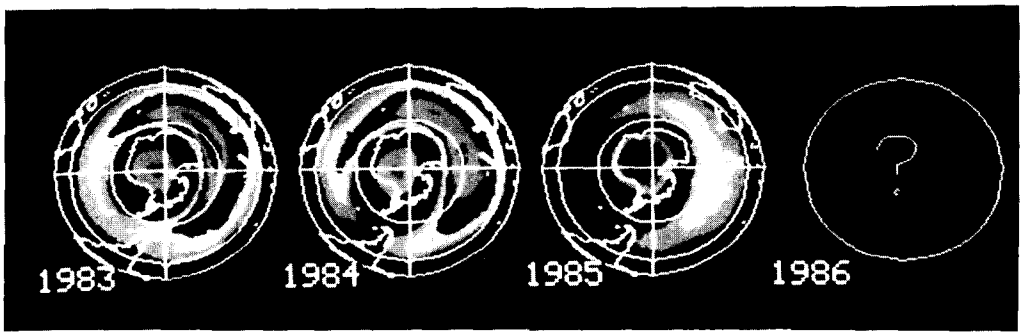


WIDENING HOLE—Over the South Pole, a hole in the stratospheric ozone has expanded to cover an area as large as the United States. This decrease in ozone concentration has been verified by atmospheric research scientists at Goddard using observations, such as the examples pictured, made by a Total Ozone Mapping Spectrometer (TOMS) aboard NASA's Nimbus-7 satellite. The view is from a point above the South Pole, with the southern edges of Africa, Australia and South America visible at the sides. The depletion of the protective ozone layer from 8 to 16 miles up is most extreme at the center, where levels have fallen 40 percent since 1979. Story on page 2.

NASA
National Aeronautics and Space Administration
Goddard Space Flight Center

Goddard News

Vol. 32 No. 10 November 1986

Map of Ocean Surface Reveals Rugged Terrain

by Michael Braukus

Imagine how the world's oceans would look if there were no winds, no waves and no currents. If you're thinking that they would appear flat and smooth, you're wrong. In fact, during such a state of rest, the oceans would appear very rough.

"The ocean has its own hills and valleys, just as there are on land," explained James Marsh, a scientist in Goddard's Geodynamics Branch, Laboratory for Terrestrial Physics. "Think of the ocean surface as if it were a blanket thrown over rugged terrain: the force of gravity pulls water down into the depressions or forces it up around the mountains causing bumps and valleys on the water surface."

The Goddard geophysicist said the ocean surface is so rough that if you were to look north from Puerto Rico toward Bermuda, you would see the ocean drop nearly 60 feet in depth over a distance of almost 30 miles.

A map generated by Marsh and his coworkers shows the true topography of the Earth's ocean surface in a much finer detail and more accurately than ever before.

The map was developed using data obtained from the altimeters of the Geodynamic Experimental Ocean Satellite (GEOS)-3 and the Sea Satellite (SEASAT) which measured the distance from space to the ocean surface with radar. This radar-generated data then were used to develop a computer image of the surface of the world's oceans.

"The altimeter data allowed us to measure profiles of the ocean surface," Marsh said. "By putting together many, many profiles, we were able to compute a map of its true shape.

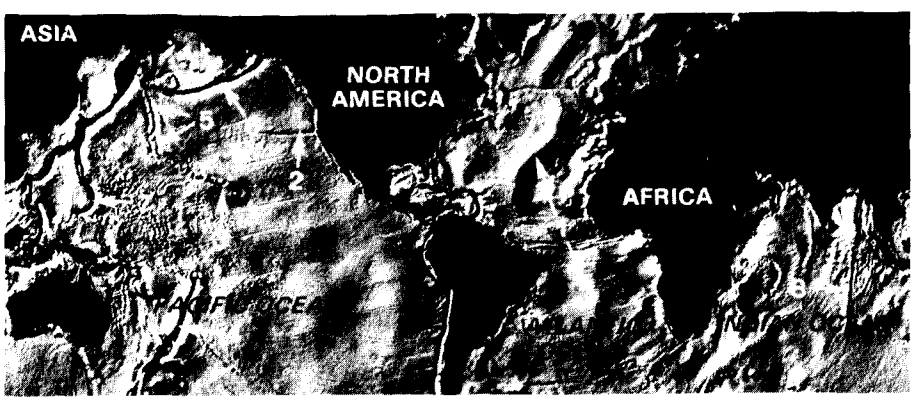
"The map reflects what the Earth's structure is like under the ocean. If we can understand the underlying crustal structure, it'll give us information on other important phenomena, such as earthquakes and volcanoes."

Marsh believes that the success of these experiments led to the development of the Ocean Topography Experiment (TOPEX) satellite, a joint venture with the French space agency.

"The data generated by GEOS-3 and SEASAT also increased our knowledge of ocean circulation and ocean current systems. The spacecrafts' altimeters allowed us to detect and study features 1 to 2 meters in height," Marsh said.

The altimeters on board future geodetic satellites, such as TOPEX, scheduled for launch in 1991, will be so accurate that they'll enable scientists to observe most of the world's ocean surface currents, according to the Goddard scientist.

"The ocean is a major means for transporting heat around the Earth," Marsh said. "TOPEX will help us study ocean currents and their circulation and how they influence the world's weather patterns."



SEA-FLOOR IMAGE—Contour of ocean floor shows up in satellite image of ocean surface. Computer enhancing simulates light shining from northwest.

