

1989: A Banner Year For Goddard

The year 1989 was an historical year. For Goddard, 1989 marked three decades of achievement in space and Earth science, launch operations, and project management. For NASA, 1989 marked 20 years since the first human set foot on the moon on July 20, 1969.

Meanwhile, Goddard continued to fulfill its role as one of NASA's most versatile centers, launching the completely in-house COBE (Cosmic Background Explorer) satellite to look back in time at galactic radiation; completing the three-satellite communications system known as TDRSS (Tracking and Data Relay Satellite System); pushing the threshold of scientific discovery with instruments onboard the planetary probe Voyager; and providing crucial information in the study of atmospheric ozone depletion.

Some highlights of center activities for 1989 paint a picture of the multifaceted scientific and engineering institution that is Goddard Space Flight Center.

Launch Operations

COBE. One of the most exciting science events of the year for NASA took place on November 18, with the launch of the Goddard-managed Cosmic Background Explorer spacecraft, onboard a Delta expendable launch vehicle, into the crystal-clear dawn sky above Vandenberg Air Force Base, California.

Following deployment by the Delta rocket, the COBE began a two-year mission from its 559 mile (900km) orbit to study the origin and dynamics of the universe—including the theory that the universe began about 15 billion years ago

with a cataclysmic explosion known as the Big Bang.

Goddard designed, developed, built and tested the COBE and its three infrared and microwave-measuring instruments; managed its launch; and now has begun to analyze the data it is returning.

COBE, a classic case of an in-house project, is expected to provide scientists with new insights into the origin and evolution of the universe.

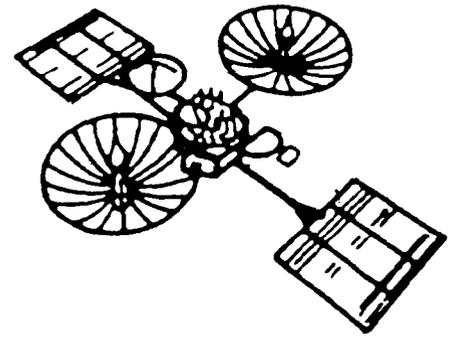
Project Management

TDRS-D. March 1989 was a banner month for NASA and Goddard: the Space Shuttle Discovery (STS-29) made its second trip into space in the "Return to Flight" era and deployed the Goddard-managed Tracking and Data Relay Satellite-D (TDRS-D), completing the three-satellite space communications constellation. Following deployment by Discovery, TDRS-D was boosted by its on-board propulsion unit into a geosynchronous orbit 22,000 miles (35,887km) from Earth and was designated TDRS-4. When it became operational June 3, 1989, the satellite assumed its role of improving communications with and tracking of orbiting near-Earth spacecraft, including the Space Shuttle.

Earlier—in September 1988—the Space Shuttle Discovery (STS-26) had deployed the second communications satellite, TDRS-C, which became TDRS-3 when it reached its geosynchronous altitude. The oldest of the communications satellites, TDRS-1, has been in operation since April 1983.

The TDRS system of satellite communications will support up to 23 user spacecraft simultaneously and provides both multiple-access and single-access service. The multiple access service relays data from as many as 19 low-data-rate user spacecraft at the same time; the single-access service provides two high-data-rate communications relays from each satellite.

The 5000-pound Tracking and Data Relay Satellites are the largest and most complex communications satellites ever launched. They are built by TRW, Redondo Beach, CA and operated for NASA by CONTEL Federal Systems, Fairfax, VA.



Science

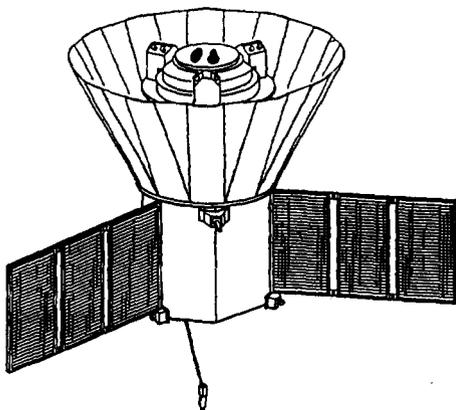
Terrestrial Physics. During summer of 1989, Goddard scientists from the Laboratory for Terrestrial Physics led a NASA effort to learn about the effect of vegetation on climate and weather, an effort expected to improve weather forecasting and the understanding of how human activities influence Earth's climate.

The key NASA scientist was Dr. Forrest Hall, an experiment scientist with Goddard's Earth Resources Branch.

The effort—led by NASA scientists but including others from the U.S., Soviet Union, Canada, England and France—was conducted on a prairie grassland site in central Kansas. An element of the International Satellite Land Surface Climatology Project (ISLSCP), it was known as FIFE, the first ISLSCP Field Experiment.

