

MISSION UPDATE



MSL-1 Spacelab module and long tunnel in payload bay of orbiter Columbia in Orbiter Processing Facility Bay 1, Feb. 19, prior to payload bay door closure.

STS-83

Columbia (22nd flight)
83rd Shuttle flight
Target launch date: April 3,
2:01 p.m.
Pad: 39A
Mission: Microgravity Science Laboratory-1 (MSL-01)
Duration: 16 days
Crew: Halsell; Still; Voss; Thomas; Gernhardt; Linteris; Crouch

GOES-K

Geostationary Operational Environmental Satellite-K
Target launch date: April 24
ELV: Atlas I
Pad: 36B
Mission: Next generation weather satellite providing improved weather imagery and atmospheric sounding information.

STS-84

Atlantis (19th flight)
84th Shuttle flight
Target launch date: May 15
Pad: 39A
Mission: 6th Shuttle-Mir Docking; Spacehab-Double Module
Duration: 9 days
Crew: Precourt, Collins, Foale, Noriega, Lu, Clervoy (ESA), Kondakova (Russia), Linenger (STS-81) and Foale change places on Mir.

Spaceport News

America's gateway to the universe. Leading the world in preparing and launching missions to Earth and beyond.

John F. Kennedy Space Center

USA gets new top management as Black retires

Paul B. Smith, president of Boeing North American's Rocketdyne Division, has been named president and chief executive officer of United Space Alliance (USA) effective April 1.

Smith will succeed Kent M. Black, who recently announced his plans to retire. Black had served as USA's first CEO since November 1995. USA is a joint venture between Lockheed Martin and Boeing, which acquired Rockwell's interest in the venture in December 1996. USA is the Space Flight Operations Contractor (SFOC) for the Space Shuttle program.



Smith



Hanford

Smith comes to USA following a 32-year career with Rockwell, where he most recently was responsible for directing space-related activities of the Rocketdyne unit since March 1994.

USA President Denton R.

Hanford will return to Boeing headquarters in Seattle. Hanford led the Boeing-Rockwell merger transition team and will lend his experi-



Black



Adamson

ence to the ongoing transition effort resulting from Boeing's recent merger with the McDonnell Douglas Corp.

James C. Adamson will continue in his role as chief operating officer of USA and will report to

Smith.

Black agreed to undertake the SFOC effort with NASA as

(See USA, Page 6)

New SLF centerline lights help guide Discovery home

When Mission Commander Kenneth Bowersox steered the orbiter Discovery toward final approach to Kennedy Space Center's Runway 15 Feb. 21, new runway centerline lights helped him guide the orbiter safely home. Discovery touched down at 2:32 a.m.

The new lights will assist any aircraft pilot making a night landing at KSC's Shuttle Land-

ing Facility (SLF), but astronaut requests for improved centerline visibility during orbiter landings were the driving factor for installation.

KSC is the prime landing site for all Shuttle missions and night or dawn landings are becoming more commonplace, as evidenced by end-of-mission landings in 1996. Six of the seven Shuttle missions last year

ended at KSC. One occurred during nighttime (STS-72), two near dawn (STS-77, STS-80), one was scheduled to occur around dawn but was waved off to a later opportunity (STS-75) and preparations for the other two (STS-78 and STS-79) would have begun under low-light conditions. Existing visual naviga-

(See RUNWAY, Page 6)



THIS view of Runway 15 at the Shuttle Landing Facility shows the new centerline lights quite clearly, despite encroaching fog, giving one an idea what a Shuttle commander sees as the orbiter makes its final approach. The photo was taken on Feb. 13, around sunrise. Also providing illumination are the approach lights (foreground), runway edgelights and PAPI lights (to left of runway).

National Space Club honors three space pioneers

Three space pioneers, including two former KSC officials, were honored by the National Space Club Feb. 7 for their contributions to the U.S. space program.

