



**THE TORNADO**—one of the most destructive forces on Earth, is being investigated by Goddard satellites.

## Severe Storms Under Study

NASA/Goddard Space Flight Center recently participated in a series of experiments to develop techniques for predicting when and where life-threatening tornadoes will strike.

Five Goddard-developed weather satellites, aircraft, radar, and balloons were used in the investigation. The NASA/Marshall Space Flight Center, the U.S. Air Force, Army and National Weather Service were also involved.

A total of 52 tornadoes were reported during three 24-hour experiments. Information was compared with ground truth observations to determine the relationship between severe storms and their environment.

The large number of tornadoes that occurred during the experiment period provided an excellent data base for the study of circulation patterns and satellite soundings versus ground based measurements in terms of severe atmospheric phenomenon identification and prediction.

Another experiment is scheduled for April and May, 1976—the high probability period for severe weather.

## 1975 Lindsay Award To Ness

The John C. Lindsay Memorial Award, which is given annually to a member of the Goddard Space Flight Center for an outstanding contribution to science or technology, was presented to Dr. Norman F. Ness for his pioneering work in the investigation of magnetic fields of planetary bodies and the interaction of the solar wind with these magnetic fields.

Dr. Ness was a member of the scientific team on Explorer 10, the first spacecraft to measure the earth's distant magnetic field. As Project Scientist on the Anchored IMP satellites and Principal Investigator for their magnetometer experiments, he was the discoverer of the earth's magnetic tail and the first to explore the circumlunar magnetic field. These studies culminated in 1974 with his participation as Principal Investigator for magnetic field experiments on Mariner 10 which flew past Venus and Mercury, and on the Pioneer II flyby of Jupiter. The recent third encounter with Mercury confirmed his surprising discovery in 1974 that Mercury has a small, but measurable, intrinsic magnetic field.



**MONITORING THE ATS-6** move to its new location over Africa is from left to right R. G. Pillai, ISRO Representative; Ravi Khanna, Voice of America reporter; J. H. Barnes of NASA's Office of International Affairs; John E. Miller, Goddard SITE Project Manager; Mr. M. Varalu, Production Manager for SITE direct receive terminals; and Dr. Ananda Krishnan, Science Attache, Embassy of India.

## "SITE" Begins

Goddard's Applications Technology Satellite-6 has completed its 40-day journey eastward along its orbital path 22,300 miles over the equator from a location above the Galapagos Islands in the Pacific where it was placed last May 30th, to one above Lake Victoria in Africa.

The umbrella-shaped satellite will be tested for a month before the Indian Government begins using it August 1, to broadcast programs to schools in over 5,000 villages. After a year ATS-6 is scheduled to be returned to a location over the Western Hemisphere.

The Indian Satellite Instructional Television Experiment (SITE), is regarded as a landmark in the rapid upgrading of education in a developing country. It is a forerunner of operational "direct broadcast" satellites in the 1980's.



**PETER P. PUROL**, (left) 17, of Baltimore, Md., winner of the National Viking Student Emblem Contest, discusses his winning entry with Dr. James C. Fletcher, NASA Administrator. Purol's emblem will be carried on the Viking spacecraft to Mars in 1976, and the student will be a special guest of NASA at the Viking launch this summer at Kennedy Space Center, Fla. The contest which drew entries from thousands of high school students throughout the nation, was sponsored by NASA in cooperation with the National Science Teachers Association.

## Teleconferencing Network Expanded

Travel budget restricted? The NASA Teleconferencing Network may provide the solution to your problem.

The network has recently been expanded, and now consists of 34 teleconference rooms known as the "NASA VOICE TELECONFERENCING NETWORK."

Teleconference between individuals is commonplace, and can be conducted over normal telephone channels. Groups of several people can be accommodated over speaker phones. The Teleconference Network is intended to handle larger meetings at multiple locations where projection equipment is available.

It is capable of augmenting and in many instances replacing many face to face management meetings previously requiring travel.

Meetings involving inspection of hardware, facilities, techniques, or get acquainted sessions may not be well suited for teleconferences. However, management meetings between people who know each other, which involve exchanges of information, presentations, coordination, or giving and receiving orders are ideally adapted for the technique and can save the participants a great deal of time and travel money.

As a supplement to the Voice Network, a data system called the NASA TELECONFERENCING FACSIMILE NETWORK transmits documents of figures which can be converted into vugraphs at the receiving installation.

To arrange a Teleconference call Mr. Samuel W. Fordyce, Area Code 202-755-8565. Try it—you'll like it.



**THIRTY GIRLS** enrolled in Project Women at Kelly Miller Junior High School, Washington, D.C., and three of their coordinators recently visited and toured Goddard's facilities. Project Women is a program co-sponsored by the D.C. Government Commission on the Status of Women and the D.C. Public School System for adolescent girls in several inner city schools. It's primary purposes are to stimulate the interests of girls, particularly in the areas of careers and to provide the girls a meaningful and realistic exposure to the world of work.