With data gathered from five Earth remote-sensing satellites, six research aircraft and dozens of high-tech surface and airborne measurement devices, scientists evaluated how land-surface vegetation—in order to survive—regulates the rate of

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INSIDE

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Goddard
Pioneer

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Talk from the Top

John W. Townsend Jr.

Q. The recent road construction in front of Bldg. 18 was extremely unnecessary. They tore up our parking lot to move the road 1/4 block over. Now, there isn't enough parking. Why was this done?

Q. The parking situation here at Bldg. 4 is ridiculous. You RIF [reduction in force] five people, hire 20 to replace them and provide no parking facilities. Real bright move.

A. The Bldg. 18, 19, and 20 parking lots were in need of significant rework to correct degradation resulting from use and aging. Rather than just repaving the area, the Facilities Engineering Division saw an opportunity to solve a number of traffic, parking, and potential safety problems. We have been concerned for a long time about the safety of the triangular intersection by Bldg. 18 and the amount of traffic flow past the new Child Development Center and exiting the Center through the Bldg. 26 parking lot. Easier access to the Center's perimeter road via Delta Road will help this initiative and be more convenient for Center drivers. Straightening out the road relieves the difficult intersection by Bldg. 18 and relocates also the bulk of the parking for Bldgs. 18, 19, and 20 to the "building side" of the road thereby isolating the people who work in these buildings from the greater traffic flow along Delta Road. When implementation of our plan is completed (early summer 1990, funds permitting) an additional 30 parking spaces will be available for Bldgs. 18, 19, 20 occupants. Parking at Bldg. 4 may have been impacted by the construction in the Bldg. 18, 19, 20 area. However, it has not been impacted by the contracting out of plant operations and maintenance functions. There has been no increase in the Bldg. 4 and power plant area in employees needing parking spots because of the rapid attrition in the civil service workforce in the past six months. Completion of the Bldg. 18/19/20 initiative should relieve the situation sufficiently to minimize the current inconvenience to Bldg. 4 occupants.

Center Director John W. Townsend, Jr. wants to hear from you! Send questions to TALK FROM THE TOP, Code 130.

Children Break Ground for Center Addition

by Rande Exler

Goddard gave its employees and their children a holiday gift too large to wrap—a 5,000 square-foot addition to the Goddard Child Development Center (GCDC)!

The new wing will be built by MRC Construction Company, Washington, DC. This firm has been designated as 8(a), small and disadvantaged, by the Small Business Administration. The construction contract with MRC is for \$430,000.

The 30-minute groundbreaking ceremony for the new addition took place on December 18. Following brief remarks by Paul Demino, Chief, Facilities Engineering Division; Dr. John W. Townsend, Jr., Center Director; Bennie Shell, MRC President; and Nancy Abell, GCDC President; the children of the GCDC, some equipped with miniature hard hats and shovels provided by MRC, broke the icy soil.

The GCDC is a pioneer in the field of Federal day care. "Our Center was among the first five Federal Day Care Centers to open," explained GCDC Director Barbara Karth. This is the Center's third expansion since it opened for business in June 1973 with 30 students.

Today, 65 children ranging in age from 32 months to five years are taught in classrooms by teachers with Baccalaureates in Early Childhood Education. Assistant teachers are certified paraprofessionals. The facility accommodates children of both

civil service and contract employees.

The new wing will more than double the size of the existing facility; it will grow from 4,000 to 9,000 square feet. Enrollment and staffing also will increase considerably.

"When the new facility opens this summer, we should be able to accommodate 125 children," said Karth. "Our staff will double in size, also," she added.



PHOTO: D. McCALLUM

GROUND BREAKING—Center Director Dr. John W. Townsend, Jr. and MRC President Bennie Shell initiate the ground breaking ceremonies for a 5,000 square-foot addition to the Goddard Child Development Center (GCDC). This is the Center's third expansion since it opened for business in June 1973 with 30 students.

Center Exceeds CFC Goal by 13 Percent

by Michael Braukus

Frances Shepherd didn't appear nervous as the Center's 1990 Combined Federal Campaign (CFC) was drawing to a close. That's because, as this year's CFC center coordinator, she never doubted that the campaign wouldn't make its goal—and she was right.

After all the donations were counted, the tally showed that the Center collected more than \$335,000, which was 13 percent beyond the Goddard goal of \$283,000. But what Shepherd found surprising was that the goal was obtained with fewer contributors. "This year we received fewer donations from Goddard's employees," said Shepherd. "But we received larger donations from the people who did give."

In fact, 88 Goddard employees who gave 1 percent or more of their gross income were awarded the Golden Eagle Award by the CFC. The largest single employee con-

tribution was \$2,000 and the average Goddard employee gift was \$151.

