

Browning manages Goddard's Space Station Program

Ronald K. Browning has been named Deputy Director for Space Station, Flight Projects Directorate.

In his new position, Browning will manage the Goddard Space Station effort. The Center will be responsible for definition of the automated free-flying platforms which are part of the overall Space Station program. Goddard also is responsible for provisions to service, maintain and repair these platforms as well as other free-flying spacecraft. Additionally, Goddard will define the provisions for instruments and payloads to be attached externally to the pressurized sections of the Space Station and will be responsible for definition of the pressurized modules as a laboratory.

As Deputy Director for Space Station, Browning brings experience and knowledge of a variety of space missions: from Explorers to Shuttle delivery.

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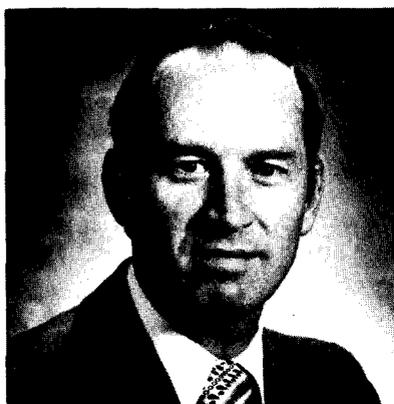
Joe Walters photo

STS 41-D SCRUBBED - The billboard tells the story here as Joni Shipp and Darlene Ahalt (both of code 130) provide the launch delay information on the Orbiter Discovery's maiden flight. The launch was aborted twice in as many days. First (June 25), because of a failed backup computer aboard Discovery; and the next day when computers automatically shut down the three main engines because of an apparent fuel flow problem.

Goddard spacecraft arrive at Kennedy; AMPTE, Spartan readied for launch

Two Goddard spacecraft—AMPTE and Spartan—have arrived at the Kennedy Space Center where AMPTE will be launched aboard a Delta in August and Spartan will go aboard the Space Shuttle at a time still indefinite as Goddard News goes to press.

In the first project—in support of the Active Magnetospheric Particle Tracer Explorers (AMPTE) program—a single Delta launch vehicle will carry three satellites into orbit to study forces within the magnetosphere. (This region covers from 400 to several thousand miles above the Earth's surface and is filled with charged particles trapped and dominated by the Earth's magnetic field.)



Gilbert W. Ousley
AMPTE Project Manager

This international experiment involves one satellite each from the United States, the Federal Republic of Germany and the United Kingdom. After the German satellite has injected lithium and barium ions (electrically-charged group of atoms or molecules) inside and outside of the magnetosphere, the two sister satellites will measure and monitor the results.

Some questions which AMPTE hopes to answer are how much and

where the solar wind enters the magnetosphere and how it circulates and energizes.

The AMPTE project manager at Goddard is Gilbert W. Ousley.

In the second project the space shuttle will deploy GSFC's Special Projects Division Spartan 1 spacecraft from its cargo bay in a mission to scan the direction and sources of X-rays in outer space.

Known as an autonomous subsatellite, Spartan 1 will be deployed from and retrieved by the shuttle in a mission that will offer a 40-hour view of the heavens, as opposed to a "snapshot" glimpse offered by sounding rockets. This long-duration look will allow astronomers to map X-rays emitted from clusters of galaxies, including our own Milky Way.

The Spartan had been scheduled for launch August 29. That schedule will be delayed, however, because of the delay in the launch of STS 41-D in June when an apparent fuel flow problem caused computers to shut down the orbiter's three main engines and the mission to be aborted. Goddard's Spartan project manager is Dave Shrewsberry.



Dave Shrewsberry
Spartan Project Manager

NOAA-8 spacecraft develops problems

The NOAA-8 environmental monitoring satellite appears to have lost its attitude control system and is tumbling through space unable to relay its signals effectively to Earth, officials at the National Oceanic and Atmospheric Administration (NOAA) and NASA announced July 3.

The satellite, the first in a series of three Advanced TIROS-N (ATN), began showing some problem June 12, according to Charles E. Thienel, Deputy Metsat Project Manager at Goddard. At that time, he explained, the spacecraft experienced a "clock interrupt" that caused the spacecraft's gyros to desynchronize. Continued clock perturbations interfered with the meteorological instruments, preventing scientists and engineers from obtaining "good" data.

