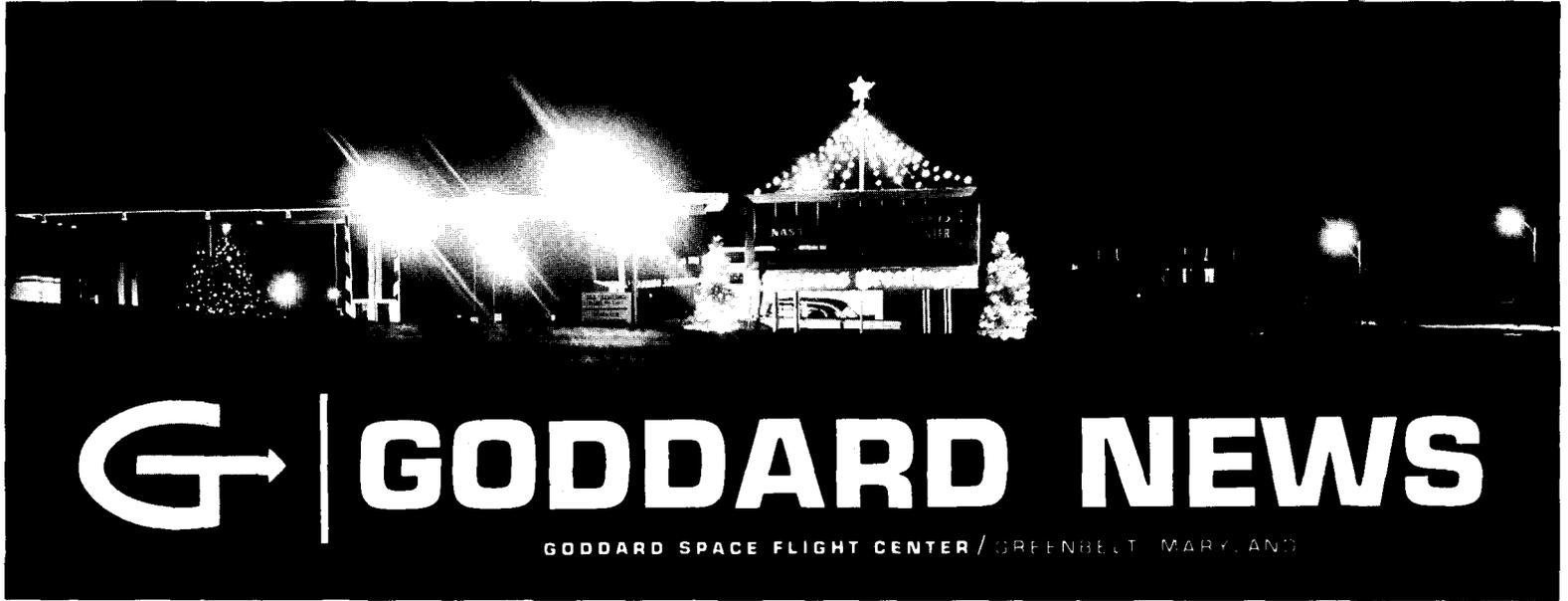


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G | GODDARD NEWS

GODDARD SPACE FLIGHT CENTER / GREENBELT, MARYLAND

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THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

DECEMBER 17, 1962

Santa Hosts 900 Youngsters at First Christmas Party

An estimated 900 Goddard children between 3 months and 12 years old kicked off Goddard's first children's Christmas party Sunday in gala fashion.

They visited with Mr. and Mrs. Santa Claus, giggled at the Goddard clowns and bunny rabbit, and watched in awe the magic marvels of Jerry Farrell.

The event was sponsored by the Goddard Welfare association. The Goddard Gals (30 of the Center's secretaries) handled arrangements and preparations.

It was a full and tiring day for the tykes. They sang Christmas carols, drank punch and ate cookies, and got a special gift from Santa himself.

Sister combinations Carol and Elaine Gilbert and Susan

and Sharon Edwards of Northwestern high school in Washington sang Christmas carols.

The cafeteria conference room was cleverly decorated and the gifts brightly wrapped by the hard-working Goddard Gals. They duplicated the inside of Santa's house, with fire place and logs, and hung a big picture of Rudolf the Red Nose Reindeer. Mr. and Mrs. Santa sat in white rocking chairs in loyal New Frontier tradition.

