

New cooling system could extend instrument lifetime on satellites

Goddard engineers in code 713.0 have developed an advanced spaceborne cooling system which could prolong refrigeration necessary for the operation of many astronomical and Earth-watching instruments by as much as six times. The new system represents a technological advancement which also continues the Center's lead in the areas of linear motor and mechanical refrigeration design for use in Stirling cycle coolers.

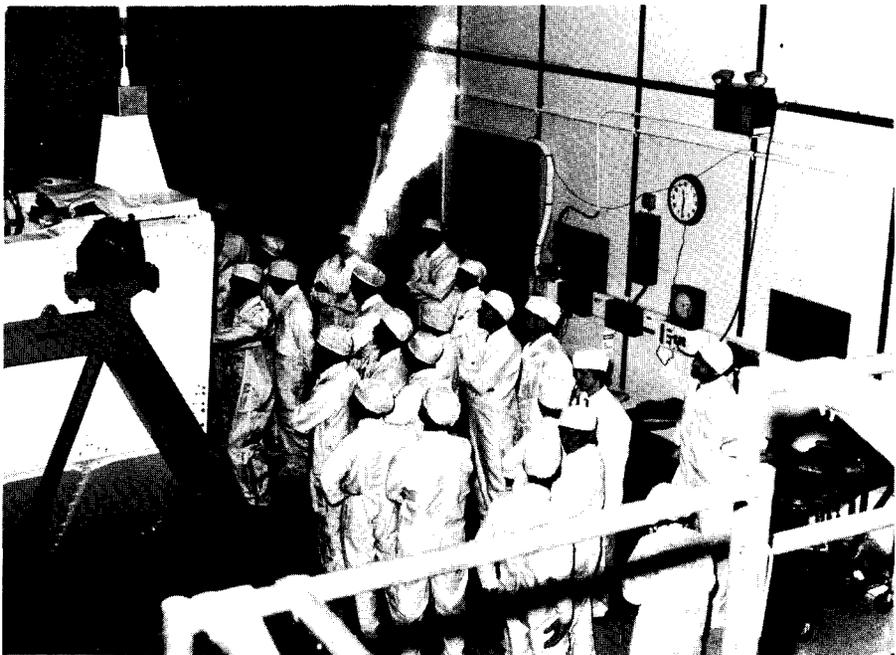
Stirling cycle coolers will be used for both scientific and applications satellites to provide cooling for instruments onboard the spacecraft. The new developments will allow for a much higher capacity for cooling and a more durable cooling system.

The current systems either have very limited capacity for cooling or limited durability they last for only about six to ten months. The new Goddard cooler will have a three to five year lifetime and a virtually unlimited cooling capacity.

Previously, most instruments did not require cooling, however, technology has produced better instruments, such as gamma and infrared radiation detectors, which call for a new cooling system.

Goddard engineers have been working on this project for about two years and expect the first model to be delivered and ready for testing in March 1981. Allan Sherman, Head, Cryogenics, Propulsion & Fluid Systems Branch said that by utilizing magnetic bearings, the new design is almost "wearless" and promises to be a major milestone in future space applications.

Sherman, along with two other Goddard engineers, Philip Studer and Max Gasser, recently attended a conference sponsored by the Office of Naval Research/Naval Research Laboratory and



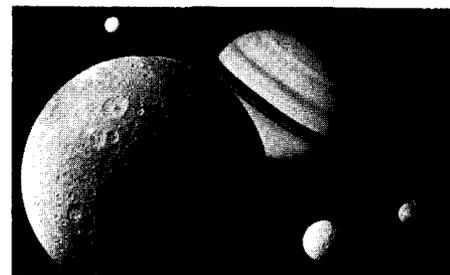
Astronauts visit Goddard

Astronaut Candidates for the Space Shuttle visited Goddard in December. The purpose of the visit was to familiarize the candidates with the operations and missions here at Goddard. After a welcome by Center Director A. Thomas Young, the Astronaut Candidates toured the following operations: Network Test and Training Facility, International Ultraviolet Explorer Science Center, Gamma Ray Observatory, OSS-1 (Office of Space Science) Payload, Satellite Test Facilities, Landsat, HCMM (Heat Capacity Mapping Mission), Space Tracking and Data Acquisition, NASA Communications. The Astronaut Candidates were also given an overview on Space Science Programs by Dr. George Pieper, Director, Sciences Directorate and on Goddard History by William P. O'Leary, Protocol/Congressional Liaison Officer, Office of Public Affairs.

