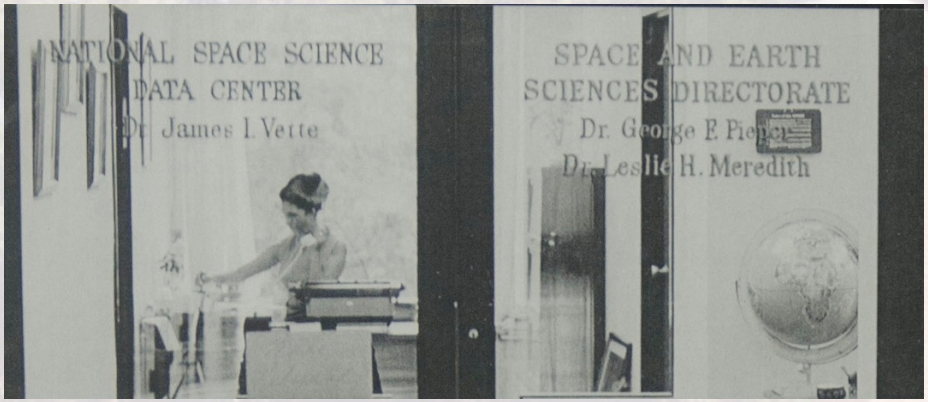
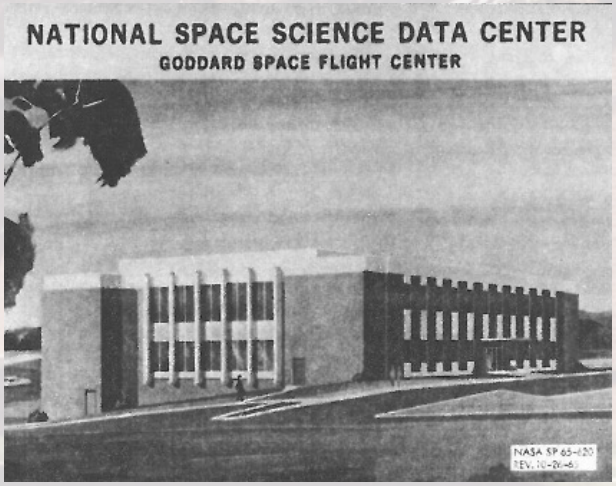
The History of the National Space Science Data Center







The International Geophysical Year

April 5, 1950 – James Van Allen's House

ANNÉE GÉOPHYSIQUE INTERNATIONALE
1957
1958
INTERNATIONAL GEOPHYSICAL YEAR

The Starfish Prime Experiment

Honolulu, Hawaii, July 9, 1962
Midnight

1.4 megaton atomic bomb launched into space and detonated 400 km over the Pacific Ocean. Van Allen Belts showed flux increases over 100x normal, 10 satellites destroyed or damaged.

Led to formation of the Trapped Radiation Environment Model Program (TREMP) led by Jim Vette

The NASA/National Space Science Data Center

Trapped Radiation Environment Model Program

(1964-1991)

James I. Vette

Origins of the NSSDC

March 16: Dr. Homer E. Newell, NASA Associate Administrator for Space Science and Applications, told the House Committee on Science and Astronautics' Subcommittee on Space Science and Applications that NASA had an obligation to make information gained from space exploration available to the public. He continued: "To help achieve this, a National Space Science Data Center was established at GSFC in April 1964. . . .

"The Data Center is responsible for the collection, organization, indexing, storage, retrieval, and dissemination of all scientific data resulting from experiments in space and the upper atmosphere. Since

Astronautics and Aeronautics, 1965

The National Space Science Data Center was officially established in November 1965, as part of Goddard Space Flight Center, Greenbelt, Maryland, USA, to provide the means for further analysis and dissemination of space science data beyond that provided by the

NSSDC and WDCA: Their Role in X-ray Astronomy Data, 1981

ment, and dissemination of this information. NSSDC was established by NASA in 1965 as an extension of a local data center activity at the Goddard Space Flight Center. By restricting the activities to the scientific class of space data, the proper lines of communication with the generators as well as the users of

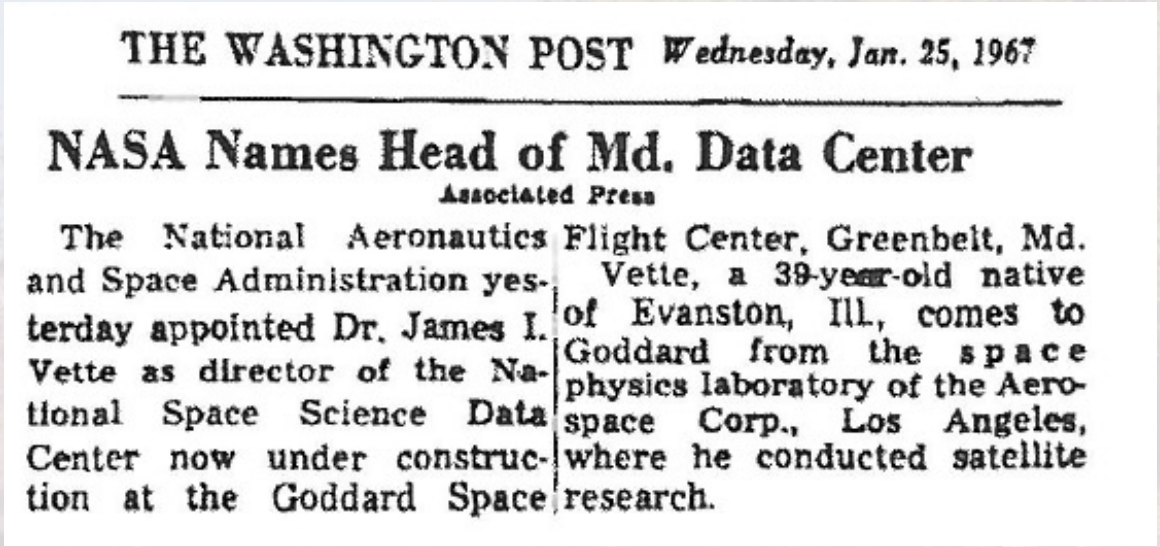
The Operation of the National Space Science Data Center, 1967