Goddard's contractors also shared in the success of the campaign with Bendix Field Engineering Corp. contributing \$4,000, Computer Sciences Corp. \$3,000 and NSI Technical Services Corp. \$800.

Playing a major role in the success of the campaign were the members of the Goddard CFC team including: Center director Dr. John W. Townsend, Jr., Chairman; Code 500 director Dale Fahnestock, Vice-Chairman; Theresa Wirth, Code 100; Marg Barton, Code 150; Bill Cooper, Code 200; Marietta Sturgell, Code 300; Barbara Trott, Code 400, Chris Alexandre, Code 500; Bob Sullivan and Jack Van Zant, Code 600; Clay Magee, Code 700 and Lois Ryno, administrative officer.

Launch Update: HST Camera Installed

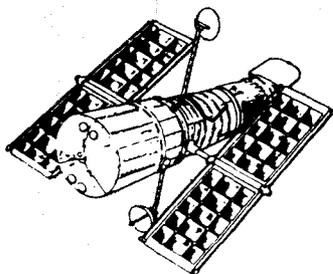
A significant event in the preparation of the Hubble Space Telescope (HST) for launch next spring occurred Dec. 20 in the Vertical Processing Facility at Kennedy Space Center. The Wide-Field Planetary Camera (WFPC) was installed and made ready for checkout activity.

One of two cameras aboard HST, the Wide Field Planetary Camera will photograph brighter objects of larger area. It can be used to photograph the face of a planet in our solar system or hundreds of galaxies at once.

The installation is being performed by the HST payload test team from NASA and the Jet Propulsion Laboratory (JPL), Lockheed, Perkin Elmer, and McDonnell Douglas. The WFPC arrived at KSC on Dec. 6 from JPL. The camera weighs 600 pounds, and its dimensions are 7½ feet long, 6 feet wide, and 2½ feet high. After the installation on the telescope in the Vertical Processing Facility, a series of functional tests are required.

Meanwhile, the latest in a series of prelaunch functional tests on the Hubble Space Telescope was completed on Dec. 8. Since testing began on Oct. 27, there have been no significant problems with the telescope itself and only minor problems with associated test equipment. Testing is performed via satellite from the Lockheed Sunnyvale facility, and from the HST Payload Operations Control Center (STOCC) located in Goddard's Building 3/14.

Based on the current manifest, the Hubble Space Telescope is scheduled to be transported to Pad B on Launch Complex 39 on March 9, 1990, placed in the payload bay of Discovery on March 12, and launched no earlier than March 26.



NASA Pipeline

NASA HEADQUARTERS, Washington, D.C.—NASA Administrator Richard H. Truly officially presented the NASA 1988-89 Excellence Award for Quality and Productivity to Robert Young, President of Lockheed Engineering and Sciences Company (LESC), Houston, in ceremonies held at NASA's Johnson Space Center, Houston, Dec. 5, 1989. Key activities of LESG include support at the Johnson Space Center in Shuttle crew earth observation activities. Lockheed also has been engaged in critical return-to-flight activities for NASA. The company was selected from among eight finalists in NASA's fourth annual awards program, which recognizes NASA's aerospace industry contractors, subcontractors and suppliers that consistently demonstrate ways to maintain and improve the quality of their products and services. Lockheed is the first support service organization to attain this honor.

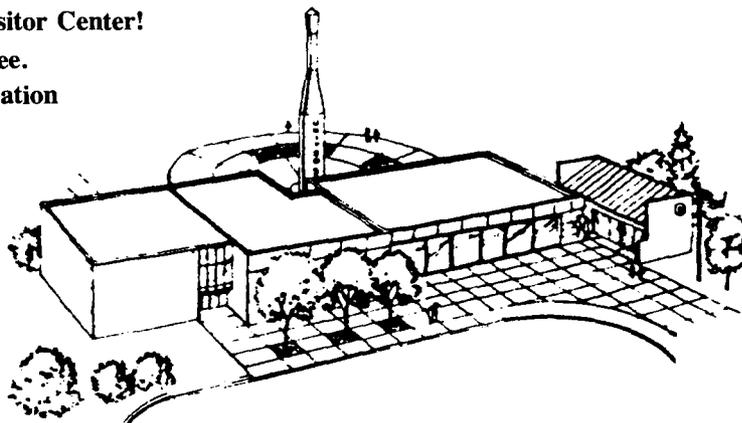
LANGLEY RESEARCH CENTER, Hampton, VA—NASA's Langley Research Center has selected TRW Inc., Redondo Beach, CA, for contract negotiations to develop space flight instruments for NASA's polar orbiting platform, the European Space Agency (ESA) polar orbiting platform and Space Station Freedom as part of the proposed Earth observing System (Eos). The goal of Eos is to advance scientific understanding of the Earth's land masses, oceans and atmosphere, their interactions and how the Earth's system is changing. The two-phase contract, estimated at \$37 million, will take effect about January 15, 1990.

