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Goddard Space Flight Center

Goddard News

Greenbelt, Maryland and Wallops Island, Virginia

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Jeff Elliott photo

NASA Administrator James M. Beggs applauds as President Reagan cuts the first slice of NASA's 25th Anniversary cake during the ceremony October 19 at the National Air and Space Museum. President Reagan said that NASA's accomplishments over the past 2½ decades had served America well. "When the figures are put together, we're not only getting our money's worth, our commitment to space has been one of the best investments we've ever made as a nation," the president said. At least 800 people attended the ceremony.

Space Telescope renamed after Edwin P. Hubble

The Space Telescope, America's future orbiting optical astronomical observatory, has been renamed the Edwin P. Hubble Space Telescope in honor of one of the nation's foremost astronomers.

It is scheduled for launch aboard the Space Shuttle in 1986. Dr. Burton Edelson, NASA's Associate Administrator for Space Science and Applications, announced the renaming.

Hubble's astronomical research over three decades profoundly changed our understanding of the basic structure of the universe.

Before Hubble, scientists held differing views on the extent and dimensions of the universe. It was believed that our solar system was part of a larger system which contained all the stars visible to the naked

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Spacelab Data Processing Facility

Housed and managed at Goddard

One of the key elements in any Shuttle mission is the capability to track the spacecraft, communicate with the astronauts, command the Orbiter, and obtain the telemetry data that informs ground controllers of the condition of the spacecraft and its crew.

For the STS-9/Spacelab mission, a second and equally important consideration is to return the vast amounts of data from the Spacelab payload. Spacelab is the first Shuttle mission to gather data on a scale equivalent to earlier Skylab missions and planetary probes. As such it requires a communication network unlike any NASA has used previously with the Space Transportation System.

NASA had planned to handle STS-9 tracking and communications, and Spacelab experiment data through the Tracking and Data Relay Satellite System (TDRSS),

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Hand in Hand members of this year's Goddard Employee Campaign Committee prepare to exercise their ability to make life richer for someone else through their support to the Combined Federal Campaign (CFC). Members of the committee pictured left to right are: Steve Fogleman, chairman, code 800; Diane Lewis, publicity chairperson, code 802; Marietta Sturgel, code 300; Clay Magee, code 700; Rodney Green, code 150; Rick Keegan, code 200; Kathy Henderson, code 600; Barbara Sweeney, code 400; Betsy Edwards, code 500; Roberta Valonis, code 800; A. T. Danessa, co-chairperson; and Nina Desmond, publicity committee, code 850. Not pictured are Lynn Marra, co-chairperson, code 802; Carol Arkwright, code 900; and Nancy Spencer, code 100.

This year's goal, as established by the committee, is $215,000. As of November 3, Goddard had reached 77 percent of its goal. Won't you join them in helping others in need? Your gift will make a difference.

SLDPF

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a pair of two large communications satellites linking the Shuttle and other low Earth orbiting satellites to Goddard Spaceflight Center in Greenbelt, MD. However, due to complications during deployment of Tracking and Data Relay Satellite-1 (TDRS-1: carried aboard STS-6 on April 4, 1983), the launch of a second TDRS has been postponed beyond the Spacelab mission.

All communications with STS 9/Spacelab will now be handled by the combined use of TDRS-1 and NASA's network of worldwide ground stations (the ground Space Tracking and Data Acquisition Network, or GSTDN). Both TDRS-1 and GSTDN are managed by the Goddard Space Flight Center.

During the Spacelab mission, TDRS-1 will be used to relay data from the experiments aboard Spacelab. The GSTDN will supplement TDRS-1 and provide routine, realtime tracking and communications with the Shuttle orbiter and its crew.

Goddard also will house and manage the Spacelab Data Processing Facility (SLDPF), where all data from Spacelab experiments will be received and processed prior to distribution to users at the European Space Agency and in the U.S. The STS-9/Spacelab I mission is scheduled for no earlier than November 28.

The Spacelab Data Processing Facility (SLDPF) is an integral and important component for successful Spacelab support. The SLDPF was developed primarily as a generic system to handle the payload data from Spacelab missions which will be beamed down in voluminous data streams (up to data rates of 50 MBS) from as many as 70 or more widely varying scientific experiments. The SLDPF mirrors the "reusable concept" of the Space Shuttle. The facility can handle data from the Spacelab missions as well as other attached Shuttle payloads which use the Spacelab onboard data system.

