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Naming of the Space Shuttle 5/16/89 [OA 6265]

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1 \* insert on Space Station

Sen. Gary  
Congress. Whitten  
Congress. Jenkins

(Smith/Blessey)  
May 15, 1989  
Draft Three  
END

PRESIDENTIAL REMARKS: SPACE SHUTTLE  
ROSE GARDEN  
TUESDAY, MAY 16, 1989

Justice D'Andrea  
2800

Commander Walker and Crew, friends and families of the Shuttle Atlantis, students, my fellow Americans. *Admiral Truly*

You know, the late Jackie Gleason immortalized the words, "And away we go." Well, it is a pleasure to be with Americans who, by exploring the horizons of outer space, have made those words reality.

We gather here to celebrate the continuity of America's space program, and of America herself.

In a sense, today's setting reflects that continuity. For you are pioneers pushing back the boundaries of America's technological future. And this house embodies the greatness of America's present and past.

And the two space missions that we celebrate -- they, too, reflect America's continuity. For in Magellan, we salute achievement which has come to pass. And in Endeavour, the glory which still lies ahead.

NASA memo to Justice  
5/11/89

Atlantis's deployment

Atlantis

or in process.

P. 1

Acquainted  
English  
Richard Lederer

Forbes p. 21  
4/3/89  
Goldwyn  
quote

Some of you may recall how Winston Churchill said, "The farther backward you can look, the farther forward you are likely to see."

JP's Thought for the Day 4/13/83

Well, Magellan was named after the sea-faring explorer of the 16th century. And as the first U.S. planetary mission since 1978, it marks the rebirth of America's planetary program. From Magellan, we will learn more about Venus, and thus ourselves. For Venus is the planet most like Earth.

Encyclopedia Britannica Vol. 11 p. 292

NASA facts on Magellan 3/89 David Carroll NASA 453-8400

To Commander Walker and his Atlantis crew, my heart-felt congratulations. Today, America salutes your courage and enterprise. For you have reaffirmed you Nation's genius in science and technology. And yet, it's only a beginning.

NASA facts on Magellan 3/89

Four more solar-system missions through the mid-1990s. And 13 more shuttle flights in 1989 and '90. These flights will chart new frontiers in science and exploration. And we will explore those frontiers through the leaders of tomorrow.

David Carroll NASA 453-8400

We see those leaders in the students here today -- from Mississippi, and from Georgia. For in a nationwide orbiter-naming competition, involving over 71,000 students and 6,100 entries from elementary and secondary schools, you showed how the possibilities of tomorrow point us onward and upward.

NASA MAMINC Endeavor memo 5/10/89

You know, choosing a name can be a thankless task. Consider the new father who was once reproached by Sam Goldwyn. "You're going to call your son William?" he said. "What kind of a name is that? Every Tom, Dick, and Harry is called William."

Jay

My friends, you fared much better. Both of your schools chose the name Endeavour, which Webster's defines as "to make an effort, strive; to try to reach or achieve." And each of your schools has lived that definition.

X X X X

NASA Release on naming of Endeavour 5/10/89 p. 2

Webster's

In the Division I category -- kindergarten through Grade Six -- the national winner is the fifth graders from Senatobia Middle School in Senatobia, Mississippi. Your team taught lower elementary students about space through ~~the up-close and~~ hands-on personal. Like simulating a space camp's wireless communications. Or trying on a team-made spacesuit.

NASA Release on naming of Endeavour p. 1 5/10/89

activities

And in Division II -- Grades 7 through 12 -- the winning team came from a nearby State -- Tallulah Falls School, Inc., in Tallulah Falls, Georgia. Here, students developed a math magazine, "Math Exploration With James Cook." And created a play comparing Cook's 18th-Century sea exploration to Endeavour's 20th-Century space exploration.

NASA Release on naming of Endeavour p. 1 5/10/89

You know, if my history doesn't fail me, Endeavour was the first ship commanded by James Cook, a British explorer,

NASA memo on Endeavour 92 5/10/89

navigator, and astronomer. And in August 1768, on Endeavour's maiden voyage, Cook recorded the transit of the planet Venus.

In a sense, then, the Magellan mission completes the circle from Cook, detailing Venus, to Magellan, exploring Venus. And Endeavour will build on that tradition -- again, continuity.

The orbiter-naming contest was, and is, a partnership between NASA and the Council of Chief State School Officers. The CCSO played a key role in organizing this contest. And I would like to thank its members. And also my good friend Congressman Tom Lewis, whose legislation created the event.

But most of all, I want to thank you -- Commander Walker and crew, and the students. For you have acted not for ourselves alone -- but for generations to come.

And in so doing, you are making possible -- now, and tomorrow -- that picture of the orbiter lifting off, its rise a swirl of magic. And of Americans cheering its safety and success. And dreaming of the new worlds, and faraway heavens, which form America's destiny.

That is the continuity of America. And of our space shuttle program which points us toward the stars. Thank you, my heart-felt congratulations, God bless you, and God bless America.

# # # #

(Present teams w/ plaques)

VASA memo on Endeavour p.2 5/10/89

VASA note from Jessy Finarelli p.2 5/11/89

Jestine D'Andrea x2800

VASA memo on Endeavour p.2 5/10/89

Jestine D'Andrea x2800

team coordinators

X





National Aeronautics and  
Space Administration

Washington, D.C.  
20546

Reply to Attn of:

X

May 11, 1989

NOTE TO: Justine D'Andrea

SUBJECT: Talking Points for the President

Justine--

You mentioned that the President's speech writers would be pulling together remarks for him to make at the May 16 Rose Garden meeting with the STS-30 crew and the winners of the orbiter-naming contest. You also asked me to suggest any additional points that he might make. Here are a few ideas in addition to the most important general point about the importance of space endeavors as an educational motivator:

-- Point out that, as we move into the future, we will have a permanently manned space station to conduct important scientific, technological and commercial activities in space. Space Station Freedom is also a mandatory stepping stone for our "destiny"--the human exploration of the solar system. [Jake Garn, ranking minority member of NASA's Senate appropriations subcommittee, has asked us to make sure that the President includes a strong statement about the space station in this speech. He forecasts grave difficulties for the program without active Presidential support.]

-- Note that the children he is commending could very well be living and working on Space Station Freedom. Also note that their children could very well benefit from educational activities related to the space station. Just as the Shuttle serves as a classroom and provides opportunities for student research projects, the space station will do so on a much grander scale in the future.

-- Already, many schools around the country are using space station related projects as educational tools. Schools in states like Mississippi, West Virginia and Texas have undertaken educational projects based on the station--in some cases, even building station mockups. [Key Congressional figures with authority over NASA's budget come from the three states mentioned. They have been invited to the ceremony.]

-- We are facing serious shortages of scientists, engineers and other technical personnel in this country. We must grab the attention and the interest of children early in their school years if we are going to solve this problem and keep America competitive in this ever increasingly technological world.

-- Note that the orbiter-naming contest represented a remarkable partnership between NASA and the Council of Chief State School Officers. [The CCSSO, comprised of the chief educational officers from the fifty states and the U.S. territories, is an important educational organization that played a key role in organizing and implementing the contest. Key members will be at the ceremony and they warrant recognition.]

-- Remark about the coincidence between the task assigned to Cook's ship "Endeavour" to study the transit of the planet Venus from the South Seas and the task assigned to the STS-30 crew to launch Magellan to study the planet Venus from orbit.

Although you probably already have them, I'm enclosing the letters we've sent to Joe Hagin and to the President on the orbiter-naming contest. I'm also sending a NASA booklet on Magellan for background on that topic.

*Peggy*  
Margaret G. Finarelli

Enclosures

# Biographical Data

# NASA

Lyndon B. Johnson Space Center  
Houston, Texas 77058

National Aeronautics and  
Space Administration

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**NAME:** David M. Walker (Captain, USN)  
NASA Astronaut

**BIRTHPLACE AND DATE:** Born May 20, 1944, in Columbus, Georgia, but considers Eustis, Florida, to be his hometown. His mother, Mrs. Walter Rundle, resides there.

**PHYSICAL DESCRIPTION:** Red hair; blue eyes; height: 5 feet 10 inches; weight: 165 pounds.

**EDUCATION:** Graduated from Eustis High School, Eustis, Florida, in 1962; received a bachelor of science degree from the United States Naval Academy in 1966.

**MARITAL STATUS:** Married to the former Stacy Randal Hall of Kilgore, Texas.  
Her father, Mr. Homer Hall, and mother, Mrs. Jo Randolph, reside there.

**CHILDREN:** Michael, March 11, 1969; Matt, September 15, 1971.

**RECREATIONAL INTERESTS:** He enjoys reading, music and a variety of sports, particularly squash, tennis and snow and water skiing.

**SPECIAL HONORS:** Awarded the Defense Superior Service Medal, 6 Navy Air Medals, a Battle Efficiency Ribbon, the Armed Forces Expeditionary Medal, the National Defense Service Medal, the Nasa Space Flight Medal, the Vietnamese Cross of Gallantry, the Vietnam Service Medal, and the Republic of Vietnam Campaign Medal.

**ORGANIZATIONS:** Member of the Society of Experimental Test Pilots, the American Institute of Aeronautics and Astronautics, and the Naval Institute.

**EXPERIENCE:** Walker was graduated from Annapolis and subsequently received flight training from the Naval Aviation Training Command at bases in Florida, Mississippi, and Texas. He was designated a naval aviator in December 1967 and proceeded to Naval Air Station Miramar, California, for assignment to Fighter Squadron 92, where he completed two combat cruises in Southeast Asia as a fighter pilot flying F-4 Phantoms aboard the carriers USS ENTERPRISE and USS AMERICA. From December 1970 to 1971, he attended the USAF Aerospace Research Pilot School at Edwards Air Force Base, California, and was subsequently assigned in January 1972 as an experimental and engineering test pilot in the flight test division at the Naval Air Test Center, Patuxent River, Maryland. While there, he participated in the Navy's preliminary evaluation and Board of Inspection and Survey trials of the F-14 Tomcat and tested a leading edge slat modification to the F-4 Phantom. He then attended the U.S. Navy Safety Officer School at Monterey, California, and completed replacement pilot training in the F-14 Tomcat at Naval Air Station Miramar, California. In 1975, Walker was assigned to Fighter Squadron 142, stationed at Naval Air Station Oceana, Virginia, as a fighter pilot and was deployed to the Mediterranean Sea twice aboard the USS AMERICA.

He has logged more than 5,000 hours flying time--4,500 hours in jet aircraft.

**NASA EXPERIENCE:** Selected by NASA in January 1978, Walker became an astronaut in August 1979, qualified for assignment as a pilot on future Space Shuttle flight crews. His technical assignments since then include: Astronaut Office Safety Officer; Deputy Chief of Aircraft Operations; STS-1 chase pilot; software verification at the Shuttle Avionics Integration Laboratory (SAIL); mission support group leader for STS-5 and 6, Assistant to the Director, Flight Crew Operations; leader of the astronaut support crew at Kennedy Space Center; and Branch Chief, Space Station Design and Development.

# Biographical Data

# NASA

Lyndon B. Johnson Space Center  
Houston, Texas 77058

National Aeronautics and  
Space Administration

**NAME:** Ronald J. Grabe (Colonel, USAF)  
NASA Astronaut

**BIRTHPLACE AND DATE:** Born June 13, 1945, in New York, New York.  
His mother, Mrs. Martha Grabe, resides in Lakewood, New Jersey.

**PHYSICAL DESCRIPTION:** Brown hair; hazel eyes; height: 6 feet; weight: 185 pounds.

**EDUCATION:** Graduated from Stuyvesant High School, New York, New York, in 1962, received a bachelor of science degree in Engineering Science from the United States Air Force Academy in 1966; studied Aeronautics as a Fulbright Scholar at the Technische Hochschule, Darmstadt, West Germany, in 1967.

**MARITAL STATUS:** Married to the former Marijo A. Landon.  
Her parents, Mr. and Mrs. Jack N. Landon, reside in Clovis, New Mexico.

**CHILDREN:** Hilary, December 25, 1974; and Alison, March 9, 1979.

**RECREATIONAL INTERESTS:** He enjoys skiing, wind surfing, and racquet sports.

**SPECIAL HONORS:** The Air Force Distinguished Flying Cross, the Air Medal with 7 Oak Leaf Clusters, the Air Force Meritorious Service Medal, the Liethen-Tittle Award (for Outstanding Student at the USAF Test Pilot School), the Royal Air Force Cross, and the NASA Space Flight Medal.

**EXPERIENCE:** Upon graduating from the Air Force Academy in 1966, Grabe went to Darmstadt, West Germany, as a Fulbright Scholar. He returned the States in 1967 to complete pilot training at Randolph Air Force Base, Texas. He subsequently flew F-100 aircraft with the 27th Tactical Fighter Wing at Cannon Air Force Base, New Mexico, and in 1969 was assigned as an F-100 pilot with the 3d Tactical Fighter Wing at Bien Hoa Air Base in the Republic of Vietnam where he flew 200 combat missions. In 1970, he was reassigned to the 27th Tactical Fighter Wing at Cannon Air Force Base to fly F-100 and F-111 aircraft. He participated in the operational test and evaluation of the weapons system of the F-111D aircraft. Grabe attended the USAF Test Pilot School in 1974 and, upon graduating in 1975, was assigned to the Air Force Flight Test Center as a test pilot for the A-7 and F-111. He was the program manager and chief project pilot for the Air Force's digital flight control system for tactical fighters (DIGITAC) evaluation. He later served as an exchange test pilot with the Royal Air Force at Boscombe Down, United Kingdom, from 1976 to 1979. During this tour of duty, he served as the chief project pilot for the Royal Air Force Harrier and the Royal Navy Sea Harrier. He was an instructor at the USAF Test Pilot School at Edwards Air Force Base, California, when advised of his selection by NASA.

He has logged more than 4,000 hours flying time.

**NASA EXPERIENCE:** Grabe became a NASA Astronaut in August 1981. He served as a chief verification pilot for STS-3 and STS-4 entry guidance, navigation and control simulation testing, as the Deputy Manager for Operations Integration, Space Shuttle Program Office, and subsequently as the Chief of Training within the Astronaut Office.

Grabe was pilot for STS 51-J, the second Space Shuttle Department of Defense mission, which launched from Kennedy Space Center, Florida, on October 3, 1985. This was the maiden voyage of the Atlantis, the final Orbiter in the Shuttle fleet. After 98 hours of orbital operations, Atlantis landed on Edwards Air Force Base, California, on October 7, 1985.

# Biographical Data

# NASA

Lyndon B. Johnson Space Center  
Houston, Texas 77058

National Aeronautics and  
Space Administration

**NAME:** Mary L. Cleave (Ph.D.)  
NASA Astronaut

**BIRTHPLACE AND DATE:** Born February 5, 1947, in Southampton, New York.  
Her parents, Dr. and Mrs. Howard E. Cleave, reside in Williamstown, Massachusetts.

**PHYSICAL DESCRIPTION:** Brown hair; green eyes; height: 5 feet 2 inches; weight: 103 pounds.

**EDUCATION:** Graduated from Great Neck North High School, Great Neck, New York, in 1965; received a bachelor of science degree in Biological Sciences from Colorado State University in 1969 and master of science in Microbial Ecology and a doctorate in Civil and Environmental Engineering from Utah State University in 1975 and 1979, respectively.

**MARITAL STATUS:** Unmarried.

**RECREATIONAL INTERESTS:** She enjoys cross-country and downhill skiing, sailing, hiking, and camping.

**ORGANIZATIONS:** Member of the Texas Society of Professional Engineers, the Water Pollution Control Federation, Tri-Beta, Sigma Xi, and Tau Beta Pi; associate member of the American Society of Civil Engineers.

**SPECIAL HONORS:** Recipient of NASA Space Flight Medal (1985), NASA Exceptional Service Medal (1988).

**EXPERIENCE:** Dr. Cleave held graduate research, research phycologist, and research engineer assignments in the Ecology Center and the Utah Water Research Laboratory at Utah State University from September 1971 to June 1980. Her work included research on the productivity of the algal component of cold desert soil crusts in the Great Basin Desert south of Snowville, Utah; algal removal with intermittent sand filtration and prediction of minimum river flow necessary to maintain certain game fish; the effects of increased salinity and oil shale leachates on freshwater phytoplankton productivity; development of the Surface Impoundment Assessment document and computer program (FORTRAN) for current and future processing of data from surface impoundments in Utah; and design and implementation of an algal bioassay center and a workshop for bioassay techniques for the Intermountain West. In conjunction with her research efforts, she has published numerous scientific papers.

**NASA EXPERIENCE:** Dr. Cleave was selected as an astronaut in May 1980. Her technical assignments have included flight software verification in the Shuttle Avionics Integration Laboratory (SAIL), CAPCOM on five Space Shuttle flights, Malfunctions Procedures Book, and Crew Equipment Design.

Dr. Cleave was a mission specialist on the crew of STS 61-B which launched at night from Kennedy Space Center, Florida, on November 26, 1985. During the mission, the crew deployed the MORELOS-B, AUSSAT II, and SATCOM K-2 communications satellites, conducted two 6-hour spacewalks to demonstrate Space Station construction techniques with the EASE/ACCESS experiments, operated the Continuous Flow Electrophoresis (CFES) experiment for McDonnell Douglas and a Getaway Special (GAS) container for Telesat, Canada, conducted several Mexican Payload Specialist Experiments for the Mexican Government, and tested the Orbiter Experiments Digital Autopilot (OEX DAP). This was the heaviest payload weight carried to orbit by the Space Shuttle to date. After completing 108 orbits of the Earth in 165 hours, STS 61-B Atlantis landed on Runway 22 at Edwards Air Force Base, California, on December 3, 1985.

With the completion of this flight Dr. Cleave has logged a total of 165 hours in space.

# Biographical Data

# NASA

Lyndon B. Johnson Space Center  
Houston, Texas 77058

National Aeronautics and  
Space Administration

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**NAME:** Mark C. Lee (Major, USAF)  
NASA Astronaut

**BIRTHPLACE AND DATE:** Born August 14, 1952, in Viroqua, Wisconsin.  
His parents, Mr. and Mrs. Charles M. Lee, reside in Viroqua, Wisconsin.

**PHYSICAL DESCRIPTION:** Blonde hair; blue eyes; height: 6 feet; weight: 200 pounds.

**EDUCATION:** Graduated from Viroqua High School, Viroqua, Wisconsin, in 1970; received a bachelor of science degree in Civil Engineering from the U.S. Air Force Academy in 1974, and a master of science degree in Mechanical Engineering from Massachusetts Institute of Technology in 1980.

**MARITAL STATUS:** Married to the former Deidre Ann O'Brien of Oklahoma City, Oklahoma.  
Her parents, Mr. and Mrs. Robert D. O'Brien, reside in Oklahoma City, Oklahoma.

**RECREATIONAL INTERESTS:** He enjoys jogging, swimming, carpentry, furniture refinishing, and farming.

**ORGANIZATIONS:** Registered professional engineer in the State of Colorado. Member of the American Angus Association.

**SPECIAL HONORS:** Awarded a Meritorious Service Medal, and 2 Air Force Commendation Medals.

**EXPERIENCE:** Following pilot training at Laughlin Air Force Base, Texas, and F-4 upgrade at Luke Air Force Base, Arizona, Lee spent 2-1/2 years at Okinawa Air Base, Japan, in the 25th Tactical Fighter Squadron flying F-4's. He began his studies at MIT in 1979 specializing in graphite/epoxy advanced composite materials. Following graduation in 1980, he was assigned to Hanscom Air Force Base, Massachusetts, in the Airborne Warning and Control System (AWACS) Program Office, as the Operational Support Manager and was responsible for resolving mechanical and material deficiencies which affected the mission readiness of the AWACS aircraft. In 1982 he returned to flying upgrading in the F-16 and serving as the 388TFW Deputy Commander for Operations, Executive Officer, and Flight Commander in the 4th Tactical Fighter Squadron at Hill Air Force Base, Utah, until his selection as an astronaut candidate.

He has logged 2,200 hours flying time, predominantly in the T-38, F-4 and F-16 aircraft.

**NASA EXPERIENCE:** Lee was selected as an astronaut candidate by NASA in May 1984. In June 1985 he completed a 1-year training and evaluation program, qualifying him for assignment as a mission specialist on future Space Shuttle flightcrews. His technical responsibilities within the Astronaut Office have included extravehicular activity (EVA), the inertial upper stage (IUS), and the Auxiliary Power Unit (APU). He has taken part in the planning and simulation for several EVA missions and served as the support crewmember for mission 51-I, Leasat retrieval and repair. He has served as a Capsule Communicator (CAPCOM) in the Mission Control Center, and also as Chief of Astronaut Appearances.

**CURRENT ASSIGNMENT:** Major Lee is in flight training as a mission specialist on STS-30, scheduled for launch in April 1989. Mission objective will be the deployment of Magellan, a planetary probe, scheduled to arrive at Venus in August 1990. Magellan will map the surface of Venus, using high resolution radar instruments.

FEBRUARY 1989

# Biographical Data

# NASA

Lyndon B. Johnson Space Center  
Houston, Texas 77058

National Aeronautics and  
Space Administration

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**NAME:** Norman E. Thagard (M.D.)  
NASA Astronaut

**BIRTHPLACE AND DATE:** Born July 3, 1943, in Marianna, Florida, but considers Jacksonville, Florida, to be his hometown. His father, Mr. James E. Thagard, is deceased; his mother, Mrs. Mary F. Nicholson, is a resident of St. Peterburg, Florida.

**PHYSICAL DESCRIPTION:** Brown hair blue eyes; height: 5 feet 9 inches; weight: 156 pounds.

**EDUCATION:** Graduated from Paxon Senior High School, Jacksonville, Florida, in 1961; attended Florida State University where he received bachelor and master of science degrees in Engineering Science in 1965 and 1966, respectively, and subsequently performed pre-med course work; received a doctor of medicine from the University of Texas Southwestern Medical School in 1977.

**MARITAL STATUS:** Married to the former Rex Kirby Johnson of Atlanta, Georgia.  
Her mother, Mrs. Rex Johnson, resides in Dallas, Texas.

**CHILDREN:** Norman Gordon, May 15, 1968; James Robert, November 29, 1970; Daniel Cary, November 22, 1979.

**RECREATIONAL INTERESTS:** During his free time, he enjoys classical music, and electronic design.

**ORGANIZATIONS:** Member of American Institute of Aeronautics and Astronautics, and Phi Kappa Phi.

**SPECIAL HONORS:** Awarded 11 Air Medals, the Navy Commendation Medal with Combat V, the Marine Corps "E" Award, the Vietnam, Service Medal, and the Vietnamese Cross of Gallantry with Palm.

**EXPERIENCE:** Dr. Thagard held a number of research and teaching posts while completing the academic requirements for various earned degrees.

In September 1966, he entered on active duty with the United States Marine Corps Reserve. He achieved the rank of Captain in 1967, was designated a naval aviator in 1968, and was subsequently assigned to duty flying F-4s with VMFA-333 at Marine Corps Air Station, Beaufort, South Carolina. He flew 163 combat missions in Vietnam while assigned to VMFA-115 from January 1969 to 1970. He returned to the United States and an assignment as aviation weapons division officer with VMFA-251 at the Marine Corps Air Station, Beaufort, South Carolina.

Thagard resumed his academic studies in 1971, pursuing additional studies in electrical engineering, and a degree in medicine; prior to coming to NASA, he was interning in the Department of Internal Medicine at the Medical University of South Carolina.

He is a pilot and has logged over 2,200 hours flying time--the majority in jet aircraft.

