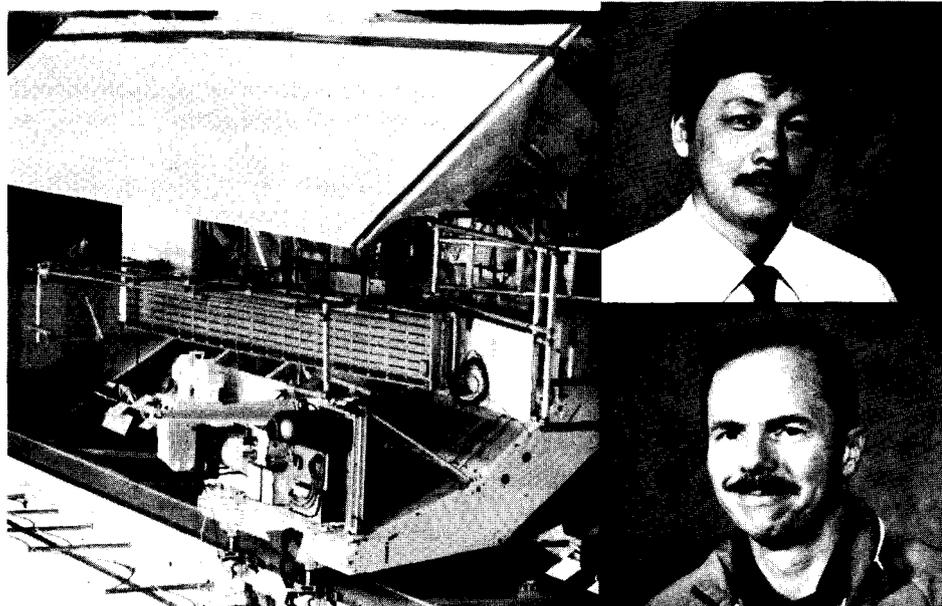


Goddard payload to fly on next Space Shuttle mission



OSTA-1 payload with five experiments has already been mounted on the orbiter. Final integration tests will be performed July 25 and 26. (Top right) Hongsuk H. Kim, OCE Principal Investigator; (Bottom right) Bertrand Johnson, OCE Project Engineer.

Following the success of the first shuttle mission, preparations are being made for the next launch. The Shuttle's second test flight, now scheduled for September 30, will carry the first payloads into space. The payloads, designated OSTA-1 for NASA's Office of Space Terrestrial Applications, will provide an early demonstration of the Space Shuttle's research capabilities. For approximately 88 hours of the 5-day mission, the Shuttle, *Columbia*, will be in an Earth viewing orientation. During this period, six Earth viewing experiments on the OSTA-1 pallet will be turned on and collect data.

One of these experiments is the STS-2/Ocean Color Experiment (OCE), and is

Goddard's first shuttle payload. The Principal Investigator for the Ocean Color Experiment is Hongsuk H. Kim of Code 941. Other investigators include: L. R. Blaine, Code 944; Dr. R. S. Fraser, Code 915; Dr. N. E. Huang, Code 912 — Wallops; and Dr. C. R. McLain, Code 912. Dr. H. van der Piepen from DFVLR, West Germany, is a foreign co-investigator.

The scientific objectives of the experiment include measurement of ocean bioproductivity and observation of ocean circulation patterns. During the flight the OCE will take data over several pre-planned ocean areas. The presence of high concentrations of chlorophyll-bearing algae shifts the color of the ocean water from blue toward green. The subtle changes in the color patterns will be monitored by the OCE and the information will be used to produce quantitative maps of chlorophyll distribution.

Continued to page 6

Lovelace takes post at General Dynamics

Dr. Alan M. Lovelace, Acting Administrator for NASA, resigned as of July 11 for a position as Corporate Vice President—Science and Engineering at General Dynamics Corp., St. Louis, Mo.

In his new position, he will be responsible for directing and coordinating the company's engineering, research, advanced products and program development and for developing and implementing corporate engineering and research policy.

Lovelace retired as Deputy Administrator of NASA in December 1980 but remained on board through the flight of the Space Shuttle *Columbia* and the appointment of a new administrator. He became Acting Administrator after the departure of Dr. Robert A. Frosch in January 1981.

Since entering federal service with the Air Force in 1954, Lovelace has held many research management positions. He served at the Air Force Materials Laboratory, Wright-Patterson Air Force Base, Ohio from 1954 through 1972, having been named director in 1967.