February Visitor Center Events

Support your Visitor Center!

All events are free.

For more information
call 286-8981.



NASA's Hubble Space Telescope: The Search Begins

- Launch Site Goddard — Sunday, February 4 and 18, 1:00 p.m. — Bring a rocket and participate or just watch the fun!
- Saturday Videos — Saturday, February 10, 1:00 p.m. — Take an in-depth look at "NASA's Hubble Space Telescope" and learn about this observatory that will change the way we look at the Universe.
- Know and Tell — Sunday, February 25, 1:00 p.m. — John Paul Ondrus of the Hubble Space Telescope project for a fascinating discussion about the 43-foot long telescope, its scientific instruments, and Goddard's role in the effort.
- Star Watch — Saturday evening, February 10, 7:00 to 9:00 p.m. — Bundle up and bring your binoculars, or use one of the Visitor Center's telescopes. Staff members will be on hand to assist.

A Banner Year

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soil moisture return to the atmosphere, ultimately regulating local weather and regional climate.

Solar Maximum Mission Reentry. The Solar Maximum Mission (SMM) satellite reentered Earth's atmosphere on December 2 at 5:26 a.m. EST over the Indian Ocean. Goddard operations for the SMM ended on Friday, November 24, after flight controllers jettisoned the spacecraft's solar panels. This final engineering test left the spacecraft powerless and marked the end of 9.5 years of solar science.

Most of the SMM's discoveries were in the area of solar flares; SMM recorded more than 12,000 of these powerful eruptions during its lifetime.

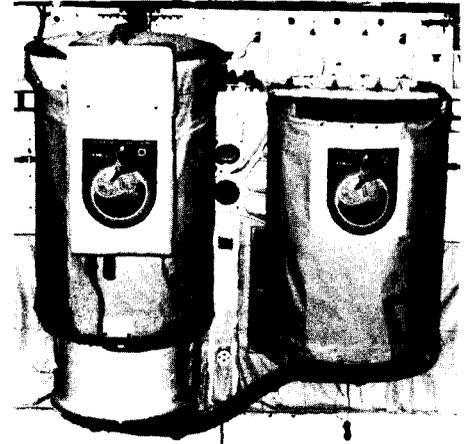
The spacecraft will probably be best remembered, though, as the first satellite to be repaired on orbit. The retrieval and repair of SMM in April 1984 invigorated both the manned space program and solar physics.

SSBUV. Goddard's Shuttle Solar Backscatter Ultraviolet (SSBUV) instrument made its first shuttle flight as a secondary payload on STS-34 which was launched Oct. 18.

SSBUV will be used to calibrate similar ozone measuring space-based instruments on the National Oceanic and Atmospheric Administration's TIROS satellites (NOAA-9 and 11).

Global concern over the depletion of the ozone layer has sparked increased emphasis on developing and improving ozone measurement methods and instruments.

Accurate, reliable measurements from space are critical to the detection of ozone trends and for assessing the potential effects and development of corrective measures.



OZONE MEASUREMENT—Global concern over the depletion of the ozone layer has made accurate and reliable methods of measuring ozone crucial to the understanding of ozone depletion phenomena. Goddard's Shuttle Solar Backscatter Ultraviolet (SSBUV) missions are so crucial to the support of Earth sciences in this matter that six additional missions have been added to NASA's Shuttle manifest. The first of these SSBUV missions was flown as a secondary payload on STS-34 launched on October 18, 1989.

TOMS. Continuing observations by the Total Ozone Mapping Spectrometer (TOMS) confirmed that the ozone hole over the Antarctic this year equalled the record-setting hole observed in 1987.

Atmospheric scientists at Goddard have closely monitored ozone levels over the Southern Hemisphere with the TOMS, an instrument onboard the Goddard-managed NIMBUS-7 satellite.

Previous measurements had indicated this year's hole might be as severe as the 1987 hole, when a record low ozone level was reached on Oct. 5.

Voyager. On August 24, 1989 nineteen Goddard scientists involved with five instruments onboard the Voyager 2 spacecraft anxiously awaited the results of its final planetary encounter in our solar system—the planet Neptune. The images and data returned from that encounter amazed the public, both confirmed and confounded scientific expectations, and provided fodder for scientific investigation for years to come.

Voyager 2 returned startlingly clear images of the blue planet, discovering rings, moons, and atmospheric and geologic phenomena never before known.

With this encounter, Voyager 2 completed its "grand tour" of the four giant outer planets—Jupiter, Saturn, Uranus and Neptune—and will continue on to the very edge of the solar system.



