



National Aeronautics and
Space Administration
Goddard Space Flight Center

Goddard News

HST Promises "Excellent Science"

by Randee Exler

NASA's Hubble Space Telescope (HST) will continue to do "excellent and unique science," in spite of difficulties with an imaging problem on board the spacecraft, announced NASA Associate Administrator Dr. Lennard Fisk during a press conference conducted at the Goddard News Center last month. "The criteria of success is . . . not whether it produces pretty pictures but whether it uncovers the secrets of the Universe," the scientist said.

Optical Assessment

In assessing the HST's optical performance, the orbital verification team conducted a series of focus tests, which involved moving the secondary mirror to a number of positions. Images were taken from the Wide Field Planetary Camera, the HST's primary imaging instrument, at each position to assess how the image quality changes with secondary mirror motion.

The anticipated image quality was not achieved. Computer models of the images indicate the source of this lesser quality image may be caused by either the primary or secondary mirror aboard HST, accord-

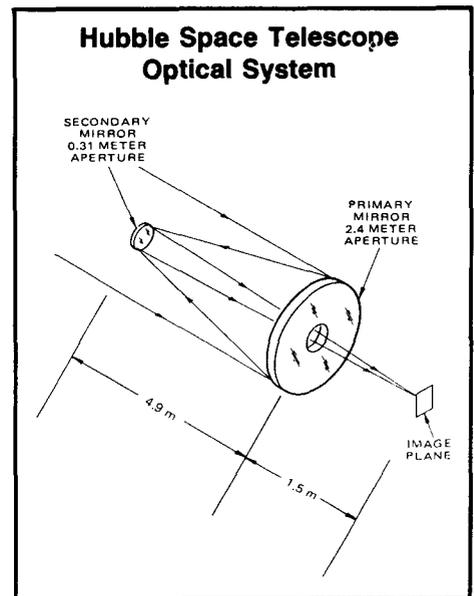
ing to officials. "The aberration is textbook perfect," said HST Deputy Project Manager at the Marshall Space Flight Center, (MSFC), Jean Olivier, who explained that this is one reason it is believed that this condition happened on the ground during the construction of one of the mirrors. It has not been determined which mirror is affected or how the condition occurred.

The design of the optical system is sound, according to HST Program Scientist, NASA Headquarters, Dr. Ed Weiler, who explained that the primary and secondary mirrors on HST are "perfect mirrors" individually. Dr. Weiler drew the following analogy comparing the two mirrors to lenses in a pair of eye glasses: If both lenses are perfect, but one is ground to the wrong prescription, vision will suffer. Such, is the case with the HST, according to Weiler, who equates this problem with a bad case of myopia.

To restore "20/20 vision" for HST, NASA will attempt to modify instruments on board the telescope in 1993 when the Space Shuttle Discovery is scheduled to

revisit the HST. Corrective optics on a second generation of instruments under construction will compensate for the spherical aberration. "We will ultimately achieve full potential in imaging," explained Dr. Weiler.

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NASA Officials Discuss Shuttle, HST, and Budget Issues

by Kasse Andrews-Weller

NASA Administrator Richard H. Truly, Associate Administrator for Space Science and Applications Dr. Lennard Fisk, and Associate Administrator for Space Flight Dr. William Lenoir, held a media briefing on July 2, on three complex issues: the liquid hydrogen leaks in the Space Shuttle's Columbia and Atlantis, the Hubble Space Telescope's (HST) current capabilities and what is needed to get the optimum of science, and the status of the Congressional budget actions affecting NASA.

Dr. Lenoir emphasized, "We will ensure that the shuttle is a safe and reliable vehicle and are confident that we will have safe flights in the future." He described the areas that are being examined concerning the liquid hydrogen leaks in the 17-inch disconnect. There are four efforts underway: hardware design, hardware processing, data analysis, and a review fault tree.

He added, "The process is working to resolve the problem. The current stand down in the shuttle program is short term."

Dr. Fisk addressed the concerns of the spherical aberration in the HST. He stated: "We are looking at three things: How we got it, what are we going to do until the problem is resolved, and what are we going to do to get to the full capacity of HST." A review panel, chaired by Dr. Lew Allen, Director of the Jet Propulsion Laboratory, includes: Charles P. Spoelhof, (Retired) Vice President, Eastman Kodak Co.; George Rodney, Associate Administrator for Safety and Mission Quality, NASA Headquarters; John Mangus, Head, Optics Branch, Space Technology Division, GSFC; Dr. Bob Shannon, Optical Sciences Center, University of Arizona, Tucson; and Dr. Roger Angel, Steward

Observatory, University of Arizona, Tucson.

Truly expressed concern over the proposed \$800 million reduction in the NASA budget. He said, "We will continue to work to improve the posture of our budget allocations for Mission to Planet Earth and the exploration programs for the next century."