From 1972 to 1973, he served as Director of Science and Technology with the Air Force Systems Command, Andrews Air Force Base, Washington, D.C. From 1973 to 1974, he was Acting Deputy Assistant Secretary of the Air Force for Research and Development.

Lovelace joined NASA in 1974 as Associate Administrator for the Office of Aeronautics and Space Technology. He was named Deputy Administrator in June 1976 by President Ford.

His awards include: the Presidential Citizens Medal, 1981; the Air Force Decoration for Exceptional Service, 1973;

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Notice:

Baltimore-Washington Parkway Bridge going south will be closed intermittently August through November. For details see inside, page three.

Inside

SHARP students return to Goddard page 4
Congressman lauds NASA page 2

Directorate Notes: Goddard Closed Circuit TV System

There exists at Goddard a little known but extensive system of complex electronic equipment and underground cable networks, collectively known as the GSFC Data Communications — CCTV System. This system has been steadfastly expanding since Goddard was started, obtaining electronic equipment and installing cables between buildings and between rooms of buildings in order to provide technical support for the many projects which the Center has been responsible for over the years. This has resulted in over 1,000 circuit miles of underground cable connecting every building at Goddard, as well as a large compliment of television equipment supporting both the operational and administrative functions of the Center.

Responsibility for management of the Data Communications — CCTV Systems rests with the Control Center Support Section, code 513.2. Maintenance and operation is provided under contract by the Bendix Field Engineering Corporation.

Over the years, Data Communications personnel have had the opportunity to participate in some very exciting projects, both within NASA and at other government agencies. Among these was the 1976 two-way, full-color teleconferencing with 27 countries around the world hooked into the studio in building 8. There, members of the State Department, the Agency for International Development, the U.S. Geological Survey, and NASA communicated with foreign Heads of State, complete with an interpreter for both sides, concerning the use of Landsat remote sensing capabilities of their respective countries. The group has had many other exciting and interesting assignments over the years with the U.S. Congress, the White House, and other agencies; all with success.



Employees monitor equipment in the Data Communications room in building 14. (l) Rich Meeks (Bendix); (c) John Arslanian (NASA); (r) Wes Shaw (Bendix)

The cable network is very versatile, carrying information such as television, audio, computer-to-computer data, data between GSFC and Nascom to interface us with the outside world, and spacecraft data for operations and testing between control centers and their respective spacecraft. In buildings 3/14, over 400 operations consoles contain TV monitors connected via a complex central switching system to provide each operator with instantaneous access to information concerning their responsibilities toward the tracking network and/or orbiting spacecraft. In the basement of building 8, a TV Master Control/Studio facility provides support for GSFC management functions and Public Affairs activities, as well as Shuttle TV Network quality evaluation and video distribution within the Center and to NASA Headquarters.



Bendix employees are responsible for the maintenance and operation of CCTV system. In the CCTV control room in building 8 are: (standing foreground) Chuck Sommer; (standing background l-r) Rao Amaraneni and Jesse Callahan; (seated l-r) Herb Frankel and Jeff Bonar.

Congressman Hoyer lauds NASA/Goddard

The following is an excerpt from a Congressional Record on June 23, 1981.

“... (NASA's) authorization of \$6.1 billion is probably one of the best investments Americans have to encourage productivity, technological advancements, and profitable exploration of the world around us.

We need only recall that exciting moment 2 months ago when the Space Shuttle *Columbia* touched down on California's Mojave Desert as evidence that America's pioneer spirit is alive and flourishing. Much like Charles Lindberg, Amelia Earhart, and the Wright Brothers, the men and women at NASA represent our dedication to the goal of maintaining a dynamic, adventuresome America.

The Fifth Congressional District of Maryland is privileged to have the Goddard Space Flight Center within its boundaries. It was Goddard that kept a vigilant eye on *Columbia* as it orbited the Earth. Just this morning at 6:53 a.m., Goddard personnel launched another National Oceanic and Atmospheric Administration weather satellite from California. Before launching that satellite, scores of individuals participated in the research, development, and implementation of the satellite — a satellite that will tell us even more about weather conditions around the world than we have learned in the past.