On the windows, Christmas greetings in ten different languages reminded the children that Christmas—like space—has no political or geographical boundaries.

See pages 7 and 8 for special picture report.

Holiday Greetings

As we approach the Holiday Season, I extend to you and your families best wishes for a Merry Christmas and a New Year of good health and continued success.

We are completing a busy year during which the Goddard staff has made important contributions to the efforts of the United States in space science and technology. At the same time we have expanded our staff by 1000 new employees and have made substantial progress improving our physical facilities at the Center.

I take this opportunity to thank all of you for your cooperation during the past year and invite your continued support in order that we may accomplish the challenging tasks that lie ahead for all of us.

Harry J. Goett
HARRY J. GOETT
Director



WRAPPING presents for the children's party are, left to right, Lil Fleenor, Russell Smith, Florence Fife, and Eileen Deacon.



GODDARD GALS decorate the Christmas tree in building 1.



ANN SNOW decorates a door to compete in a personnel division contest.

Two Goddard Experiments Are Aboard S-55B Spacecraft Launched Saturday

Two experiments designed by a Goddard physicist—one of them his own invention—were among seven experiments aboard the micrometeoroid satellite (S-55B) when it was launched from Wallops Station last week.

Luc Secretan, physicist in the physics branch, redesigned a cadmium sulfide cell detector to measure numbers and sizes of micrometeoroids that would come in contact with the device in space. The detector previously has been used only as a photo sensitive cell.

The modified detector consists of a Cd-S cell (a layer of cadmium sulfide deposited on a plate two inches in diameter). The cell is mounted beneath a sheet of mylar, a thin transparent film coated with aluminum to make it opaque.

Penetration of the aluminized mylar by micrometeoroids will allow sun light to illuminate the cell. As this is done, the resistance of the cell is changed so that it becomes conductive. In this condition, the cell can pass currents and signals, thus recording data on particle impacts. Size of the particles can be determined by the size of the penetration and subsequent amount of light emitted to the cell.

In the course of three months, it is possible the cell would receive as few as ten

impacts, said Mr. Secretan. "But I'd be satisfied if it were hit only five times."

Micrometeoroids are particles as small as a thousandth of a millionth the size of a large drop of water. They are composed of stone or combinations of iron and nickel and iron and stone. They move with terrific velocity through space, coming as fragments of asteroids, stellar bodies or even the moon.

They provide a "constant rain" on the earth's surface, according to Mr. Secretan. "The integrated accretion rate amounts to 10,000 tons per day on the earth."

Also aboard S-55b is a wire grid detector. It consists of 46 7-inch by 1¼-inch melamine cards wound with copper wire .002-inch in diameter. When the wires are broken by micrometeoroid impacts, the cards will stop carrying current. This indicates the existence of particle impacts and the data is transmitted to the ground that they have been hit.

Both of the experiments are considered to be relatively uncomplicated, light in weight and requiring little advancement in amplification and telemetry techniques.

The cadmium-sulfide idea was first conceived in 1957. A small model of the device was used on the Vanguard III and Explorer XVII satellites. This work started when Mr. Secretan was with the Naval Research laboratory.

A graduate of the Federal Polytechnicum in Zurich, Switzerland, Mr. Secretan did special instrumentation studies with the late August Piccard at the University of Brussels prior to coming to the U.S. He has been associated with the California Institute of Technology in experimental work on model fuselages.

Anyone interested in forming a group to play badminton seriously, or any soaring pilot wishing to share a glider for the summer of 1963, contact John Firth on 5544. Mr. Firth, who is from Cambridge university, England, will be working on the UK-2 program at Goddard for the coming year.



Delta Records 14th Success in Relay Launch

The 14th straight launch for the Delta launch vehicle was recorded Thursday when the Relay experimental communications satellite was boosted from Cape Canaveral.

The lift off occurred just 1.424 seconds after the scheduled time of 6:30 p.m. EST. The Delta placed the spacecraft into a near nominal orbit.

Soon after launch, the satellite's power supply voltage began to drop. Telemetry information showed that an abnormal drain on the power supply is the probable cause for its low voltage.