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Goddard Welcomes Center Director

Goddard's new Center Director, effective July 1, is no stranger to NASA. In fact, he's a 20-year space-agency veteran. Dr. John Klineberg, who succeeds retired GSFC Director Dr. John W. Townsend, Jr., joins Goddard after a three-year stint as director of the Lewis Research Center, Cleveland, OH.

"We are fortunate to have on our management team a man of Dr. Klineberg's experience and ability to take over this challenging assignment at a time when Goddard Space Flight Center is at the heart of so many of NASA's science programs, both in flight now and planned for the next few years," commented NASA Administrator Richard H. Truly on Klineberg's appointment.

Klineberg joined NASA in 1970 at the Ames Research Center, Moffett Field, CA. He conducted research in



Goddard Space Flight Center Director
Dr. John Klineberg

on an aerodynamically advanced supersonic aircraft. He was a member of the NASA Advisory Committee on Space Technology from 1970 to 1972 and was named Director in 1972 and was named Director in 1987.

Klineberg is the former president of the American Institute of Aeronautics and Astronautics, a member of the National Academy of Sciences, and a member of the University of California, Berkeley. He received his Ph.D. in Aeronautical Engineering from the University of California, Berkeley, and his M.S. in Aeronautical Engineering from the University of California, Berkeley.

Contel Transfers Title of TDRSS to NASA

by Jim Elliott

NASA gained title to the Tracking and Data Relay Satellite System (TDRSS) on July 1, according to a joint announcement made recently by officials of Goddard and Contel Federal Systems.

Under a negotiated agreement, Contel relinquished ownership of the space communications system 42 months earlier than called for under the original contract.

The early transfer of title, along with other contract modifications, is expected to save the government \$16 million, according to William A. Hatchl, TDRSS Project Procurement Manager at Goddard.

The TDRSS includes three orbiting satellites and a ground communications terminal at White Sands, NM. Under the original contract, a two-phased agreement, effective December 22, 1976, covering construction of the spacecraft and ground communications terminal on one hand and maintenance and operation of the satellite-ground terminal operations for 10 years on the other, Contel was to supervise construction of six spacecraft and the ground terminal and to operate three of the satellites in orbit and to operate and maintain the White Sands ground terminal.

Under the contract reformation:

1. NASA gains ownership of the TDRSS earlier than originally planned.
2. NASA will pay Contel \$107 million over a three-year period for fees incurred



IT'S A DONE DEAL—Richard Pickett, Contel Federal Systems Group's Director of Contracts and Procurements, seated left, shakes hands with Bill Hatchl, GSFC's TDRSS Procurement Manager, while Charles Wohlstetter, Chairman of the Board, Contel, standing left, and GSFC Retired Director Dr. John W. Townsend, Jr., looks on.

in managing the construction of the satellites, built by TRW, Redondo Beach, CA. Under terms of the contract, Contel was not due this money until the system became operational. Because of launch delays and for other reasons, the system did not become operational until October 1989.

3. Contel will get a 21-month extension, to September 30, 1995, to continue oper-

ating the three on-orbit satellites and the ground terminal at White Sands for NASA. Estimated cost is \$19.3 million.

4. TRW will complete the remaining two TDRS spacecraft under the construction phase of the Contel contract which has been assigned by Contel to NASA. The estimated completion cost to NASA is \$60 million.

Launch Update: Three Crews Assigned For 1991 Missions

Astronaut crew assignments have been made for three Space Shuttle missions scheduled for early to mid-1991, bringing the total number of Shuttle crews currently in training to 12. Navy Capt. David M. Walker will command a crew aboard the Space Shuttle Atlantis on STS-44, a Department of Defense-dedicated flight currently targeted for March 1991. Air Force Lt. Col. Terence T. "Tom" Henricks will serve as pilot. Mission specialists for the flight will be F. Story Musgrave, M.D.; Navy Lt. Cmdr. Mario Runco Jr., and Army Lt. Col. James S. Voss. Marine Col. Charles F. Bolden Jr. will command Shuttle flight STS-45 (ATLAS-01), a mission dedicated to studying atmospheric phenomena from a laboratory aboard the Space Shuttle Columbia. Air Force Maj. Brian Duffy will serve as pilot. Mission specialists are payload commander Kathryn D. Sullivan, Ph.D.; C. Michael Foale, Ph.D.; and Navy Capt. David C. Leeana. Payload specialists for the mission, currently projected for April 1991, are Michael L. Lampton, Ph.D., and Byron K. Lichtenburg, Ph.D. Air Force Col. John E. Blaha will command STS-43, a five-day mission to deploy the Tracking and Data Relay Satellite, TDRS-E, planned for May 1991. Serving as pilot aboard Discovery will be Navy Cmdr. Michael A. Baker. Mission specialists will be Shannon W. Lucid, Ph.D.; G. David Low and Army Lt. Col. James C. Adamson.

