NASA
National Aeronautics and Space Administration

GODDARD NEWS

Goddard Space Flight Center Greenbelt, Md. Volume 30 no. 9 May 11, 1981

Reagan names new NASA Administrator and Deputy Administrator

President Reagan announced April 23 the nomination of business executive James Montgomery Beggs to become Administrator of the National Aeronatics and Space Administration and Dr. Hans Mark as Deputy Administrator.

Beggs has been Executive Vice President, Aerospace, and a director of General Dynamics Corp., St. Louis, Mo. Mark is former Secretary of the Air Force and former Director of NASA's Ames Research Center, Mountain View, Calif.

Beggs, if confirmed, will succeed Dr. Robert A. Frosch who resigned on Jan. 20, 1981, to take over as the first president of the American Association of Engineering Societies in New York. Frosch had been Administrator since June 21, 1977.

Beggs, who would be the sixth man to head the nation's civilian space agency, has been responsible for General Dynamics Convair, Electronics, Fort Worth and Pomona Divisions.

He holds an honorary LL.D. degree from Washington and Jefferson College, Washington, Pa., and an honorary doctor of engineering management degree from Embry-Riddle Aeronautical University, Daytona Beach, Fla.

Born in Pittsburgh, Pa., Jan. 9, 1926, Beggs and his wife, the former Mary Harrison, have five children.

Mark served as Secretary of the Air Force from July 1979 to 1981. He had served as Under Secretary since 1977.

A physicist and nuclear engineer, he joined Ames Research Center in February 1969 and prior to that was a professor and researcher and had served as a consultant to several government agencies and held a number of university committee assignments. He was chairman of the Department of Nuclear Engineering at

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Columbia arrives back at the Cape

"The Magnificent Flying Machine," NASA's Space Shuttle orbiter Columbia has now returned to the Kennedy Space Center in Florida.

The 100-ton spacecraft was ferried from the Dryden Flight Research Center, Edwards, Calif., to the Kennedy Space Center aboard a 747 jet aircraft modified to carry Space Shuttle orbiters. Departure data from Dryden was April 27, 1981.

The cross country trip took two days. A refueling and overnight stop was made at Tinker Air Force Base, near Oklahoma City, Okla. and the 747/orbiter combination arrived at KSC the following day.

Technicians worked around the clock deservicing the DC-9 size spacecraft, clearing the systems aboard the Columbia of the hazardous toxic materials and purging the fuel cells. A thorough inspection of the more than 30,750 thermal protection system tiles was conducted before the Columbia was loaded atop the 747 for its piggyback ride to Florida.

To improve flight characteristics of the tandem aircraft, a streamlined tailcone was attached to the aft end of the orbiter to cover the three main liquid fuel rocket engines.

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Code 100 Notes

NASA Consolidates Wallops under Goddard and Dryden under Ames

NASA is consolidating its Dryden Flight Research Center under Ames Research Center Management and its Wallops Flight Center under Goddard Space Flight Center Management.

Under the consolidations Dryden, Edwards, California, becomes an operational element of Ames, Mountain View. California, and Wallops, Wallops Island, Va, becomes an operational element of Goddard, Greenbelt, Md. The Dryden and Wallops Centers will retain their identities but will be under the overall management and direction of Ames and Goddard, respectively.

Dr. Alan M. Lovelace, NASA Acting Administrator, said the consolidations will focus the resources of each of the installations on what it can do best.

"The close relationship between Ames' and Dryden's efforts in aeronautical programs and Wallops' and Goddard's efforts in suborbital programs, as well as the unique facility capabilities and the physical proximity of the installations provides an opportunity to improve overall program effectiveness through these consolidations," Lovelace said.

Flight research operations for Ames will be carried out primarily at Dryden and sounding rocket development and operations for Goddard will be carried out primarily at Wallops.

The consolidations are expected to be completed by October 1, 1981.

Inside

REORGANIZATION & KEY APPOINTMENTS

Mission & Data Operations Directorate

Effective February 22, 1981, Mr. S. Richard Costa is appointed Associate Chief, Mission Operations Division (510). Mr. Costa, formerly Head, Project Operations Branch, will continue to lead that organization in an acting capacity pending selection of a replacement.