**NASA EXPERIENCE:** Dr. Thagard was selected as an astronaut candidate by NASA in January 1978. In August 1979, he completed 1-year training and evaluation period, making him eligible for assignment as a mission specialist on future Space Shuttle flight crews.

Dr. Thagard was a mission specialist on STS-7, which launched from Kennedy Space Center, Florida, on June 8, 1983. This was the second flight for the Orbiter Challenger and the first mission with a 5-person crew. During the mission, the STS-7 crew deployed satellites for Canada (ANIK C-2) and Indonesia



National Aeronautics and  
Space Administration

Washington, D.C. 20546  
AC 202-453-8400

For Release:

Terri Sindelar  
Headquarters, Washington, D.C.  
(Phone: 202/453-8400)

May 10, 1989  
Embargoed until 3 p.m. EDT

RELEASE: 89-70

#### PRESIDENT BUSH NAMES REPLACEMENT ORBITER "ENDEAVOUR"

President Bush today chose the name "Endeavour" for the new Space Shuttle orbiter, currently under construction.

The name Endeavour resulted from a nationwide orbiter-naming competition supported by educational projects created by student teams in elementary and secondary schools.

In the nationwide competition, involving over 71,000 students, the national winner in Division I (kindergarten through grade 6) is the fifth graders from Senatobia Middle School, Senatobia, Miss. The team created a space camp simulation, where they taught lower elementary students facts about space through hands-on activities. The nine activities ranged from packaging payload experiments, wireless communication, working a manipulator arm to trying on a team-made spacesuit.

In the Division II category (grades 7 through 12), the winning team is from the Tallulah Falls School, Inc., Tallulah Falls, Ga. The nine-member team was composed of math students in grades 8-12. The team project was two-fold. They developed a math magazine, "Math Exploration with James Cook," written on 3 education levels, and they created a play, "Where On Earth?...", comparing Cook's 18th-century sea exploration to the Space Shuttle "Endeavour's" 20th-century space exploration.

These two national winning teams were selected from over 6,100 entries. The judging criteria was: 80 percent for the quality and creativity of the educational project to support and justify the name; 20 percent for the name's pronounceability for transmission and the ability to capture the spirit of the American pioneer spirit. The name had to be that of a seafaring vessel used in research or exploration. Both winning teams proposed the name "Endeavour."

- 2 -

Endeavour was the first ship commanded by James Cook, a British explorer, navigator and astronomer. In August 1768, on Endeavour's maiden voyage, Cook observed and recorded the transit of the planet Venus. In the view of the students, Cook's navigations, explorations and discoveries eventually led man to the possibilities of space exploration.

"In selecting the name Endeavour, the students and the President have identified a name that symbolizes perfectly NASA's goals of space exploration and discovery," said Dale D. Myers, NASA's Acting Administrator. "The nation can rest assured that we will use this ship with the same commitment that Captain Cook used his in the pursuit of new knowledge to benefit all mankind."

The two winning teams will be recognized in a Rose Garden ceremony at the White House on May 16 together with the STS-30 crew of Space Shuttle Atlantis.

The Council of Chief State School Officers administered the year-long program for NASA.

House Joint Resolution 559, introduced March 10, 1986, by Congressman Tom Lewis (R-Florida), called for the name of the replacement orbiter to be selected from suggestions submitted by students.

The new orbiter, previously designated OV-105, is being built by Rockwell International, Downey, Calif., to replace the Space Shuttle orbiter lost in the Challenger accident. Endeavour is scheduled to be completed in 1991 with her maiden voyage scheduled for March 1992.

- end -

NOTE TO EDITORS: Fact Sheets about the two winning teams, the competition, the history of "Endeavour" and OV-105 are available from the NASA Headquarters Newsroom, Room 6043, 400 Maryland Ave., S.W., Washington, D.C., 202/453-8400.

# NASA Facts



National Aeronautics and  
Space Administration

Washington, D.C. 20546  
AC 202-453-8400

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Barbara Selby  
Headquarters, Washington, D.C.  
(Phone: 202/453-8536)

## ORBITER VEHICLE (OV) 105

### Background Information

In April 1983, under contract to NASA, Rockwell International's Space Transportation Systems Division, Downey, Calif., began the construction of structural spares for completion in 1988. The \$400 million structural spares program consisted of an aft fuselage, crew compartment, forward reaction control system, lower and upper forward fuselage, wings (elevons), payload bay doors, vertical stabilizer (rudder/speed brake), body flap and one set of orbital maneuvering system/reaction control system pods.

At its plant in Downey, Rockwell constructed the upper and lower forward fuselage, pressurized crew compartment, nose landing gear doors, forward reaction control system, airlock and aft fuselage (including thrust structure). The payload bay doors were built by Rockwell in Tulsa, Okla., and the body flap was constructed by its division in Columbus, Ohio.

General Dynamics' Convair Aerospace Division, San Diego, Calif., built the mid fuselage. Grumman Corp., Bethpage, N.Y., constructed the wings, elevons and main landing gear doors. Fairchild Republic, Farmingdale, Long Island, N.Y., provided the vertical stabilizer and rudder/speed brake. The orbital maneuvering system reaction control system pods were built by McDonnell Douglas Astronautics Co., St. Louis, Mo.

On Aug. 1, 1987, NASA awarded Rockwell a \$1.3 billion contract to build a replacement orbiter using the structural spares. The replacement orbiter, designated OV-105, is currently being fabricated at Rockwell's Downey facility and assembled at their facility in Palmdale, Calif. It is scheduled for delivery to the Kennedy Space Center, Fla. in May 1991. The parts of the orbiter which have now been mated together are the lower forward fuselage, the mid fuselage and the wings.

### The Orbiter

OV-105 will be essentially identical to its sister ships, Discovery and Atlantis, capable of flying 100 missions. Like the other orbiters, the new orbiter will incorporate the latest modifications, upgrades and technologies that have evolved during the Space Shuttle return-to-flight activities.

- 2 -

The spaceplane will weigh approximately 150,000 pounds (without the main engines) and measure 122 feet in length with a wingspan of about 78 feet. The payload bay is 60 feet long and 15 feet in diameter.

### Orbiter Naming Program

House Joint Resolution 559, introduced March 10, 1986, by Congressman Tom Lewis (R-Florida), called for the name of the replacement orbiter to be selected from suggestions submitted by students. In October 1987 Congress authorized a program for a name to be selected "from among suggestions submitted by students in elementary and secondary schools."

In March 1988 NASA, in cooperation with the Council of Chief State School Officers (CCSSO), issued an announcement inviting America's students to participate in a national competition to name OV-105.

In March 1989, NASA and the CCSSO announced the state-level winners of the competition. More than 71,650 U.S. students (grades kindergarten through 12) had formed some 6,100 teams and submitted orbiter naming projects in their quest for the honor of naming the replacement orbiter.

### Current Payload Assignment

The primary payloads currently scheduled for OV-105's maiden voyage in March 1992 are the European Retrievable Carrier (EURECA-1R), a platform to be placed in orbit for 6 months offering conventional services to experimenters, and the GEOSTAR-01, an interactive radiodetermination satellite.

NASA's Johnson Space Center, Houston, Texas, has management responsibility for the Shuttle orbiter program.

- end -

# NASA Facts



National Aeronautics and  
Space Administration

Washington, D.C. 20546  
AC 202-453-8400

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Terri Sindelar  
Headquarters, Washington, D.C.  
(Phone: 202/453-8400)

## "ENDEAVOUR"

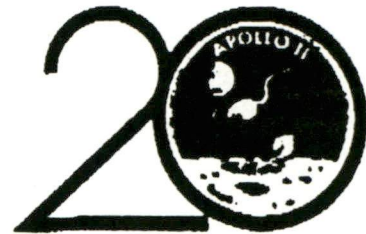
Endeavour was the first ship commanded by James Cook, the 18th century British explorer, navigator and astronomer. In August 1768, on Endeavour's maiden voyage, Cook sailed to the South Pacific, around Tahiti, on a mission to observe and record the important and seldom occurring event when the planet Venus passes between Earth and the sun. Determining the transit of Venus allowed early astronomers to determine the distance of the sun from Earth. This distance then could be used as a unit of measurement essential in calculating the parameters of the universe. On June 3, 1769, Cook completed this mission and continued his voyage to explore the southern hemisphere. He discovered and charted New Zealand and surveyed the eastern coast of Australia and navigated the Great Barrier Reef.

In addition, Cook's voyage on the Endeavour set a precedent of establishing the usefulness of sending scientists on voyages of exploration. Joseph Banks and Carl Solander, who sailed with Cook, became the first naturalists to examine plants and animals in an organized manner. The wealth of scientifically collected material was unique. They collected specimens from more than 100 new plant families with 800 to 1,000 new species. They also encountered hundreds of new species of animals. Cook also had astronomers and artists onboard.

Endeavour and her crew made the first long-distance voyage on which no crewmen died from scurvy, the dietary disease caused by the lack of ascorbic acids. Cook is credited with being the first to use diet as a cure for scurvy, making his crew follow a strict diet that included cress, sauerkraut and an orange extract. He also ensured cleanliness and ventilation in the crew's quarters.

The Endeavour was small, 368 tons, about 100-feet long and 20-feet wide. She had a round bluff bow and a flat bottom that provided uncommon spaciousness and helped prevent her from being torn apart by coral. However, in 1795, Endeavour ended her career on a reef along Rhode Island.

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## NASA ORBITER-NAMING COMPETITION

The Orbiter-Naming Program is designed to enhance students' interest in and enthusiasm for space exploration through educational projects related to space research, exploration and discovery.

On March 10, 1986, Congressman Tom Lewis (R-Florida), called for the name of the replacement orbiter to be selected "from among suggestions submitted by students in elementary and secondary schools." Subsequently, in October 1987, Congress authorized House Joint Resolution 559.

During the 1988 fall semester, over 71,650 U.S. students formed some 6,100 teams, each led by a school faculty member. They prepared and submitted interdisciplinary classroom projects to support and justify the proposed name which had to be that of a sea vessel used in research or exploration.

The Orbiter-Naming competition was open to all students in the 50 states, District of Columbia, five U.S. jurisdictions, Bureau of Indian Affairs, Department of Defense Dependent Schools and Department of State Overseas Schools. There were two entry divisions: Division 1, kindergarten through 6th grade; and Division 2, grades 7 through 12.

The Council of Chief State School Officers (CCSSO) administered the program for NASA. Announcements of Opportunity were issued in March 1988 and Program Entry Packets were mailed between June and the fall semester. Entry deadline was December 31, 1988. On March 20, 1989, NASA-CCSSO announced the state-level winners. During April, a team of judges at NASA Headquarters reviewed the state-level winning projects and selected the national division finalists. Entries were judged on the name proposed and on the quality and creativity of the educational project.

Each participant will receive recognition for the team's entry. State-level winners have received recognition from NASA field centers. In addition to having their chosen name on the orbiter, the two national-winning teams will receive an expense-paid visit to Washington for special recognition ceremonies and NASA's Educational Affairs Division will conduct special programs at the two schools.

The replacement orbiter is being built by Rockwell International's Space Transportation System, Downey, Calif. and is scheduled for delivery April 1991.

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## "Endeavour" is Chosen as Winning Name in NASA's Orbiter-Naming Competition Division 1 winner

A nine-member team from Senatobia Middle School, Senatobia, Miss., who proposed the name "Endeavour," has been chosen as the national winner in the Division 1 category (kindergarten through 6th grade) in the competition to name the replacement orbiter. The team is comprised of fifth graders in the gifted and talented education class. The Senatobia team chose the name Endeavour, Lt. James Cook's 18th century ship that sailed from England in 1768 to the Pacific to observe and record the transit of Venus in 1769.

The team chose the name Endeavour because the U.S. space program's "spirit is a united effort to strive, reach and achieve goals in areas of exploration and discovery."

The team's project "First Endeavours in Space" was a classroom activity created by the fifth-graders to teach lower elementary students (K-2) facts about the space program. A space camp simulation was set up in the gymnasium with nine activity areas. In area 1, the students experienced the feeling of enclosure in a space bubble; in area 2, they tried on a space suit created by the team; in area 3, the pupils were blindfolded and turned in a swivel chair to experience dizziness; in area 4, samples of freeze-dried space food were distributed; in area 5, participants built a space structure from plastic straws; in area 6, the youngsters experienced sleeping standing up and were told about the importance of exercise in space; in area 7, the pupils packaged an egg and dropped it from the gym window to demonstrate the importance of payload packaging; in area 8, the students experienced wireless communication using walkie-talkies and learned about communication satellites; and in area 9, the pupils had hands-on experience using a manipulator arm.

At the conclusion, the captains of the nine activity areas gave the participants coloring/activity books as a tangible remembrance of their "First Endeavours in Space."

To learn more about space activities the team took a trip to the Alabama Space and Rocket Center, Huntsville, to see movies and tour the museum and park. They also visited NASA's Marshall Space Flight Center.

The team coordinator is Ms. Martha S. Riales, a teacher of gifted and talented students in grades 3-6 at Senatobia Middle School. The teams members include: Sarah alford, Thomas Anzalone, Ryan Burke, Casey Craig, Melody Durrett, Jennifer Hale, Spencer Miller, Mac Monteith, and Zack Zettergren.

# NASA Facts



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Terri Sindelar  
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## "Endeavour" is Chosen as Winning Name in NASA's Orbiter-Naming Competition Division 2 winner

A nine-member team from Tallulah Falls School, Inc., Tallulah Falls, Ga., who proposed the name "Endeavour," has been chosen as the national winner in the Division 2 category (grades 7-12) in the competition to name the replacement orbiter. The team is comprised of math students in grades 8-12. Endeavour was the name of James Cook's 18th-century ship that sailed from England in 1768 to the Pacific to observe and record the transit of Venus in 1769.

The competition required production of a creative and interdisciplinary project supporting and justifying the name proposed. The nine-member team proposed a two-fold project. One part was to develop a math magazine, "Math Exploration with James Cook." The magazine was written on 3 levels (grades 1-5, 6-8 and 9-12) and incorporated seven activities for each level, combining mathematics with historical information about Cook's travels and his contributions to world exploration and natural science exploration. The team created a variety of math problems, crossword puzzles and word search games. In addition to extensive research, the students learned about magazine production and computer page design and layout.

The second part of the team's project was a play, "Where On Earth?...", comparing 18th-century exploration on the sea to 20th-century exploration in space. The team not only researched the speech patterns and voyages of James Cook, but also researched the Space Shuttle to understand orbiter configuration, crew duties and mission tasks.

Ms. Martha Cantrell, a teacher at Tallulah Falls School, was the team coordinator for the nine-member Orbiter-Naming team. The team members include Todd Besier, Martha Chan, May Chan, David Farris, Tanya Favus, Kerri Hirsch, Ricky Kuhr, Lee Markham, and Damon Wood.

Captain David Walker  
(Stacy)

Colonel Ronald Grobe  
(Marijo)

Dr. Mary Cleave  
(not married)

Major Mark Lee  
(Deidre Ann) (Dee)

Dr. Norman Thagard (Norm)  
(Kirby)

Confirmed  
by David Garrett  
455-8400

I have a slight change  
on p. 1 and some  
additional acknowledgements.

1ST STORY of Level 1 printed in FULL format.

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Time

May 1, 1989, U.S. Edition

SECTION: VIDEO; Pg. 61

LENGTH: 830 words

HEADLINE: The Show-and-Sell Machine;  
At the Smithsonian, a fresh angle on TV's 50th anniversary

BYLINE: BY RICHARD ZOGLIN

BODY:

Anniversaries are television's most annoying bad habit. No TV series, it seems, can pass a milestone ending in zero (Barbara Walters' 50th special, Sesame Street's 20th season) without leading us on a forced march down Memory Lane. Now, saints preserve us, the 50th anniversary of TV itself has arrived -- at least by one measure. On April 20, 1939, RCA formally introduced the modern system of TV broadcasting at the New York World's Fair. One could just as plausibly trace TV's origin back to 1927, when the nation's first experimental TV stations went on the air. Or ahead to the start of regularly scheduled national TV broadcasts, which did not come until after the end of World War II.

But who's counting? The real problem in celebrating TV's anniversary is not locating the proper date but encompassing adequately a medium whose impact has been so broad, so overpowering, so unfathomable. What should TV's birthday revelers commemorate? TV as an entertainment medium? As a chronicler of our times? A business enterprise? A technological device? A social force?

The folks at the Smithsonian Institution's National Museum of American History have come to the wise conclusion that "all of the above" is the worst possible answer. In an admirably focused and thoughtful new exhibit, "American Television: From the Fair to the Family, 1939-89," running until next April, the museum shies away from a nostalgic, you-must-remember-this approach. Imagine a survey of TV history with no mention of Milton Berle, Edward R. Murrow or the Kennedy-Nixon debates.

Instead, the exhibit treats TV as a chapter in American social and economic history: it shows how the medium worked its way into the American home and what changes it wrought there. In the view of curator Larry Bird, who wrote the show's text, television was not just a masterpiece of marketing, it was a key shaper of the postwar consumer age. TV helped induce Americans, still reeling from the Depression and a world war, to start buying again.

Introduced at the end of a decade of economic hardship, TV was touted early on as a creator of jobs as much as a purveyor of entertainment. The centerpiece of the Smithsonian's exhibit is a display of old TV sets -- clunky wooden boxes with tiny, anemic-looking screens. But perhaps more significant is a selection of print advertisements that tried to sell Americans on this strange new gizmo.

The first ads for TV sets showed elegantly dressed models watching in posh surroundings, and often contained practical advice. ("Should the room in which you are viewing television be darkened to resemble a movie theater? Answer:

(c) 1989 Time Inc., Time, May 1, 1989

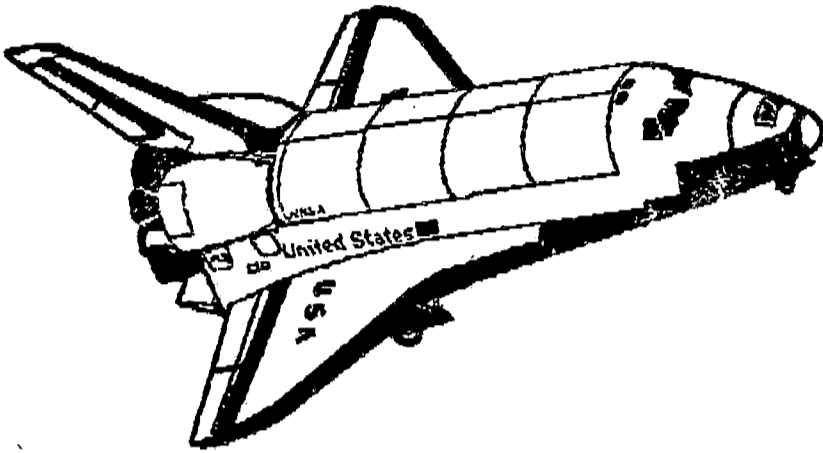
Definitely not!") But soon the marketers of TV had a brainstorm: promoting the new device as a way of bringing the family together again. "There is great happiness," exulted an ad for DuMont sets, "in the home where the family is held together by this new common bond -- television." Another promotional piece listed the things that "took the family away from home" -- including baseball, vaudeville and movies -- and presented TV as the family-saving alternative. (The job may have been done too well; today a lot of parents might welcome a baseball game or two to get the kids away from the set.)

Many of TV's first users were reluctant to give the set a conspicuous place in the home, often hiding it behind cabinets. But the TV set soon became the focus of the living room. By the early '50s, Motorola was advertising "a TV set for every decorating scheme" -- schemes helpfully defined as "period formal," "period informal," "modern formal" and "modern informal." Only later, when families could afford more than one set, was TV marketed as a personal item -- from the first bulky "portables" to the Sony Watchman.

Once Americans were sold on TV, the new medium began to sell them on a wealth of consumer products -- both through commercials and, more subtly, through the well-appointed suburban homes portrayed in the shows themselves. One of the exhibit's cleverest displays is a caseful of advertiser premiums tied in with popular shows: a Lone Ranger deputy badge (15 cents plus a Cheerios box top), a Captain Video board game, a Cisco Kid writing tablet. Such premiums were one of the first methods used by sponsors to gauge the size and composition of their audience. Also on display is a collection of TV-inspired lunch boxes, as well as a tribute to another important box: the early Audimeters used by the A.C. Nielsen Co. to measure viewership, which helped turn TV into a sophisticated selling medium.

Yes, Fonzie's jacket is here too. So is J.R. Ewing's hat, a coffeepot from The Guiding Light and an "Awwa-a-y We Go" toy bus marking Jackie Gleason's switch from the DuMont network to CBS in 1952. But the Smithsonian has gone well beyond such mementos. Refreshingly, it has illuminated what TV -- the medium itself, and not merely the programs it has presented -- has meant in American life. Not a bad birthday present.

GRAPHIC: Picture 1, An RCA set from 1939: no need to dim the lights descColor: 1939 television set., DANE A. PENLAND; Picture 2, In a marketing brainstorm, TV was promoted as a boon to family togetherness -- and a lunch-box emblem descColor reproduction: Early advertisement for television set., DANE A. PENLAND; Picture 3, See above. descColor: Lunch box with picture of Lassie., ERIC LONG



**NASA HEADQUARTERS NEWSROOM  
FACSIMILE COVER SHEET**

DATE: 5/16/89  
TO: Stephanie Blesse  
FROM: DAVID GARRETT

**TOTAL NUMBER OF PAGES INCLUDING COVER SHEET:**

2

**COMMENTS:**

**IF THERE ARE ANY PROBLEMS WITH THIS TRANSMISSION CALL  
202/453-8400.**

5/16/89

There are four more solar system missions through mid-1990.

Yes. Galileo 1989  
Mars Observer 1992  
CRAF- Cassini 1995 and 1996

Venus is the planet most like Earth.

Yes. Has been called Earth's twin.

There are 13 more Shuttle flights planned for 1989 and 1990.

Yes.



David W. Garrett  
NASA News Chief  
NASA Headquarters

# NASA Facts

National Aeronautics and  
Space Administration

**John F. Kennedy Space Center**  
Kennedy Space Center, Florida 32899  
AC 407 867-2468

KSC Release No. 24-89  
March 1989

## STS-30 MAGELLAN

U.S. planetary exploration resumes with the STS-30 Space Shuttle mission, which has as its primary objective the deployment of the Magellan spacecraft on its quest to map the surface of Venus.

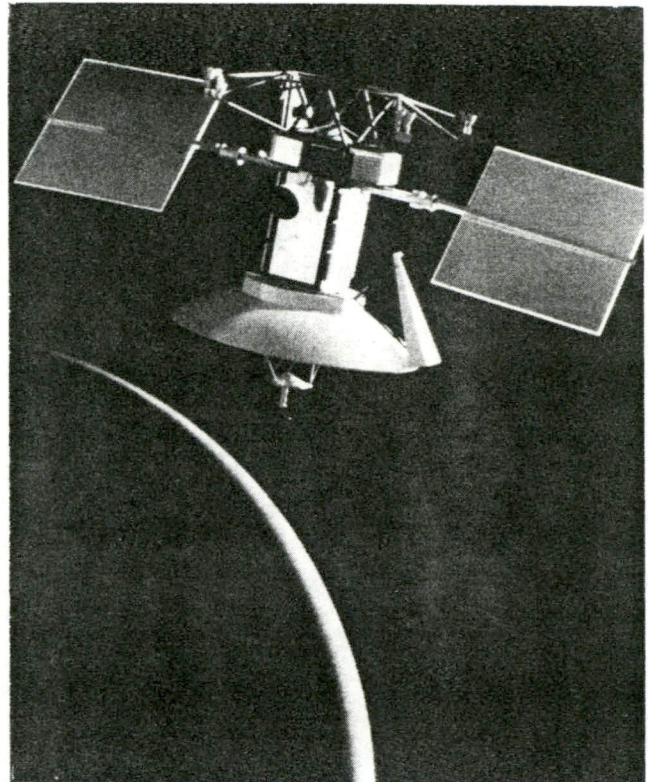
The flight will be the fourth for the orbiter Atlantis and the 29th Space Shuttle mission. Atlantis will be launched from Pad 39B at Kennedy Space Center into a 184-statute mile circular orbit inclined 28.85 degrees to the equator.