"We really haven't had any good data since June 13," Thienel said.

Over the weekend of June 30-July 1, he continued, the situation deteriorated so badly that conditions affected the satellite's attitude control system to the extent that the spacecraft began tumbling.

While engineers at NOAA, NASA and RCA, which built the spacecraft, have not given up hope for recovering the spacecraft, they are pessimistic about their chances.

Among the problems they face is that the spacecraft has no fuel. Nitrogen that normally would be available for trying to stabilize the spacecraft was used shortly after the spacecraft was launched from the Vandenberg Air Force Base Western Test Range in California on March 28, 1983.

Following what appeared to have been a successful launch, the satellite started tumbling when it reached orbital altitude of 470 nautical miles. On April 2, 1983, the engineers stabilized the spacecraft.

Launched aboard an Atlas E launch vehicle, the 3,775-pound satellite is equipped with six environmental monitoring instruments and a search and rescue experiment. Failure of the spacecraft will result in the loss of the search and rescue capability, which permits the satellite to pick up emergency

Scientist to serve as shuttle payload specialist for astronomy mission series in 1986

A scientist who works at Goddard is one of three who were selected last month to train as payload specialists for a series of astronomy missions scheduled for the Shuttle, beginning in March 1986.

The mission series, called Astro, will use major elements of Spacelab, a Shuttle-based research facility.



Dr. Ronald A. Parise
Payload Specialist

Dr. Ronald A. Parise, manager of the Advanced Astronomy Section, Computer Sciences Corporation, Silver Spring, Md., has been involved in flight software development, electronic system design, and mission planning activities for the Ultraviolet Imaging Telescope (UIT). The other two scientists are Dr. Samuel T. Durrance of the Johns Hopkins University, Baltimore, Md., and Dr. Kenneth H. Nordsieck of the University of Wisconsin, Madison.

"They (payload specialists) will be the on-orbit experts for the instruments they have helped develop these several

signals from downed aircraft and ships in distress, Thienel said. However, much of the environmental monitoring that would be lost by NOAA-8's failure will be conducted by NOAA-6, which is still in operation. NOAA-6 was launched June 27, 1979.

Engineers are analyzing the difficulty, Thienel explained, and hope to correct the problem before the launch of the next advanced TIROS-N, known as NOAA-F, now scheduled for October 23, 1984.

years," explained Goddard's Astro mission scientist Dr. Ted Gull. "The astronomical observations will be a team effort on orbit between the payload specialists who know the instruments well and the astronaut mission specialists who know the Shuttle operations. The payload specialists also will coordinate closely with the instrument teams on the ground at a payload operations control center."

The UIT was built and designed by Goddard and will be flown along with two other specifically-built ultraviolet astronomical instruments on the Astro series of Shuttle missions.

Astro consists of three specially designed ultraviolet telescopes that will be used to study stars and galaxies in ultraviolet light. A pair of visible-light cameras have been added to the payload to study Halley's Comet during the first flight. Goddard's Halley team is composed of Dr. John Brandt, Laboratory for Astronomy and Solar Physics (LASP); Dr. Malcolm Neidner, LASP, and Dr. Bertram Donn, Laboratory for Extraterrestrial Physics.

The UIT is designed to obtain and record on film, images of faint astronomical objects. Its 15-inch diameter telescope and image-intensifiers will permit ultraviolet photography of objects with a resolution and field-of-view comparable to that attainable at visible wavelengths with large ground-based telescopes.

The other two instruments are the Hopkins Ultraviolet Telescope, which is designed to record the far ultraviolet spectra from very faint cosmic sources, and the Wisconsin Ultraviolet Photopolarimetry Experiment, which will make simultaneous observations of the spectrum and polarization of light from stars.

The Astro mission will use a pair of Spacelab pallets and the Spacelab Instrument Pointing System. Spacelab subsystems will be carried in a pressurized container called an igloo, and the crew will operate the instruments from the aft flight deck of the Shuttle. Spacelab is a modular, reusable Shuttle-based laboratory system developed for NASA by the European Space Agency.

Goddard team completes Space Telescope testing

A NASA-industry team at Goddard has completed testing on the Space Telescope Scientific Instrument Command and Data Handling (SI C&DH) subsystem and shipped it to the Lockheed Missiles and Space Company in Sunnyvale, Calif., for integration into the telescope assembly.