The SLDPF is divided into two major functional elements: the Spacelab Input Processing System (SIPS) and the Spacelab Output Processing System (SOPS). After capturing the digital telemetry data stream, the SIPS demultiplexes, synchronizes, time tags, quality checks, accounts for the data, and formats the data onto computer-compatible tapes (CCTs). Further processing for digital data is performed in the SOPS where the data are

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Joe Walters photo

This picture shows some of the Spacelab unique front end equipment in the Spacelab Input Processing System (SIPS). The two High Rate Demultiplexer (HRDM) units compose the heart of the SIPS. Each unit can receive a composite data stream from the NASCOM link or from a High Density Tape (HDT) recording. The HRDM performs the inverse function of the onboard SL High Rate Multiplexer (HRM). Also shown are the 2 frame synchronizer subsystems which synchronize serial data from the HRDM.

Joe Walters photo

This picture shows the High Density tape Recorders (HDTR) developed especially for the SL ground system. These HDTRs are capable of recording data rates up to 50 mbps. The five SLDPF HDTRs will perform the critical data capture function for the mission. The High Density Tapes for each mission will be archived for one year after the mission.

SLDPF

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SPACELAB DATA PROCESSING FACILITY CIVIL SERVICE TEAM – Back row l-r: Al Gault; Owen Kardatzke; Louis Figueroa; Orlanda Reyes; Ted Southerland; Bill Withgott; Ron Reeder; and Ira Lewis. Middle row l-r: Bill Stallings; Bob Jones; William Robinson; Marie Rabyor; Freddie Akers; Jack Thomson; and Nate Heifetz. Front row l-r: Dave Neill; Dick Libby; Tony Maione; Angie Kelly; Bill Barnes, SLDPF project manager; Ellen Herring; and Gene Smith.

edited, time ordered, quality checked, blocked, formatted for distribution, accounted for, and recorded onto tapes for shipment to the individual users.

Audio and analog data products, which are processed in the SIPS, are output directly to the users. When specifically requested by the user, selected digital tape products may also be obtained from the SIPS. For Spacelab 1, approximately 60 percent of the experiment data will be shipped directly from the SIPS to the European Space Agency (ESA) Data Processing Center in Oberpfaffenhofen, Germany within 30 days. Other users, mostly scientists in the United States, will receive their data from the SOPS within 60 days after receipt.

The data tapes that go to ESA consis. of audio, unedited digital (SIPS tapes) and SOPS ancillary data. ESA will further process the tapes, where necessary, before sending them on to the scientific users in the ESA program.

During the flight, all data is received not only at Goddard, but at Johnson as well, flowing into the JSC Payload Operations Control Center (POCC) via the TDRSS/NASCOM/Domsat link. The POCC is where the mission management personnel, engineers and other technical experts from JSC, Marshall Space Flight Center (MSFC, in Huntsville, AL), and user scientific teams are located to oversee payload experiment operations and adjust realtime support requirements.

In addition to its primary realtime function of data capture, the SLDPF supplements the JSC role of realtime data quality monitoring. Whereas the POCC can monitor only 4 experiment data streams, the SLDPF monitors all 16 dedicated experiment data streams and the two computer input/output data streams as well as the composite multiplexed stream. Thus, the realtime data quality monitoring function must be closely coordinated between the JSC and the SLDPF via the voice data quality monitoring loop. If requested during the mission, the SLDPF will provide data quality reports to the POCC via voice and/or facsimile.

In fulfilling its overall system requirements, the SLDPF interfaces with other NASA centers - the Marshall Space Flight Center, the Johnson Space Center, and the Kennedy Space Center. For prelaunch verification, Kennedy provides test data for the SLDPF pre-mission processing and shipment to the users. Marshall, which has mission management responsibilities for the early Spacelab missions, levies project requirements upon the SLDPF and supplies pre-mission time-line and format tapes and information essential to mission specific support. Johnson and Marshall coordinate real-time mission support with the SLDPF relating to data quality monitoring and updating of the nominal timelines. After the mission is completed, Johnson also supplies Spacelab and Orbiter ancillary data to the SLDPF.