Engineering Directorate

The following changes are effective March 22, 1981, within the Instrument Division:

- The Instrument Electronics Branch (724) is retitled Instrument Microelectronics and Detectors Branch. Mr. John C. Lyons continues as Head of the retitled Branch.
- Mr. Donald C. Lokerson, formerly Head, Flight Data Processors Section, Instrument Data Management Branch (728.3), is appointed Head, Microelectronics Section (724.3).
- The Electronic Systems Section (724.4) is disestablished.
- The title of the Instrument Data Management Branch (728) is changed to Instrument Electronic Systems Branch, Mr. Everett J. Pyle continues as Head of the retitled Branch.
- The Electronic Development Section (728.1), Mechanical Recording Techniques Section (728.2), Flight Data Processors Section (728.3), and Instrumentation Section (728.4) are disestablished. The following sections are established and key personnel appointed in their stead:
  Code 728.1 – Senior Signal Processing Section. Mr. Bill K. Gabbert, Head.
  Code 728.2 – Digital Signal Processing Section. Mr. Everett J. Pyle, Acting Head pending selection to fill the vacancy.
  Code 728.3 – Electronic System Section. Mr. John C. Moyer, Head. Mr. Moyer was formerly Head, Electronic Systems Section, Instrument Electronics Branch (724.4).
  Code 728.4 – Data Storage Section. Mr. John M. Hayes, Head. Mr. Hayes was formerly Head, Mechanical Recording Techniques Section, Instrument Data Management Branch (728.2).

The following actions are effective March 22, 1981, within the Mission and Data Operations Directorate:

Mission Operations Division (510)

a. The Operations Center Branch (512) and personnel assigned to the newly established Control Center Support Section, Project Operations Branch (513.2). Mr. Earl D. Quirey is appointed Section Head.

b. The Mathematical and Operations Analysis Section, Spacecraft Control Programs Branch (514.1) is abolished.

Mission Operations Computing Division (530)

This Division is reorganized, and its new organizational structure and key personnel are listed below:

Code	
530	Evmenios P. Damon, Chief, Mission Operations Computing Division (530)
530.1	Evmenios P. Damon, Acting Head, Systems Analysis and Contract Administration Office (530.1)
531	Jack Balakirsky, Head, Computer Management Branch (531)

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GOES-E set for launch

GOES-E, the third in a series of three improved geostationary operational environmental satellites developed by Goddard for NOAA (National Oceanic and Atmospheric Administration), will be launched aboard a Delta 3914 rocket from Cape Canaveral no earlier than this month.

The satellite, to be designated GOES-5 once in orbit, will be positioned 22,240 miles (35,792 kms) out in space at 85 degrees west longitude, ultimately to replace an older GOES-type satellite at 75 degrees west, and will monitor the eastern half of the U.S. and Canada, all of Central and South America, and much of the Atlantic Ocean.

As the "GOES East" satellite, the spacecraft will watch hurricane development and movement in the Caribbean Ocean, locate Gulf Stream System currents for marine interests, warn Florida citrus growers of approaching crop-killing frosts, and provide government and private weathercasters with a variety of information crucial to the accurate forecasting of the weather.

Once checked out in orbit by Goddard controllers, the new spacecraft will be under the control of NOAA's National Earth Satellite Service, which will make the imagery and digital data available to users worldwide.

Instruments aboard GOES-E include systems to collect environmental data from more than 1,500 platforms on land, sea, and air, and to measure solar activity and detect flares, as well as a promising new instrument called the Visible Infrared Spin-Scan Radiometric Atmospheric Sounder (VAS).