The shipment on June 27 marked a major milestone in the Space Telescope program, according to Tom LaVigna, the Verification and Acceptance Program manager at Goddard, in that the equipment is the first flight subsystem to be delivered to Lockheed by an associate. The SI C&DH was built by Fairchild Space Company with IBM supplying the NASA standard computer and the flight software.

The subsystem had operated more than 11 months in supporting the Verification and Acceptance Program at Goddard with no significant problem or anomaly during an estimated run time in excess of 3,000 hours.

The subsystem provides a general computer facility for the five instruments on Space Telescope as well as command storage, housekeeping telemetry and a 1.024 megabit (high rate) data link.

Before shipment, the subsystem, approximately 1 by 2 by 3 feet in size, and 135 pounds in weight, successfully completed a vacuum thermal test and some rework to resolve a particle problem found in computer memories on the Space Shuttle.

The subsystem and the first of five Space Telescope instruments arrived at Goddard in March, 1983 under the Verification and Acceptance Program (VAP). The tests verified that the instruments, both alone and all five together, will work with the SI C&DH system, which controls the instrument's operations and return of data. The tests simulated typical orbital operations for scientific observations and verified all flight software.

NASA starts "Operation Liftoff"

A new educational program known as Operation Liftoff has been launched by NASA to encourage pupils in the nation's 75,000 elementary schools to take greater interest in mathematics and science.

The program, to cost an estimated \$3 to \$5 million over three years, was announced by President Ronald Reagan recently during ceremonies dedicating a new building at the National Geographic Society.

"For more than 25 years, NASA has pioneered on the cutting edge of science and technology and has stimulated our young people to strive for excellence in all they do," the President said.

"Now NASA, in cooperation with the private sector, will expand its educational outreach program to our very young people. . . throughout the country. NASA will be able to share its engineering know-how and scientific discoveries and sow the seeds of future progress by stimulating our young people to study science and engineering," he continued.

"We call this new program Operation Liftoff," the President said, "and it will incorporate such advanced instructional tools as computer software, laser disks and audiovisual materials"

"It also will involve private enterprise," he continued. "I have asked NASA to reinforce its ties with the aerospace industry and with private citizens' groups to expand this effort to the fullest."

In that connection, the President said, he was pleased to learn of efforts of the National Space Institute to develop and support a new national Young Astronauts program, designed to involve young Americans more directly in "our space program."

The organization will be for boys and girls ages 6 to 12 and will be nationwide in scope.

The National Space Institute is a non-profit organization founded in 1974 by space pioneer and former NASA official Dr. Wernher von Braun. Its headquarters are in Washington, D.C.

Codes consolidated: 600 combined with 900, 500 merged with 800

The Sciences (Code 600) and Applications Directorates (Code 900) have been combined to form the Space and Earth Sciences Directorate. Center Director Noel W. Hinnners said the move will "enhance our ability to interface more effectively and efficiently with NASA HQ, whose organizational structure is comparable. The combined organization is designed to react more expeditiously and to produce a better end-product. Further, within the organizations there are some similarities, such as the computer capabilities, which, when combined, can better serve the total user community."

Dr. Franklin D. Martin, formerly Sciences Director will be the Director of the Space and Earth Sciences.

The 600/900 merger preceded the recent announcement of the consolidation of two other directorates, the Networks and Mission and Data Operations Directorates, codes 800 and 500 respectively. This new directorate is called Mission Operations and Data Systems.

Keep us informed

The editor is seeking help from the Goddard family to keep him informed of recent deaths of fellow co-workers or retirees. Please send your notices to: Editor, Goddard News, Public Affairs Office, Code 130.

Telescope _____

In addition, Goddard engineers tested each instrument's alignment with the Space Telescope's focal plan.

The VAP program was completed 10 days ahead of schedule, LaVigna reported, "in large part to the effective cooperation of the industry and government team consisting of 12 contract organizations and Goddard."

AAAS announces third Science Photo Contest

The American Association for the Advancement of Science (AAAS) has announced the Third Annual Science Photography Contest.

Awards will be given for photographs that stimulate curiosity about some aspect of the world we live in, that celebrate its beauty, or that help explain how it works. Judging criteria for the awards include subject interest, aesthetic quality, and technical excellence or difficulty.