1. Mid-Atlantic Ridge
2. Mendocino Fracture Zone
3. Hawaiian Islands chain
4. Tonga Trench
5. Emperor Seamounts
6. Aleutian Trench
7. Marianas Trench
8. Ninetyeast Ridge

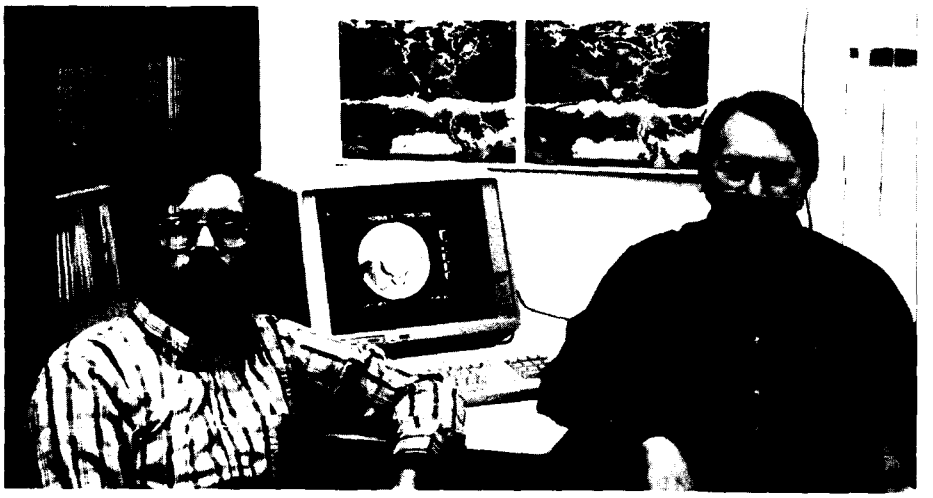
Research Reveals No Clear Link Between Ozone Depletion and Man-Made Pollutants

by Michael Braukus

Two scientists at NASA's Goddard Space Flight Center report that no clear link has been established between the ozone depletion over Antarctica and man-made pollutants.

Their observation is contained in a special November issue of Geophysical Research Letters, an American Geophysical Union (AGU) publication.

Following reports of a decrease in the ozone layer above Antarctica, AGU asked scientists to submit papers dealing with relevant observations and theoretical models of the year-to-year decline in total ozone. Eleven of the forty-six accepted papers were authored by the following Goddard employees and contractors:



DISAPPEARING OZONE—**Dr. Mark Schoeberl, Code 616 (left) and Dr. Arlin Krueger, Code 614 (right) report that no clear link has been established between the ozone depletion over Antarctica and man-made pollutants.**

Dr. Arthur Aikin, Code 616; Dr. Pawan K. Bhartia, Systems and Applied Sciences Corporation (SASC); Dr. Sushil Chandra, Code 616; Dr. Albert Fleig, Code 600; Dr. Robert Hudson, Code 616; Dr. Arlin Krueger, Code 614; Dr. Richard McPeters, Code 616; Paul Newman, Applied Research Corporation; Dr. Richard Rood, Code 616; Joan Rosenfield, Sigma Data; Dr. Barry Schleshinger, SASC; Dr. Mark Schoeberl, Code 616; David Silberstein, SASC; Dr. Richard Stolarski, Code 616; Dr. Charles G. Wellemeyer, SASC.

The Goddard scientists, Dr. Mark Schoeberl and Dr. Arlin Krueger, were guest editors for the November issue.

Summarizing the submitted research, Schoeberl said, "Despite public pronouncements, there is no firm evidence to support the theory that the ozone depletion over Antarctica is caused by man-made pollutants, although the level of chlorofluorocarbons measured at the surface is still increasing."

Schoeberl said, "A number of scientists have found a strong correlation between changes in stratospheric temperatures and the decline in ozone.

"Some of the research also revealed that the total amount of ozone from mid-latitudes to the South Pole is conserved during the spring period when the hole develops. These observations, along with other studies, suggest that a change in the dynamics of redistribution of ozone is a very important component of the hole's formation," said Schoeberl.

The decrease in ozone in the Antarctic region was first noted in 1985 by British Antarctic Survey scientists taking ground-based measurements at Halley Bay Station. These original observations, supported by those made by other Antarctic stations, have been confirmed by NASA's NIMBUS-7 satellite using a total ozone mapping spectrometer and a solar back-scatter ultraviolet instrument.

The area of ozone depletion has been found to nearly cover the continent of Antarctica with the largest depletion occurring during its spring months of September and October.

GSFC Launches New Instrument for Solar Study

by Randee Exler

A new instrument for investigating the physical characteristics of the Sun's outer atmosphere was successfully launched from the White Sands Missile Range, New Mexico, October 15.

The scientific payload, called a Solar Extreme Ultraviolet Telescope and Spectrograph (SERTS), was designed and developed by Goddard's Laboratory for Astronomy and Solar Physics. Dr. Werner Neupert, Code 680, is the project principal investigator.

SERTS is the prototype of a new optical design specifically intended to study the solar chromosphere and corona through images of extreme ultraviolet (EUV) radiation emitted by these regions. Together, the chromosphere and corona form a gaseous envelope above the visible surface of the Sun.

The scientific objective of the project is two-fold, according to Neupert. SERTS will be used to understand how the corona is heated over regions of enhanced solar activity. Questions about the origin and acceleration of solar wind also will be studied.