The National Space Science Data Center (NSSDC) was established in 1966 by NASA to further the use

Guide to the National Space Science Data Center, 1990

Jim Vette

In any case, in 1967 Jim Vette was appointed as the first director of NSSDC



THE WASHINGTON POST *Wednesday, Jan. 25, 1967*

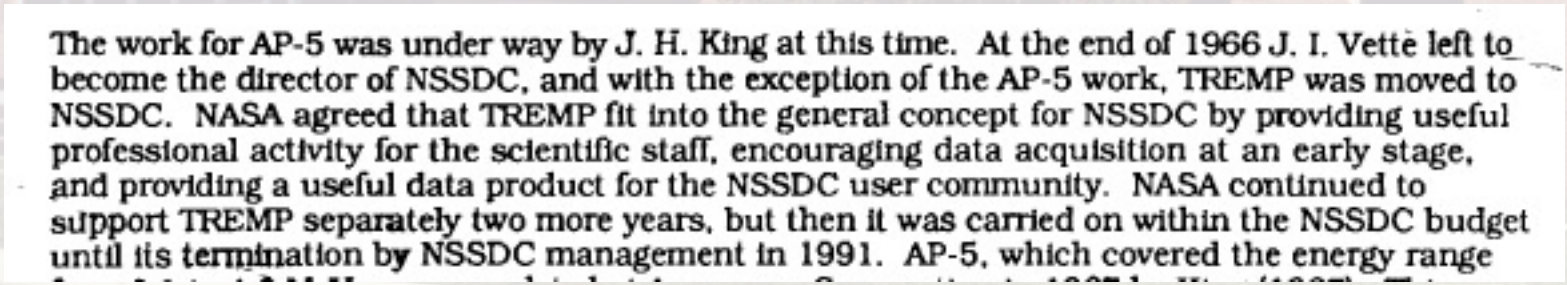
NASA Names Head of Md. Data Center

Associated Press

The National Aeronautics and Space Administration yesterday appointed Dr. James I. Vette as director of the National Space Science Data Center now under construction at the Goddard Space Flight Center, Greenbelt, Md.

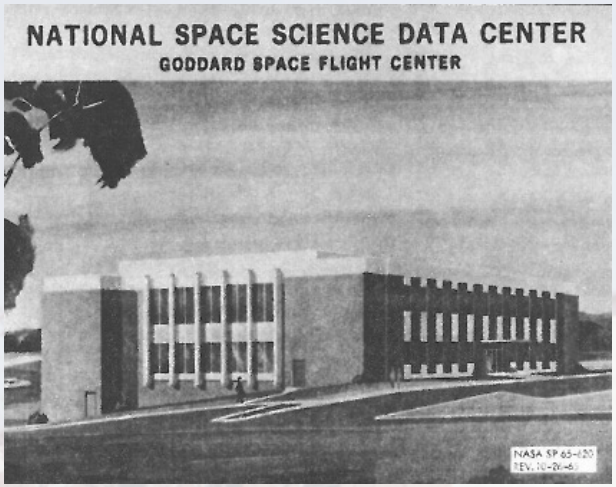
Vette, a 39-year-old native of Evanston, Ill., comes to Goddard from the space physics laboratory of the Aerospace Corp., Los Angeles, where he conducted satellite research.

Trapped Radiation Environment Model Program



The work for AP-5 was under way by J. H. King at this time. At the end of 1966 J. I. Vette left to become the director of NSSDC, and with the exception of the AP-5 work, TREMP was moved to NSSDC. NASA agreed that TREMP fit into the general concept for NSSDC by providing useful professional activity for the scientific staff, encouraging data acquisition at an early stage, and providing a useful data product for the NSSDC user community. NASA continued to support TREMP separately two more years, but then it was carried on within the NSSDC budget until its termination by NSSDC management in 1991. AP-5, which covered the energy range

