

ENLARGED TEN TIMES, this photo shows the main center and cross arm supports for thousands of tiny antennae on the male *Cecropia* moth. The antennae are used to detect the sex scents of the female moth.

Insect antennae such as these are being evaluated in a NASA/GSFC grant to the University of Florida. The grant was awarded in an effort to determine the theoretical feasibility of a solar energy-to-electricity conversion technique which utilizes energy absorbers patterned after nature's design of insect antennae.

Nature Provides Clue For Solar Energy Conversion

Insect communications and animal eyes have provided a fundamental clue for a Goddard effort to investigate the properties of a proposed new type of solar energy conversion for space and Earth-bound use.

These electromagnetic wave energy converters could have several applications. They might supplement the supply of electric power. They might be used in the area of early warning radar. Additionally, a better understanding of the functions of electromagnetic insect antenna could provide means of trapping insects to prevent crop and food destruction.

Robert J. Bailey of the University of Florida has been awarded a Goddard basic research grant to develop the theory for estimating the overall efficiency of converting the sun's electromagnetic radiation by absorbing it in an array of insulated components and converting it directly to electricity. The absorber is functionally similar to insect antennae and to the retina of the eye.

Insects can communicate by the transmission and reception of infra-red and other electromagnetic radiation or energy using tiny antennae tuned to the proper frequency by nature's design. Once received, this energy is converted to electrical impulses. Similarly, electromagnetic radiation in the form of visible light is received by the retina of the eye and converted to electrical impulses.

"The EWEC concept may also offer a possible improvement over solar cells" says Harold J. Peake, Head of Goddard's Aerospace Technology National Needs Office which administers the grant.

Research has indicated that insects utilize electromagnetic radiation waves in locating a mate, and perhaps in hunting prey and homing to a food source.

Negrito Pigmys have long known that large ghost moths, emerging from their pupal cases, fly directly into the embers of a hot fire, thereby providing them with a tasty roasted morsel.

Research reveals that the swirling heated mass of hydrocarbons released from the fire emit infrared frequencies, some of which are the same wavelengths as the mating signal from the sex scent of the female ghost moth.

Tracking by Satellite Another Step Closer

Another major advance in the tracking and communications control of satellites by other satellites occurred recently with a unique experiment utilizing NASA's Applications Technology Satellite (ATS-6).

Conducted here at Goddard, the experiment involved the tracking of, and communications with, NASA's GEOS-3 geodetic satellite by the ATS-6.

Even as GEOS disappeared behind the Earth in its lower orbit, ATS-6 continued to track a path across the Earth indicating the location of the geodetic satellite. When GEOS reappeared, ATS-6 again locked onto it and tracked it for over 50 per cent of its orbit. Present ground station tracking of GEOS-3 can cover only 15 percent of the orbit.

"Despite the fact this was the first tracking of one satellite by another, the operation went so smoothly, it looked like a simulation instead of the real thing" said Bernie Trudell, Goddard's Manager for the ATS-6 Tracking and Data Relay Experiment.

This success contributes materially to the future transition from the current ground based tracking system to a Tracking and Data Relay Satellite System known as T&DRSS.



DR. ICHTIAQUE S. RASOOL, (left), NASA's Chief Scientist for Planetary Programs, and **Dr. Gerald Saffen**, Viking Project Scientist, discuss the forthcoming Viking Project on a special 30-minute television program originating in Goddard's Operation Control Center and beamed live via satellite to the Roman public in Italy. An interpreter relayed questions and answers between the Italian viewers and the scientists.

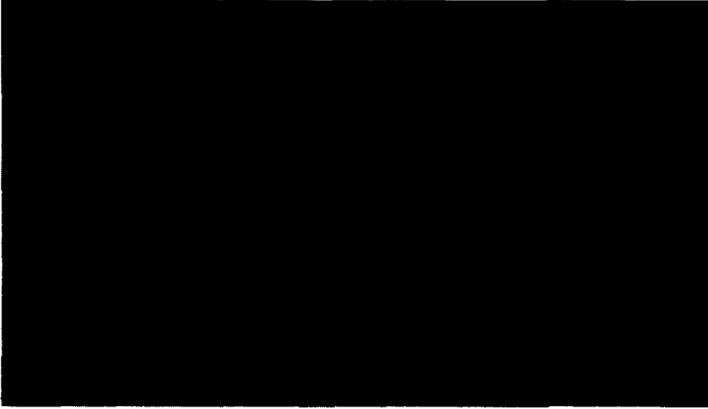
Attention Innovators!

NASA needs new science presentations to be used in Spacemobile school assembly presentations.

In FY 1974, 7,767 presentations were made to 1,290,000 students and teachers—and that's a lot of exposure.

