

Getting There From Here: Goddard's Strategic Planning Progress Report

By Randee Exler

Suppose you wanted to build a house. Where would you begin? First you would picture what you wanted the house to look like—this is your vision. Then you would begin planning the construction process—setting goals for getting each job done. But once the construction is finished, is the job complete? Not really—eventually the roof will have to be replaced. Suppose you wanted to add an addition?

The upkeep of a home is an ongoing process and so is strategic planning. Center Director Dr. Noel W. Hinners introduced Goddard to strategic planning in November 1985 with the anticipation that it would help us better understand where we want to be as a Center and what steps we'll take to get there.

Planning is nothing new to GSFC, but a purposefully organized process that examines key questions that relate to our work is a new approach.

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NASA
National Aeronautics and
Space Administration
Goddard Space Flight Center

Goddard News

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1986: A Diverse Year For GSFC

by Carter Dove

The year 1986 will live forever in the minds of Americans as a year of difficulties for the Nation's space program. The tragic loss of *Challenger* and its crew of seven left the world shocked, stunned and saddened.

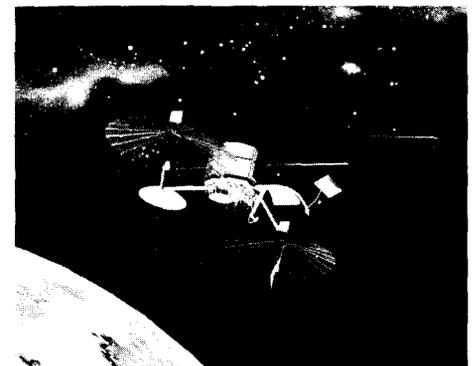
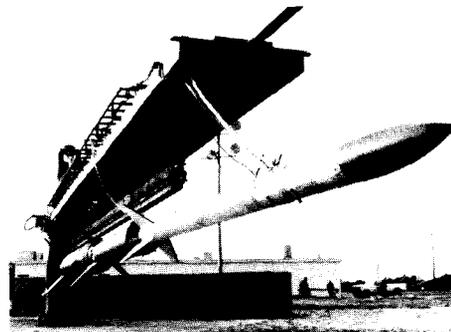
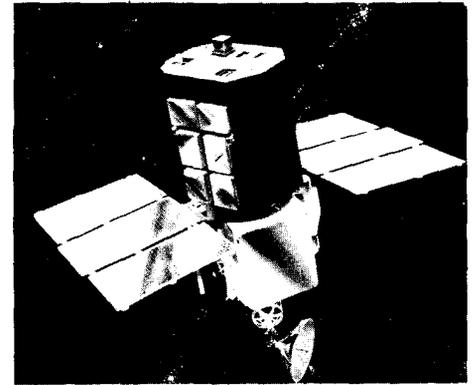
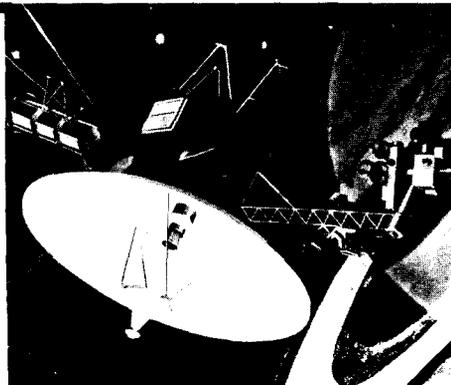
Two Goddard payloads—the Tracking and Data Relay Satellite (TDRS-B) and Spartan-Halley—were on *Challenger* on that fateful January 28.

While NASA and Goddard still live with reminders of the Shuttle tragedy, and will for many years to come, many significant scientific and other achievements were accomplished by NASA personnel in 1986.

For Goddard, the year underscored the diversity of its scientists, engineers and technicians. Among the events that marked 1986, we remember the following:

JANUARY

MODEL FOR COMET HALLEY OBSERVATIONS: A team of Goddard and university scientists announced the first direct confirmation of water in a comet as a result of observing Comet Halley. The discovery lends new support to the widely-held astronomical theory that comets are dirty "snowballs" composed primarily



A DIVERSE YEAR—Goddard scientists conducted observations with six of the eleven scientific instruments aboard NASA's Voyager 2 spacecraft (upper left) during its late January encounter with Uranus. In February, the Goddard-managed Solar Maximum Mission (SMM) (upper right) produced images of Comet Halley which showed clearly a bright cometary head about 50,000 miles in diameter and a tail more than one million miles in apparent length. The Wallops Flight Facility, successfully launched two sounding rockets—a Black Brant X and a Taurus-Nike-Tomahawk (lower left)—carrying complex plasma physics payloads used to help explain details about the early formation of the solar system. In August, the Tracking and Data Relay Satellite (TDRS) (bottom right) became part of the world's largest telescope in an experiment with two ground-based antennas.

of frozen water. The discovery stems from a new theoretical model developed at Goddard by Dr. Michael Mumma, Head of the Planetary Systems Branch; and Dr. Harold Weaver, now an associate research

scientist at the Center for Astrophysical Sciences, Johns Hopkins University, Baltimore, Md.

URANUS ENCOUNTER: More than twenty scientists from Goddard

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Thirteen Nations Participate in Global Exercise

by Randee Exler

All beacons went on and off properly during a four-day worldwide COSPAS/SARSAT system exercise conducted November 11-14, Lloyd Green, Code 480 reported recently.

