NASA
National Aeronautics and Space Administration

GODDARD NEWS

Goddard Space Flight Center Greenbelt, Md. Vol. 29 no. 8 May 15, 1982

Computer Fair attracts over 1000

Computer Fair held at Goddard

The World's Fair is in Knoxville this year but Goddard hosts a Computer Fair every year. Goddard's Computer Club held its second annual Computer Fair April 22 under the direction of Curt Barrett, (code 734.2), attracting over 1000 people. Participants became acquainted with the latest in microcomputers from nine commercial computer representatives and 14 club members who brought their own computers.

Participants learned about financing home computers and how to buy them; discovered how to program them; learned how to compare different brands; learned how to apply computers to their businesses; played computer games; and learned more about a very fascinating hobby.

Moreover, other attractions included: a flea market in which hardware and software were sold; $150.00 in door prizes; and demonstrations of programming, word processing, business, database, languages, and games.

The club has 165 paid club members and most of them own microcomputers. Altogether the club has about $5,000 worth of equipment in their club computer room. One club member provided the computer-printed banners which were placed aboved each set-up, describing its function.

Club president and founder Chuck Mason (code 972) said the number of participants increased sharply from last year's gathering of 300, and next year's plans call for a day-long affair with seminars, exhibits, and "the works," according to Mason. The main Computer Club meeting is on the third Thursday every month, and anyone interested in the fast-growing hobby is invited.

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"Mystery cloud" originates from volcanic eruptions

Goddard researchers helped in unraveling a "mystery cloud" that has covered the Earth's northern hemisphere since early winter and baffled scientists for months about its origin. Goddard researchers from Wallops, along with researchers from other NASA centers, several universities, and the U.S. Geological Survey (USGS) have concluded that the cloud comes from volcanic eruptions.

Using data collected from aircraft and satellites, the researchers have determined that the cloud comes from volcanic eruptions in late December of 1981 or early January 1982. According to Dr. M. Patrick McCormick from NASA's Langley Research Center, Hampton, Va., the cloud probably comes from the eruption of Pagan volcano on the Mariana Islands in the South Pacific, although other possibilities have not been ruled out.

Ruling out the possibility of an undetected nuclear detonation or meteor impact, McCormick said the cloud is actually a layer of particulates that looks identical to data scientists are accustomed to seeing

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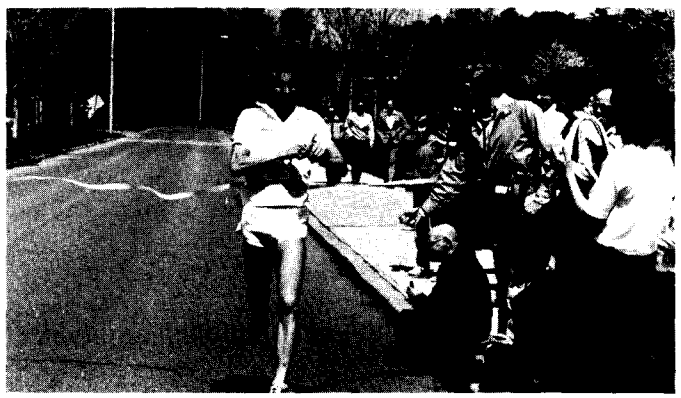

Goddard holds two-mile run..... page 3
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Dr. Rodger Cliff awarded Hugh L. Dryden Memorial Fellowship

Dr. Rodger Cliff is shown here with a plaque he received at the annual Goddard Memorial Dinner, sponsored by the National Space Club. Dr. Cliff was awarded the Hugh L. Dryden Fellowship and will be going to the Stanford Unversity Artificial Intelligence Laboratory to study for one year. Dr. Cliff is the first Goddard employee to receive the award since 1967.

Goddard scientist Dr. Rodger Cliff has been awarded the 1982 Hugh L. Dryden Memorial Fellowship for his work in artificial intelligence and robotics. Dr. Cliff is the first Goddard employee to receive the award since 1967 and only the second Goddard scientist to have won the honor.

Dr. Cliff is a study manager in the Advanced Missions Analysis Office (AMAO, code 400A) and the award cites him "for his substantive contributions in the development of computer logic for onboard spacecraft management." The award was presented at the annual Goddard Memorial Dinner, sponsored by the National Space Club.

Dr. Cliff will be going to Stanford University's Artificial Intelligence Laboratory this summer for one year as a visiting researcher.

The Hugh L. Dryden Memorial Fellowship was established by the Board of Governors of the National Space Club in 1966 to provide further education to a deserving individual in disciplines applicable to science, astronautics, and space administration.

The scholarship is awarded in memory of Hugh L. Dryden who, during his distinguished government career, played an important role in the development of science-based technology, employing his skills as a fundamental scientist, engineer, and public administrator.

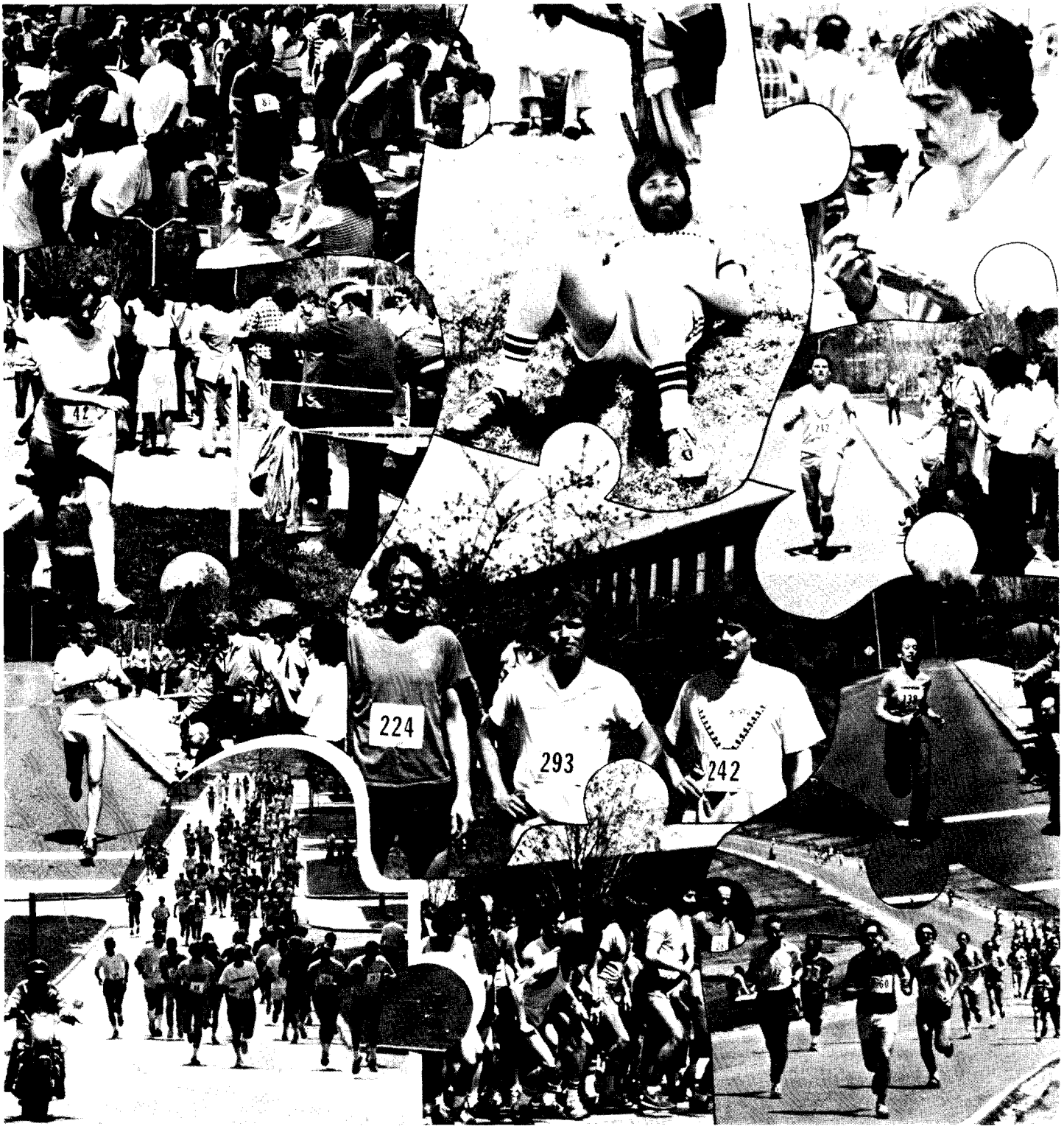
The grant was first given to Johns Hopkins University, Dr. Dryden's alma mater, for a worthy recipient of the school's choice. In subsequent years, the recipients have been selected from applicants in NASA.

Dr. Cliff's work in the AMAO entails using computers to do work in advanced automation, (artificial intelligence and robotics) and office automation. As an early proponent of using computers onboard spacecraft, Dr. Cliff designed the first Goddard computer ever used on a scientific spacecraft, Explorer 43 (IMP-I).

Goddard's AMAO is responsible for further defining proposed scientific and applications missions and determining the feasibility of the mission through analysis. AMAO also identifies areas of technical risk, determines cost estimates for missions, and conceives mission schedules.

Dr. Cliff came to Goddard in 1961. He received his B.S. at MIT, and his M.S. and Ph.D. at the University of Maryland, all in engineering. In the summer of 1980, he attended a NASA workshop at the University of Santa Clara on "Advanced Automation for Space Missions." Last summer he managed a Goddard workshop called "Computer Science: Key to Space Renaissance."

Two-mile run held at Goddard



Over 250 runners finished the course in NASA's 13th Intercenter Two-Mile Fun Run at Goddard on April 14. This montage depicts activities before, during and after the race. At center are the 1st, 2nd, and 3rd place winners: l-r: 3rd place, Tom Nolan; 1st place, Ned Poffenberger; and 2nd place, Ed Boggess.

Mystery cloud

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from volcanic eruptions.

The researchers recently returned from an eight-day trip to Costa Rica and Mexico, where they conducted aircraft flights to measure gases present in volcanic plumes for project RAVE (Research on Atmospheric Volcanic Emissions). An unexpected bonus was obtained enroute to San Jose and from New Orleans to Wallops as NASA's Airborne LIDAR and the Wallops Electra aircraft gathered data which turned out to be the much reported "mystery cloud".

The Wallops Electra aircraft was instrumented with remote and in situ sensors for measuring constituents in the volcanic plumes as NASA's Airborne LIDAR made night measurements of the aerosol particle density in the stratosphere. The data was compared to Stratospheric Aerosol and Gas Experiment (SAGE) satellite data from 1979 to 1981 and convinced scientists that the cloud is of volcanic origin.

Scientists from Wallops, Langley, the USGS, and the universities of Arizona, Drexel, Maryland, and Michigan Tech participated in the project RAVE experiment to determine the effects of volcanic gases on the stratosphere. It was during these experiments that scientists obtained data which turned out to be the "mystery cloud".

The results were first observed by the Japanese, January 23, and then by another gound-based station in Moana Loa, Hawaii, January 18. Not until later, when a NASA research plane flew from Wallops to Costa Rica, did the evidence begin to overwhelmingly point to a volcanic eruption as the source of the high altitude pollution.

"It had to be one that had little local damage but moved material high enough to get into the stratosphere where it can travel around the world," McCormick said. "Historically, information on the height of volcanic eruptions has proven unreliable due to, among other things, the difficulty of accurately observing them at night or through cloud cover."

The altitude and intensity of the cloud, by then a diffused layer, was detected continously from Wallops, at 38 degrees north latitude, to Costa Rica, at ten degrees north latitude.

A remote-sensing laser radar, looking upward from the plane, mapped the otherwise invisible layer as being approximately ten miles high at the middle and an average of two to three miles thick.

The airplane instrument recorded peak concentration at about 20 degrees north latitude, close to the latitude of Hawaii. This indicates that the emission was probably a low latitude eruption perhaps between the equator and 20 degrees north, as atmospheric travel tends to be away from the equator.

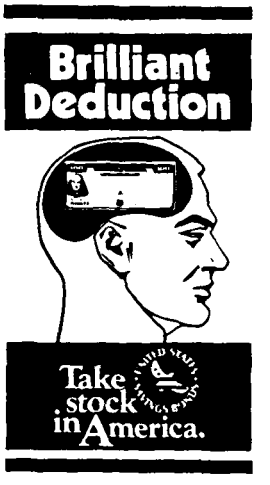
Goddard to hold Small Business Exposition

Goddard's Industry Assistance and Procurement Analysis Branch is sponsoring the Ninth Annual Small Business Exposition May 19. The Exposition will be held in the building 8 auditorium from 9 a.m. to 4 p.m.

The purpose of the Exposition is to provide small and disadvantaged businesses marketing opportunities with the technical and administrative users at Goddard. Representatives from NASA Headquarters and the Small Business Administration have also been invited along with several large firms.

Bendix, Fairchild, McDonnell Douglas, Motorola, Westinghouse, Martin Marietta, and Computer Sciences are among the firms that will be available for subcontracting opportunities.

