



Goddard Space Flight Center re-enacted Dr. Robert H. Goddard's successful launch, March 16, 1976.



Dr. Robert H. Goddard achieved flight of a liquid-fueled rocket on March 16, 1926, after 17 years of theoretical and experimental work.

GODDARD HOLDS DUAL COMMEMORATION

The Goddard Space Flight Center honored its namesake Dr. Robert H. Goddard on March 16th with a repeat performance of his feat performed 50 years ago—firing a rocket about 40 feet above the ground.

The event re-enacted in a cold driving rain, was a two-fold commemoration—Dr. Goddard's successful launch of the world's first liquid fueled rocket at a farm near Auburn, Massachusetts in 1926, and the 15th Anniversary of the Goddard Space Flight Center.

"Not a line appeared in a single newspaper about the Auburn flight," Dr. John F. Clark, Center Director noted in

his address. "In fact, the attention he did get in the early 1920's was adverse."

This was in striking contrast to the re-enactment which received a deluge of favorable publicity by the press, television and radio.

After 17 years of theoretical and experimental work, Dr. Goddard fired his first rocket using gasoline and liquid oxygen for propulsion. The ungainly looking contraption attained a speed of 60 miles an hour and rose to an altitude of 41 feet.

His theories were later convincingly confirmed when liquid fueled rockets launched astronauts into earth orbital

flight and sent men to the moon.

The replica was powered by a tiny solid fuel engine in deference to safety and practicality. The model was ignited by electricity from an automobile battery rather than a blowtorch on a stick which provided the generous spark to the memorable experiment a half century ago.

The recreation of the first flight and the 15th Anniversary of the Center was watched by a large contingent of Goddard officials, employees, students, and media representatives. Appropriate music was provided by the band of nearby Robert H. Goddard Junior High School.

"It is difficult to say what is impossible, for the dream of yesterday is the hope of today and the reality of tomorrow."

— Dr. Robert H. Goddard

Deputy Administrator Leaves NASA

Dr. George M. Low, Deputy Administrator of NASA, will leave the Government in June to become the president of Rensselaer Polytechnic Institute, Troy, N.Y.

Low, a graduate of Rensselaer and a Trustee of the Institute since 1971, has been NASA Deputy Administrator for the past six years. With the exception of one year as an aerodynamicist with General Dynamics in Ft. Worth, Texas, in 1948, Low's entire professional career has been with the space agency and its predecessor, NACA.

NASA Administrator, James C. Fletcher, said that he knows of no other person who has contributed as much to achieve and maintain United States leadership in space exploration.

"George Low's influence on the manned space flight program from the very beginning of NASA, his courageous decisions in the Apollo program, his direction of the agency's programs toward the practical application of space technology, and his initiatives in the development of international cooperation in space have earned the admiration and gratitude of the entire country," Dr. Fletcher said.

In announcing his plans to leave Government service after nearly 29 years, Low said, "I

have an opportunity now which will not be available to me again—to become the president of my own alma mater. Since I am totally dedicated to the proposition that the future of our nation depends on the advancement of science and technology, I know of no better way to help assure that future than by participating directly in the technological education of our young people."

Appointed Deputy Administrator of NASA by the President in December 1969, Low also served as Acting Administrator from September 1970 to May 1971. He has guided the agency in the transition to the new goals of the 1970's and beyond, and has negotiated the space agreements with the Soviet Union which led to the Apollo-Soyuz joint flight and other cooperative space projects.

Low is a Fellow in the American Institute of Aeronautics and Astronautics, a member of the National Academy of Engineering and a member of several other engineering and technical societies. He received an honorary degree of Doctor of Engineering from Rensselaer and an honorary Doctor of Science degree from the University of Florida in June 1969.

Among the other honors Low has received are two

NASA Distinguished Service Medals for his contributions to Apollo 8 and for his work in the Apollo program; NASA's Outstanding Leadership Medal for his contributions to Project Mercury; the Arthur S. Fleming Award as one of the 10 outstanding young men in Government in 1963; the Robert H. Goddard Memorial Trophy in 1973; the National Civil Service League's 1973 Career Service Award for Sustained Excellence in 1973 and the Rockefeller Public Service Award (for Administration) in 1974.

Low attended Rensselaer and received a Bachelor of Aeronautical Engineering Degree in 1948 and a Master of Science in Aeronautical Engineering Degree in 1950.



Dr. George M. Low

Go West, Young Comet

Although the Comet Kohoutek was dubbed "Kapooktek" by amateur astronomers for its failure to live up to advance billing, an unheralded visitor from outer space called Comet West put on a brilliant show this March as it swung through our part of the solar system.