A Nike-Black Brant rocket carried the payload to a peak altitude of 189 miles before SERTS performed a pre-programmed series of observations of the Sun over five minutes.

At the time of the rocket flight, solar activity was extremely low, and there were no sunspots or other indications of solar activity present on SERTS' solar disk. However, a small active region had receded over the Sun on the previous day and a portion of the corona above this region was included in the instrument's field of view.

Continued on page 3

Editor's Note

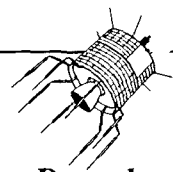
December 6, 1966 marked the beginning of an era—the highly successful launch of the Applications Technology Satellite (ATS)-1. This large, communications-meteorology-scientific satellite went into a synchronous orbit and immediately began a series of pioneering space experiments. By the end of the year, it had produced pictures showing more than 40 percent of the Earth's surface; relayed the first two-way voice communications between ground stations and inflight aircraft; and its microwave repeaters sent color television from Australia to the U.S. and from Japan to the U.S. Next month, ATS-1 celebrates 20 years in orbit. Goddard remembers the successful launch of this space-pioneer and the spirit of teamwork which has carried our Center through twenty more years of technological wonderment.

Goddard Historian Jim Capshew came across this article about ATS-1 (right) and personnel in the Office of Public Affairs wanted to share it with our readers.

Solar Study

Continued from page 1

Preliminary analysis of the science data, recorded on a special photographic emulsion, indicates that EUV radiation from the corona above this region was recorded by the instrument, thus making this flight a success.



1966 — December 6 — 1986

Come Celebrate ATS-1 20 Years in Orbit at the GSFC Recreation Center on Friday, December 5

For Ticket Information Contact: Gil Bullock X63229

Correction

In an article in last month's issue of the Goddard News, the Center's payloads involvement on future Space Shuttle missions was highlighted, according to the new shuttle manifest. The article failed to mention the Shuttle Solar Backscatter Ultraviolet Instrument (SSBUV), which is a Goddard project.

The Evening Star

A—10 ** THURSDAY, DECEMBER 22, 1966

WASHINGTON CLOSE-UP

When It's Good, It's Very Good

By WILLIAM HINES

Even the severest critic of the National Aeronautics and Space Administration must acknowledge that this big and sometimes brash agency is strikingly like the little girl with the curl. To turn the nursery rhyme around, when NASA is bad it is horrid, but when it is good it is very, very good.

One of its "very, very good" performances occurred at Goddard Space Flight Center near Washington last week, when NASA demonstrated the capabilities of its latest unmanned spacecraft. This was ATS 1, launched Dec. 6, the first of five "applications technology satellites" to be orbited by the middle of 1969.

In the course of about half an hour, ATS was put through a most remarkable set of paces:

1. It relayed a live color television broadcast from California to Goddard and simultaneously to a ground station in Australia.

2. It established a live voice-radio link of excellent clarity between the Goddard center and a commercial jet transport in flight near the Aleutian Islands.

3. Simultaneously, a telescopic camera aboard the craft made and transmitted a photo of the earth from an altitude of 22,300 miles which clearly showed storm clouds that were blanketing the East Coast with snow at the time.

One is hard put to decide which of ATS' three "acts" was the most significant—or the most impressive. All three have tremendous implications for the future as the world continues to shrink and demands for reliable global communications continue to expand.

Probably the most immediate need, still unfilled by satellites, is in the realm of communications between airplanes in flight and their ground-based control stations. Aerial commerce is growing explosively, doubling each 10 years in terms of passengers and cargo tonnage carried. Also, radically new commercial planes including supersonic ones are on the horizon.

Present radio communications between the ground and transoceanic commercial planes are hardly tolerable even today; by tomorrow they will be grossly inadequate.

Fitted with the proper type of antennas, aircraft in flight will be able to keep in constant touch with control centers by means of satellite relay. Better communications will enhance aviation safety and at the same time permit heavier traffic on the air lanes.

Use of a high-altitude satellite as a weather eye, demonstrated for the first time with ATS 1, is an old idea that was resurrected after having been buried for budgetary reasons. At the time the Tiros weather-bird project got its start in 1960, a three-step meteorology program was envisioned. After Tiros would come the polar-orbiting Nimbus, and after that would come Aeros, a super-satellite hanging motionless in the sky, scanning the weather over a third of the globe.

Space technology has come so far since then that the 1966 version of Aeros could be packed piggy-back on a multipurpose satellite rather than requiring one of its own. Also, ATS' weather pictures probably are a little better than Aeros' planners would have thought possible. Cloud formations no more than three or four miles across can be spotted with careful study.

NASA uses the word "applications" to denote those useful things done with inventions and discoveries from the space effort. Communications and weather constitute the principal applications to date—at least in the civilian end of space—and probably will continue to head the list for some time to come.

It is easy to forget how far and how fast these two branches of space technology have moved. Tiros 1 was launched in April 1960; today, less than seven years later, world-wide weather reports from space are routine and a non-space-oriented agency (the former Weather Bureau) is operating a network of meteorological satellites.

Communications is an even newer field but—possibly because of its rich commercial promise—has progressed even further. The first workable relay satellite, Telstar 1 (a private, not a NASA, payload) was orbited only 4½ years ago. Today a special corporation, "Comsat," is busily engaged in international trade—and busily engaged, also, in fending off would-be competitors, which probably tells all that needs saying about the success of space communications.

