National Aeronautics and Space Administration
Goddard Space Flight Center

Goddard News

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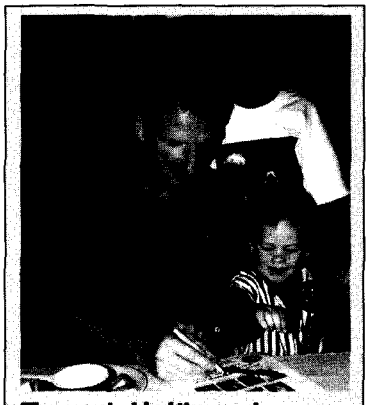


The man behind the mask, Joe Tanner.

Goddard is responsible for managing Hubble servicing, overseeing the development of replacement instruments, and designing special tools to be used during the mission.

Mission Profile

Vehicle: Discovery
Mission number: STS-82
Primary payloads: NICMOS/STIS
- Near Infrared Camera and Multi-Object Spectrometer
- Space Telescope Imaging Spectrograph

Astronauts: 7
Mission Duration: 10 days, 4 EVA's scheduled
Launch schedule: Feb. 1997

Background
Deployed: Apr. 1990
Servicing Mission 1: Dec. 1993, STS-61, Endeavour

Hubble Second Maintenance Mission

Crew
Ken Bowersox, Comander
Scott Horowitz, Pilot
Mark Lee. Payload Commander
Greg Harbaugh, Mission Specialist
Steve Smith, Mission Specialist
Joe Tanner, Mission Specialist
Steve Hawley, Mission Specialist

Hands Like A Surgeon

Hubble astronaut, Joe Tanner, stays focused on his task, working with the precision and dexterity required to handle Hubble's delicate replacement instruments. Tanner and his fellow second servicing mission astronauts practiced in Goddard's building 29 cleanroom with Hubble replacement hardware. The STS-82 crew have visited the Center several times this fall in preparation for next year's house call to Hubble. While visiting, the astronauts took time out from their busy practice schedule to socialize with members of the Goddard project and their families. The Hubble team also spoke to Goddard employees about plans for their February mission during a special colloquium held this fall.

"1776" to 1996 - Anyone for a Congressional Reenactment?

by Mike Harris

Hear Ye All Patriots! All persons bearing witness to the tyranny of King George within these Continental Colonies — Your presence is requested at the First Continental Congress in the township of Philadelphia. Issues at hand: Royal tariffs & taxes, German mercenaries in kilts, and the irrepressible Benjamin Franklin dancing rings around Congress with the 'obnoxious and disliked' John Adams.

You may recognize someone you know...

You are hereby invited to the 220th birthday celebration of this great nation. This year's party, presented by Goddard's Music and Drama (MAD) company, is "1776".

Goddard's theater production team takes you back over 200 years, and sports statesmen, lawyers, ministers, wives of the congressional delegates, and General George Washington's own courier. By traveling back to the scene of the Declaration, and watching the Congress in action, we are reminded that those we tend to think of as serious historical figures, memorialized in marble and granite, were actually people as full of human frailty and foible as we are.

Benjamin Franklin, played by Goddard's own ***Jerry Simpson***, Director of Human Resources cuts a rug and exchanges verbal musketshot with the likes of John Adams, played by ***David Quinn***, Guidance-Navigation-Control engineer.

"1776" has a large cast of characters, well represented by Goddard employees across the center. You may recognize someone from your own organization ...***John Degnan***, physicist, as John Dickinson; ***Bill Struthers***, electrical engineer, as the 'other' Ben