Commander of the five-member crew is David M. Walker (Capt., USN), who piloted STS 51-A in November 1984. Pilot Ronald J. Grabe (Col., USAF) had the same role on STS 51-J in October 1985. The three mission specialists are Mary L. Cleave (Ph.D.), Norman E. Thagard, (M.D.), and Mark C. Lee (Maj., USAF). Cleave was a mission specialist on STS 61-B, Thagard on STS-7 and STS 51-B; STS-30 is Lee's first flight.

Magellan marks the first U.S. planetary mission since Pioneer Venus 12 in 1978. It also kicks off a core program of solar system exploration involving NASA and organizations from the United States and the international community. The 31-day launch period for the mission extends from April 28 to May 28, when Earth and Venus are properly aligned.

The Magellan spacecraft arrived at Kennedy Space Center in October 1988 for pre-launch processing. In February 1989, it was mated with the Inertial Upper Stage (IUS) booster which will place it on its trajectory toward Venus.

Three middeck experiments will be conducted during STS-30. All have flown before. The Fluids



Experiment Apparatus, a joint endeavor agreement between Rockwell International and NASA, is a modular zero-gravity biology, chemistry and physics laboratory. The Mesoscale Lightning Experiment is a NASA-sponsored effort involving several universities. Its objective is to study the visual characteristics of large scale lightning in the upper atmosphere. Atlantis will act as a calibration target for a third experiment, involving the Air Force Maui Optical System Facility in Hawaii.

After a four-day flight, Atlantis and her crew are scheduled to land at Edwards Air Force Base, Calif. Atlantis' next mission, STS-34 in October, also involves deployment of a planetary explorer. Galileo, a spacecraft and atmospheric probe, will study Jupiter and its satellites.



## MAGELLAN

Since 1961, the United States and Soviet Union have sent more than twenty missions to Venus, making it the most visited of Earth's fellow planets. But the Magellan Venus Radar Mapper will yield the most detailed and comprehensive picture to date of the veiled planet. Magellan will map up to 90% of the planetary surface with a resolution as sharp as 130 yards. By contrast, the Pioneer Venus spacecraft launched in 1978 was able to map about the same amount of surface, but with a resolution of only 60 miles. The Soviets' Venera spacecraft attained better resolution—about 1.2 miles—but mapped only about 30% of the surface near Venus' north pole.

The Magellan mission's three specific scientific objectives are to improve knowledge of Venus' structure and geologic history; its geophysics, such as density distribution; and its small-scale surface physics, such as surface temperature and roughness.

### Spacecraft, Instrumentation:

In keeping with the core program goal to keep costs down, much of Magellan's design and flight hardware came from earlier programs, primarily Voyager and Galileo. For example, its Synthetic Aperture Radar (SAR) antenna is a flight-qualified spare from a Voyager spacecraft.

Because Venus is obscured by a thick cloud cover, radar is the mapping instrument of choice, rather than an imaging instrument which relies on optics. Unlike conventional radar, where resolution is linked to antenna size, SAR uses spacecraft motion to simulate a large antenna. Computers at the Jet Propulsion

Laboratory in Pasadena, Calif., will take into account this spacecraft motion and synthesize a much larger antenna than the 12-foot one Magellan actually has.

Besides radar imaging, the SAR will also collect radiometry data (measure of surface radiation from which material content can be inferred) and its antenna will serve as the telecommunications link with Earth.

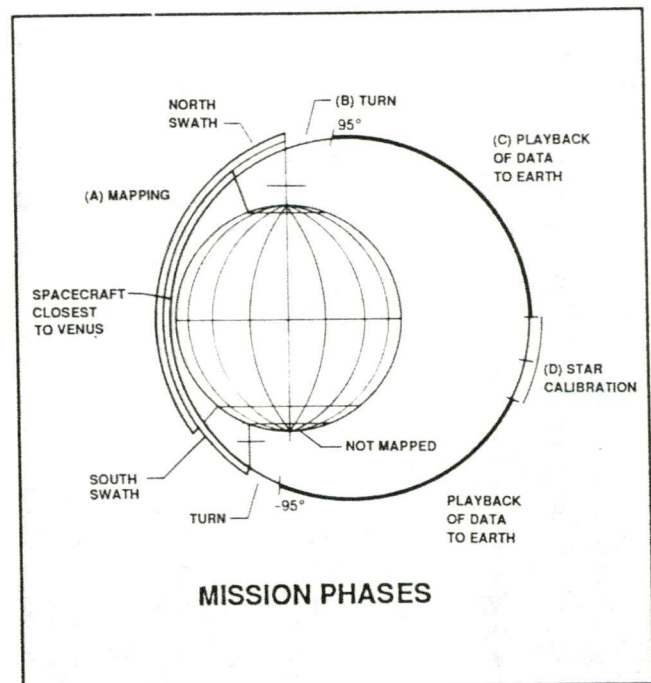
Other features of the three axis-stabilized spacecraft are a low-gain omni-antenna to receive transmissions from Earth and a horn-shaped altimetry antenna. Its two movable solar panels are capable of producing up to 1,545 watts of power in Venus orbit; two nickel cadmium batteries will supply alternative power.

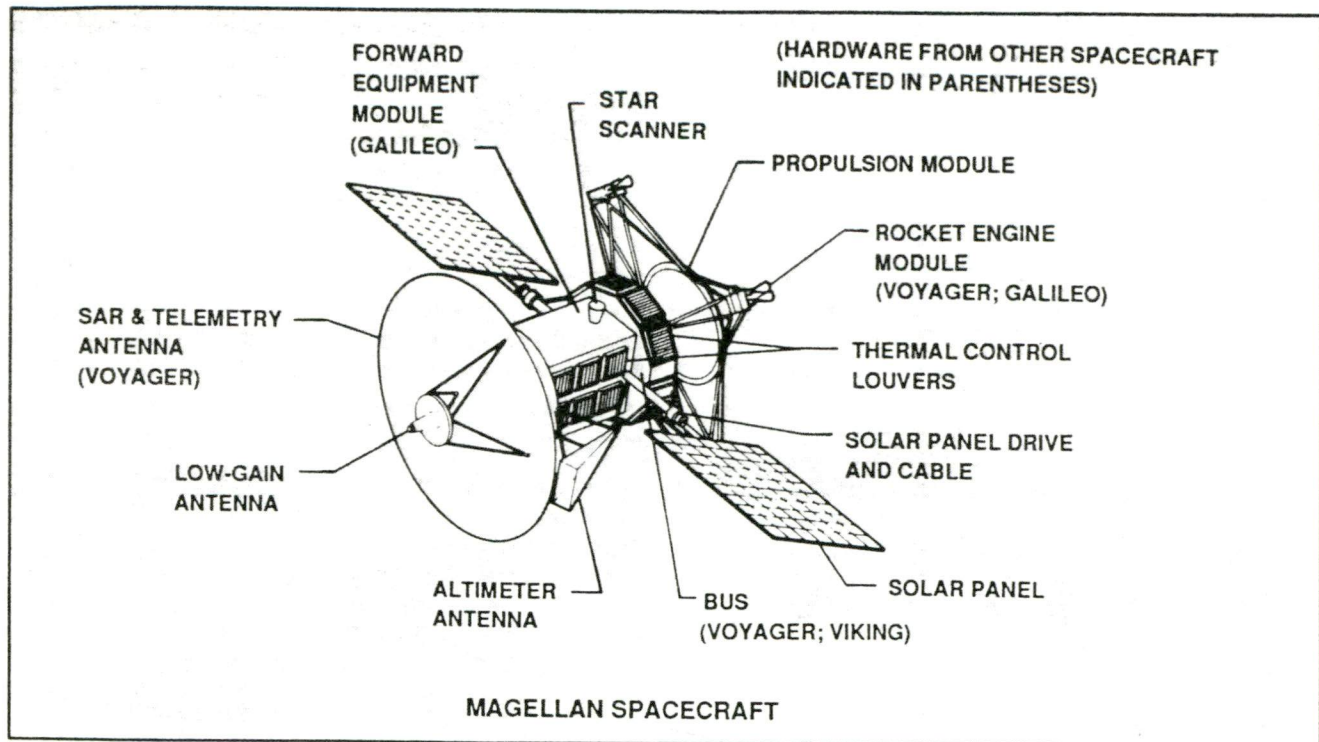
Together with its Star-48 solid rocket motor, Magellan weighs 7,603 pounds. The Jet Propulsion Laboratory, Pasadena, Calif., manages the Magellan project for NASA. Prime contractor for the spacecraft is Martin Marietta Astronautics Group, Denver, Colo., and for the SAR, Hughes Aircraft Co., Los Angeles, Calif.

### Deployment, Journey to Venus:

Magellan will arrive at Venus in August 1990, after a 15-month journey through space. The trip will include one and a half revolutions around the sun and two planned mid-course corrections.

The spacecraft and IUS will be deployed from the orbiter payload bay nominally about six hours into the mission. Magellan's solar panels will then be deployed. Less than an hour later, the IUS first stage motor will fire and then separate. Only minutes later, the IUS second stage motor fires, placing Magellan on





its interplanetary trajectory toward Venus, and then separates. This rapid sequential firing of the IUS motors means the spacecraft is not parked in an intermediate orbit, as occurs when the IUS is used to place a spacecraft in geosynchronous Earth orbit. In the latter instance, an interval of several hours separates the first and second stage motor firings.

Once Magellan arrives at Venus, the Star-48 motor will fire to place the spacecraft in its elliptical orbit around the planet. Magellan will be in a fixed polar orbit and will pass nearly, but not quite, over the planet's north and south poles, coming as close as 155 miles when near the equator and moving as far away as 4,977 miles.

After an approximately two-week checkout process is completed, the spacecraft will begin its mapping operation. Since it takes Venus 243 Earth days to complete a single rotation, it will take the same amount of time for nearly every point on the planet to pass under Magellan's radar; hence, the mapping mission is meticulously timed to last exactly 243 days.

## Mission:

Magellan's highly elliptical orbit will be divided into two phases, mapping and playback. When closer to the planet - about 35 minutes of each three and a quarter hour orbit - Magellan's high gain antenna will be pointed toward the planetary surface for radar mapping, and the data saved on an onboard tape recorder.

As the spacecraft swings away from Venus,

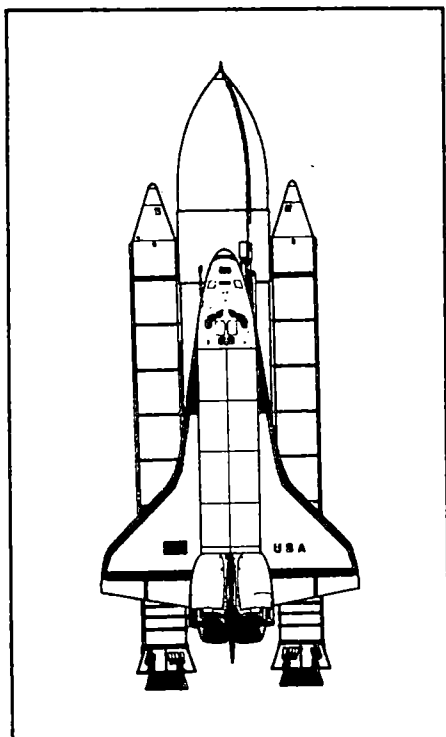
the same antenna will be turned toward Earth. Magellan's tape recorder will play back to Deep Space Network (DSN) ground station antennas the raw data it has just collected. Monitor, command and control of the spacecraft will be from the Jet Propulsion Laboratory, which also manages the DSN for NASA. Magellan's Star Scanner, a navigation instrument, will be used in conjunction with reference stars to reset the spacecraft attitude control system's pointing knowledge during the playback phase.

During the mapping phase, the SAR will image a swath of the Venusian surface between 10 and 17 miles wide and 9,942 miles long, starting at or near the north pole and continuing into the southern hemisphere. Altogether, 1,852 of these immense imaging swaths will be produced. They eventually will be compressed into mosaics which will then be made into maps of the planet.

Magellan's altimeter will measure with up to better than 50-yard accuracy the height of surface features. When combined with radar imaging, researchers will be able to catalogue the volcanic, tectonic, cratering and erosional processes shaping Venus.

Gravity data will be obtained through radio measurements of the minute deviations in the spacecraft's orbital path, caused by variations in the planet's density.

Once this primary mission is completed in 1991, and should there be adequate fuel remaining, Magellan will map areas previously missed and perform gravity experiments.



## ATLANTIS

The Shuttle orbiter Atlantis (OV-104) joined NASA's fleet of reusable winged spaceships in April 1985 when it was delivered to Kennedy Space Center for flight processing. It was ordered under a January 1979 contract with Rockwell International.

On Oct. 3, 1985, Atlantis roared off Pad 39A on its maiden flight, STS 51-J, the second Shuttle mission totally dedicated to the Department of Defense. On Atlantis' second mission, STS 61-B in November 1985, three communications satellites were deployed. The orbiter flew its second classified Department of Defense mission, STS-27, in December 1988.

Like its two sister orbiters, Discovery and Columbia, Atlantis is named for a famous sailing ship. The Woods Hole Oceanographic Institute, a research facility, operated a two-masted ketch named Atlantis that traversed more than half a million miles of the Earth's surface between 1930 and 1966.

As part of the Shuttle return-to-flight effort, Atlantis underwent more than 200 modifications. These included various vehicle upgrades and hardware changes to enhance performance and provide added safety margins. Post-STS-27 modifications included extensive repairs to the orbiter's outer Thermal Protection System tiles.

The delta-winged spaceship looks a lot like an airplane and is about the size of a DC-9. It is launched into space like a conventional rocket, bolted to an external propellant tank and two solid rocket boosters.

Kennedy Space Center engineers and technicians prepare the orbiter for flight by servicing its systems and loading cargo into its bus-sized payload bay. They attach the orbiter to the tank and boosters on a mobile launcher platform and the entire vehicle is transported out to the launch pad.

After liftoff, the boosters burn for a little more than two minutes. They are jettisoned, and parachutes slow their descent to the Atlantic Ocean, where recovery ships are waiting to retrieve the spent casings and return them to port. The orbiter's three main engines burn for about six more minutes following booster separation. After the engines shut down, the external tank is jettisoned to break up upon reentry into the Earth's atmosphere.

The orbiter then carries out its mission in space and returns to Earth like a glider. Planned end-of-mission landing site is Edwards Air Force Base, Calif. Atlantis will then be towed to NASA's Dryden Flight Research Facility and prepared by the Kennedy Space Center recovery team for the ferry flight back to KSC and turnaround for its next mission.

THE WHITE HOUSE  
WASHINGTON



Date: 5-11-89

TO: Chriss Winston

FROM: **JUSTINE D'ANDREA** *JDA*  
**Associate Director**  
**Office of Cabinet Affairs**

Attached is backup material from NASA for the event on Tuesday, May 16th to announce the winners of the naming of the new space shuttle



National Aeronautics and  
Space Administration

Washington, D.C.  
20546

Reply to Attn of:

X

May 11, 1989

NOTE TO: Justine D'Andrea

SUBJECT: Talking Points for the President

Justine--

You mentioned that the President's speech writers would be pulling together remarks for him to make at the May 16 Rose Garden meeting with the STS-30 crew and the winners of the orbiter-naming contest. You also asked me to suggest any additional points that he might make. Here are a few ideas in addition to the most important general point about the importance of space endeavors as an educational motivator:

-- Point out that, as we move into the future, we will have a permanently manned space station to conduct important scientific, technological and commercial activities in space. Space Station Freedom is also a mandatory stepping stone for our "destiny"--the human exploration of the solar system. [Jake Garn, ranking minority member of NASA's Senate appropriations subcommittee, has asked us to make sure that the President includes a strong statement about the space station in this speech. He forecasts grave difficulties for the program without active Presidential support.]

-- Note that the children he is commending could very well be living and working on Space Station Freedom. Also note that their children could very well benefit from educational activities related to the space station. Just as the Shuttle serves as a classroom and provides opportunities for student research projects, the space station will do so on a much grander scale in the future.

-- Already, many schools around the country are using space station related projects as educational tools. Schools in states like Mississippi, West Virginia and Texas have undertaken educational projects based on the station--in some cases, even building station mockups. [Key Congressional figures with authority over NASA's budget come from the three states mentioned. They have been invited to the ceremony.]

-- We are facing serious shortages of scientists, engineers and other technical personnel in this country. We must grab the attention and the interest of children early in their school years if we are going to solve this problem and keep America competitive in this ever increasingly technological world.

-- Note that the orbiter-naming contest represented a remarkable partnership between NASA and the Council of Chief State School Officers. [The CCSSO, comprised of the chief educational officers from the fifty states and the U.S. territories, is an important educational organization that played a key role in organizing and implementing the contest. Key members will be at the ceremony and they warrant recognition.]

-- Remark about the coincidence between the task assigned to Cook's ship "Endeavour" to study the transit of the planet Venus from the South Seas and the task assigned to the STS-30 crew to launch Magellan to study the planet Venus from orbit.

Although you probably already have them, I'm enclosing the letters we've sent to Joe Hagin and to the President on the orbiter-naming contest. I'm also sending a NASA booklet on Magellan for background on that topic.



Margaret G. Finarelli

Enclosures

# Biographical Data

# NASA

Lyndon B. Johnson Space Center  
Houston, Texas 77058

National Aeronautics and  
Space Administration

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**NAME:** David M. Walker (Captain, USN)  
NASA Astronaut

**BIRTHPLACE AND DATE:** Born May 20, 1944, in Columbus, Georgia, but considers Eustis, Florida, to be his hometown. His mother, Mrs. Walter Rundle, resides there.

**PHYSICAL DESCRIPTION:** Red hair; blue eyes; height: 5 feet 10 inches; weight: 165 pounds.

**EDUCATION:** Graduated from Eustis High School, Eustis, Florida, in 1962; received a bachelor of science degree from the United States Naval Academy in 1966.

**MARITAL STATUS:** Married to the former Stacy Randal Hall of Kilgore, Texas.  
Her father, Mr. Homer Hall, and mother, Mrs. Jo Randolph, reside there.

**CHILDREN:** Michael, March 11, 1969; Matt, September 15, 1971.

**RECREATIONAL INTERESTS:** He enjoys reading, music and a variety of sports, particularly squash, tennis and snow and water skiing.

**SPECIAL HONORS:** Awarded the Defense Superior Service Medal, 6 Navy Air Medals, a Battle Efficiency Ribbon, the Armed Forces Expeditionary Medal, the National Defense Service Medal, the Nasa Space Flight Medal, the Vietnamese Cross of Gallantry, the Vietnam Service Medal, and the Republic of Vietnam Campaign Medal.

**ORGANIZATIONS:** Member of the Society of Experimental Test Pilots, the American Institute of Aeronautics and Astronautics, and the Naval Institute.

**EXPERIENCE:** Walker was graduated from Annapolis and subsequently received flight training from the Naval Aviation Training Command at bases in Florida, Mississippi, and Texas. He was designated a naval aviator in December 1967 and proceeded to Naval Air Station Miramar, California, for assignment to Fighter Squadron 92, where he completed two combat cruises in Southeast Asia as a fighter pilot flying F-4 Phantoms aboard the carriers USS ENTERPRISE and USS AMERICA. From December 1970 to 1971, he attended the USAF Aerospace Research Pilot School at Edwards Air Force Base, California, and was subsequently assigned in January 1972 as an experimental and engineering test pilot in the flight test division at the Naval Air Test Center, Patuxent River, Maryland. While there, he participated in the Navy's preliminary evaluation and Board of Inspection and Survey trials of the F-14 Tomcat and tested a leading edge slat modification to the F-4 Phantom. He then attended the U.S. Navy Safety Officer School at Monterey, California, and completed replacement pilot training in the F-14 Tomcat at Naval Air Station Miramar, California. In 1975, Walker was assigned to Fighter Squadron 142, stationed at Naval Air Station Oceana, Virginia, as a fighter pilot and was deployed to the Mediterranean Sea twice aboard the USS AMERICA.

He has logged more than 5,000 hours flying time--4,500 hours in jet aircraft.

**NASA EXPERIENCE:** Selected by NASA in January 1978, Walker became an astronaut in August 1979, qualified for assignment as a pilot on future Space Shuttle flight crews. His technical assignments since then include: Astronaut Office Safety Officer; Deputy Chief of Aircraft Operations; STS-1 chase pilot; software verification at the Shuttle Avionics Integration Laboratory (SAIL); mission support group leader for STS-5 and 6, Assistant to the Director, Flight Crew Operations; leader of the astronaut support crew at Kennedy Space Center; and Branch Chief, Space Station Design and Development.

Walker was pilot on the crew of STS 51-A which launched from Kennedy Space Center, Florida, on November 8, 1984. This was the second flight of the Orbiter Discovery. During the mission the crew deployed two satellites, Canada's Anik D-2 (Telesat H) and Hughes' LEASAT-1 (Syncom IV-1), and operated the Radiation Monitoring Equipment (RME) device and the 3M Company's Diffusive Mixing of Organic Solutions (DMOS) experiment. In the first space salvage mission in history the crew also retrieved for return to earth the Palapa B-2 and Westar VI satellites. STS 51-A completed 127 orbits of the Earth before landing at Kennedy Space Center, Florida, on November 16, 1984. With the completion of his first flight Walker has logged a total of 192 hours in space.

**CURRENT ASSIGNMENT:** Captain Walker is in flight training as spacecraft commander for STS-30, scheduled for launch in April 1989. Mission objective will be the deployment of Magellan, a planetary probe, scheduled to arrive at Venus in mid-1990. Magellan will map the entire surface of Venus for the first time, using specialized radar instruments.

**FEBRUARY 1989**

# Biographical Data

# NASA

Lyndon B. Johnson Space Center  
Houston, Texas 77058

National Aeronautics and  
Space Administration

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**NAME:** Ronald J. Grabe (Colonel, USAF)  
NASA Astronaut

**BIRTHPLACE AND DATE:** Born June 13, 1945, in New York, New York.  
His mother, Mrs. Martha Grabe, resides in Lakewood, New Jersey.

**PHYSICAL DESCRIPTION:** Brown hair; hazel eyes; height: 6 feet; weight: 185 pounds.

**EDUCATION:** Graduated from Stuyvesant High School, New York, New York, in 1962, received a bachelor of science degree in Engineering Science from the United States Air Force Academy in 1966; studied Aeronautics as a Fulbright Scholar at the Technische Hochschule, Darmstadt, West Germany, in 1967.

**MARITAL STATUS:** Married to the former Marijo A. Landon.  
Her parents, Mr. and Mrs. Jack N. Landon, reside in Clovis, New Mexico.