George Pieper and Building 26



NEWS NASA

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
WASHINGTON, D.C. 20546

TELS. WO 2-4155
WO 3-6925

FOR RELEASE: TUESDAY P.M.
January 24, 1967

RELEASE NO: 67-6

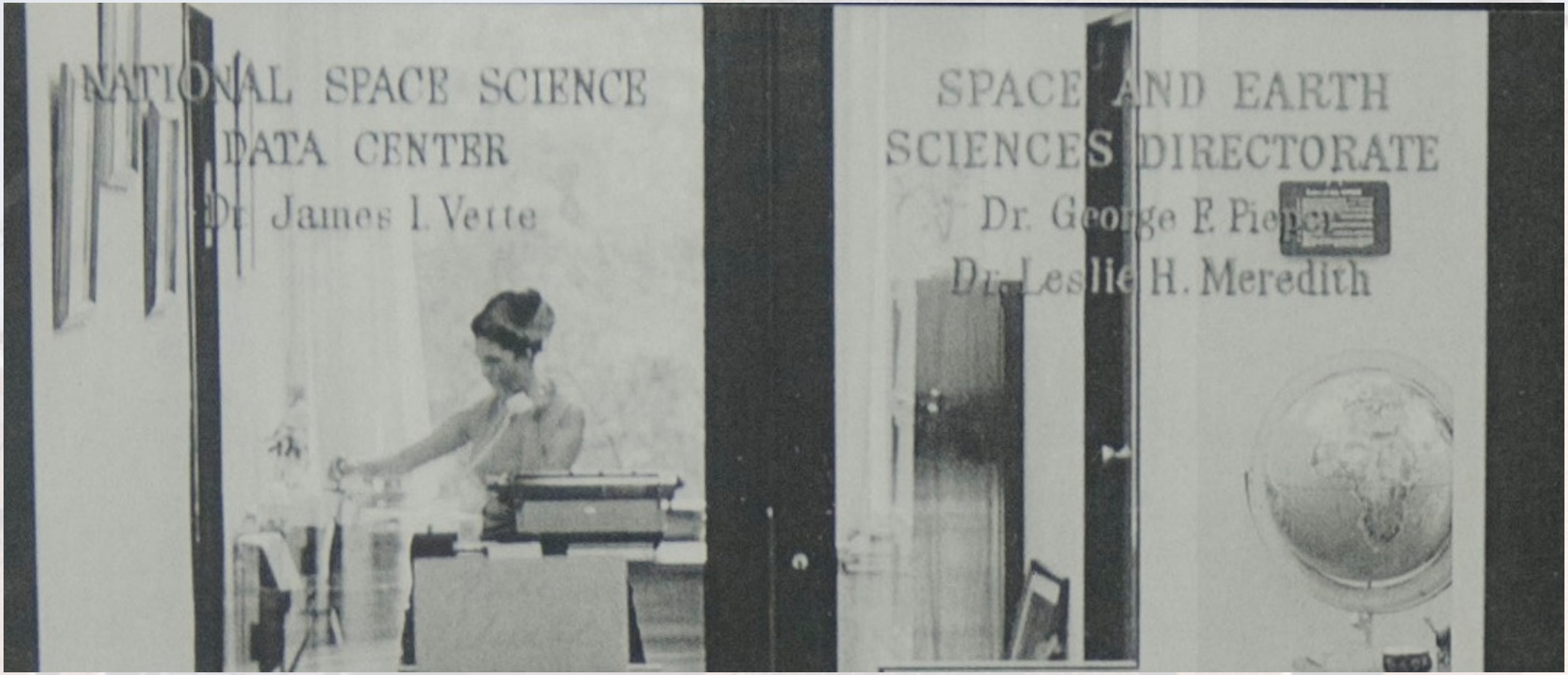
DR. J. I. VETTE
DIRECTOR OF NEW
SPACE DATA BANK

Dr. James I. Vette, 39, has been appointed Director of the National Space Science Data Center (NSSDC) located at the Goddard Space Flight Center, Greenbelt, Md.

Construction of a $1,491,600, three-story, 50,000-square-foot building to house NSSDC is nearing completion at Goddard, which is a field center of the National Aeronautics and Space Administration.

George Pieper, Director of the Space and Earth Sciences Directorate from 1965-1983, oversaw the design and construction of Building 26, which also served as the Directorate Office.

“Pieper’s Palace”



NSSDC Mission

"The Data Center is responsible for the collection, organization, indexing, storage, retrieval, and dissemination of all scientific data resulting from experiments in space and the upper atmosphere. Since its establishment the Data Center has begun: (1) to maintain a continuing inventory of data from sounding rockets and spacecraft; (2) to acquire data generated by spacecraft previously launched; (3) to collect selected ground correlative data; and (4) to produce the announcement publications which support its functions.

The new NSSDC will be the central facility for the collection, organization, storage, retrieval, announcement and dissemination of U. S. space science data obtained from satellites, sounding rockets, balloons and high-altitude aircraft. Data housed at the center are available to the worldwide scientific community.

All That Data……..

The need to prepare and preserve space science data for use and further study is vital to many scientists and engineers. To help fill this need, NASA's National Space Science Data Center collects data from all space science flight experiments. At the present time, scientific satellites alone, exclusive of picture-taking, are generating 8×10^{11} bits per year. The goal of the Data Center effort is maximum dissemination and use of these data.

This document has been prepared to inform interested parties about (a) the forms in which data are collected, (b) the present activities and use of the Data Center, and (c) some of our future plans.

James I. Vette

Dr. James I. Vette
Director
National Space Science Data Center

8×10^{11} bits = 100 Gigabytes

The Early Military Association - 1967

TABLE 3

VOLUME OF DATA AT NSSDC

Present (August 1967) and Projected, Annually (January 1970)