Space Telescope

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eye. Astronomers were uncertain whether the faint spiral nebulae were also part of our Milky Way system or themselves distant universes each composed of countless stars.

Working at the 100-inch telescope at Mount Wilson, California, Hubble succeeded in observing individual stars in the Andromeda nebula. By the end of 1924, he thus was able to show that Andromeda was many times more distant than any star within the Milky Way system. By means of similar observations of other nebulae, Hubble established that these nebulae were in fact galaxies far beyond our system.

Equally important was a later discovery by Hubble and his assistant, Milton Humason, that the universe was expanding, providing the basic evidence of the Big Bang theory. Their observations showed that external galaxies were traveling away from us, and, the more remote the galaxy, the faster it moves. This phenomena is known as Hubble's Law and the coefficient relating the distance and the velocity of the galaxy is called the Hubble constant.

Hubble was an active research scientist until his death in 1953.

The Hubble Space Telescope will be operated much like a ground-based observatory. The 94.5-inch (2.4-meter) telescope and five scientific instruments will be housed in the space observatory configuration in orbit while spacecraft command, control and scientific operations will be ground based. The observatory, which will not have any interference introduced by earth's atmosphere, will be able to look into space seven times farther than any ground-based observatory, and its imaging will have 10-20 times better resolution. Thus, the Hubble Space Telescope offers the potential of making new cosmological discoveries, in the spirit of its namesake.

NASA Headquarters in Washington, D.C., is responsible for the overall direction of the program; Marshall Space Flight Center in Huntsville, Ala., has responsibility for overall project management including development of the Optical Telescope Assembly and Support Systems Module; Goddard Space Flight Center in Greenbelt, Md., has responsibility for spacecraft operations and scientific instrumentation development; and the Space Telescope Science Institute in Bal-

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Chemical vapor experiments conducted at Wallops

NASA began conducting three rocket-borne chemical vapor experiments in the skies above Goddard's Wallops Flight Facility during a 19-day period beginning October 31.

The experiments, conducted for the U.S. Air Force and the Brazilian Air Force, are taking place over the Atlantic Ocean just east of the Wallops Island, Va. facility. Unlike previous chemical vapor releases, which have brightened the skies, these experiments are barely visible, if at all, to viewers along the East Coast, officials said.

The tests are being conducted during evening and early morning hours, scheduled at 24 hour intervals.