A variety of products and services will be displayed at the Exposition including computer hardware, software design and analysis, graphic systems, optical components and devices, electronic and communication equipment, metal fabrication, and engineering services.



Keeping Track

Donald E. Smith (left), vice president and STDN program director, BFEC, Columbia, Md., presents the quarterly Outstanding Performance Award to Daniel M. Funamura, Hawaii senior manager. He accepts the award on behalf of the employees at the NASA STDN station in Kokee Park, Kauai, Hawaii. This is the second quarterly award received by the Hawaii station employees. The previous award was earned for the quarter ending March 1980. This award was for the July, August, and September 1981 performance period.

Employees at Vernon Valley RCA Earth Station, Vernon Valley, N.J., receive a certificate of appreciation from Goddard's Robert Plaumann and Donald Henry for their STS-1 support. l-r: Johnny Johnson (RCA), Archie Miller (RCA), Donald Henry, Duane McMillen (RCA), and Robert Plaumann.

Short Takes

NASA raises possibility of 5th Orbiter buy

NASA officials have indicated that they are recommending to the Reagan Administration that supplemental funds be provided in FY '83 to initiate the development of a fifth Space Shuttle Orbiter, which the agency is looking at procuring in a block buy with the fourth Orbiter from Rockwell.

NASA Administrator James Beggs and STS chief James Abrahamson told the House HUD-IA Appropriations Subcommittee that they do not believe that NASA will require any supplemental funds in FY '82 or '83 to maintain the delivery schedules for the second, third or fourth Orbiters, but Beggs said the agency would have to add more money to its FY '83 budget if the Administration made the decision to buy a fifth Orbiter.

The NASA chief said the agency is looking at the most cost-effective way to procure a fleet of five Orbiters, which he said might involve a delay in delivery of some of the out-year Orbiters. NASA is looking at possible delivery of a fifth Orbiter in late 1987.

NASA prepares for start on space station

NASA's Associate Deputy Administrator, Phillip Culbertson, responsible for the station/platform project, said that NASA would be able to start development of the project in FY '84 if funding is approved, but he added that the agency has not decided whether it will be a manned or unmanned project.

NASA's advanced program studies in FY '83 include such possibilities as "unmanned platforms in both low orbit and geosynchronous orbit, and a permanently manned facility, or space station, in low orbit...."

Think about it .....

How do you know so much about everything? -- was asked of a very wise and intelligent man; and the answer was, "By never being afraid or ashamed to ask questions as to anything of which I was ignorant."

Computer Fair

Continued from page 1

Left: Chevelle Thomas, son of Computer Club member Valerie Thomas, code 934.1, is engulfed in PAC-MAN on his mother's Apple II microcomputer while other youngsters eagerly await their turn. Right: Computer Club member Ken Duck, code 725.3 (r), and his son next to him watch as a youngster plays Armor Patrol on a Radio Shack TRS-80 Model III microcomputer.

***** After this issue, the Goddard News will be published monthly. The next issue will be June 15. Deadline for submitted material is two weeks from the date of publication.***

NASA

GODDARD NEWS

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Editor: David W. Thomas

Assistant Editor: Traci D. Warnick

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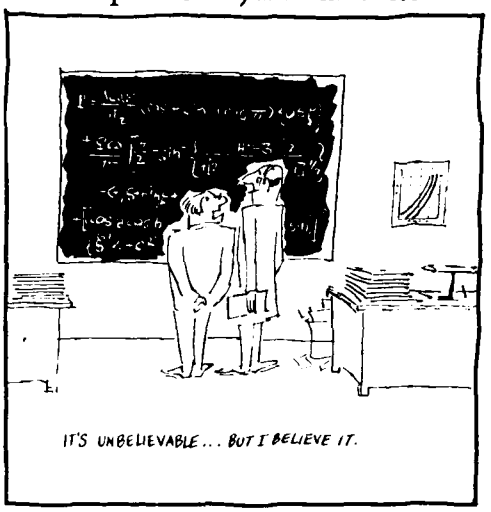

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ERRSAC helps establish remote sensing programs

by Ron Witt

The Eastern Regional Remote Sensing Applications Center (ERRSAC) at Goddard is instrumental in helping states establish their own remote sensing data acquisition programs. Just last year, it helped Maryland become one of six northeastern states with its own program, after holding a workshop at Goddard to bring together representatives from various organizations who were using or interested in Landsat images of the Earth.

As a result of the workshop, Maryland made a broad-based commitment to remote sensing data acquisition, and formed the Maryland Remote Sensing Steering Committee (MRSSC) to oversee all remote sensing activities within the state. MRSSC now coordinates remote sensing projects and research, conducts data inventory and archival, and serves as a clearinghouse for information on all remote sensing activities within Maryland, including internal and external liaison.

Some 35 state government representatives attended the workshop, along with state universities and private industry. Maryland, Vermont, New Jersey, Minnesota, Delaware, and Virginia now have their own programs, and ERRSAC helped in establishing each one.

Prior to the workshop, ERRSAC had been involved with Maryland for three years, working to transfer remote sensing technology under the aegis of NASA's Regional Applications Program (RAP). This included basic remote sensing education, training in the use of software and hardware systems, cooperative remote sensing applications projects, and user

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STS-4 payload to carry nine GAS experiments

Officially titled "Small Self-Contained Payloads," the Getaway Special program is offered by NASA to provide anyone who wishes the opportunity to fly a small experiment aboard the Space Shuttle. The experiment must be of a scientific research and development nature.

A Getaway Special Flight Verification Payload flew aboard the STS-3 mission. The test payload, a cylindrical canister two feet in diameter and three feet deep, measured the environment in the canister during flight. The data were recorded and will be analyzed for use by Getaway Special experimenters on future shuttle missions.

The Getaway Special, or "GAS" experiments, will be flown on shuttle missions on a space-available basis. The first private sector payload will be flown on STS-4, scheduled for launch June 27. This payload, consisting of nine experiments, was purchased by Gilbert Moore and donated to Utah State University where it is being used as a program for student constructed experiments. All nine experiments will be contained in the 5-cubic-foot payload canister. A description of each experiment follows.

1. Drosophilia Melanogaster (Fruit Fly) Growth Experiment

Student Investigator: Walt L. Moore, HDR Sciences Co., Santa Barbara, California, Grad/Environmental Sciences

This experiment is designed to provide a means of raising and separating succeeding generations of fruit flies, Drosophila Melanogaster, in orbit to study the effects of micro-gravity on their genetic structure. This will be a test of equipment that is proposed to be flown on the Long Duration Exposure Facility.

2. Artemia (Brine Shrimp) Growth Experiment

Student Investigator: Bruce W. Moore, Weber State College, Ogden, Utah, Freshman/Music

The brine shrimp Artemia will be flown to determine the genetic effects of micro-gravity on cysts hatched in space. Cysts will be injected into a saline solution upon experiment activation. The growing shrimp, called Nauplii, will be observed during the remainder of the flight with a 35mm motor-driven Nikon camera with a 55mm micro-Nikkor lens. The camera will be shared between this experiment and another experiment concerning observations of Duckweed growth in micro-gravity. Powdered rice hulls will be fed to the shrimp by a linear actuator. The shrimp will be studied post-flight by means of electron microscopy.

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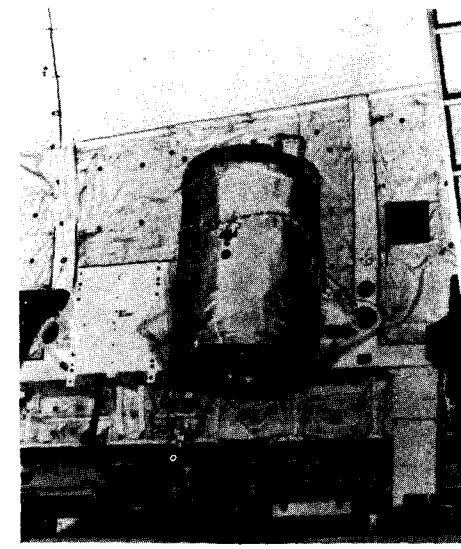

This GAS test canister was flown aboard STS-3. A five cubic foot payload canister carrying nine experiments will fly on STS-4.

Emergency Medical Technicians provide Wallops with on the spot medical care

Wallops employees perform a mock emergency situation with the EMT ambulance. From left to right: Eugene Bowden, Gene Godwin, Linda Layton, Betty Fitchett, and in the stretcher, C. B. Cherrix.

Emergency medical care is a major concern to those living or working in remote, rural areas. Rural living has many benefits, but it also creates a few problems. A major concern facing Wallops personnel in the seventies was how to provide the best emergency medical care to the Wallops workforce when the nearest hospital was 50 miles away.

The 6,500 acre Wallops Flight Center on Wallops Island, Virginia, is located 40 miles southeast of Salisbury, Maryland, which is the closest municipality in any direction leading from Wallops.

Wallops's problem was solved with the development of the Emergency Medical Technician (EMT) program. It had the following major objectives: to provide a cadre of skilled Emergency Medical Technicians; to supplement the medical staff/fire department with immediate response capability to any accident site or location of an acutely ill person; and to provide skilled medical support to off-range expeditions at various launch ranges throughout the world.

In addition to serving Wallops, the EMT program was implemented in other remote ranges in places like Alaska, Canada, and Sweden, where Wallops supports launch operations, and where medical facilities are hours away.

The program required volunteers. It got them from the ranks of firefighters, nurses, engineers, technicians, clerks, and secretaries. This mixture of volunteers in the first class proved to be the key to the success of the program since the backgrounds of the students helped in broadening the learning skills.

Classroom discussions became highly motivated and a source of common ground. The class opted for extended testing procedures from the course physician by requesting the National Registry of Emergency Medical Technicians Examination. This became an accepted part of the program, thus, each graduate of the program is a National Registered EMT-A.

Graduates have no problem adapting to their new duties. They easily incorporate newly learned skills with normal duties and it is common to see an EMT, equipped with walkie-talkie radio and pager, performing routine duties at the usual work place. What is not common is the instant change of an individual from his/her normal job to EMT in case of an emergency. The EMT responds directly to the location of the sick or injured, providing emergency care while the ambulance and nurse are enroute.

One of the guidelines of the program is to recruit volunteers from geographically located areas which assures the disbursing of EMTs throughout the prospective center. While one of the EMTs is assigned to an EMT vehicle each day for response to any emergency location, the entire cadre can be alerted for a disaster.

Likewise, each EMT is equipped with a trauma kit for use in treating victims, in an emergency, in their locality. The duty EMT proceeds with the patient on the ambulance to the nearest medical facility.

Since its inception in 1976, the program has averaged approximately 100 responses a year. These are responses to trauma cases involving fractures, severe bleeding, respiratory arrest, and cardiac arrest.

GAS experiments

Continued from page 1

3. Surface Tension Experiment
Student Investigator: James Elwell, Utah State University, Ogden, Utah, Grad/EE

The goal is to study the shape of a liquid meniscus in a weightless environment. An aluminum block contains several holes filled with solder. Upon entering weightlessness, the block is heated, allowing the solder to flow and assume a meniscus (crescent-like) shape. The block is allowed to cool, "freezing" the meniscus when the solder solidifies.

4. Composite Curing Experiment
Student Investigator: Amber M. Dalley, Utah State University, Ogden, Utah, Sr./Math-Philos

This experiment will complete the cure of a B-staged (partially cured) epoxy resin-graphite composite sample in micro-gravity. The composite sample will be heated to 163 degrees C and maintained at that temperature for one-half hour to allow the resin to gel. The flight sample will be compared with samples processed in one G, and post flight laboratory analysis will determine the quality of wetting between the resin and the graphite fibers and test the tensile strength of the sample.

5. Thermal Conductivity Experiment
Student Investigator: Russel R. Laher, Utah State University, Ogden, Utah, Jr./Phy.-Geology

An oil and water mixture in a one G environment will separate due to the density difference. The goal of the experiment is to carry oil and water into orbit and mix the two, then heat the mixture with a platinum wire. Temperatures of the heater wire, the mixture, and the air around the cylinder will be monitored. Ultimately, the thermal conductivity of the mixture will be calculated from these data.

6. Micro-Gravity Soldering Experiment
Student Investigator: G. Christian Alford, Utah State University, Ogden, Utah, Sr./EE

The Micro-Gravity Soldering Experiment studies the separation of flux from solder while soldering in weightlessness. The lack of buoyancy in a non-accelerating environment could allow pockets of flux to become trapped in the solder. The experiment will melt samples of resin core and coreless solder on four heated copper foils. When the experiment is returned, the solder will be analyzed for trapped pockets of flux and compared with solder similarly processed on Earth.

7. Root Growth of Lemna Minor L. (Duckweed) in Micro-Gravity
Student Investigator: Kelly D. Hunt, Utah State University, Ogden, Utah, Jr./Phy

Using the 35mm Nikon, shared with the experiment described earlier, this experiment will photograph the root growth patterns of Lemna Minor L. (Duckweed). The investigation centers on the nutrient transport role played by sieve tubes in the plants' roots in response to the force of gravity in Earth-grown specimens. The plants will be injected with a fixing agent before experiment deactivation. Electron microscopy will be used to compare control and flight specimens.