TO THE BEGINNING OF TIME—The Cosmic Background Explorer (COBE), Goddard's classic in-house satellite, was launched on November 18, 1989, on its two-year mission to study the origin and dynamics of the universe. By studying the galaxy's background radiation, which may be left over from the "Big Bang," the cataclysmic explosion that scientists believe may have formed the universe, the COBE is expected to provide scientists with new insights into the origin and evolution of the universe.



PLANETARY REVELATIONS—In its August, 1989 encounter with the planet Neptune, the Voyager 2 spacecraft revealed some surprising details about the mysterious planet, including several new moons, planetary rings, and atmospheric and geologic phenomena never before known. The crystal clear images returned by Voyager on this its last stop before encountering the edge of the solar system will continue to provide fodder for scientific investigation for years to come.

Humanitarian Operations

Telemedicine Spacebridge. In perhaps the most celebrated humanitarian effort of the decade for the agency, Goddard led NASA in linking U.S. and Soviet physicians via television for consultation on the diagnosis and treatment of the victims of the December 1988 Armenian earthquake—the “Telemedicine Spacebridge.”

Key officials and engineers of the NASA Communications Division (NASCOM) at Goddard assumed a leading role in the effort by monitoring and controlling the satellite-transmitted video and audio signals of the televised discussion between doctors in Soviet Armenia with their counterparts at four designated U.S. hospitals.

The three-month operation began April 28, 1989.

The Soviet transmissions—originating from the Republic Diagnostic Center, Yerevan, Armenia—included live video of the earthquake victims for evaluation by U.S. medical experts.

Systems Testing

HST. NASA managers reported that an 11-day ground system test with the Hubble Space Telescope (HST) which began November 27 and concluded December 8, at Goddard was a success.

The ninth in a series of ground system tests (GST-8), this test demonstrated the performance capabilities, as well as validated the design requirements of the HST ground system. The test simulated space flight and involved direct communications with the HST located in the Vertical Processing Facility at the Kennedy Space Center.

The HST is scheduled to be carried into space onboard the Space Shuttle Discovery on March 26, 1990. When placed in

orbit, the HST will allow astronomers to observe objects in sharper detail than any telescope before it.

Historical Milestones

Apollo 11 - Goddard Heard it First. When humans set foot on the Moon for the first time on July 20, 1969, the first word spoken may have been “Houston”—but the first place it was heard was Greenbelt. It was heard by the technicians, voice control operators, and managers of the Manned Space Flight Network (MSFN) and NASA Communications (NASCOM) at Goddard.

On July 20, 1989, Goddard employees observed the 20th anniversary of the historic moon landing of Neil Armstrong, Buzz Aldrin, and Michael Collins, celebrating their role in what has since been named one of man’s greatest engineering feats of the past 25 years—the landing of humans on the moon.

Goddard Turns 30. Goddard celebrated its 30th anniversary on May 1. During the past three decades, the center has built and tested more than 40 satellites at the Greenbelt facility; managed approximately 160 different satellite projects for NASA; launched 171 payload-carrying Delta Rockets; and flown more than 2,500 sounding rockets and 550 scientific balloons from all corners of the Earth.

The Center marked the anniversary with a week-long schedule of events celebrating Goddard’s diversity, scientific achievements, and community service. The week began with a special ceremony honoring 39 Goddard pioneers. Other events included a tree planting ceremony officiated by the children of the Goddard Child Development Center; special facil-

Goddard Makes Visitor Center A “Barrier-Free” Educational Facility

by Randee Exler

Recent acquisitions and expanded services make the Goddard’s Visitor Center a “barrier-free” educational facility where patrons with disabilities can learn about our National space program.

Many tools are available at the Goddard Visitor Center’s information desk to assist guests with disabilities. Staff members can provide braille and large-print copies of all exhibit text throughout the facility for individuals with visual impairments. Also available from the information desk is a braille relief map of the Goddard Visitor Center facilities and grounds.

Three of the Goddard Visitor Center’s newest acquisitions are three-dimensional models of the Space Shuttle, NASA Hubble Space Telescope and Space Station which give sight-impaired guests a hands-on opportunity to learn about the structure of these spacecraft.

Visitors with hearing-impairments may borrow remote control units from the information desk to activate closed captions on the video display exhibits. Audio-tape players with on/off “head switches” that can be mounted to wheelchairs also can be borrowed from the information desk to help explain exhibits.

Deaf visitors may pre-arrange sign language walking or riding tours of the center through a TTY setup on 286-8103, Wednesday through Friday from 9 a.m. to 5 p.m.

The Goddard Visitor Center is open to the public five days a week, Wednesday through Sunday, from 10 a.m. to 4 p.m., and on Federal holidays except Thanksgiving, Christmas, and New Year’s. There is no admission charge, and parking is free. For group reservations (twenty or more guests), general, special service and tour information, call (301) 286-8981 during Visitor Center hours.

ity tours; a seminar presented by Goddard’s former Center Directors; a birthday party at the Rec Center; and a Community Day at the Visitor Center.