If you can suggest a demonstration which illustrates science and engineering principles used in aeronautical and astronautical research, please call Elva Bailey, Educational Programs Officer, on x2205.

Mercury Revisited



TELEVISION PICTURES of Mercury taken by Mariner 10 reveal a heavily cratered surface remarkably similar to the Moon in surface morphology and optical properties. Such large-scale scarps and ridges as seen near the center of this view may reflect a unique period of planetary compression near the end of heavy bombardment by small planetesimals.



MARINER 10 magnetic field and electron data relayed from JPL to teleprinters in the LEP IBM 1800 computer facility in Building 2 are being closely monitored by Dr. Ronald Lepping, John Scheifele, Kenneth Behannon and Jack Scudder.

Distinguished Police Chief Joins Goddard

A career spanning nearly three decades of public law enforcement service ended last month when G. Russell Walters retired as Chief of the Howard County Police Department.

Howard County's loss, however, was Goddard's gain, since Chief Walters has assumed duties here as project manager for Advance Services Inc. one of the nation's major security service organizations which provides government facilities with industrial security.

Mr. Walters succeeds Richard M. Jessop who transferred to corporate staff headquarters in Atlanta, Georgia.

"It will be the same type of work I have always done," emphasizes Chief Walters, "but on a smaller scale." "I'll still be supervising a uniformed force, but dealing primarily with employees and internal problems within a federal installation. I am looking forward to an exciting position with new challenges."



A REAL TIME picture of an East Coast Storm is shown to NASA Administrator James C. Fletcher during his recent visit to Goddard. Chuck Vermillion holds the photograph as Dr. William Nordberg looks on.

President Ford Establishes International Women's Year 1975

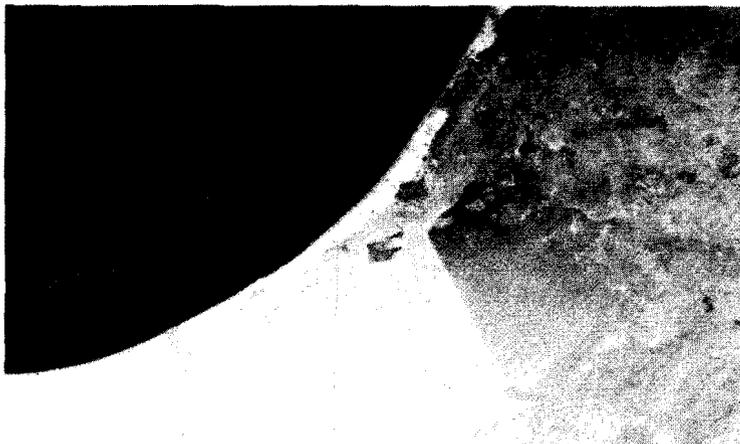
"There is increasing recognition of, and interest in, the contributions of women to the national life of this country in all its important aspects—cultural, political, economic and social." So begins President Ford's Executive Order Establishing a National Commission on the Observance of International Women's Year, 1975. He continues, "We must also support and strengthen the laws that prohibit discrimination based on sex."

What is International Women's Year? The General Assembly of the United Nations designated it in 1975 in order to focus attention throughout the world on the status of women—the UN Commission had requested the designation in order to mobilize action throughout the world. In the case of the developed countries, priority was given to securing women's access into policymaking positions and obtaining equal pay for equal work.

The Year is planned to review the progress to date on the rights and responsibilities of women, and to serve as a staging period for new ideas and programs to be carried out for future years. The Year should involve *everyone*, men as well as women, because the IWY, by aiding women, will simultaneously help the family, community and nation.

NASA Administrator James C. Fletcher endorsed the IWY and said, "The theme, 'Equality, Development and Peace,' points up the need for a determined effort to achieve all three." Dr. Fletcher is proud of the "continuing and growing contribution of women in our agency and in the aerospace industry" but he added, "despite progress already made in eliminating discrimination against women, much must yet be done to promote full equality."

Dr. Fletcher has asked all of us to recognize the contributions of women and join in the effort to continue and expand their progress. Here at Goddard, plans are underway for pertinent exhibits and a Federal women's program week featuring speakers, workshops, and other events.



The lines (lower center) separating the relatively dark and bright areas correspond to the 1948-49 armistice line between Israel and Egypt. The area to the left of the line shows highly reflective soil denuded by overgrazing, in contrast to the region to the right which is covered by natural vegetation. Scientific measurements conducted by Joseph Otterman, LANDSAT investigator at the University of Tel Aviv, have shown that the denuded surfaces are cooler, when compared under sunlit conditions. It is his conclusion that this "thermal depression" effect could, on theoretical grounds, result in a decreased lifting of air necessary for cloud formation and precipitation and thus lead to desert conditions.