First place prizes of \$1,000 each will be awarded in three categories: the Physical World, the Living World, and Synthetic Images (SEMs, digital images, and non-conventional imaging systems). Honorable mention photographs will receive \$100. Entries can be in either black-and-white or color.

Student entries are encouraged and will be judged separately. Winners will receive certificates and a \$100 prize. A selection of the winning photographs will be published in the June issue of *SCIENCE 85* and exhibited at the AAAS Annual Meeting in Los Angeles in May 1985 and at other sites around the United States.

The contest is open to everyone except employees of the AAAS and their relatives. There is a \$5 entry fee per contestant, except for the student category for which there is no entry fee. The student category is open to students of high school age or younger. Entries must be postmarked no later than 1 December 1984 and cannot have been previously published in any medium intended for the general public.

Entry forms will be available in Fall issues of *SCIENCE 84*, or by calling (202) 842-9581.

Correction

The late Marilyn J. Fowler, formerly chief nurse of Goddard's Health Unit, was reported as Marilyn J. Flowers in her obituary in the last issue of the Goddard News.

Summer Institute for junior high girls begins

Thirty girls from local junior high schools will spend six hours a week at Goddard this summer as they explore career opportunities in space.

The girls, who are enrolled in schools in Montgomery County, Prince Georges County and the District of Columbia, will enter ninth grade this Fall. But from July 18 to July 27, they will be working with women scientists, engineers, and mathematicians at Goddard to gain exposure to a wide variety of traditionally non-female career options.

While at Goddard, the girls will participate in activities such as computing a satellite orbit, wiring an electrical circuit, writing computer programs, and making a prism. They also will attend career guidance seminars and hold a panel discussion with women scientists and engineers.

The program is sponsored by Goddard's Federal Women's Program Role Modeling Subcommittee and is known as the Goddard Summer Institute in Science and Technology for Junior High School Girls. The program is now in its seventh year.

During the Summer Institute, the girls work in pairs with a mentor and as a group in activities. The mentors are technical and professional women who

have volunteered to demonstrate their work, and each works with only two girls at a time, allowing them to learn by doing.

The Summer Institute has been received enthusiastically by teachers and participating students. Many of this summer's applicants mention that the program has been recommended to them by former participants. Their typical reasons for attending the program, as stated in their applications, include:

- "Careers are closed to me if I do not know they exist."
- "When I saw Sally Ride (the first female astronaut) go into space, I knew then that women really played an important role in the science field."
- "I have always been interested in careers that do not have many women."
- "One of my many wishes has been to travel in space."
- ". . . this year I discovered that science is a living, breathing thing, not just a bunch of laws in a textbook."

For more information, contact Mary Jo Sharp at 344-7770, Naomi Nichols at 344-0502, or Varona Wynn at 344-6380.

New Employees

- Allen, Kenneth J.**, Summer Aide (Code 290.1)
Anthony, Tobin C., Aerospace Engineer AST, Flight Mechanics (Code 582.2)
Atkins, Patricia M., Secretary (Code 804.0)
Barrett, Ronald J., Student Trainee (Aerospace Engineering) (Code 226/034)
Brown, Mia L., Summer Aide (Clerk-Typist) (Code 272.2)
Chan, Cheryl E., Summer Aide (Code 151)
Dodohue, John T., Student Trainee (Engineering) (Code 226/822)
Dove, E. Carter, Public Affairs Specialist (Code 130)
Gostomski, Thomas, Aerospace Engineer AST, Quality Assurance (Code 303)
Hemphill, Eric B., Summer Aide (Code 751.1)
Holston, Karen A., Summer Aide (Code 225)
Kaiser, Gerard, Aerospace Engineer AST, Quality Assurance (Code 303)
Kuhn, Stephen J., Mathematics Aide (Code 684.1)
London, Breta L., Summer Aide (Code 300)
Mahowald, Joanne E., Student Trainee (Accounting) (Code 226/150)
Marshall, Maggie J., Clerk-Typist (Code 240)
McDuffie, Eugene, Summer Aide (Code 290.1)
Murphy, Robert M., Computer Scientist AST, Computer Sciences (Code 532.2)
Nottingham, Quinton J., Student Trainee (Electrical Engineering) (Code 226/021)
Paquin, Krista C., Presidential Management Intern (Code 228/200)
Poulette, Sharon H., Secretary (Code 696.0)
Rykowski, Lisa Marie, Computer Scientist AST, Computer Sciences (Code 563.1)
Serenford, Alexander Franklin, Aerospace Engineering Technician (Code 716.2)
Shirah, Gregory W., Student Trainee (Mathematical Science) (Code 226/582.2)
Shirley, Jeannine T., Student Trainee (Mathematical Sciences) (Code 226/853)
Smith, Trina C., Summer Aide (Code 140)
Thorn, Karen E., Student Trainee (Mathematics) (Code 224/522)
Wise, John Walter, Jr., Physical Science Aide (Code 717.2)
Woodhouse, Christopher E., Electronics Engineer AST, Measurement & Instrumentation Systems (Code 733.1)
Zura, Jessica G., Aerospace Engineer AST, Flight Systems Safety (Code 302)