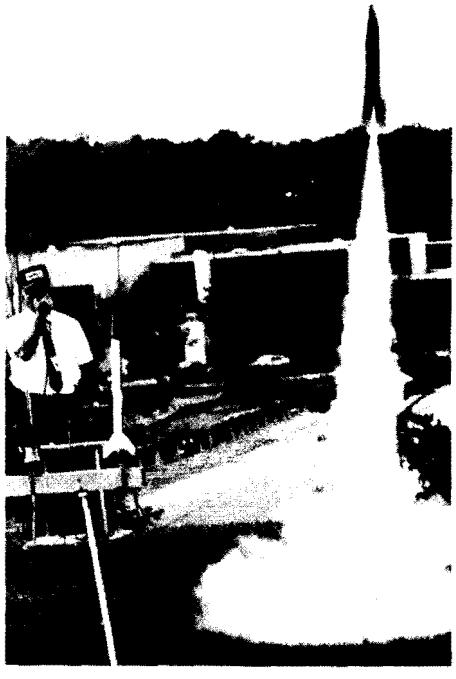
By all the measures to which the public has become accustomed in the space age, the payoffs through weather and communications satellites have come cheap. Counting Tiros, Nimbus and the Relay and Syncom communications programs, the total NASA-funded cost to date has been $240 million. The ATS series through 1969 will add $150 million to this.

Alongside $400 million for Project Mercury, $1.35 billion for Project Gemini and the $23 billion anticipated for the Apollo manned moon program, these are bargain-basement price tags indeed.

Community Day Features New Visitor Center Exhibit Area

by Michael Braukus

Visitors may sign up to have their name carried into space on a future mission.



The model rocket launch was a Community Day highlight.

"It's really impressive," said one employee. "It makes you feel proud about working here at Goddard," replied another. These were just two of the many positive comments that were made about the Goddard Visitor Center's new exhibit on space exploration which opened on Monday, October 27.

The ceremony for the grand opening began at 12:30 p.m. with welcoming comments by Center Director Dr. Noel W. Hinners. The ribbon cutting was performed by children from the Goddard Day Care Center.

Following the ribbon cutting, the exhibit was opened for viewing to NASA employees and contractors and their families. More than 400 people took advantage of the special viewing hours.

Designed for children of all ages, the new exhibit area focuses on current and future projects of the Nation's space program. Among other attractions, visitors can sit in a mock-up of a Manned Maneuvering Unit—used for propelling astronauts during their excursions outside the shuttle—and simulate the operation of the vehicle, sign up to have their name carried into space, or sit in a gyro chair and feel what it's like to navigate and control a spacecraft.

The centerpiece of the new exhibit area is a theatre featuring an eight-screen visual presentation highlighting a window into space.

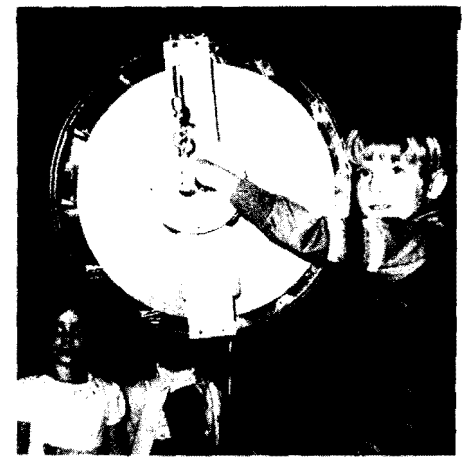
To commemorate the opening of the new exhibit, the public was invited to attend a special "Community Day" at Goddard on Sunday, November 2.

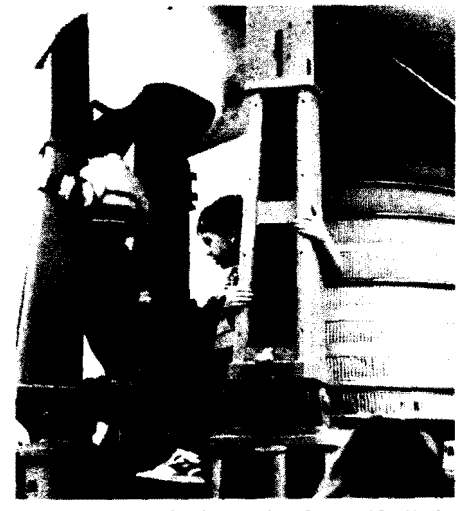
Music provided by the DuVal High School Jazz Band helped create a special atmosphere for the people who attended the event.

In addition to viewing the new exhibit, visitors had an opportunity to take a guided tour of buildings seven and 10 which house a mock-up of the space shuttle, satellite assembly areas and clean rooms. Model rocket launches and lectures and demonstrations on aviation and space achievements also were held.

The Visitor Center is open to the public five days a week, Wednesday through Sunday, from 10 a.m. to 4 p.m. There is no admission charge.

For more information call the Visitor Center at 286-8981.





Young rocket enthusiasts enjoy the outside display as much as the new exhibits.

Pre-schoolers from the Goddard Daycare Center assist Dr. Hinners during the ribbon cutting ceremony.