National Bureau of Standards on the International Institute of Refrigeration Cryogenic Engineering. The conference was a vehicle for exchanging progress reports on the developments in this area. Goddard engineers presented papers on their latest developments and Sherman was session chairman on the Interagency Cryogenic Refrigeration Coordination Committee.

Sherman said that there is a possibility of a spin-off production for commercial use but major emphasis now is on its scientific applications.

Saturn: a gallery of curious moons



and rings...

See page 2

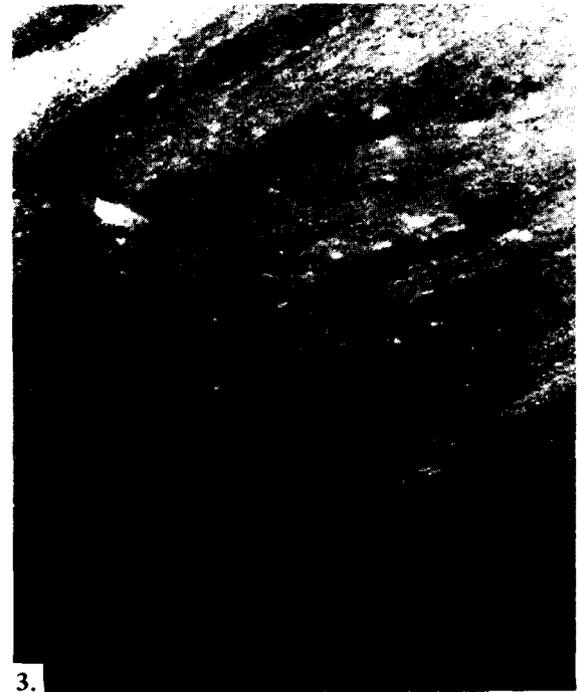
Photos taken by Voyager



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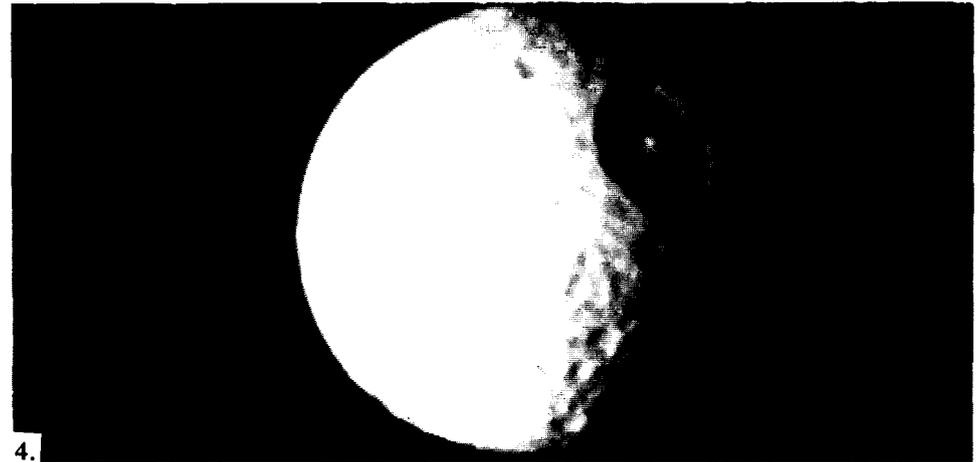


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Saturn's F, or outermost ring was photographed from the unilluminated face of the rings by Voyager I at a range of 750,000 kilometers (470,000 miles). Complex structure is evident, with several components seen. Two narrow, braided, bright rings that trace distinct orbits are evident. Visible is a broader, very diffuse component about 35 kilometers (20 miles) in width. Also seen are "knots" which probably are local clumps of ring material, but may be mini-moons.

2.

These Voyager I images of Saturn's Eleventh moon, a trailing co-orbital satellite, were taken on Nov. 12, 1980 at a range of 177,000 kilometers (110,000 miles) and show the south polar region of the body. The packmarked moon is approximately 135 by 70 kilometers (83 by 43 miles). Comparison of the two images, taken 13 minutes apart, reveal a narrow shadow moving across its face. The shadow is probably cast by a small, narrow ring of Saturn a few thousand kilometers away from the satellite.