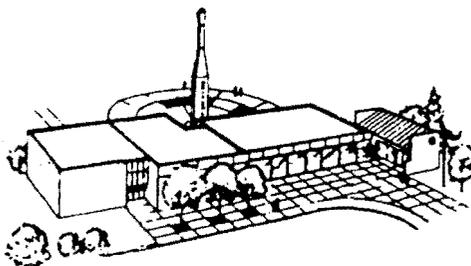
NASA Pipeline

NASA HEADQUARTERS, Washington, DC—NASA has selected 37 graduate students at U.S. universities to take part in the Global Change Fellowship Program. The Global Change Fellows, students pursuing Ph.D. degrees, were selected by a panel of representatives from the Earth Science and Applications Division, Office of Space Science and Applications (OSSA) and the Educational Affairs Division at NASA and from professional scientific societies and universities. Fellowships of \$22,000, beginning in the 1990-91 academic year and renewable for three years, will be awarded based on research proposals submitted by the selected applicants. Their proposals included research in atmospheric physics and chemistry, biogeochemistry, data and information systems, ecosystems, hydrology, oceanography and solid-Earth sciences. "The thing we hope to do," said Dr. Shelby G. Tilford, Director of OSSA's Earth Science and Application Division, "is encourage and train a new generation of Earth scientists, who may one day be responsible for much of the analysis of data from the Earth Observing System."

KENNEDY SPACE CENTER, FL—KSC will get a taste of its own progress when spin-off technology is used to upgrade the Space Station Logistics and Resupply section of the Payload Support Building. Under a contract awarded to Precision Mechanical, Inc., Cocoa, FL, heat pipe technology will be used in the addition of a new air conditioning system which will control the temperature and humidity in the Payload Support Building. KSC is the first NASA center to make use of this energy saving technology. Heat pipes were initially used as an efficient cooling method for satellites in space. Later, through the efforts of the NASA Technology Utilization office, heat pipes were adapted to assist in the air conditioning and dehumidification of buildings on Earth. Outside applications for heat pipe dehumidification began with the work of Khanh Dinh of Alachua, Fla. Working under a contract with NASA, Dinh Company developed a line of heat pipe dehumidification systems that significantly increased the moisture removal capacity of conventional air conditioning systems. Such a system will be used in the Payload Support Building.

HEADQUARTERS, Washington, D.C.—NASA Administrator Richard H. Truly has announced that NASA has launched an outreach program to seek new and innovative ideas, systems and technologies to carry out the nation's Space Exploration Initiative (SEI). The outreach program is in response to Vice President Quayle's request to "cast the nets widely" for new approaches to space exploration. Former astronaut Lt. Gen. Thomas P. Stafford, USAF (Retired), is chairman of the Synthesis Group, which will play a key role in the outreach program. The program seeks approaches to mission and system concepts; and innovative, high leverage technologies that could significantly affect cost, schedule and performance for SEI, which sets the future course of the U.S. civil space program.

Greenbelt Visitor Center Events for August



The Visitor Centers at Greenbelt and Wallops are open every day from 10 a.m. to 4 p.m. through Labor Day, September

3. All events are free. For more information about Greenbelt programs, please call 286-8981.

Launch Site Goddard—Sunday, August 5 and 19, 1:00 p.m. Join in the excitement and fun of model rocketry. Enjoy the day with the family at the Visitor Center by bringing a picnic lunch and a model rocket.

Saturday Videos—Saturday, August 11, 1:00 p.m. View "Ulysses" the joint mission of NASA and the European Space Agency (ESA) scheduled for Space Shut-

tle Discovery in October. The purpose of Ulysses is to explore the region of space dominated by the Sun, sampling its entire three-dimensional realm.

Know and Tell—Sunday, August 26, 1:00 p.m. Dr. Robert Stone, Senior Scientist of Goddard's Laboratory for Extraterrestrial Physics and a principal investigator of the project Ulysses, will explain how the spacecraft will explore and collect information about the Sun. Come and learn more about our Universe.

Goddard Boasts Largest "Clean Room" in the Free World



A ribbon cutting ceremony was conducted recently opening the doors to Building 29, a new facility that many have dubbed the largest "clean room" in the free world — Goddard's \$16 million Spacecraft Systems Development and Integration Facility (SSDIF). With the opening of this 86,000-square-foot (7,989-square-meter) building, NASA is one step closer to satisfying a national need for increased capacity to handle large payloads in a clean environment. Pictured cutting the ribbon for the Spacecraft Systems Development and Integration Facility (SSDIF) are former Center Directors John Townsend, Jr. and Noel Hinners; Bille J. McGarvey, Assistant Associate Administrator of Facilities Management, NASA HQ; John Scully, Acting Director of Management Operations, GSFC; and Jim Robinson, Associate Director of Engineering, GSFC.