The VAS, first carried onto space on GOES-4 last September, not only provides the traditional visual imagery of the Earth's surface and cloud cover familiar to most television weather viewers–as well as infrared sea surface temperature data–it also records atmospheric temperatures and the amount, distribution, and

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New release techniques investigated in chemical cloud tests

Chemical cloud tests were conducted in early April forming red and bluish-yellow clouds high over the mid-eastern U.S. coast. The National Aeronautics and Space Administration launched a pair of rocketborne chemical vapor trail experiments from Wallops Island, Virginia, in a continuing investigation of neutral winds and convective electric fields in the upper atmosphere. Specific objectives were to investigate new release techniques and evaluate traces formed by releases of various chemical compounds.

The trails and clouds released from the two-stage Taurus-Orion Rockets contained two constituents. One remained neutral and its glow enabled wind motions of the upper atmosphere to be observed.

The other component was oionized by the Sun, and its motion governed by the electric and magnetic fields. Observation of these trails provide a technique for measuring winds and electric fields in space. These techniques will be candidates for use in later flights on Space Shuttle.

Launch time each day was 4:48 a.m. EST with clear skies necessary for observation purposes. The primary source of data acquisition was photographic data obtained from three tracking sites located at Blackstone, VA., Raleigh, N.C. and Wallace, N.C.

In this type of experiment, chemicals are released as the rocket ascends, at apogee, and as the payload descends. The first payload will release three clouds. The first cloud at 180 km (113 miles) appeared bright red from lithium emissions. The second at 220 km (138 miles) was blue-green from barium and strontium emissions and the third at 180 km (113 miles) on the descent contained both lithium and barium.

The second payload released a red and blue trail of lithium and strontium beginning at an altitude of 140 km (88 miles) and ending near 200 km (125 miles). Then a blue-green barium and stronium cloud was released at 210 km (131 miles). On the down-leg of the trajectory another lithium and strontium trail began at 190 km (119 miles) and ended near 120 km (75 miles).

Although bright to an unaided eye the amount of released material was quite small involving a total of only 1.5 pounds (.68 km) of lithium, 7.5 pounds (3.4 kg) of barium, and 9.0 (4 kg) of strontium for the two payloads.

The highest releases were visible above elevation angles of 10 degrees from Boston to Savannah, Georgia and west to Greenville, South Carolina. From Washington, D.C. they appeared 15 to 30 degrees above the horizon on the southeast.

The project is managed by the Goddard Space Flight Center, Greenbelt, Maryland, and the launch was under direction of Wallops Flight Center and Thiokol Corporation, Ogden, Utah, fabricated the payload.

Dr. James P. Heppner is the Goddard Project Scientist. Paul J. Alfronsi is the Wallops Project Manager and Robert T. Long is the Wallops Project Engineer.

Columbia

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NASA officials reported that the Columbia was in excellent condition following its 54 1/2-hour space mission. Donald K. "Deke" Slayton, Orbital Flight Test Manager and former astronaut, was the senior NASA official who accompanied the Columiba back to the Kennedy Center.

The 747/orbiter landed on the 15,000-foot Shuttle Landing Facility at the KSC, was demated and towed to the Orbiter Processing Facility where it is now undergoing servicing in preparation for its next flight, scheduled for sometime next fall.

GOES

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movement of water vapor at various levels. These latter functions, "atmospheric soundings," are being researched by NASA and the data collected is not yet available operationally. NASA and NOAA are working to determine how atmospheric temperature and moisture profiles could be provided to operational users such as the National Weather Service in the late 1980's.

The VAS instrument detects and measures reflected sunlight and can sense infrared energy in 12 spectral bands, 11 more than the radiometer carried on earlier GOES satellites. This expanded capability gives the VAS its sounding capability. At its present stage of development, however, VAS cannot obtain sounding data and provide imagery simultaneously.

The GOES/Delta team at Goddard includes: Paul Mowatt, Associate Director for GOES and Delta; David Grimes, Delta Project Manager; William Russell, Deputy Delta Project Manager, Technical; Frank Laurence, Delta Mission Integration Manager; Robert Pickard, Project Man-

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STS-2 External tanks shipped to Kennedy Space Center

Although the dust has hardly settled on Rogers Dry Lake in California after Columbia's historic first landing, preparations are already underway for STS-2, the second flight of the Space Shuttle.