The Goddard Space Flight Center employs 3,300 men and women who operate the world-wide tracking network, they develop and launch America's weather satellites, manage tracking and data acquisition activities for Earth orbital missions, and coordinate the very successful Delta launch vehicle program. In short, Goddard is responsible for many of this country's technological initiatives — initiatives that have far-reaching effects on our daily lives, our industry, our growth as an informed, progressive society, and probably most important of all, our security as a free nation.

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Baltimore/Washington Parkway Bridge to undergo repairs

The Baltimore-Washington (B-W) Parkway Bridge will undergo repairs beginning in mid-August and continuing through mid-November.

Repair activities will affect traffic utilizing the southbound lanes of the B-W Parkway only. Traffic utilizing northbound lanes will be unaffected.

When required during the repair period, use of the Parkway Bridge will generally be restricted to the following hours:

Incoming Traffic: 6 am to 9 am

Outgoing Traffic: 3 pm to 7 pm

The bridge will be closed to traffic at all other times.

It may be necessary to extend access restrictions for periods of up to one week during the course of the repairs. At such times, an announcement will be made in advance of the closing.

During the repair period the south-west gate (at Road No. 4 behind building 11) will be open in the afternoon to allow right-hand-turn-only traffic to exit onto Greenbelt Road. When the bridge is closed, employees who must utilize the southbound B-W Parkway may wish to use this exit. Employees incoming from north of the Center on the B-W Parkway may wish to exit the B-W Parkway at Powdermill Road, turning left and continuing to Soil Conservation Service road from which they can enter the east gate.

Roadside signs will be posted at major intersections on Center and along the southbound lanes of the Parkway advising motorists when the bridge is open to traffic.

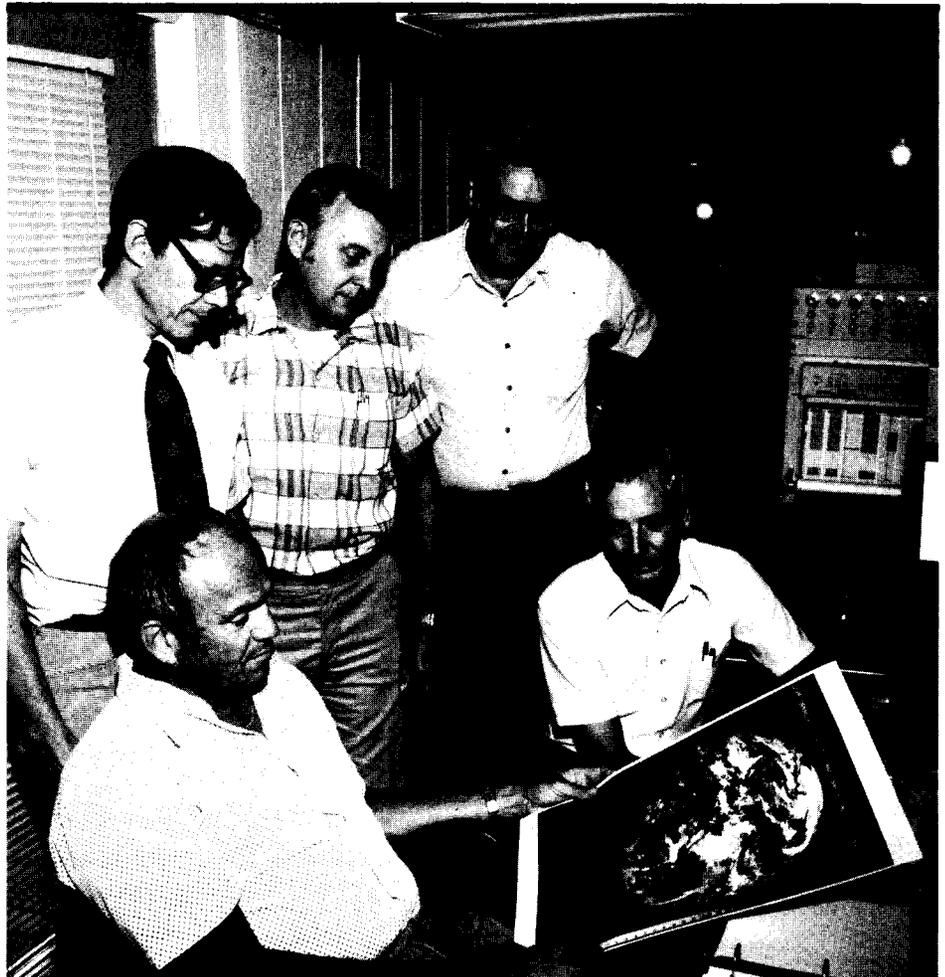
All further notices regarding the bridge closing will be published in "Dateline Goddard".