8. Homogeneous Alloy Experiment
Student Investigator: Terrance L. Thomas, Utah State University, Ogden, Utah, Jr./EE

An aluminum chamber containing a powdered bismuth-tin mixture will be placed into Earth orbit. The chamber will be heated, passing the melting points of the chemicals and allowing alloying to take place. The chamber will cool down and the alloy will be returned for Earth-based analysis.

9. Algal Micro-Gravity Bioassay Experiment
Student Investigator: Steven M. Walker, Utah State University, Ogden, Utah, Sr./Bio.

The goal of the experiment is to monitor the growth rate of Chlorella vulgaris, a unicellular green algae, in micro-gravity. Upon experiment activation, a freeze-dried sample of algae will be injected into the media-filled growth chamber. Over the duration of the experiment the culture optical density and temperature will be measured. Near the end of this experiment, a fixative will be injected into the chamber preserving the cells for post-flight analysis.

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Goddard mourns Mrs. Goddard

Mrs. Esther C. Kisk Goddard, widow of American rocketry pioneer Dr. Robert H. Goddard, died on Friday, June 4, at the age of 81 after an extended illness. Funeral services were held June 7 for Mrs. Goddard in Worcester, Massachusetts, where she resided for many years.

Mrs. Goddard visited the Center on several occasions in the last two decades as a guest of honor and speaker at commemorative events. Her reminiscences of her husband, for whom the Center is named, vividly recalled the earliest days of American rocketry. An interesting speaker, she was entertaining as well as informative to her audiences, for much of Dr. Goddard's work was conducted in relative obscurity and went unnoticed by the public until well after his death in 1945.

Mrs. Goddard met Dr. Goddard at Clark University, Worcester, Massachusetts, where she was secretary to the president and he a professor at the school. They were married in 1924 and she then became a member of the Goddard team, assisting him in his work and photographing the early launches. Mrs. Goddard photographed the historic launch of Dr. Goddard's first liquid fuel rocket in 1926.

Mrs. Goddard attended Clark University as a widow and received a masters degree in 1951. She served on the Board of Trustees from 1964 until 1970, and from 1970 until her death, was an Honorary Trustee. Survivors include Ms. Beatrice Kisk, her sister-in-law, and several distant cousins.

The Center will commemorate the 100th anniversary of Dr. Goddard's birth on Tuesday, October 5, 1982.

Mrs. Goddard looks at a bust of her husband during the formal dedication of the Center in 1961.

GAS experiments

Continued from page 3

The Getaway Specials are available to industry, educational organizations, and domestic and foreign governments for legitimate scientific purposes. Since the offer for Space Shuttle space first was made in 1976, more than 326 GAS reservations have been made by more than 197 individuals and groups from 33 states, the District of Columbia and 14 foreign nations. Although many reservations have been obtained by persons and groups having an obvious interest in space research, a large number of spaces have been reserved by persons and organizations entirely outside the space community.

Reservations are held, for example, by realtors, bankers, newspaper publishers, and school children, among others, who have an interest in conducting experiments in biology, chemistry, Earth science, physics, and other disciplines. Examples include an inner city high school class in Camden, New Jersey, which intends to fly an ant colony in space to determine the effect of weightlessness on the ants, and a Japanese newspaper, the Ashai Shimbun, is planning a snow-making experiment under zero-G conditions to investigate crystallization.

There are no stringent requirements to qualify for space flight, but the payload does have to meet safety criteria. It must also have a scientific or technological objective.

For example, a manufacturer may want to test, on a priority basis, a certain type of metal-making in space for later use in his own production. This is not only permissible, but welcome. However, a person who wishes to fly items of a commemorative nature, such as medallions for later resale as "objects that have flown in space" would be refused. While payloads must be related to a technical or scientific objective, NASA will not attempt to judge their scientific merit or novelty.

Getaway Special requests must first be approved at NASA Headquarters, Washington, DC. It is at this point that requests for shuttle space are screened for propriety, and scientific or technical aim. These requests must be accompanied or preceded by the payment of $500 earnest money. Requests approved by NASA are given a payload identification number and referred to the GAS Team at the Goddard Space Flight Center, Greenbelt, Maryland.

The GAS Team screens the proposal for safety and provides advice and consultation for payload design. Shuttle crew members will turn on and off up to three payload switches, but there will be no opportunity for crew monitoring of GAS experiments, or for any form of in-flight servicing.

The GAS Team must certify that the proposed payload is safe - meaning that it will not harm or interfere with the operations of the shuttle, its crew, or other experiments on the flight.

If any physical testing must be done on the payload to answer safety questions prior to the launch, the expense of these tests must be borne by the customer.

Getaway Special spaces come in three standard sizes: 5 cu. ft., with a maximum of 200 pounds; 2 and 1/2 cu. ft. and up to 100 pounds; and 2 and 1/2 cu. ft. and up to 60 pounds. The prices for flying these are $10,000, $5,000, and $3,000 respectively. These prices will remain fixed for the first three years of shuttle operations.

The Getaway Special program is managed by the Goddard Space Flight Center. Project Manager is James S. Barrowman. Clark Prouty, also of Goddard, is technical liaison officer.

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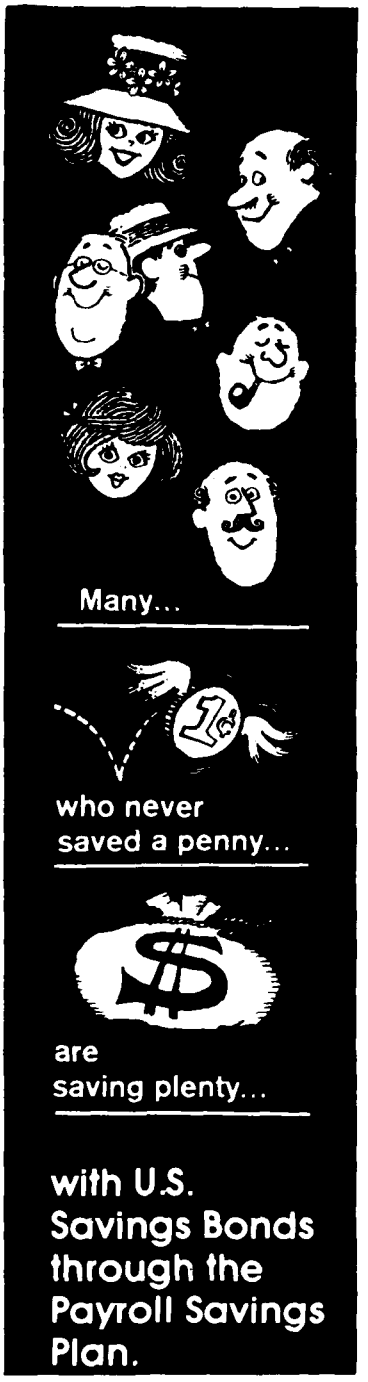

PEOPLE

Oscar Weinstein receives Moe I. Schneebaum award

From left to right: Acting Center Director Dr. Leslie H. Meredith, Mrs. Moe I. Schneebaum, Mr. and Mrs. Weinstein.

Oscar Weinstein, code 435.0, has been awarded the 1982 Moe I. Schneebaum Memorial Award for his exceptional leadership and contributions to the planning, design and successful development of the Thematic Mapper (TM) instrument for the Landsat-D mission.

Since the inception of the program, Weinstein has directed contractor development and related in-house efforts which culminated in the delivery of a flight qualified TM instrument in October 1981. Weinstein provided crucial technical troubleshooting expertise and numerous innovative work-around plans that resulted in maintaining development progress in spite of many technical problems.

TM is the most advanced earth viewing instrument ever built for a NASA program. It is unprecedented in terms of size, resolution, data rates and radiative cooler requirements, and represents a major advancement in state-of-the-art multispectral scanners. The advanced capabilities of TM will enable scientists to evaluate better the earth observations activities in many areas. TM has been integrated into the Landsat-D spacecraft, which will be launched in July 1982.

Moe I. Schneebaum started work at Goddard in 1958 and played a significant role in the development of the Multispectral Scanner, Return Beam Vidicon Camera, and Wide Band Video Tape Recorder which have been outstanding performers on the Landsat series of earth observation satellites. Schneebaum was instrumental in the development of cameras for the early meteorological satellite program.

Tresansky receives Patent Counsel award

Goddard's John Tresansky, Patent Counsel (code 204), has been awarded the 1982 Government Patent Lawyers Association's (GPLA) Distinguished Achievement Award. The award is presented annually to a government employee for unique achievement or outstanding service in the field of intellectual property rights performed within the preceding five years.

Tresansky has not only performed outstanding service during the last five years, but for many years before that. In his many years of government service, he has distinguished himself as a recognized authority in patent and copyright matters both within government and by the private sector. He has published legal articles, lectured, and participated in panel discussions before professional audiences on a wide range of intellectual subjects. Tresansky also teaches intellectual property law at Catholic University.

Tresansky got his B.E.E. degree at Catholic University and LL.B. degree at Georgetown University. He has held numerous positions in government over the years in the Department of Navy and NASA, and has been with Goddard since 1975.

John Tresansky receives the GPLA Award from Tenny Johnson, general counsel, Department of Energy, at the May 12 GPLA meeting.

ERRSAC

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liaison and support. It also included four joint ERRSAC/Maryland projects: a holding pond location and water quality study in the Curtis Bay area; a forest cover type inventory in Worcester County on Maryland's Eastern Shore; a land use survey in the developing corridor between Baltimore and Washington, DC; and a land cover change detection project for the Patuxent River Watershed. Only the holding pond location/water quality study had been completed by the time of the workshop.

Since the workshop, the MRSSC has met six times and published four issues of a quarterly newsletter. They are presently overseeing a statewide forest/non-forest inventory conducted by the Maryland Forest Service and the University of Maryland. It has been proposed that, after the former project is completed, a statewide land use/land cover inventory be conducted by the Department of State Planning and the University of Maryland.

Also, the Worcester County forestry project, mentioned previously, is to be extended to the other three Maryland counties on the Eastern Shore by the Forest Service and the Salisbury State College. Thus, coniferous, deciduous, and mixed forest types will be mapped for Dorchester, Somerset, and Wicomico Counties as well, and more members of the Forest Service will be trained in remote sensing.

Maryland's remote sensing program has come a long way in a short time, with the help of ERRSAC. The state is now operational as a Landsat user, with its own data archive/bank; computer hardware at several agencies and state universities; Landsat analysis software for digital image processing; and the Maryland Automated Geographic Information (MAGI) System. ERRSAC is also writing a final report on the cooperative demonstration projects between ERRSAC and Maryland, completed in 1981.

ATS-1 helps in saving man's eyesight

One of Goddard's oldest operating communications satellites, ATS-1, may have been instrumental in helping a research vessel crewman keep his eyesight. The man was helping conduct climate tests in the Pacific Ocean when one eye became infected. (He previously had surgery on the eye after fragments from an exploding light bulb injured it.) The man's doctor in Seattle was contacted via radio to prescribe care, but the infection worsened and radio contact was lost. The ship's medical technician turned to Goddard's ATS-1 satellite to arrange an evacuation. When the ship docked at Galapagos Islands, a waiting plane flew the crewman to Panama for treatment that may have saved his sight.

Scientific Colloquium

Mr. Louis A. Frank, Department of Physics, University of Iowa, was the speaker for the Scientific Colloquium held June 4. He talked about global imaging of earth's faint lights with the DE spacecraft.

The high-altitude Dynamics Explorer spacecraft, DE-1, is instrumented with three spin-scan imaging photometers for obtaining global views of the faint lights of earth. Each of these three unique imaging instruments is equipped with asymmetric catoptric optics with super-reflecting surfaces for the critical rejection of stray light along the sunlit orbit, a scanning mirror, and twelve filters. Two of these instruments provide images at visible wavelengths, the third at vacuum-ultraviolet wavelengths.

An artist's illustration of the two DE spacecraft. DE-1 is shown in the foreground, DE-2 is the background.

NASA
GODDARD NEWS

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Editor: David W. Thomas
Assistant Editor: Traci D. Warnick

ALL IN FAVOR OF SAVING FUEL
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NASA
National Aeronautics and Space Administration

GODDARD NEWS

Goddard Space Flight Center Greenbelt, Md. Vol. 29 No. 11 August 15, 1982

Message from the Director

Congratulations Goddard

Landsat-D had a perfect launch on Friday, the 16th of July. On Monday, the 19th of July, we acquired data from the Multispectral Scanner (MSS). The first picture received was excellent. On Tuesday we acquired data from four of the bands of the Thematic Mapper (TM).

I congratulate all of the Goddard personnel involved with the Landsat-D launch. Mr. David Grimes, Project Manager for Delta, and the entire Delta Project did their usual high-quality job. Congratulations to Frank Cepollina and and the MMS project for their contribution to the successful launch of Landsat-D. The MMS project was responsible for building the spacecraft portion of the Landsat observatory. The MMS portion of Landsat-D consists of an attitude control module, communications and data handling, power subsystem, propulsion subsystem, and the spacecraft structure and electrical system. This was the 152nd successful launch for Goddard's Delta rocket.