**CHILDREN:** Hilary, December 25, 1974; and Alison, March 9, 1979.

**RECREATIONAL INTERESTS:** He enjoys skiing, wind surfing, and racquet sports.

**SPECIAL HONORS:** The Air Force Distinguished Flying Cross, the Air Medal with 7 Oak Leaf Clusters, the Air Force Meritorious Service Medal, the Liethen-Tittle Award (for Outstanding Student at the USAF Test Pilot School), the Royal Air Force Cross, and the NASA Space Flight Medal.

**EXPERIENCE:** Upon graduating from the Air Force Academy in 1966, Grabe went to Darmstadt, West Germany, as a Fulbright Scholar. He returned the States in 1967 to complete pilot training at Randolph Air Force Base, Texas. He subsequently flew F-100 aircraft with the 27th Tactical Fighter Wing at Cannon Air Force Base, New Mexico, and in 1969 was assigned as an F-100 pilot with the 3d Tactical Fighter Wing at Bien Hoa Air Base in the Republic of Vietnam where he flew 200 combat missions. In 1970, he was reassigned to the 27th Tactical Fighter Wing at Cannon Air Force Base to fly F-100 and F-111 aircraft. He participated in the operational test and evaluation of the weapons system of the F-111D aircraft. Grabe attended the USAF Test Pilot School in 1974 and, upon graduating in 1975, was assigned to the Air Force Flight Test Center as a test pilot for the A-7 and F-111. He was the program manager and chief project pilot for the Air Force's digital flight control system for tactical fighters (DIGITAC) evaluation. He later served as an exchange test pilot with the Royal Air Force at Boscombe Down, United Kingdom, from 1976 to 1979. During this tour of duty, he served as the chief project pilot for the Royal Air Force Harrier and the Royal Navy Sea Harrier. He was an instructor at the USAF Test Pilot School at Edwards Air Force Base, California, when advised of his selection by NASA.

He has logged more than 4,000 hours flying time.

**NASA EXPERIENCE:** Grabe became a NASA Astronaut in August 1981. He served as a chief verification pilot for STS-3 and STS-4 entry guidance, navigation and control simulation testing, as the Deputy Manager for Operations Integration, Space Shuttle Program Office, and subsequently as the Chief of Training within the Astronaut Office.

Grabe was pilot for STS 51-J, the second Space Shuttle Department of Defense mission, which launched from Kennedy Space Center, Florida, on October 3, 1985. This was the maiden voyage of the Atlantis, the final Orbiter in the Shuttle fleet. After 98 hours of orbital operations, Atlantis landed on Edwards Air Force Base, California, on October 7, 1985.

**CURRENT ASSIGNMENT:** Colonel Grabe is assigned as the pilot on STS-30, scheduled for launch in April 1989. Mission objective will be the deployment of Magellan, a planetary probe, scheduled to arrive at Venus in mid-1990. Magellan will map the entire surface of Venus for the first time, using specialized radar instruments.

APRIL 1988

# Biographical Data

NASA

Lyndon B. Johnson Space Center  
Houston, Texas 77058

National Aeronautics and  
Space Administration

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**NAME:** Mary L. Cleave (Ph.D.)  
NASA Astronaut

**BIRTHPLACE AND DATE:** Born February 5, 1947, in Southampton, New York.  
Her parents, Dr. and Mrs. Howard E. Cleave, reside in Williamstown, Massachusetts.

**PHYSICAL DESCRIPTION:** Brown hair; green eyes; height: 5 feet 2 inches; weight: 103 pounds.

**EDUCATION:** Graduated from Great Neck North High School, Great Neck, New York, in 1965; received a bachelor of science degree in Biological Sciences from Colorado State University in 1969 and master of science in Microbial Ecology and a doctorate in Civil and Environmental Engineering from Utah State University in 1975 and 1979, respectively.

**MARITAL STATUS:** Unmarried.

**RECREATIONAL INTERESTS:** She enjoys cross-country and downhill skiing, sailing, hiking, and camping.

**ORGANIZATIONS:** Member of the Texas Society of Professional Engineers, the Water Pollution Control Federation, Tri-Beta, Sigma Xi, and Tau Beta Pi; associate member of the American Society of Civil Engineers.

**SPECIAL HONORS:** Recipient of NASA Space Flight Medal (1985), NASA Exceptional Service Medal (1988).

**EXPERIENCE:** Dr. Cleave held graduate research, research psychologist, and research engineer assignments in the Ecology Center and the Utah Water Research Laboratory at Utah State University from September 1971 to June 1980. Her work included research on the productivity of the algal component of cold desert soil crusts in the Great Basin Desert south of Snowville, Utah; algal removal with intermittent sand filtration and prediction of minimum river flow necessary to maintain certain game fish; the effects of increased salinity and oil shale leachates on freshwater phytoplankton productivity; development of the Surface Impoundment Assessment document and computer program (FORTRAN) for current and future processing of data from surface impoundments in Utah; and design and implementation of an algal bioassay center and a workshop for bioassay techniques for the Intermountain West. In conjunction with her research efforts, she has published numerous scientific papers.

**NASA EXPERIENCE:** Dr. Cleave was selected as an astronaut in May 1980. Her technical assignments have included flight software verification in the Shuttle Avionics Integration Laboratory (SAIL), CAPCOM on five Space Shuttle flights, Malfunctions Procedures Book, and Crew Equipment Design.

Dr. Cleave was a mission specialist on the crew of STS 61-B which launched at night from Kennedy Space Center, Florida, on November 26, 1985. During the mission, the crew deployed the MORELOS-B, AUSSAT II, and SATCOM K-2 communications satellites, conducted two 6-hour spacewalks to demonstrate Space Station construction techniques with the EASE/ACCESS experiments, operated the Continuous Flow Electrophoresis (CFES) experiment for McDonnell Douglas and a Getaway Special (GAS) container for Telesat, Canada, conducted several Mexican Payload Specialist Experiments for the Mexican Government, and tested the Orbiter Experiments Digital Autopilot (OEX DAP). This was the heaviest payload weight carried to orbit by the Space Shuttle to date. After completing 108 orbits of the Earth in 165 hours, STS 61-B Atlantis landed on Runway 22 at Edwards Air Force Base, California, on December 3, 1985.

With the completion of this flight Dr. Cleave has logged a total of 165 hours in space.

**CURRENT ASSIGNMENT:** Dr. Cleave is in flight training as a mission specialist on STS-30, scheduled for launch in April 1989. Mission objective will be the deployment of Magellan, a planetary probe, scheduled to arrive at Venus in August 1990. Magellan will map the surface of Venus, using high resolution radar instruments.

**FEBRUARY 1989**

# Biographical Data

**NASA**

**Lyndon B. Johnson Space Center**  
Houston, Texas 77058

*National Aeronautics and  
Space Administration*

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**NAME:** Mark C. Lee (Major, USAF)  
NASA Astronaut

**BIRTHPLACE AND DATE:** Born August 14, 1952, in Viroqua, Wisconsin.  
His parents, Mr. and Mrs. Charles M. Lee, reside in Viroqua, Wisconsin.

**PHYSICAL DESCRIPTION:** Blonde hair; blue eyes; height: 6 feet; weight: 200 pounds.

**EDUCATION:** Graduated from Viroqua High School, Viroqua, Wisconsin, in 1970; received a bachelor of science degree in Civil Engineering from the U.S. Air Force Academy in 1974, and a master of science degree in Mechanical Engineering from Massachusetts Institute of Technology in 1980.

**MARITAL STATUS:** Married to the former Deidre Ann O'Brien of Oklahoma City, Oklahoma.  
Her parents, Mr. and Mrs. Robert D. O'Brien, reside in Oklahoma City, Oklahoma.

**RECREATIONAL INTERESTS:** He enjoys jogging, swimming, carpentry, furniture refinishing, and farming.

**ORGANIZATIONS:** Registered professional engineer in the State of Colorado. Member of the American Angus Association.

**SPECIAL HONORS:** Awarded a Meritorious Service Medal, and 2 Air Force Commendation Medals.

**EXPERIENCE:** Following pilot training at Laughlin Air Force Base, Texas, and F-4 upgrade at Luke Air Force Base, Arizona, Lee spent 2-1/2 years at Okinawa Air Base, Japan, in the 25th Tactical Fighter Squadron flying F-4's. He began his studies at MIT in 1979 specializing in graphite/epoxy advanced composite materials. Following graduation in 1980, he was assigned to Hanscom Air Force Base, Massachusetts, in the Airborne Warning and Control System (AWACS) Program Office, as the Operational Support Manager and was responsible for resolving mechanical and material deficiencies which affected the mission readiness of the AWACS aircraft. In 1982 he returned to flying upgrading in the F-16 and serving as the 388TFW Deputy Commander for Operations, Executive Officer, and Flight Commander in the 4th Tactical Fighter Squadron at Hill Air Force Base, Utah, until his selection as an astronaut candidate.

He has logged 2,200 hours flying time, predominantly in the T-38, F-4 and F-16 aircraft.

**NASA EXPERIENCE:** Lee was selected as an astronaut candidate by NASA in May 1984. In June 1985 he completed a 1-year training and evaluation program, qualifying him for assignment as a mission specialist on future Space Shuttle flightcrews. His technical responsibilities within the Astronaut Office have included extravehicular activity (EVA), the inertial upper stage (IUS), and the Auxiliary Power Unit (APU). He has taken part in the planning and simulation for several EVA missions and served as the support crewmember for mission 51-I, Leasat retrieval and repair. He has served as a Capsule Communicator (CAPCOM) in the Mission Control Center, and also as Chief of Astronaut Appearances.

**CURRENT ASSIGNMENT:** Major Lee is in flight training as a mission specialist on STS-30, scheduled for launch in April 1989. Mission objective will be the deployment of Magellan, a planetary probe, scheduled to arrive at Venus in August 1990. Magellan will map the surface of Venus, using high resolution radar instruments.

FEBRUARY 1989

# Biographical Data

# NASA

Lyndon B. Johnson Space Center  
Houston, Texas 77058

National Aeronautics and  
Space Administration

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**NAME:** Norman E. Thagard (M.D.)  
NASA Astronaut

**BIRTHPLACE AND DATE:** Born July 3, 1943, in Marianna, Florida, but considers Jacksonville, Florida, to be his hometown. His father, Mr. James E. Thagard, is deceased; his mother, Mrs. Mary F. Nicholson, is a resident of St. Peterburg, Florida.

**PHYSICAL DESCRIPTION:** Brown hair blue eyes; height: 5 feet 9 inches; weight: 156 pounds.

**EDUCATION:** Graduated from Paxon Senior High School, Jacksonville, Florida, in 1961; attended Florida State University where he received bachelor and master of science degrees in Engineering Science in 1965 and 1966, respectively, and subsequently performed pre-med course work; received a doctor of medicine from the University of Texas Southwestern Medical School in 1977.

**MARITAL STATUS:** Married to the former Rex Kirby Johnson of Atlanta, Georgia.  
Her mother, Mrs. Rex Johnson, resides in Dallas, Texas.

**CHILDREN:** Norman Gordon, May 15, 1968; James Robert, November 29, 1970; Daniel Cary, November 22, 1979.

**RECREATIONAL INTERESTS:** During his free time, he enjoys classical music, and electronic design.

**ORGANIZATIONS:** Member of American Institute of Aeronautics and Astronautics, and Phi Kappa Phi.

**SPECIAL HONORS:** Awarded 11 Air Medals, the Navy Commendation Medal with Combat V, the Marine Corps "E" Award, the Vietnam, Service Medal, and the Vietnamese Cross of Gallantry with Palm.

**EXPERIENCE:** Dr. Thagard held a number of research and teaching posts while completing the academic requirements for various earned degrees.

In September 1966, he entered on active duty with the United States Marine Corps Reserve. He achieved the rank of Captain in 1967, was designated a naval aviator in 1968, and was subsequently assigned to duty flying F-4s with VMFA-333 at Marine Corps Air Station, Beaufort, South Carolina. He flew 163 combat missions in Vietnam while assigned to VMFA-115 from January 1969 to 1970. He returned to the United States and an assignment as aviation weapons division officer with VMFA-251 at the Marine Corps Air Station, Beaufort, South Carolina.

Thagard resumed his academic studies in 1971, pursuing additional studies in electrical engineering, and a degree in medicine; prior to coming to NASA, he was interning in the Department of Internal Medicine at the Medical University of South Carolina.

He is a pilot and has logged over 2,200 hours flying time--the majority in jet aircraft.

**NASA EXPERIENCE:** Dr. Thagard was selected as an astronaut candidate by NASA in January 1978. In August 1979, he completed 1-year training and evaluation period, making him eligible for assignment as a mission specialist on future Space Shuttle flight crews.

Dr. Thagard was a mission specialist on STS-7, which launched from Kennedy Space Center, Florida, on June 8, 1983. This was the second flight for the Orbiter Challenger and the first mission with a 5-person crew. During the mission, the STS-7 crew deployed satellites for Canada (ANIK C-2) and Indonesia

(PALAPA B-1); operated the Canadian-built Remote Manipulator System (RMS) to perform the first deployment and retrieval exercise with the Shuttle Pallet Satellite (SPAS-01); conducted the first formation flying of the orbiter with a free-flying satellite (SPAS-01); carried and operated the first U.S./German cooperative materials science payload (OSTA-2); and operated the Continuous Flow Electrophoresis System (CFES) and the Monodisperse Latex Reactor (MLR) experiments, in addition to activating seven Getaway Specials. During the flight Dr. Thagard conducted various medical tests and collected data on physiological changes associated with astronaut adaptation to space. Mission duration was 147 hours before landing at Edwards Air Force Base, California, on June 24, 1983.

Dr. Thagard served as a mission specialist on STS 51-B, the Spacelab-3 science mission, which launched from Kennedy Space Center, Florida, on April 29, 1985, aboard the Challenger. He assisted the commander and pilot on ascent and entry. Duties on orbit included satellite deployment operation with the NUSAT satellite as well as animal care for the 24 rats and two squirrel monkeys contained in the Research Animal Holding Facility 9RAHF). Other duties were operation of the Geophysical Fluid Flow Cell (GFFC), Urinary Monitoring System (UMS), and the Ionization States of Solar and Galactic Cosmic Ray Heavy Nuclei (IONS) experiment. After 110 orbits of the earth Challenger landed at Edwards Air Force Base, California, on May 6, 1985.

**CURRENT ASSIGNMENT:** Dr. Thagard is assigned as a mission specialist on STS-30, scheduled for launch in April 1989. Mission objective will be the deployment of Magellan, a planetary probe, scheduled to arrive at Venus in mid-1990. Magellan will map the entire surface of Venus for the first time, using specialized radar instruments.

**FEBRUARY 1989**

National Aeronautics and  
Space Administration

Washington, D.C.  
20546

Office of the Administrator

MAR 20 1989

Mr. Joseph Hagin  
Deputy Assistant to the President  
for Appointments and Scheduling  
The White House  
Washington, DC 20500

Dear Mr. Hagin:

NASA would like to offer the President the opportunity to be involved in the naming of the new Space Shuttle Orbiter, now called simply Orbiter Vehicle-105. This vehicle, currently under construction by the Rockwell International Corporation in Palmdale, California, is the replacement for the lost Challenger. Names have been proposed by American students through a national competition that will result in two national finalists (one for grades K-6 and one for grades 7-12) by May 1. In a ceremony either at the White House or at the Rockwell facility in California, ideally in early May, the President could present an award to both finalists and at the same time announce the name he had selected for this new Orbiter which will bring the Nation's space transportation system back up to full strength.

As background, the Orbiter-Naming Program is an educational outreach program designed to enhance students' interest in and enthusiasm for space exploration through educational projects related to space research, exploration, and discovery. Congressman Tom Lewis (R/FL) called for the replacement Orbiter to be named by students in House JR 559, March 10, 1986, and Congress authorized such a program in October 1987.

The Orbiter-Naming competition was open to all students in United States public and private schools in the 50 States, District of Columbia, five U.S. jurisdictions, Bureau of Indian Affairs, Department of Defense Dependent Schools, and Department of State Overseas Schools. Entries were divided into two divisions: Division 1, Kindergarten through 6th grade, and Division 2, 7th grade through 12th grade. Each entry had to be the product of a team effort by students with a member of the school faculty serving as Team Coordinator.

The Council of Chief State School Officers (CCSSO) is administering the program for NASA. Announcements of Opportunity were issued in March 1988, Program Entry Packets were distributed between June and September, and the competition took place during the fall semester. As of the December 31, 1988, deadline for entries to the CCSSO, over ~~12,000~~ 6,000 teams comprising over 70,000 students had responded.

There were two program components: the student participants selected a name and also prepared a classroom project related to the name. As with the other members of the Shuttle fleet, the name had to come from an actual sea vessel used in research and exploration. The project had to be a creative, innovative, interdisciplinary project supporting and justifying the name selected. Each entry included a list of the learning goals of the project, an explanation of how they fit into the curriculum objectives of the school system and their educational value for the students participating in the project, and a discussion of the project's potential as a model for future classroom and school activities.

On March 20, a joint NASA-CCSSO press release announced 112 state-level winners. During April, an in-house team of judges at NASA Headquarters will review and rate the state-level winning projects and select the national finalist from each division.

Participation in the selection of the winning name and in the announcement of that name would give the President the opportunity to tie together his interest in education and his strong support for the American space program. Since the beginning of this Nation's space program in 1958, space has served as a stimulus to American students by generating interest in the broad science, engineering, and mathematics disciplines.

If you need any further information about this subject, please do not hesitate to call me or Mr. Kenneth Pedersen, NASA's Associate Administrator for External Relations (453-8310).

Sincerely,

Original signed by  
James C. Fletcher

James C. Fletcher  
Administrator



National Aeronautics and  
Space Administration

Washington, D.C.  
20546

Office of the Administrator

MAY 2 1989

The President  
The White House  
Washington, DC 20500

Dear Mr. President:

I understand that you have indicated interest in selecting the name for the new Space Shuttle orbiter as the culmination of the nationwide Orbiter-Naming competition among American school children. The details of the contest were outlined in my letter to Joseph Hagin, Deputy Assistant to the President for Appointments and Scheduling, of March 20, 1989 (copy enclosed for background).

We are still working with members of your staff to develop the best scenario for you to announce your selection of the winner. However, since any such scenario would involve student representatives from the schools of the two national finalists (one from the elementary school division, the other from the secondary school division), it is important that the selection of the orbiter name be made in advance. This is necessary so that we can issue timely invitations to the winning students to come to Washington to participate in an event at the White House.

The name which I would like to recommend is Endeavour. In both divisions, the school with the highest scoring project proposed the name Endeavor. Your selection of this name would be consistent with the contestants' performance in the competition and would also obviate the need for you to select the national finalist in one division over the other--both finalists would be declared winners. It is also important to note that Endeavour was the most popular choice among all entrants at all grade levels (1000 of 6100 total entries and 32 of 111 state-level winners used the name Endeavour in their projects).

Endeavour was the first ship commanded by the 18th-Century explorer, James Cook. On his voyage to the South Pacific, 1768-71, he was sent to Tahiti to observe and

record the transit of the planet Venus in June 1769. After completing that phase of his mission, Endeavour circum-navigated the globe, exploring New Zealand, Australia and the Great Barrier Reef. Through three voyages, Cook did more to define the map of the world than any explorer before him. His voyages of exploration included several scientific studies--geography, hydrography, ethnography, zoology and botany--and his crews also included artists as well as scientists.

The contestants drew a strong parallel between the astronomy conducted on Cook's Endeavour and that which will surely be conducted on the Space Shuttle Endeavour. They also saw coincidences in the payloads of science, medicine and commerce on both vehicles. The fact that Cook's crews were comprised of numerous scientists also struck the students as an argument for naming the replacement orbiter after his ship Endeavour.

Student projects associated with two other names also scored highly in the Orbiter-Naming competition. These two names, presented for your consideration, are Horizon and North Star.


Horizon was a U.S. Navy seagoing tug that was purchased by the Scripps Institute of Oceanography in 1948 for its marine life research program. In service until 1968, Horizon made numerous discoveries that added to the world's knowledge of oceanography. It made 267 cruises, spent 4,207 days at sea, and logged 620,522 miles. A major part of its work was sounding fracture zones and trenches. It was the first ship to sound the depth of the Tonga Trench north of New Zealand and it discovered a pattern of great fractures in the Pacific. The work of the Horizon forms much of the basis for the theory of continental drift.

The North Star was a ship used by the English explorer John Davis in his search for a Northwest Passage through the Canadian Arctic to the Pacific Ocean. Davis first proposed his plan in 1583. From 1585-87, he made three voyages during which he rediscovered Greenland and its west coast. Imaginative in his dealings with the native Eskimos, he took musicians with him to help establish cordial relations. One of the finest early seamen and something of a scientist, Davis invented a quadrant used through the 18th Century.

As soon as you have made your selection and we settle on a scenario for your announcement, we will notify the two national finalists' schools so representatives can make arrangements to come to Washington to participate in the event. I think this represents an excellent opportunity for you to combine two of your key messages: first, the importance of space as an investment in this Nation's future and, second, the importance of quality education in preparing the next generation. We know that space excites students and stimulates their interest in studying science and mathematics. The shining faces of the winning students will project that message unambiguously.

With highest regards.