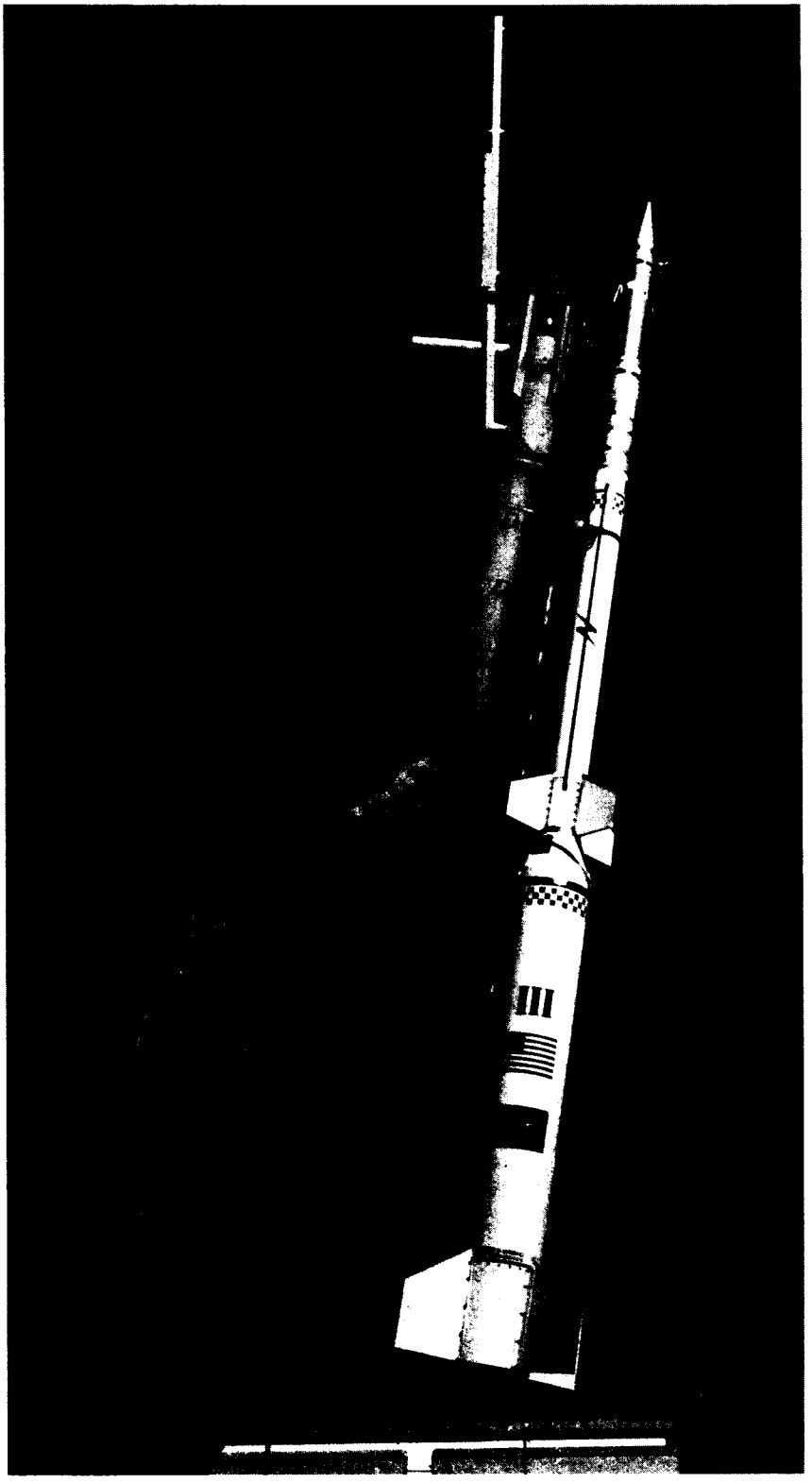
Purpose of the tests is to investigate a portion of the upper atmosphere between 185 and 350 kilometers (115 to 217 statute miles). The specific objective is to conduct studies of ionospheric modifications by means of chemical cloud techniques to improve communications with satellites.

A Nike-Tomahawk launch vehicle with a chemical release module plus two Brazilian Sonda III rockets, each equipped with an ion mass spectrometer and two chemical release, were launched on two separate days from Wallops. The chemicals were released in the ionosphere, and the resultant disturbances measured by ground-based and airborne ionosondes, radars, and optical sensors. Ground-based and airborne receivers also record satellite transmissions through the disturbances from locations from North Carolina to Massachusetts.

The Nike-Tomahawk is 27 feet long and 16-1/2 inches in diameter, and the Sonda III is 21 feet long and 22 inches in diameter.

Three different chemicals - sulfur hexafluoride, samarium, and trifluoromethyl bromide - are used in these tests. The chemicals, which create blue and pink clouds, are released at 357 kilometers (222 miles) on the ascent and at 185 kilometers (115 miles) during the descent.

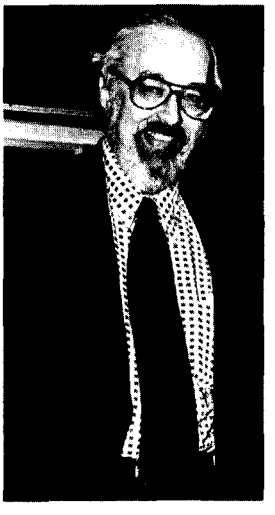
The experiments are being conducted for the Air Force Geophysics Laboratory, Hancom AFB, Massachusetts, in cooperation with the Brazilian Aerospace Technical Center. Dr. Rocco Narcisi is the Air Force project scientist, William T. Burns is the Wallops project engineer, and Colonel Lauro Eduardo de Souza Pinto is the Brazilian operations coordinator.



A Brazilian Sonda III Rocket sits poised for launch.

PEOPLE

Employee receives 40-year award



Irv Ross, a parts engineer in the Office of Flight Assurance received recently a 40-year government service award. His career started in 1943 with the War Production Board and has included service with a number of different agencies. Ross was one of the first engineers at Goddard to work with electronic-part reliability.