Thirteen nations cooperated in this demonstration of the space-based search and rescue system which contributed to the saving of over 650 lives since its inception in 1982.

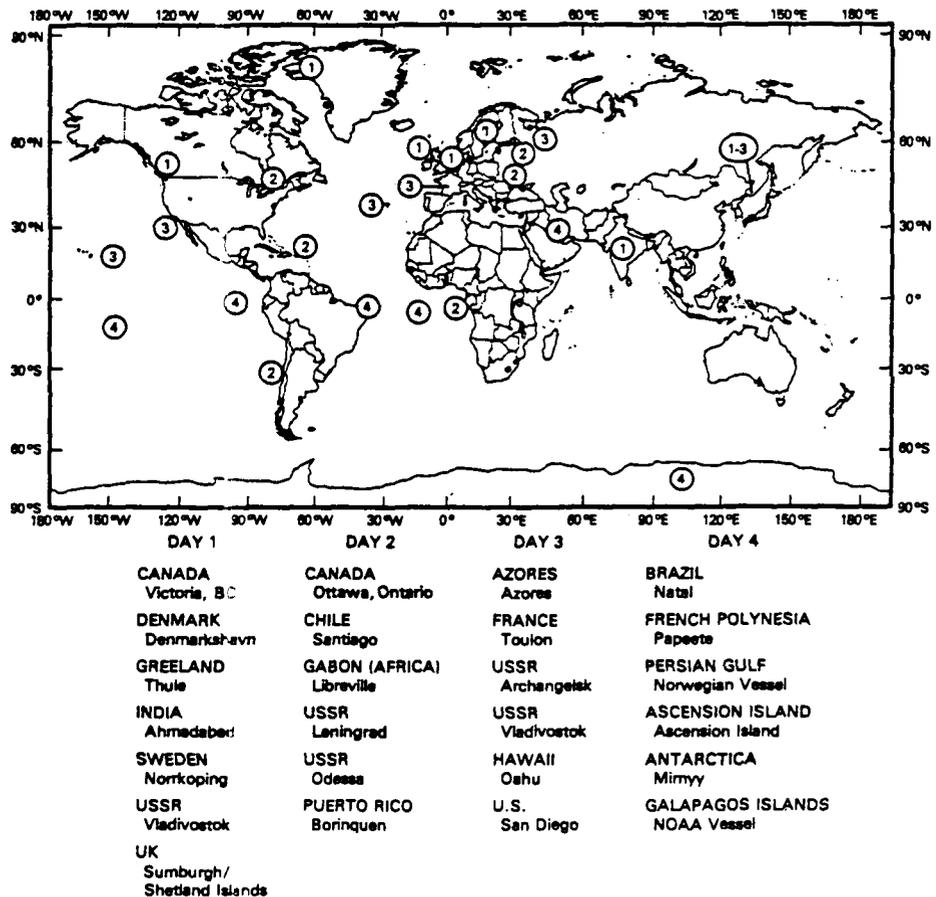
The exercise was designed to demonstrate, evaluate and assure the accuracy and timeliness of a new 406 MHz frequency system nearing adoption for global marine operations by the world's seafaring nations.

Green served as the international coordinator for the exercise and used the U.S. mission control center for the drill. He directed a team of Air Force, Coast Guard, National Oceanic and Atmospheric Administration (NOAA) and contractor (MITRE, ORI, Westinghouse) personnel.

The exercise was conducted by activating emergency beacon transmitters in 24 locations on five continents. The three Soviet and two U.S. spacecraft which carry search and rescue equipment participated in the exercise by beaming the stress signals to the mission control center.

During the first three days Green and his team knew exactly when and where beacons would go off. Participants followed a set script.

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BEACON LOCATIONS — Thirteen Nations participated in a four-day exercise to demonstrate a new frequency system for COSPAS/SARSAT, the space-based search and rescue system. Note: On Day Four, a beacon originally thought to go off in the Persian Gulf was located in the South China Sea aboard a Norwegian Tanker.

New Source Evaluation Board Facility Opens

by David Thomas

From now on, Source Evaluation Board (SEB) members probably won't have to worry about a work site when they are determining what proposals for goods and services are best for Goddard. Last month, the Center opened a permanent place for five to seven concurrent SEBs; now, SEBS have "a place to call their own."

The 5,000 square-foot, 18-room facility is located in the basement of Building 25, and includes 13 evaluation/meeting rooms; a storage room; a safe room for centralizing storage of sensitive documents; and a break room. Each work room also has a personal computer and a telephone.

"We want to make it as comfortable as possible for SEB members," said

Janet Jew, SEB coordinator. "SEBs perform a lot of work ... it usually takes a year to complete a project."

The main goal of the SEB is to "ensure impartial, equitable and comprehensive evaluation of proposals; thereby ensuring the selection of that source whose proposal offers optimum satisfaction of NASA objectives," according to the SEB handbook.

Last December, when the Center's spaceflight tracking functions were transferred to its Wallops Island Flight Facility, the Mission Operations and Data Systems Directorate "identified" the resulting unused office vacancy as a possible SEB space and offered it to the Management and Operations Directorate (Code 200).