Goddard Salutes 1990 Joint NASA/Goddard Honor Award Winners

The Building 8 Auditorium was standing room only for the 1990 Joint NASA/Goddard Honor Award ceremony, conducted June 14. The presentation of the NASA and Goddard awards were made following a welcome by Retired Director Dr. John W. Townsend, Jr. and an address by NASA Deputy Administrator James R. Thompson, Jr. The winners follow:

NASA Award Winners

Certificate of Appreciation: Norman R. Beard, Code 733.2; W. William Ingerski, Code 115, and James E. Kalshoven, Code 925.

Group Achievement Awards: AMPTE Mission Operations, Astronomy Sounding Rocket, Cosmic Background Explorer (COBE), Delta Project, 1989 Earthquake Response, Facilities Engineering Spacecraft Systems Development and Integration Facility Design and Construction, First ISLSCP Field Experiment Science, International Hally Watch/Large-Scale Phenomenon, NASA Sounding Rocket Support at White Sands Missile Range, Pegasus Development, Shuttle Solar Backscatter Ultraviolet Experiment, Solar

Extreme Ultraviolet Rocket Telescope and Spectrograph, and Tracking and Data Relay Project/Contractor.

Public Service Medals: Steven J. Battel, Space Science Laboratory; Jimmy A. Gregory, Contel Federal Systems, Inc.; and Marshall W. Novick, Federal Systems Division, TRW Space and Technology Group.

Exceptional Service Medal: James F. Andary, Code 409; Jimmy E. Cooley, Code 735.2; Bernard Dixon, Code 152; Anthony D. Fragomeni, Code 704; William S. Guion, Code 501; Jerre B. Hartman, Code 460; William A. Hatchl, Code 284.6; Lawrence E. Hyatt, Code 302; Kenneth R. Kirks, SSAI, Code 674; Richard G. Long, Code 405; Robert E. Martin, Code 153. Roger A. Mattson, Code 401; Dennis K. McCarthy, Code 600; Roger L. Navarro, Code 831.1; Dorothy C. Perkins, Code 510; Bruce R. Pincus, Code 740.2; Robert D. Price, Code 930.3; E. John Pyle, Code 710; Joseph H. Rothenberg, Code 500; Michael Ryschkewitsch, Code 716, Robert G. Sanford, Code 501; F. Ronald Sawyer, Code 824; Benjamin Seidenberg, (posthumous)

formerly of Code 750; I. Steve Smith, Code 842; James A. Smith, Code 923; William P. Spear, Code 285; H. Wade Stonesifer, Code 405; Thomas E. Williams, Code 405; James W. Woods, Code 731.2.

Exceptional Engineering Achievement Medal: James R. Chesney, Code 521; and Aristides Serlemitsos, Code 713.1

Exceptional Scientific Achievement Medal: Michael Desch, Code 695; Thomas L. Duvall, Code 682; John W. Harvey, National Solar Observatory; Jan M. Hollis, Code 930; Chester J. Koblinsky, Code 926; Yoji Kondo, Code 684; Martin Pomerantz, Barstal Research Foundation, University of Delaware; and Bonnard J. Teegarden, Code 661.

Outstanding Leadership Medal: Milton Halem, Code 930; Allan Sherman, Code 710; Charles S. Vanek, Code 405.

Distinguished Service Medal: Dale W. Harris, Code 400.

Goddard Award Winners

Group Achievement Award: Broad Band X-Ray Telescope Instrument Development

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Wallops Flight Facility Celebrates 45 Years of Aerospace Research

by Keith Koehler

Among the marshes of Virginia's Eastern Shore fly a variety of fowl such as geese, ducks, cranes and seagulls. Since 1945, birds of a different feather have been known to rise from the area—rockets from the launch pads of Wallops Island. This month Goddard's Wallops Flight Facility (WFF) celebrates 45 years of aerospace research.

On April 25, 1945, Congress approved funds for the construction of a test station under the direction of the Langley Aeronautical Laboratory of the National Advisory Committee for Aeronautics (NACA).

With the approval of NACA Headquarters, Langley began construction of the station on Wallops Island, a barrier island on Virginia's Eastern Shore named for the 17th century surveyor John Wallop. Called the "Pilotless Aircraft Research Station," the facility became known as "Wallops."

Two months after construction began, on July 4, 1945, a Tiamat research rocket lifted off the launch pad, beginning a long history of innovative aerospace research techniques from what is now known as the Goddard Space Flight Center's Wallops Flight Facility.