ODE TO GOAT AND SHEEP

J. Otterman

Data sensed from a satellite remote
Show the surface bare
Plants and grasses rare!
Who's done it? The goat.

With a long, long beep
Satellite sends a picture
Shown on a Goddard fixture
What do we see? Goat and sheep.

No, we don't count them by rote,
But inference we use
Showing the abuse,
To the vegetation, by goat

Indeed, track we keep
Of seasonal changes,
Whether vegetation manages
To survive the appetite of sheep.

Surface loses its plant coat,
And albedo grows big.
No trace of castor bush or fig.
Who's to blame? The goat.

Thermal depression deep
When illuminated by the sun,
And clouds and rain—none.
Who has Desert created? Sheep.

Attractive Lady Lawmaker Addresses Goddard Group



Congresswoman Gladys Noon Spellman of the 5th Congressional District, flanked by her husband and Dr. John F. Clark, Director of the Goddard Space Flight Center, addressed the 26th Annual Credit Union meeting on March 8th in the Building 21 Cafeteria. New officers elected to the Board of Directors were Malcolm (Sam) Tarleton and Richard Shumacher, Isabelle Cole was elected to the Credit Committee.

Space Benefits!

The Mariner 9 pictures of Mars telecast to Earth were enhanced by computers to bring out details that would otherwise have been lost or obscured.

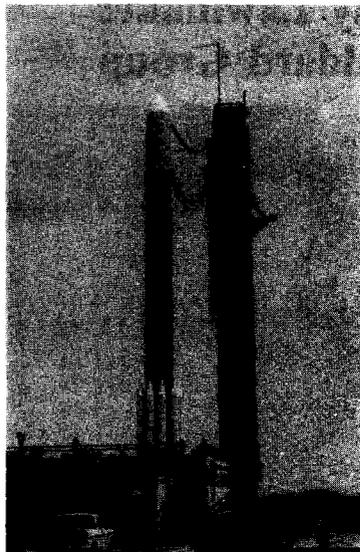
The same techniques applied to X-rays are now revealing much about the human body that formerly could not be discerned, contributing significantly to diagnosis and treatment of disease and injury.

This spin-off benefit is but one of many thousands resulting directly or indirectly from space research.

GODDARD MOURNS . . .

Deborah J. Darnall, age 21, of the Communications and Navigation Division, who passed away April 21st.

Debbie's family wishes to extend their heartfelt appreciation to her host of friends, admirers, coworkers and the Goddard Blood Bank, who expressed their deep concern and sympathy in so many ways during her long illness.



DELTA 110 stands poised on Complex 17B just prior to its successful launch of Anik-3.

DELTA, ANIK, AND SAS

After a smooth countdown and launch from Cape Canaveral on May 7th, a Delta rocket boosted Canada's third Telesat communications satellite (now designated ANIK-3) into a near nominal transfer orbit. The apogee motor of Telesat fired several days later as planned and the spacecraft is now in geosynchronous orbit over the equator. THIS WAS THE 100TH SUCCESSFUL SPACECRAFT LAUNCH for the Delta family.

Also on May 7th, less than an hour before the Telesat success, the Small Astronomy Satellite-C (now Explorer 53) was launched by a Scout solid fuel rocket and placed in a planned equatorial orbit described as "right on target."

SAS spacecraft controllers are, however, wrestling with a stuck nutation damper. At press time, they were still attempting to reduce the two degree nutation or wobble, and are optimistic that this can be accomplished. The experiments aboard are functioning properly.

Goddard Around the World

GODDARD PERSONNEL at the Quito, Ecuador STDN Station are proud to introduce the twelfth member of their pet llama herd shown standing between his mama and papa. The alert youngster was only two days old when this photo was taken. For those unfamiliar with the llama (pronounced yah-mah), it is a ruminant cameloid, native to the Andes and prized for its fine wool and for surefooted services as a beast of burden along treacherous mountain trails. The tall "tower of Pisa" in the background is the station antenna.



"Time is a sort of river of passing events; no sooner is a thing brought to sight than it is swept by and another takes its place. . . ."
 Marcus Aurelius/121-180 AD



The Occasion: TIROS-I 15th Anniversary. The Place: National Press Club Luncheon, Washington, D.C. The Gentlemen receiving the awards, John E. Clark, Director, Goddard Space Flight Center, flanked on his right by Michael L. Garbacz, Manager Operations Meteorological Satellite Program, and on his left by Abe Schnapf, President of RCA.

FLASH!

Two days after the *Goddard News* was put to bed, Dr. Clark was also awarded the prestigious Collier Trophy. Pictures slated for the June issue.

Incongruously, action pictures of a lovely belly dancing Goddard professional doing her thing at the Scheherazade Affair will also appear in June.

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