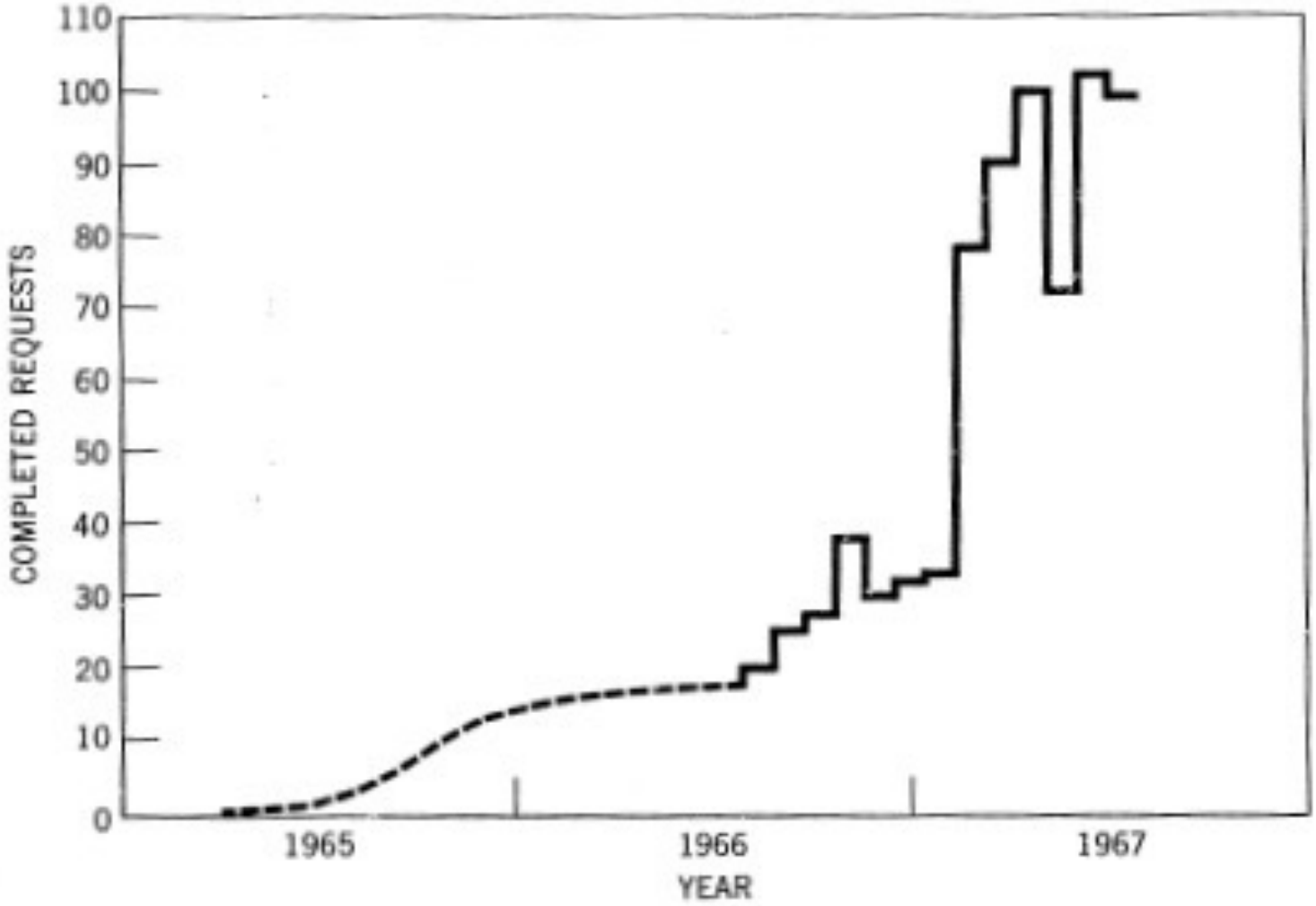
MEDIUM	ON HAND	INCOMING
SHEETS AND BOUND VOLUMES, SHEETS	175,000	100,000
ROLL CHARTS, LINEAR FEET	360,000	150,000
DIGITAL MAGNETIC TAPES, 1/2"x2400'	291	10,000
ANALOG MAGNETIC TAPES, 1/2"x2400'	1,035	0
MICROFILM, 100-FT ROLLS	7,800	2,000
PHOTOGRAPHIC FILMS:		
9-1/2" WIDTH, LINEAR FEET	14,000	4,000
70-mm WIDTH, LINEAR FEET	33,200	12,000
4- x 5-INCH, EACH	2,100	1,000
16- x 20-INCH, EACH	93	--
20- x 24-INCH, EACH	2,200	800
PHOTOGRAPHIC PRINTS:		
8- x 10-INCH	600	500
11- x 14-INCH	200	300
16- x 20-INCH	93	--
20- x 24-INCH	2,200	800

Operation of the National Space Science Data Center - 1967

FIGURE 4

THE GROWTH OF NSSDC USERS

The availability of Lunar pictures produced the rapid increase in early 1967.



Operation of the National Space Science Data Center - 1967

The First Information System - 1968

1968 – NSSDC develops the first information system on an IBM 7094 computer, using magnetic tapes and punch cards

THE USE OF THE DIGITAL COMPUTER

Although the Data Center has been in existence for 2-1/2 years, extensive use of the digital computer has been undertaken only recently. Much of the data collected in the beginning was not in digital form, and a manual operation sufficed. At the present, several different computer-oriented projects are being implemented.

Operation of the NSSDC – October 1967

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
WASHINGTON, D.C. 20546

OFFICE OF THE ADMINISTRATOR

NOV 12 1968

Dr. M. A. Tuve, Chairman
Geophysics Research Board
National Academy of Sciences
2101 Constitution Avenue
Washington, D. C. 20418

Dear Dr. Tuve:

In reply to your letter of 13 September 1968, to Mr. Webb, we agree with the transfer of the Subcenter for Rockets and Satellites of World Data Center A (WDC-A) to the National Aeronautics and Space Administration, and are willing to assign management of the subcenter to the National Space Science Data Center (NSSDC) at the Goddard Space Flight Center (GSFC). Such a move has distinct advantages for both the subcenter and our NSSDC. In operating the subcenter it is definitely our intention to continue to honor the existing international arrangements, and to be responsive to the general policy guidance as it pertains to international affairs from the National Academy of Sciences in the future. In addition, we will provide adequate support to the subcenter so that the identity of the subcenter will be preserved.

World Data Center A

Rockets & Satellites

If you agree with our understanding of the responsibilities for the operation of the subcenter, I suggest that the transfer of the subcenter be made effective January 1, 1969, or as soon as possible thereafter.

Sincerely yours,

Original Signed by
Homer E. Newell

Homer E. Newell
Associate Administrator

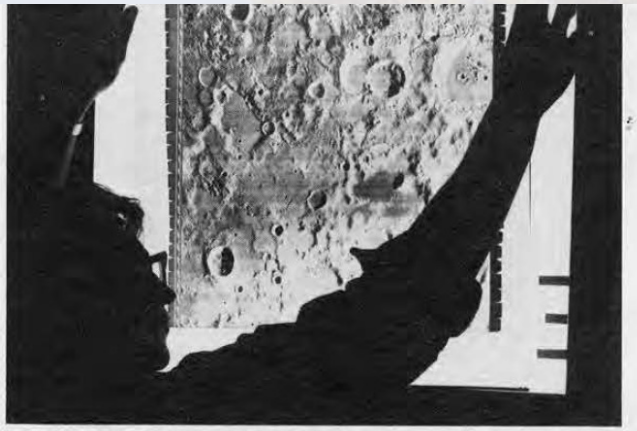
World Data Center A for Rockets and Satellites

Goddard News—January 13, 1969

National and World Data Centers Now at Goddard

On January 2, 1969, Goddard assumed operation of World Data Center (WDC) A, Rockets and Satellites, under the auspices of the Geophysics Research Board of the U. S. National Academy of Sciences. It is co-located with the National Space Science Data Center (NSSDC) in Building 26. Dr. James I. Vette is serving as director of both data centers. Prior to the move, WDC-A, Rockets and Satellites, was operated by the National Academy of Sciences in Washington, D. C.