"Common Sense" Head of Human Resources is Ben Franklin

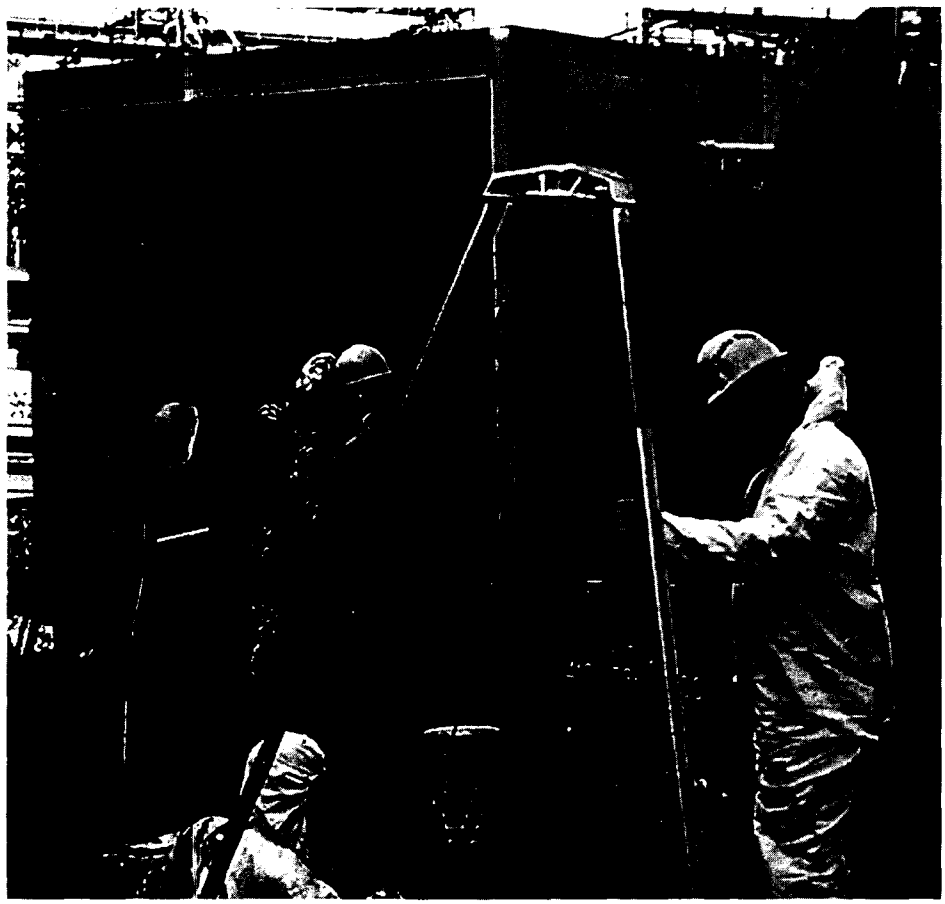
Continued on Page 7

EMT Group 'To the Rescue'

It may have been "only a test," but the more than 50 members of the Emergency Management Task Group and their colleagues were deadly serious during their emergency preparedness simulation held at Goddard this September. Personnel from the Safety, Environmental and Security Office; the Facilities Management Division; Logistics Management Division; and Public Affairs participated in an all-day simulated drill in which a fictitious fuel oil truck spilled its 7,000 gallon cargo into the storm drains at the intersection of Delta and Tiros roads.

The real-life Goddard emergency team worked alongside the Emergency Management Task Group, NASA Headquarters, Prince Georges County Fire Department, and Prince Georges County Office of Emergency Preparedness to put Goddard's newly developed functional plans for communications, public affairs, logistics, and resource management to the test.

Goddard's Emergency Preparedness Coordinator, ***Phillip Tapper***, said the dress rehearsal was extremely successful, and explained that lessons learned from the day of battling a mock fuel spill, radio system glitches, and other contingencies would be incorporated in the Center's future emergency planning.



Progress on Process

SEWP-II Speeds Computer Purchases

This month's entry features Goddard's Scientific and Engineering Workstation Procurement (SEWP-II) selections announced in October. NASA has awarded contracts worth $1.8 Billion for purchasing UNIX-class workstations, networking equipment, super computers and computing peripherals. SEWP-II enables Goddard, NASA and other government agencies to purchase computing equipment at the best possible price. SEWP-II also reduces the procurement processing time for small purchases by an estimated factor of eight or better. Small purchases that once required months to process will be completed in a matter of days. In the case of larger purchases, the resulting impact is even greater. Procurements that would have typically required more than a year to complete may now be accomplished in as little as five working days. By re-engineering business and procurement practices, work is accomplished by fewer people in less time, at greater savings. SEWP-II makes buying computing power faster, better and cheaper than ever.

SEWP-II is the follow-on program to Goddard's highly successful SEWP-I initiative instituted in 1992. SEWP-II builds upon the general principles pioneered and tested with SEWP-I , expanding on the original program's scope and increasing the number of eligible participants.

Submit your best examples of impacts and achievements resulting from Goddard's process improvements and re-engineering efforts. If your new process is saving time or money, and/or improving service, let others know in the "Progress on Process" corner.

Space Telescope: The Next Generation

by Dr. John Mather
Space Sciences Infrared Astrophysics Branch

NASA has chartered Goddard and the Space Telescope Science Institute (STScI) to lead the study of a Next Generation Space Telescope (NGST), an orbiting observatory capable of studying the early formation of stars and galaxies at high red shift. Three teams are conducting next generation studies, with guidance that total construction costs should be no more than $500 million, and that the telescope proposed should fit within an Atlas IIAS launch vehicle. This government-led effort is managed by Bernie Seery (GSFC). I serve as the Study Scientist, and Peter Stockman leads the STScI effort in addition to co-chairing the Science Working Group. Lloyd Purves (GSFC) is the Systems Engineer and leads the spacecraft team. Pierre Bely (STScI) leads the science module team, and Jim Bilbro (MSFC) leads the telescope team. In addition, Keith Kalinowski leads an operations team, and Richard Capps leads the JPL effort. Other key figures in this activity are Rob Kennicutt, the chair of the Science Advisory Committee reporting to the head of the Origins Program at NASA Headquarters, Ed Weiler.

There also are two industrial consortia, selected to do completely independent studies. The TRW team is led by Dr Chuck Lillie, and the Lockheed-Martin team by Domenick Tenerelli.