The Landsat-D team, headed by Mr. Harry Mannheimer, Headquarters Program Manager, Mr. Jon Busse, the Project Manager, and Dr. Vince Salomonson, the Project Scientist, deserve high praise for the outstanding professional manner in which the project was brought to a successful launch.

Landsat-D, called Landsat-4 now that it is in orbit, is possibly the most important satellite that Goddard has launched in recent years. The NASA/Goddard team has once again demonstrated a most reliable and highly capable performance.

My personal thanks to all Goddard employees and contractors for an excellent job well done. You've provided me with a wonderful welcome to Goddard.

Noel W. Hinners

Noel W. Hinners Director

Landsat-D a success!

Center Director Dr. Noel W. Hinners (l), Congressman Guy V. Molinari, R-N.Y. (c), and former Center Deputy Director John H. McElroy chat before the Landsat-D launch. The congressman witnessed the launch of the latest in earth resources technology from the Network Operations Control Center (NOCC) viewing area. According to Hinners, Landsat-D is possibly the most important satellite that Goddard has launched in recent years.

America celebrated twice on July 4

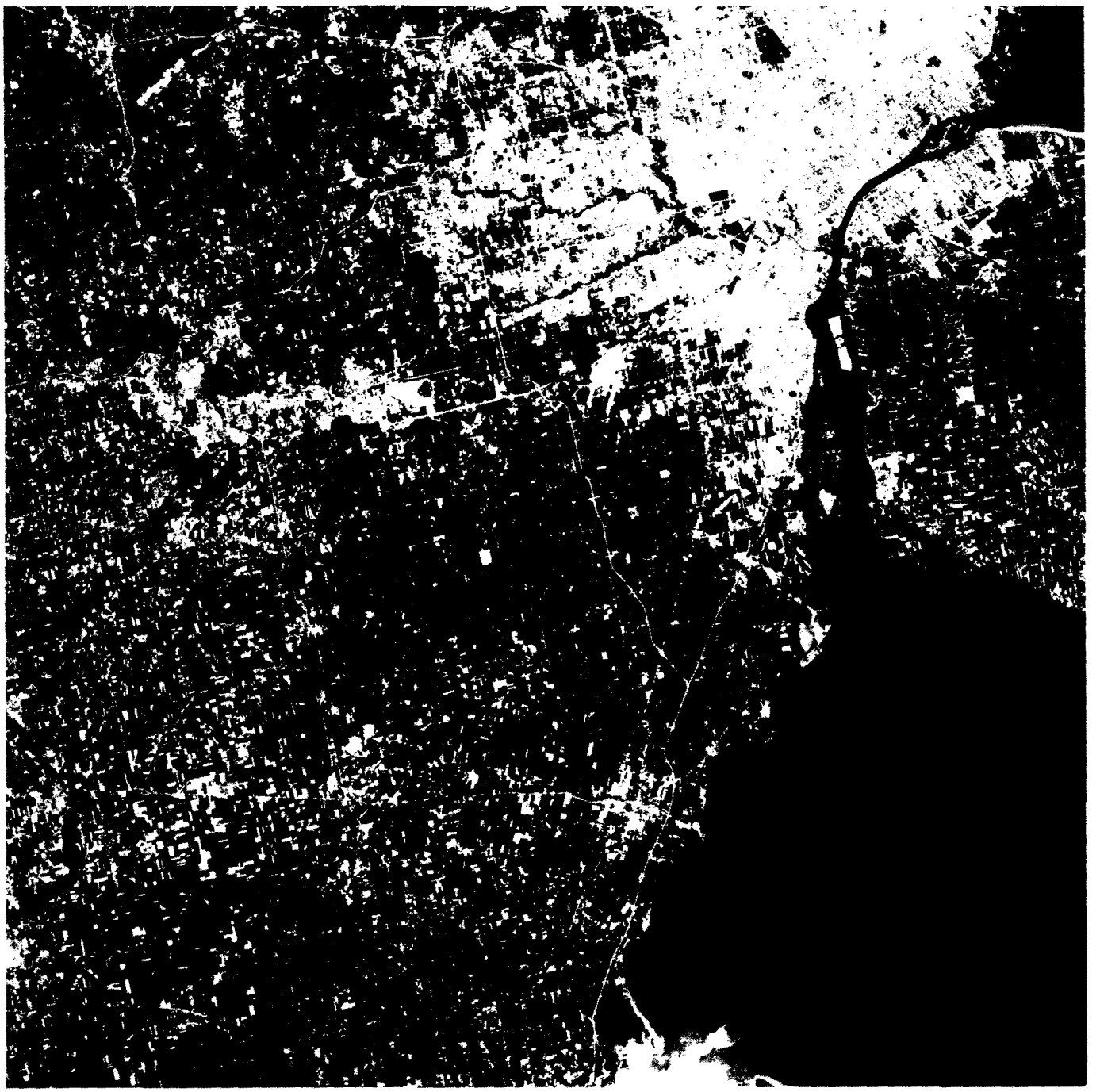
On July 4 the nation had two reasons for celebration. America celebrated its 206th year of independence and it celebrated the fourth and final test flight of the Space Transportation System. With the fourth test flight successfully completed, the STS is scheduled for its first operational flight in November.

STS-4 astronauts Mattingly and Hartsfield achieved all of the major objectives, including tests of the orbiter's thermal response and exercises with the Canadian-built manipulator arm. All four of the Columbia's orbital flight tests were aimed at verifying, in a building-block scheme, the shuttle system's capability to do the job for which it was designed—haul heavy payloads into and out of Earth orbit with a reusable vehicle.

After viewing Columbia's landing President Reagan said, *"In the future, as in the past, our freedom, independence and national well-being will be tied to new achievements, new discoveries and pushing back frontiers. The fourth landing of the Columbia is the historical equivalent of the driving of the golden spike which completed the first transcontinental railroad. It marks our entrance into a new era. The test flights are over, the groundwork has been laid,*

Continued to page 3

Landsat-4's first Thematic Mapper image



The first image from Landsat-4's Thematic Mapper was taken on July 20, four days following its successful launch. The resultant (185 km x 185 km) image is a composite of three individual images from detectors in the green, red, and infrared portions of the spectrum. In this quadrant section enlargement of the image, nearly all of Detroit, Michigan, and the northern parts of Toledo, Ohio, are clearly visible in the top and bottom portions of the picture, respectively.

The large body of water in the lower right is Lake Erie and in the upper right is Lake St. Clair. In the lower (southern) outskirts of Detroit, near the center of the picture, the Detroit Metropolitan Wayne County Airport is visible and to its immediate left (west) is the Willow Run Airport.

Landsat-4's Thematic Mapper (TM) was designed to identify areas as small as 30 meters; preliminary examinations point to an image resolution and quality beyond expectations.

Celebration

Continued from page 1

now we will move forward to capitalize on the tremendous potential offered by the ultimate frontier of space."

President and First Lady Nancy Reagan meet with astronauts Ken Mattingly (r) and Henry Hartsfield after the successful landing of the Space Shuttle Columbia July 4 at Edwards AFB, California.

Model Rocket launch

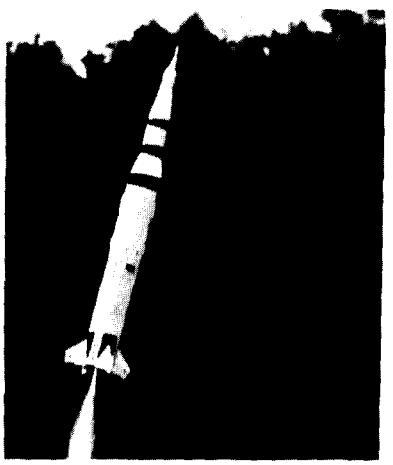


Photo by Debora McCallum

Goddard's Visitors Center hosted a model rocket contest last month commemorating the 13th anniversary of the first lunar landing on July 20, 1969.

Competitive events consisted of spot landings and streamer duration. Each contestant received by mail a certificate of participation and winners of each event received first through third place trophies. Trophies were awarded to two groups, ages 15 and under and 16 and over.

This year over 900 spectators watched some 65 model rocketeers compete. Last year some 60 persons launched rockets and about 600 spectators viewed the activities.

The contest is sponsored by the Goddard Visitors Center through the Public Affairs Office, the National Space Institute, and in cooperation with local sections of the National Association of Rocketry.

Man your stations

Goddard HAMs prepare for emergency

When disaster strikes or when there is an emergency situation, normal channels of communication are sometimes disrupted or unavailable. Makeshift communication operations have to be established to restore order. Members of Goddard's Amateur Radio Club (GARC) recently drilled for such a crisis in the 46th Annual American Radio Relay League Field Day Emergency Preparedness Test.

A group of 17 GARC members manned three operating stations at Goddard's Visitors Center from 4 pm June 26 to 4 pm June 27. Using only emergency power and portable antennas, Goddard HAMs contacted over 1000 different stations throughout the U.S. and Canada.

One contact, sent by Goddard HAMs to a station in Davidsonville, Md., sounded like this: "This message notifies you that the Goddard Amateur Radio Club has 17 members present and participating in 46th Annual Field Day Exercise. Emergency power and antennas used."

Highlighting this year's field day was a 12 watt solar powered radio station. The solar panels used to power the station were surplus International Sun/Earth Explorer (ISEE) panels donated by Harry Burke (code 711) for field day use.

According to Frank Bauer (code 712.3), president of GARC, the solar powered radio station worked quite well despite the dense clouds that persisted over the weekend.

"Although clouds wiped out about one third of the solar station's anticipated output," Bauer said, "our competent radio operators still enabled us to make contacts in Illinois, Oregon, Kansas, Iowa, Canada, Alabama, and Oklahoma all

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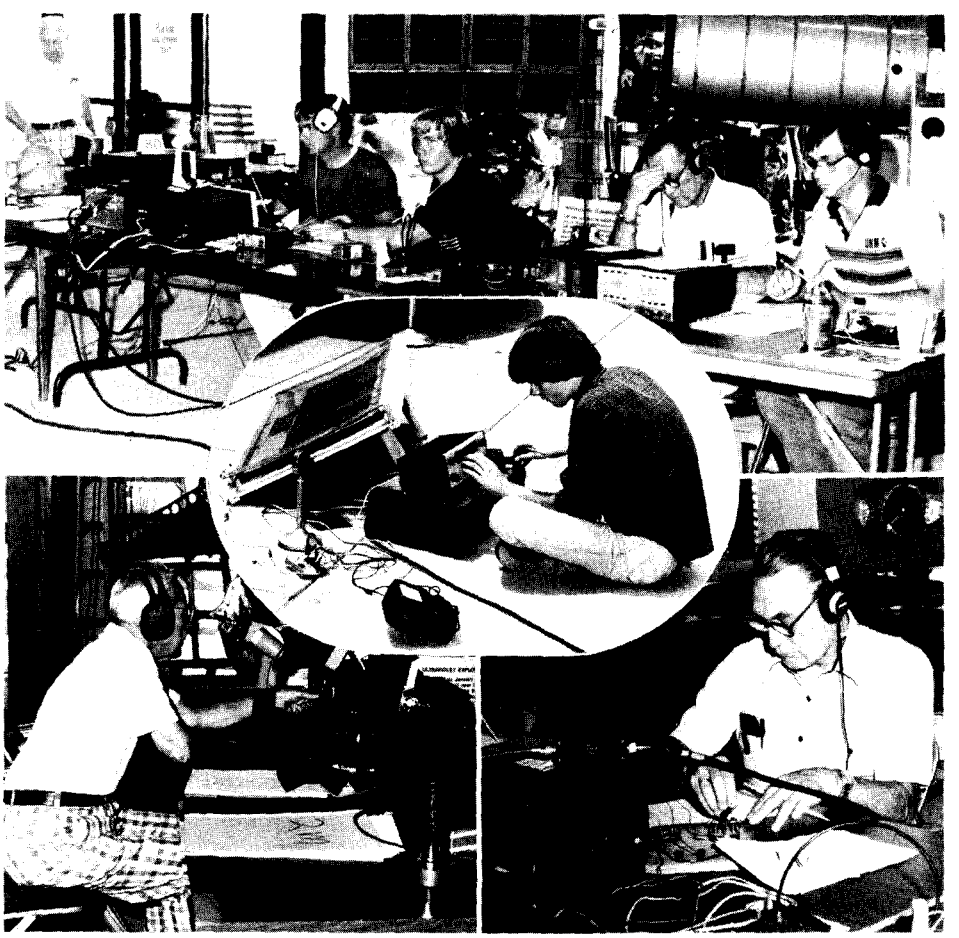


Goddard HAMs man their stations at the Visitors Center during the Emergency Prep Test. Top from left: Richard Coan, Hugh O'Donnell, William Mullauer, Frank Turano, and James Gass. Bottom l-r: Richard Coan and Frank Turano. Center: AMSAT employee Andrew Swirko makes contacts using the solar powered station.