According to Dr. Vette, the two data centers are separate and distinct entities, each of which has its own mission to perform. The concept of WDC's dates back to an international agreement in 1955 which authorized at least three International Geophysical Year (IGY)



PROCESSING LUNAR PHOTOGRAPHY at the National Space Science Data Center. Shown is Mike Canyes, Photographic Technician.

N72-22891 MARCH 1972

WORLD DATA CENTER A
Rockets and Satellites

CATALOGUE OF DATA

VOLUME I

PART A. SOUNDING ROCKETS

7 MARCH 1947 - 31 DECEMBER 1971

Responsibilities of NSSDC / WDC-A

Archiving satellite data

Maintaining sounding rocket database

SPACEWARN bulletin – announcement of all rocket launches

Assigning international spacecraft IDs

Publication of data catalogs and supporting documentation

Safeguarding magnetic tape, microform, and hardcopy media

Developing and promoting data standards

Make data available to scientists and the general public

Satellite Situation Center - 1971

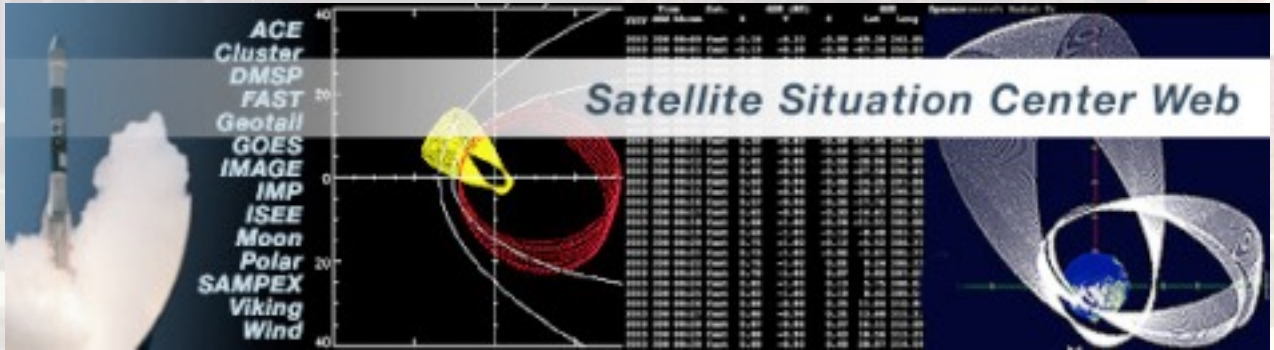
SATELLITE SITUATION CENTER

The Satellite Situation Center (SSC) is designed to serve the planning needs of diverse investigators for coordination of data acquisition for collaborative efforts both large and small. This part of the NSSDC was developed to meet the challenge of the International Magnetospheric Study (IMS).

During the IMS period (1976-79), and in 1971-75, the SSC developed a variety of programs to compute and display orbit-related parameters of spacecraft in any of a number of coordinate systems used in space physics. It provides both predicted and after-the-fact

The Satellite Situation Center was developed at NSSDC to keep track of the positions of satellites to aid in coordinated measurements, particularly for space physics investigations.