Goddard co-op has definite plans; to build school in native homeland

When trying to sell a client on a policy, an insurance salesman once said as a clincher, "most people don't plan to fail, they just fail to plan."

Roderick Evans (253.3) doesn't plan to fail. And he is a man with definite plans—in 20 years he intends to build a Fine Arts School in his native homeland St. Thomas, Virgin Islands. "That's my ultimate goal," Evans said. "I'd like to design it for those in high school and above."

Evans, a junior at Morgan State University in Baltimore, Md., is a co-op in the Goddard Presentations Section. The self-acclaimed high achiever works as a graphics artist and since joining Goddard in Dec. 1983 has completed several notable projects—two of which are wall montages in buildings three and five. "Of all the assignments I've had here, I really enjoy montages," he said.

Evans is majoring in both Graphic Arts and Advertising and Art Education with a minor in English/Psychology. Before attending Morgan, however, he studied a year at the Minneapolis College of Art and Design in Minnesota.

His interest in the arts, painting is his favorite, started when he was a little boy. Apparently, it has influenced his two-year-old son, who, he said, can draw "E.T." and several letters of the

alphabet. He also majored in art in high school where he spent half of each class day taking art courses.

Evans came to the U.S. in 1975 and, after finishing studies in Minnesota in 1976, enrolled in Morgan in the spring of 1977. That summer he joined the Army National Guard and served six years. In 1979, he had to postpone his education to earn more money for tuition.

By 1980, he had started Lyon Graphics, which became incorporated last February. His business services include paintings, portraits, photography and composition. Two other people, a consultant and an agent, work for him.

Two years ago, he returned to college and plans to graduate in 1986. He also plans to get masters degrees in Public Administration and Architecture within six years.

Evans has been editor of Morgan State's year book for the past two years and is a member of Omega Psi Phi Fraternity. He was elected Man Of The Year in the Virgin Islands for 1983. His first co-op ends this summer but he said he looks forward to returning after a semester of classwork.

"I look forward to my second co-op," he said. "I'd like to get more projects under my belt."



Ron Craig photo

A MAN WITH PLANS - Roderick "Rick" Evans is a Morgan State University (Baltimore, Md.) co-op now working in Goddard's Presentation Section. One of his long-range goals is to build a school in his native homeland in the Virgin Islands. Meanwhile, the college junior will be busy with school and running Lyon Graphics, the business he started in 1980, which became incorporated last February.

NASA aircraft fly gypsy moth study

A NASA U-2 type aircraft has completed photographing more than 80,000 square miles of five states and the District of Columbia in a gypsy moth study that has been conducted through operations at Goddard's Wallops Flight Facility.

The plane—known as an ER-2—is a larger version of the U-2 high altitude reconnaissance aircraft. Operations were conducted for three weeks, mapping the current year's damage by the gypsy moth in Maryland, New York, Pennsylvania, Virginia and West Virginia, as well as the District of Columbia.

The photography is designed to identify areas defoliated by the caterpillars and to gauge the effectiveness of spraying programs involving chemical and biological insecticides. In recent years, several million acres of hardwood forest suffered damage by the gypsy moth, according to officials with the U.S. Forest Service, which is conducting the study.

In 1981, a peak year, more than 12 million acres were defoliated, they reported.

Normally, the ER-2 flights started at 9 a.m. and extended to four and six hours.