The space became available last June; Code 200 then put together plans, solicited funding and organized the renovation which took six weeks.

Past SEB participants were polled to determine a flexible, comfortable work environment. Each directorate provided financial support, Jew said, and priorities were set to ensure the facility was ready to handle proposals due this fall. Four SEBs currently are operating, and the new facility is booked—until next spring.

"We're thankful to all the people who made it happen," Jew said. "SEBs previously worked wherever we could find space. This facility provides a comfortable environment with enhanced security for the Center's SEB process."

Diverse Year

Continued from page 1

conducted observations with six of the eleven scientific instruments aboard NASA's Voyager 2 spacecraft during its late January encounter with the planet Uranus. The Goddard scientists included two principal investigators, Drs. Norman F. Ness and Rudolf Hanel. Ness was the principal investigator for an experiment to find out if Uranus had a magnetic field and, if so, determine its characteristics; record the interaction of any magnetic field with Uranus' moons; and study the interplanetary magnetic fields in the vicinity of Uranus. Hanel was the key scientist on the Voyager 2 team for a very specialized camera with a sensor to determine if Uranus was generating heat in its interior and to analyze the composition of the Uranian atmosphere.

FEBRUARY

SMM OBSERVES COMET HALLEY: The coronagraph polarimeter of the Goddard-managed Solar Maximum Mission (SMM) spacecraft produced images of Comet Halley which showed clearly a bright cometary head (coma) about 50,000 miles in diameter and a tail more than one million miles in apparent length. At the times of the images, January 27-28, Comet Halley was about 14° from the Sun—nearing perihelion passage (closest to the Sun)—and about 60 million miles away from the Sun. Dr. Chris St. Cyr was the High Altitude Observatory team leader for the coronagraph at Goddard; Dr. Malcolm Niedner, a cometary scientist at Goddard, provided expert assistance.

SUBORBITAL ROCKET OBSERVES COMET HALLEY: Goddard's Wallops Flight Facility, Wallops Island, Va., launched two Black Brant rockets from the White Sands (NM) Missile Range to obtain far ultraviolet images of Comet Halley. The scientific payload consisted of two electrographic (film recording) Schmidt cameras. At the time of the rocket observation, Comet Halley was approximately 28 degrees from the Sun as viewed from the Earth. The NASA/Wallops project manager was Mendel N. Silbert.

MAY

DELTA 178 DESTROYED: On May 3, a Goddard-managed Delta

rocket—Delta 178—was destroyed by the range safety officer shortly after launch from Cape Canaveral Air Force Station, FL when the main engine shut down prematurely and the rocket began tumbling out of control. This failure ended a string of 43 successful flights, dating back to 1977. On board Delta 178 and lost in the explosion was the GOES-G weather satellite, also managed by Goddard and intended for operation by NOAA.

GODDARD EXPERIMENTS PRODUCE URANIAN FINDINGS: Using observations from the planetary

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Goddard CFC Surpasses Goals

Goddard's Combined Federal Campaign (CFC) enjoyed another successful year thanks to employees' generous contributions. To date, the total collected is \$291,504 with contributions still being received. Of this amount, \$286,963 goes to the United Way Campaign for the National Capital Area through CFC. An additional \$4,541 was raised for the United Way campaign of the Baltimore area (Central Maryland).

Contributions to the CFC by directorate this year were as follows:

Code	\$ Contributions	% of Goal	% of Participation
100	4,856	202	87
150	4,982	115	61
200	29,325	108	65
300	13,378	144	89
400	31,802	111	79
500	66,742	147	67
600	65,119	106	60
700	70,759	125	77

Subtotal
CFC 286,963

Subtotal
Central
Md. 4,541

Total \$291,504



A Toast to Dr. Goddard

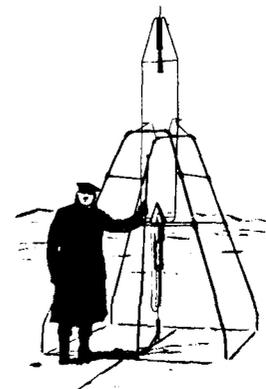
Often, the Goddard News gets correspondence that we would like to share with you. We can't print most of it because of space contractions, but sometimes there is room. The following is a letter to a Goddard employee from her uncle who recently died of cancer. The employee is Sharon Garrison, Resource Analyst, Code 201. Her uncle, Francis X. Welch, a member of the American Bar Association since 1926, retired in 1976 as vice president of Public Utilities Reports, Inc., and as editor-in-chief of all PUR publications. He served as a special consultant to the White House, Office of Telecommunications from 1966-1976. Among his many achievements, he was honored by the National Association of Regulatory Utility Commissioners in 1970 for making a "significant contribution toward improving the quality of public utility regulation in the United States."

This is a belated thanks for sending me the NASA material about the Goddard Centennial (Oct. 5, '82) ... Goddard has always been one of my heroes, mainly because of his stubborn conviction and persistence in the face of much lack of support and even criticism in his early years. Every so often I look back with a smile at a stupid N.Y. Times editorial (which was abjectly apologized for, many years later) ridiculing Goddard for advocating "what any bright high school student should know"—that a rocket combustion is impossible in a vacuum.

Oddly enough, Goddard never did get a Nobel prize, although a number of second rate novelists and politicians have been so recognized. But, of course, time has vindicated Goddard far beyond question. You are fortunate in being associated with an agency which now carries on his work ...