Work on a future passively cooled telescope to study stars and galaxies in the infrared is the direct result of recommendations made by the "Hubble Space Telescope (HST) and Beyond Committee," chaired by Alan Dressler. This committee recognized the enormous scientific capabilities of a large-aperture, infrared-optimized space telescope, and recommended strongly that such a mission be developed to follow the HST and Space Infrared Telescope Facility (SIRTF) programs. The Committee identified the scientific requirement for such a telescope and listed a wide range of scientific research which would be enabled in both the optical and far infrared.

Based on our work to date, it appears possible to build a deployable telescope of the order of 8 meters in diameter. The telescope would be placed in an orbit far from Earth, like the Lagrange point L2, or a solar drift orbit like SIRTF, so that it could cool to around 30 K by radiation.At that temperature, special detector arrays could cover the desired wavelength range without additional cooling. With some additional effort, hydrogen and helium coolers could enable the use of special silicon detectors for broader wavelength coverage.

The NGST will demand careful use of new technology. The deployment of a lage mechanical structure to hold up the mirrors requires great care in design.The mirrors will have to be adjusted after launch, and to achieve a low enough weight they will have to be very thin. New materials and processes make this possible, and there is a wide range of choices. Researchers like RogerAngel of the University of Arizona are beginning to tackle many of the technical challenges with important technical and engineering demonstrations. This is the first step in the proof that adjustable mirrors in space can enable orders of magnitude improvement in capability It is a tremendous challenge and a tremendous opportunity.■

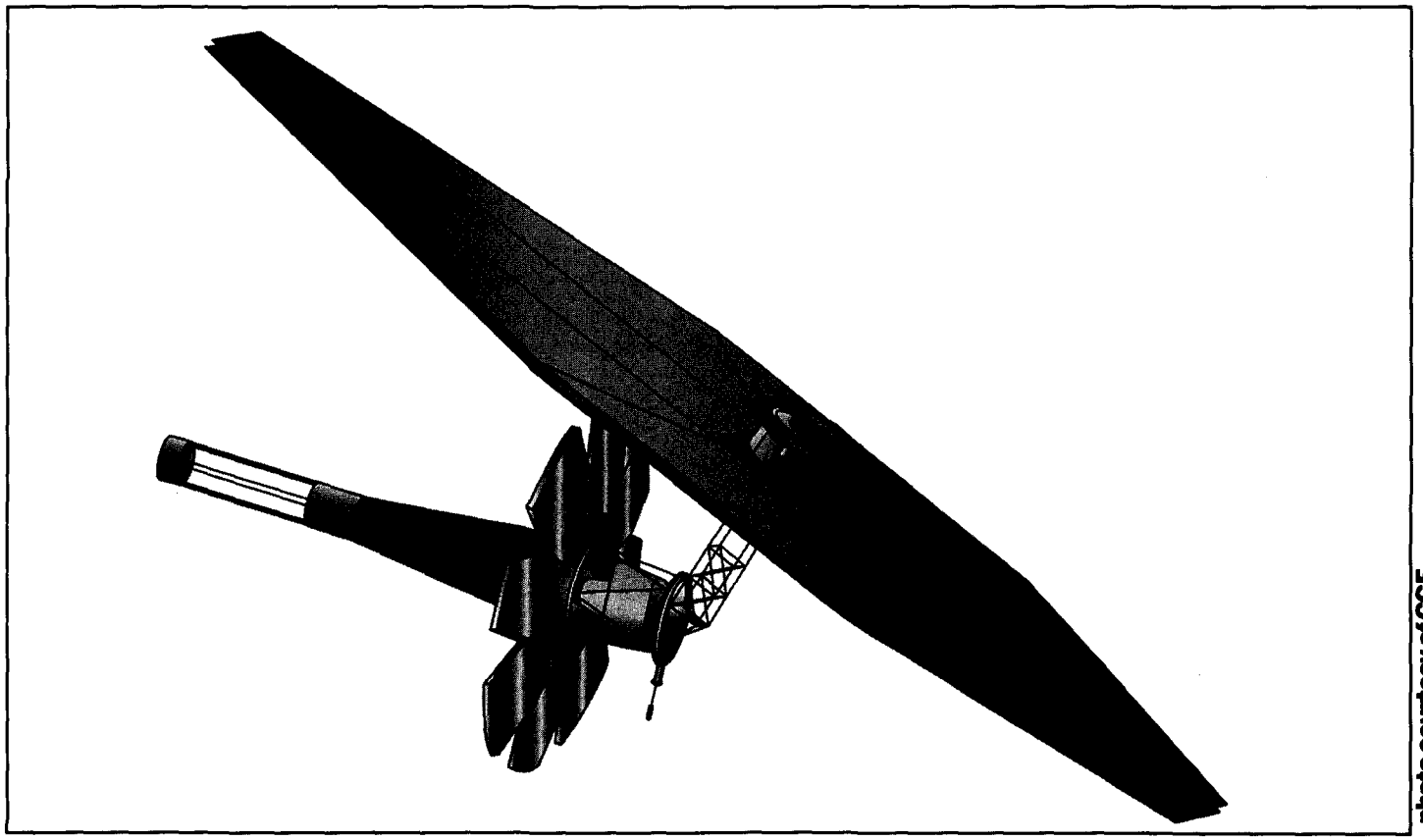


photo courtesy of CGF

Artist concept: Next Generation Space Telescope

A Century of Progress:

Goddard Contributions in Geology and Geophysics

by Dr. Paul D. Lowman Jr.
Earth Sciences Geodynamics Branch

The end of a spectacular century is approaching and the dawn of the 21st Century is here. As a tribute to Goddard's great scientific contributions, Dr. Paul Lowman in the Geodynamics Branch of the Laboratory for Terrestrial Physics, compiled a list of the things he believes to be the 12 most important discrete discoveries in geology and geophysics since 1900. Lowman's work is in press for the November issue of The Journal of Geoscience Education, the country's leading geological education journal. Below is a select summary of the geological discoveries. Items that only a geologist could love, such as overthrust faulting, have been omitted.

The most fundamental discrete discovery in geology and geophysics since 1900 was the radioactive decay law formulated by Rutherford and Soddy in 1902. Their experiments at McGill University produced a differential equation for radioactive decay that became the foundation for radiometric dating, calculations of the Earth's age, and many other applications including the thermal evolution of planets, studied by Gordon MacDonald while at Goddard in 1960. However, several later key discoveries arose largely from space research.

A 'Who's Who' account of Goddard Scientists, past and present, who have blazed the trails for Earth sciences and planetary geology and geophysics.

Sea-floor spreading was first proposed by Harry Hess of Princeton University in 1962. Sea-floor spreading rapidly became an accepted theory due in part to Goddard's ***Jim Heirtzler*** when he was at Columbia University in the mid-1960s. Heirtzler developed a chronology for sea-floor spreading from the magnetic reversal pattern, and later explored spreading centers himself in the Alvin submersible. Sea-floor spreading has now been directly demonstrated by the space geodesy techniques of the former Goddard Crustal Dynamics Project, headed by ***Bob Coates*** and ***Dave Smith***, current Chief of the Laboratory for Terrestrial Physics.

The field of space geodesy itself was founded by ***John O'Keefe***, recently retired from Goddard, who in 1955 proposed using satellites for geodetic measurements. Satellite laser ranging and very long baseline interferometry (to which ***Tom Clark*** has made major contributions) have now produced a geodetic *tour de force*, showing that because of sea-floor spreading several islands in the Pacific Ocean are moving away from the East Pacific Rise at several centimeters per year. Australia, an example of continental drift as a consequence of plate movement, also appears to be moving northward. Movement along the San Andreas Fault system, part of the Pacific-North American plate boundary, has similarly been measured over several hundred kilometers by space geodesy.

Impact cratering has been very much in the news since Shoemaker-Levy-9 bombarded Jupiter. Scientists now realize that similar impacts, have had catastrophic effects on the Earth, including the extinction of dinosaurs. Goddard scientists played a key role in crater studies in the mid-1960s. Nick Short and Bevan French, of the former Planetology Branch, developed petrographic criteria for recognizing shock-metamorphosed minerals, and organized an international meeting at Goddard in 1966 that founded a new branch of geology: impact metamorphism.

French also demonstrated the impact origin of the Sudbury Structure, a 60 by 30 km nickel-bearing basin in northern Ontario. We have continued the Goddard-Sudbury connection with radar mapping, where I was privileged to work with Herb Blodget and Penny Masuoka, in cooperation with the Canada Centre for Remote Sensing. Herb Frey continued this important work, demonstrating the broad application of impact concepts by showing that the first ocean basins may have been formed by impacts analogous to those that formed basins on the Moon, Mercury, and Mars.

High Impact! Our Moon's 'Sea of Rains,' Mare Imbrium, features impact cratering. Photo courtesy of Mt. Wilson Observatory.

Lowman shows Stone Age tool found with Space Age technology. Ancient stone axe retrieved from Egyptian desert by U.S. Geological Survey with the help of 1981 NASA Shuttle Imaging Radar mission, SIR-A.

Common patterns of planetary differentiation for the Moon, Mercury, Mars, and perhaps Venus and Earth, have been deduced from various Goddard projects. John O'Keefe and Wini Cameron (now retired) proposed as early as 1962 that the Moon was differentiated, applying the petrologic studies by Lou Walter, current Associate Director of Earth Sciences at Goddard. This was soon demonstrated directly by an Apollo X-ray fluorescence experiment, led by the late ***Isidore Adler*** of Goddard, and by gamma ray spectroscopy, in which ***Jack Trombka*** is still active. Adler also headed a Goddard Apollo sample analysis team that arrived at a similar conclusion. ***Rudy Hanel's*** IRIS team on Mariner 9 found evidence in 1972 for differentiation on Mars. Again, I was fortunate to work with Goddard staff members, including ***John O'Keefe***, ***Bill Kaula*** (formerly of the Theoretical Division), and ***Herb Frey*** — this time to produce broad theories of planetary evolution.