"This is the way Kohoutek was anticipated" commented Goddard's Dr. Bertram D. Donn, Acting Chief of cometary science. It was about 50 million miles long from head to tail, and glowed with exceptional brilliance when it apparently broke into four parts.

Comets are interesting to astronomers and other scient-

ists because they can provide man with clues to the very distant past.

According to Dr. John C. Brandt of Goddard "comets promise to give us a look at the primeval history of our solar system because they could be remnants, still close to their original form, of the interstellar material from which our solar system was created."

Comet West was named for its discoverer, Richard M. West of the Southern Observatory in Geneva.

If you failed to see it in early March, it may be that you weren't looking to the East between 4 a.m. and 5 a.m.

Goddard Mourns . . .



Phyllis N. Beal

Phyllis N. Beal, secretary for the Director of Administration and Management, died February 23, 1976 at the Washington Sanitarium in Takoma Park.

Mrs. Beal had been employed at Goddard since 1963. Prior to that she worked at the Navy Department.

In 1974, Mrs. Beal received a 30 year Career Service Award. She also received an Apollo Achievement Award in July, 1969, and a Sustained Superior Performance Award in April, 1969.

She is survived by her husband, Oswald; a daughter, JDee; and a son, Craig.



Comet West measures approximately 50 million miles from head to tail.

AWARDS CEREMONY REVIEWS DELTA ACHIEVEMENTS

Forty-five members of NASA's "Delta Team" received recognition for their performance at the Delta Awards Ceremony held at Goddard Space Flight Center, on February 11, 1976.

NASA Administrator James C. Fletcher and Deputy Administrator George M. Low presented the awards. Dr. John F. Clark, Goddard Director, also participated in the event.

Dr. Fletcher said, "The Delta Program has been managed by an outstanding government-industry team, and that team's record of accomplishment is one of the most remarkable in NASA's two decades of existence . . . The legacy of Delta has indeed been a rich one. Delta is becoming a standard against which to measure the conduct of NASA's business in the future. The agency is building on Delta's successes and its tradition of accomplishment. We are extremely proud of this team."

In the period 1960 through January 1976, there have been 119 Delta launches with an increasing number, in the later years, of reimbursable missions for non-NASA users. The continued demand for the Delta vehicle for scientific, weather, applications, Earth resources and communications satellite missions is evidenced by the schedule of 11 Delta missions this year with all but two of them slated for foreign and commercial users on a reimbursable basis.

Award recipients were:

DISTINGUISHED SERVICE MEDAL

Isaac T. Gillam, Headquarters; Charles R. Gunn, Goddard Space Flight Center; John J. Neilon, Kennedy Space Center; William R. Schindler, Goddard Space Flight Center.

DISTINGUISHED SERVICE MEDAL

Edward W. Bonnett, McDonnell Douglas Astronautics Company; Theodore D. Smith, McDonnell Douglas Astronautics Company.

OUTSTANDING LEADERSHIP MEDAL

Robert C. Baumann, Goddard Space Flight Center.

EXCEPTIONAL SERVICE MEDAL

Thomas I. Bell, Colonel, USAF, Wright-Patterson AFB; Lucille L. Bourdeau, Goddard Space Flight Center; Jon R. Busse, Goddard Space Flight Center; Arthur C. Chandler, Jr., Goddard Space Flight Center; Mason R. Comer, Kennedy Space Center; Michael A. Cushman, Goddard Space Flight Center; Peter T. Eaton, Headquarters; James S. Evans, NASA Pasadena Office; Robert J. Goss, Goddard Space Flight Center; Edward J. Kunec, Headquarters; Anthony A. Longo, Goddard Space Flight Center; Arthur J. Mackey, Jr., Kennedy Space Center; Wayne L. McCall, Kennedy Space Center; Robert M. Montgomery, Patrick AFB; Harry O'Dell, Goddard Space Flight Center; William A. Russell, Goddard Space Flight Center; Edward M. Shafer, Headquarters; Arthur L. Sprott, Goddard Space Flight Center; James C. Sweat, Kennedy Space Center; James F. Towles, Kennedy Space Center; Richard B. Umlauf, Kennedy Space Center; Henry R. Van Goey, Kennedy Space Center; Joseph A. Yienger, Goddard Space Flight Center.

PUBLIC SERVICE AWARD

William W. Barnes, Thiokol Corporation/Huntsville Division; Henry J. Dhuyvetter, McDonnell Douglas Astronautics

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Robert C. Baumann



Edward Cranston, Delta Support Team



Elizabeth Beyer, Delta Technical Team



Michael A. Cushman



Lucille L. Bourdeau



Robert J. Goss



Jon R. Busse



Charles R. Gunn



Arthur C. Chandler, Jr.