... I expect to drink a toast to Goddard on the next Space Shuttle event ...

Your Uncle Xav.



RETIREE

Best wishes to John Park, Code 313.2 who retired in November with 38 years of service.

Mail your story to the Goddard News (Code 130), or call the Editor at 286-7277.

Progress Report —

Continued from page 1

Why Strategic Planning?

NASA had a vision in 1959—the Goddard Space Flight Center. If Goddard technology is to keep up with the Country's space program then it is time to evaluate our vision and develop new goals.

Strategic planning is not an attempt to blueprint the future. It is not the development of a set of plans that are so concrete they cannot be changed. Like the homeowner who revises his environment periodically, strategic planning is flexible in order to take advantage of our changing environment.

Dr. Hinners believes that goals are not enough. "Goals in and of themselves are nice but relatively useless. In all areas we need to develop specific plans of action to work towards accomplishing our goals," Dr. Hinners explained in the June issue of the Goddard News.

Writing the Report

Before planning how we're going to get there, we need to know where we're going. Last February, members of the Goddard Executive Council, along with a significant number of Goddard employees, began examining the basic mission, goals and objectives for our Center. One result of their extensive time and effort is a strategic planning process report which was distributed to Center employees this month.

Where should GSFC be in the year 2000? Before the Executive Council

could tackle this question and develop a vision statement, it took inventory of our Center environment, looked at our strengths and weaknesses, and examined who are key stakeholders who have an interest in GSFC's projects and the forces that affect us.

An initial vision statement was drafted and key issues that require action as part of strategic planning were identified: Next In-House Project; GSFC Space Station Role; Satellite Assembly; Maintenance and Repair Role; Operations of the Hubble Space Telescope and "Great Observatories" and Construction of Facilities.

"In all areas we need to develop specific plans of action to work towards accomplishing our goals."

Dr. Noel W. Hinners

The key issues were discussed in depth and a criteria to be used for the evaluation of these issues was developed. Both the key issues and the vision statement were tested against the criteria and revised as needed.

Next the Executive Council began developing Center goals which also were tested against the evaluation

criteria. These goals identify long range efforts—and suggest what we have to do today if we want to be in some particular place in the future.

Critical Success Factors

Five critical success factors were identified and developed. These are factors which are essential to the achievement of our mission and will receive our closest attention to ensure our successful performance.

The strategic planning process report includes the following areas: Goddard's Vision; Critical Success Factors; Highlights of the GSFC Strategic Planning Process; and the goals and near term emphasis for GSFC's Sciences, Engineering, Project Management, Operations, and Institution; and Contributors to the Strategic Planning Process.

What's Next?

"We will pay special attention to integrating the Goddard strategic planning process with NASA-level strategic planning and to working more effectively with Headquarters programs to assure that we are headed cooperatively and in consonance towards the future," explained Dr. Hinners in the introductory Director's Message.

Strategic planning touches everyone. The Executive Council carefully has examined its expectations to avoid false hope of where we want to be. The progress report is only the first step of this ongoing process. The Executive Council will continue to reexamine, reorient and expand the process throughout the organization.

Project JULIE Donated to NASM

by George G. Gerondakis

A Get Away Special (GAS) project which flew on the maiden voyage of Goddard's GAS Bridge was presented to the National Air and Space Museum (NASM) recently.

The Joint Utilization of Laser Integrated Experiment, or Project JULIE as it is more affectionately known, is a series of medically-related laser experiments developed by scientists and various organizations throughout the U. S. in cooperation with the staff of St. Mary's Hospital in Milwaukee, Wisc.

Project JULIE flew on the GAS bridge,

Continued on page 5



JULIE GIVEN TO NASM—A Get Away Special Project was donated to NASM in a recent ceremony at the museum. Pictured from left to right: Dr. David DeVorkin, Space and Exploration Department, NASM; Sister Julie Hanser, President and Chief Executive Officer, St. Mary's Hospital; Derek Elliott, Assistant Curator, NASM; M. C. Muckerheide, Payload Manager, St. Mary's Hospital; Gary Walters, GSFC Gas Field Operations Manager; Clark Prouty, Gas Program Manager, NASA Headquarters; Allen Lindonmoyer, GSFC/NASA Technical Manager.