This condition has precluded for the time being the conducting of the communications experiments which were planned.

Transmissions from the satellite were turned off Saturday afternoon. The satellite will be interrogated periodically to determine its status.

Objectives of Relay are to test intercontinental microwave communications by low-altitude active repeater satellites, measure energy levels of space radiation in the orbital path and determine the extent of radiation damage to solar cells and electronic components.

Plans were to conduct TV, two-way telephone, teletype and data experiments between the U.S. and Europe. Telephone, teletype and data experiments also were scheduled between the U.S. and Brazil. In addition, one-way voice and teletype tests were scheduled to be received from the U.S. and Brazil at Fucino, Italy.

Data Systems Has New Associate Head

New associate chief of the data systems division is Darrin Gridley who comes to Goddard from the Electro Nuclear Systems corporation of Minneapolis.



Mr. Gridley previously was associated with Maico Electronics corporation in Minneapolis for two years and the Naval Research laboratory for 13 years. At NRL he was head of the digital systems section and data coordinator for Project Vanguard.

A native of Chicago, he is a graduate of Purdue university.

Headquarters Forms New Group

In an effort to coordinate manned and unmanned space programs, a joint working group has been formed from personnel of the offices of space sciences and manned space flight, NASA headquarters.

Chairman of the group is Dr. Eugene Shoemaker, assistant to the director of lunar and planetary programs, office of space sciences.

Responsibilities of the new group will be to

- Recommend a detailed program of scientific exploration in future manned flights.
- Define the information desired from unmanned flights for support of manned flights.
- Establish and maintain a close liaison with NASA field centers, other government agencies and universities in the development of an integrated scientific program for manned flight.

Recent Technical Publications Authored by Goddard Staff

K. Stumpff, "Calculations of Ephemerides From Initial Values," NASA Technical Note D-1415, December 1962.

N. L. Bonavito, "Differential Correction for Vinti's Accurate Intermediary Orbit," NASA Technical Note D-1445, December 1962.

Syun-Ichi Akasofu, S. Chapman, U. of Alaska, and J. C. Cain, "The Magnetic Field Of A Model Radiation Belt Numerically Computed," NASA Technical Note D-1447, December 1962.



LUC SECRETAN inspects the cadmium sulfide detector in its metallic mount which he holds in his left hand. The mylar cover to protect the cell is held in the other hand.

A Professional Program of Transition

A College Graduate Comes to Goddard...

An intensive program of career development patterned after the best practices in industry, education and government, is providing a fresh approach at Goddard to the old problem of job growth and advancement.