Mail your story to the
Goddard News, Code 202,
or call the Editor at

344-5566

GOES-E sends back first photo



The first photo received from the recently launched GOES-E weather satellite is reviewed by Goddard and contractor representatives here shortly after it was received on June 9. Examining the photo are (left to right) John Chandler, GSFC; Harold Ausfresser, Westinghouse Electric, Baltimore, Md.; Larry Rouzer, GSFC; Gary Vincent, GSFC; and Frank Malinowski, Hughes Aircraft, Santa Barbara Research Center.

AE-5 satellite reenters Earth's atmosphere after 5 years service

After 31,268 orbits and more than five years of service, the Goddard-managed Atmosphere Explorer (AE-5) satellite reentered the Earth's atmosphere Wednesday, June 10.

The North American Air Defense Command (NORAD) reported that trackers had received the last signal from the spacecraft over Hawaii at 9:40 a.m. Its descent trajectory was across the Pacific Ocean, the North American continent, and into the Atlantic Ocean. No signal was picked up from the satellite when it was due over Ascension Island at 10:14 a.m., indicating that it has burned up completely in the atmosphere, officials said.

The 1,587-pound satellite, which collected data on the atmosphere during its mission, was launched from the Kennedy Space Center on November 20, 1975. It was the first spacecraft to use the Spacecraft Command Encoder system, first to use the Digital Data Processing System, and the first to use the "data bank" technique in which the scientific data collected from the spacecraft is stored in a computer at Goddard and made available to investigators via small terminals at their own facilities.

Project Scientist for the AE-5 mission was Nelson Spencer (Code 960). Project Manager was Joseph (Pat) Corrigan (602).

NOAA-7 successfully launched

NOAA-7, a new environmental monitoring satellite whose development was overseen for the National Oceanic and Atmospheric Administration (NOAA) by Goddard, rocketed into space June 22 on a two-year mission to improve sea surface temperature measurements of use to marine and transportation industries, weather forecasters, and many others.

The satellite, the latest in the TIROS-N series, carries the most versatile scanning radiometer ever sent aloft in an environmental spacecraft gathering visual and infrared imagery and measurements in five spectral channels. This should permit more accurate evaluation of sea surface temperatures, as well as the temperatures of land, ice, surface water, and clouds under the satellite's orbital path.

The improved sea surface temperature data, computed from sensor readings returned to earth, will be of special value to fishermen off the West Coast and in the Gulf of Alaska, and to marine shipping companies in the Gulf of Mexico and along the East Coast.

Commercial fishermen in California, Oregon, Washington, and Alaska use sea surface temperature charts compiled from satellite infrared imagery and data to locate the most productive fishing grounds for those species which are water temperature sensitive. Catches of salmon, albacore, and herring have been improved, and fuel costs reduced many fishermen report.

On the other side of the continent, along the East Coast and in the Gulf of Mexico, shipping interests use charts showing the Gulf Stream and Gulf Loop Current, also derived from satellite observations. Oil tankers, tugs towing barges and other vessels take advantage of, or avoid, the swifter currents, reducing transit time and saving fuel. One towing and transportation company operating 60 vessels in the Caribbean estimates fuel savings of from 20 to 40 percent by incorporating the stream and loop current information into its fuel conservation program.

NOAA-7 was launched atop an Atlas-F by an Air Force launch team from the Western Test Range at Vandenberg Air Force Base, Lompoc, California. With the successful launch of NOAA-7, two polar-orbiting satellites are circling the globe, returning weather and environmental information to NOAA's National Earth

Satellite Service. Each spacecraft, NOAA-6 and NOAA-7, views virtually all of the earth's surface from about 500 miles in space at least twice every 24 hours.

Instruments aboard the polar-orbiters take atmospheric soundings; measurements in vertical "slices" of the atmosphere showing temperature profiles, water vapor amounts, and the total ozone content from the earth's surface to the top of the atmosphere. The sounding data are especially important in producing global weather analyses and forecasts at the Weather Service's National Meteorological Center.

In addition to imaging the earth and obtaining atmospheric soundings, the satellites also collect environmental observations from remote data platforms. Finally, they also have a communications function, distributing unprocessed sensor data to earth stations in more than 120 nations in real-time as the spacecraft pass overhead.