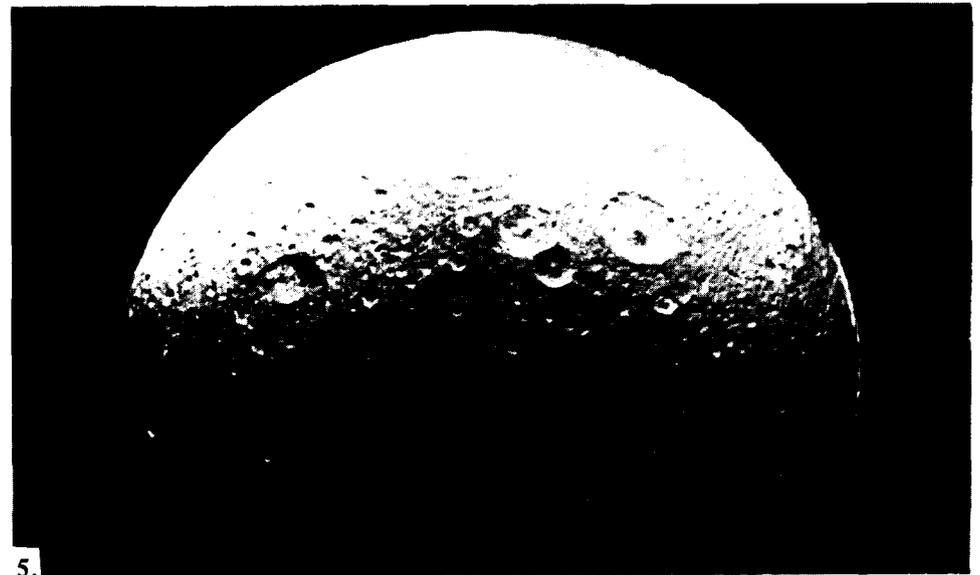
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Numerous small cloud features are shown in this Voyager I wide-angle image of Saturn's south polar region and mid-southern latitudes. At these polar latitudes the large scale light and dark bands break down into small-scale features, seen here as waves and eddies. This image of 442,000 kilometers (265,000 miles) on Nov. 12, 1980. The Voyager Project is managed for NASA by the Jet Propulsion Laboratory, Pasadena Calif.

4.

The cratered surface Saturn's moon Mimas is seen in this image taken by Voyager I on Nov. 12, 1980 from a range of 425,000 kilometers (264,000 miles). Impact is more than 100 kilometers (62 miles) in diameter and displays as prominent central peak. The smaller crater are abundant and indicate an ancient age for Mimas surface.



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Goddard has re-organization in A&M

Major changes in management and organizational assignments have begun at Goddard. One of Center Director A. Thomas Young's immediate concerns, once onboard, was to assess the effectiveness of the people and organization to successfully conduct the programs assigned to Goddard and to maintain a high quality institution. With this in mind, the following changes have taken place:

Mr. William A. Mecca, Jr., formerly Director of Administration and Management, was appointed to the newly established position of Assistant Director for Special Projects within the Office of Center Director, code 100. This position was established in order to provide intensified Center focus to TDRSS efforts and to insure executive-level attention to the complex management requirements of this highly visible NASA program. Ms. Benita A. Sidwell, in her capacity as Deputy Di-

rector of A&M, will lead the Directorate pending selection of a permanent replacement for Mr. Mecca. In addition, the A&M Directorate has been retitled as the Management Operations Directorate.

The Advanced Planning Office, code 110, has been disestablished and its functions have been transferred to a new office, the Program and Institutional Planning Office. According to Young, the establishment of goals and objectives, long-range program and institutional planning, determination of work that should be performed in-house and that which should be contracted, manpower planning, and the critical review of proposed new work are important functions in managing an organization such as Goddard. Mr. Robert S. Kraemer, formerly Special Assistant to the Director, has been appointed Director of this new office.

The Office of the Chief Counsel, code 293, has been transferred from the A&M Directorate to a staff office of the Center Director. Mr. Gary L. Tesch continues as Chief Counsel.