Over the years, the facility and work conducted at Wallops has undergone many changes. With the establishment of NASA in 1958, Wallops became an independent

center known as Wallops Station. Wallops was to undergo two more name changes in its history, the Wallops Flight Center in 1974, and its current title came with the consolidation with Goddard in 1981.

From its operations on Wallops Island, the facility expanded to include an area across from the island, called the Mainland, and the site of the former Chincoteague Naval Air Station, known as the Wallops Main Base. Today, the Wallops Flight Facility covers more than 6,000 acres.

Early Research

In the early years, the research focused on obtaining aerodynamic data at very high speeds as part of the effort to penetrate the sound barrier and operate at supersonic speeds. In the late 1950s and early 1960s, component development tests for manned spacecraft such as the escape and recovery techniques and maximum dynamic pressure tests (Little Joe series) were conducted at Wallops. With the use of the Scout launch vehicle, many small satellites, atmospheric reentry tests, and space probes have been launched from Wallops.

The hallmark of Wallops has continued to be its suborbital research projects. Wallops sounding rockets, scientific balloons, and aircraft provide scientists with unique avenues for conducting science and

research worldwide.

The Observational Science branch of the Laboratory for Hydrospheric Processes, also based at Wallops, is actively studying the interaction of the oceans, atmosphere, and weather.

The sounding rocket program conducts an average of 35 missions each year. The Wallops role involves all aspects of the mission, including payload design, fabrication and testing, launch vehicle systems, launch operations, and tracking and data acquisition. The Wallops sounding rocket fleet consists of 15 different vehicles ranging from 10 to 64 feet (3 to 20 meters) in length. These one to four stage vehicles fly vertical trajectories carrying their payloads from 30 to 800-miles (48 to 1287-kilometers) altitude.

Balloon Program

Wallops manages NASA's Balloon Program including management of the National Scientific Balloon Facility (NSBF) in Palestine, TX. An average of 35 scientific balloon flights are made each year from NSBF and other locations. Current balloons carry payloads up to 6,000 pounds (2,621 kilograms) and fly at altitudes up to 25 miles (40 kilometers) for flights of 12 to 24 hours.

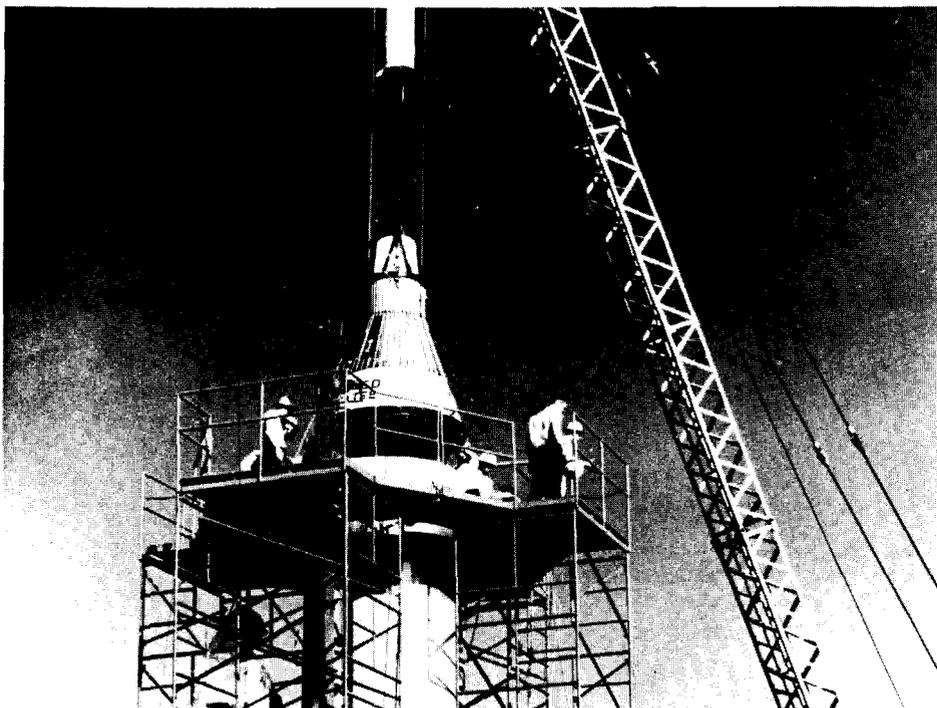
Balloon and sounding rocket campaigns are supported in other areas around the world. A permanent balloon launch site has been established at Ft. Sumner, NM, permanent sounding rocket facilities are used at White Sands Missile Range and a contract with the University of Alaska provides for operation of the Poker Flat Research Range. Personnel using mobile equipment have conducted campaigns in Artic and Antarctic regions, South America, Africa, Europe, Australia, and aboard ships.