ET-2, the External Tank which will provide liquid oxygen and liquid hydrogen for the Shuttle's three main engines during its second flight, left the Marshall Space Flight Center's Michoud Assembly Facility in New Orleans Friday, April 17, enroute to the Kennedy Space Center, Florida.

It arrived at Port Canaveral sometime on the afternoon of April 22. It was then taken to the Kennedy Center's Vehicle Assembly Building where it will undergo flight preparations and will eventually be mated with the Orbiter Columbia and two Solid Rocket Boosters.

The STS-2 mission is planned for launch in the fall.

Directorate Notes

Plant Operations & Maintenance Division responsible for Center upkeep

The physical plant of the Goddard Space Flight Center consists of the buildings, paved areas, grounds, and utility systems which, taken together, comprise this National Aeronautics and Space Administration (NASA) field installation. The responsibility for the maintenance of the physical plant and the operation and maintenance of the utilities systems rests with the Plant Operations and Maintenance Division (POMD) of the Management Operations Directorate (MOD).

The POMD presently maintains and/or supplies utilities services for 2,405,006 square feet of building space, 1100 acres of grounds and paved areas, and 56 miles of utility lines. The Central Power Plant has a boiler system which consists of 5 boilers which can produce 156,000 lbs of steam an hour for heating and industrial purposes, and 4 electric chillers capacity for cooling purposes. Additionally, the POMD operates and maintains the Emergency Control Console which monitors various alarm systems and the heating and cooling units within the buildings and provides special mission coverage within the building 3/14 complex for launches.

Size is not the only variable that can be thought of when considering the magnitude of the POMD operation. The complexity of the Center is such that different areas have different requirements. For example, a computer area has different requirements than routine office space. A computer room has a 24 hour operation which requires that energy systems for these areas must be in constant operation and constantly monitored. Furthermore, humidity and temperature levels must be maintained within narrow limits.

The specific functions of the POMD can be found in the Goddard Organizational Manual and in the Services Directory located in the back of the Goddard phone book. In general, the POMD maintains the structural elements of the buildings such as lighting, plumbing, windows, walls, and floors, operates and maintains the heating, ventilating, and air conditioning systems throughout the Center, provides custodial services, maintains the grounds to include patching of roads, sidewalks, and parking lots, maintains the elevators and some cranes, and operates and maintains the Center electrical power systems and alarm systems. This list is but a small sampling of the multiple functions of the POMD.

Work arrives in the Division through various methods such as calls to the trouble desk, POMD Work Requests (the perferred method), or inspections by Division personnel. The work is classified according to its nature into these categories:

a. Emergencies–threat to life, health, safety, or mission.
b. Routine maintenance–work can be accomplished in under 2 hours.
c. Work Orders–scheduled work of an extensive nature.

Work is dispersed within the Division according to its category and the trade lines or craft involved. Shops are aligned along trade lines and similar types of work. Each shop has an emergency person assigned to his own truck who handles the emergency work of that shop. Other work is scheduled on either Thursdays or Fridays for the upcoming week. This is accomplished through a mutual meeting with the shop supervisor and the planner/estimator responsible for that shop.

In the Central Power Plant, Division personnel operate and maintain the equipment around the clock, 7 days a week. This is also the case on the Emergency Control Console which, because of its essential functions, requires constant monitoring. In buildings 3/14, POMD personnel are continually on-duty to insure that these important Networks and Data Support buildings are always in operation. During NASA flight missions, including the upcoming Shuttle launches, the POMD workforce in these buildings is increased to provide emergency coverage. Diesel generators are started and take over the electric load of these buildings to protect against power losses.

Some work is handled through contract personnel such as maintenance painting, cutting grass, cleaning air system filters, trash disposal, and custodial services. The technical officer assigned to monitor each contract area assures that work is scheduled and accomplished for these areas.

The grounds are maintained on a scheduled basis and custodial services are provided according to a pre-arranged schedule with work of a non-routine nature being accomplished through the trouble desk or a Work Request.

The POMD civil service workforce consists of skilled craftsmen and supervisors who are entirely knowledgeable within their trade areas. An apprenticeship program has been established within the Division to insure that it has the skilled personnel to meet its obligations in the future.