## Did You Know?

A NASA scientist has determined that black chrome is about 20 percent more efficient than the coatings now employed for solar collectors used in the heating and cooling of homes and buildings.

The first Viking Mission is scheduled to touch down on the Martian surface on July 4th, 1976, which will help celebrate the 200th birthday of the United States.



**GLEN CLARY** of Bendix Field Engineering Corporation demonstrates soldering techniques to a teacher in one of the Visit Demonstration Areas.



**EIGHT PANEL MEMBERS** discussed possible classroom uses of OSCAR satellites and amateur radios. Panel members are, from left: James Lin, Dr. Ronald Oines, Minot Parker, Robert C. Reiley, Angelos Tsiatsos, and Donald Waters.



**BARRY CROUCH**, Training Analyst for the Bendix Field Corporation, speaks to visitors as part of the Electronics Fabrication Demonstration, one of nine Visit Demonstration Areas at the conference.

## A CONFERENCE ON THE USE OF OSCAR SATELLITES AND AMATEUR RADIO IN THE MODERN CLASSROOM

was held at the

**GODDARD SPACE FLIGHT CENTER**  
Greenbelt, Maryland  
FRIDAY, MAY 23, 1975

It was sponsored by . . .

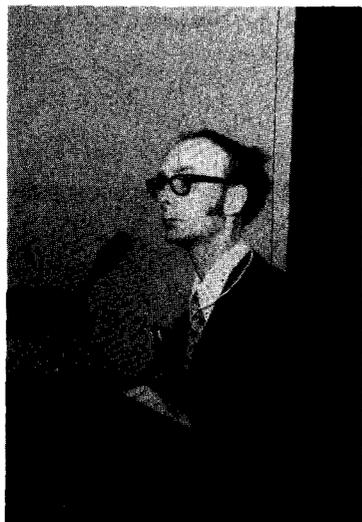
Educational Programs Office  
*Goddard Space Flight Center*

Goddard Amateur Radio Club

American Radio Relay League

Radio Amateur Satellite Corporation

Space Science Education Project  
*Oklahoma State University*



**WILLIAM DUNKERLEY**, Educational Program Manager for the American Radio Relay League, speaks about the *Orbiting Satellite Carrying Amateur Radio (OSCAR)*.



**HUGH TURNBULL**, President of the Goddard Amateur Radio Club, welcomes 116 participants to the amateur radio and satellite conference.



**ADDRESSING THE CONFERENCE** is Harry Dannas, President of the American Radio Relay League (ARRL). The ARRL is a national association of radio amateurs with close to 100,000 members.



**TEACHERS**, American Radio Relay League members, the Goddard Amateur Radio Club, and other amateur radio enthusiasts attended the program. From left are Leonard David, Director of Aerospace Youth Council; Marie Marr, an AMSAT employee responsible for the fabrication and testing of OSCAR satellites; and T. P. Matthewson of Richmond, Virginia.



**DR. JAMES W. LATHAM, JR.**, Consultant in Science for the Maryland State Department of Education, summarizes the program. One of the primary purposes of the day at Goddard was to allow communication between educators and radio amateurs to take place.



**TWO MARYLAND** high school students, Caroline C. Kenner and Donald Whitney, Jr., were chosen as national finalists in the 1975 Exploration Scholarship Program. Shown above from left are Dr. Fred J. Brown, Association of State Superintendents; Caroline C. Kenner, Chevy Chase Senior High School, Chevy Chase, Maryland; Donald Whitney, Jr., Southwestern High School, Baltimore City; and Mrs. William F. Robie, Maryland State Board of Education.



**PARTICIPANTS TOURED** Goddard facilities, visited Center laboratories, and had luncheon with Goddard scientists, engineers, and mathematicians. Above, students and teachers observe operations at the NASCOM Voice Switchboard.



**DR. PAUL D. LOWMAN**, left, of the Geophysics Branch of the Earth Survey Applications Division converses with students and teachers. Dr. Lowman gave a speech entitled, "Monitoring Earth Resources from Space."



**MARYLAND FINALISTS** in the 1975 National Exploration Scholarship Competition and their teachers attended a VIP Recognition Ceremony held in their honor at Goddard on May 7, 1975. The program enables students who are gifted in the sciences to work with explorers or scientists during their summer vacations.

# STUDENT FINALISTS IN THE MARYLAND EXPLORATION SCHOLARSHIP PROGRAM



## GSFC SALUTES TWO OUTSTANDING WOMEN EMPLOYEES DURING I.W.Y.

Wanda Korwin-Pawlowska, Goddard librarian since 1966, received her Bachelor's Degree from the University of Maryland on May 11, 1975, 46 years after attending her first college class. She was awarded the degree in political science with a minor in Russian studies.