Six Different Aircraft

Wallops also operates a fleet of six different aircraft which conduct nearly 150 research missions each year. Used as flying scientific platforms, the aircraft can accommodate a variety of research equipment such as laser systems, specialized radar systems, scatterometers, and atmospheric sampling devices for conducting scientific studies and instrument development.

Wallops continues to operate its launch range from Wallops Island and a research

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LITTLE JOE—Pictured is a prototype Mercury capsule and escape tower being lowered onto a Little Joe booster for launch on August 23, 1959.

INSIDE

Dr. Stephen J. Paddack: Pilgrim

by Cheryl Madson

Dr. Stephen J. Paddack is a silver-haired salty dog with his feet in the oceans and his head in the skies. His deep tan could have been acquired while sailing beneath West Indies skies, or while gazing into the dazzle of his NASA crystal ball. He has plied the seas since childhood, but always with an eye towards the heavens, for there is an abiding duality in his nature, inherent in his cultural heritage and in his life-long occupation with ships and planes, with nautical and aeronautical engineering. The name of his sailboat, *Pilgrim Soul*, aptly describes the captain as well as his vessel. Another facet of Paddack's versatile personality is his determination "to give his best shot," never less, and to proceed with whatever that shot delivers, confident that he has made his "best effort."

Paddack has a duality of cultures as well. His Hispanic heritage stems from his maternal side. His native tongue was Spanish, for he was born and raised in Puerto Rico. His paternal side can be traced back from Ireland to the earliest Nantucket seamen and whalers.

Ironically, young Paddack, saw himself in the light of family accomplishments, as "the black sheep of the family." His high school teachers did not encourage his facility with math and physics, so his true bent in life was discovered late. Seeing himself as very "ordinary," he threw away his books and went to sea at age seventeen. Always looking skyward, sailor Paddack took flying lessons in port and pursued celestial navigation at sea. His moment of enlightenment came on the bridge, when Paddack recalls, "My shipmates were awed with my ease with calculating, and it dawned like a bright flash I wasn't a dummy after all." He decided that moment to try for college admission to study aeronautical or nautical engineering.

"I always give my best shot!"

Dr. Stephen J. Paddack

"College enrollment and the birth of the space age marked the start of self-discovery for me," he reflected. He was admitted to Catholic University, where he pursued three degrees: a B.A. in Aeronautical Engineering, an M.A. in Aerospace Engineering, and a Ph.D in Engineering. The direction of his career was determined by the "GSFC Employees



EPIRB PROTOTYPE—Dr. Stephen Paddack holds a test version of an Emergency Position Indicating Radio Beacon (EPIRB), that allowed Goddard to track his sailing route via satellite on what proved to be this veteran sailor's most dangerous high seas adventure.

Only" road sign. On the way back from a job interview in Baltimore, he spontaneously entered the gate to explore job opportunities. The young scientist reported to work the following week at GSFC's Sciences Directorate in astrodynamics.

Crystal Ball Gazing

As Chief of the Advanced Missions Analysis Office at GSFC since 1981, Paddack focuses on future spacecraft missions. When he gazes into his crystal ball to envision the future of NASA he prophecies, "NASA is on the verge of extraordinary accomplishments, and Goddard will play an increasingly vital part in our future missions." Paddack predicts that "Space will become a place of no national boundaries, similar to Antarctica, with international teams working together to explore and to colonize space as permanent inhabitants."

As for Goddard's future, Paddack foresees two key focuses. "GSFC will be involved in the new directions of this nation: the Space Exploration Initiative, which will involve planetary studies, astro and space physics, robotics, and telerobotics; and Mission to Planet Earth, the Earth Observing System." Goddard will maintain pre-eminence in communication and data handling, like optical communication, and

our Tracking and Data Relay Satellites will be "the communicating terminals for a lunar-based major astronomical observatory."

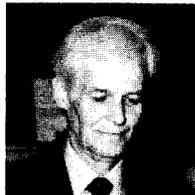
Paddack reports, "I have had some really extraordinary adventures with sailing mates from Goddard: Ernie Rodriguez, Jack Hayes, and Jack Triolon." The sea tale that involved Goddard was the 1987 delivery of a Cal 40 sailboat to Puerto Rico. The boat was outfitted with a test version of the frequency EPIRB (Emergency Position Indicating Radio Beacon), to monitor the sail route via the then-new SARSAT (Search and Rescue Satellite-Aided Tracking) system, which detect signals of distress and speeds world-wide rescue efforts. Paddack and crew took to the seas at Annapolis in stormy weather. They encountered full gale conditions south of Hatteras, where nine-foot waves became 30-foot walls of fury. Paddack remembers vividly, "The backstay of the main mast snapped. We almost lost the mast and all the rigging. Next, the head sail blew apart, it just exploded." Skipper Paddack is proud that they managed, with some adroit seamanship, to limp home without pushing the EPIRB's emergency button. The test was successful, and Goddard was able to track their erratic course. In evaluating this escapade at sea, Dr. Paddack readily admits, "It was frightening and sobering, but also exhilarating."