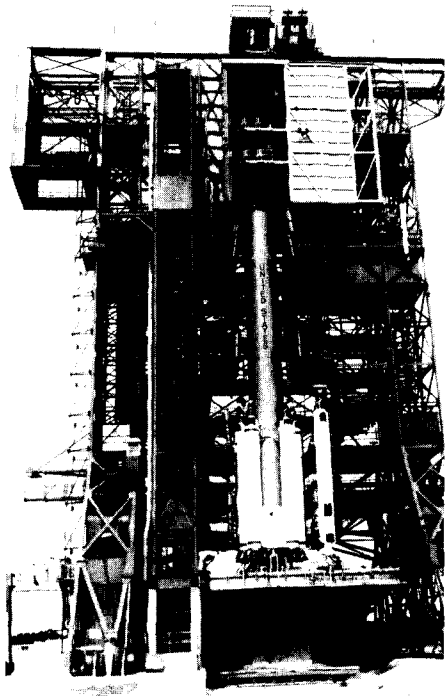
Weather Satellite Launch Delayed

The launch of the National Oceanic and Atmospheric Administration's (NOAA) GOES-H satellite has been postponed from December 4 to no earlier than February 19, 1987, officials at NOAA and the National Aeronautics and Space Administration (NASA) announced recently.

The launch is planned for the Cape Canaveral Air Force Station, Florida, on a McDonnell-Douglas Delta 3924.

The delay was necessitated by a decision to have some components within the photo imaging system on the spacecraft returned to the manufacturer, Hughes Aircraft Company in California. The rework of these components within the lightsource system is designed to assure the full life expectancy of the satellite.

GOES (Geostationary Operational Environmental Satellite)-H will be the seventh GOES spacecraft and the tenth meteorological satellite to be launched since 1974 for bringing images from a geosynchronous satellite 22,300 miles in space of cloud cover on Earth.



***DELTA 179* waits on Launch Complex 17-A at the Kennedy Space Center, Fla. for a launch date now set for no earlier than February 19, 1987. Delta 179, managed by Goddard, will carry into orbit GOES (Geostationary Operational Environmental Satellite)-H.**

NASA To Extend Tracking Station Operations

by Carter Dove

Goddard has announced plans to extend operations at five of its ground tracking stations until at least September, 1988.

The ground tracking stations planned for extended operational status are at Ascension Island in the southeast Atlantic Ocean; Santiago, Chile; Guam; Hawaii; and the Yarragadee Shuttle air-to-ground voice station located in western Australia.

The five stations are part of a network which relays commands to and receives data from near Earth-orbiting spacecraft, including the Space Shuttle.

The planned five station closure is conditional on the February, 1988 launch by the Space Shuttle of the second Tracking and Data Relay Satellite (TDRS) and sub-

Continued on page 8

Cousteau Speaks at Annual GAS Symposium

by Michael Braukus

Nearly 300 people from 12 different countries attended the third annual Get-Away Special (GAS) Experimenters Symposium at Goddard on October 7 and 8.

The symposium's attendees came to hear 27 scientific reports on the results of experiments conducted aboard the space shuttle. They also heard guest speaker Jean-Michel Cousteau, of the Cousteau Society and son of famous undersea explorer Jacques Cousteau, discuss the value of space exploration in helping scientists to better understand our world.

As part of his presentation, Cousteau showed a portion of a new documentary film entitled "Waters of the Wind." The film recorded the adventures of the Cousteaus and their crew while on a voyage aboard a sail-less wind-powered boat around South America's Cape Horn.

While exploring one of the islands off the tip of Chile, Jean-Michel was notified of the Space Shuttle Challenger accident, only minutes after it happened. The film captured the look of disbelief on the faces of Cousteau and his men as they learned of the loss of the shuttle and its crew.

About the film, Coustea said, "The significance of this film is that it shows that the whole world was in pain as a result of the accident.

"Maybe the tragedy did not have to happen, ... but it did. However, not everything about the accident is bad. The accident brought mankind together. It made us better people, and that is a tremendous lesson."

The audience also was addressed by Jacques Cousteau via satellite from his ship, Calypso, at sea in the South Pacific.

Broadcasted over the public address system, the senior Cousteau praised the symposium and its attendees for their work. Then, he extended an invitation to them.

Cousteau said, "I want you to play a more active role in discovering the global habitability of our planet. This is a project that needs to be addressed. It's one that needs an answer.

"I want you to place a small package into space to contribute to this global habitability investigation project. We need to know how we can improve the capacity of Earth to sustain life."

This year's GAS presentations included those of foreign experimenters from Japan, Germany and Venezuela. Two of the many experiments that received recognition were: Norfolk Public Schools' Northstar Project, which was the first high school student-run space flight project; and St. Mary's Hospital, Milwaukee, Wisconsin, which conducted laser integrated experiments.

Although NASA has stopped taking reservations temporarily, Goddard personnel are continuing to process GAS payloads for future shuttle flights. To date, 495 payloads are lined up for the program. Thirteen of these payloads have passed NASA's safety tests and are ready for flight. Another 83 payloads are being prepared at Goddard.

The low cost of the GAS program is made possible by the space shuttle's large payload bay which allows NASA to accommodate the mission's primary payload and usually leaves room for smaller experiments. This remaining space is used for the GAS program.

The first GAS was launched on June 27, 1982, when the Space Shuttle Columbia carried a canister containing nine experiments by students of the Utah State University and Weber State College, Ogden, Utah, into space. To date, 53 GAS payloads have flown aboard the space shuttles.

Attention: Goddard Wants You!

by Randee Exler

One of the best ways to help "fresh outs" find Goddard is to go out and look for them. This is one reason why the Personnel Division hosted the Center Recruiters' Conference on October 28.