"This is something I wanted all my life," comments Wanda. "I've dreamed about it. I'm very proud that I have finally finished."

The process began when she enrolled in Detroit's Wayne State University in 1929. However, after one semester, Wanda had to drop out because her father became ill and the family needed money. She was unable to return to college until the mid 1930's when she went to live with her aunt in London and attended the University of London for one semester. She then returned home, got a job as a copywriter for a New York advertising firm, married, and started a family.

In 1965 her husband retired and the couple moved to Greenbelt. A year later, Wanda joined Goddard and began taking courses at the University of Maryland. She took two courses each semester until she earned enough credits to graduate last month.

While at Maryland, Wanda was active in many extra-curricular activities. She was editor of the University College student newspaper, first vice-president of the University College Student Association, member of the Dean's Advisory Group on implementation of policy, and member of the University College Appeals Board. In 1972 she was awarded the Dean's Achievement Award for Outstanding Service and made the Dean's List a year later. Last fall she received the first Clairol Scholarship Award which is given to two women in Maryland over age 35 who are continuing their educations.

"Now I feel very proud that I could keep up with people, most of whom could be my children and some of whom could have been my grandchildren."

But it's not over yet. Wanda already has plans to start taking graduate courses in September at the University of Maryland.

Helen Attick is a Technology Utilization Assistant in the Technology Utilization Office. She coordinates administrative functions in the approvals and publications of new items of technology in Tech Briefs and Special Publications. She is also responsible for the Tech Brief Award Program for the Center. Helen has received several awards at GSFC in relation to her job performance. She received in 1974 the Outstanding Performance Award for her many contributions towards a smooth and an effective program in the Technology Utilization Office. Helen is also interested in the community where she has served (10 years) as a Life Member of the Prince George's Area Science Fair. She enjoys travelling, especially to Seattle, Washington, where her daughter and granddaughter live.

### Biofeedback and Autogenic Control To Be Explained

The Goddard Health & Safety Engineering Office in collaboration with the GSFC Health Unit is sponsoring a Medical Scientific Colloquium on July 8, 1975, which will explore the fascinating subject of biofeedback and autogenic control.

Many aspects of bodily function once thought wholly involuntary may, in fact, be brought under voluntary control. This is accomplished by providing a patient with a signal related to the behavior he is trying to control.

Using this "feedback signal" the motivated patient can then control functions such as heart rate, blood pressure, blood flow, brain electrical activity, skin resistance, kidney action, and subtle muscle reaction.

In effect, the patient is trained to read electronically reproduced feedback signals of his involuntary bodily functions, and through autogenic control, can promote in himself certain self normalizing functions which are directed and coordinated by his brain.

Biofeedback? Autogenic Control? Find out for yourself. The date is July 8, from 3:00 to 4:30. The place, the Building 3 Auditorium. This colloquium may change your life.

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About 34,000 people are currently at work on the development of the Space Shuttle. This number is expected to increase to a maximum of 50,000 within two years.



DR. AND MRS. JOHN F. CLARK stand beneath the 1975 Collier Trophy, awarded to him recently.



THIS SIGN near Building 17 obviously means business!

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THE NIMBUS-6 spacecraft is similar in design to the previous six spacecraft of this type.

## Nimbus-6 Successfully Launched

The most sophisticated package of meteorological research instruments ever developed was successfully launched aboard Goddard's Nimbus-6 spacecraft at 4:12 AM EDT, June 12, 1975.

The butterfly-shaped craft was placed in a near polar orbit by a two-stage Delta launch vehicle from the Western Test Range near Lompoc, California.

Data collected by nine instruments, will assist in the development of numerical models of the atmosphere which eventually will help provide up to three-week accurate weather forecasts.

## Goddard Mourns . . .

Leslie E. Twitty, an air-conditioning and refrigeration mechanic who has been with Goddard for thirteen years. Mr. Twitty passed away on April 10 at the age of 59. He is survived by a wife and two sons.

Walter I. Adams, who passed away on May 13 at the age of 53. Systems Hardware Manager of the Mission Operations Computing Facility, Mr. Adams directed the CADFISS project, having an important role in establishing the GSFC Realtime Manned Space Computer Complex for the Mercury, Gemini, and Apollo spacecraft.

Kenneth G. Mattocks, who passed away on May 29 at age 48. A technician in network operations, Mr. Mattocks was responsible for the maintenance and operation of unified S-band equipment and radar. He is survived by a wife and two children.

Pio H. Dalle Mura, an electronics engineer who was considered Goddard's foremost expert in low-noise parametric amplifiers. Mr. Dalle Mura passed away on June 2 at the age of 48.