Goddard's past and ongoing role in this Century of Progress shows clearly that space sciences and earth sciences are closely coupled, and that the exploration of space has also been the exploration of Earth.■

Regional Data Center Established

Nation's investment in Earth remote sensing yields practical results

by Donna Drelick

This fall, Goddard formed a collaborative effort with the University of Southwestern Louisiana (USL), Lafayette, La., to establish a Regional Data Center (RDC) to service the Gulf region. Through this effort, technology and techniques of advanced information management developed at Goddard will be made accessible to scientists and students of USL. Potential applications of the NASA data include improvements in weather forecasting, agriculture, and land uses for the Gulf region.

"We are living in an age of incredible data generation. Our aim is to provide the public with usable and flexible information systems which will make this information both practical and accessible," said ***William Campbell***, Chief of Goddard's Information Science Technology Branch.

The primary purpose of the RDC is to allow NASA to test and transfer its technology to the outside community. Through the RDC concept, universities, private industry and federal agencies have the ability to receive and use localized satellite data at low cost and on a routine basis. These highly effective end-to-end systems use a combination of satellite direct-readouts, advanced image processing and artificial intelligence and database techniques.

The satellite data collected by the RDC in La. will be analyzed by a team from the USL's Center for Advanced Computer Studies, which will distribute the information to Gulf region businesses and institutions. The RDC is expected to greatly improve meteorological services for the Gulf region.

"This is a wonderful opportunity for USL," said President Ray Authement. "We know we are in good company and look forward to working collectively with everyone involved. Many benefits will result from this collaboration."

The RDC is expected to be operational by the end of this year, and is part of NASA's Mission to Planet Earth Program, a long term, coordinated research effort to study the Earth as a global environment system.

IUE "Lights Out"

by Jim Sahli

After nearly 19 years of operation, NASA's International Ultraviolet Explorer (IUE) spacecraft received its final "shutdown" command on Sept. 30 — marking the end of one of the longest and most productive missions in the history of space science.

"The decision to shut down a hardy veteran like IUE was not an easy one," said Dr. Wesley Huntress, Associate Administrator for Space Science at NASA Headquarters, Washington, DC. "However, we have to balance our available budgetary resources with an increasing number of productive space science missions that require operational support5e over its long lifetime.

"IUE was a pioneering research spacecraft for observing the ultraviolet spectrum," said Dr. Yoji Kondo, IUE project scientist at Goddard. "Many of the scientists that use the Hubble Space Telescope and other space-based observatories today began by studying the ultraviolet with IUE."

Some of IUE's most recent research included observations of Comet Hyakutake during March 1996. Scientists using IUE tracked and observed the nucleus of Comet Hyakutake for five days, obtaining exposures of up to five hours in duration that provided new insights into the chemical processes taking place inside the comet.

IUE also contributed to many branches of astronomical research over the years, ranging from studies of objects in the Solar System to observations of distant galaxies. This included the historic first identification of the star that exploded and became known as Supernova 1987A.

Other Lifetime Achievements for IUE include:

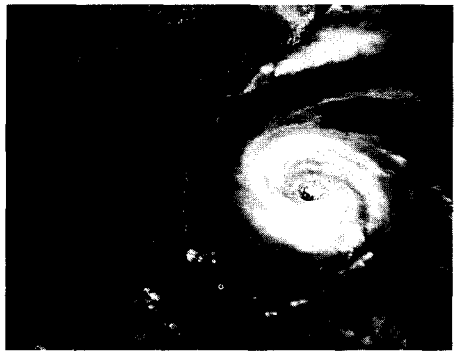
- Serving more than 2,000 guest observers from all corners of the world, including astronomers from North and South America, Europe, China, India, Russia, Africa, and Australia.
- Enabling approximately 3,500 scientific articles in peer-reviewed journals based on IUE observations — the largest number for any satellite observatory thus far.
- Launching the careers of more than 500 doctoral students who used IUE results in

Continued on Page 7

Kondo issues shutdown command

GOES Earth Images: National Treasures Displayed in Smithsonian Institution's Museums

This cover page, headline-making image of Hurricane Fran may be on its way to the Smithsonian Institution soon. GOES-8 images are now appearing in three of the Smithsonian's complex of museums: the National Air and Space Museum's "Looking at Earth From Space" display; the National History Museum's one-year, three dimensional 'Hologlobe' exhibit; and, the Smithsonian's newest exhibit space — the Smithsonian Virtual Museum on the internet.