Dale Call retires after 32 years

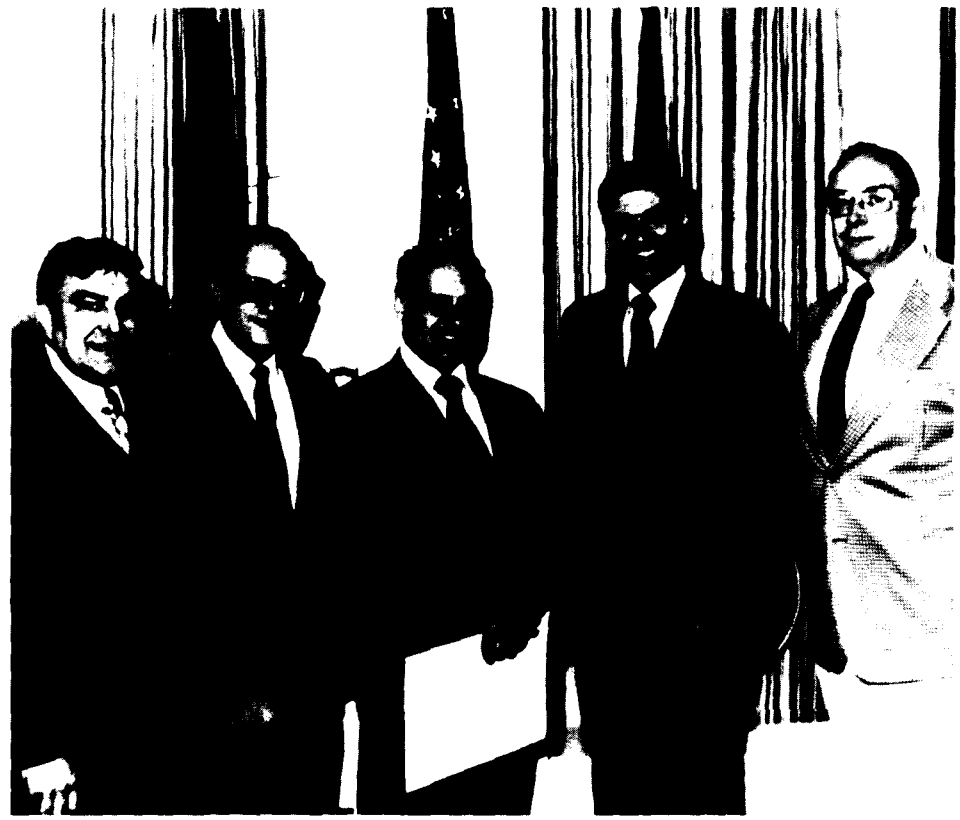
Former Network Director honored with Silver Snoopy Award at special presentation

Astronauts have very busy schedules, whether working in space or on earth. But only astronauts can present the coveted Silver Snoopy Award to distinguished individuals or groups. STS-2 Commander Joe Engle recently adjusted his busy schedule to make a special presentation of the Silver Snoopy Award to Goddard's Dale Call, Network Director (ND), who retired this year after 32 years of government service. Call received the award specifically for his outstanding contributions as ND in support of the Shuttle Program.

"Mr. Call's significant contributions towards making STS successful follow a long string of accomplishments." said Daniel Spintman, Network Operations Division Chief. "During his career, his support of manned flight has spanned from the early days at White Sands, through the pioneering missions of Mercury, Gemini, Apollo, Skylab, ASTP, and now STS."

Presentation of the Silver Snoopy Award started during the Apollo program and was designed and initiated by the astronauts, who wanted to express their appreciation to the support personnel of manned flight missions. Call was presented the award at a special ceremony at NASA Headquarters June 18. He retired from Goddard June 26. The award includes a letter of appreciation from astronaut Joe Engle, a certificate, and his Silver Snoopy.

Above: Retiree Dale Call (1) receives Snoopy Award from astronaut Joe Engle during ceremony at NASA HQ. Below: Others present at the ceremony were, from left: A.T. Dannessa, chairman, Manned Flight Awareness Council; Dan Spintman, division chief, code 850; retiree Dale Call; astronaut Joe Engle; and William Bastedo, HQ manager STDN Program, code TN.



The spotlight will shine on Goddard's manned flight support personnel this fall when the Silver Snoopy Award Program returns. "Snoopy" will fly again when awards will be presented to groups and individuals instrumental in making the Space Shuttle's Orbital Flight Tests (OFT) a success. The last Snoopy Award Ceremony held at Goddard was in 1974 at the end of the Apollo/Soyuz Test Program (ASTP).

Less than two percent of the total support population receive this coveted award, first presented during the Apollo Program by astronauts wanting to express their appreciation to manned flight support personnel. The Silver Snoopy Award is presented to any employee recognized for his or her outstanding contributions to the Manned Flight Program. Its recipients are further honored by having the award presented by astronauts.

For example, Snoopys have been presented to a production line worker who tested the Shuttle's engine valves, an employee who developed a new safety procedure, and a logistics clerk who developed a safer way to package and transport delicate Shuttle parts. At Goddard, awardees might include control center personnel; documentation personnel; station technicians; software programmers; engineers, etc. Anyone can receive the award if they meet the criteria established, according to A. T. Dannessa, chairman of Goddard's Manned Flight Awareness (MFA) Council.

"The performance must be oriented to or pertain directly to flight crew safety or mission success," Dannessa said. "It must be an outstanding performance, and the contribution must be described specifically and not generally."

The Silver Snoopy Awards are part of NASA's Manned Flight Awareness Program and Goddard's MFA Council selects the recipients. Members of the council are: Sandy Morey, Roberta Valonis, Seaton Norman, Henry Iuliano, Ray Mazur, and A. T. Dannessa, all of Goddard; Larry Hare/BFEC and Robert Yost/CSC. Morey will coordinate this year's Silver Snoopy activities.

Once reinstated, the Silver Snoopy Awards will be held annually in support of the many Shuttle flights scheduled for the future. Along with NASA's Launch Honoree Program, Snoopy Awards will continue to instill in all personnel an awareness of their personal responsibility to the success of manned flight.

Wallops launch:

Nike Orion rocket checks earth's upper atmosphere

Goddard launched a two-stage Nike Orion sounding rocket last month from its Wallops Island facility, Wallops Island, Va., to investigate ionization sources in the earth's upper atmosphere during geomagnetic activity.

The rocketborne experiment, second in a series of two, had been postponed daily since June 1, awaiting an intense magnetic storm which usually follows a solar flare. The absence of solar activity precluded one of two scheduled launches last year; however, experimenters were pleased to obtain data during a major magnetic storm from this latest launch. The first experiment was launched on October 14, 1981.

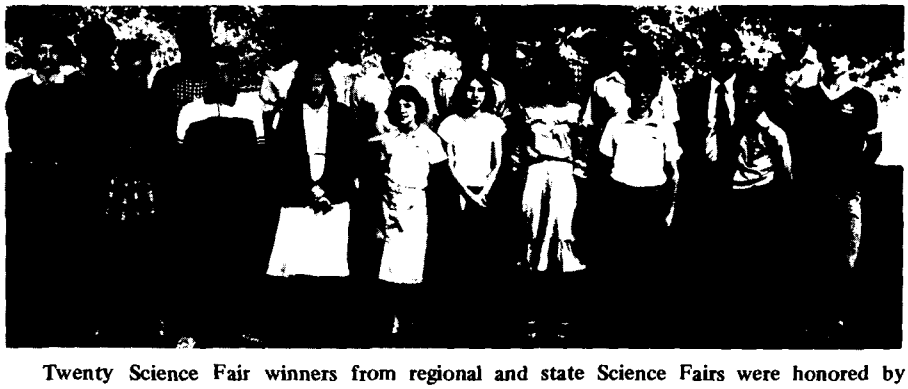
The 110 pound payload reached a peak altitude of 132 statute miles. Preliminary results indicated that all instrumentation performed satisfactorily and good data were obtained. The Nike Orion is a two-stage, solid-propellant, unguided sounding rocket about 30 feet long.

The launching was conducted for the University of Illinois as part of its continuing investigation of energetic particles trapped in the Van Allen radiation belt by the earth's magnetic field, and have gradually flowed into the ionosphere, according to Dr. L. G. Smith, University of Illinois project scientist. "We are not only studying the loss of these particles from the Van Allen belt but also their

Continued to page 8

PEOPLE

Fifteen secretaries and the Payroll Office received awards at the seventh annual Secretaries/Clericals Awards Luncheon held recently. The Payroll Office, selected from among four nominated groups, is the first recipient of a group award in the annual luncheon. The secretarial awardees were selected from 58 nominees of the approximately 470 clericals at Goddard. The secretarial awards consisted of a plaque and a $250.00 check and the Payroll Office received a group certificate and individual checks of $100.00. The awards were presented by Acting Center Director Leslie H. Meredith. Guest speaker for the event was Ann P. Bradley, deputy associate administrator for the Office of Management at NASA HQ, who talked about the vital role of the secretary. Incoming Center Director Dr. Noel W. Hinners was also a guest and he too gave remarks about the important role that clericals play. Left: Secretarial awardees with Acting Center Director Leslie H. Meredith. Right: Payroll Office clerical group awardees.



Twenty Science Fair winners from regional and state Science Fairs were honored by Goddard last month for their space related projects. The winners hailed from Science Fairs held in New York, Maryland, and Pennsylvania. While on center, the honorees heard lectures on the R and D missions of Goddard, on the STS, on Voyager spacecraft's trips to Jupiter and Saturn; and, they toured the center.

Astronauts lend support during STS-4

Two astronauts were at Goddard during STS-4. Above: WJLA reporter Carlos Ramirez (r) interviews astronaut John Fabian, mission specialist for future shuttle flights; Below: Ramirez talks to STS-2 astronaut Dick Truly.

Photo by Pete Baltzell

TAP Graduates

Seven of the 12 graduates from Goddard's Technician Apprenticeship Program (TAP) are shown here. The 12 students graduated from Montgomery Community College June 26, completing the academic phase of their training at Goddard. Sitting (l-r): Sterling Edwards, code 717.2; Jim Phillips, 291; Donna Bailey, 717.2; Steve Lineweaver, 291.3. Standing (l-r): Matt Conway, 291; John Parker, 291.4; and Troy Joyner, 291.3. Not pictured are: Everett King, 291; Kenneth Williams, 291; Richard Fedorchak, 751; Dwayne McCall, 751; and Walter Goodale, 751.

High Speed Photometer arrives

First of five scientific instruments delivered to Goddard

The first of five scientific instruments to be flown on the Space Telescope (ST) arrived at Goddard last month to undergo acceptance testing. The 600-pound High Speed Photometer (HSP), about the size of a phone booth, was delivered to building 7 and placed in the 'clean room'. It will undergo testing for the rest of 1982.

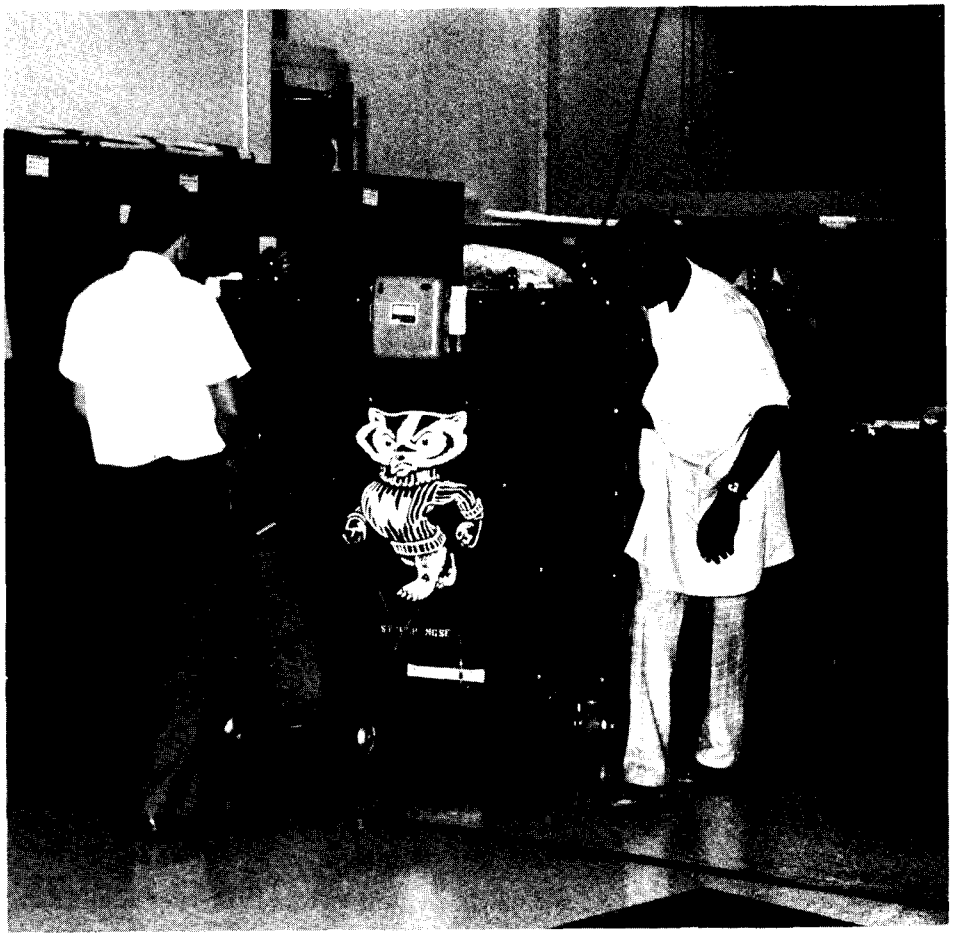
In 1983, the HSP will be joined by the High Resolution Spectrograph, the Faint Object Spectrograph, the Wide Field and Planetary Camera, and the Faint Object Camera for the Verification and Acceptance Program, managed by Goddard's ST Science and Operations Project Office.