Paddack's lengthiest sea tale (1985-89) relates the recovery of the *Pilgrim Soul*, a marooned 30-foot Cape Dory that had been driven into the rocks of the West Indian island of Mayaguana in foul conditions and subsequently vandalized. After a two-year search Paddack located the owner, bought the boat, and in attempting recovery, sailed two round trips that were both futile and dangerous. Paddack decided he would give the recovery his last but "best shot" in October 1989. At the highest tides in ten years, his crew finally succeeded in getting the boat to deeper water. After installing new rigging and hardware, and after loading aboard food, navigational gear, and outboard motor, the elated crew set sail for a "white-knuckled" trip home. Presently, the *Pilgrim Soul* is undergoing repairs in Galesville, and Paddack is confident that she'll be sea-worthy this summer, so that ship and skipper can ply their "pilgrim souls" once again across the high seas!



Congratulations to **CARY F. MILLINER**, the newly appointed Chief, Operations Division, Code 830. He succeeds **ROBERT T. DUFFY** who was appointed Deputy Director of Suborbital Projects and Operations.

Milliner will oversee engineering, technical, and supporting skills necessary to plan, manage, and



MILLINER

conduct aerospace and other project operations at the Wallops Flight Facility (WFF) and other locations. . . The Employee Suggestion Award Program really works, according to **ROBERT REYNOLDS**, Code 293, the winner of a cash award



REYNOLDS

for a suggestion regarding the use and disposal of solvents at the WFF. His suggestion involved a solvent recycling system which may save the WFF up to \$30,000 a year. Additionally, it would significantly reduce Wallops' hazardous waste and environmental concerns.



OVAL OFFICE CEREMONY—President George Bush congratulates Goddard scientists, Code 690, **DR. RUDOLPH HANEL** (pictured left) and **DR. BARNEY CONRATH** (pictured right), on the success of Voyager's Grand Tour of the Universe. NASA scientists and engineers presented a gigantic mosaic photograph of our solar system compiled from Voyager images to President Bush in a ceremony in the Oval Office in June. Hanel and Conrath have been a science team for 18 years, as Principal Investigators of the Infrared Interferometer Spectrometer and Radiometer (IRIS), a two-part instrument on Voyager which gathers information about the temperature and composition of the planet's atmosphere and the total amount of energy emitted by the planet. Nineteen Goddard Scientists were involved with five of the spacecraft's 11 instruments.

Retirees

Congratulations on the following employees who recently retired!

Name	Code	Years	Name	Code	Years
Albright, Henry	743.1	38	Treimer, John A.	534	31
Buckler, Thomas R.	415	29	Triolo, Jack	732.4	33
Eckel, Donald	530.4	30	Velgos, Paul	743.1	27
Prithatt, Harry C.	534.2	32	Washburn, Albert B., Jr.	530.4	30
Townsend, John H., Jr.	100	34			

Goddard Wins Red Cross Award

Goddard was honored recently with the Blood Services Pacesetter Award from the National Capital Chapter of the American Red Cross. The luncheon ceremony was held at the National Press Club in Washington, DC. Morris Jones, FOX-TV, Channel 5 was the Master of Ceremonies. The honorable Lindy Boggs, representative from Louisiana's 2nd Congressional District, was the keynote speaker.

Two employees from Code 205.2, **GAIL REGAN** and **LYNN DALKIEWICZ**, (pictured left to right) accepted the plaque. Goddard was cited for its long standing participation in the Red Cross Bloodmobile program and specifically for exceeding goals on donated blood. Goddard was recognized as an organization dedicated to ensuring an adequate blood supply for the community needs.

The June Bloodmobile was held in the

Building 8 auditorium and 176 prospective donors volunteered to donate blood. The following is a list of Goddard employees who were cited by the American Red Cross with gallon pins at the Bloodmobile.

Gallons	Name	Code
2	Dale Allen	616
3	Ed Burke	440.8
1	Dan Burns	
1	Ken Cory	751
5	Howard Dew	511.1
8	Greg Manfra	405
1	Steve Marsico	520.9
2	Roy Nakatsuka	602.6
2	Oren Sheinman	731.1
1	Sandy Shuman	667.1

The Bloodmobile is held the first Wednesday of every other month, with the next Bloodmobile on August 1, 1990. Watch *Dateline Goddard* for details.