"Recruiting is essential for getting people for the future," explained Center Director Dr. Noel Hinners during the morning session of the conference. In addition, recruiters need to know when we will be hiring people, keep personal contact with applicants and develop contacts with the campus community.

Center recruiters accept a tremendous responsibility when they agree to represent Goddard at approximately 60 schools and universities. They must do their best to adopt a school and to recruit and evaluate candidates. Our recruiters are the ambassadors of Goddard and must know about the entire center.

The goal of the seminar, according to Recruitment Coordinator Michael Parrish, was to provide Goddard recruiters and interested supervisors with a better perspective as to what our Fiscal Year (FY) 87 needs are and to cover recruiting techniques and related information.

Goddard's FY87 plan, according to Roger Jenkin, Chief, Personnel Division, allows for approximately 260 new hires, of which approximately 90 will be scientists and engineers.

But Goddard is looking for more than just scientists and engineers. Goddard also needs professional administrative people as well.

During the morning session, representatives from each directorate explained what their particular needs are. The afternoon dealt with recruiting techniques and topics such as "Projecting Our Image," "Techniques of a Successful Interview," and "The Recruiting Process/Beginning to End."

Goddard's recruiters and codes are: Howard Ottenstein, 130; Helen Mitchell, 150; Bernard Dixon, 152; John Speargas, 205; Darlene Brummel, 271; Virgil Cleveland, 302; Janice Buckner, 311; Peter Jones, 311; Bradford Parker, 313; Charles Powers, 313; Nicholas Chrissotimos, 405; Sterling Smith, 420; Dale Schulz, 425; David Haykin, 480; John Underwood, 480; Thomas Ryan, 501; David Campbell, 511; William Holmes, 511; Daniel Mandl, 511; Michael Rackley, 511; Steven Wadding, 511; Lawrence Zeigenfuss, 511; Joseph Hennessy, 512; William Lebair, 512; Phillip Merwarth, 512; Robert Adams, 513; Robert Lively, 513; Patricia Lightfoot, 514; Michael Paoletta, 514; James Christo, 515; Anthony Comberiate, 515; Robert Stanley, 515; David Howell, 521; Karen Moe, 522; Madeline Butler, 532; Paul Ondrus, 532; Kenneth Dearth, 533; Paul Brumberg, 540; Raymond Mazur, 543; Karl Peters, 551; Terri Wood, 552; James Jeletic, 552; Lucien Cox, 553; Susan Hoge, 553; William Kelly, 563 David Neill, 563; Angelita Kelly, 564; John Loicano, 615; Harvey Walden, 615; James Kalshoven, 625; Herb Durbeck, 632; Valerie Thomas, 633; Regina Cody, 691; Walter Payne, 691; Donald Friedman, 702; Joseph Turtil, 704; Oscar Gonzales, 711; Tobin Anthony, 712; Henry Hoffman, 712; Samuel Placanica, 712; Howard Branch, 713; Dean Elliott, 716; Renee Boucarut, 717; Barton Howell, 717; Douglas Leviton, 717; James Abshire, 723; George Alcorn, 724; David Bundas, 725; William Case, 725; James Gatlin, 725; John Wolfgang, 725; Robert Jones, 727; Robert Patschke, 727; Everett Pyle, 728; Chris Woodhouse, 728; Brian Lockyear, 730; Kelly McEntire, 730; Stephen Brodeur, 731; William Reaves, 732; Ralph Cosme, 733; Charles Chidekel, 733; Paul Guy, 733; Robert Kasa, 733; Donald Wood, 733; Patrick Cudmore, 735; Kenneth Label, 735; Raymond Hartenstein, 735; Leonard Arnowitz, 740; James Kellogg, 741; Laura Milam, 750; Pedro Alea, 754; Steve Smith, 842.

ERBS Memory Reprogrammed

Engineers at Goddard recently "jogged" the memory of the Goddard-managed Earth Radiation Budget Satellite (ERBS) by remotely loading a new computer program into the orbiting spacecraft, resulting in a marked reduction of memory upsets.

A report from the Engineering Directorate indicates that after 6 weeks only 3 upsets had occurred in contrast with the previous average of 20 for the same period.

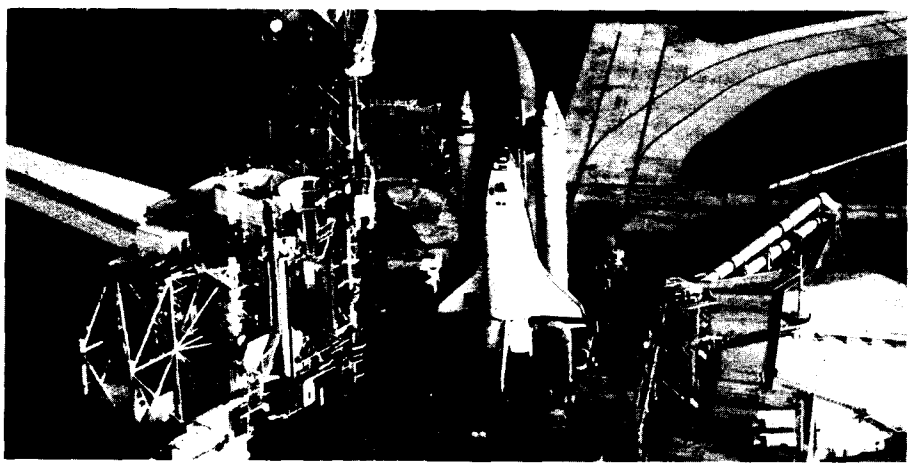
The ERBS was launched by the Space Shuttle Challenger (STS 41-G) on October 5, 1984. It successfully reached its orbital altitude of 372×373 miles (598×609 km) five days later.