Respectfully,



Dale D. Myers  
Acting Administrator

Enclosure

cc:

Mr. R. Douglas Wead  
Special Assistant to the President  
for Public Liaison

Mr. Brad Mitchell  
Office of Policy Development

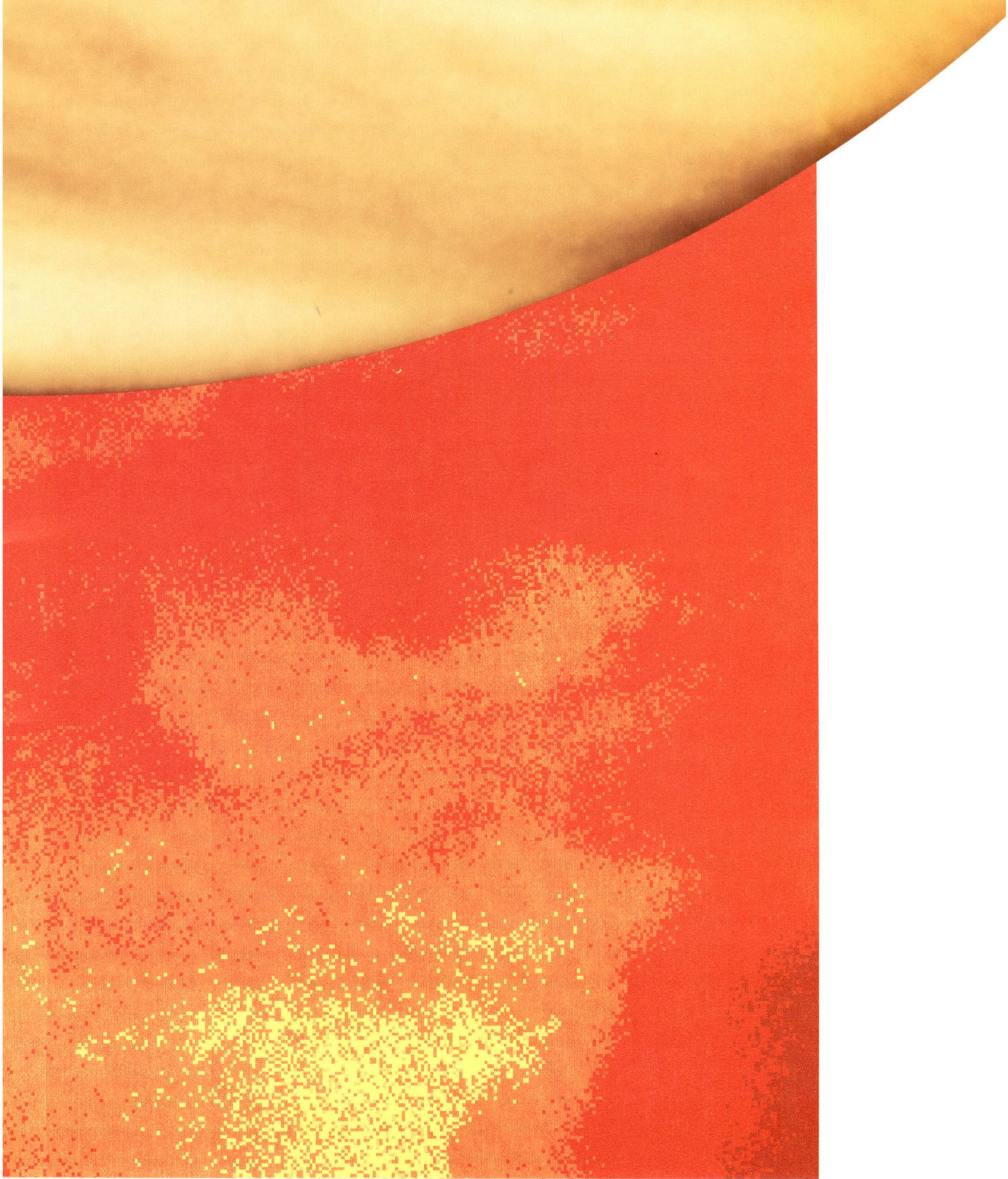
Ms. Justine D'Andrea  
Office of the Cabinet Secretary

Dr. Mark J. Albrecht  
Executive Secretary of the National Space Council

# Magellan

*The Unveiling of Venus*







*f all the planets in the solar system, Venus is the most like our own Earth in size, mass, and distance from the Sun. The motions of our planetary “twin” were known to the ancients, and its apparent changes in shape, similar to the phases of the Moon, were first studied by Galileo more than four centuries ago. In the modern era, Venus has been one of the most visited planets in the solar system—20 spacecraft from the Soviet Union and the United States have been sent there since the early 1960s. Venus’ sulfur-yellow clouds have been probed, its atmospheric structure and composition have been measured, and automatic landers have photographed portions of its landscape and chemically analyzed its rocks.*

*Yet, for all our fascination with Venus, we have only a sketchy, general knowledge of the planet’s surface. While the faces of the other “terrestrial” planets—Earth, Mars, and the lighted sides of Mercury and the Moon—have long since been mapped, details of Venus’ face are still largely unknown, due to the planet’s dense, constant cloud cover. The clouds prevent us from photographing the solid surface from space with conventional cameras.*

*Since the early 1960s, scientists have used radar to counter this problem. Unlike visible light, radar waves penetrate the Venusian clouds and reflect off the solid planet back to Earth. With the help of computer processing, these radar reflections can be turned into pictures of the Venusian surface. Earth-based radar imaging is thus extremely valuable,*

*but it also is limited—Venus always shows the same hemisphere to us when it is near enough in its orbit for high-resolution study, so only a fraction of the planet can be explored from Earth.*

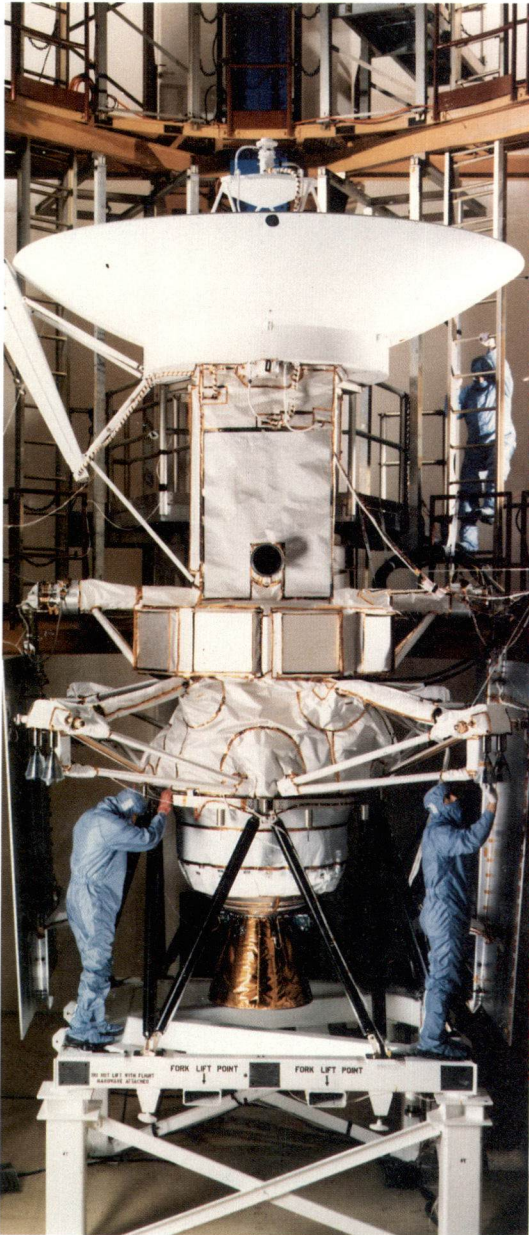
*Therefore, in the late 1970s and early 1980s, the United States and the Soviet Union sent the Pioneer Venus and Venera spacecraft, respectively, to study Venus more closely and to image its surface with radar. These missions have answered many of our questions about Venus’ atmosphere and large-scale surface features. However, many more questions remain unanswered about the extent to which Venus’ surface has been shaped by volcanoes, plate tectonics, impact craters, and water and wind erosion.*

*To help answer these remaining questions, NASA plans to launch a new radar imaging spacecraft, Magellan (named for the 16th century explorer Ferdinand Magellan), from the space shuttle Atlantis in April 1989. Arriving at Venus in August 1990, Magellan will spend eight months mapping most of the planet at a resolution (a measure of the smallest objects that can be seen in its map) nearly ten times better than that of any previous spacecraft views of the surface. More than any other single mission, Magellan is expected to unveil the secrets of the Venusian past, just as Mariner 9 revealed the unsuspected richness of Martian geology in 1972. In 1990, for the first time, we will really come to know the face of our planetary “twin.”*

In 1978, NASA launched the Pioneer Venus Probe and Orbiter mission to conduct the most comprehensive investigation of Venus undertaken to date. Most of the experiments concerned the planet's atmosphere, but the orbiting spacecraft also carried a radar system that mapped 92 percent of the surface with a resolution of about 50 to 140 kilometers (30 to 84 miles). For the first time, planetary scientists had a global map of Venus. This map showed the existence of continent-like highlands (Aphrodite and Ishtar), hilly plains, large volcano-like mountains, and flat lowlands. However, as important as this radar map is, it shows only large-scale features. The hills and valleys, craters and lava flows—the telling details of Venusian geology—are as yet uncharted. ■ Five years after the Pioneer mission, in 1983, the Soviet Union sent two Venera spacecraft to map Venus at a resolution of approximately 2 to 4 kilometers (1.2 to 2.4 miles). Because of the nature of their orbits around the planet, the spacecraft were able to map only about 25 percent of the surface, near the north pole. In comparison, Magellan will map 70 to 90 percent of the planet at a resolution varying from 250 to 750 meters (820 to 2,461 feet).

#### THE MAGELLAN SPACECRAFT

A key feature of the Magellan spacecraft is the economy and relative simplicity of its design. To save costs, spare hardware has been used from other planetary projects, notably Voyager and Galileo. The 3,449-kilogram (7,604-pound) spacecraft has only one science instrument: a radar sensor. This one instrument, however, will perform three important functions: collecting imaging data of the surface of Venus, acquiring altimetric data of the planet's topography, and measuring the natural thermal emissions from the Venusian surface. Magellan's only visible moving parts are a pair of 3.5 by 3.5 meter (11 by 11 foot) square panels that collect solar energy for charging the spacecraft's nickel-cadmium

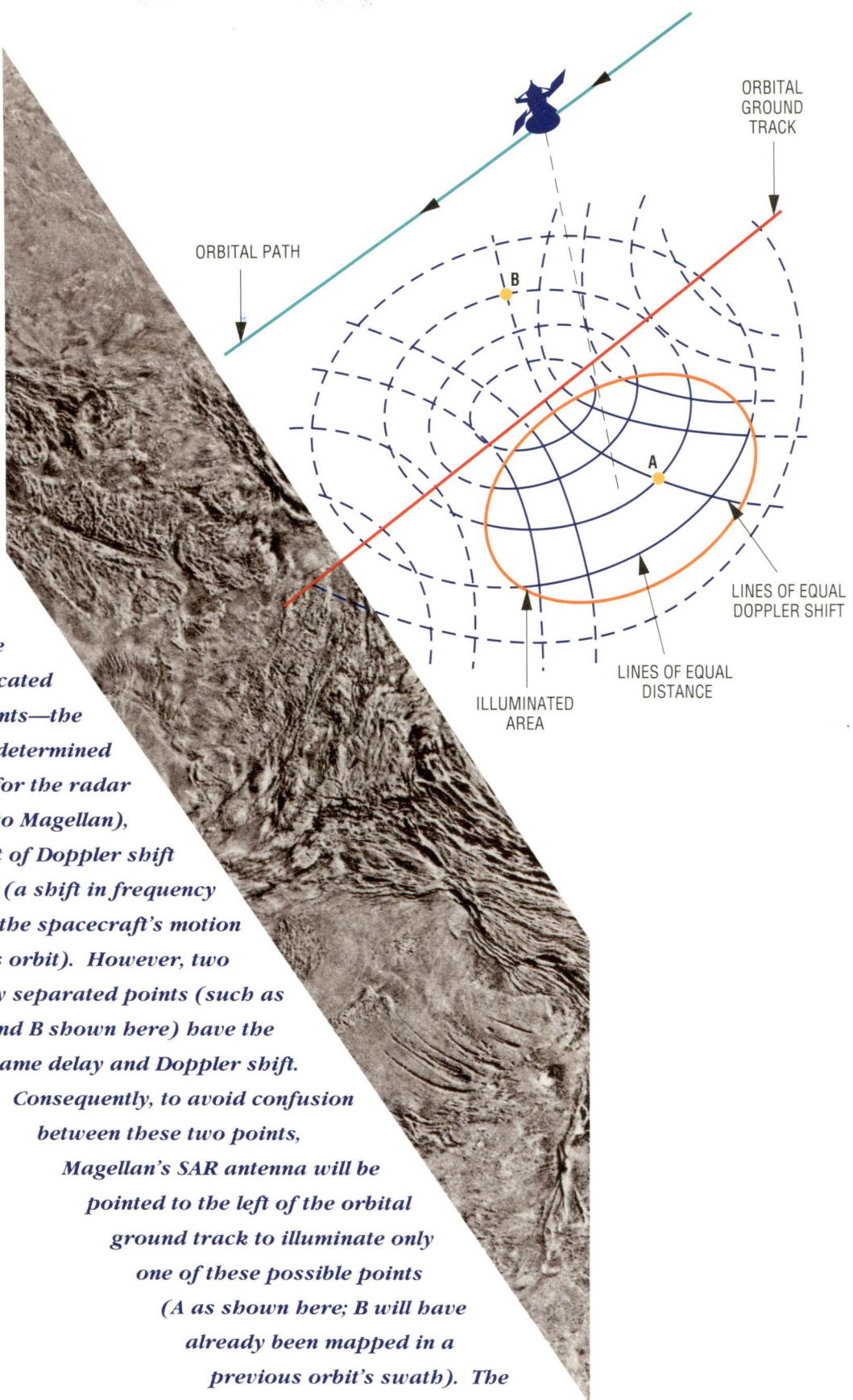


*The Magellan spacecraft is prepared for testing in Denver, Colorado, at the Martin Marietta Astronautics Group, prime contractor for the spacecraft. Most of Magellan's major parts are wrapped in reflective white thermal blankets to maintain temperature control. The spacecraft's radar sensor was built by the Hughes Aircraft Company of El Segundo, California.*

batteries. ■ Magellan's 3.7-meter-diameter (12-foot-diameter) high-gain antenna dish (used both for radar imaging and for communicating with Earth) and the ten-sided "bus," which contains some of the electronics subsystems, were both spares from the Voyager Project.

#### THE RADAR

With conventional radar, the resolution of an image depends on antenna size: the bigger the antenna, the better the resolution. A large antenna on a spacecraft, however, would be expensive and difficult to manipulate. To solve this problem, the signals from Magellan's synthetic aperture radar (SAR) will be computer-processed on Earth so that they will imitate, or synthesize, the behavior of a large antenna on the spacecraft. Through this synthesis, the onboard radar sensor will operate as if it has a huge antenna and will produce high-resolution images, even though the antenna is only 3.7 meters (12 feet) in diameter. This computerized process of "aperture synthesis" is what gives SAR its resolving power as well as its name. ■ As Magellan passes over the Venusian surface, its dish antenna will look downward and to the left side of the spacecraft's orbital path. For 37.2 minutes, the SAR antenna will emit several thousand radar pulses each second. Traveling at the speed of light, the pulses will strike and illuminate a 25-kilometer-wide (16-mile-wide) swath of the planet's surface, and then will immediately bounce back and be received at the instrument. ■ By recording the returned pulses, we can use two measurements on each pulse to locate each point on the planet's surface. The first measures the time it takes for the radar signal to return to Magellan; this will give the spacecraft's distance (or range) to that point. The second carefully measures the returned signals for their Doppler effect, a shift in frequency caused by the spacecraft's motion over the surface. This second measurement will give the location of the point with reference to the spacecraft's line of flight, since Magellan will be either approaching or receding from the point at any



*How synthetic aperture radar (SAR) works: Any point in the radar map image can be located by using two measurements—the distance to the point (determined by the time it takes for the radar signals to return to Magellan), and the amount of Doppler shift in the signal (a shift in frequency caused by the spacecraft's motion along its orbit). However, two widely separated points (such as A and B shown here) have the same delay and Doppler shift. Consequently, to avoid confusion between these two points, Magellan's SAR antenna will be pointed to the left of the orbital ground track to illuminate only one of these possible points (A as shown here; B will have already been mapped in a previous orbit's swath). The resulting radar map will therefore show only features to the left of the ground track. The portion of the Venusian surface shown here is a radar image from the Soviet Venera mission.*

given time. ■ Since each point in the radar image will have a unique range and Doppler shift, these two coordinates, together with knowledge of the angle of the antenna's line of sight with respect to the surface, are all that is needed to determine the location of any returned signal. The brightness of the image at that point then becomes an element of the map image. ■ Through this technique, data will be collected by the radar instrument and radioed back to Earth, where images of the Venusian surface will be constructed by computers at the Jet Propulsion Laboratory. In these images, it will be possible to distinguish features as small as 250 meters (820 feet) for the equatorial regions of the planet (where Magellan will pass closest to the surface) and about 750 meters (2,461 feet) near the poles. By comparison, the best existing ground-based and spacecraft maps of Venus show no features smaller than 2,000 meters (6,562 feet).

#### APRIL 1989 TO AUGUST 1990: FROM EARTH TO VENUS

In late April 1989, Magellan will be carried into low Earth orbit by the space shuttle Atlantis. After several revolutions around Earth, the spacecraft, with an Inertial Upper Stage (IUS) booster attached to its base, will be deployed from Atlantis' cargo bay into its own orbit. After two-thirds of another revolution around Earth, the IUS will fire and propel the Magellan spacecraft toward Venus. The IUS will then be jettisoned. ■ The launch period will begin on April 28 and will last for 30 days. During this launch period, Venus will be approximately 255 million kilometers (158 million miles) from Earth. After launch, it will take just under 15 months for Magellan to reach its destination. Three adjustment maneuvers along the way will keep the spacecraft on time and on target for its rendezvous with Venus. ■ When Magellan arrives at Venus in early August 1990, a solid rocket motor attached to the spacecraft will fire to place Magellan in orbit around the planet. After a few adjustment maneuvers, the spacecraft will be in an elliptical orbit, with its lowest point at an altitude of 250 kilometers (155 miles) above the planet's surface and its highest point at 8,029 kilometers (4,989 miles). The time



required for Magellan to make one complete orbit around Venus—the orbit period—will be three hours and nine minutes.

Since the orbit will be tilted four degrees to the axis of Venus, the spacecraft will pass nearly, but not quite, over both the north and south poles.

#### AUGUST 1990 TO APRIL 1991: MAPPING THE VEILED PLANET

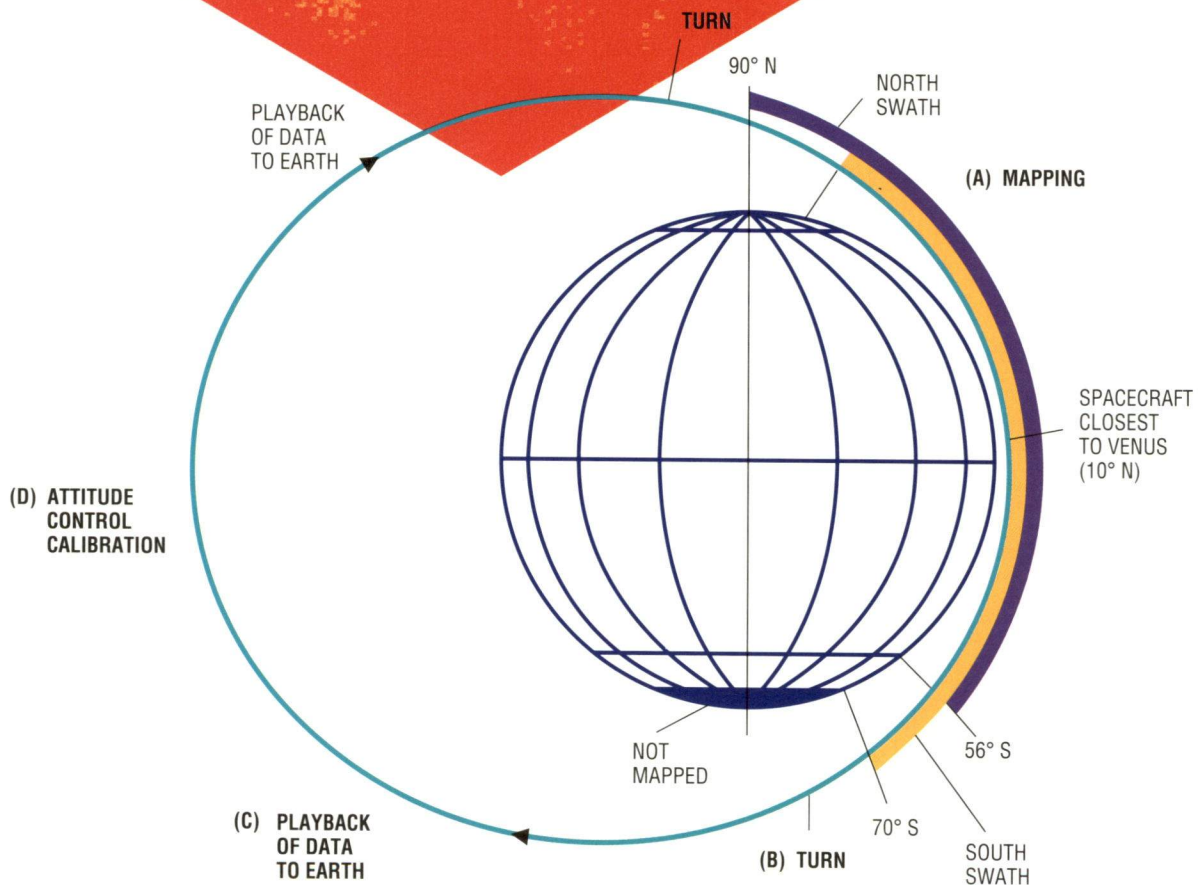
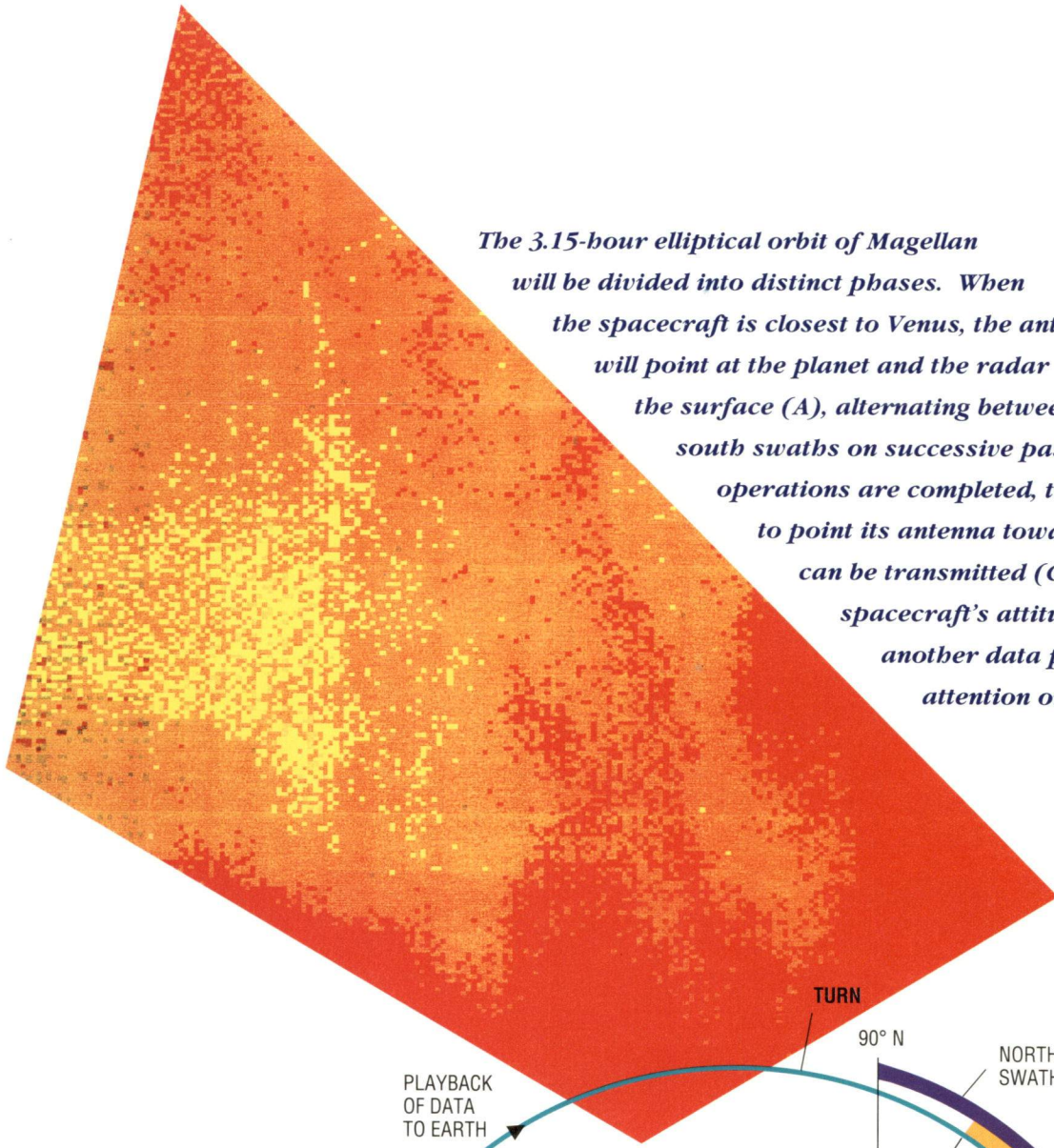
Although Venus is very much like Earth in size and mass, the veiled planet's rotation on its axis has several peculiar and unexplained differences. One is that Venus turns in the opposite direction from the way Earth does, spinning on its axis from east to west, so that the Sun rises in the west and sets in the east. Another is that the Venusian "day" is very long—it takes 243 of our Earth days for the planet to turn once on its axis. Since Magellan will be in a fixed, nearly polar orbit around a very slowly turning planet, it will take 243 days for most of the surface to pass under the spacecraft's gaze once.