Project JULIE

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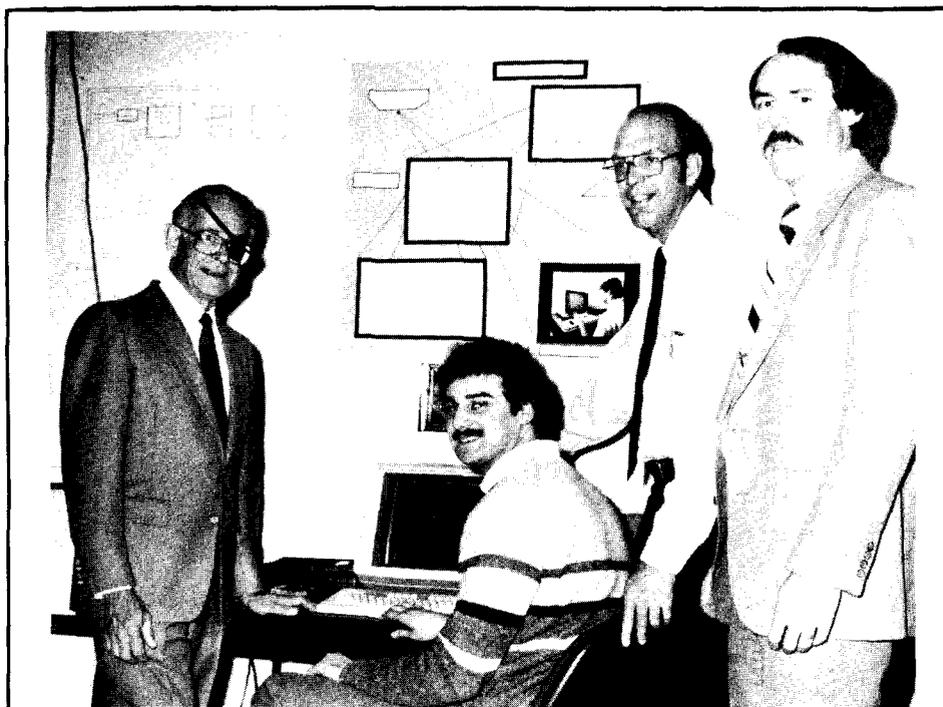
an aluminum structure attached to the Space Shuttle's payload bay. Space Shuttle Mission 61-C was the first flight for the gas bridge, which is managed by Goddard and was launched on January 12, 1986.

Sister Julie Hanser, President and Chief Executive Officer of St. Mary's Hospital, presented the payload to museum officials in Washington, D.C. There are tentative plans to exhibit the Project JULIE payload in NASM in 1987.

"Everyone at St. Mary's is very proud to extend Project JULIE's journey to our Nation's showcase museum, and we are looking forward to sharing our pioneering effort with the public," said Sister Hanser. "The opportunity to display our payload at the Smithsonian is yet another exhilarating moment that our participation in NASA's Space Shuttle program has afforded us."

St. Mary's Hospital is the first hospital in the world to be accepted and participate in the NASA Get Away Special (GAS) program. The GAS program was initiated to fly self-contained scientific payloads from industry, educational institutions, domestic and foreign governments, as well as from individuals who wish to carry out scientific research on shuttle flights.

Project JULIE was composed of 20 experiments designed to study the effects of laser light, cosmic radiation and weightlessness on medications, human tissues, laser protective eyewear, fiber-optics and other materials in the zero-gravity environment of space. An experiment to test blood typing in space also was included in the 80-pound payload. The experiments currently are being evaluated and results are pending.



NASA DEPUTY ADMINISTRATOR Dale Myers visited Goddard on November 17. On his tour he visited the Very Large Scale Integration Lab (pictured) where data systems are designed utilizing CAE/CAD (computer aided engineering/computer aided design) tools and VSLI components. Pictured from left to right: NASA Deputy Administrator Dale Myers; Nick Especiale, Code 521.1; Section Head Jim Chesney, Code 521.1; and Division Chief John Dalton, Code 520.

Global Exercise

Continued from page 2

Day 4 followed a different set of rules—participants turned on their beacons whenever they chose. The only rule was that the beacon had to remain on for eight hours.

In two instances, the team did not know the exact location of the beacon either. "We were given the answer book afterwards," Green explained. "We found a beacon in the South China Sea and one off the western coast of South America." The beacon in the South China sea was carried by a

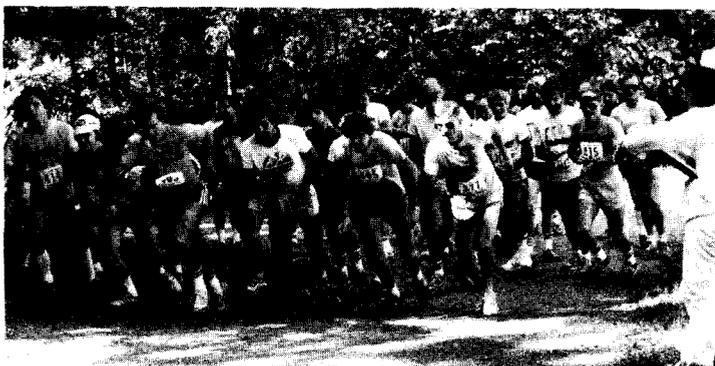
Norwegian Tanker enroute to Japan and the beacon off of the western coast of South America was carried by a National Oceanic and Atmospheric Administration (NOAA) vessel. The ships confirmed their locations after the exercise.

"Due to the extraordinary collaboration of the nations involved, we will be able to evaluate the performance of this system," said Fred Flatow, Search and Rescue Mission Manager at Goddard. "The preliminary findings look promising," Green added. The data is currently being evaluated and the results will be out in February.

You Don't Have to Run ... To Join in the Fun



GODDARD WALKERS strolled behind racing runners during the Two-Mile Fun Run around the Center.



GODDARD RUNNERS competed against other Centers during NASA's Intercenter Run held recently at Greenbelt Lake.

NUSAT Dedication at Senate Office Building

by David Thomas

Goddard's Len Arnowitz was presented with a model of the first satellite to be launched from a Get Away Special (GAS) container flown aboard a Space Shuttle in a ceremony last month at the Senate Office Building in Washington, D.C.