Jerry Hoyt and Ron Williams were the two Ames pilots participating in the flights. Jim Cherbonneau is the NASA Ames U2 Branch Chief and was Deployment Manager for the 1984 Gypsy Moth project, and Gene Godwin served as the Wallops coordinator.

Nimbus 20th Anniversary celebration planned

The Nimbus Association is having a 20th anniversary celebration of the launch of Nimbus 1 on the evening of August 28, 1984 at Goddard's Rec Center. The affair will be in the Nimbus Tradition—dinner, dance, and other activities. Invitations have been sent to everyone associated with the Nimbus Program. Persons who have been associated with the program but have not received an invitation are asked to call Josephine Aldrich at 344-6551 or Michael Forman at 344-9287.

NASA studies aerial application of chemicals

NASA research may contribute to more efficient methods for aerial application of insecticides and herbicides.

The agency has conducted basic research in aerodynamics relating to aerial applications since 1976, when chemical drift from target areas was identified as the aerial application industry's most important technical concern because of increasing chemical costs and environmental factors.

Control of chemical drift is a complex problem requiring an understanding of many factors, including airplane wake aerodynamics. Researchers at NASA's Langley Research Center, Hampton, Va., have worked to improve the integration of airplane wake characteristics with dispersal equipment to produce wider, more uniform application patterns for liquid or solid agricultural chemicals released in the wakes of airplanes or helicopters with minimum losses due to chemical drift.

Initial investigations involved ground testing a scale model agricultural airplane in Langley's Wake Vortex Facility and a full-scale airplane in the center's 30 by 60 Foot Wind Tunnel. "These tests," explains Dana Morris, an engineer in Langley's Low-Speed Aerodynamics Division, "showed us we could alter the airplane wake and measure the impact of the spray deposition pattern."

Then experimental flights were conducted at NASA's Wallops Flight Facility, Wallops Island, Va. In the tests, an Ayres Thrush S2R-800

agricultural airplane (loaned without charge by the Ayres Corporation, Albany, Ga.) was flown low over three long rows of adhesive strips, 50 feet apart, and solid particles were released to simulate spray droplets. The tests provided wake interaction data showing the influences of atmospheric and airplane operating conditions on spray patterns. These data were then correlated with computer predictions.

One aerodynamic modification of the airplane during flight test was the addition of winglets, relatively small vertical wing surfaces at the wing tips. AGDISP correctly predicted that the modification would improve spray results. The swirling vortex of air that normally comes off the wing tip was displaced to near the tip of the winglet. Without winglets, the vortex was lower, closer to the spray nozzles and tended to entrain more particles around the vortex, contributing to the drift problem.

The U.S. Air Force and Lockheed-Georgia Corp. are working with Langley to apply knowledge from AGDISP to the design of a new dispersal system to be mounted on Lockheed C-130 aircraft to spray mosquitoes. The State Department is using information gained from a spray system designed and tested by Langley, at the department's request, for high-speed, high-altitude spraying of illicit drugs. Future users may even include ultralight aircraft companies considering a move into aerial applications.

Blood donors honored

Some very dedicated blood donors at Goddard recently were awarded gallon pins at the June 4, 1984 visit:

Darlene Ahalt	130	2 GAL
John Adolphsen	311	13 GAL
David Cleveland	311.2	1 GAL
Michael Forman	513	6 GAL
Almon Gray	470	1 GAL
Gene Jones	405	1 GAL
James Ming	313.2	2 GAL
Merrick Shawe	850.1	4 GAL
Danford Smith	510	1 GAL
John Tominovich	287	9 GAL
John Unger	802.3	13 GAL
Jon Walker	853.1	3 GAL

Goddard should be proud of its donors. Please mark August 1, 1984, as the next bloodmobile date and be there!

Suggestions generate cash awards for four Goddard employees

Silvia Green, code 253, Jean Hubbard, 253, Andre Jackson, 290, and Helen Zug, 250, won cash awards recently for their ideas in the Suggestion Program.

Green increased parking convenience for visitors attending Center events by suggesting reserved parking spaces. The yellow spaces on the building 8 parking lot resulted from Green's idea.

Zug's suggestion resulted in a more economical production of the Director's Weekly Report. The report's index previously was made by photocopying it from a large board and then reducing it to standard letter size. Zug suggested that the original board be reduced to standard size, thereby eliminating photocopying. Turnaround time in producing the report is quicker as a result.