Anthony A. Longo

MOST NASA LAUNCHES IN 1976 FOR PAYING CUSTOMERS

Most of the launches of spacecraft in calendar 1976 by NASA will be for cash customers.

NASA has plans to launch 19 satellites or space probes during the U.S. Bicentennial Year and will be reimbursed by customers for 15. The customers include NATO, the Republic of Indonesia, the International Telecommunications Organization, Comsat General Corp., RCA, the National Oceanic and Atmospheric Administration, and the Department of Defense.

In 1975 NASA had nine reimbursable launches in which the customers provided the spacecraft and paid NASA for the launch vehicles and the associated launch costs.

"The growth of the reimbursable launch activity is a true indication of the maturity of the space program," Joseph B. Mahon, NASA's Director of Expendable Launch Vehicles, said. "When commercial firms and other outside-NASA organizations account for more than two-thirds of NASA launches, and pay for them, the age of space exploitation is really here."

Already launched by NASA in 1976 are:

Helios-B, second in a series of solar probes built by West

Germany, was launched by a Titan Centaur from KSC on January 15. *Helios-B* was placed in an orbit which is to carry it closer to the Sun than any previous manmade object. It carries a number of instruments enabling German and American scientists to carry out experiments enlarging our knowledge of the Sun and interplanetary space.

Communications Technology Satellite (CTS), launched aboard a Delta rocket from Kennedy Space Center (KSC) Fla., January 17. This is the world's most powerful communications satellite and represents a five-year effort between NASA and Canada's Department of Communications. CTS has transmitting power levels 10 to 20 times higher than today's satellites and is designed to transmit high-quality color television to small, simple ground stations.

Scheduled later in the year is *PALAPA*, an Indonesian communications satellite to provide telephone, teletype, telegraph and television to the thousands of Indonesian islands never before so connected. It will be launched from KSC aboard a Delta rocket.

Improved Tiros Operational Satellite (ITOS), a weather satellite to be placed in a polar

orbit for the National Oceanic and Atmospheric Administration. This launch is scheduled for September from the California launch site.

Intelsat IV-A-B, second in a series of improved communications satellites owned by the International Telecommunications Organization, was launched aboard an Atlas Centaur from KSC January 29. *Intelsat IV-A-C*, third in the series will be launched in the fourth quarter of the year.

Marisat-A, first link in a new satellite communications system designed specifically for maritime needs, was launched for the Comsat General Corporation aboard a Delta rocket from KSC February 19. Interconnected with existing terrestrial networks, the new system will provide for the first time satellite communications to ships at sea and offshore exploration and drilling operations. *Marisat-B* will be launched in May and *Marisat-C* will follow later in the year if needed.

RCA Satcom-B, second in a series of domestic communications satellites in the RCA network, aboard a Delta rocket from KSC in March. *RCA Satcom-C* will be launched later in the year if needed.

Launches for the remainder of the year are:

NATO-3A, a satellite to be placed in synchronous orbit to provide a communications relay for the North Atlantic Treaty Organization (NATO), will be launched aboard a Delta rocket from KSC in April. *NATO-3-B*, second in the series, is to follow in August.

LAGEOS, an acronym for Laser Geodynamic Satellite, will be KSC's first launch from its West Coast Facilities at Vandenberg Air Force Base, California in 1976. *LAGEOS*, expected to yield data helpful in alleviating earthquake hazards and the predicting of ocean surface conditions and ocean circulation patterns, will be launched aboard a Delta rocket in April.

Comstar I-A, the first in a new class of domestic communications satellites for the Comsat General Corporation, will be launched aboard an Atlas Centaur rocket from KSC in May. *Comstar I-B* will follow in August.

Relativity Program Gravity Probe will be one of three Scout launches by NASA in 1976. It will take off from NASA's Wallops Flight Center, Wallops Island, Virginia, in May on a 3 1/2-hour flight that will take it to an altitude of 18,350 kilometers (10,000 nautical miles) to test the principle of equivalence which is the cornerstone of Einstein's Relativity Theory. The second Scout will place an Air Force satellite in orbit from the Vandenberg launch site. The third is a Navy Transit Navigation Satellite launch scheduled for the second quarter of the year from Vandenberg.