INSIDE

Dr. John O'Keefe: Goddard Pioneer

“When you have 18 grandchildren, you must think about outer space,” says septuagenarian Dr. John O'Keefe, Goddard scientist and resident tektite expert. Where are they all going to live?

Although this concern probably wasn't the main thing on his mind when he came to Goddard in 1958, Dr. John O'Keefe has channeled his interest in space into 30 years of space and Earth sciences at Goddard.

His first job at Goddard was in geodesy—measuring the curvature, shape and dimensions of the Earth. From geodesy, to his role as Assistant Chief of the now-defunct Theoretical Division, to his current position as a senior scientist in the Astronomy Branch of the Laboratory for Astronomy and Solar Physics, O'Keefe has been a catalyst for scientific discovery across the board.

Armed with a Ph.D. in astronomy from the University of Chicago, and 16 years of experience doing geodesy with the Army Corps of Engineers, O'Keefe came to Goddard in the early days of American rocketry, amidst an atmosphere of excitement and the promise and mystery of outer space.

Space Buff

“I would have dug latrines to be involved with the space effort,” said the soft-spoken scientist matter-of-factly. “I was that interested in space.”

Representing the Army Corps of Engineers, O'Keefe went to the Redstone Arsenal at what later became Marshall Space Flight Center, in Huntsville, Alabama, to attend the Explorer I launch in February 1958. O'Keefe's job was to accept the launch parameters from Cape Canaveral and calculate the orbit of the rocket's 4th stage—which couldn't be figured until the 3rd stage had fired.

O'Keefe's eighth child, daughter Lucy, was born the same day the rocket was launched!

Scientific results from that satellite changed perceptions of the shape of the Earth. Where geodesists had used a mathematically symmetrical model of Earth for their calculations, O'Keefe's team used data from Explorer I to reveal a slight correction to the “flattening” of the Earth.

It was perhaps this discovery which



PHOTO: J. WALTERS

O'KEEFE

helped NASA—and Goddard—find Dr. O'Keefe.

Once at Goddard O'Keefe became interested in tektites—a natural form of fused glass found on Earth that he believes came from the Moon. Scientists have debated the origin of these small glassy pebbles for more than 200 years.

Although analyses of lunar samples to date have neither proven nor confirmed his theory that these tektites came from the Moon, O'Keefe remains convinced.

“I still think they do [come from the Moon],” said O'Keefe. “The evidence suggests that they are not a major constituent of the lunar surface, but they still could be there.”

O'Keefe said the dispute over the origin of tektites is essentially the same question as “what killed the dinosaurs?” Whatever caused their extinction, he contends, probably came from the sky.

In 1980, O'Keefe said, he realized that if tektites came from the Moon, huge showers of the glassy pebbles would cause collisions between the particles which missed the Earth. They would collide and their orbits would become round, resulting in Saturn-like rings around Earth.

“I think that these rings not only existed, but that they came and went at various times in Earth's history,” said O'Keefe, who believes this theory is made more plausible by the Voyager probe's recent discovery of rings around the planet Neptune. “All the great planets have rings of one kind or another,” said O'Keefe.

The sudden extinction of the dinosaurs

around 65 million years ago could be explained by a ring of ash and dust particles around the Earth that blocked out light from the Sun, the primary source of energy for life on Earth, and caused major climatic changes.

O'Keefe currently is working on a joint project with the Department of Energy (DOE), University of Delaware, and Catholic University of America (CUA) to study properties of a magnesium-rich coating found on certain tektites which protects the glass from corroding. Similar coated glass is used to store nuclear waste—further investigation of this property of natural magnesium-coated tektites could yield a more effective way to store nuclear waste.

Time Out

For relaxation, Dr. O'Keefe retires to his Peterborough, NH farm on spring and summer weekends. Purchased by his grandfather in 1900 for \$200, the family farm has stone walls, fields, brooks, “and a view of Mt. Monadnock that is very relaxing,” said O'Keefe.

Despite the weighty and far-reaching concerns of his work, Dr. O'Keefe still manages to keep up correspondence with all eight of his living children: George, age 47; Katharine, age 46; Mary, age 42; John, age 39; Emily, age 35; Jane, age 34; Lucy, age 31, and Rachel, age 31. His second son, Roy, born 1946, was killed in action at Ben Het, Vietnam, in 1969.

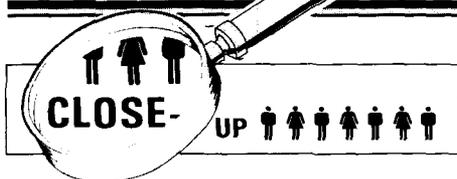
O'Keefe says his entire family could not fit under his roof all at one time. “They have to come visit me one family at a time,” he laughed.