Once work is accomplished by the POMD personnel, the hours that the job took and the materials costs associated with the job are assembled into a computerized reporting system operated by the Division. This system also has Center energy usage and major types of equipment usage recorded in it. The computerized system forms a baseline of data for various informational, scheduling, and management of resources purposes.

The POMD is continually seeking to improve its service to the Center. As such, the Division has plans for the future which will help increase its service capability. For instance, in the near future, users will be asked to respond on the

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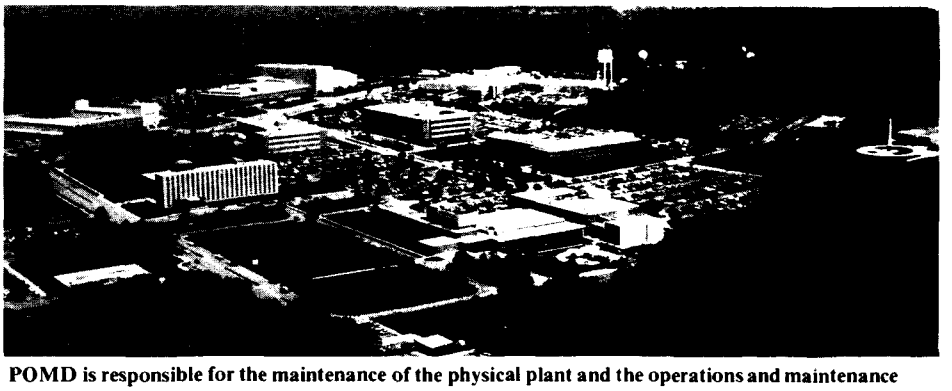

POMD is responsible for the maintenance of the physical plant and the operations and maintenance of the utilities systems for the entire Goddard Center.

April 18, 1981

Dear Employees of NASA

This is a small tribute to all the people of NASA who were instrumental in anyway, in bringing the Columbia to its final reality.

Remember no matter how small the deed; whether flying or vaccuuming the Columbia, all was important.

Sincerely
Dottie Blakely #205
1720-27th St. SE
DC 20020

Salute to Columbia

The world observed closely as you jetted out in space; and some wondered privately if the Columbia was just another waste,

The tiles you lost while ascending in air, made your landing an anxious, but thrilling dare,

You roamed the earth's boundries and watch the sunset repeat; that in itself was a miraculous feat,

You peered at life down here on earth, where the Columbia's conception was first given birth,

In the weightless atmosphere you got the work done, and still found time to have some fun,

And then came the time to re-enter the States; where all the once nonbelievers now patiently wait,

Now they applaud your courage and confidently say; "Oh, we knew they could do it anyway,"

Your dream has been manifested without a doubt, and with this great achievement, you have given America unyielding clout.

DOTTIE BLAKELY

GOES

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ager, GOES-E; Richard Wirth, Deputy Project Manager, Technical; August Wessels, Deputy Project Manager, Resources; W. H. Farthing, Science Manager; Arthur Clarke, Spacecraft Manager; John Lahzun, Assistant Spacecraft Manager; William Bryant, Mission Operations Manager; Ralph Bannin, Network Operations Manager; Kermit Blaney, Network Support Manager; Michael Prokopchak, Mission Support Manager; Larry Rouzer, Instrument Manager.

POMD

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quality of the work accomplished by the Division through a form attached to the Work Request. A "Service Center" concept will be instituted based on historical records which will assist Division personnel in being able to tell a user approximately when the work will be accomplished. This concept should also provide for more streamlined service to the Center.

Additionally, the Division wants to become more proactive rather than reactive to user needs. In order to do this, an aggressive inspection plan will be undertaken which will identify potential problems before they occur.

The POMD has a central role in assuring that the physical plant at the GSFC is such that a safe, healthy, aesthetic working environment is maintained. The skilled craftsmen, supervisors, and support personnel of the POMD are a source of pride to the Management Operations Directorate.