The Office of the Comptroller, code

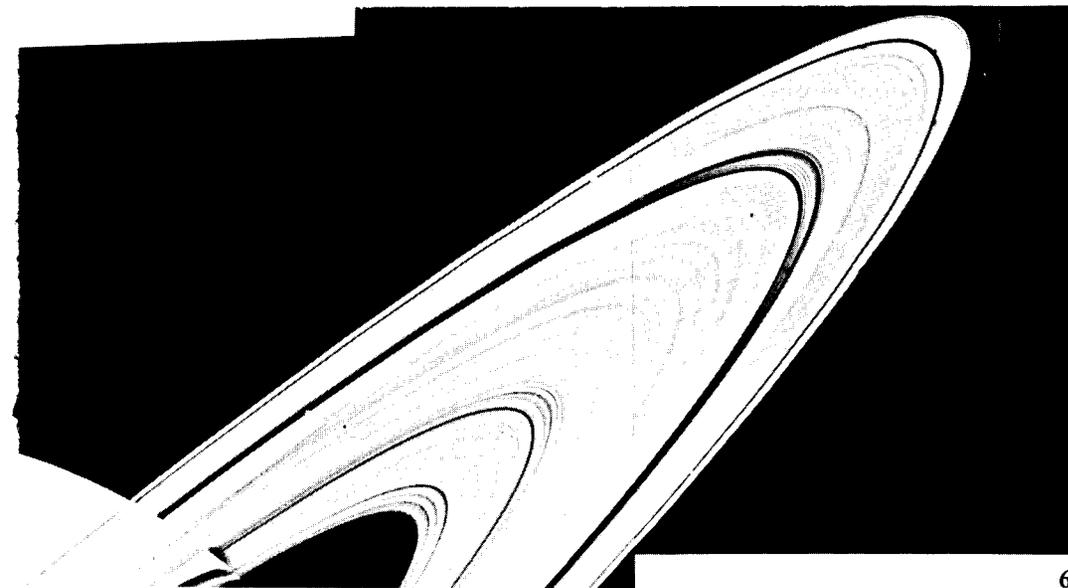
150, has been established at the directorate level to perform independent assessment of cost proposals for new projects; to audit projects to assure proper systems are in place to measure performance; and to assure an independent mechanism to penetrate and analyze performance versus plans for projects. The Comptroller will be responsible for the submission of all official budgets and cost estimates. The office will include the functions of the current Financial Management Division, code 210 (with the exception of the pricing function) and the project cost estimating function of the Resource Analysis Group, code 400.7, from the Project Management Directorate. The above two organizations have been transferred to the new office—the Financial Management Division as code 151 and the Resource Analysis Group, which has been retitled as the Resource Analysis Office, code 152—as well as the resource analysis support personnel from the Project Support Division, code 280A, who have been assigned to the Resource Analysis Office.

In addition to his duties as Deputy Director of the Center, Dr. John H. McElroy will act as Comptroller for the Center until a permanent selection is made to fill this position. Dr. John E. Green will continue as Chief, Financial Management Division, code 151, and Mr. Paul A. Villone as Chief, Resource Analysis Office, code 152.

The Project Management Directorate has been reorganized to provide effective flight project management. The Directorate has been retitled as the Flight Projects Directorate and Mr. William C. Keathley, formerly Director of Project Management, has been assigned Director of Flight Projects. Mr. H. Robert Lynn, formerly Assistant Director of Applications for Operations has been appointed Deputy Director. Mr. Henry K. Arneson, formerly Assistant Director for Flight Projects Support, A&M, is reassigned to the Flight Projects Directorate as Deputy Director for Resources. In addition, three new Associate Director positions have been established along functional lines as staff positions, and individuals have been reassigned as follows:

—Mr. Joseph Purcell, formerly
Deputy Director of Project

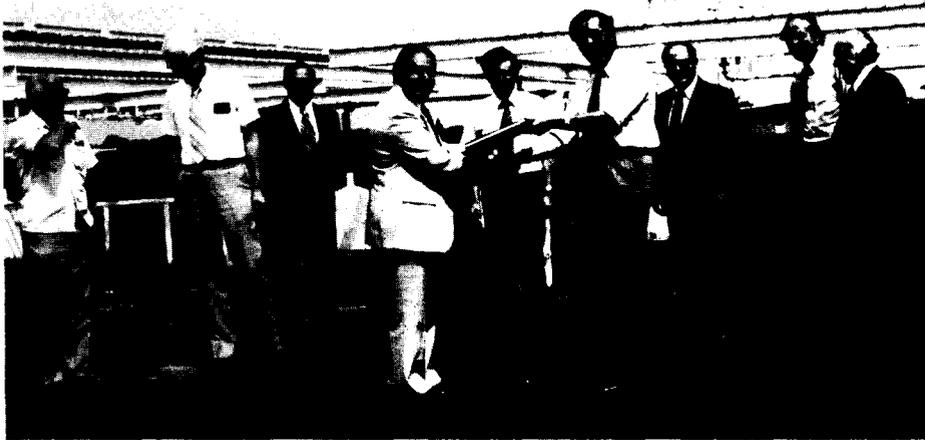
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6.