Hubbard recommended that ramps for the handicapped be painted with yellow lines. This makes them easier to locate and prevents a safety hazard because these ramps are sometimes unnoticeable, according to Hubbard, and cause trips and falls.

Jackson submitted that Braille emergency instructions for the visually impaired be placed on elevators. Jackson witnessed a blind employee stuck in an elevator for 20 minutes. His idea resulted in Braille instructions being placed under the elevator's emergency phone.

If you have a "bright idea," call 344-6118.



VIEWING A VORTEX - The air flow from the wing of this agricultural airplane is made visible by a technique that uses colored smoke rising from the ground. The swirl at the wing tip traces the airplane's wake vortex, a source of problems in aerial application of spray material. The vortex, as can be seen here, exerts a powerful influence on the flow field behind the airplane.

GAS User's Symposium planned

Goddard will hold a Getaway Special (GAS) User's Symposium August 1 and 2 in the building 8 auditorium. The symposium will provide a forum for exchanging information within the GAS community on experimental results and plans, as well as engineering and safety lessons learned during the first two years of payload operation and flight. The symposium will be open to all users, domestic and foreign.

About two hundred people are expected to attend. The tentative agenda includes three sessions for experimenter papers and one panel discussion with Goddard engineers. Papers will be presented from ex-

perimenters who have already flown as well as from potential users whose payloads are near flight-ready.

A banquet has been planned for the evening of August 1, the fee is \$10; attendees can register at 8 a.m. August 1, the fee is \$5 and can be paid at the time of registration.

The GAS program allows individuals, groups and organizations to buy space on a Shuttle to conduct scientific experiments. Payloads can be purchased for \$3,000, \$5,000 and \$10,000, depending on size and weight.

For more information contact Clarke Prouty on (301) 344-6760.

Facilities project could bring \$50,000 savings

Goddard's power plant, located in building 24, is undergoing major facility repairs which will cost \$2.2 million. The project calls for the complete replacement of a cooling tower, the installation of two heat exchangers, and the installation of two new chillers.

The chillers produce cold water which is circulated to each Center building to provide air conditioning. Each of the two new units is rated at 1,500 tons and brings the total chiller capacity in the power plant to 12,000 tons. An air conditioner for a typical single-family house might be 3 tons which indicates that Goddard has the capacity to cool 4,000 houses.

In addition to improving the overall reliability of the Center's air conditioning, the new units are approximately 18 percent more energy efficient than the existing chillers and savings in energy alone should exceed \$50,000 per year, officials reported.

The project is being managed by the Facilities Engineering Division, Code 270. Completion date for the project is April 1985.

July 20 marks 15th anniversary of lunar landing

July 20 marks the 15th Anniversary of man's first lunar landing. "Houston, Tranquility Base here, the Eagle has landed," was what Astronaut Neil Armstrong said July 20, 1969, as he made a milestone in space exploration by becoming the first man to set foot on the moon. The Apollo 11 Lunar Module landed in the Moon's

Sea of Tranquility.

Armstrong was followed by Lunar Module pilot Edwin E. Aldrin, Jr., as Command Module pilot Michael Collins orbited above. The returning spacecraft splashed down in the Pacific, southwest of Hawaii July 24.

Model Rocket Contest held at Visitor Center

All eyes were skyward at Goddard Sunday, July 15 as Washington area model rocket enthusiasts salvaged their best shots in a competition to commemorate the 200th anniversary of manned flight in America, the 25th anniversary of Goddard, the 15th anniversary of the Apollo moon landing and to focus attention on U.S. space-related activities.

The contest—open to all area model rocketeers and conducted under the National Association of Rocketry (NAR) safety code—featured flying on both a team and individual basis in two separate events. Each event was flown in two age divisions: 15 years and younger and 16 years and older.

Providing their own models, engines, wadding and prepping tools, the modelers used a single 1/2A (NAR classification) standard-size engine (no mini-size engines). Total model weight

with engine must be less than 2.5 ounces. Goddard furnished the launch equipment for both 1/8" and 3/16" diameter straws (rocket stabilizing devices which fit over launch rails).

The streamer event opened the competition at 10 a.m. In this phase of the flying, the contestants vied to record the longest rocket flight time. At 1 p.m., precision prevailed as the rocketeers tried to land their charges on a predetermined spot on the ground.