NOAA-7, as with its predecessors in the TIROS-N series, was designed and built by RCA Astro-Electronics under contract to Goddard which acts as industry interface for NOAA. Following successful

launch and check-out in orbit by NASA, NOAA-7 was turned over for operation by NOAA's National Earth Satellite Service. Four more satellites in the series are scheduled through 1985, to be launched on a "call up" basis to insure an uninterrupted data flow. NOAA-7 cost approximately \$15 million to build, with launch costs about \$7.5 million.

The Goddard team for NOAA-7 is headed by Project Manager Jerry Longanecker; Deputy Project Manager Dr. William Redisch; Deputy Project Manager for Resources John Underwood; Spacecraft Manager William Peacock; Instrument Manager Lawrence Draper; Launch Vehicle Manager John Corrigan; and Mission Operations Manager David Coolidge.

Change of payday at GSFC

Employees are reminded that the change of payday from Friday to Tuesday necessitated by the new Treasury Department Direct Deposit/Electronic Funds Transfer (EFT) System will be effective on *Tuesday, August 4, 1981*. This new payday will replace the normally scheduled payday on *Friday, July 31* and will remain on *Tuesday* thereafter.

SHARP students start summer apprenticeship



SHARP students, along with their mentors and faculty coordinators recently started their eight-week program at Goddard.

Twenty-one academically talented students began their eight-week stay at Goddard recently in the second annual Summer High School Apprenticeship Research Program (SHARP). The program, one of many under the aegis of the Educational Programs Office, started June 29 and ends August 21. The NASA-wide program allows qualified high school students to work directly with Goddard professionals in science and technology in current research and development activities.

The students were nominated by science/math teachers and coordinators in the Washington Metropolitan area and chosen by a selection committee. They are

placed under the tutelage of mentors or role models who provide practical experience and assistance in charting their career paths.

According to Ms. Ann Pratt, faculty coordinator for SHARP, the program has been very successful, and students are eager to enhance their scientific and technical capabilities.

Three of last year's SHARP students have been accepted at accredited universities. They are: Toussaint Myricks, MIT, Cambridge, Mass.; Floyd Feeling, University of Pennsylvania, Phila., Penn.; and Terri Leary, G.W.U., Washington, D.C.

Giacconi to head Space Telescope Institute

Dr. Riccardo Giacconi has been named the first Director for NASA's Space Telescope Science Institute, Baltimore, Md., effective Sept. 1.

The announcement was made by John M. Teem, President of the Association of Universities for Research in Astronomy, Inc. (AURA), which is the NASA contractor selected to operate and manage the Institute, which will be the science nerve center for NASA's Space Telescope scheduled for launch in 1985.

Giacconi, chosen after a four-month search, now is Associate Director of the High Energy Astrophysics Division of the Harvard-Smithsonian Center for Astrophysics, Cambridge, Mass., and Professor of Astronomy at Harvard University.

Giacconi received a degree in physics at the University of Milan in 1954. His thesis work was on nuclear interaction by cosmic rays.

He was awarded a Fulbright Fellowship and continued his work in elementary particles at the University of Indiana, Bloomington, and at Princeton University in 1959.

He joined American Science and Engineering, Inc., in 1958, to initiate a program of space science, and there became interested in X-ray astronomy.

In 1962, Giacconi's group succeeded in detecting the first extrasolar X-ray source. In 1963, the same group obtained the first solar X-ray picture by use of an X-ray telescope which had been conceived, advocated, designed, fabricated and tested by them.

In 1963, Giacconi proposed an X-ray astronomy Explorer. The proposal led to a program of construction in 1966-1970, followed by successful launch in 1970. The satellite became known as Uhuru and represented a major qualitative step in X-ray astronomy's observational capability.

In 1970, the program for construction of a 1.2 meter X-ray telescope for study of extrasolar sources was initiated. The program was modified in 1973 and finally led to the High Energy Astronomical Observatory, HEAO-2 (Einstein Observatory) mission, successfully launched in 1978.

In 1973, Giacconi joined the faculty of Harvard University and became an Associate Director for the Center for Astrophysics, High Energy Astrophysics Division.