The HSP is designed to make photometric measurements at rates as fast as 100,000 times per second in spectral bandpasses from the far-ultraviolet to the red. Such measurements are impossible with ground based telescopes because of the earth's atmosphere. The earth's atmosphere filters out all of the ultraviolet radiation and introduces "noise," or twinkling, which complicates the search for variability on time scales shorter than about one second.

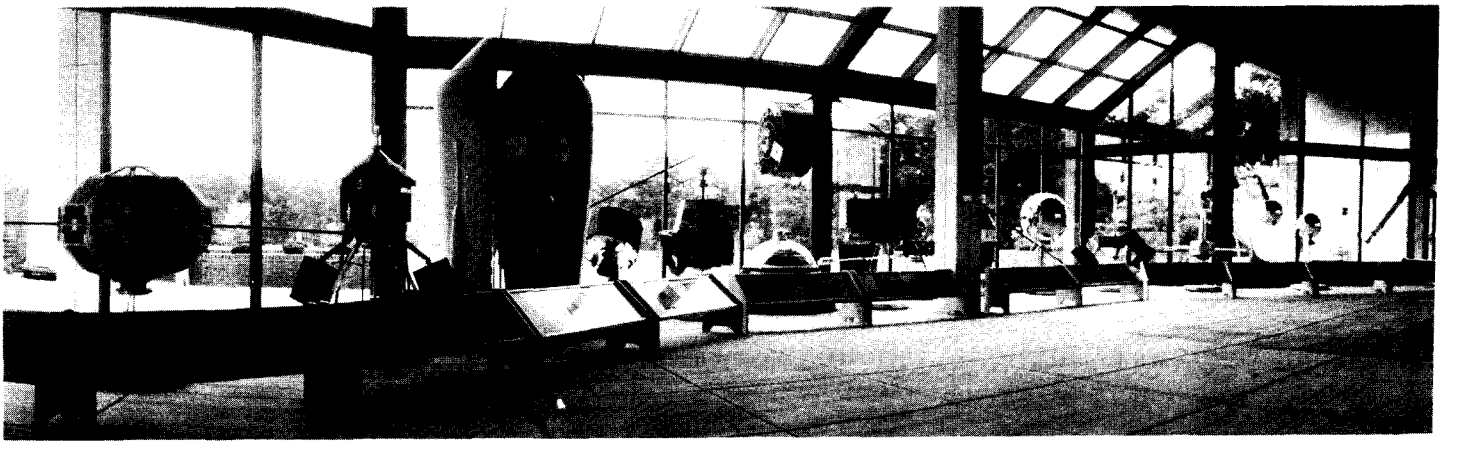
The ST, with its superb optics and stable pointing system, will enable observations to be made of objects like white dwarfs, neutron stars (pulsars), and x-ray binaries, which are among the most intriguing stars in the sky. These measurements should give important clues as to the nature of those objects.

The HSP was designed and built by the University of Wisconsin, Madison, Wisconsin.

Photo by Joe Walters



Code 754 technicians take the Instrument Package (IP) containing the HSP to the clean room. The 600-pound HSP is designed to make photometric measurements at rates as fast as 100,000 times per second in spectral bandpasses from the far-ultraviolet to the red.



Hall of Satellites exhibit 1958-1978

Photo by Randy Frisch

A new exhibit spanning 20 years of satellite technology is on display at Goddard's Visitors Center. The Hall of Satellites exhibit traces the development of satellites from America's first launch, the Explorer I in 1958, to the launch of the International Ultraviolet Explorer (IUE) in 1978. The exhibit is comprised of 19 first and second generation satellites used for meteorological, communications, and scientific research.

In memory

Andy Chi

9-12-20 to 6-19-82

Think about it ...

There are obviously two educations. One should teach us how to make a living and the other how to live. – James Truslow Adams.

HAMs

Continued from page 3

within a 17 minute time span." Bauer added that in times of an actual emergency, it is of utmost importance to keep messages as short and precise as possible.

Thus, the field day test is designed to help HAMs refine operating skills that are vitally needed to efficiently handle messages during an emergency when normal means of communication are unavailable.

The GARC is sponsored by Goddard's Employee Welfare Association (GEWA) and holds meetings on the third Wednesday of each month. All Goddard employees, contractors, and their immediate families are invited to join. For more information, call Bauer on 344-9047.

American Red Cross

Time on your hands?

We could use those hands.

Join us.

A Public Service of The Magazine & The Advertising Council Ad

Wallops launch

Continued from page 5

effects on the ionosphere," Smith said.

The rocketborne experiment was conducted during nighttime conditions because the sun's radiation during daylight would mask the energetic particle precipitation in the E-region.

Personnel for the project included: Dempsey B. Bruton, project engineer; Carl W. Ballance, payload manager; and William L. Lord, test director.

NASA GODDARD NEWS

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Editor: David W. Thomas
Assistant Editor: Traci D. Warnick

Safekeeping:

Breeding ground for safety un-cooperation

It starts with a plant manager whose sole contribution to safety is a gesture of once-a-year attendance at a safety meeting. The occasion may be the presentation of an award or the induction of a new safety committee. His remarks usually stress how important safety is to the company and to himself personally. He may even continue with a recollection of his own harrowing experience in having to inform an employee's wife that her husband was seriously maimed or dead. If the meeting is for the presentation of a safety plaque, the manager usually concludes his remarks by giving full credit for success in safety to the plant committee, the safety director (who usually finds the manager inaccessible), the company physician and hospital staff.

With these various gracious gestures he bows out until next year at the same time. He can now go back to the real business of running his plant: production, quality, costs, scrap control, and other important business. Behind him he has left the safety committeemen cynical and irritated . . . because their suggestions and recommendations on urgent service orders have been ignored by the manager's staff. He leaves a thwarted safety director, who is fully aware of the true situation, and a generally bored group of disinterested onlookers, who have heard the same speech every year. In short, this manager is not sold on the need for an intelligent, dynamic safety program and his attitude is reflected throughout his plant. It results, at all levels, in a complete lack of understanding of safety objectives. This is the breeding ground for lack of cooperation.

Safekeeping is a new column starting with this issue. If you have any articles, suggestions, or tid-bits of information concerning safety, please submit them to the editor of the Goddard News. Increase the Center's safety consciousness and send in your contributions to help Goddard become a safer place to work. This article was submitted by Sharon Garrison, code 200 safety committee member.

NASA
National Aeronautics and Space Administration

GODDARD NEWS

Goddard Space Flight Center Greenbelt, Md. Vol. 29 No. 12 September 24, 1982

Message from the Director

Affirmative Action

NASA's policy on equal employment opportunity is to maintain a strong affirmative action program, to accomplish our technical mission with a fully integrated work force, to prohibit discrimination and to insure full participation of minorities, women and handicapped persons in all Center programs. I am committed to continuing this policy and to ensuring Goddard's full compliance with both the letter and spirit of legal requirements.

I am encouraged by the progress the Center has made in increasing the representation of minorities, women and handicapped individuals in the work force; however, there is still much to be done and much that can be done despite budget restrictions and a reduced personnel ceiling. Particular attention needs to be paid to the placement of minorities, women and handicapped individuals in supervisory and managerial positions and to the achievement of NASA's prescribed hiring goals. I have a personal as well as an official interest in promoting the Center's equal employment opportunity program and urge your commitment and support.

Noel W. Hinners

Noel W. Hinners
Director

Quann named Deputy Director of Goddard

John Quann, former Director of Mission and Data Operations (M&DOD), has been named Deputy Director of Goddard. The appointment was effective September 8.

Quann has served the Center as Director of M&DOD since October 1980. He has a long Goddard history of successive, increasingly responsible positions since 1963.

He was the Data Processing Engineer on the Orbiting Geophysical Observatory Project (OGO) from 1963 to 1967. Then, he was promoted to Head of the Experiment Computation Section where he developed the Data Reduction Laboratory, a facility which enabled the rapid postlaunch analysis of data from scientific experiments.

In 1970, Quann became Head, Data Analysis Branch of the Sciences' Laboratory for Planetary Atmospheres.

John J. Quann

When the Applications Directorate was newly formed in 1974, he was chosen to build and head the Information Extraction Division to develop the computational and analytical expertise required by remote sensing.

In 1978, upon direct request from the Executive Office of the President, the Information Extraction Division under Quann's management, developed the Domestic/Decision Information Display System (DIDS) which produced full color demographic maps of statistical information instantaneously for analysis by the legislative and executive branches of the government. In 1979, Quann received the NASA Medal for Outstanding Leadership for his management and technical direction of the Information Extraction Division.

Peter A. Bracken, Deputy Director of M&DOD, will be acting director of M&DOD.

COBE approved for development funding

The Cosmic Background Explorer satellite (COBE) was approved for development funding by the NASA Administrator, James Beggs, on July 19. The COBE, now planned for launch by the STS in January 1989, will observe the diffuse infrared and microwave background radiation from the primeval explosion that started the expansion of the universe 15 billion years ago. It will cover the wavelength range from 1 micron to 13 mm with three instruments, a Differential Microwave Radiometer (DMR), a Far Infrared Absolute Spectrophotometer (FIRAS), and a Diffuse Infrared Background Experiment (DIRBE). These instruments will also measure radiation from the earliest galaxies, sources in our own Galaxy such as stars, interstellar dust, and electrons, as well as interplanetary dust.

Continued to page 2

Inside

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Reaching into the past

Jim Barrowman: twenty years ago, a Goddard Co-op student, now, manager of the GAS program

JAMES BARROWMAN (1) was a co-op student from the University of Cincinnati in 1962. Here he works out a problem with Oliver Clark, physicist, in the instrumentation branch. At the right Supervisor Arthur White Jr., mechanical engineer, observes. Barrowman was studying aeronautical engineering.

James Barrowman today is Goddard's GAS (GetAway Special) program manager.

Goddard's link with America's colleges dates back 20 years to when the space age opened up a new frontier in the cooperative work-study program between colleges and industry.

In 1962, 23 students from 5 colleges underwent training here in what was then one of newest fields of the work-study program, aero-space technology. They developed as the technology itself developed. They witnessed history being made, and they help make it.

James Barrowman, manager of Goddard's Getaway Special Program, is a prime example of the success of Goddard's cooperative work-study program. In 1962, Barrowman, then a student at the University of Cincinnati, had a co-op at Goddard in the instrumentation branch.

Since that time, Barrowman has become manager of GAS, one of the most unique group of experiments flown on the most advanced space transportation system in the world.

COBE

Continued from page 1

The result of the mission will be a set of sky maps, equivalent to a multicolor photograph of the early universe.

The COBE will be developed in house at Goddard. Roger Mattson (401) is Project Manager. The Science Working Group, appointed in 1976, is composed of R. Weiss (Chairman, MIT), D. Wilkinson (Princeton), G. Smoot (DMR PI, UC Berkeley), S. Gulkis (JPL), and Code 600 - J. Mather (Project Scientist and FIRAS PI, GSFC) and M. Hauser (DIRBE PI, GSFC). Code 700 is building all three instruments, as contractor to the three Principal Investigators, as well as building the spacecraft. The program is a significant challenge and opportunity for Goddard, since the COBE instruments require special infrared, cryogenic, and microwave technology, the spacecraft is 3-axis controlled to spin at 1 RPM rate, and the STS launch system is new.

Great thanks and appreciation are due to the GSFC staff for their continuing support over the past six years of studies. Congratulations!

The buck starts here.

Making a start is probably the most important step toward saving.

There is a way to take the initial step and know you're on the right track toward a regular, scheduled savings. Just join the Payroll Savings Plan at work. A little is taken out of each paycheck toward the purchase of U.S. Savings Bonds. You don't have to worry about making a special effort to put something aside each payday. It's all done for you. Automatically.

The bucks start piling up, the interest grows, and you realize you've found one surefire way to save.

Spotlight

meet Darlene Brummell, code 271.4 recent grad is architect in FED

Only two weeks are needed to become a certified bartender. But much more time is needed to become qualified to work on Goddard's architectural team, and 25 year old Darlene Brummell, code 271.4, knows the difference indeed.

Not only can Brummell draft plans for a prospective building, but she can mix your favorite drink. You name it, she can make it.