ERBS is one of three satellites which now carry instrumentation developed under the NASA-directed Earth Radiation Budget Experiment (ERBE) research program aimed at improving our understanding and prediction of the Earth's climate.

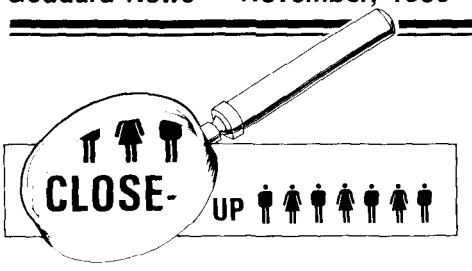
In fact, preliminary data from the ERBE experiments suggest that clouds reflect more heat than they retain, possibly cooling Earth's climate and offsetting the atmospheric "greenhouse effect."

The other satellites in the ERBE program are the polar-orbiting NOAA-F and NOAA-G spacecraft launched December, 1984 and September 1986, respectively.

Both satellites were managed by Goddard's Meteorological Satellite (METSAT) projects office and later turned over to the National Oceanic and Atmospheric Administration (NOAA) for operation.



THE SPACE SHUTTLE ATLANTIS was rolled out to Pad 39-B at the Kennedy Space Center, Fla. in the early morning of October 9. Atlantis will remain at Pad B for seven weeks where it will support checkout of new weather protection structures, a variety of special measurements, launch team proficiency exercises, and emergency egress simulations. The 4.2-mile journey from the Vehicle Assembly Building to the launch pad was the first since the Space Shuttle Challenger accident.



Don't be surprised if **JIM CAPSHEW** contacts you and wants to talk about Goddard's past and present. As the Center's newly appointed historian, he is writing a history of Goddard. Capshew is not interested in writing a purely chronological story but wants to document what it is that makes Goddard a working institution. He is also developing a historical document collection which will include not only written material relating to the Center but oral histories as well. Capshew, a Research Associate in the Department of History at the University of Maryland, completed his doctoral studies at the University of Pennsylvania. He served as a fellow in the Office of Air Force History at Bolling Air Force Base before joining Goddard.

CAPSHEW

MARTHA J. JUTTE has been appointed Head, Employee and Organizational Development Branch (Code 224). Jutte was formerly employed by the Defense Communications Agency where she served as an organizational effectiveness consultant. She also has served as Chief of Employee Training and Development and Career Management of a Civilian Personnel Office in Europe. She brings to this position extensive consulting experience in the areas of assessment, design, delivery, and evaluation of managerial and employee development programs.

Retirees

Best wishes to the following Goddard employees who retired in October!

	CODE	YEARS
Jamieson, Lillian B.	563.2	28
Kaufmann, Donald C.	531.3	21
Lindstrom, John W.	480	24
Rhodes, Carl	834.1	34

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

New Search and Rescue Receiver

Goddard's Office of Chief Counsel recently filed for a patent on behalf of Paul Wren, Code 531 for a new search and rescue receiver he invented.

This hand-held receiver promises to extend greatly the detection range of Emergency Locator Transmitters (ELTs) which are small transmitters carried by aircraft and marine vessels and activated in times of distress.

Wren's receiver may detect signals otherwise missed by conventional receivers because of a fundamentally simple concept—phase lock technology. This means that the phase portion of the radio signal from an ELT will be locked in and amplified. This should greatly improve detection of weak ELT signals

Goddard filed a patent for a carrier-burst ELT, also invented by Wren, which is already on the market. Signals from the carrier-burst ELT are 60% stronger than signals from conventional transmitters, according to Wren.

WREN

The Civil Air Patrol has shown great interest in this receiver, Wren explained. When operated together, the carrier-burst ELT and receiver should offer an efficient, cost-conscious system, Wren said.

CHRISTOPHER RODRIGUEZ recently joined the Office of Equal Opportunity Programs as an Equal Employment Opportunity (EEO) Specialist with the primary responsibility of managing the areas of Hispanic recruitment and fostering the employment of the handicapped. Rodriguez, formerly employed with the Washington Metropolitan Area Transit Authority, began as a personnel specialist and eventually was promoted to the position of EEO/Hispanic Coordinator. He brings to Goddard extensive experience in administering a variety of EEO programs with a special emphasis in personnel recruitment and staffing. A native of New York City, he graduated in 1974 from Wesleyan University, Middletown, Connecticut with a B.A. in history and Spanish. In addition, Rodriguez is active in local community affairs, he serves on the Hispanic Business Development Committee with the D.C. Mayor's Office of Latino Affairs and is on the Advisory Council for the Multi-Cultural Internship Program (D.C. Bilingual Public High School).

RODRIGUEZ

WILLIAM BRIAN KEEGAN has been appointed Deputy Director of the Office of Flight Assurance, Code 300. Since January 1985, he has served as Head of the Verification Engineering Office, Engineering Services Division, Engineering Directorate. He began his career with GSFC in January 1966 in Code 300 where he became involved with evaluation of spacecraft suitability to the launch environment. In April 1982, he became the Office of Flight Assurance's senior staff engineer in the field of structural loads, vibroacoustics, mechanical shock, and related areas which bear upon environmental verification of flight equipment.