Later to become the SSCWeb



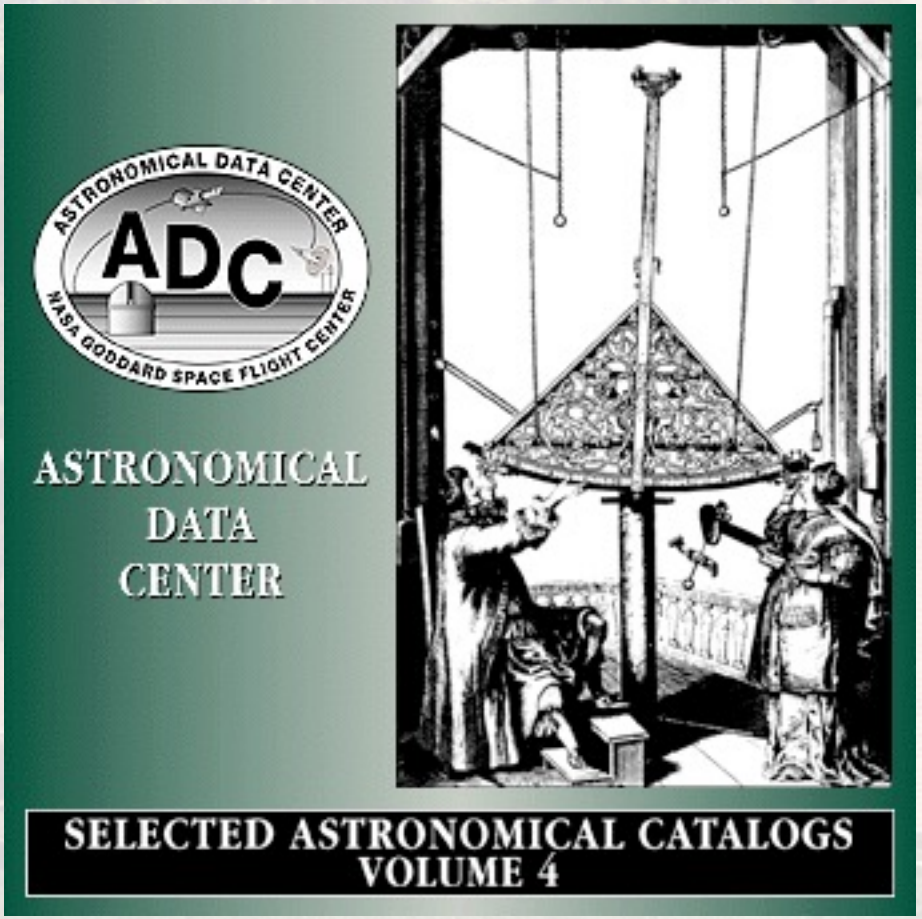
New Computer - 1975

MODCOMP IV minicomputer with 1 MB (!) of storage replaces IBM 7094

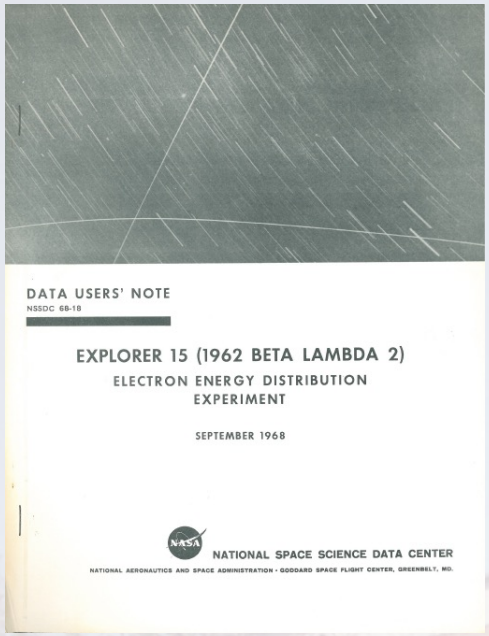
First Coordinated Data Analysis Workshop (CDAW) - 1977

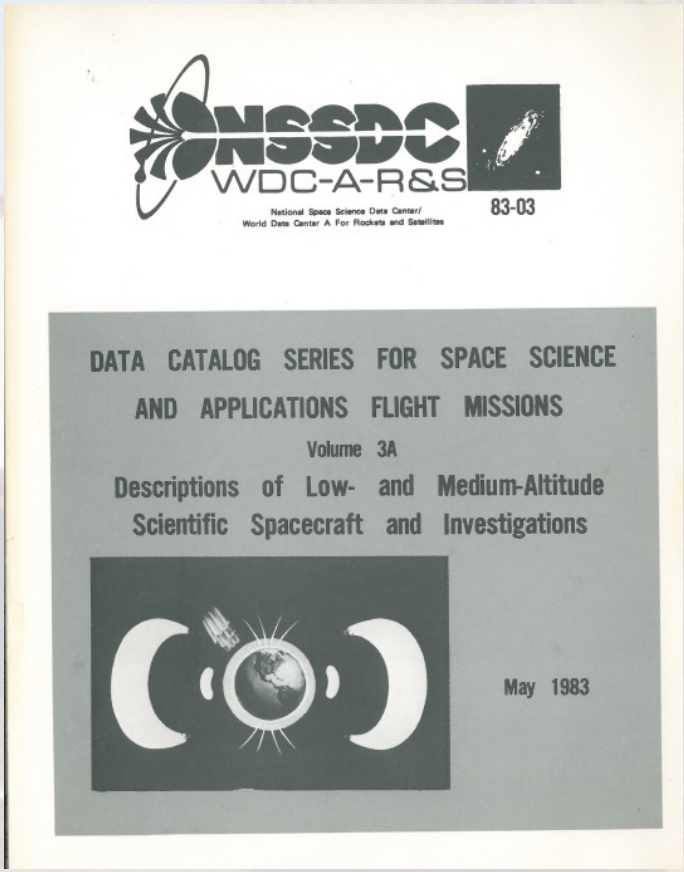
A total of 9 CDAWs were held between 1977 and 1993

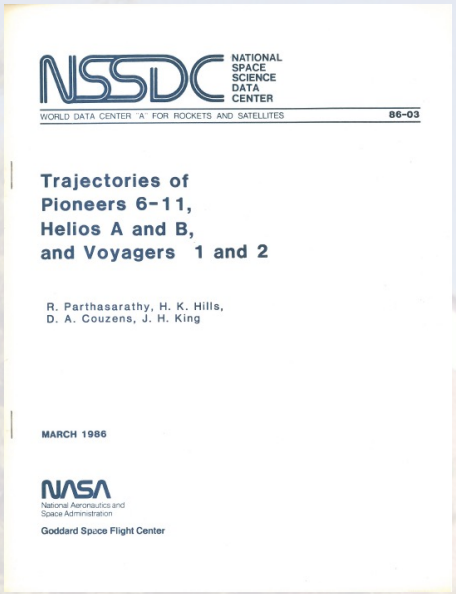
Astronomical Data Center
Established - 1978