Impact craters — the record of the collision of cosmic debris — are shown in the Voyager I color mosaic of Saturn's Dione. The largest crater is less than 100 kilometers (62 miles) in diameter and shows a well-developed central peak. Bright rays represent material ejected from other impact craters. Sinuous valleys probably formed by faults break the icy crust. Images in this mosaic were taken from a range of 162,000 kilometers (100,600 miles) on Nov. 12, 1980.

A two-image mosaic of Saturn's rings, taken by NASA's Voyager I on Nov. 6, 1980 at a range of 8 million kilometers (5 million miles), shows approximately 95 individual concentric features in the rings. The extraordinarily complex structure of the rings is easily seen across the entire span of the ring system. The ring structure, once thought to be produced by gravitational interaction between Saturn's satellites and the orbit of ring particles, has now been found to be too complex for this explanation alone. The 14th satellite of Saturn, discovered by Voyager is seen (upper left) just outside the inner ring, which is less than 150 kilometers (93.2 miles) wide.



Winkfield station phased out

From left to right, are Dr. H.G. Hopkins, Appleton Laboratory, UK Science Research Council (who was responsible for building the Winkfield station in 1960 and for its operation until his retirement in 1974); Mr. Charles A. Taylor, Director Network Systems Division, NASA HQ; Mr. D. Duovarjo, Contracts Division, NASA HQ; Mr. Richard S. Sade, Director, Networks Directorate, Code 800 GSFC; Mr. G. Lewes Addison, Senior Administrator, Appleton Laboratory, UK Science Research Council; Mr. Harold C. Bevan, SRC, Winkfield Station Director (who has worked at Winkfield since the building of the station in 1960, apart from a period of 7 years, 1972 to 1979 on the IUE and UK-6 project teams); Mr. Daniel A. Spintman, Associate Chief, Network Operations Division of the Networks Directorate, Code 850, GSFC; Mr. Clyde Medhurst, SRC Winkfield deputy station director (who has worked at Winkfield since 1961 apart from a period of 4 years, 1968 to 1972 on the UK-4 project team); Mr. Tecwyn Roberts, International Affairs Office, Code 802, of the Networks Directorate and NASA representative at BFEC, Columbia. Tec was, until 1979, Director of the Networks Directorate Code 800, until he resigned because of ill health.

GWU students attend Goddard workshop

The Educational Programs office sponsored a four day workshop for the Vocational/Special Education Program of the George Washington University, Washington, D.C. This was the fourth year for the workshop and the students were as enthusiastic as in previous years.

There were 20 students broken into groups of four each which rotated in the following areas: Plant Operations and Maintenance; Logistics Management; Printing and Duplicating Services; Mail Services; Food Services; Library Services; Computer Operations; and Engineering Design.

The Vocational/Special Education Program concentrates on three phases of vocational education training areas follows: (1) classroom lectures and discussions; (2) visitation and observation of simulated work experiences; and (3) hands-on experiences in the real work world. The final session of the workshop included a brief discussion of Federal Government employment requirements and practices.

NCAR Director briefed on SMM

Wilmot N. Hess (right), Director, National Center for Atmospheric Research (NCAR) in Boulder, Colorado, visited the Experimental Operations Facility of the Solar Maximum Mission (SMM) at Goddard Space Flight Center recently. In this photo, the NCAR Director is being briefed by Rose Reynolds, the system programmer for the coronagraph/polarimeter experiment aboard the space-

craft, and by Kenneth J. Frost, SMM Project Scientist. The coronagraph/polarimeter experiment was designed and built by scientists at NCAR's High Altitude Observatory (HAO), and the HAO scientists are conducting experiments with the instrument as the spacecraft provides one of the most comprehensive observations ever made of solar flares on the Sun.



A&M Continued from page 3

Management, has been appointed Associate Director of Flight Projects for Mission Systems.

—Dr. James E. Kupperian, formerly Associate Director of Project Management, has been appointed Associate

Director of Flight Projects for User Systems.

—Mr. Robert C. Baumann, formerly Associate Direc-

tor of Project Management, has been appointed Associate Director of Flight Projects for Systems Management.

—Mr. Joseph Fuller, formerly Project Manager, Tiros Project has been appointed to the newly established position of Deputy Director of Applications.

—A line position of Associate Director of Flight Projects for New Projects has been established. Mr. Mr. Paul A. Mowatt has been assigned to this position.

NASA
National Aeronautics and Space Administration

GODDARD NEWS

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