How did he manage such a large family for all those years? “The trick is to marry the right woman,” he said.

O'Keefe's wife, Martha, an English major and Emily Dickenson scholar, has written several manuscripts on the life and poetry of Emily Dickenson, and is the founder of the Emily Dickenson Society.

O'Keefe exhibits the tweedy air of a college professor as he describes Goddard as probably the “most scholarly of NASA installations.”

“Where else,” said O'Keefe, can you walk down the corridor and see the controllers working the IUE (International Ultraviolet Explorer). Or stroll down the hallway and say, ‘How's COBE (Cosmic Background Explorer) doing?’”



Congratulations to **ALDA SIMPSON**, formerly Head of the Space Simulation Test Engineering Branch, who recently was appointed Head of the Environmental Test Engineering Branch, Code 754.4. Her branch performs a full range of testing on flight hardware to ensure that components, subsystems, systems and complete spacecraft are qualified to survive both launch and orbital conditions. "Our branch has recently moved away from an accent on facilities to an emphasis on actual test engineering," said Simpson, "this is a major shift, requiring us to focus on building our manpower, and broadening our expertise." . . . The new Project Manager of the Tracking and Data Relay Satellite (TDRS) project (Code 405) is **CHARLES S. VANEK**, formerly Deputy Project Manager/Space for TDRS. In his new position, Vanek is responsible for the planning, development, management, and implementation of all aspects of the TDRS and the Advanced Tracking and Data Relay Satellite which is of vital importance to the Agency's need for a spaceborne communication and tracking and data network. . . .



SIMPSON **VANEK**

PHOTOS: M. SMALL

JAMES J. KERLEY, Code 754.1, and colleague **WAYNE, D. EKLUND**, NSI Technology Services Corp. have invented a compliant prosthetic or robotic joint, featured in the December 1989 issue of *Tech Briefs* magazine. The joint can be used in a prosthetic device to replace a diseased or damaged human joint, or in a robot linkage to limit movement and cushion overloads. . . . A new program to select and train project management personnel will soon advertise positions on center. The program, known as the **PROJECT MANAGEMENT DEVELOPMENT EMPRISE (PMDE)**, is designed to offset potential retirement losses and attrition among the highly specialized ranks of those in key management positions on center. The program will select qualified employees and provide them with the work experiences, training, guidance and direction necessary for them to assume key management positions on the Center's flight projects.



PHOTO: R. FRISCH

HST ASTRONAUTS VISIT—A highlight of December was a visit from all but one of the five astronauts scheduled to fly on STS-31, slated to launch Goddard's Hubble Space Telescope (HST) no earlier than March 26, 1990. During a tour of the Space Telescope Operations Control Center, Gene Stull (far right) of Lockheed Missiles and Space Co., who built the telescope, explains to them particulars of the control room. The astronauts are, from left to right, mission specialist Bruce McCandless, Capt. USN; pilot Charles F. Bolden, Col. USMC; mission specialist Steven A. Hawley, Ph.D.; and commander Loren J. Schriver, Col. USAF.

GI+VE

On December 6, the Bloodmobile was held in Building 26, and 140 prospective donors volunteered to donate blood. The following is a list of Goddard donors who were cited by the American Red Cross with gallon pins at the Bloodmobile:

Name	Gallons	Name	Gallons	Name	Gallons
Charles Fleetwood	4	Linda Pattison	1	Mary-Louise Schein	1
Morton Friedman	24	Rick Sabatino	1	Mike Stark	1
Cathy Gormley	3	Mike Schools	2		

Our next Bloodmobile is scheduled for February 7 in the Building 8 auditorium. Watch Dateline Goddard for more details.

Retirees

Best wishes to the following Goddard employees who recently retired!

Name	Code	Years	Name	Code	Years
Arlauskas, Joseph	720.1	31	Jones, Granvil L.	233	42
Austin, Patricia K.	683	32	Karpescak, Paul	720.1	27
Baden, Joseph E.	407	31	Kirks, Kenneth R.	674	35
Bandeem, William R.	600	45	Laverty, Charles R.	745.2	30
Bayne, Carl R.	724.2	34	Lawrence, John P.	311.2	23
Busse, Jon	700	31	Lyons, John C.	723	30
Cain, Oliver, Jr.	253.4	32	MacKenzie, Charles M.	415	36
Carpino, S. Francis	408	26	Malone, Thomas, Jr.	212.1	22
Carr, Barbara T.	211.3	36	Mason, William B.	833.1	30
Davenport, Paul	510.1	30	McDermond, Duane K.	728.1	36
Demorest, Robert H.	470	24	Merritt, Raymond	244.3	42
Gahbert, Bill	301	30	Mitchell, Pat M.	480	30
Gates, Richard J.	513	32	Palmasano, Marion	291.3	30
Gerace, Rudolph	470	29	Palmer, William D.	562.1	32
Gilbert, Arthur L.	253.2	36	Parker, Lucille W.	670	30
Godwin, Gene	832.3	38	Puffenberger, Richard P.	730.1	37
Guthrie, James E., Jr.	693	38	Rothenberg, Ed	301	38
Heath, Donald F.	616	30	Stephenson, Joseph S.	743.1	33
Hoggard, William D. II	733.1	39	True, Virgil	530	42
Humphreys, John M.	674	28	Wyatt, George H.	621	28
Jameson, Ray S.	405	32	Young, Kenneth M.	711.3	25
Jones, Eddie	544.2	31			