Delta Awards . . . From Page 3

Company; Lloyd S. Erickson, McDonnell Douglas Astronautics Company; Larry W. Gale, McDonnell Douglas Astronautics Company; Savorio F. Giffoni, TRW Systems; Willard J. Green, Aerojet General Corporation; Frank P. Klatt, Rockwell International Corp./Rocketdyne Div.; Charles H. Lee, Aerojet General Corporation; Charles A. Ordahl, McDonnell Douglas Astronautics Company; Phillip W. Payne, McDonnell Douglas Astronautics Company; James A. Pletz, Thiokol Corporation/Elkton Division; J. Crane Simmons, McDonnell Douglas Astronautics Company; M. Dale Steffey, McDonnell Douglas Astronautics Company; Donald W. Tutwiler, McDonnell Douglas Astronautics Company; Gerald W. Ainchell, McDonnell Douglas Astronautics Company.

GROUP ACHIEVEMENT AWARD

Delta Launch Agreement Team, Headquarters; Delta Operations Team, Kennedy Space Center; Delta Procurement Team, NASA Pasadena Office; Delta Support Team, Goddard Space Flight Center; Delta Technical Team, Goddard Space Flight Center.



William A. Russell



William R. Schindler



Joseph A. Yienger

COLLOQUIA SERIES IMPLEMENTED

Goddard has inaugurated a series of afternoon colloquia in the field of management and public policy. The purpose of this series is to provide Goddard employees with an awareness of current and future trends in the management of public science and technological programs, public policy, and public administration.

Dr. John F. Clark, Goddard



Professor James Lyneis

Director, presented the opening remarks at the first colloquia, held on January 21. Professor James Lyneis of MIT spoke on the topic of "World Dynamics: Implications for Public Decision Making."

The second colloquium featured Professor Arthur Miller

of Harvard Law School on March 25. He addressed the topic of "Freedom of Information and the Privacy Act."

The colloquia series will be comprised of six to ten speakers per year with the colloquium hour scheduled for Tuesday, Wednesday or Thursday afternoons from 3:30-4:30 in the Building 3 auditorium.

One future speaker will be Chairman Hampton, head of the Civil Service Commission. His colloquium on Personnel Management is currently scheduled for the fall series.



Dr. John F. Clark

Dr. Clark Receives AIAA Fellowship

Dr. John F. Clark, Goddard Director, has been appointed a Fellow of the American Institute of Aeronautics and Astronautics. The AIAA Fellow Citation was given to Dr. Clark for "His outstanding technical leadership and management of the design, development, and employment of scientific research and applications satellites."

BEEP Selects Goddard Employee

William N. Weston, Mathematician/Programmer, in the Mission Support Computing Analysis Division at Goddard, was the second participant in the Black Executive Exchange Program's (BEEP) lecture series at the University of Arkansas, at Pine Bluff.

BEEP was developed six years ago by the National Urban League, and offers black college and university students a first-hand view of business and industry.

BEEP's Computer Science lecture series utilizes black

professionals chosen from some 400 major corporations and government agencies. These corporations and agencies invest in BEEP by releasing their executives for two consecutive days and cover their travel and related expenses.

Rotating throughout the semester, each week a different executive lectures on his area of expertise as part of the credit-bearing course. Weston spoke on the topic of "Computer Science as a Career."

BEEP courses are designed to demonstrate to students that

theory and practical experience are equal survival essentials in the business world. It also provides role models as reinforcements for students.

Weston is a member of the Association of Computing Machinery (ACM), N.A.A.C.P., the Urban League and the Y.M.C.A. He is also associated with the Northwest Boundary Civic Association, Alice Deal Home & School Association and is Regional Vice President of the Savannah State College Alumni Association.