As one of the most recent additions to the Facilities Engineering Division (FED), Brummell also mixes her talents at the drafting table, where she combines her ideas into a comprehensive architectural plan, eventually to be used as a guide for erecting a building, or for a renovation project.

Brummell, a 1982 spring graduate of Howard University, acquired bartending skills to help defray college expenses. At the same time she acquired a degree in architecture, and prepared for her current job as an architect.

She began preparing with her first co-op at Wallops as an electrical engineer in telecommunications. That co-op did not "hit the spot," according to Brummell, but it did have its benefits.

"One of the major advantages of the co-op experience is that it gives you a chance to float around," she said. "It enables you to experience a particular area of interest without really making a long term commitment."

It was the second co-op at Wallops that formally introduced Brummell to drafting. As a student trainee in architecture in the FED, she learned and developed basic drafting techniques. At the time, she was enrolled at Maryland Eastern Shore College and had not made definite commitments to a particular curriculum.

After transferring from Maryland Eastern Shore and joining Howard's architectural program, Brummell had her first co-op at Goddard in the FED where she continued her work in drafting and also worked on minor renovations. She completed three co-ops at Goddard before graduating.

Each co-op was a progressive step for Brummell, gaining more responsibilities and learning more about her prospective career with each assignment.

"When I first started, I was usually assisting someone else with their project. But with each additional co-op, I had more responsibility. I started with learning basic drafting skills and progressed to field investigations and troubleshooting within the work request system, and was eventually assigned as project engineer," Brummell said.

As a co-op, Brummell assisted in drafting plans for the Salt Dome near the Mobile Shelter and the Landsat-D building, both on Center. Other assignments have been the renovation of the snack bar in building 14 and solving a drainage problem in the inflatable structure (the bubble) near building 20.

In the future, Brummell anticipates heading a design team for a proposed Goddard Employee Welfare Association (GEWA) gymnasium. She said that she looks forward to this because if approved it could be a major accomplishment for her.

Brummell said that she really enjoys her work because of her genuine interest in architecture. According to her, the most challenging task is learning the procedural system.

"Once you learn the work request system, it's not too difficult," she said," and you have to be able to interface with the users, the contractors, and the supervisors."

According to Brummell's supervisor, Will Bullock, she is learning the system very well because "she does very good work. . ."

Brummell's work reflects a fine blend of talent. From the concept to the planning and design, on to the eventual construction or renovation of a building, Brummell combines many skills to complete a project. Presently, she hopes to develop proficient managerial skills so that one day she can mix other people's talents as well.

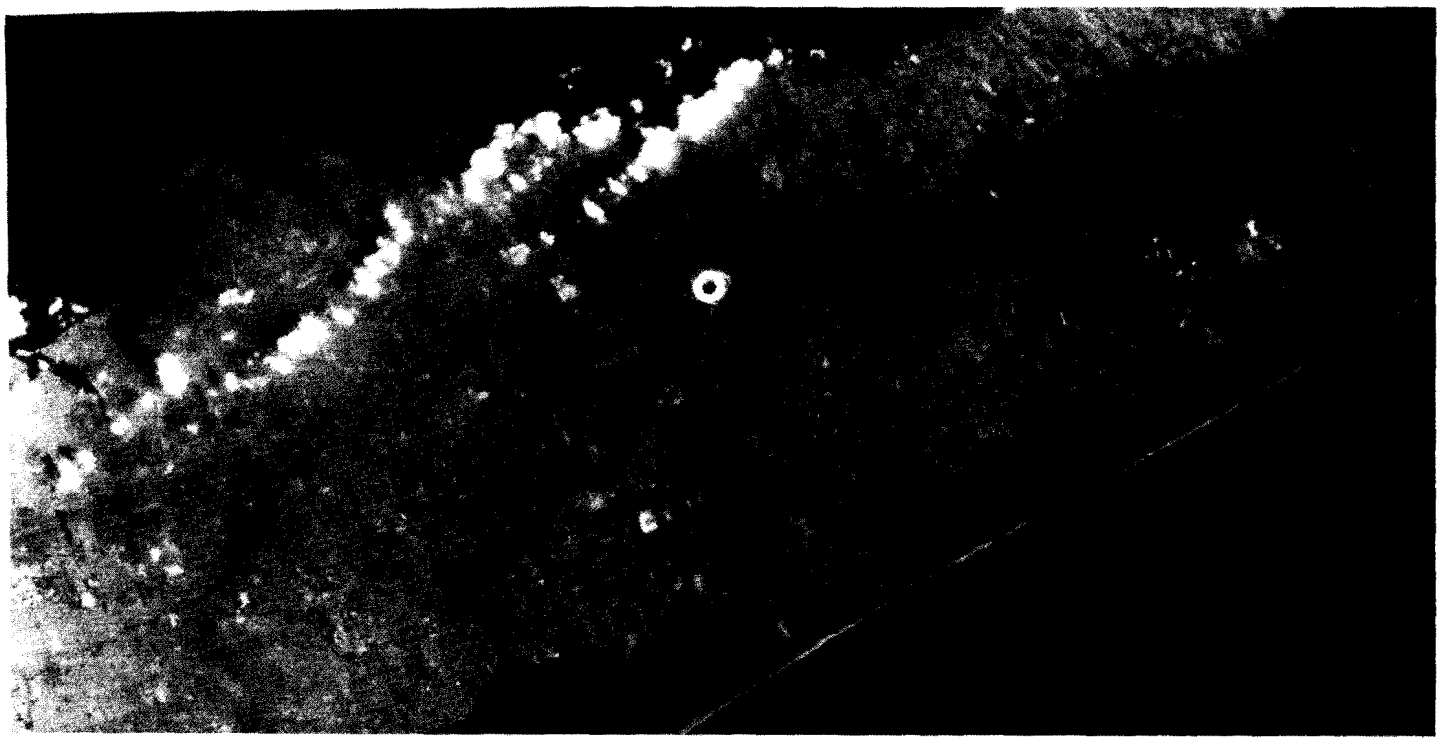
Darlene Brummell
recent addition to FED

Photo by Joe Walters

This is the first multispectral scanner image from the Landsat-4 spacecraft. The Landsat-4 multispectral scanner was successfully activated on July 19 during a pass over New York City. The resultant 185 kilometer by 185 km (115 by 115 mile) image is a false color composite of three individual images from detectors in the green, red and infrared portions of the spectrum.

The Landsat-4 multispectral scanner, like its predecessors on Landsat 1, 2 and 3, has an approximately one acre (80 by 80 meters) resolution. The Verrazano Narrows Bridge which has even smaller dimensions is clearly visible across the New York Bay because of its high contrast with the water. Also visible, toward the eastern end of Long Island, is a 5,000 foot diameter construction site for a new high energy physics research facility at the Department of Energy's Brookhaven National Laboratory. The Laboratory, located in Upton, New York, will use the site for the new ISABELLE particle accelerator, to be completed in 1988.

Successful Landsat-4 multispectral scanner operations will provide data continuity for a worldwide body of civil remote sensing data users beyond the aging multispectral scanner instrument on Landsat-3. Landsat-4 was launched July 16, from Vandenberg Air Force Base, California.



Above: An enlarged photo of the Long Island strip enables a better look at the MSS image of the 5,000 diameter construction site. Below is an aerial view of the construction site for ISABELLE, a particle accelerator to be completed in 1988.

Hispanic Heritage Week September 13-19

Director's comment

National Hispanic Heritage Week was observed this year by the Federal government from September 13 through September 19. This annual observance is the result of a joint resolution passed by the Congress which authorized and requested the President to proclaim the week which includes September 15 and 16 as National Hispanic Heritage Week.

Hispanic men and women have made historic and continuing contributions to the social, economic and cultural growth of our Nation. Their accomplishments in science, technology and the arts have greatly enhanced the American way of life. As in earlier decades, the 1980s present Hispanic Americans new opportunities to pursue their goals and continue to advance our society. Goddard observed National Hispanic Heritage Week with the following activities:

Monday, September 13 — Film — Our Hispanic Heritage was shown on TV monitors in cafeterias 1 & 21 and Building 8.

Tuesday, September 14 — Visit of Dr. Juan A. Bonnet, Jr., Director, Center for Energy and Environmental Research, 2-4:30 pm.

Tuesday & Wednesday, September 14 & 15 — Cultural Exhibit, Lobby, Building 1

Thursday, September 16 — Hispanic Menu, cafeteria 21

Noel W. Hinners

Noel W. Hinners
Director

Photo by Debora McCallum

From left to right: Front row: Madeline J. Butler, Hispanic Employment Program Manager (Code 854.4), Marita Llaverias (Code 221), Orlando Figueroa (Code 713.1), Patrice Sine (Code 913), Regina Sylto (Code 931.2), Jorge Balma (Code 292.1); Second row: Pedro Alea (Code 754.1), Gilberto Colon (Code 713.3), Marcos Toral (Code 727.1) and Jose Lugo (Code 841.2).

Hispanic is defined as "Pertaining to Spain and its language, people and culture; having cultured origin in Iberia."

There are 19 countries in which Spanish is the main language. These countries were discovered and colonized by Spain during the 15th and 16th centuries and have since then obtained their independence, all except Puerto Rico, which maintains a commonwealth relationship with the United States of America.

The Spanish language is spoken by more than 200 million persons around the world, mostly in Spain and Latin America. In the United States, there is a good representation of Hispanics. They are mostly located in California, New Mexico, Texas, Florida and New York.

Join us.
American Red Cross
Together, we can change things.

PEOPLE

Photo by Joe Walters

Center Director Noel W. Hinners accepts a plaque on behalf of the Goddard Running Club from Jim Hirshman, President-Elect of the American Heart Association of Southern Maryland. Goddard's team collected $1,524 in pledges in the 1982 Blake Heart Run for Life, a 10 kilometer race to benefit the American Heart Association. From left: Emil Kirwan, Gincy Stezar, Jim Hirshman, Dr. Hinners, and Jane Jellison.

Dukes receives 50 year service award

Photo by Margie Small

Wallops Flight Facility employee John P. Dukes Jr. receives a 50 year service award from Management Operations Director Benita A. Sidwell. Dukes is a Communications Specialist in the Mechanical/Electrical Services Section, Plant and Operations Maintenance Branch.

Summer at Goddard means OJT for students

At left from top: 1982 Summer High School Apprenticeship Research Program (SHARP) students with coordinator Ann Pratt. Middle: Summer Institute in Computer Applications (SICA) students from Bowie State College along with Dr. Carl Kirksey of Bowie and Jim Chapman, Goddard's Equal Opportunity Specialist. Bottom: Recruitment into Engineering of High Ability Minority and Female Students (REHAMFS) along with Equal Opportunity Specialist Jim Chapman.

These programs offer on-the-job training for students in the areas of computer applications, engineering, science, and many other complex technical/professional occupations.

The photo at the bottom shows a former SHARP student bidding farewell to Goddard's SHARP coordinator. Michelle Barrett (r) is now a student at Virginia Polytechnic Institute and Ann Pratt, SHARP coordinator, has taken a teaching job in North Carolina.

Goddard runners speed to victory

Goddard runners won trophies for speed and fundraising at the 1982 "Blake Heart Run for Life"—a 10-kilometer race to benefit the American Heart Association. Twenty-five entrants from Goddard's Running and Orienteering Club (GROC) collected $1,524 in pledges from their fellow workers to make Goddard's team one of only three corporate teams in the Washington Metropolitan Area to earn a First Division Award—the highest fundraising honor offered by the American Heart Association in this event. In addition, Goddard's women's team sped to victory in the women's team competition. Goddard's two men's teams finished second and sixth out of 42 teams in the open category (men only or men and women team members).

Nelda Casper (formerly with Code 310), the ninth woman to finish the race, led Goddard's championship women's team with a time of 42.3 minutes. Dorothea Nase (Code 964), running in her first 10-kilometer race, finished tenth. Other members of the winning team were Claire Parkinson (912), Gincy Stezar (205), Bev Hartline (924), and Dawn Elliott (140).

Ned Poffenberger (Bendix) placed second in the overall competition with a time of 31.8 minutes. Goddard runners and joggers may remember Ned. He habitually sets the pace for the NASA 2-mile Fun Run, held at Goddard every spring and fall. Ed Boggess (581.2) placed eleventh. Other members of Goddard's second-place men's team were Tom Nolan (872), Chuck Naegeli (732), Ken Brown (972), Ray Hartenstein (730), Bob Phillips (284.3), Richie Weiss (405), and Dan Mandl (511). The sixth place team consisted of Larry Tabachnick (200.5), John Parker (291.4), Dick Backe (310.1), Ed Fung (734), Emil Kirwan (823), Mike Markus (914), Brian Schmidt (914), Mark Stauffer (923), Mike McGlynn (former contractor), and Bob Rosenberg (911)

NASA
GODDARD NEWS

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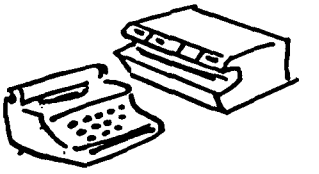
Editor: David W. Thomas
Assistant Editor: Traci D. Warnick

Safekeeping

Machines save muscle power--but people provide the "brain-power."