Thus the mapping will take 243 days. ■ The arrival date at Venus, August 10, 1990, will place Magellan in Venus orbit approximately three months before superior conjunction (the passage of the planet behind the Sun as seen from Earth). During superior conjunction, radio interference from the Sun's atmosphere will make it impossible to communicate with the spacecraft and to conduct the radar mapping. The resultant gap in mapping coverage can be filled in during

subsequent 243-day mapping cycles. ■ Circling the planet every three hours and nine minutes, Magellan will pass closest to the surface just north of the equator, at 10 degrees Venus latitude, and will then move down around the south pole and around the planet in a wide loop. Because of this elliptical orbit, Magellan will be close enough to the surface to conduct mapping operations for only about 37 minutes out of each three-hour orbital period. The rest of the time will be spent transmitting the recorded raw data from the just-completed mapping pass, receiving telemetry instructions from

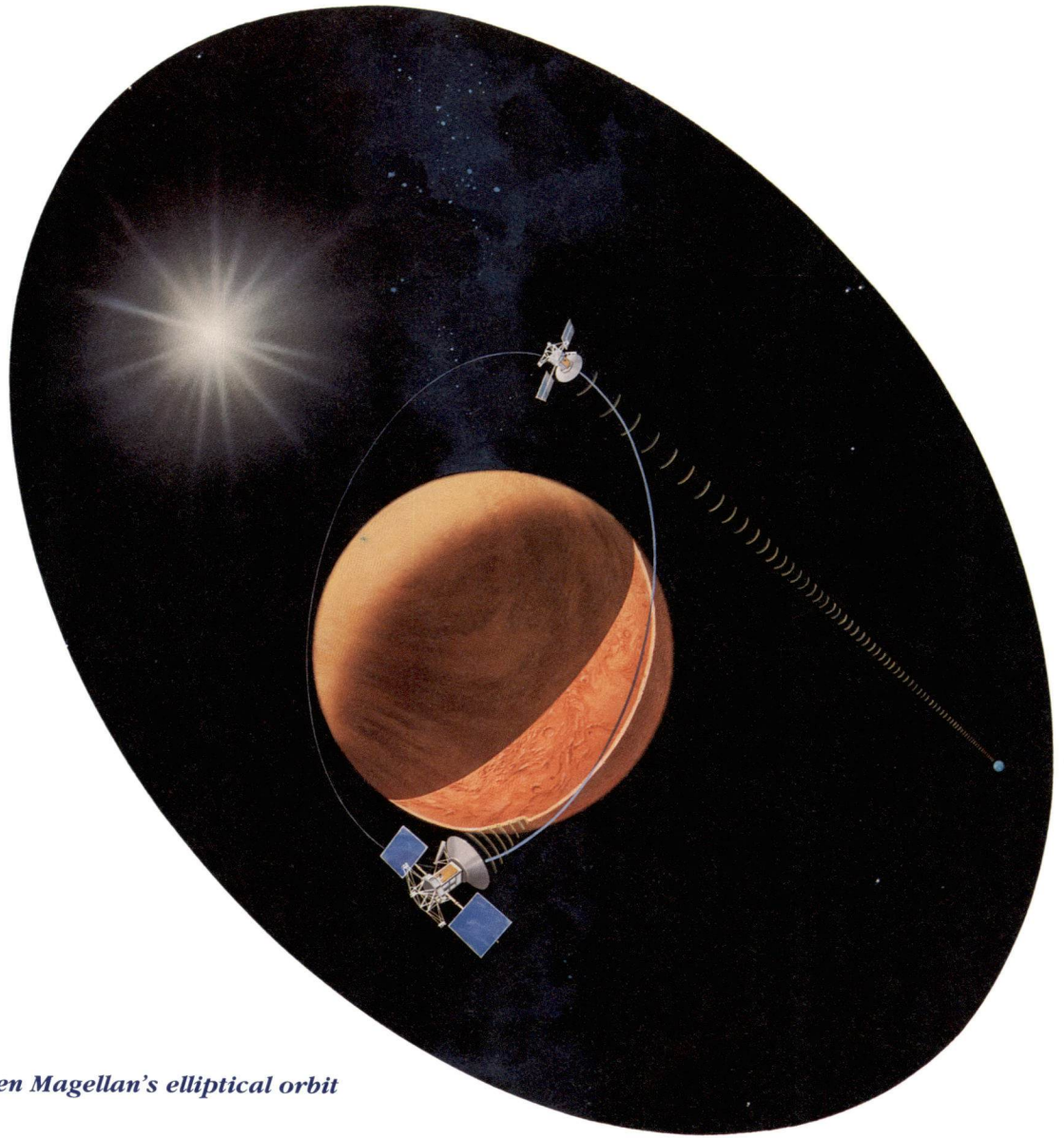
Earth, and calibrating the spacecraft's attitude control system with reference stars. ■ During mapping operations,

*The 3.15-hour elliptical orbit of Magellan will be divided into distinct phases. When the spacecraft is closest to Venus, the antenna will point at the planet and the radar will map the surface (A), alternating between north and south swaths on successive passes. After radar operations are completed, the spacecraft will turn to point its antenna toward Earth (B) so that data can be transmitted (C). After calibration of the spacecraft's attitude control subsystem (D) and another data playback, Magellan will turn its attention once again to the surface.*



the high-gain antenna dish will point toward the surface of Venus. In addition to acquiring radar imaging data, the radar sensor will use a separate fan-beam horn antenna aimed at the surface directly beneath the spacecraft to conduct Magellan's altimetry experiment. Radar pulses from this antenna will bounce off the surface and return to the radar receiver. By measuring the time it takes for the signal to return, the altimeter will determine the distance to the point directly below the spacecraft, and so will construct a topographic profile of the planet in much the same way that sonar is used on board ships to profile the ocean floor. By mission's end, the Magellan altimeter experiment will have produced a topographic map showing height variations as small as 30 meters (98 feet) for the entire mapped part of the planet.

■ Several additional types of information will be collected by Magellan. When the dish antenna is pointing down at Venus, it will also be used to measure the amount of natural thermal emissions, from which temperature variations on the planet's surface can be determined. Analysis of the way in which the radar signals are reflected will yield data on the electrical conductivity and roughness of the Venusian surface. ■ After each mapping pass, the spacecraft will recede from Venus and the tape recorders will be rewound in preparation for data transmission. Because the same antenna used for mapping will also be used for radio communications, the spacecraft must reorient itself to point the antenna toward Earth. The transmissions will be received by the large antennas of NASA's Deep Space Network located at various sites around the world, then relayed to the Jet Propulsion Laboratory in Pasadena, California. While Magellan is in radio communication with Earth, precise measurements can be made of the slight changes in the spacecraft's orbital motions. These tiny motions, which are produced by variations in Venus' gravitational field, will provide important clues about the nature of the planet's interior. After its "call home" is completed, the spacecraft will maneuver into position to begin another mapping pass and will again point down toward the surface. ■ Since Venus will be rotating slowly



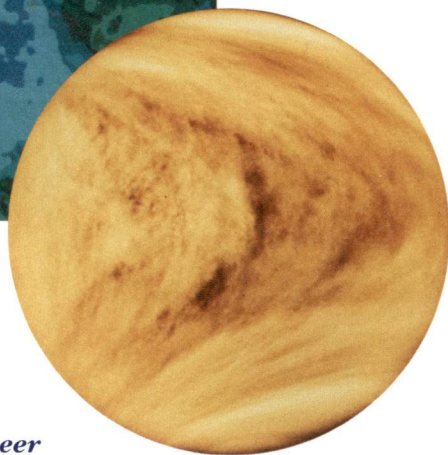
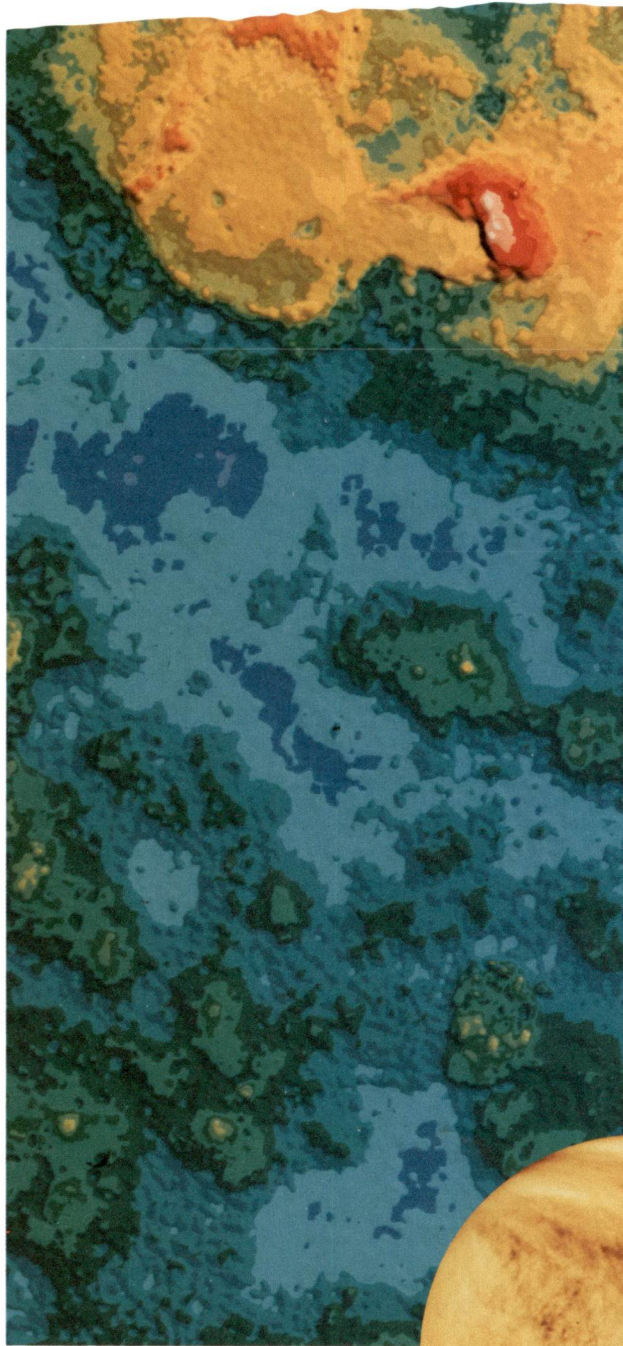
*When Magellan's elliptical orbit  
brings the spacecraft close to  
the Venusian surface, the radar  
instrument will look through the  
clouds to map the solid planet.*

*Magellan will spend most of the rest of  
its orbit transmitting data back to Earth.*

beneath Magellan's orbit, the surface will be mapped in successive, slightly overlapping strips. Each strip, or swath, as it is called, will be about 25 kilometers (16 miles) wide and about 16,000 kilometers (9,942 miles) long. Close to the north pole, successive swaths will naturally converge, causing considerable overlapping. Since complete coverage of the north pole can be obtained by using every other swath, an alternating pattern of northern and southern mapping passes will be used. Thus, on one orbit, mapping will be performed from the north pole to a southern latitude for exactly 37.2 minutes. On the next orbit, mapping will start 4.7 minutes later than on the previous orbit and will stop 4.7 minutes farther south. ■ Magellan's inclined orbit and its limited time for transmitting data to Earth make it impossible to obtain full coverage of both poles during the course of one 243-day mapping cycle. Scientists and mission designers therefore faced a difficult choice: whether to fully map the northern or the southern hemisphere. Because the large "continent" of Ishtar, which extends into high northern latitudes, seems to have a number of significant geologic provinces, it was decided to provide full coverage of the northern hemisphere. Mapping of the low southern hemisphere, which does not have as high a scientific priority, will extend to about 70 degrees south latitude. ■ Thus, eight times each day, for 243 days, Magellan will take radar images of the Venusian surface. At the end of the primary mission, almost 90 percent of the planet will have been mapped. The image strips will be combined by computers on Earth into photomosaic images covering large regions of the Venusian surface.

#### THE PLANET VENUS

Earth and Venus have many similar characteristics, such as size, density, and the presence of atmospheres. However, they also show important differences. Although both planets are most likely made of the same type of silicate rock and probably have similar interiors, Venus does not appear to have a magnetic field as Earth does. Venus is closer to the



*Sweltering under a perpetual cloud cover, Venus reveals no surface details even in ultraviolet light, but a radar instrument on the Pioneer Venus Orbiter revealed the large-scale geography of the planet for the first time. Blue areas represent the Venusian lowlands, while highlands are shown in green, yellow, and red.*

Sun than Earth and receives almost twice as much solar radiation. Although both planets have atmospheres, the Venusian atmosphere is much denser than our own and is composed almost entirely of carbon dioxide, with a high-altitude covering of clouds laced with sulfuric acid droplets. This thick atmospheric blanket of carbon dioxide traps outgoing thermal radiation between the solid surface and the atmosphere. Far from being Earth's "twin" at the surface, Venus is a perpetual furnace, where surface temperatures reach 480 degrees Celsius (900 degrees Fahrenheit) and the atmospheric pressure is 90 times that of Earth. Any liquid water that might have once existed has long since disappeared: Venus today is bone-dry. ■ We know some things about Venusian geology from past space probes and from Earth-based radar studies.

Soviet lander photos and chemical analysis experiments have shown that the rocks of the highland areas at the lander sites are basaltic, like the rocks on Earth's ocean floor or the rocks that are formed from oozing volcanic lava flows.

■ Venus' large-scale geography has been disclosed by radar studies from Earth, by the Pioneer Venus Orbiter in 1978, and by the Soviet Venera 15 and 16 missions in 1983. Most of the planet consists of either rolling upland plains (apparently composed of older crustal rock) or smooth lowland areas. There are two major "continents," or elevated plateaus—Aphrodite, named for the Greek equivalent of the goddess Venus, and Ishtar, named for the Babylonian equivalent—that appear to be younger geologically. Ishtar is about the size of Australia; Aphrodite is about twice as large, or approximately the same size as South America. Jutting up from the Ishtar highlands is one of the highest mountains in the solar system, 10,800-meter-high (35,400-foot-high) Mount Maxwell. Two other highland areas of possible volcanic and tectonic origin, Alpha Regio and Beta Regio, also stand out conspicuously.

*A portion of the elevated “continent” of Ishtar Terra (about the size of Australia) is shown in this computer-processed Pioneer Venus image. At the center is Mount Maxwell (also called Maxwell Montes), which is 10,800 meters (35,400 feet) high, more than a mile taller than Mount Everest. There is some evidence that this huge mountain is an active volcano. The Lakshmi plateau, rising 4 to 5 kilometers (2.5 to 3.1 miles) above the mean level of Venus, is bordered by mountain ranges to the north and northwest. This plateau is thought to consist of thin lavas overlying an uplifted section of older crust. Soviet Venera radar data suggest that the depression called Colette is a collapsed volcanic crater. On Ishtar’s southern flank are the Ut and Vesta Rupes (cliffs), which descend to vast lowlands.*

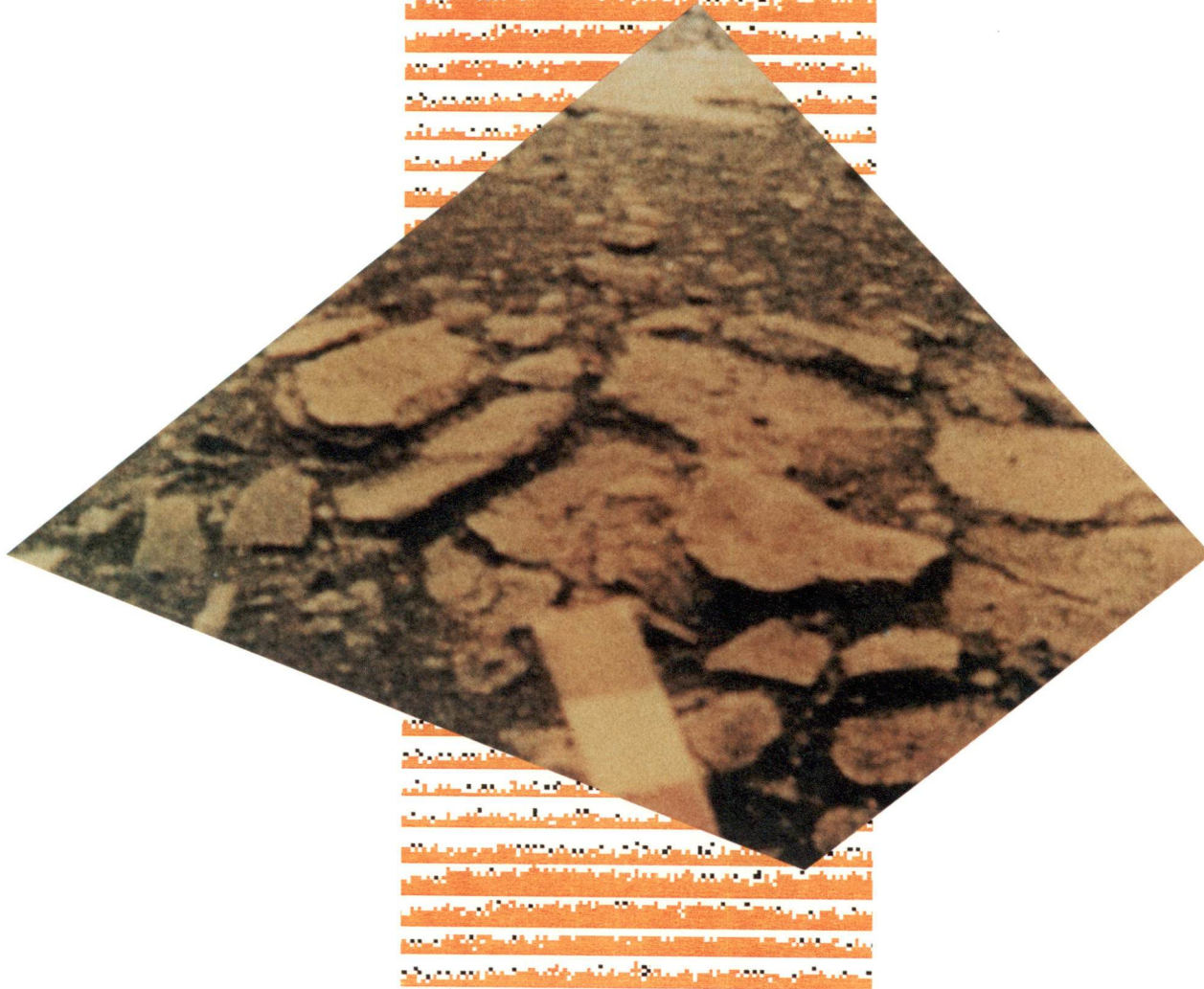
#### ISHTAR TERRA



#### APHRODITE TERRA

*Aphrodite Terra, Venus’ largest elevated landmass (about the size of South America), has two major mountain regions on opposite sides of the “continent.” Aphrodite also has the lowest elevations on Venus—in the trenches of the Diana Chasma, which may be a rift valley caused by the movement of two blocks of crust away from each other.*

Some 4.6 billion years ago, the planets of the solar system condensed as large, individual bodies in a whirlpool of solid material and gas revolving around the Sun. Heavier elements like iron and silicon remained in the inner solar system to form the rocky planets, Mercury, Venus, Earth, and Mars. The lighter gases—hydrogen and helium—went to form the giant planets beyond the asteroid belt. The largest rocky planet, Earth, was extremely hot in those millennia after it condensed into a solid sphere, and in its early history the planet released this heat through violent eruptions from great volcanoes that covered its surface. Earth still sheds its heat today, but now as a low simmer, with only isolated chains of volcanoes spewing hot material from its interior. ■ Earth's upper crust is divided into irregular, flat pieces—tectonic plates—that move around the planet's surface, driven by convection cells in the hot, fluid rock underneath the solid crust. Virtually all of Earth's large-scale geological features, including mountain chains and ocean basins, result from the movement of these plates. When continental plates collide, mountains such as the Himalayas and the Alps are thrust upward. Where the plates pull apart, rift valleys and ocean basins form. Earthquakes and volcanoes, the major geologic upheavals on our planet, occur primarily at plate boundaries where pieces of the crust are stretching apart or crunching together. One of the most important questions for the study of Venus is whether similar tectonic plate movements have shaped the surface of our planetary "twin." ■ Although we might reasonably expect Earth's "twin" to have similar processes shaping its surface, the limited data about Venus do not provide evidence of planetwide plate tectonics. On Earth, where plates are pushing away from each other in the middle of the Atlantic Ocean, there is a volcanic ridge thousands of miles in length where a great deal of the planet's internal heat is vented. No such conspicuous plate boundaries appear in the Pioneer Venus Orbiter map, suggesting that if a system of plate tectonics does exist on



*This glimpse of the Venusian surface was taken by one of the Soviet Venera landers. The reddish appearance of the rocks is due to the reddish color of the thick atmosphere. The slabby rocks, which are probably volcanic in origin, would appear neutral gray in natural sunlight. The rectangular color bar at the bottom of the photo is a part of the lander.*

Venus, it must be of a different kind than Earth's. (However, evidence of plate tectonics, even on Earth, would only be marginally visible at the image resolution of the Pioneer Venus Orbiter. Also, the Venera 15 and 16 coverage [25 percent of the planet] may not be extensive enough to reveal a systematic, global pattern of plate tectonics.)

## QUESTIONS FOR MAGELLAN'S EXPLORATION OF VENUS

### Volcanoes

One of the most important tasks for Magellan during its mapping mission will be to take an inventory of volcanic craters and other volcanic features on Venus so that scientists can reconstruct the planet's geologic history. Ground-based and Venera radar images have shown the existence of volcanic craters on the Ishtar plateau. Variations in the concentration of sulfur dioxide in the atmosphere, detected by Pioneer Venus, suggest that Venus may be volcanically active. By counting how many volcanoes are on Venus' surface and identifying where and what kind they are, Magellan will provide data on the planet's internal processes. ■ The high-resolution radar images will allow us to discriminate between individual overlapping lava flows so as to determine the sequence of volcanic events that have helped shape the surface. By examining the slopes and shapes of these volcanic flows, scientists can make judgments about the composition of the lava and thus obtain further clues about the nature of the planet's interior and the thickness of the crust. ■ Earlier spacecraft data have shown that the gravitational field of Venus is stronger over the planet's elevated plateaus—evidence that these topographic features are related to the interior structure. Magellan's high-resolution gravity survey, constructed by precise measurements of the spacecraft's orbital motions, will provide details about this important correlation between gravity and topography.