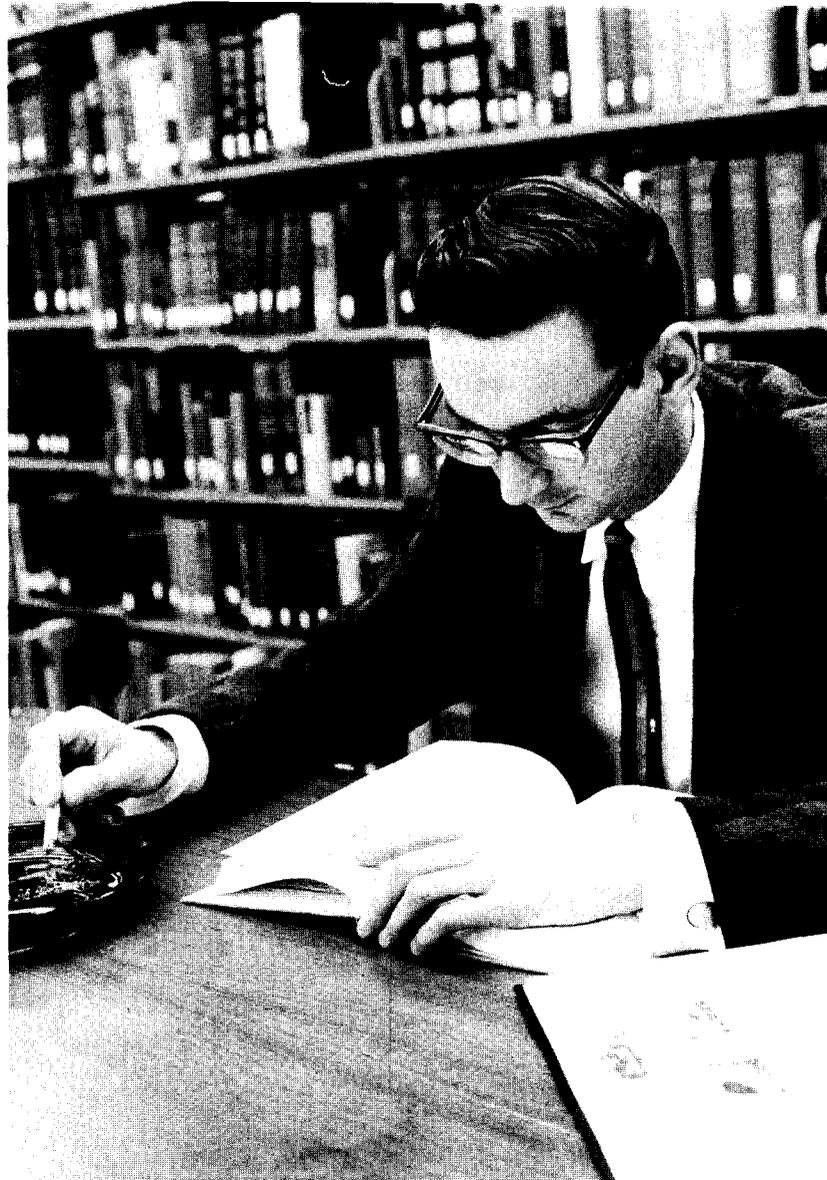
The Center's new graduate training program is designed to provide a professional and planned transition from college to career for new college graduate engineers and scientists.

Purposes of the program are to

- Bridge the gap between formalized academic learning and applied aero-space technology.
- Develop the trainee to full productivity in the shortest possible time.
- Extend engineering and scientific knowledge and skills.
- Broaden the understanding of Goddard and the interrelationships of its functions, and
- Create in the trainee an awareness of Goddard's active concern that its scientists and engineers continue to grow professionally.

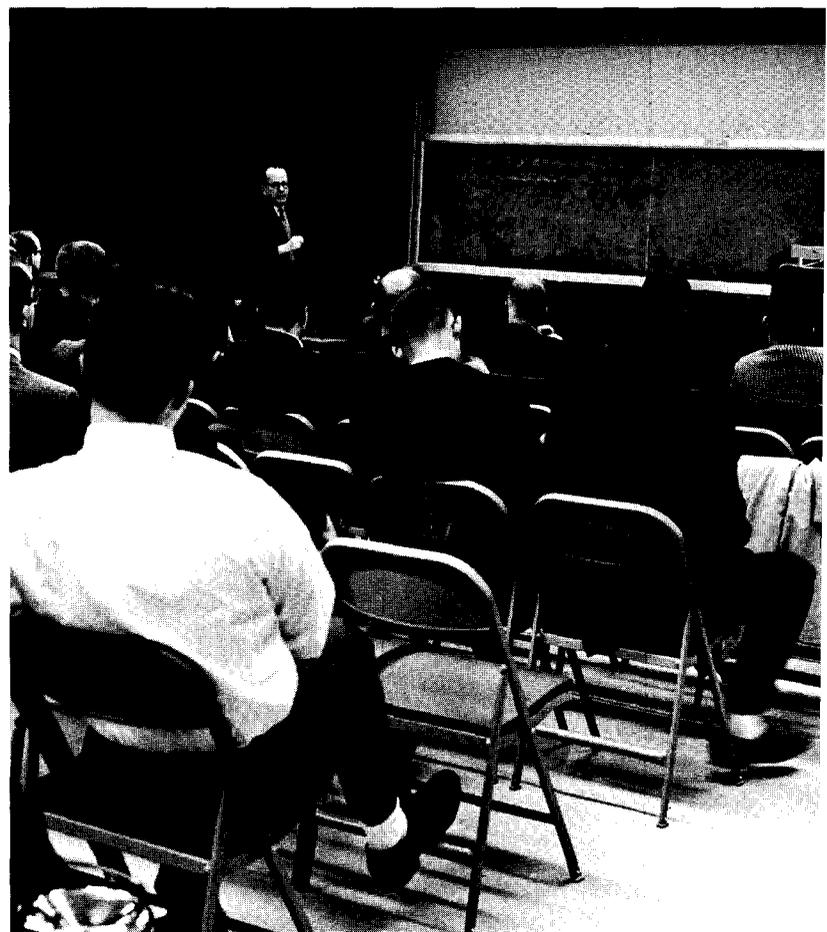
"The program is shortening the period of time normally spent to assimilate new graduates into the organization," said Jim Reese, head of the employee development branch.