The rocket contest, free and open to the public, was staged at the Goddard's Visitor Center and Museum.

The model rocket competition is sponsored by the National Space Institute, the American Institute of Aeronautics and Astronautics/National Capital Section and the Goddard's Office of Public Affairs, in cooperation with local sections of the NAR.

In Memoriam

John C. Onda, 68, a retired Goddard electronics technician, died of a heart attack April 22 at Prince Georges County Hospital, Md.

Onda was a chief radioman in the U.S. Navy for 5 years during WWII. After a brief tour at the Bureau of Standards and the Naval Research Laboratory, he started a 23 year career with Goddard in its infancy at the Naval Receiving Station, Anacostia, D.C. in 1960.

Onda was involved with the application of newly developed UHF high power semiconductors when he retired in 1970.

As an active amateur radio operator, he once established a communications link from Newfoundland to the U.S. while attached with an outpost of the Bureau of Standards.

Safekeeping

Watch body's warning signs for Summer's heat stress

By Gincy Stezar

Goddard Physical Fitness Director

With summer fast getting unbearable, the outdoor enthusiast must take measures to avoid heat-related illnesses and death. Each year thousands of people, from professional athletes to weekend gardeners, suffer from heat stroke. Some even die. This should never happen. By recognizing and heeding the warning signs offered by the body, heat injury can be prevented.

There are basically three primary categories of heat stress:

1. Heat cramps are due to excessive sodium loss and involve involuntary contractions of the muscles. (The warning here is **DO NOT TAKE SALT SUPPLEMENTS.**)

2. Heat exhaustion occurs when dehydration becomes extreme. The individual may experience confusion, weak, rapid pulse, extreme thirst and a feeling of weakness and nervousness.

3. Heatstroke, the most dangerous form of overheating, occurs when the body cannot eliminate excess heat. The skin is generally hot, red and dry. The victim may become irritable, incoherent and aggressive. Medical attention is required.

If you experience *any* of these symptoms, stop the activity immediately, get into the shade and drink plenty of water. One should not wait until the final stage of heat illness—by then it may be too late. To prevent this life threatening situation, heed the following guidelines:

1. Drink water often. Don't wait until you are thirsty. Force yourself to drink more water than you actually feel

you need. Beware of coffee and alcoholic beverages—they tend to act as diuretics. Sugar drinks such as soda and gatorade-type drinks pull moisture into the stomach and reduce the fluids available to the rest of the body.

2. Acclimatize your body to summer's heat. Exercisers should make their activity periods slower, easier and shorter.

3. Choose a time of day—early in the morning, or late in the evening—when the heat and/or humidity are less intense.

4. Eat lightly and avoid fats. **DO NOT INCREASE SALT INTAKE.** Eat plenty of fruits and vegetables to ward off mineral deficiencies.

5. Take frequent rest/water breaks. Pour water over your head and body.

6. Wear sunscreens, hats and cotton clothing of light colors.

7. Cool down after your activity. This prevents dizziness and the possibility of fainting by allowing a normal return of blood flow.

8. Get plenty of rest and sleep.

9. Runners should avoid running on dark pavement. Seek routes that include plenty of shade and provide opportunity for frequent water stops.

10. Persons with heart and respiratory conditions should take extra precautions due to the stress placed upon the heart.

When summer arrives, we pay particular attention to our vehicle's cooling system. By giving the engine in our bodies the same consideration, we can have a safe and enjoyable summer.

Browning

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Ronald K. Browning
Deputy Director, Space Station

Browning joined NASA in 1959 as a Project Engineer, Mechanical Systems, on the Explorer program. Following success of the Explorer X mission, he formed and led a team responsible for definition, design, development, integration, test and launch support of integrated scientific experiments on the Orbiting Geophysical Observatories (OGO).

After OGO-4, in 1966, he became Spacecraft Manager for the Small Astronomy Satellites. In 1969, he was named Project Manager of the joint U.S./Netherlands Astronomical Netherlands Satellite.

Browning has been a project manager continuously since then on the following programs: HEAO Experiments, Landsat/Nimbus, Upper Atmosphere Research Satellite, and the Tracking and Data Relay Satellite Systems (TDRSS). During the last five years, he has directed the TDRSS project from initial design, through launch anomaly recovery to operation of a totally new space/ground telecommunications system.

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