You can visit the virtual museum at:
http://www.si.edu/hologlobe.html

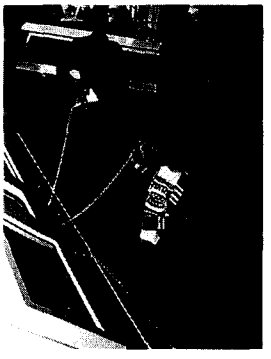
Or, you may choose to peruse more hurricane images and other visualizations from Earth science spacecraft at:
http://rsd.gsfc.nasa.gov/rsd/

Little digital versions of Earth science "movies" can be found at:
http://rsd.gsfc.nasa.gov/rsd/movies/movies.html

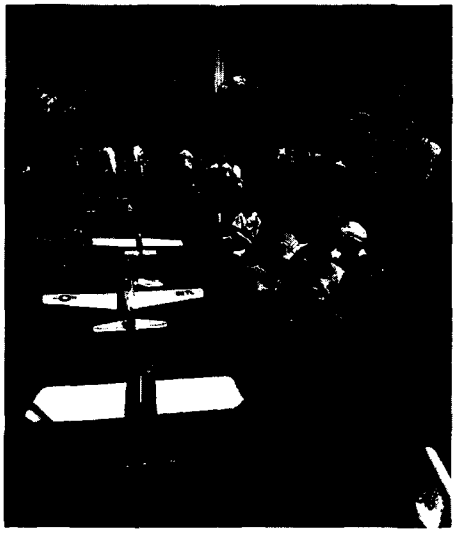
Goddard Hosts Thousands for Community Day

by Steve Moore
Visitor Center Manager

On a beautiful fall day in September, over 3,700 people spent the afternoon enjoying the sights and sounds of Goddard. By all accounts this was one of the best community days ever.



Special thanks go to all the volunteers from the Engineering Services Division and the Hubble Space Telescope Project for their extraordinary efforts in conducting tours of Goddard's facilities. Guests were also treated to an Engineering Fair featuring special Center projects.



At the Visitor Center, members of the Skylancers returned for another year to delight the crowd with acrobatics from model airplanes. The Goddard Amateur Radio Club conducted demonstrations, spreading the word on this 'fun-for-all-ages' hobby, and the High Energy Astrophysics Lab gave a demonstration of their High Energy Astrophysics Learning Center Web-site. Visitors also listened to Satellite Search and Rescue Mission Manager, Ron Wallace, who spoke about the SARSAT life saving system of orbiting spacecraft.

I think that events like this bring out the best in people, and the best in Goddard, and I am honored to have been a part of it. Thanks again to all who volunteered. We hope to see you in April '97!■

Center Vies for Presidential Seal of Approval

by Dennis Reed

This October, Goddard submitted to the Office of Personnel Management (OPM) its application for the government's equivalent of the Malcolm Baldridge Award, the 'Presidential Award for Quality.' Goddard's award application team was led by John Baniszewski. Results of this year-long process are not expected before December.

"I believe that by competing for this award and participating in the demanding OPM application process, Goddard is not just looking for a pat on the back," said Center Director Joe Rothenberg. "Our primary motivation for applying for this sought-after award has been to help us look critically at how we accomplish our work, and to uncover ways that we can continually improve in our delivery of services and products."

The President's Award is given to organizations that have improved their overall performance and demonstrated a sustained trend in providing high quality products and services to customers. The award recognizes organizations that have accomplished outstanding performance results through continuous improvement.

Organizations applying for the award must address, and be judged according to, seven criteria: Leadership, Information and Analysis, Strategic Planning, Human Resource Development and Management, Business Results, and Customer Focus and Satisfaction.

Feedback from this application will be used by the Center for identifying areas to prioritize for improvement.■

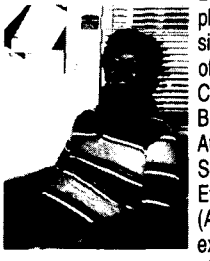
Kudos!

Special Honors

Fung, Sellers and Stolarski named American Geophysical Fellows this year. Dr. Inez Fung, Dr. Piers Sellers, and Dr. Richard Stolarski were selected in recognition of their acknowledged prominence in geophysical sciences — an honor bestowed on only 0.1% of the AGU membership in a given year.

Dr. Inez Fung, a physical scientist at Goddard's Institute for Space Studies in New York City has been employed by NASA since 1986. Her research interests include geophysical fluid dynamics and large scale numeric modeling; bio geochemical cycles; remote sensing of earth systems and atmosphere-ocean and atmosphere-biosphere interaction. At present Fung is as a professor in the School of Earth and Ocean Sciences at the University of Victoria, Canada.

Dr. Piers Sellers worked as an earth scientist in the Biospheric Sciences Branch of Goddard's Laboratory for Terrestrial Physics. This year he was accepted as an astronaut candidate and left Goddard in August to participate the 2-year training program at Houston, TX. Sellers, who joined Goddard in 1982, specializes in Land Atmosphere Interactions and Remote Sensing.



Dr. Richard Stolarski, an astrophysicist, has been with NASA since 1972. He served as Head of the Goddard's Atmospheric Chemistry and Dynamics Branch in the Laboratory for Atmospheres and was Program Scientist for the Atmospheric Effects of Stratospheric Aircraft (AESA). Stolarski's research experience is in theoretical physics and chemistry of atmospheres with emphasis on atmospheric and tropospheric chemistry.