GODDARD makes good use of its talents. Here, Jack McReynolds, engineer, astrophysics branch, teaches an in-service course in Digital Computer Logic Design.



DON BARTEL, electronics engineer in the r-f systems branch, tracking systems division, keeps abreast of technical literature in the Goddard library.

WILLIAM CAHILL, head of the mathematics and computing branch, lectures on Goddard computer capabilities in the professional orientation lecture series.





FRANK MARTIN, right, head of the mechanical systems branch, listens to trainee Dennis McCarthy explain the mechanical design of the broad band ozone detector on the S-52. This type of training helps Mr. McCarthy prepare for his oral panel presentation.



DR. GEORGE LUDWIG, left, head of the instrumentation section, fields and particles branch, and Charles Ehrmann, electrical engineer, examine a wave form on the Tektronics Oscilloscope in the branch instrumentation lab. Guidance such as this provides the trainee with additional insight into his work.

WORKING on an assignment for their course in the Physical Principles of Masers are left to right, Louis Ippolito, David Nace, Paul Heffernan, Joe Deskevich and Leonard Roach, communications branch trainees.



Under the direction of Goddard's employee development branch, the graduate training program has four major steps:

- **On-the-job training**—Most of the new graduates' first year is taken up by this phase. The trainee receives direct guidance from his supervisor. This type of supervision enables the trainee to gradually assume more complex duties and responsibilities. By the end of the program, he is well along toward working on essentially independent projects under only general supervision.

- **Written progress reports**—As the trainee progresses, he submits written reports on work assignments and progress. This gives management and the trainee an opportunity to see what future patterns his career is taking. In addition, the supervisor writes progress reports on the trainee. These allow the supervisor to make changes and improvements on the career plan originally set up for the trainee.

- **Professional orientation lectures**—After the trainee has gotten a feel for his job, he begins the professional orientation lecture series. With other trainees, he attends a comprehensive series of lectures on the organization and mission of NASA and Goddard, on Goddard's major projects, and on current trends in research and development. This aspect of the program gives the trainee needed information and allows him to meet and get to know key Goddard personnel as well as other trainees.

- **In-service courses**—Because applied aerospace technology is advancing faster than college



JOHN CARL, of the advanced projects branch, left, explains a problem in spherical astronomy to computer programmers John Watson, Walt Truszkowski, Clarissa Thompson and Sandra Lazorick. These informal discussions are a major part of the new graduates' on-the-job training.

PLANNING an in-service course in satellite communications are, left to right, Dr. J. J. Freeman, consulting physicist, Robert Rochelle, head of the flight data systems branch, and David Hepler, electronic engineer in the flight r-f systems branch.



curriculums, Goddard provides its own courses to help fill the gap between theory and applied aero-space technology. What courses are offered depends upon needs of Goddard and the individual concerned.

Courses now being offered or in preparation, include Scientific Programming for the IBM 7090, The Physical Principles of Astronautics, The Physical Principles of Masers, Digital Computer Logic Design, Satellite Communications, Antennas, Transistor Circuit Applications, and Physics of Planetary atmospheres. Classes meet during working hours, usually for two or three hours a week. Each trainee takes a minimum of one course.

• **Oral panel presentation**—During the eleventh month of the training program, each trainee gives an oral presentation on some phase of his work assignment. The panel is composed of Goddard professionals. The trainee prepares his presentation with considerable care since its main purpose is to demonstrate the success of his training and his understanding of and insight into his work.