Center Director Speaks On The Future of Goddard

Continued from last issue, December, 1989

GN: Do you see any special challenges for GSFC in the future that may need our attention now?

JWT: The first challenge for the future is to train the next generation. We have lots of fresh-outs, and we need to pass on the experience they will need in the future. This necessarily involves lots of on-the-job training. Our second challenge is manpower—hiring. Through attrition, we lose almost 300 people a year. To increase to about 4,000 people by '92, we need to add another 300. And we have a hiring capability of something over 400 per year. So hiring to the full complement we're allowed may take up to three years. A Congressional pay raise would be a great help in attracting the talent we need. A third challenge is the Earth Observing System. The experiments are a major challenge and there is an even greater challenge in the data handling area. Most NASA projects require about 70% concentration on hardware and about 30% on data; Eos will require about 40% hardware effort and about 60% data. And, unlike many NASA projects, the effort will continue for more than 15 years, not just through launch plus a few years, as with COBE. Finally, there is the challenge of answering serious questions on global change that have major political, economic, and social implications.

GN: If you plan on fixing something, what is the one thing that you would fix at NASA? At GSFC?

JWT: For NASA, the one thing I would fix is to prevent the agency from taking on too much work without the necessary resources. So far, we've been able to get the money we need to keep projects going. But NASA doesn't have the civil service strength it used to; buildings are deteriorated; and funding is short. We don't have the infrastructure to do the big projects that we used to, and we can't keep taking on programs without adequate people, facilities, and test equipment. At GSFC, the one thing I would "fix" is space for our people. Now that NASA and OMB [Office of Management and Budget] have approved an increase in people, we need to work on adequate space for the people we have, plus new people incoming.

GN: Do you think there is enough, not enough, too much work for us to do? Explain.

JWT: There is certainly enough work for us to do at Goddard. Although some areas may feel they have too much work and there even may be some where there's not enough to do, overall we have more than enough work. Goddard has a voracious appetite for programs—we began Space Station Freedom at GSFC with no visible means of support. And we have many projects for which levels of effort will be peaking in the coming year. ISTP/GGS (International Solar-Terrestrial Physics/Global Geospace Science) is in high gear this fiscal year, and we begin serious-

ly doing Eos work; Hubble Space Telescope will launch in March; and we're just starting the Small Explorer project. We have Astro/BBXRT [Broad Band X-Ray Telescope] to be launched from the Shuttle in April; GRO (Gamm Ray Observatory) in the early summer; the UARS [Upper Atmosphere Research Satellite] is one year from completion; and we still have a few Hitchhikers and the Spartan. Although some projects, such as COBE, may be "winding down," Goddard still has a lot of work to do next year, and in the years to come.

GN: How, if at all, do you see the GSFC lifestyle changing in the future?

JWT: I don't see any fundamental change. It wouldn't be very easy for Goddard to change. Organizations are like people: there's a time when they're young and impressionable, but once a culture sets in, it's not easy to change.

GN: What effect do you see commercialization having on Wallops and GSFC?

JWT: So far, I suspect it's more talk than action.

GN: Astronauts, former astronauts, and manned space people appear to be "taking over" NASA Headquarters. Do you think this will have an impact on the unmanned space program—and Goddard's place—within NASA?

JWT: Definitely not. For one thing, if it's true that advocates of manned space flight are "taking over," they would most likely bend over backwards to be fair, and accommodate the unmanned side of the house. Furthermore, the importance of Eos and answering the questions on global change is self-evident. We have strong public as well as Congressional support. I think Administrator [Admiral Richard] Truly and Deputy Administrator [J.R.] Thompson are good people and they will support Goddard—and the unmanned space program—even-handedly.

GN: If you could leave the people of Goddard with just one message, what would you like to say to them?

JWT: Keep up the good work! There's lots of challenge ahead—we must keep at the state of the art in science and engineering, and management is constantly faced with new challenges—but the challenges aren't insurmountable. Goddard has followed its own common sense for 30 years, and we just need more of the same. Keep up the good work!

NASA
National Aeronautics and
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Goddard Space Flight Center

Goddard News

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