Sporting Chances

LAN Administrator is Straight Shooter. LAN Administrator for the Code 700 Engineering Directorate, Jeff Barnes of ANSTEC, won a national rifle title at the International Benchrest National Championship Matches held in Fairchance, Pa. late this summer.

Goddard's own *Fritz Hasler* medalled in his chosen sport this summer, taking a silver medal in the National Water Ski Championship for 1996.

Rave Reviews

BasicBooks publishes COBE author. "The Very First Light," by ***John Mather*** and science writer John Boslough, will be in stores soon. Nobel Laureate, Arno Penzias calls this account by the originator of the Cosmic Background Explorer, "A compelling account of a headline making discovery, and the human stories behind it."

Top Dogs

Fidos for Freedom, Inc. return to Goddard. The FFF is one of the hundreds of non-profit organizations highlighted in this year's Combined Federal Campaign (CFC) "Catalog of Caring." Goddard's CFC Kick-off program on Oct. 9, featured demonstrations with these amazing dogs, raised and trained by volunteers. FFF is a local organi-

zation, serving clients within a 75-mile radius. The program's main focus is training hearing assistance and mobility assistance dogs. If you missed them last month, your next chance to see these caring canines on campus is on Nov. 21, when they will be in the building 32 lobby between 9:00 a.m. and 10:00 a.m.

Award Winning Performance

Robert C. Baumann celebrates Jubilee. The Director of Flight Assurance, ***Baumann***, celebrated 50 years with Goddard this summer, reaching the half-century mark in his career at the center. *Happy Anniversary, Bob!*

The Center for Technology Commercialization (CTC) bestowed its "Commitment to Excellence" award on Goddard this year in recognition of Goddard's dedication to NASA's Small and Disadvantaged Business Program, and its support and utilization of NASA's New England Outreach Center. The award was accepted by ***Janet Laws Jew*** on behalf of the Industry Assistance Team, the Office of Commercial Programs, and the center's engineering and technical divisions.

Goddard's Director Joins State Technology Leaders. ***Joe Rothenberg*** was elected to Suburban Maryland's Technology Council Board of Directors. The Council is charged with developing linkages among industry, government, and higher education institutions; and serves as a united voice for technology in Maryland, encouraging entrepreneurship, and working to enhance public understanding of technology and related issues.

AIAA award goes to Landsat engineer. ***Michael K. Choi*** received the 1995 Intersociety Energy Conversion Engineering Conference (IECEC) Best Paper Award this year for his paper entitled "Methods of Modifying a Heritage Wine-Rack Design for Thermal Management of Nickel-Hydrogen Batteries on the Landsat-7 Spacecraft." Both the American Institute of Aeronautics and Astronautics and Goddard have honored Choi for his work this year.

Winner's Circle

Essay Finalist Wins Trip to Goddard. Fourteen-year old George Garcia of Phoenix, Ariz., wrote a winning essay on science, and was awarded a trip to NASA's Center for Excellence in Scientific Research. During his visit, Garcia spoke with Deputy Center Director, ***Al Diaz***, toured the campus, and ate lunch with the Hubble astronauts. Garcia is a real achiever, successfully competing against students across the state to win this special honor. His achievements are not limited to the academic arena alone. A quadriplegic since 1993, Garcia has also had to overcome significant physical challenges. With his winning attitude, Garcia is definitely going places. Garcia's visit was hosted by ***Dave Campbell*** in the Hubble Project.

Fifteen from Goddard see Shuttle Liftoff. Goddard spaceflight honorees joined more than 200 special NASA guests to see the launch of NASA's fourth Shuttle-MIR rendezvous mission this fall. This year's Shuttle watchers were: ***Keith Brenza, Kevin Hughes, Samuel Adams, Wilbur Burton, Richard Lonigro, Michael Rudy, Kevin Mathews, Frank Stocklin, Patricia Sargent, Mary Gum, Julio Marius, James Harper, William Forcey, and Thomas Wallace.***

Wallops Beachcombers Do Heavy Lifting

Wallops Cleans up the Beach. More than 1.57 tons of debris was collected in September when Wallops participated in the area's annual beach cleanup organized by the Marine Conservation Coastweeks Program. Twenty-seven NASA, Navy and contractor employees and their families collected and cataloged debris along the north beach of Wallops Island.

Face-to-Face

Communication technology closes the distance for conferences across the continent

by Pam Davis
Video Conference Room Coordinator

Orbital debris, Total Quality Management, the Internet, forklift training, engineer certification, and pollution prevention are just a few of the topics being discussed across the country and around the world — courtesy of Goddard's Video Teleconference System (VITS) and actual television conferencing. People from all over come face to face via the VITS rooms in buildings 8 and 23. The VITS room can be conferenced with government agencies, Sprint rooms, NASA centers and some low bandwidth video systems.

VITS room capabilities include: action and still graphic display, video recording and playback, lecture board, fax machine, and slide presentation equipment. Best of all, it is open to all contractors and civil servants.