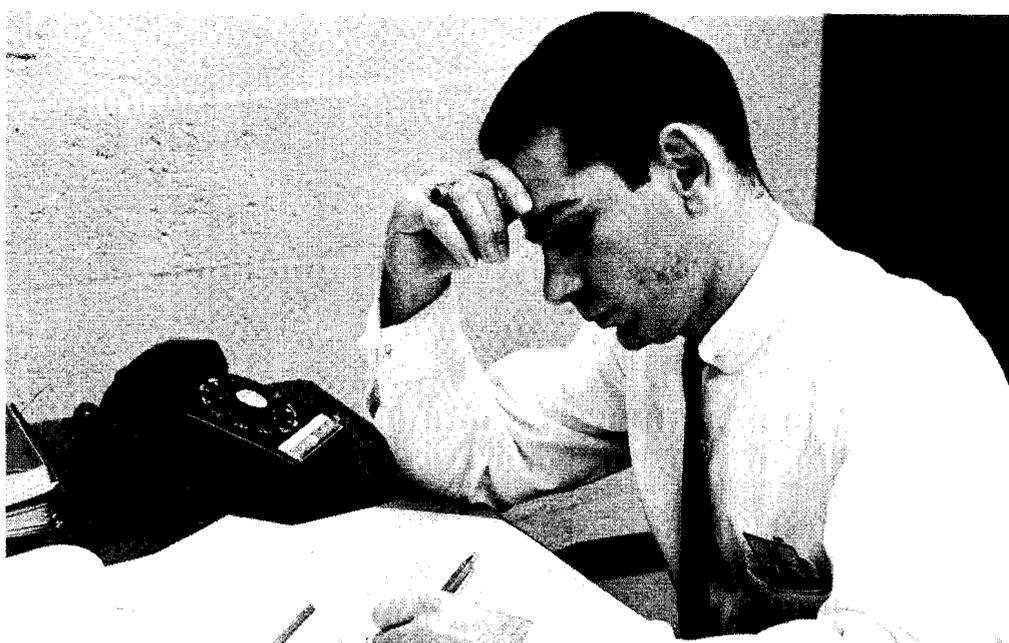
What does Goddard hope to accomplish with the new program? Said Clarence Schroeder, chief of the tracking systems division:

“As a Goddard supervisor we recognize our responsibilities for the training of our subordinates. We must understand the endless cycle of appraising the individual, selecting suitable training, evaluating the results, and re-appraising, re-training, and re-evaluating as both the individual and technology progress. This is the aim of the graduate training program.”



JACK PEAKE, left, head, flight r-f systems branch, and **Harry Moore**, electrical engineer plan Mr. Moore's development and training for the coming year.

THREE mathematicians, left to right, **Fred Whitlock**, **Patricia Egan** and **Neal Paris**, all of the mathematics and computing branch, get a briefing on the graduate training program from **Charles Jones** of the employee development branch. All new grads receive this briefing shortly after coming to Goddard.



HERB CUNHA, electronics test branch, prepares a progress report on his latest work assignment.

WASYL LEW, operations branch, reflects a moment while studying for his course in radio engineering at the University of Maryland. Goddard encourages its young professionals to further their development by attendance at local universities.



Current Theories on Mars, Venus Discussed

Since Mars and Venus are both terrestrial planets, why are they so different from earth?

Mars is similar to the earth except that it is small and, being farther away from the sun, is much colder. Its low mean temperature is minus 40 degrees Fahrenheit, compared to 60 degrees Fahrenheit for earth.

Venus is about the same size as the earth, but slightly nearer the sun. We therefore should expect an atmosphere similar to that of the earth with a slightly higher ground temperature. Recent measurements indicate, however, that the ground temperature may be as high as 600 degrees Fahrenheit, and the pressure 10 times that of the earth. If the interpretation of these measurements is correct, it is difficult to understand how the Venus atmosphere evolved in such an entirely different manner from that of the earth.

What are the clouds of Venus made of?

Three are two current theories on the composition of these clouds. One holds that the clouds are composed of tiny ice crystals, while the other suggests that they may be dust churned up by the high winds on the surface. Actual measurements, however, made by the study of the polarization of the sunlight reflected by the clouds favor the hypothesis of ice crystals.

Could the high surface temperature of Venus be explained by heating from the interior of the planet?

It is difficult to estimate the radio active or volcanic heating at the surface of a planet which is never visible. However, from what we know about our own earth, we can assume that this form of heating is extremely small compared to solar heating.