George L. English, G. Merritt Preston and Peter Hoffman-Heyden were presented with Lifetime Achievement Awards by National Space Club Chairman Dr. James Drake at a luncheon in Cocoa Beach.

Former KSC Director Forrest McCartney, vice president of Launch Operations at Lockheed Martin Astronautics, praised each man's contributions.

Preston, who retired in 1973, was the director of the first Space Shuttle Program Office at KSC. He played a key role in Shuttle design and operations concepts, and contributed to the decision to have KSC chosen as the launch site for the Space Shuttle. He is a resident of Indian Harbour Beach.

English, who retired in 1994, was honored for his work as director of KSC's Executive Management Office. He helped develop policies, oversaw congressional and international affairs, and served as liaison with Air Force test ranges on both coasts. He lives in Cocoa Beach.

Hoffman-Heyden was recognized for his efforts in developing methods to improve the science of position and trajectory evaluation. He developed a technique for radar-beacon sharing which permits many radars to track spacecraft without interfering with each other.

Hoffman-Heyden spent most of his career with RCA before joining Computer Science Raytheon as a consultant. A former Satellite Beach resident, he now resides in Lakeland.



ENJOYING a moment together are (from left) former KSC officials G. Merritt Preston; George L. English, and Forrest McCartney; Peter Hoffman-Heyden; and Dr. James Drake, during the Feb. 7 National Space Club luncheon and awards ceremony in Cocoa Beach. McCartney, Preston and English are all former KSC employees.

Dates set for spring running events

Two popular running events are set for this spring:

• 8th Annual Spring Intercenter Run

This event will be held March 26 at 5 p.m. on the KSC Shuttle Landing Facility runway. It features a 10K, 5K and 2-Mile Run/Walk on the runway.

All civil service and contractor personnel are eligible and registration is free. This year, trophies will be awarded to the top three male and female finishers of each race.

Stop by either KSC Fitness Center in the Operations Support Building in the Launch Complex 39 area or in the Operations and Checkout Building in the Industrial Area to register, or contact Cheryl Tragesser for details.

The registration deadline is by close of business, March 17.

• 6th Annual Beat the Boss Competition

Set for April 12 is the 6th Annual Beat the Boss Competition, sponsored by United Space Alliance (USA), the Space Flight Operations Contractor.

The Saturday event begins at 8 a.m. and features a 5K run and

2-Mile walk at the Patrick Air Force Base (PAFB) Club North Pavilion.

All NASA, military, KSC contractor employees and their immediate families are eligible to enter. An entry fee of \$7 covers the cost of a post-race pancake breakfast and a specially-designed T-shirt for all participants.

The first overall male and female employee winner and the first family member winner in the run and walk events will receive an award. All runners and walkers who beat the

bosses in their event will also receive awards.

Registration forms for the Beat the Boss Competition are available at both KSC exercise facilities, all NASA Exchange Stores, the NASA Shuttle Logistics Depot building lobbies, the PAFB exercise facility, and the guard desks at the USA Titusville facilities. Early registration is encouraged.

For more information on Beat the Boss competition, contact Marty Winkel at 861-7502 or Kathy Jacobs at 861-7485.

34th Space Congress is April 29 – May 2

The theme for this year's Space Congress is *Our Space Future — Uniting for Success*.

"This year's objective is to demonstrate how unity and cooperation have led to technological triumphs in the demanding realm of space..." said Space Congress General Chairman Richard Jolley, general manager of EG&G Florida.

The four major panel sessions are: *Space Successes and Failures*, addressing successes and failures that provided the stepping stones to space exploration; *Uniting for Success*, focusing on the synergy of partnering efforts in the space industry; *Our Space Future*, delving into the systems, technology and business practices for tomorrow; and *A New Beginning*, presenting a roadmap to achieving set goals.

A *Meet the Astronauts* panel will be held May 1.