*The improvement in resolution*

*expected from the Magellan data*

*is illustrated in these images of*

*the Mount Saint Helens region of*

*Washington, which are simulations*

*derived from the radar imaging data*

*acquired by the Seasat oceanographic*

*satellite. The still-active volcano does*

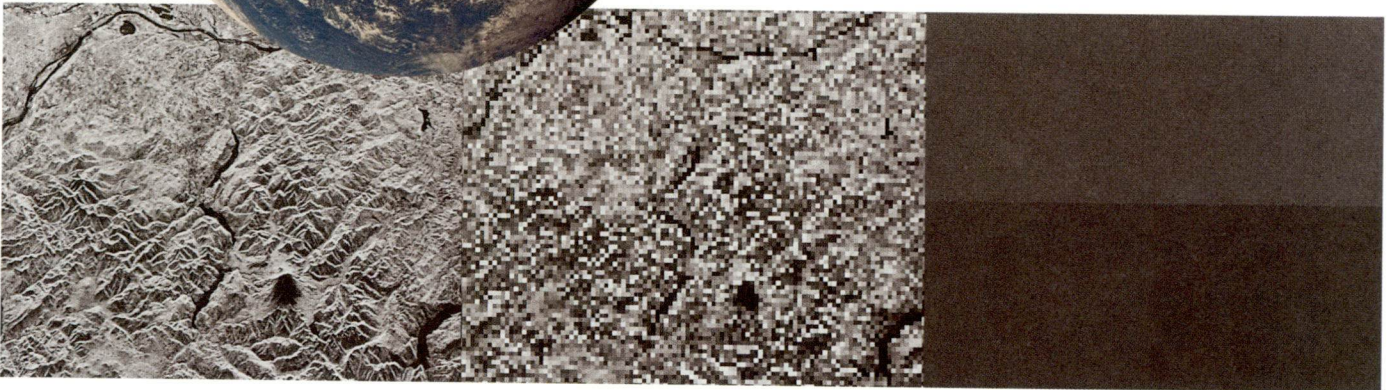
*not show at the Pioneer Venus resolution.*

*Although the feature is visible at the*

*Venera resolution, it is not possible to tell*

*whether it is a volcano or a meteorite*

*impact crater.*



MAGELLAN

VENERA

PIONEER

Meteorite impact craters also appear in abundance in radar images of Venus. Such craters are more plentiful than on Earth, but much less so than on Mercury, the Moon, and Mars. Another major task for Magellan will be to distinguish these impact scars from volcanic craters, to count how many are still preserved on the surface, and to note where they exist. It is important to establish Venus' impact cratering record, since the more cratered a surface is, the older it must be. Earth's surface is relatively young-looking and uncratered. Although meteorites have struck our planet in the past, most impact craters have been erased by wind and water erosion and by the constant motion of tectonic plates through time. The surface of Earth is a slate that has been drawn on, wiped clean, redrawn, and rewiped over millions of centuries. Venus, on the other hand, appears to retain evidence of a comparatively distant past. Magellan's global inventory of impact craters will have much to tell scientists about the history of the planet and the ages of different geologic provinces. The rate of surface cratering may also provide information on how dense the planet's atmosphere has been through time. ■ At the best resolutions obtained to date, it is unclear whether many of the circular features seen on Venus are the scars of old impacts, collapsed remnants of volcanic craters, or domes of rock somehow warped upward by tectonic forces. Magellan's high-resolution radar images will clear up the mystery. If these images show large stretches of old, cratered terrain, it would argue against tectonic motion in those regions, because crustal movements would destroy old craters. It would also indicate that the processes of erosion proceed much more slowly on Venus than on Earth.



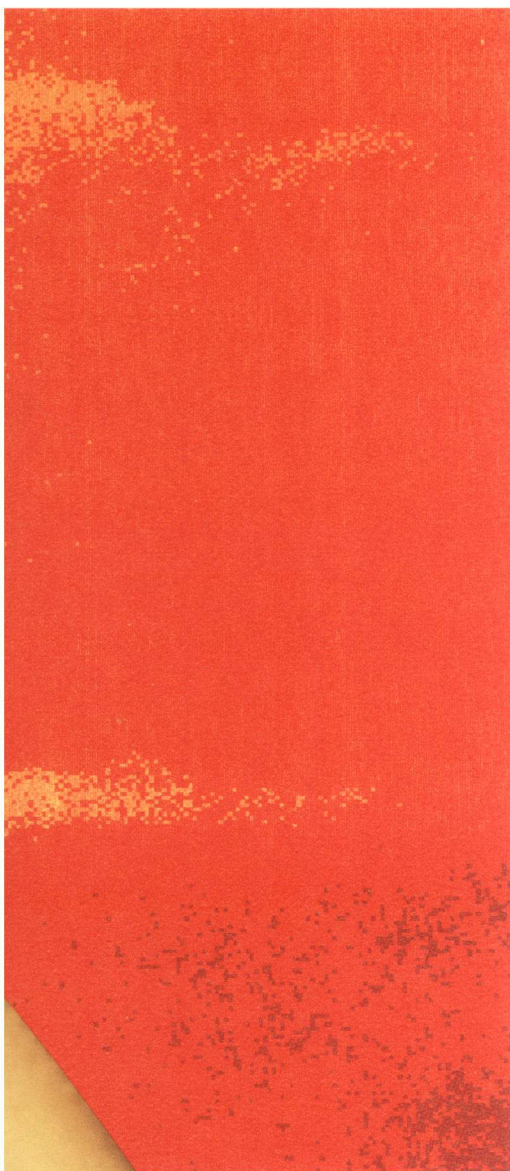
*This computer-generated photo shows that only very general conclusions about the geology of a planet—Venus or Earth—can be drawn from radar images with the resolution obtained by Pioneer Venus. The images from the higher-resolution Magellan radar will give scientists a better understanding of processes that have shaped the Venusian surface and interior.*





NASA HQ S84-1663D (3)  
7-20-84

**T**he Soviet Venera 15 and 16 spacecraft mapped less than one-third of the Venusian surface at high resolution. Over the course of one Venusian day (243 Earth days), the Magellan spacecraft will map most of the surface with detail that exceeds that of these best previous radar images. The resultant maps will reveal the traces (if they exist) of many fundamental planetary forces: volcanism, wind, water, and meteorite impacts—in short, all the processes that determine a planet's history and shape its face. By giving us this new information, the Magellan mission will help to tell us why Venus, our planetary "twin," is at the same time so much a stranger.



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May 10, 1989  
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RELEASE: 89-70

#### **PRESIDENT BUSH NAMES REPLACEMENT ORBITER "ENDEAVOUR"**

President Bush today chose the name "Endeavour" for the new Space Shuttle orbiter, currently under construction.

The name Endeavour resulted from a nationwide orbiter-naming competition supported by educational projects created by student teams in elementary and secondary schools.

In the nationwide competition, involving over 71,000 students, the national winner in Division I (kindergarten through grade 6) is the fifth graders from Senatobia Middle School, Senatobia, Miss. The team created a space camp simulation, where they taught lower elementary students facts about space through hands-on activities. The nine activities ranged from packaging payload experiments, wireless communication, working a manipulator arm to trying on a team-made spacesuit.

In the Division II category (grades 7 through 12), the winning team is from the Tallulah Falls School, Inc., Tallulah Falls, Ga. The nine-member team was composed of math students in grades 8-12. The team project was two-fold. They developed a math magazine, "Math Exploration with James Cook," written on 3 education levels, and they created a play, "Where On Earth?...", comparing Cook's 18th-century sea exploration to the Space Shuttle "Endeavour's" 20th-century space exploration.

These two national winning teams were selected from over 6,100 entries. The judging criteria was: 80 percent for the quality and creativity of the educational project to support and justify the name; 20 percent for the name's pronounceability for transmission and the ability to capture the spirit of the American pioneer spirit. The name had to be that of a seafaring vessel used in research or exploration. Both winning teams proposed the name "Endeavour."

- 2 -

Endeavour was the first ship commanded by James Cook, a British explorer, navigator and astronomer. In August 1768, on Endeavour's maiden voyage, Cook observed and recorded the transit of the planet Venus. In the view of the students, Cook's navigations, explorations and discoveries eventually led man to the possibilities of space exploration.

"In selecting the name Endeavour, the students and the President have identified a name that symbolizes perfectly NASA's goals of space exploration and discovery," said Dale D. Myers, NASA's Acting Administrator. "The nation can rest assured that we will use this ship with the same commitment that Captain Cook used his in the pursuit of new knowledge to benefit all mankind."

The two winning teams will be recognized in a Rose Garden ceremony at the White House on May 16 together with the STS-30 crew of Space Shuttle Atlantis.

The Council of Chief State School Officers administered the year-long program for NASA.

House Joint Resolution 559, introduced March 10, 1986, by Congressman Tom Lewis (R-Florida), called for the name of the replacement orbiter to be selected from suggestions submitted by students.

The new orbiter, previously designated OV-105, is being built by Rockwell International, Downey, Calif., to replace the Space Shuttle orbiter lost in the Challenger accident. Endeavour is scheduled to be completed in 1991 with her maiden voyage scheduled for March 1992.

- end -

NOTE TO EDITORS: Fact Sheets about the two winning teams, the competition, the history of "Endeavour" and OV-105 are available from the NASA Headquarters Newsroom, Room 6043, 400 Maryland Ave., S.W., Washington, D.C., 202/453-8400.

# NASA Facts



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## ORBITER VEHICLE (OV) 105

### Background Information

In April 1983, under contract to NASA, Rockwell International's Space Transportation Systems Division, Downey, Calif., began the construction of structural spares for completion in 1988. The \$400 million structural spares program consisted of an aft fuselage, crew compartment, forward reaction control system, lower and upper forward fuselage, wings (elevons), payload bay doors, vertical stabilizer (rudder/speed brake), body flap and one set of orbital maneuvering system/reaction control system pods.

At its plant in Downey, Rockwell constructed the upper and lower forward fuselage, pressurized crew compartment, nose landing gear doors, forward reaction control system, airlock and aft fuselage (including thrust structure). The payload bay doors were built by Rockwell in Tulsa, Okla., and the body flap was constructed by its division in Columbus, Ohio.

General Dynamics' Convair Aerospace Division, San Diego, Calif., built the mid fuselage. Grumman Corp., Bethpage, N.Y., constructed the wings, elevons and main landing gear doors. Fairchild Republic, Farmingdale, Long Island, N.Y., provided the vertical stabilizer and rudder/speed brake. The orbital maneuvering system reaction control system pods were built by McDonnell Douglas Astronautics Co., St. Louis, Mo.

On Aug. 1, 1987, NASA awarded Rockwell a \$1.3 billion contract to build a replacement orbiter using the structural spares. The replacement orbiter, designated OV-105, is currently being fabricated at Rockwell's Downey facility and assembled at their facility in Palmdale, Calif. It is scheduled for delivery to the Kennedy Space Center, Fla. in May 1991. The parts of the orbiter which have now been mated together are the lower forward fuselage, the mid fuselage and the wings.

### The Orbiter

OV-105 will be essentially identical to its sister ships, Discovery and Atlantis, capable of flying 100 missions. Like the other orbiters, the new orbiter will incorporate the latest modifications, upgrades and technologies that have evolved during the Space Shuttle return-to-flight activities.

- 2 -

The spaceplane will weigh approximately 150,000 pounds (without the main engines) and measure 122 feet in length with a wingspan of about 78 feet. The payload bay is 60 feet long and 15 feet in diameter.

### **Orbiter Naming Program**

House Joint Resolution 559, introduced March 10, 1986, by Congressman Tom Lewis (R-Florida), called for the name of the replacement orbiter to be selected from suggestions submitted by students. In October 1987 Congress authorized a program for a name to be selected "from among suggestions submitted by students in elementary and secondary schools."

In March 1988 NASA, in cooperation with the Council of Chief State School Officers (CCSSO), issued an announcement inviting America's students to participate in a national competition to name OV-105.

In March 1989, NASA and the CCSSO announced the state-level winners of the competition. More than 71,650 U.S. students (grades kindergarten through 12) had formed some 6,100 teams and submitted orbiter naming projects in their quest for the honor of naming the replacement orbiter.

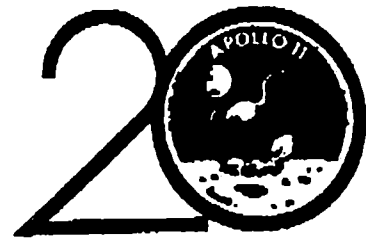
### **Current Payload Assignment**

The primary payloads currently scheduled for OV-105's maiden voyage in March 1992 are the European Retrievable Carrier (EURECA-1R), a platform to be placed in orbit for 6 months offering conventional services to experimenters, and the GEOSTAR-01, an interactive radiodetermination satellite.

NASA's Johnson Space Center, Houston, Texas, has management responsibility for the Shuttle orbiter program.

- end -

# NASA Facts



National Aeronautics and  
Space Administration

Washington, D.C. 20546  
AC 202-453-8400

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Terri Sindelar  
Headquarters, Washington, D.C.  
(Phone: 202/453-8400)

## "ENDEAVOUR"

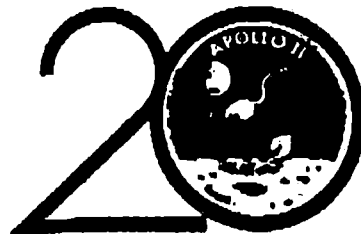
Endeavour was the first ship commanded by James Cook, the 18th century British explorer, navigator and astronomer. In August 1768, on Endeavour's maiden voyage, Cook sailed to the South Pacific, around Tahiti, on a mission to observe and record the important and seldom occurring event when the planet Venus passes between Earth and the sun. Determining the transit of Venus allowed early astronomers to determine the distance of the sun from Earth. This distance then could be used as a unit of measurement essential in calculating the parameters of the universe. On June 3, 1769, Cook completed this mission and continued his voyage to explore the southern hemisphere. He discovered and charted New Zealand and surveyed the eastern coast of Australia and navigated the Great Barrier Reef.

In addition, Cook's voyage on the Endeavour set a precedent of establishing the usefulness of sending scientists on voyages of exploration. Joseph Banks and Carl Solander, who sailed with Cook, became the first naturalists to examine plants and animals in an organized manner. The wealth of scientifically collected material was unique. They collected specimens from more than 100 new plant families with 800 to 1,000 new species. They also encountered hundreds of new species of animals. Cook also had astronomers and artists onboard.

Endeavour and her crew made the first long-distance voyage on which no crewmen died from scurvy, the dietary disease caused by the lack of ascorbic acids. Cook is credited with being the first to use diet as a cure for scurvy, making his crew follow a strict diet that included cress, sauerkraut and an orange extract. He also ensured cleanliness and ventilation in the crew's quarters.

The Endeavour was small, 368 tons, about 100-feet long and 20-feet wide. She had a round bluff bow and a flat bottom that provided uncommon spaciousness and helped prevent her from being torn apart by coral. However, in 1795, Endeavour ended her career on a reef along Rhode Island.

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## NASA ORBITER-NAMING COMPETITION

The Orbiter-Naming Program is designed to enhance students' interest in and enthusiasm for space exploration through educational projects related to space research, exploration and discovery.

On March 10, 1986, Congressman Tom Lewis (R-Florida), called for the name of the replacement orbiter to be selected "from among suggestions submitted by students in elementary and secondary schools." Subsequently, in October 1987, Congress authorized House Joint Resolution 559.

During the 1988 fall semester, over 71,650 U.S. students formed some 6,100 teams, each led by a school faculty member. They prepared and submitted interdisciplinary classroom projects to support and justify the proposed name which had to be that of a sea vessel used in research or exploration.

The Orbiter-Naming competition was open to all students in the 50 states, District of Columbia, five U.S. jurisdictions, Bureau of Indian Affairs, Department of Defense Dependent Schools and Department of State Overseas Schools. There were two entry divisions: Division 1, kindergarten through 6th grade; and Division 2, grades 7 through 12.

The Council of Chief State School Officers (CCSSO) administered the program for NASA. Announcements of Opportunity were issued in March 1988 and Program Entry Packets were mailed between June and the fall semester. Entry deadline was December 31, 1988. On March 20, 1989, NASA-CCSSO announced the state-level winners. During April, a team of judges at NASA Headquarters reviewed the state-level winning projects and selected the national division finalists. Entries were judged on the name proposed and on the quality and creativity of the educational project.

Each participant will receive recognition for the team's entry. State-level winners have received recognition from NASA field centers. In addition to having their chosen name on the orbiter, the two national-winning teams will receive an expense-paid visit to Washington for special recognition ceremonies and NASA's Educational Affairs Division will conduct special programs at the two schools.

The replacement orbiter is being built by Rockwell International's Space Transportation System, Downey, Calif. and is scheduled for delivery April 1991.

# NASA Facts



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## "Endeavour" is Chosen as Winning Name in NASA's Orbiter-Naming Competition Division 1 winner

A nine-member team from Senatobia Middle School, Senatobia, Miss., who proposed the name "Endeavour," has been chosen as the national winner in the Division 1 category (kindergarten through 6th grade) in the competition to name the replacement orbiter. The team is comprised of fifth graders in the gifted and talented education class. The Senatobia team chose the name Endeavour, Lt. James Cook's 18th century ship that sailed from England in 1768 to the Pacific to observe and record the transit of Venus in 1769.

The team chose the name Endeavour because the U.S. space program's "spirit is a united effort to strive, reach and achieve goals in areas of exploration and discovery."

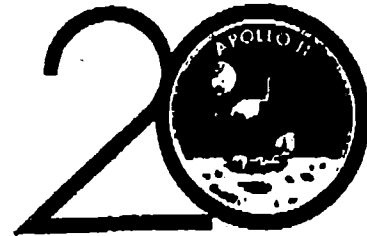
The team's project "First Endeavours in Space" was a classroom activity created by the fifth-graders to teach lower elementary students (K-2) facts about the space program. A space camp simulation was set up in the gymnasium with nine activity areas. In area 1, the students experienced the feeling of enclosure in a space bubble; in area 2, they tried on a space suit created by the team; in area 3, the pupils were blindfolded and turned in a swivel chair to experience dizziness; in area 4, samples of freeze-dried space food were distributed; in area 5, participants built a space structure from plastic straws; in area 6, the youngsters experienced sleeping standing up and were told about the importance of exercise in space; in area 7, the pupils packaged an egg and dropped it from the gym window to demonstrate the importance of payload packaging; in area 8, the students experienced wireless communication using walkie-talkies and learned about communication satellites; and in area 9, the pupils had hands-on experience using a manipulator arm.

At the conclusion, the captains of the nine activity areas gave the participants coloring/activity books as a tangible remembrance of their "First Endeavours in Space."

To learn more about space activities the team took a trip to the Alabama Space and Rocket Center, Huntsville, to see movies and tour the museum and park. They also visited NASA's Marshall Space Flight Center.

The team coordinator is Ms. Martha S. Riales, a teacher of gifted and talented students in grades 3-6 at Senatobia Middle School. The team members include: Sarah Alford, Thomas Anzalone, Ryan Burke, Casey Craig, Melody Durrett, Jennifer Hale, Spencer Miller, Mac Monteith, and Zack Zettergren.

# NASA Facts



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## "Endeavour" is Chosen as Winning Name in NASA's Orbiter-Naming Competition Division 2 winner

A nine-member team from Tallulah Falls School, Inc., Tallulah Falls, Ga., who proposed the name "Endeavour," has been chosen as the national winner in the Division 2 category (grades 7-12) in the competition to name the replacement orbiter. The team is comprised of math students in grades 8-12. Endeavour was the name of James Cook's 18th-century ship that sailed from England in 1768 to the Pacific to observe and record the transit of Venus in 1769.

The competition required production of a creative and interdisciplinary project supporting and justifying the name proposed. The nine-member team proposed a two-fold project. One part was to develop a math magazine, "Math Exploration with James Cook." The magazine was written on 3 levels (grades 1-5, 6-8 and 9-12) and incorporated seven activities for each level, combining mathematics with historical information about Cook's travels and his contributions to world exploration and natural science exploration. The team created a variety of math problems, crossword puzzles and word search games. In addition to extensive research, the students learned about magazine production and computer page design and layout.

The second part of the team's project was a play, "Where On Earth?...", comparing 18th-century exploration on the sea to 20th-century exploration in space. The team not only researched the speech patterns and voyages of James Cook, but also researched the Space Shuttle to understand orbiter configuration, crew duties and mission tasks.

Ms. Martha Cantrell, a teacher at Tallulah Falls School, was the team coordinator for the nine-member Orbiter-Naming team. The team members include Todd Besier, Martha Chan, May Chan, David Farris, Tanya Favus, Kerri Hirsch, Ricky Kuhr, Lee Markham, and Damon Wood.

AE5  
E5  
1984

# The New Encyclopædia Britannica

in 30 Volumes

MACROPEDIA  
Volume 11

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Knowledge in Depth

FOUNDED 1768  
15 TH EDITION



Encyclopædia Britannica, Inc.  
William Benton, Publisher, 1943–1973  
Helen Hemingway Benton, Publisher, 1973–1974  
Chicago/Geneva/London/Manila/Paris/Rome  
Seoul/Sydney/Tokyo/Toronto

writing as the reflection of a character undermined by good and bad fortune alike. He was "lolling Maecenas," with his tunic let down like a petticoat, hobnobbing with eunuchs or the notorious pantomimist Bathyllus. Maecenas certainly loved gracious living, jewelry, dainty food, wine, and women. He gave the Romans a taste for pantomime, heated swimming pools, and other harmless amenities. With his vast wealth he could be the most munificent of patrons, and every parasite in Rome knew it. It was in his circle of intimate friends that he revealed his discrimination and unerring judgment of men's character and quality.

**BIBLIOGRAPHY.** No trace of any formal biography of Maecenas survives from antiquity. His literary fragments are collected in R. AVALLONE (ed.), *Mecenat: I Frammenti* (1945). A recent biography is J.M. ANDRE, *Mécène, essai de biographie spirituelle* (1967). Two older works are R. SCHOMBERG, *The Life of Maecenas: With Critical, Historical and Geographical Notes*, 2nd ed. (1766), a brief life with very useful notes; and H. RICHER, *Vie de Mécènes, avec des notes historiques et critiques* (1746), also brief, with copious reference to contemporary sources.

(E.W.G.)

## Magellan, Ferdinand

Often referred to as the first circumnavigator of the earth, Ferdinand Magellan, since he died before the completion of the first voyage round the world, is more correctly described as initiator and leader of the Magellan-Elcano expedition. The voyage was successfully terminated by the Basque navigator Juan Sebastián de Elcano (del Cano). Fernão de Magalhães, the son of Rui de Magalhães and Alda de Mesquita, belonged to the Portuguese nobility; his birthplace was most probably Porto, which he left to serve as a page to Queen Leonor in Lisbon.

Alinari



Magellan, painting by an unknown artist. In the Uffizi Gallery, Florence, Italy.

**Portuguese service.** In early 1505 he enlisted in the fleet of Francisco de Almeida, first Portuguese viceroy in the East, whose expedition, sent by King Manuel to check Muslim sea power in Africa and India, left Lisbon on March 25; at a naval engagement at Cannanore on the Malabar Coast of India, Magellan is said by the chronicler Gaspar Correia to have been wounded. Though Correia states that during this early period of his Indian service he acquired considerable knowledge of navigation, little is known of Magellan's first years in the East until he appears among those sailing in November 1506 with Nuno Vaz Pereira to Sofala on the Mozambique coast, where the Portuguese established a fort. In 1508 he was back in India, taking part, on February 2-3, 1509, in the great Battle of Diu, which gave the Portuguese supremacy over most of the Indian Ocean. Reaching Cochin in the fleet of Diogo Lopes de Sequeira, he left as one of the men-at-arms for Malacca. Magellan is mentioned as being sent to warn the commander of impending attack by Malays, and during the subsequent fighting courageously

Indian expedition

saved the life of a Portuguese explorer, Francisco Serrão, who later from the Moluccas (Maluku) sent him helpful information about those islands. At a council held at Cochin on October 10, to decide on plans for recapturing Goa, he advised against taking large ships at that season, but the new viceroy, Afonso de Albuquerque, did so, the city falling on November 24; Magellan's name does not appear among those who fought. There is no conclusive evidence for the theory that during his Indian service he attained the rank of captain.