Do the Martian ice caps melt in summer?

No, they evaporate. During the summer season in the northern hemisphere the water vapor from the evaporated northern cap travels with an average speed of 30 miles a day across the equator to the opposite pole, and condenses to form the winter pole's ice cap. With the change of season, the reverse is observed.

Dr. S. Ishtiaq Rasool is a senior research associate at Goddard's Institute for Space Studies. He spoke at the weekly colloquium on the Atmospheres of Mars and Venus. Because of the intense interest that has developed in the planets as the result of recent space probes, a summary of his talk is presented here.

How can the clearing of the blue haze of Mars be accounted for at the time of the opposition?

I personally think that this may be an illusion, because most of the observers on earth look carefully at Mars only during the two times a year when she is in opposition with earth. **Do the dark areas of Mars change with the seasons?**

Yes, they acquire a dark green coloration at the time water vapor passes over them. This leads biologists to believe that an extremely primitive form of plant life may exist.



SCIENTIFIC advances are providing new data and theories about cloud-shrouded Venus, right, and Mars, left.

However, this matter is controversial and arguments have been advanced against this theory due to several observational facts, such as the higher temperatures observed over the dark Martian areas and the absence of bands of chlorophyll.

On earth it has recently been shown by satisfactory measurements that even in a cloudless atmosphere vegetated areas like the Congo, with high water vapor content, radiate at a lower temperature than adjoining desert regions.

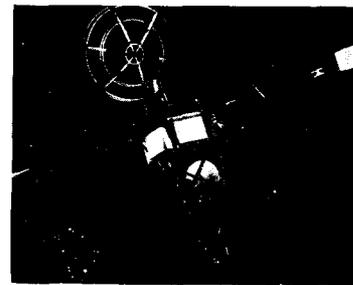
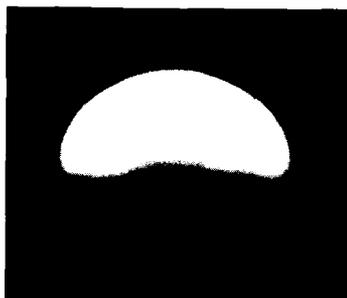
Is there any possibility of life on Mars?

The temperature and pressure conditions on the surface of Mars and the composition of the atmosphere can certainly support some primitive form of plant life as known to us. Lichens have often been suggested as the organisms which can easily survive under Mar-

tian conditions. More information on this problem will come from higher resolution and photographs taken from space vehicles.

How will the Russian spacecraft Mars I increase our knowledge?

Very little information has been made available on the Soviet probe. But, if new data is obtained from closeup pictures of Mars, many problems regarding the surface features and the atmospheric conditions of the planet may be resolved. Pictures taken at different regions and with different color features would probably indicate the heights of various types of clouds which have been seen floating in the atmosphere of Mars. The data also would supply new information on the altitude of the blue haze, on the superficial difference between equatorial and polar diameters of Mars, on the topography of the surface, and, above all on



Mariner II

Space Dust Less Than Expected Mariner Finds

Mariner II, which completed its historic space trip by flying past Venus on Friday, turned up new evidence on the amount of dust particles in interplanetary space.

Data from Goddard's dust detector aboard the spacecraft shows that the amount of dust in space is 10,000 times less than the dust closer to the earth. Earlier predictions had placed the amount of dust at 1000 times less than near earth.

At the present time, none of several published theories appears to explain the difference, according to Mr. Wesley Alexander, head of the astrochemistry section.

"Our next logical step is to determine how and why this difference in dust distribution exists."

By "next step", Mr. Alexander was referring to Goddard's orbiting geophysical observatory (EGO), scheduled for a late 1963 launch.

"Experiments on EGO will be of such sophistication as to measure the velocity of space particles as well as their energy and momentum."

EGO's orbit will carry the satellite from 150 to 60,000 miles in space, thus giving scientists "a common ground on which to compare near-earth and interplanetary particles." Until Mariner, past estimates of space particles were made entirely on the basis of observation.

Principal EGO investigators, in addition to Mr. Alexander, are Curtis McCracken, Otto Berg and Luc Secretan.

Goddard News

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Goddard Children and Parents Have a Gala Time