The Bendix Field Engineering Corporation (BFEC), Columbia, Maryland, has made a generous contribution on behalf of its employees to the Combined Federal Campaign (CFC) of the National Capital Area at the Goddard Space Flight Center, Greenbelt, Maryland. Robert H. Oertly (second from left), BFEC 1983 United Way Campaign co-chairman, presents the $2,000 check to Stephan W. Fogleman, Goddard's 1983 CFC chairman. Also attending the presentation are Donald E. Smith (left), BFEC vice president and director, Spaceflight Tracking and Data Networks; and Roberta A. Valonis, Goddard Networks Directorate CFC coordinator.

Employee receives Red Cross Award

CONGRATULATIONS!– Brian Stewart bandages the hand of a youngster. Stewart, a contractor employee, was recently awarded the American Red Cross CPR Chairman's Award for outstanding service in providing CPR training. Steward received the award October 13 at Goddard and was cited for providing CPR training to Goddard employees, Prince George's County firefighters and residents of Bowie and Laurel, Md. Earlier this year Center Director Noel W. Hiners awarded Stewart a Gold Plate Safety Award, the highest recognition that NASA bestows on its employees.

Space Telescope

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timore, Md., has responsibility for managing the scientific investigations and the dissemination of scientific results.

Hubble was a member of the 1909 University of Chicago championship basketball team and almost became a professional boxer. He spent the next three years as a Rhodes Scholar at Oxford, where he studied in the field of law. He was admitted to the bar in Kentucky, but after a year in private law he returned to astronomy at the Yerkes Observatory of the University of Chicago and earned his doctorate in 1917.

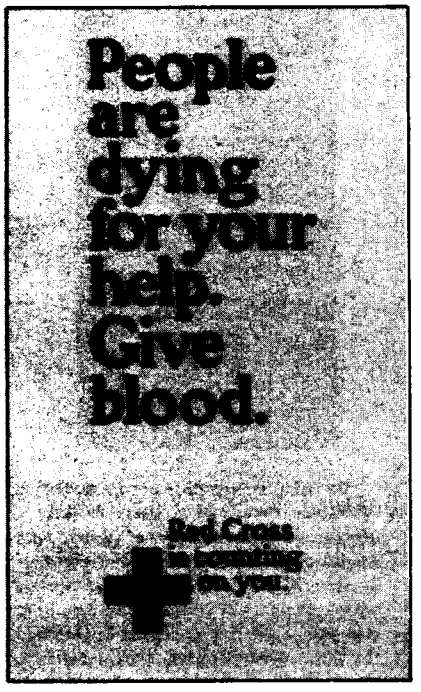
Edwin Powell Hubble, born Nov. 20, 1889 in Marshfield, Mo., revolutionized our knowledge of the size, structure and properties of the universe. He was an outstanding leader in the observational approach to cosmology, and his work made as great a change in man's concept of the universe as did the Copernican revolution 400 years before.

Hubble spent his early years in Kentucky and attended high school in Chicago. He won a scholarship to the University of Chicago, majoring in mathematics and astronomy, and received his bachelor's degree in 1910.

Safekeeping

Think safety while shopping

Before you clutter up your gift list with loud ties and Ginsu knives, consider the wide variety of products that may protect the recipient from harm. How about a smoke detector ($10-$20)? If your parents live in an older house or your friend lives in an apartment, its a perfect gift. Also consider a fire extinguisher for someone's car or kitchen. The little automatic rechargable power failure lights ($15) that plug into household outlets can protect the grandparents (or anyone) from a serious fall when the lights go out – plus its always nice to have a working flashlight handy. Reflective vests for joggers or bicyclists are thoughtful. Kids enjoy the generator type head/tail light sets for their bikes – and no batteries to burn out. Auto emergency kits with tire inflators, flares, distress signs, etc. are appreciated when one's car conks out in the boonies. How about a first aid kit for the home, boat or for that camper? Folding step-stools for the kitchen or good hearing protectors for the shooter are nice. The list is endless. Just think of safety when you flip through a catalog and you'll find a whole new group of gifts to consider, gifts that show you really care.



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