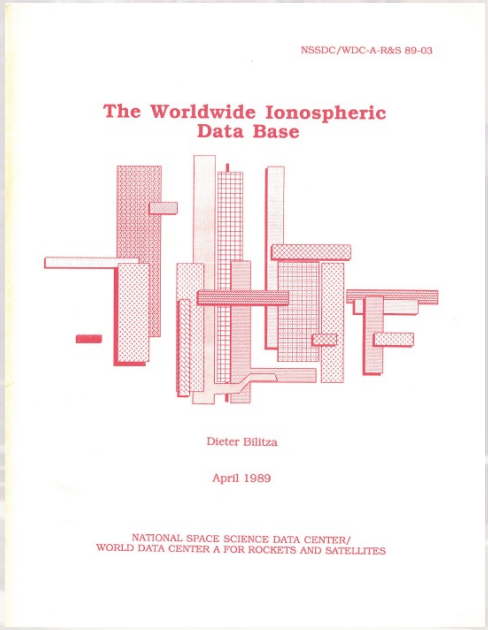


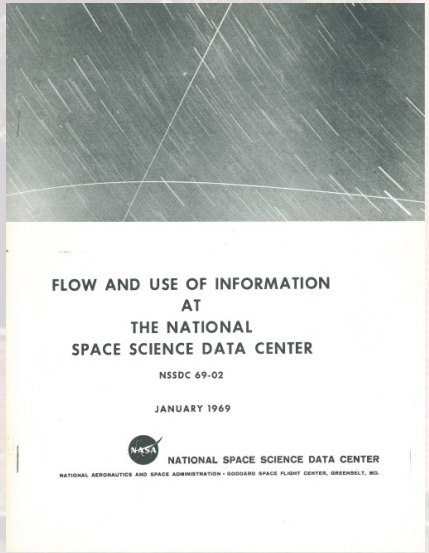
NSSDC Reports











Jim Green Becomes Head of NSSDC July 1, 1985

Meet the New Director of NSSDC

On July 1, 1985, Dr. James L. Green will assume the Directorship of NSSDC and will also become an Associate Chief of the Space Data and Computing Division. Dr. Green is currently at Marshall Space Flight Center where he has been instrumental in the creation and evolution of the Space Physics Analysis Network (SPAN).

Dr. Green is an active space plasma physicist with dozens of publications to his credit including those on the subjects of auroral kilometric radiation, ion composition, and magnetospheric cold plasma. He was involved in the discovery of the polar wind and nitrogen in the magnetosphere and intends to remain an active scientist, continuing his role as a Dynamics Explorer science investigator.

can do our part in speeding that up, we will have done well and we will have served NASA well."

Dr. Green is concerned about providing post-graduate students with easily-

NSSDC News, June 1985

Storm Clouds on the Horizon - 1986

From Space Research Data Management in the National Aeronautics and Space Administration – George Ludwig – 1986:

The National Space Science Data Center has been a long-standing object of debate and concern. Throughout much of its history there has been criticism that it was not fulfilling its envisioned role. This role was

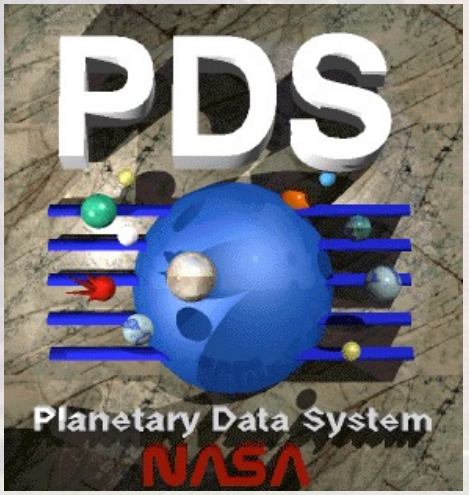
These functions have not always been performed as envisioned. In some cases the data have not been acquired by the Data Center; in others, data have been collected, but not in forms which made their use by third party investigators easy or, in some cases, possible. Some attribute this to the low level of support for the NSSDC by management, including inadequate budgets. Others cite failure of the project and program managers to enforce the requirements of NASA Management Instruction 8030.3A. Still others

A Recommendation

3.2.1. A Distributed Data Center Concept

An active, distributed network concept should be adopted to make the data centers a more dynamic part of the research process. This should include the National Space Science Data Center, but should also encompass holdings at other locations. These other holdings, such as the planetary

This led in part to the formation of the Planetary Data System in 1989



Joe King Becomes Head of NSSDC - 1992

Jim Green heads up newly formed Space Science Data Operations Office (SSDOO), an umbrella organization overseeing NSSDC, Astronomical Data Center, and the Space Physics Data Facility.

NSSDC

ASTRONOMICAL DATA CENTER
ADC
NASA/GODDARD SPACE FLIGHT CENTER

Space Physics Data Facility

CD-ROM Workshop

1993

1993

First NASA Home Page

National Aeronautics and Space Administration

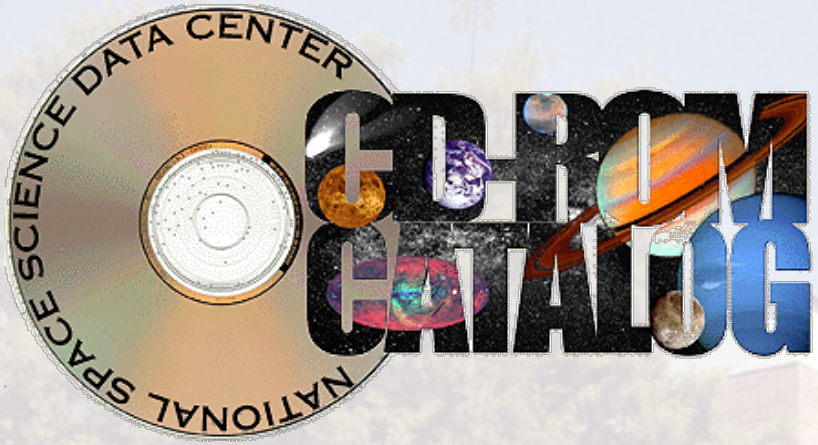
The NASA Homepage

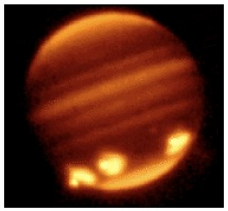
- Welcome - This is a good place to begin your journey. Start by reading a letter from NASA Administrator, Dan Goldin, or NASA's Strategic Plan. Check out the User Tips page to find the helper applications you will need to get the most out of what we have to offer.
- Today@NASA - If you've read about NASA recently or seen something on TV, this is place to go for links to more details about breaking news. You can find the most recent Hubble Space Telescope Images, links to the Shuttle Web and the latest news releases. [This site is extremely busy, please be patient.]
- Go To - Links back to the NASA Organization, the NASA Centers, other nations' space agencies and other U.S. federal agencies.
- Gallery - Video, audio clips and still images are here for the downloading.
- Aeronautics - An overview of NASA's aeronautics research and links to related Webs.
- Space Science - What lies beyond our home world? Here's information on NASA's planetary exploration, astronomy and research into the origins of life.
- Mission to Planet Earth - Dedicated to understanding the many ways the Earth is constantly changing and how human beings influence those changes.
- Human Space Flight - This Web provides links to the Office of Space Flight, including the Space Shuttle and Space Station Home Pages, and the Office of Life and Microgravity Sciences, which conducts research aboard the Shuttle and is planning experiments for the Space Station.
- Education - If you're a student looking for information for a school paper or a teacher seeking material to add to your curriculum, this is the place to start.