The ceremony commemorated the historic deployment of NUSAT (Northern Utah Satellite), designed and built by students from Weber State College, Ogden, Utah. NUSAT, an air traffic control radar system calibrator for the Federal Aviation Administration (FAA), was deployed during the 17th space shuttle mission, launched in April 1985.

Arnowitz, Chief of Goddard's Special Payloads Division, said the GAS program "has brought a whole new dimension to our space program ..." He said the model would "always remind us at Goddard that just like the people who laid the transcontinental railroad and took part in driving the golden spike, we, too, took part in the history of our great and wonderful country."

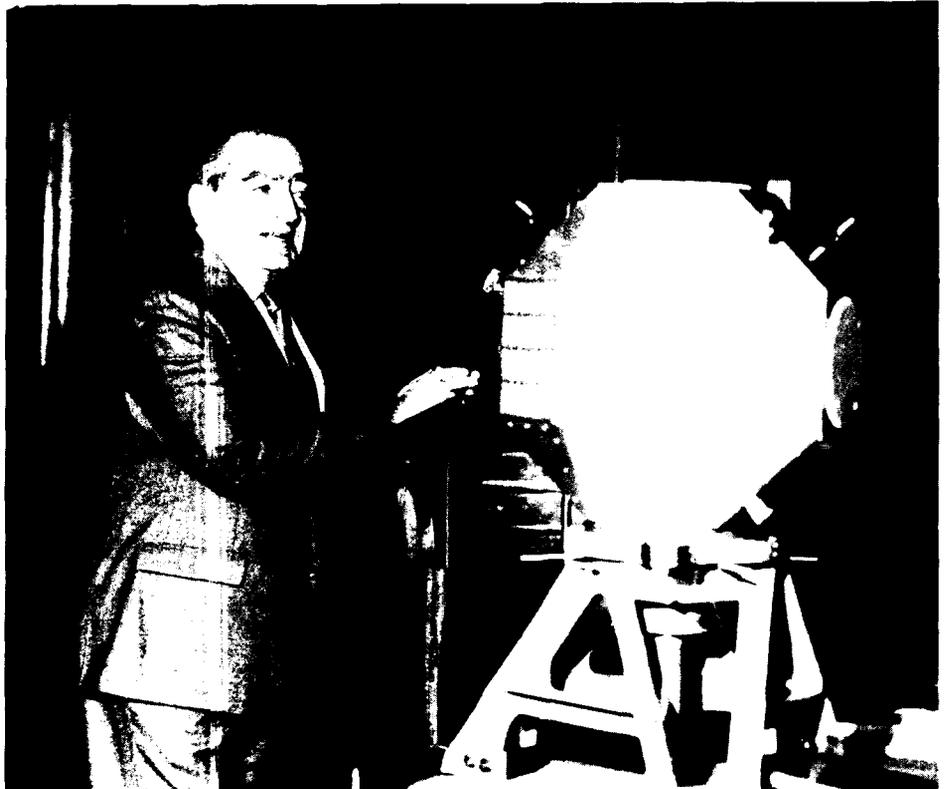
Wayne Barlow, regional director, FAA, also received a full-scale model of the 150-pound, 19-inch satellite.

In making the presentations, Dr. Stephen Nadauld, president, Weber State College, said he was proud of the satellite effort and appreciated help from the respective federal agencies.

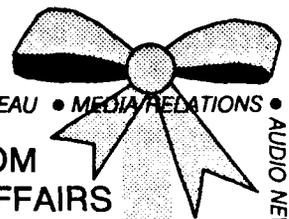
"This is the best example of student involvement in the education process," he said, "... it's wonderful to be associated with successful projects ... I'd like to thank you on behalf of the college and Senator Jake Garn's office."

NUSAT, designed for a six-month lifetime, operated successfully for over a year. Moreover, the launchings of NUSAT and a communications satellite from GAS containers on Shuttle missions have paved the way for NASA to establish an inexpensive way to deploy small satellites during routine shuttle operations.

The Goddard-managed GAS program is available to anyone who wishes to fly a small experiment aboard the shuttle. Space is made available in 2-1/2 and 5-cubic feet containers, and experiments must pertain to scientific research and development.



NUSAT MODEL—Goddard's Chief of the Special Payloads Division Leonard Arnowitz was presented with a model of the Northern Utah Satellite (NUSAT) recently at the Dirksen Senate Office Building. NUSAT was the first satellite to be launched from a Get Away Special (GAS) container.



● GODDARD NEWS ● EXHIBITS ● FILMS ● SPEAKERS BUREAU ● MEDIA RELATIONS ●

**HAPPY HOLIDAYS FROM
THE OFFICE OF PUBLIC AFFAIRS**

JAN WOLFE
CHIEF

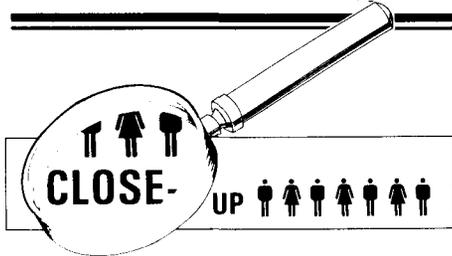
PAT RATKIEWICZ SECRETARY	TERRI PATTERSON SECRETARY	
ELLEN SEUFERT RESOURCE MANAGER	KATHY BAYER FREEDOM OF INFORMATION	