The Portuguese victories off the eastern coast of Africa and the western coast of India had broken Muslim power in the Indian Ocean, and the purpose of Almeida's expedition—to wrest from the Arabs the key points of sea trade—was almost accomplished; but without control of Malacca their achievement was incomplete. At the end of June 1511, therefore, a fleet under Albuquerque left for Malacca, which fell after six weeks. This event, in which Magellan took part, was the crowning Portuguese victory in the Orient. Through Malacca passed the wealth of the East to the harbours of the West, and in the command of the Malacca Strait the Portuguese held the key to the seas and ports of Malaysia. It remained to explore the wealth-giving Moluccas, the islands of spice. Accordingly, early in December 1511 they sailed on a voyage of reconnaissance and after reaching Banda returned with spice in 1512. The claim made by some that Magellan went on this voyage rests on unproved statements by Giovanni Battista Ramusio and Leonardo de Argensola, and the want of evidence argues against its acceptance. Even if he did, in truth, reach the Moluccas, a further voyage—which he later commanded from Spain to the Philippines—was required to complete the circle of navigation.

In 1512 Magellan was back in Lisbon; the following year he joined the forces sent against the Moroccan stronghold of Azamor, and in a skirmish after its fall sustained a wound that caused him to limp for the rest of his life. Returning to Lisbon in November 1514 he asked King Manuel for a token increase in his pension, signifying a rise in rank. But unfounded reports of irregular conduct on his part after the siege of Azamor had reached the King, who, refusing his request, ordered him back to Morocco. Early in 1516 Magellan renewed his petition; the King, refusing once more, told him he might offer his services elsewhere.

**Allegiance to Spain.** Magellan therefore went to Spain, reaching Seville on Oct. 20, 1517. He was joined by the Portuguese cosmographer Rui Faleiro, and together they journeyed to the court at Valladolid. There, having renounced their nationality, the two men offered their services to King Charles I (later, Emperor Charles V). Magalhães henceforward became known by the Spanish version of his name—Fernando de Magallanes.

By decree of a papal bull, 1493, all new territories discovered or that should be discovered east of a line of demarcation (redrawn 1494) were assigned to Portugal, all that lay west to Spain. Magellan and Faleiro now proposed by sailing west to give practical proof of their claim that the wealth-giving Spice Islands lay west of the line of demarcation—that is, within the Spanish, not the Portuguese, hemisphere. On March 22, 1518, their proposal received royal assent; they were appointed joint captains general of an expedition directed to seek an all-Spanish route to the Moluccas. The government of any lands discovered was to be vested in them and their heirs, and they were to receive a one-twentieth share of the net profits from the venture; both were invested with the Order of Santiago. Magellan was convinced that he would lead his ships from the Atlantic to the "Sea of the South" by discovering a strait through Tierra Firme. This idea did not originate with him; others had sought a passage by which vessels sailing continuously westward would reach the East and thus avoid the route around the Cape of Good Hope, which was controlled by the Portuguese; in the royal agreement Magellan and Faleiro were directed to find "the" strait. The officials entrusted with East Indian affairs were instructed to furnish five ships for the expedition, prepared in Seville, where an unsuccessful attempt to wreck the project was made by Portuguese

Expedition of the Moluccas

agents. Magellan's flagship, "Trinidad," had as consorts "San Antonio," "Concepción," "Victoria," "Santiago." An attack of insanity prevented Faleiro from sailing.

Magellan, who in 1517 married Beatriz Barbosa, daughter of an important official in Seville, said farewell to his wife and infant son Rodrigo before his ship left Sanlúcar de Barrameda on Sept. 20, 1519, carrying about 270 men, among whom nine countries were represented. The fleet reached Tenerife on September 26, sailing on October 3 for Brazil; becalmed off the Guinea coast, it met storms before reaching the line; on November 29 it was 27 leagues southwest of Cape St. Augustine. Rounding Cabo Frio, Magellan entered the Bay of Rio de Janeiro on December 13, then sailing south to the Río de la Plata vainly probed the estuary, seeking the strait. On March 31 he reached Port St. Julian in latitude 49°20' S, where on Easter day at midnight Spanish captains led a serious mutiny against the Portuguese commander. Magellan with resolution, ruthlessness, and daring resourcefulness quelled it, executing one of the captains and leaving another to his fate ashore when, on Aug. 24, 1520, the fleet left St. Julian.

After reaching the mouth of the Santa Cruz, near which "Santiago," reconnoitring, had been wrecked earlier, Magellan started south again, on October 21 rounding the Cape of the Virgins (Cabo Vírgenes), and at approximately 52°50' S entered the passage that proved to be the strait of his seeking, later to bear his name. "San Antonio" having deserted, only three of his ships reached the western end of the passage; at the news that the ocean had been sighted the iron-willed admiral broke down and cried with joy.

On November 28 "Trinidad," "Concepción," and "Victoria" entered the "Sea of the South," from their calm crossing later called the Pacific Ocean. Tortured by thirst, stricken by scurvy, feeding on rat-fouled biscuits, finally reduced to eating the leather off the yardarms, the crews, driven first by the Peru Current and throughout the voyage by the relentless determination of Magellan, made the great crossing of the Pacific. Till December 18 they had sailed near the Chilean coast; then Magellan took a course northwestward; not till Jan. 24, 1521, was land sighted, probably Pukapuka in the Tuamotu Archipelago. Crossing the equinoctial line at approximately 158° W on February 13, the voyagers on March 6 made first landfall at Guam in the Marianas, where they obtained fresh food for the first time in 99 days. A *Memorial*, sent by Magellan to King Charles before leaving Spain, suggests that he knew (probably partly from Serrão's letters) the approximate position of the Moluccas; in sailing now from the Marianas to the Philippines instead of direct to the Spice Islands, he was doubtless dominated by the idea of early revictualing and the advantage of securing a base before visiting the Moluccas.

Leaving on March 9, Magellan's course west-southwestward next brought him to islands later called the Philippines, where at Massava he secured the first alliance in the Pacific for Spain, at Cebú the conversion to Christianity of the ruler and his chief men; but on Mactán Island, April 27, 1521, Magellan was killed in a fight with natives.

After his death only two of the ships, "Trinidad" and "Victoria," reached the Moluccas; only one, "Victoria" (85 tons), returned to Spain, under command of Elcano, originally master on "Concepción," and participator in the mutiny at Port St. Julian. For bringing home, on Sept. 8, 1522, the leaking but spice-laden ship, with only 17 other European survivors and 4 Indians, "weaker than men have ever been before," Elcano received from the emperor an augmentation to his coat of arms, a globe with the inscription "Primus circumdedisti me" ("You were the first to encircle me"). It had been left for Elcano, returning by the Cape route, to give practical proof that the earth was round.

**Achievement.** The supreme distinction of Magellan lies not in any feat of circumnavigation but in his bold conception and masterly direction of the enterprise that achieved that feat. The first navigator to cross the Pacific from East to West, he disproved the prevailing idea that a mere few days westward sailing from the New World

would bring ships to the East Indies. Instead, after a crossing lasting more than three months, he brought a fleet within easy distance of them. Magellan, with a character so complex and of such extreme contradictions, will remain an enigma; psychologically he cannot have been at peace with himself. For his transference of allegiance many writers have denounced him, bearing in mind that in his time the loyalty of a Portuguese to his sovereign was second only to his loyalty to his God; others have pointed out that in offering his services to another ruler Magellan did what Columbus, Cabot, and Vespucci had done, and that limitations imposed by nationality are irreconcilable with the advancement of knowledge. But on one thing all Portuguese are agreed: "he is ours."

The fullest account of the voyage is that of Antonio Pigafetta, Knight of Rhodes, native of Vicenza, who sailed with Magellan and returned with Elcano. The true text of the Italian version, translated, edited, and annotated by J.A. Robertson, is in *Magellan's Voyage Around the World by Antonio Pigafetta*, 2 vol. (1906). *The First Voyage Round the World by Magellan*, Hakluyt Society, vol. lii (1874), includes, as well as Pigafetta's account, the following by other members of the expedition: "The Genoese Pilot's Account of Magellan's Voyage" (believed to be Leon Pancaldo of Savona); the "Narrative of a Portuguese Companion of Odoardo Barbosa" (probably Vasco Gomes Galego, of Bayona, Galicia); the "Log-Book of Francisco Alvo or Alvaro," commencing Nov. 29, 1519, and recording on the return voyage the discovery in Cape Verde Islands that by sailing continuously westward a day had been "lost." This volume also contains the account of a contemporary writer, the "Discourse of M. Giovanni Battista Ramusio," and Gaspar Correia's account of the voyage (taken from *Lendas da Índia*, vol. ii, ch. xiv).

**BIBLIOGRAPHY.** Important introductory works to the life of Magellan include F.H.H. GUILLEMARD, *The Life of Ferdinand Magellan and the First Circumnavigation of the Globe, 1480-1521* (1890, reprinted 1971); E.F. BENSON, *Ferdinand Magellan* (1929); and VISCOUNT DE LAGOA, *Fernão de Magalhães: A sua Vida e a sua Viagem*, 2 vol. (1938). For chronicles of the voyage, see FRANCISCO LOPEZ DE GOMARA, *La Historia general de las Indias* (1554); and PIETRO MARTIRE D'ANGHERA, *The Decades of the Newe Worlde* (1555). For a historic interpretation of the voyage, see OSCAR KOELLIKER, *Die Erste Umseglung der Erde durch Fernando de Magellanes und Juan Sebastian del Cano, 1519-1522* (1908). The life and achievements of Elcano are discussed in MAIRIN MITCHELL, *Elcano: The First Circumnavigator* (1958).

(M.Mi.)

## Maghrib, Cultures of the

Arab writers gave the name Maghrib (Setting Sun, or the West) to the regions of North Africa conquered by the Muslims between the years 670 and 700. The word Maghrib denotes the whole of Morocco, Algeria, and Tunisia and the western part of Libya known as Tripolitania. It is bounded on the south by the Sahara.

The country of the Atlas, as the Greeks named it, is distinguished from the rest of the Islāmic world by its population and history. The native peoples have been able to resist successive invaders from the vastness of their mountain ranges. Yet Punic, Roman, and Christian influences left their successive marks. In the 7th and 8th centuries, the victorious Arabs, by imposing Islām and the language of the Qur'an, absorbed the Maghrib into the Muslim civilization once and for all. Nevertheless, the North African societies have preserved their cultural identity throughout the centuries.

The people of the Maghrib are ethnically Berbers and Arabs. The Berbers have lived in the Maghrib since ancient times, probably originating in a mingling of races in the Paleolithic and Neolithic periods. The Berber stock displays a wide variety of physical characteristics; their social and cultural characteristics are also quite diverse. Underlying all these differences, however, is a common ethnic substratum. A long succession of invasions, ranging from the Phoenicians to the Arabs and finally to the French, did not lead to much interbreeding. Some foreign minorities settled in the towns, but the rural Maghrib

The country of the Atlas

THE WHITE HOUSE  
WASHINGTON

**REVISED**

*5/11/89*

~~MEMORANDUM~~

TO: David Bates

FROM: JOSEPH W. HAGIN

SUBJECT: APPROVED PRESIDENTIAL ACTIVITY

EVENT: Rose Garden Ceremony greeting space shuttle astronauts and naming new Space Shuttle Orbiter

DATE: May 16, 1989

TIME: 1:00 p.m.

DURATION: 20 minutes

LOCATION: Rose Garden

ATTIRE: Business Suit

REMARKS REQUIRED: ~~No~~ Yes

MEDIA COVERAGE: Closed

FIRST LADY PARTICIPATION: TBD

ADDITIONAL INFORMATION:

CONTACT: \_\_\_\_\_

TELEPHONE: OFFICE \_\_\_\_\_ HOME \_\_\_\_\_

NOTE: PROJECT OFFICER, SEE ATTACHED CHECKLIST

Ed Rogers	Marlin Fitzwater	David Bates
James Cicconi	David Demarest	David Valdez
Fred McClure	Jean Lamb	USSS - PPD
Susan Porter Rose	Steve Studdert	Gary Walters
Patty Presock	John Keller	WHCA Audio/Visual
Chriss Winston	Tim McBride	WHCA Operations
Laurie Firestone	J. Bonnie Newman	Amy Louisa Buckley
Robert Guttman	Tony Lopez	C. Boyden Gray
		Bruce Zanca

# Space

<sup>to</sup> Don Herold "Dork is ~~the~~ the greatest thing <sup>is</sup> ~~is~~ the ~~stupid~~ <sup>stupid</sup> ~~fill~~ <sup>fill</sup>. ~~That's~~ <sup>That's</sup> why we shall

Ethel Muntford

A, man of courage never needs weapons, but he may need bail

Experience increases our wisdom  
but doesn't

Augustine Malm

Never ~~carry~~ shotgun or knowledge  
at half-cock.

Nothing is done. Everything in the world  
remains to be done or done over.

Lincoln Stephens

~~A. S. Malm~~

Improvement makes straight roads  
but the crooked roads <sup>is/are</sup>  
improvement are the roads of <sup>our</sup> ~~our~~ <sup>our</sup> ~~our~~

Konstanz  
the judge ourselves but

Life would be infinitely happier if  
we were born at the age of  
80 & gradually approached the  
age of 18.

Bordwell's  
Churchill  
181, 182, 183

The last time I saw stars was  
aft. ~~from~~ ~~conscious~~. When I  
saw the Academy Awards.

The only thing I ever exercise  
was constipation.

In baseball when I threw  
to 1st base they issued a  
U.F.O. alert.

The TX sheriff captured  
= bandit.

Where's the gold says the  
sheriff  
And the translator asks.  
¿Dónde es el oro?

The response No se

is interpreted as he said he doesn't  
know  
This goes on for a while until  
sheriff loses his temper

He puts his gun to the  
bandit's head and says  
"Tell him that unless he  
says where gold is now I'm  
going to pull the trigger"

Hearing this in Span. from  
the translator the bandit  
turns pale, blinks and  
where it is hiding the  
underneath the floor boards  
in his mother's house

"What did he say?" follows  
the sheriff while rocking  
his gun.

The translator answers.

"He says that you are a  
fatty pig and he is not  
afraid to die."

---

I was however much of an astronomer  
I used to define outer space  
Anything beyond the doors the  
science wing.

The closest I come to being an  
astronomer was when I calculated  
setting a date once in a blue moon.

1ST STORY of Level 1 printed in FULL format.

The Associated Press

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April 13, 1983, Wednesday, BC cycle

SECTION: Domestic News

LENGTH: 260 words

KEYWORD: History

BODY:

Today is Wednesday, April 13, the 103rd day of 1983. There are 262 days left in the year.

Today's highlight in history:

On April 13, 1743, Thomas Jefferson, author of the Declaration of Independence and America's third president, was born in Albemarle County, Va.

On this date:

In 1598, France's King Henri IV signed the Edict of Nantes, granting some religious freedom to the Protestant Huguenots.

In 1776, Gen. George Washington arrived in New York to prepare the city's defense in the American Revolution.

In 1961, the United Nations General Assembly condemned apartheid as practiced in South Africa.

In 1964, Sidney Poitier became the first black to win an Academy Award as Best Actor, cited for his work in the film "Lilies of the Field."

Ten years ago: The Canadian peacekeeping delegation in Vietnam charged for the first time that North Vietnam was violating the cease-fire by troops infiltrating South Vietnam.

Five years ago: The U.S. International Trade Commission ruled that American steel was being hurt by imports of carbon steel plate from Japan, permitting new import tariffs by the Treasury Department.

One year ago: The Reagan administration announced it was going ahead with the sale of military spare parts to Taiwan despite objections from the Chinese governments.

Today's birthdays: Perennial presidential candidate Harold Stassen is 76 years old. Singer Al Green is 37.

Thought for today: "The farther backward you can look, the farther forward you are likely to see." - Winston Churchill, British statesman (1874-1965)

REMARKS: SPACE SHUTTLE  
ROSE GARDEN  
TUESDAY, MAY 16, 1989

Blissey

CAPTAIN DAVID WALKER (STACY), COLONEL RONALD GRABE  
(MARIJO), DR. MARY CLEAVE, MAJOR MARK LEE (DEE), DR.  
NORM THAGARD (KIRBY)

COMMANDER WALKER AND CREW, FRIENDS AND FAMILIES OF  
THE SHUTTLE ATLANTIS, DISTINGUISHED MEMBERS OF  
CONGRESS, STUDENTS, ADMIRAL TRULY, MY FELLOW AMERICANS.

- 2 -

YOU KNOW, THE LATE JACKIE GLEASON IMMORTALIZED THE  
WORDS, "AND AWAY WE GO." WELL, IT IS A PLEASURE TO BE  
WITH AMERICANS WHO, BY EXPLORING THE HORIZONS OF OUTER  
SPACE, HAVE MADE THOSE WORDS REALITY.

WE GATHER HERE TO CELEBRATE THE CONTINUITY OF  
AMERICA'S SPACE PROGRAM, AND OF AMERICA HERSELF.

IN A SENSE, TODAY'S SETTING REFLECTS THAT  
CONTINUITY.

- 3 -

FOR YOU ARE PIONEERS PUSHING BACK THE BOUNDARIES OF AMERICA'S TECHNOLOGICAL FUTURE. AND THIS HOUSE EMBODIES THE GREATNESS OF AMERICA'S PRESENT AND PAST.  
AND THE TWO SPACE PROGRAMS THAT WE CELEBRATE -- THEY, TOO, REFLECT AMERICA'S CONTINUITY.

- 4 -

FOR IN ATLANTIS'S DEPLOYMENT OF MAGELLAN, WE SALUTE ACHIEVEMENT WHICH HAS COME TO PASS. AND IN ENDEAVOUR, THE GLORY WHICH STILL LIES AHEAD.

SOME OF YOU MAY RECALL THAT WINSTON CHURCHILL SAID, "THE FARTHER BACKWARD YOU CAN LOOK, THE FARTHER FORWARD YOU ARE LIKELY TO SEE."

- 5 -

WELL, MAGELLAN WAS NAMED AFTER THE SEA-FARING EXPLORER OF THE 16TH CENTURY. AND AS THE FIRST U.S. PLANETARY MISSION SINCE 1978, IT MARKS THE REBIRTH OF AMERICA'S PLANETARY PROGRAM. FROM MAGELLAN, WE WILL LEARN MORE ABOUT VENUS, AND THUS OURSELVES. FOR VENUS IS THE PLANET MOST LIKE EARTH.

- 6 -

TO COMMANDER WALKER AND HIS ATLANTIS CREW, AND TO THE ENTIRE NASA ORGANIZATION MY HEART-FELT CONGRATULATIONS. TODAY, AMERICA SALUTES YOUR COURAGE AND ENTERPRISE. FOR YOU HAVE REAFFIRMED YOUR NATION'S GENIUS IN SCIENCE AND TECHNOLOGY. AND YET, IT'S ONLY A BEGINNING.

FOUR MORE SOLAR-SYSTEM MISSIONS THROUGH THE MID-1990s. AND 13 MORE SHUTTLE FLIGHTS IN 1989 AND '90.

- 7 -

THESE FLIGHTS WILL CHART NEW FRONTIERS IN SCIENCE AND EXPLORATION. AND WE WILL EXPLORE THOSE FRONTIERS THROUGH THE LEADERS OF TOMORROW.

WE SEE THOSE LEADERS IN THE STUDENTS HERE TODAY -- FROM MISSISSIPPI, AND FROM GEORGIA.

- 8 -

FOR IN A NATIONWIDE ORBITER-NAMING COMPETITION, INVOLVING OVER 71,000 STUDENTS AND 6,100 ENTRIES FROM ELEMENTARY AND SECONDARY SCHOOLS, YOU SHOWED HOW THE POSSIBILITIES OF TOMORROW POINT US ONWARD AND UPWARD.

YOU KNOW, CHOOSING A NAME CAN BE A THANKLESS TASK. CONSIDER THE NEW FATHER WHO WAS ONCE REPROACHED BY SAM GOLDWYN. "YOU'RE GOING TO CALL YOUR SON WILLIAM?" HE SAID. "WHAT KIND OF A NAME IS THAT? EVERY TOM, DICK, AND HARRY IS CALLED WILLIAM."

MY FRIENDS, YOU FARED MUCH BETTER. BOTH OF YOUR SCHOOLS CHOSE THE NAME ENDEAVOUR, WHICH WEBSTER'S DEFINES AS "TO MAKE AN EFFORT, STRIVE; TO TRY TO REACH OR ACHIEVE." AND EACH OF YOUR SCHOOLS HAS LIVED THAT DEFINITION.

- 11 -

IN THE DIVISION ONE CATEGORY -- KINDERGARTEN THROUGH GRADE SIX -- THE NATIONAL WINNER IS A TEAM OF NINE FIFTH GRADERS FROM SENATOBIA MIDDLE SCHOOL IN SENATOBIA, MISSISSIPPI. THROUGH YOUR TEAM YOUNGER ELEMENTARY STUDENTS LEARNED ABOUT SPACE "UP-CLOSE AND PERSONAL."

- 12 -

LIKE SIMULATING A SPACE CAMP'S WIRELESS COMMUNICATIONS. OR TRYING ON A TEAM-MADE SPACESUIT.

AND IN DIVISION TWO -- GRADES 7 THROUGH 12 -- THE WINNING TEAM CAME FROM A NEARBY STATE -- TALLULAH FALLS SCHOOL, INC., IN TALLULAH FALLS, GEORGIA.

- 13 -

HERE, STUDENTS DEVELOPED A MATH MAGAZINE, "MATH EXPLORATION WITH JAMES COOK." AND CREATED A PLAY COMPARING COOK'S 18TH-CENTURY SEA EXPLORATION TO ENDEAVOUR'S 20TH-CENTURY SPACE EXPLORATION.

THE ORBITER-NAMING CONTEST WAS, AND IS, A PARTNERSHIP BETWEEN NASA AND THE COUNCIL OF CHIEF STATE SCHOOL OFFICERS.

- 14 -

THE CCSSO PLAYED A KEY ROLE IN ORGANIZING THIS CONTEST. AND I WOULD LIKE TO THANK ITS MEMBERS. AND ALSO MY GOOD FRIEND CONGRESSMAN TOM LEWIS, WHOSE LEGISLATION CREATED THE EVENT.

BUT MOST OF ALL, I WANT TO THANK YOU -- COMMANDER WALKER, CREW, AND THE STUDENTS. FOR YOU HAVE ACTED NOT FOR US ALONE -- BUT FOR GENERATIONS TO COME.

- 15 -

AND IN SO DOING, YOU ARE MAKING POSSIBLE -- NOW, AND TOMORROW -- THAT PICTURE OF THE ORBITER LIFTING OFF, ITS RISE A SWIRL OF MAGIC. AND OF AMERICANS CHEERING ITS SAFETY AND SUCCESS. AND DREAMING OF THE NEW WORLDS, AND FARAWAY HEAVENS, WHICH FORM AMERICA'S DESTINY.

THAT IS THE CONTINUITY OF AMERICA. AND OF OUR SPACE SHUTTLE PROGRAM WHICH POINTS US TOWARD THE STARS.

- 16 -

THANK YOU, MY HEART-FELT CONGRATULATIONS, GOD BLESS YOU, AND GOD BLESS AMERICA.

(PRESENT TEAM PLAYERS WITH PLAQUES.)

# # # #

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