You can send us comments or questions about our Web site.

Author: Brian Dunbar
Curator: Jim Gass
WebSite Design: Stephen E. Chambers

Last update: May 9, 1997





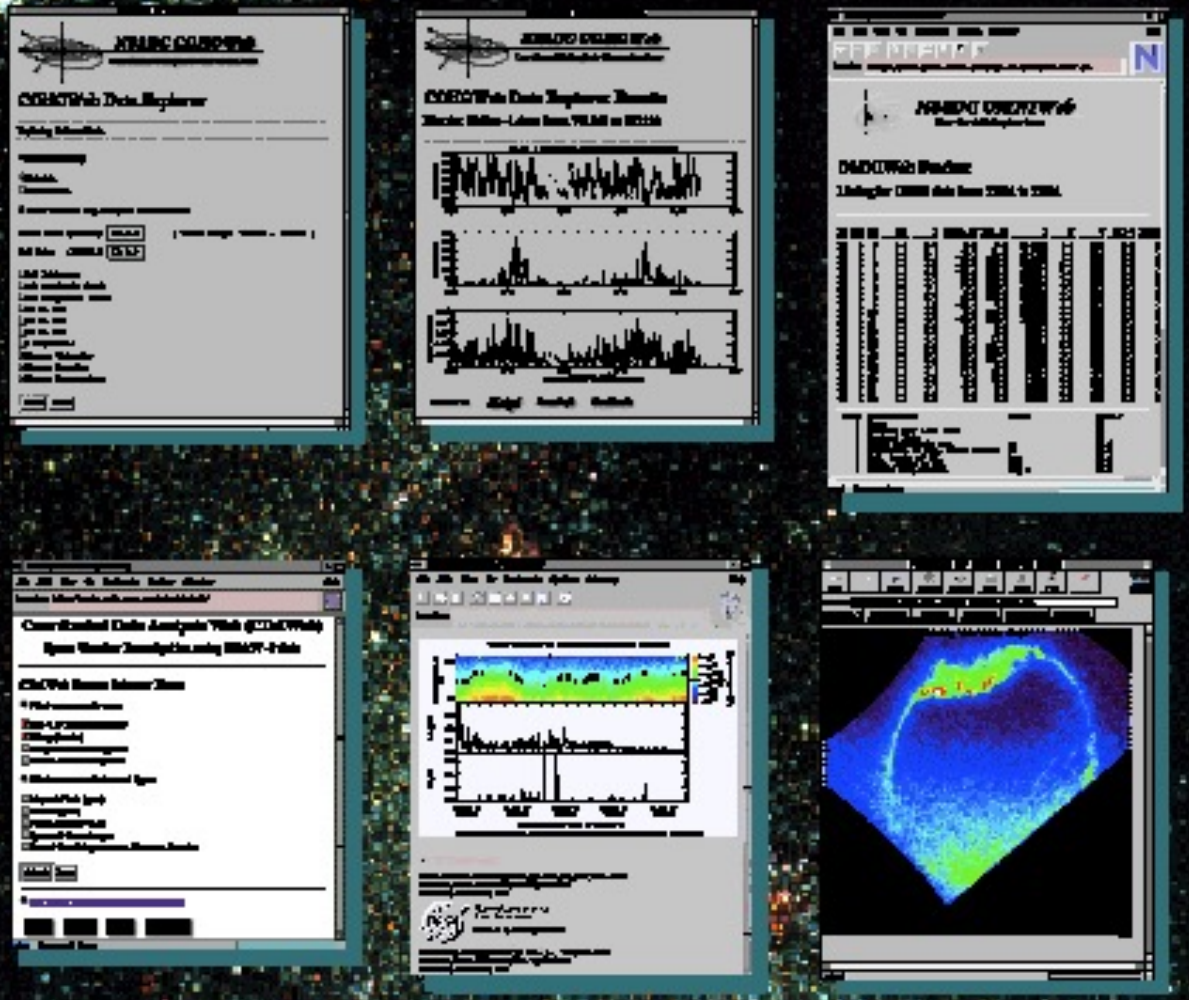
Comet P/Shoemaker-Levy 9 Collision with Jupiter

Do not go gentle into that good night.
Rage, rage against the dying of the light. **- Dylan Thomas**

From July 16 through July 22, 1994, fragments of Comet P/Shoemaker-Levy 9 collided with Jupiter, with dramatic effect. This was the first collision of two solar system bodies ever to be observed. Shoemaker-Levy 9 consists of 20 discernable fragments with diameters estimated at up to 2 kilometers, which impacted the planet at 60 Km/s. The impacts resulted in plumes many thousands of kilometers high, hot "bubbles" of gas in the atmosphere, and large dark "scars" on the atmosphere which have lifetimes at least on the order of weeks. Smaller bits and dust continue to impact the planet. Shoemaker-Levy 9 is gone, but as the Earth- and space-based images show, it did not go quietly.

WWW-BASED DATA SYSTEMS FOR INTERACTIVE MANIPULATION OF SCIENCE DATA

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



SSDOO

NASA

Extracurricular Activities

Goddard Space Flight Center Moon Tree

Greenbelt, Maryland