PUBLIC INFORMATION UNIT	PUBLIC SERVICES	EDUCATIONAL PROGRAMS
JIM ELLIOTT CARTER DOVE MIKE BRAUKUS DAVE THOMAS RANDEE EXLER	HOWARD OTTENSTEIN DARLENE AHALT SHEILA STANFORD	ELVA BAILEY DICK CRONE SHARON CHANNER, SECRETARY

SCOTT HANGEY KATHLEEN BERES BOB SCLATER	P.G. COUNTY EXCHANGE PROGRAM TEACHER IN SPACE FINALIST VISITOR CENTER MANAGER	
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● CONGRESSIONALS ● STUDENT & TEACHER PROGRAMS ● AUDIO NEWS SERVICE ● FREEDOM OF INFORMATION ●

● TEACHER RESOURCE LABORATORY ● DATELINE GODDARD ● PROTOCOL ● TOURS ●



Goddard's chief of the Laboratory for Astronomy and Solar Physics **DR. JOHN C. BRANDT** is leaving the Center to join the Laboratory for Atmospheric and Space Physics at the University of Colorado at Boulder. Brandt came to Greenbelt in 1967. Previously, he had been a senior research scientist at the Goddard Institute for Space Studies in New York, an astronomer at the Kitt Peak National Observatory, assistant professor of Astronomy at the University of California's Berkeley campus, and a National Science Foundation Fellow at the Mt. Wilson and Palomar Observatories. As Chief of the Laboratory for Astronomy and Solar Physics, Brandt has directed a wide-ranging program in all phases of theoretical and experimental solar physics.



BRANDT

LAWRENCE F. WATSON, formerly Deputy Chief Counsel, has been appointed to the Senior Executive Service position of Chief Counsel (Code 140). Watson began his Federal career in 1976 as an Attorney Advisor at the Marshall Space Flight Center. In 1981, he transferred to the Goddard Space Flight Center as an Attorney Advisor and in 1983 became Deputy Chief Counsel. Watson earned his J. D. degree at the University of Tennessee College of Law in 1976 and his bachelor's degree at Duke University in 1970.



WATSON

REGINALD BENNETT, Logistics Management Division, Vehicle Operations Section (Code 234.2) won the

first Arrow Heavy Duty Truck Technician of the Year Award. Bennett received his award at the National Institute for Automotive Service Excellence (ASE) Directors' meeting on November 20, 1986 in St. Petersburg Beach, Florida.

The award, given for the highest cumulative score on the ASE Heavy-Duty Truck Certification Tests, consists of a \$500.00 check, plaque, and an all-expense paid trip to the NIASE Directors' Meeting.

Bennett has been a mechanic for 15 years, the last 11 with Goddard. In addition to being a certified Mechanic Truck Technician, he is also ASE-certified in all eight automotive test areas.

Bennett, along with some of his co-workers, have been taking the ASE voluntary Mechanic Certification Tests at their own expense for several years. These nationally recognized tests are given primarily in private industry to ensure mechanic competency in the automotive trades.

After serving the Goddard Space Flight Center for 18 years as the Head Librarian, **ADELAIDE DELFRATE** has accepted the position of Agency Administrative Librarian located at NASA Headquarters. Until a successor is selected, John Boggess of Goddard's library staff will assume the duties of the Head Librarian. Sue Prevost, Information Management Division, Assistant Chief for Operations, will be the Acting Library Branch Head. We wish Addie every success in her new position. Her expertise and personal dedication will be missed.

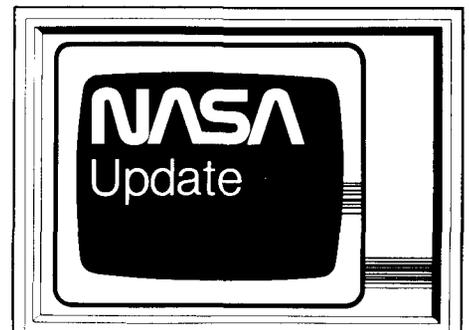
FREDERICK J. KULL has been appointed to the position of Attached Payloads and Associated Equipment Project Manager on the Space Station Project-Goddard (Code 400.6). He was formerly the Attached Payloads and Associated Equipment Deputy Project Manager on the Space Station Project-Goddard (Code 400.6).

THOMAS A. LAVIGNA has been appointed to the position of On-Orbit Assembly, Maintenance and Servicing Project Manager on the Space Station Project-Goddard (Code 400.6). He was formerly the On-Orbit Assembly, Maintenance and Servicing Deputy Project Manager on the Space Station Project-Goddard (Code 400.6).

JON R. BUSSE recently was reassigned as Director of the Office of Flight Assurance (Code 300), replacing Alton Jones who retired in June. Busse began his career at Goddard as Aerobee Vehicle Manager in the Space Sciences Division, Space Science and Satellite Applications Directorate in August 1961. He served in progressively more responsible positions at the section and branch level before becoming Chief, Sounding Rocket Division, Engineering Directorate, in August 1974. In July 1979, he was selected as Project Manager, SPIRE Project, and was reassigned as Landsat-D Project Manager in March 1981. In January 1983, he was selected as Deputy Director of the Engineering Directorate. Busse received a B.S. degree in Mechanical Engineering from the University of Arkansas in 1958 and a Masters degree in Engineering Administration from George Washington University in 1966. In recognition of outstanding service to NASA, Busse was the recipient of the GSFC Exceptional Performance Award in 1973, the NASA Exceptional Service Medal in 1976, and the NASA Outstanding Leadership Medal in 1983.