Among the most significant activities of the Division have been the scientific direction of the HEAO-2 Program. While this mission was conceived and executed as a Principal Investigator experiment, the observatory was used as a National Facility by a large number of astronomers. In its lifetime it reached a level of community involvement comparable to that at a major ground-based national center. Giacconi served as Principal Investigator during the conception, design and fabrication phase of HEAO-2 and currently is acting as Director of the Observatory.

Hoyer

Continued from page 2

Goddard however, is only part of the National Aeronautics and Space Administration's program. NASA personnel have given us a great deal to be proud of in many areas. They have served the critical role of providing advanced research and development, and as a result, many industries in this country have profited by their special abilities in everything from computer technology to perfection of solar energy use.

There is much disparaging talk today about our Government, about its size, about its ability to respond efficiently to change. That cannot be said about NASA. The programs of NASA and the fine Federal employees who serve it, are exemplary.

They raise this country's vistas to seek more knowledge of the unknown, to harness the far reaches of our galaxies. They have dedicated their education and ambition for the public's good — bringing us advancements in technology, in medicine, in energy efficiency, and in industrial capability. It is NASA that has just begun the development of the space telescope, which will provide a view into the challenging universe. That work, again, is being undertaken now at the Goddard Space Flight Center.

Mr. Chairman, on May 25, 1961, John Fitzgerald Kennedy told us that—

It is time for this Nation to take a clearly leading role in space achievement, which in many ways holds the key to our future on Earth.

NASA has proved President Kennedy correct. We have moved forward as a society both on this planet and beyond. We must continue that commitment . . ."

Center Exchange Headquarters:

Thousands of space enthusiasts and Shuttle well-wishers flocked to the Mid-Town Plaza in Rochester, N.Y., on April 13 to sign an enormous scroll, measuring 27 feet long by 3½ feet wide inscribed with the following message: "To Columbia: Thanks for putting us back in Space." The message scroll was the idea of radio station WHFM-FM99 in Rochester. Kelly McCann, program director for WHFM and Marc Cronin, music director for the station, were on hand to broadcast the Shuttle sign-in live from the plaza for a three-hour period—over 2,500 signatures were collected. The scroll, to be presented to *Columbia's* astronauts, John Young and Bob Crippen, was on display at NASA Headquarters lobby in Washington, D.C., the last weeks of April.

Dryden:

The AD-1, the world's first manned aircraft to pivot its wing in a scissor-like fashion to increase its efficiency, has successfully flown with its wing in the full 60 degree oblique position. Recent tests by Dryden research pilot Tom McMurtry have proven the airplane can fly with its wings swiveled relative to its fuselage at 30 to 60 degrees and still maneuver as required.

The oblique wing principle may provide future transport aircraft with the ability to fly much more economically than today's more conventional aircraft. The test program, numbering a total of 38 flights will provide flight data which will be used to improve computer simulations for designing oblique-winged aircraft of the future.

Ames:

On May 29 at about 7:40 a.m., the X-14B Variable Stability (VTOL) Vertical Takeoff and Landing Research Aircraft experienced a hard landing from hover 12 ft off the ground. During an experimental investigation of a low roll control power configuration, part of a study of roll control power requirements for VTOL aircraft, a roll oscillation was experienced, resulting in the hard landing which collapsed the gear. A fuel tank ruptured and there was some fire damage to the tail section of the aircraft. The pilot was uninjured.

The X-14B is a 25-year-old research aircraft. It has tested a variety of vertical takeoff, landing, and hovering control system concepts over the years.

Payload

Continued from page 1

These chlorophyll maps will be used in studies to relate color phenomena to ocean bioproductivity and water circulation. Similar chlorophyll maps have been produced in earlier experiments from a series of U-2/Ocean Color Scanner (OCS) experiments which were conducted in preflight activities by the Goddard team (see photo below). The OCS is an aircraft sensor with properties similar to the OCE.

"In ocean remote sensing experiments such as this," according to the Principal Investigator, Mr. Kim, "in-situ sea truth data collected at the same time as the Shuttle overflight is important for analyzing

the space data." Therefore, several in-situ data collection activities are being planned to support the OCE science. The participating scientific investigators and the primary test sites are truly international. Test sites will be located off the coast of Senegal, West Africa, Portugal, Costa Rica, and the Southeastern U.S. Bight. Data will also be taken over mid-Atlantic areas where warm core eddy rings are located and in the Kuroshi Current near the Japanese Islands. A West German aircraft carrying Goddard's OCS will conduct underflights off the coast of Portugal and the Mediterranean Sea at times coinciding the Shuttle flight. Research vessels from

the Woods Hole Oceanographic Institute and the Skidaway Institute of Oceanography, Savannah, GA will also assist in the experiment.