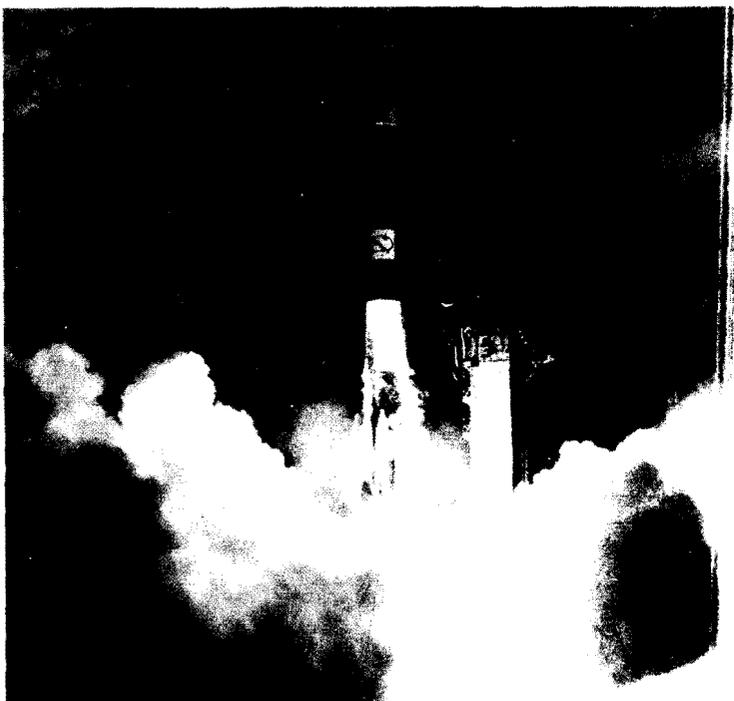
GODDARD OBSERVES BLACK HISTORY WEEK



Goddard recognized Black History Week with an exhibit highlighting the History and Culture of Minorities on February 22-24. The display was developed by Mr. Carlton Funn, an interpersonal relations resource consultant. According to Mr. Funn, "It was an outgrowth of the need to expand on the knowledge of the contributions the black man made and is



still making in history." Dr. Carter G. Woodson, founder of the Association for the Study of Afro-American Life and History, started Black History Week in 1926, to increase an awareness of achievements and contributions that have long been obscured.



Marisat-A was successfully launched from Cape Canaveral February 19. It will be used to provide high quality communications to the U.S. Navy, commercial shipping and offshore industries.

LOW COST SOUNDING ROCKET SYSTEM PROVES TO BE EFFICIENT

A joint Canadian-American effort resulted in the successful test launch of a new low cost sounding rocket system, the Nike-Black Brant V. The launch took place in December, 1975, at the Churchill Research Range in Canada.

The purpose of the launch was to demonstrate the compatibility of two proven rocket systems, the Black Brant V and the Nike, with minimal additional hardware to form a new low cost-high performance vehicle.

The Nike-Black Brant V system allows for increased time spent in space, higher altitudes, and increased payload capabilities at a lower cost per experiment round over the traditional 1

system. Payloads designed for use on the Black Brant V may now be flown on the Nike-Black Brant V without modification.

Goddard provided the Nike, interstage hardware, Black Brant tail assembly, payload subsystems, engineering analysis, and some performance instrumentation while the Canadian National Research Council provided the Black Brant vehicle and the remaining instrumentation, integration, and the launch operation through their contractor, Bristol Aerospace Limited.

The two stage vehicle is now included in the Goddard Space Flight Center's operational

Marisat Expected to Improve Maritime Communications

The first in a series of maritime communications satellites to be used by the U.S. Navy, commercial shipping, and offshore industries, Marisat-A, was successfully launched by Goddard's Delta for the Comsat General Corporation, February 19, at 5:32 p.m. EST from Cape Canaveral.

The new satellite system will permit rapid, high quality communications between ships at sea and home offices. Telephone and Telex messages may be exchanged without fear of interference or delay due to severe weather or ionospheric disturbances that might interrupt radio traffic. The satellite service is expected to significantly improve the communication of distress, safety, search and rescue, and weather reports.

Quantities of Marisat mobile terminals have been produced and many have been purchased or leased from Comsat General and installed on ships flying the flags of a number of nations of the world.

Commercial common carrier service via Marisat is expected to begin in early April.

The U.S. Navy will be a substantial customer of the Marisat system, using capacity at different frequencies for operational communications and pending the completion of its own Fleet Satellite Communications (FleetSatCom) System.

The satellite was placed into geo-synchronous orbit over the equator at 15 degrees west longitude above the Atlantic Ocean about 500 miles southwest of the coast of Liberia. A Delta 2914 launch vehicle carried the 655 kilogram (1,445 pound) Marisat A into orbit.

A second satellite, Marisat B, will be positioned over the Pacific later this year.

The satellite system is owned and operated by a consortium headed by the Comsat General Corporation. Comsat General will fully reimburse NASA for the Delta 2914 launch vehicle, launch services and related costs.

The Delta project is managed by Goddard.



Ted K. Freeman, manager of Boeing Aerospace Company's Applications Explorer Mission (AEM) Project, takes a break to chat with his NASA boss, Marjorie Townsend, AEM Project Manager from Goddard. Mrs. Townsend was at the Boeing Space Center with part of her Goddard team, to resolve interface data for each of the Boeing spacecraft and the Scout launch boost vehicle on one end and the NASA instrument payload on the other end. Behind them is a full-size mockup of the Heat Capacity Mapping Mission spacecraft Boeing will be building for the NASA AEM Project.

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Helaine Suval, Editor
Patricia Ratkewicz, Secretary, Phone Extension 4141

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