IT'S UP TO YOU TO MAKE A MACHINE A SAFE CO-WORKER

Sooo--



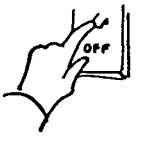
1 KNOW-HOW

Read instructions or listen to them carefully. Never use machines you don't know how to operate.

2 BE SURE MECHANICAL GUARDS ARE IN PLACE

everytime you use a machine. If you remove a guard temporarily be sure to replace it before you turn on the switch.

3 TURN MACHINES OFF



while adjusting them, before applying flammable solutions (if you must use them), and whenever you leave a machine even for a minute.

4 BE ALERT FOR ELECTRICAL HAZARDS

Current can kill. If a machine overheats, smokes or sparks, or you feel even a slight shock, unplug it and call a serviceman.

5 WATCH YOUR CLOTHES

Loose sleeves, scarves, hair, belts, dangling jewelry, ties and key chains, are dangerous around machines with moving parts.

6 CHECK MACHINE POSITION BEFORE USE--

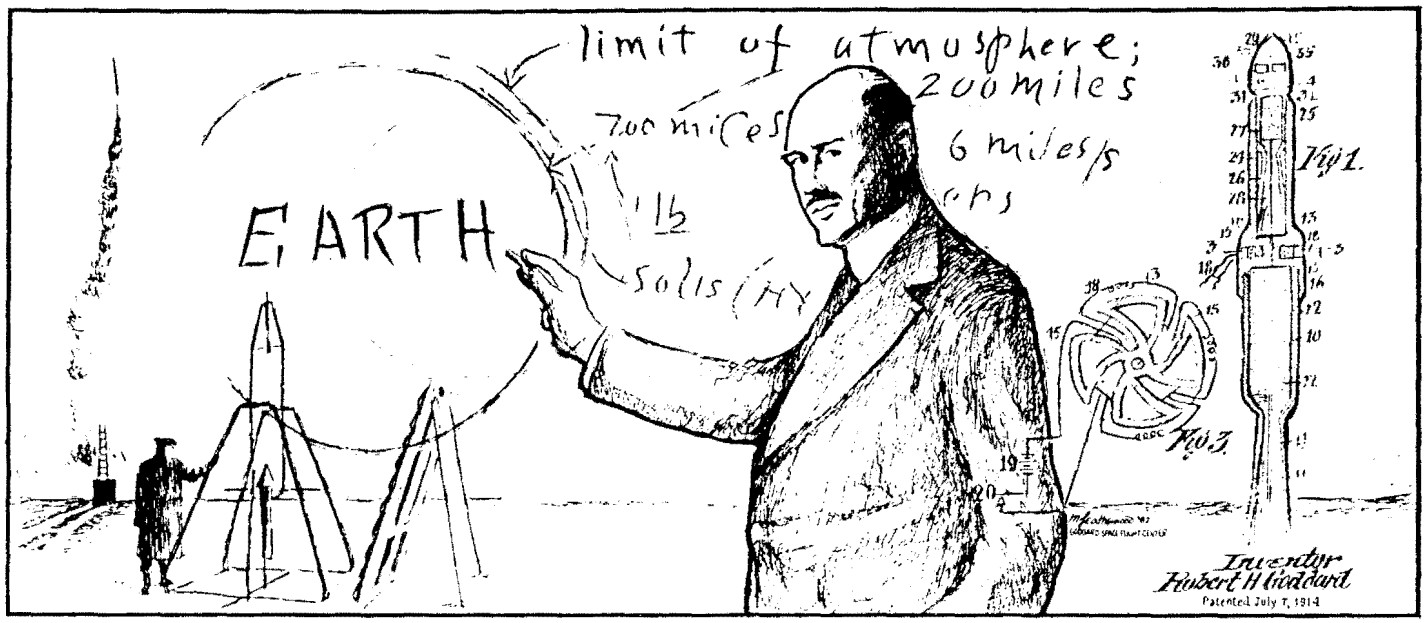
see that typewriters, duplicators and adding machines are firmly on the working surface.

NASA
National Aeronautics and Space Administration

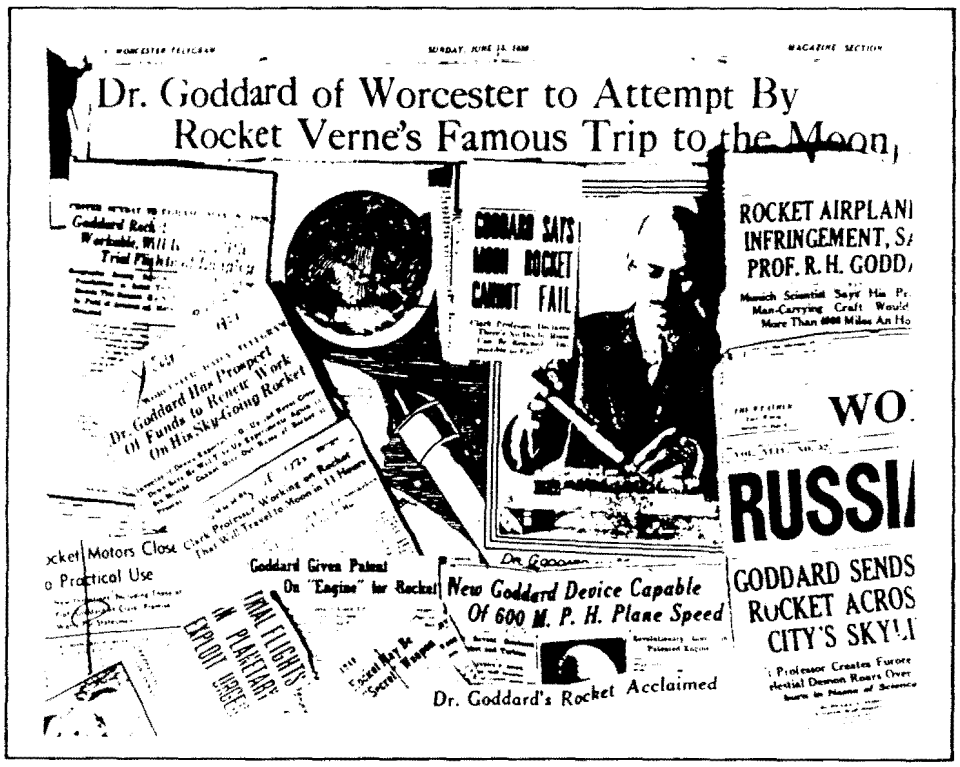
GODDARD NEWS

Goddard Space Flight Center Greenbelt, Md. Vol. 29 No. 13 October 5, 1982

Special Edition: A Tribute To Dr. Goddard's 100th Birthday Anniversary



A Dream becomes Reality



Dr. Robert H. Goddard
1882 - 1945

It is difficult to say what is impossible, for the dream of yesterday is the hope of today and the reality of tomorrow.—

Dr. Robert H. Goddard
1882 - 1945

The historical traditions of the Goddard Space Flight Center have antecedents in a period long before America's awakening to the Space Age. Named in honor of Dr. Robert H. Goddard, the Center continues in the scientific tradition of this New England scientist, who has been recognized not only as the "Father of American Rocketry" but also as one of the pioneers in the theory of space exploration.

Dr. Goddard was one of those rare combinations occasionally appearing in the history of science and technology: he was a theoretical scientist and a practical and exacting engineer, but he was also a dreamer who was considerably ahead of his time. His particular dream was the scientific conquest of the upper atmosphere and ultimately of the void of space through the use of rocket propulsion. To the fulfillment of this dream Dr. Goddard devoted his talents, his energies, and his life. He had the drive and single-mindedness found among those who today are probing the innermost secrets of the space environment.

The Life of Dr. Goddard

Robert Hutchings Goddard was born in Worcester, Massachusetts, on October 5, 1882. Childhood illnesses prevented the young boy from expressing his energy in the usual boyish activities. As a consequence, he developed his imagination and read voraciously. He was greatly influenced by H. G. Wells' *War of the Worlds*. Jules Verne's [illegible] stimulated his imagination. [illegible] known to have read [illegible] *From the Earth to the Moon*, [illegible] to have rewritten [illegible] ending instead of [illegible] [illegible] the marvels of electricity. This was the situation when, on the afternoon of October 19, 1899, he found himself high in a cherry tree, assigned the duty of clipping its dead limbs. It was, he said, "one of those quiet, colorful afternoons of sheer beauty which we have in October in New England. . . as I looked toward the fields to the east, I imagined how wonderful it would be to make some device which had even the *possibility* of ascending to Mars, and how it would look on a small scale if sent up from the meadow at my feet. . . I was a different boy when I descended the ladder. Life now had a purpose for me."

The young Robert Goddard began to construct models of his own design and devoted himself, in high school, to the study of physics and mathematics. By the time he graduated, he had, he said, "a set of models which would not work and a number of suggestions which, from the physics I had learned, I knew were erroneous." He gathered up all his models and his carefully catalogued notes, and burned them.

"But the dream would not go down," wrote Dr. Goddard [illegible] years later. "Inside of two months [illegible] I caught myself making [illegible] suggestions, for even though I [illegible] myself that the [illegible] impossible, there was some [illegible] which simply would not [illegible]." As early as 1909 Goddard [illegible] multiple-stage rocket, the [illegible] theory of hydrogen and oxygen [illegible] propulsion, and the use of [illegible] structure for rocket guidance.

By this time Goddard had graduated from Worcester Polytechnic Institute with a B.S. holding high honors in physics and mathematics. All through college the young scientist had been absorbed by his obsession with propulsion. [illegible] the contrails [illegible] the tales [illegible] the Worcester Polytechnic [illegible] physics [illegible] the results of static tests [illegible] rocket [illegible]

The years between graduation from Worcester Polytechnic Institute and 1919 were full and arduous ones for Goddard. He stayed on at Worcester as an instructor in physics while doing graduate work at Clark University, where he received his A.M. in 1910 and his Ph.D. in physics in 1911. He spent a year at Clark as an honorary fellow in physics, where he worked on various rocket methods. In 1912 he went to Princeton as a research fellow and worked on electrical theory, the subject of his Ph.D. dissertation, during the day and on rocket propulsion theory during the evenings. Through 1913 - 1914 illness prevented him from teaching but did not hinder his speculations on rocketry. In fact, during his [illegible] Dr. Goddard laid the [illegible] patents, receiv[illegible] veloped his ide[illegible] and liquid pro[illegible]

In the autum[illegible] returned to Cla[illegible] tor and bega[illegible] which led [illegible] Smithsonian [illegible] this period that [illegible] static laboratory [illegible] perform [illegible] capable of [illegible] middle of 1916 [illegible] of what he could accomplish [illegible] funds. He wrote an [illegible] titled "The Man[illegible] Reaching Extreme Altitudes" [illegible] to three organizations [illegible] might be interested enough [illegible] financially. The only encouraging reply he received was from the Smithsonian Institution, which was looking for a very high altitude device to extend meteorological research and asked for further details. This was in December 1916. After receiving the Smithsonian's recommendation for his work, Dr. Goddard [illegible] $5,000 to continue his [illegible] the next letter from Wash[illegible] $5,000 and [illegible] $1,000.

Continued on page [illegible]

Dr. Goddard with his rocket in his workshop at Roswell, New Mexico, October 1935.

Dr. Goddard

Continued from previous page

Thus began, in January 1917, the years of experimentation which Dr. Goddard continued unceasingly for the remainder of his life. When the United States entered World War I in 1917, he volunteered to direct his rocket research toward ends which might prove useful to the military. This work led to the development of a solid-fuel prototype that became the World War II "bazooka;" however, the war ended five days after he demonstrated it. During World War II, Dr. Goddard's invention was to be "dusted off" by his colleague, Dr. Clarence N. Hickman, and was perfected to provide the American soldier with the first effective hand weapon against the tank.

After returning to Clark in 1919, Dr. Goddard persuaded the Smithsonian to publish his revised "Method of Reaching Extreme Altitudes" – a rather dry and factual report on his experiments during the preceding several years which had been designed to show the Smithsonian where its money was going. The Smithsonian agreed, provided the cost of publication came from the $5,000 grant to Goddard. The study was released on January 11, 1920, as Smithsonian Miscellaneous Publication Number 2540. In this publication, Dr. Goddard mildly referred to the space potential of rocket thrust and suggested the possibility that someday a rocket such as the one he was designing might be used to hit the moon. The newspapers picked up the story, some portrayed him as a crackpot, others as an amateur who did not know that reactive thrust would not work in a vacuum. This adverse publicity had a deep and lasting effect on Dr. Goddard. From that day forward, he rarely spoke of anything which might pertain to space flight, and he avoided publicity for himself and his work. In private, however, he continued to speculate on the possibilities of the rocket in space, on possible manned and unmanned missions, on methods of navigating in space, and on the potentialities of a solar-powered engine. All this he kept locked away in a cabinet in a folder marked "Formulae for Silvering Mirrors."

Continued on page 6