This project is also interesting for another reason. The experiment was conceived as a means of demonstrating that an existing low cost aircraft sensor can be successfully flown on the Shuttle. The idea is to use some of the same commercial grade instruments in the Shuttle environment that scientists routinely use on Earth. "If successful, this approach can reduce the costs of some space experiments and put them for the first time within reach of low budget researchers. The OCE will test this proposition" says OCE Project Engineer, Bertrand Johnson of Code 944. An existing Goddard developed U-2/OCS was modified to produce the Shuttle OCE. Three OCS instruments have been built at Goddard and have been tested on aircraft flying at high and low altitude. Modification to the Shuttle configuration was done primarily by the Experiment Engineering Branch, Code 944, and took about 20 months.

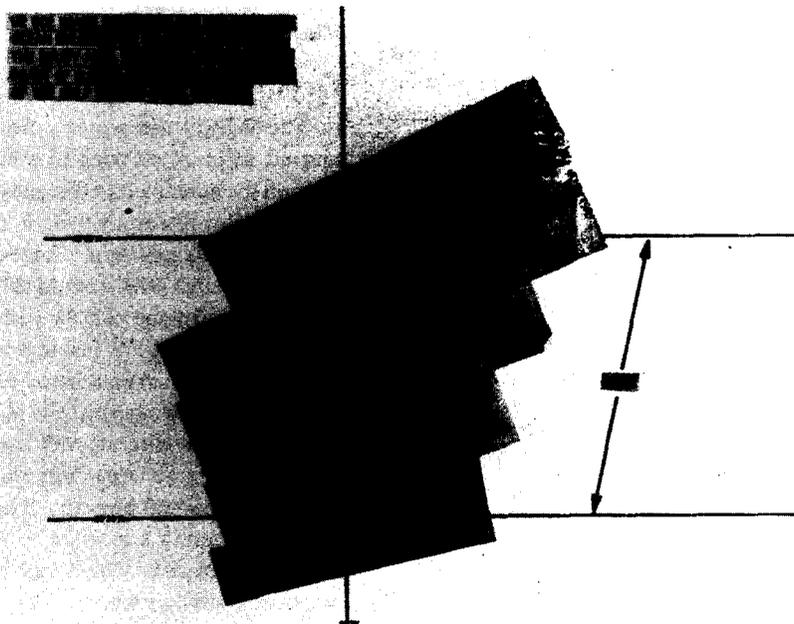
The OCE was completed in September, 1979 and was one of the first OSTA-1 payload instruments to arrive at the Kennedy Space Center. All OSTA-1 instruments have been integrated on the pallet and preparations are being made for the last integrated test which is scheduled for July 25-26, 1981. In flight, most of the on-board data transmission capability will be reserved for analyzing and controlling the Orbiter. Therefore, all the OSTA-1 scientific data will be recorded on board on tape and film, which will be removed upon landing and turned over to the investigators for immediate screening and analysis. Complete detailed analyses of the data is expected to take about a year.

Lovelace

Continued from page 1

the National Civil Service League Career Service Award, 1971; the Office of Aerospace Research Award for Outstanding Contribution to Research, 1970; the Air Force Association/Air Force Systems Command Meritorious Award for Program Management, 1969; the Air Force Commendation for Meritorious Civilian Service, 1959; the Flemming Award, 1958; and the AFML Clares J. Cleary Award, 1956.

Born in St. Petersburg, Fla., he received his bachelor's, master's and doctorate degrees in chemistry from the University of Florida.



This montage of the ocean chlorophyll patterns off the coast of Jacksonville, FL in April 1980 was created from the U-2 borne Ocean Color Scanner (OCS) data taken by a Goddard team participating in the Georgia Bight Experiment. The Florida coast, which is not included in the photo, is off to the left. Speckles are clouds. The Gulf Stream is light shaded water to the right and the dark area is colder shelf water with high chlorophyll content. (High chlorophyll water appears dark in this computer processed image.) A filament shelf water, with chlorophyll in the range of 1.5 and 2.0 mg/M³, is visible along the western edge of the Gulf Stream.

GODDARD NEWS

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