NASA Update

STAY TUNED . . .

NASA Update, a bi-weekly news magazine program, will be shown continuously from 8 a.m. - 5 p.m. on the closed-circuit TV system and in the following locations:

Bldg. 8 Auditorium — Wednesday, November 26

Bldg. 3 Auditorium — Thursday, December 11

Check *DATELINE GODDARD* and the *GODDARD AUDIO NEWS SERVICE* (286-2890) for details.

Tracking

Continued from page 5

sequent placement of TDRS into geosynchronous Earth orbit.

A third TDRS is scheduled for launch in September 1988 as a backup to either of the two operational TDRS's.

Goddard changed its original network streamlining plans, calling for station closings to start on July 1, 1986, because of the loss of a TDRS in the 1986 Space Shuttle Challenger accident.

A sixth ground station at Dakar, Senegal, (W. Africa), has been placed in caretaker status until resumption of Space Shuttle flights. Upon completion of the Tracking and Data Relay Satellite System constellation of three TDRS's planned for mid 1989, the Dakar station also will be closed.

The TDRSS, owned by the Spacecom Division of Contel and managed by Goddard, will be comprised of two operational and one spare TDRS on orbit, providing more than 85 percent coverage of a spacecraft's orbit, compared with 50 percent coverage now provided by existing ground stations and the first TDRS, launched in April 1983.

Health Benefits Fair

Choosing a health plan can be confusing because there are so many in the Washington, D.C. area to pick from. Plan on attending the third annual Health Benefits Fair on Tuesday, November 25 in the Building 8 auditorium from 11:00 a.m. to 2:00 p.m. Representatives from all of the area plans have been invited to answer questions at that time. The Federal Employee Health Benefit (FEHB) Open Season ends December 5.

Space Program at Turning Point

The following are excerpts from the statement delivered by NASA Administrator James C. Fletcher on September 20 at the Media Seminar on U.S. Space Policy in Los Angeles, California:

"Since the dawn of the space age almost three decades ago, United States space policy has been shaped by many forces, including domestic political pressures and international circumstances. But none has been more powerful or overriding than the urgent need to ensure United States' military and civilian leadership in space. Indeed, the law that created NASA in 1958 requires that the agency preserve the United States' role 'as a leader in aeronautical and space science and technology'. . . .

"Today the United States space program is at a critical turning point. We could chart a future course for America to lead the world into a golden age of space exploration and development in the next century. Or we could face an uncertain future in space, hobbled by lack of confidence and purpose and crimped by shrinking budgets and programs delayed or abandoned. . .

"Today, the Soviet Union remains our strongest competitor and is, in many ways, ahead of us in building an extended presence in space. . .

"And the Soviets are developing their own version of a Shuttle, which in many ways resembles ours.

"Some have speculated that the Soviets would begin flying their Shuttle in early 1988, about the same time we plan to start flying ours again. They not only would have a Shuttle, but they would have a permanent base in space to fly it to. That is Mir, their new Space Station, which is now in orbit. . .

"The Soviets intend to occupy Mir permanently and make it the core of a busy complex of space-based factories, construction and repair facilities and laboratories.

"The Soviets are ahead of us in long-duration manned space flight, having clocked 4,000 days in space, compared with 1,587 for American astronauts. . . .

"The Soviets' sustained national support for and commitment to space expansion, has enabled them to follow an evolutionary step-by-step process to fulfill an impressive longer-term vision. This poses several crucial policy issues for the American people.

"First, we must ask ourselves whether the United States can afford to let its space program languish much longer? If we are in danger of forfeiting our leadership, which seems to be the case, then what are the implications for our future in terms of national security, scientific and technological progress and economic growth?

"Second, have we the motivation, the capabilities and the courage to secure our leadership by seeking new goals supported by adequate resources to expand the space frontier?

"And finally, can the American people and our leaders rekindle the vision and purpose of the Apollo spirit that got us to the Moon and could get us wherever else we want to go in space over the next half century?

"Add up the implications of all three questions and you arrive at the most vital policy issue of all: whether the United States can really afford to be second-best or even third-best in space. I leave it to you to ponder that question today and in the months ahead. . .

"While our long-term future in space may be uncertain, I can assure you that, for the nearer-term, we are on a very positive course. NASA is on the move again, reshaping and rebuilding to ensure the best use of its resources to attain our national goals. . . .

"Seventeen years ago, mankind's greatest voyage of exploration was fulfilled, thanks to our nation's firm, long-term commitment. America and the world thrilled to the words of Astronaut Neil Armstrong: "Houston—Tranquility Base here—the Eagle has landed."

"In the spirit of those who went before us, it is time for the Eagle to soar once again."

NASA
National Aeronautics and Space Administration
Goddard Space Flight Center

Goddard News

The GODDARD NEWS is published monthly by the Office of Public Affairs, Goddard Space Flight Center, Greenbelt, MD 20771. Deadline for submitted material is the first of each month. For additional information, contact Randee Exler, 286-7277. The GODDARD NEWS staff is:

Executive Editor . . . . . James C. Elliott
Managing Editor . . . . . Randee Exler
Senior Editors . . . . . Michael Braukus, Carter Dove and Joyce Milliner (Wallops).