REGAN

DALKIEWICZ

Award Winners

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and Test, Cosmic Background Explore (COBE) FIRAS XCAL Repair, COBE Instruments Operations, COBE Mission Operations and Data Systems, Explorer Concept Study, FIRAS Instrument Electronics Recovery, Flight Vehicles and Systems, Global Aerosol Backscatter Experiment Instrument, Ground Space Tracking and Data Network Station Directors and Senior Managers, GSFC Joint Global Ocean Flux Study Airborne, Scientific Instrument Control and Data Handling Engineering Management, Shuttle-Attached Payloads Operational Support System Development, Two Axis Pointing System Brake Lock, and Taurus 12.043 WT Project.

Community Service Award: Frederick C. Gross, Code 313; David A. Lindauer, Code 713.3; Goddard Amateur Radio Club; and the Goddard Black History Club.

Equal Opportunity Award: Michael C. Backert, Code 210; John E. Hodge, Sr., Code 270; and the Goddard Black History Club Outreach Committee.

Productivity Improvement and Quality Enhancement Award: Wilma S. Chigas, Code 111; Michele L. Garrett, Code 247.2; Myron L. Kemerer, Code 243; NASA Property Disposal Management System; NSI Quality/Productivity Improvement Program Steering Committee; NSI Technology Services Corporation; Prompt Payment Working Group; The 'Cleanroom' Software Team

Exceptional Achievement Award: Nancy A. Abell, Code 153; John A. Balla, Code 728.3; H. Wayne Boswell, Code 110; James N. Caldwell, Code 728; Jo Ann Clark, Code 201; Anthony B. Comberiate, Code 405; Charles E. Cote, Code 610; Richard N. Crone, Code 130; Michael J. DiPirro, Code 713.1; Patricia A. Greco, Code 114.2; Abigail D. Harper, Code 303; Alfreda Harris, Republic Management Systems; Paul J. Heffernan, Code 405; Dennis R. Hewitt, Code 409; Floyd H. Hunsaker, Code 690; Charles M. Hunter, (Retired); Arthur H. Jackson, Code 533; Michael W. Kelly, Code 263; Thomas Kelsall, Code 685; Robert E. Martin, Code 515.1; George A. Matzner, III, Code 110.3; Michael E. McGrath, Code 285; James E. Milligan, Code 301; Bradley J. Poston, Code 286; Catherine Long Richards, Code 727.2; Dale F. Schulz, Code 410; Mendel N. Silbert, Code 841.2; Max J. Suarez, Code 611; John J. Tominovich, Code 284.5; Eduardo Torres-Martinez, Code 728.2; John L. Wolfgang, Code 704; and John J. Yagelowich, Code 728.1

Award of Merit: Mario H. Acuna, Code 695; Richard H. Hoffman, Code 732; and Lonnie J. Rogers, Code 727.3.

Wallops

Continued from page 5

airport on the Main Base. The launch range is the oldest continuous range in the United States. In its 45-year history, Wallops has been responsible for launching more than 14,000 rockets. The airport's

remote location and controlled airspace are ideal for conducting terminal area research dealing with the aircraft airport interface.

Tracking and data acquisition facilities are available for all operations. In addition, an orbital tracking station supports the Cosmic Background Explorer, the International Ultraviolet Explorer, the Nimbus-7 Meteorological Research, the Interplanetary Monitoring Platform and other satellites.

Throughout its history WFF has adapted to the changing focus of the country's aerospace research endeavors. From a few dozen employees in 1945 to the nearly 1,000 in 1990, the Wallops personnel have maintained a dedication to applying inexpensive and innovative methods to scientific research.

HST

Continued from page 1

Dr. Weiler emphasized during the press conference that NASA is not losing science but reordering science. Ultraviolet (UV) astronomy will get priority over visible light astronomy. The HST should still be able to detect distant quasars, as well as study closer objects. Following is a breakdown of the HST instruments and how they are affected, according to Dr. Weiler:

- **Wide Field/Planetary Camera:** Designed to observe larger sky areas in visible light and produce more data than the other instruments. Approximately 10% to 20% science can be done until the 1993 instrument change-out occurs.

- **Faint Object Camera:** Designed by the European Space Agency, images will be as good as those obtained from ground based observatories. The FOC will still be able to produce UV images, a feature that is unique to current space-based observatories.

- **Faint Object Spectrograph:** The UV spectrographs will still be good except in crowded star fields because of spatial resolution limitations.

- **Goddard High Resolution Spectrograph:** Most of the UV science can be done with only a small fraction lost due to spatial resolution limitations.

- **High Speed Photometer:** Measurements are made over a wide spectral range from visible to UV. Approximately one-half of the science can be achieved at this time.

- **Fine Guidance Sensors:** Two FGSs are used to lock onto a target allowing the third to be used for astrometry, to measure the positions of other stars in the vicinity of the target. This ability remains one-hundred percent.



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