When you need to schedule a VITS meeting, call early to schedule. Many users who conduct monthly meetings schedule their time months in advance. If specific dates and times are needed, early notification is a must. If you can be flexible about the date and time for your meeting, usually 48 hours notice is all that is needed. Time is still available for scheduling.

To schedule a teleconference, get information, or request a demonstration of VITS capabilities, stop by building 8, room 206 or call Pam Davis at 286-5701.■

Continued from Page 1

Franklin; ***Jonathan Glickman***, flight dynamics analyst, as the 'other' John Adams; ***Gene Smith***, EOS Data Systems Manager, as John Hancock; ***Eliot Malumuth***, astronomer, as Lyman Hall and also the show's producer; ***Erica Drezek***, videographer/producer, as Martha Jefferson; ***Jack Carlson***, engineer, as Ceasar Rodney; ***Priscilla Struthers***, project support specialist, as Abigail Adams; ***Tom Smith***, graphic artist, as Jonathan Witherspoon; Barbara Scott, engineer, as the courier, and ***Nina Desmond***, public affairs specialist, as the 'other' Courier; and Karen Bauer, computer specialist, as Leather Apron.

Directed by ***Ron Wilder***, "1776" has been called a masterpiece of song, history and sentiment, as well as an inspiration before voting for our next president. So don't miss it! There are 16 dinner theater performances from Oct. 25 to Nov. 23. For ticket information and availability, call: ***Marty Davis*** at (301) 657-4220.■

Continued from Page 5

their dissertations.

"IUE has contributed significantly to astronomical science over the years.Yet its ultimate legacy will be the final data archive, which will be completed by the end of 1997," Kondo said. "Using newly developed software, additional scientific information will be gleaned from more than 100,000 astronomical observations that are currently being reprocessed. This data archive will be stored for future reference and will remain an important resource for astrophysical studies for many years to come."

More information on IUE and other related astrophysics missions is available on the Internet at URL:

http://iuewww.gsfc.nasa.gov/iue iue_homepage.html

REPORT
FRAUD - WASTE - ABUSE
NASA INSPECTOR GENERAL
GSFC Field Office
Mail Code 190
Building 1, Building 208
286-5561
HOTLINE
ANSWERS 24-HOUR
Caller can be Anonymous
1-800-424-9183
★ CALLER CONFIDENTIALITY MAINTAINED ★

Mark Your Calendars for Fridays at 3:30 p.m.

Scientific Colloquia Feature Breakthrough Scientists, Newsmakers

by Tom Birmingham
Chair, Goddard Scientific Colloquium Committee

If you weren't at the kickoff Scientific Colloquium on Sept. 20, you missed Dr. Steve O'Brien's startling account of the discovery of a human genetic aberration which shields a small segment of the population from HIV infection. O'Brien and this result were featured on the national news the week after his premiere talk at Goddard. O'Brien was but the first of a host of interesting speakers to be featured in the 1996/1997 Goddard Scientific Colloquium Series. If you missed him, don't despair. It's not too late to catch up on the other breakthrough science and discoveries to be covered in upcoming programs. The schedule of lectures for the remainder of the series is listed below. The program is diverse, the topics timely, and the speakers luminaries in their fields. Don't miss out on the latest developments! We'd like to see the Building 3 Auditorium filled to capacity each Friday.

November 1
Robert Provine,
U Maryland Baltimore County
"The Science of Laughter"

November 8
Eric Barron, Penn State U
"Predicting Changes in River Basin Hydrology in Response to Global Warming"

November 15
WILLIAM NORDBERG MEMORIAL LECTURE
Mario Molina,
Massachusetts Institute of Technology "Stratospheric Ozone Depletion: a Global Problem"

Mario Molina

November 22
Philip J. Klass, Aviation Week and Space Technology
"Bringing UFOs Down to Earth"

November 29
NO COLLOQUIUM

December 6
Jonathan Bagger, Johns Hopkins U
"The Problem of Mass"

December 13
John Leibacher, National Solar Observatory
"Helioseismology: Probing the Invisible Interior of Our Star"

December 20
December 27 NO COLLOQUIA
January 3

January 10
Francis Collins,
National Center for Human Genome Research
"The Human Genome Project and the Future of Medicine"

Francis Collins

January 17
Anthony Fauci, National Institute of Allergy and Infectious Diseases
"HIV and AIDS: Considerations for the 21st Century"

Anthony Fauci

January 24
Arthur I. Poland, GSFC Laboratory for Solar Physics and Astronomy
"First Results from SOHO"

January 31
David McKay,
NASA Johnson Space Center
"Search for Past Life on Mars"

David McKay

February 7
Rich Young, NASA Ames Research Center
"Refined Results from the Galileo Probe"

February 14
Bob Ryan,
WRC-TV News 11 AM
"Predicting the Weather for the Public"

Bob Ryan

February 21
Rita Colwell, U Maryland
"Tracking the Origins of Cholera: A Paradigm for Climate and Human Epidemiology Interaction"

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