BUSSE



STAY TUNED ...

NASA Update, a bi-weekly news magazine program, is shown continuously from 8 a.m. - 5 p.m. on the closed-circuit TV system. Check *DATELINE GODDARD* and the *GODDARD AUDIO NEWS SERVICE* (286-2890) for details.

Diverse Year

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radio astronomy instrument onboard Voyager 2, Goddard scientists determined that the length of the Uranian day is just under 17 hours, 15 minutes. Using data from the magnetometer aboard the Voyager 2 spacecraft, scientists found that the planet's magnetic axis is off-center by a significant amount: 3/10 of a planetary radius or approximately 4971 statute miles (8000 km). The instrument also revealed surprisingly that Uranus' magnetic axis is tilted by 60° with respect to the rotation axis, contrasting with an angular difference of only 11.7° for Earth. The Goddard findings were released at the spring meeting of the American Geophysical Union, Baltimore, Md., May 19-22.

WALLOPS ASSISTS IN THEORY TESTING: The Wallops Flight Facility, successfully launched two sounding rockets—a Black Brant X and a Taurus-Nike Tomahawk—carrying complex plasma physics payloads to provide baseline data on Dr. Hannes Alfvén's Critical Velocity Effect Theory. The theory has been used to explain details in the early formation of the solar system. Alfvén is Professor Emeritus, Electrical Engineering and Computer Science, University of California. He is the only person ever to receive the Nobel Prize in physics for work in plasma physics.

JULY

WALLOPS TESTS SENSORS FOR WEATHER AND CLOUDS: A team of scientists from two NASA centers, two other Federal agencies and several universities began a Satellite Precipitation and Cloud Experiment (SPACE) that will lead to a better understanding

of the atmospheric processes associated with precipitation and severe storms. Three high altitude aircraft with nine experimental remote sensing systems measuring visible, infrared and microwave radiation took part in the experiment. Four of the instruments onboard the aircraft were developed at Goddard.

AUGUST

TDRS BECOMES PART OF WORLD'S LARGEST TELESCOPE: In a first-ever experiment, the Goddard-managed Tracking and Data Relay Satellite (TDRS) was linked with two ground-based antennas, effectively creating a telescope 110,000 miles (178,000 km) across. The experiment tested the feasibility of using an orbiting satellite, the TDRS, in Very Long Baseline Interferometry (VLBI). This is a process in which cosmic radio sources have been observed simultaneously—but only by two or more widely separated ground-based radio telescopes. In the July-August testing the two primary ground stations were at Tidbinbilla, Australia and Usuda, Japan. With the TDRS linked to the two ground stations, NASA scientists were able to observe several quasars.

SEPTEMBER

DELTA 180 FLIES FOR THE AIR FORCE: Delta 180 lifted off from Cape Canaveral Air Force Station, FL on September 5 with a classified Strategic Defense Initiative (SDI) Air Force payload onboard to put NASA back in the successful launch column for the first time since the Challenger disaster in January. With a more than 94% launch success rate, the Delta is one of the most reliable of all expendable launch vehicles. The Delta pro-

gram is managed by Goddard.

GODDARD LAUNCHES WEATHER SATELLITE FOR NOAA: On September 17, a Goddard meteorological satellite (METSAT) team managed the successful launch of a NOAA weather satellite—NOAA-G—from Vandenberg Air Force Base, CA. The launch vehicle was an Air Force Atlas-E rocket. The \$37.3 million spacecraft is now collecting meteorological readings and transmitting the data direct to users around the world for local weather analysis and forecasting. Additionally, NOAA-G carries a search and rescue receiver which only five days after launch picked up the first distress signal that led to the rescue of four Canadians whose plane crashed in a remote area of Ontario. The research for the U.S. portion of the international search and rescue program—COSPAS/SARSAT—is managed for NASA by Goddard.

OCTOBER

BLACK BRANT STUDIES SUN'S CORONA: The Wallops Flight Facility successfully launched a Nike-Black Brant rocket carrying a scientific payload to investigate the physical characteristics of the Sun's outer atmosphere. Designed and developed by Goddard's Laboratory for Astronomy and Solar Physics, the payload is called a Solar Extreme Ultraviolet Telescope and Spectrograph (SERTS). The objectives of the project were to understand how the Sun's corona is heated over regions of enhanced solar activity and to answer questions about the origin and acceleration of the solar wind.

NOVEMBER

GEOPHYSICAL RESEARCH LETTERS: Two scientists from Goddard's Space and Earth Sciences Directorate reported in a special issue of Geophysical Research Letters that no clear link has been established between ozone depletion over Antarctica and man-made pollutants. The decrease of ozone in the Antarctic region was noted first in 1985 by British Antarctic Survey scientists taking ground-based measurements at Halley Bay Station. NASA's NIMBUS-7 satellite, using an instrument known as the Total Ozone Mapping Spectrometer (TOMS), has confirmed these observations. Scientists have found the largest ozone depletion occurring during the Antarctic spring months of September and October.



Goddard News

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