Key Appointments

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531.1 Jack Balakirsky, Acting Head, Systems Software Section (531.1)

531.2 Gerald R. Quigley, Head, Computer Resources Management Section (531.2)

532 Morton Foxe, Head, Systems Engineering Branch (532)

532.1 Morton Foxe, Acting Head, Systems Hardware Section (532.1)

532.2 Robert R. Hohl, Head, Telecommunications and Data Base Section (532.2)

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APPLICATIONS MILESTONES

Energy Balance Model developed at Goddard

Preface: Variations in climate have a controlling effect on man's activities such as food production and energy usage. In order to prevent or predict an inadvertent climate change or assess its impact, it is essential to understand the response of the climate system to external forcing. A numerical Energy Balance Model has been developed by Drs. Li Peng, Ming-Dah Chou and Albert Arking for climate studies. Because this model includes detailed calculations of solar heating and terrestrial cooling of the atmosphere and the earth's surface, it is particularly suitable for studying the sensitivity of climate to such forcings as variations in the solar constant, atmospheric carbon dioxide (CO_2) content, stratospheric aerosols, dust, etc.

Significant Results: Experiments carried out with this Energy Balance Model have shown that the global mean surface temperature rises 2.7°C in response to a 2% increase in the solar constant, and 2.2°C to a doubling of the atmospheric CO_2 content. Due to the effect of ice/snow cover on surface reflectivity, there is a strong individual variation in response with latitudes: the change in surface temperature at low latitudes is about 2°C and that at high latitudes is about 5°C. Experiments with this model also have shown that the sensitivity of the climate system increases as ice/snow cover and atmospheric water vapor content respond to temperature changes. The sensitivity is increased by 1/3 with ice reflectivity and is doubled with water vapor greenhouse effect.

Practical Uses: The Energy Balance Model's improved portrait of the processes of heating and cooling the globe and of the important feedback mechanisms in the atmosphere promise to be useful as a guide for identifying the important parameters of physical processes in a more complicated atmospheric circulation model.

The results of the climate sensitivity study can further be used by governments for assessing the impacts of possible future climate fluctuations on food production and energy usage.

For further information, please contact Dr. Ming-Dah Chou, Code 915, Goddard Space Flight Center (301-344-6772).

Key Appointments

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Effective February 22, 1981, Dr. Paul B. Schneck is appointed Assistant Director for Computer and Information Science in the Mission and Data Operations Directorate.

In January 1979, Dr. Schneck was assigned as Assistant to the Director. Additionally, since October 1980, he is serving as Acting Chief, Information Extraction Division, Applications Directorate, a responsibility that he will retain pending selection of a permanent Division Chief.

Administrator

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the University of California, Berkeley from 1964 to 1969 and was administrator of the Berkeley Research Reactor during the same period.

Born June 17, 1929, in Mannheim, Germany, Mark came to the United States in 1940 and became a citizen in 1945. He received his bachelor's degree in physics from the University of California at Berkeley in 1951 and a doctorate in physics from Massachusetts Institute of Technology in 1954.

He served with NASA in 1968-69 as Associate Administrator, Office of Advanced Research and Technology. From 1969 to 1973, he was Under Secretary of Transportation. He went to Summa Corp. as Managing Director, Operations and joined General Dynamics in January 1974. Before joining NASA, he had been with Westinghouse Electric Corp. for 13 years.

A 1947 graduate of the U.S. Naval Academy, he served with the Navy until 1954. In 1955, he received a master's degree from the Harvard Graduate School of Business Administration.

A member of the Board of Governors of the National Space Club, the National Security Industrial Association and the American Astronautical Society, his other professional affiliations include the National Academy of Public Administration, the American Institute of Aeronautics and Astronautics, the American Society of Naval Engineers and Sigma Tau.

Mark has taught undergraduate and graduate courses in physics and engineering at Boston University, Massachusetts Institute of Technology and the University of California at both the Berkeley and Davis campuses and held an appointment as consulting professor of engineering at Stanford University.

He and his wife, the former Marion G. Thorpe, have two children.

NASA National Aeronautics and Space Administration

GODDARD NEWS

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