The keynote address April 29 will be delivered by Gen. Howell M. Estes III, U.S. Air Force Cincnorad, U.S. Space Commander Commander, Air Force Space Command.

Record-setting astronaut Story Musgrave has been invited to be the keynote speaker at the Space Congress Banquet the same night.

For \$105, registrants can attend all symposiums, two luncheons, a banquet and the exhibit receptions. Tickets for individual sessions may be purchased for \$10 each. Reservations may be made by writing to: Registration Chairman, 34th Space Congress, P.O. Box 321333, Cocoa Beach, Fla., 32932.

The 34th Space Congress is sponsored by the Canaveral Council of Technical Societies, composed of 29 national, technical and professional societies and an advisory group.



Corrections: Due to erroneous information, NASA employees Carol Tibbetts and Carol Weber are incorrectly listed on Page 5 of the Feb. 14 *Spaceport News* issue as juniors, and Claude Blackstone is misidentified as Gary Phillips in the photo on Page 5.

Cassini Titan stages arrive



FIRST and second stages for the Titan IV-B launch vehicle that will propel the Cassini spacecraft into orbit later this year arrived Feb. 14 at the Skid Strip on Cape Canaveral Air Station. The second stage is shown at left being offloaded from a C-5 cargo aircraft. At right, an osprey that had made its home atop the Skid Strip control tower continued about its business of building a nest, undeterred by the activity.



KSC provides major boost to local economy

KSC pumped \$1.135 billion into the Florida economy during Fiscal Year 1996, most of it staying within Brevard County. The figure includes \$1.01 billion in contracts and purchases along with \$125.1 million in civil service compensation.

More than 98 percent of the \$1.01 billion — about \$993 million — was expended within Brevard County, and of this total some \$953 million went to contractors operating onsite.

KSC surpassed its small business contract goal of \$56 million in fiscal 1996 by awarding more

than \$74 million in contracts to small, disadvantaged and women-owned businesses.

Permanent federal employees at KSC totaled 2,073 on Dec. 31, 1996 — a number since reduced by 168 people following the recent buyout. While 2,879 people were employed through construction and tenant jobs at KSC, most were employed by the onsite contractors and numbered 9,518. Including 50 non-permanent federal workers, there were about 14,520 people employed at KSC through the close of the year.



KSC is the home base for the U.S. Shuttle, with 82 launches completed to date.

Honeycutt honored with Tal Webb award

Center Director Jay Honeycutt received the J. Tal Webb award during a banquet dinner in Cocoa Beach Feb. 21.

Honeycutt became the fourth recipient of the award. It is given by the Canaveral Section of the American Society of Mechanical Engineers (ASME) to a senior aerospace manager for outstanding contributions to the space program during his or her career.

Honeycutt, who retires from federal service next month, has a bachelor's degree in electrical engineering.

The award is named for space program veteran J. Tal Webb, who presently is director of Facility Operations and Support for United Space Alliance (USA) and incoming Region XI vice president of ASME.

Webb's 38 years in aerospace span all the human spaceflight programs, and he had a key role in the transition to the new Space Shuttle single prime contractor, USA, under the Space Flight Operations Contract (SFOC).

NASA KSC Incubator Program Manager Kathleen Harer was named Engineer of the Year. She has two engineering degrees, one in aeronautics and astronautics, and the other in industrial engineering.

The honors were presented at the annual Canaveral Council of Technical Societies banquet, held National Engineers Week.

Interest sought in expanded Technical Consultant program

Due to the success of its pilot program, the KSC Technical Resources for Education Program may be expanded within Brevard County as well as other counties if there is enough interest.

The pilot program began last Sept. 30 and culminated with the placement of seven former NASA employees in Brevard County public schools.

Technical resource consultants first undergo a four-week classroom training session as well as a four-week internship in a public school.

Training would begin in the March/May timeframe, followed by the school internship this fall and expected placement and retirement in January 1998.

Candidates must be current NASA employees eligible for optional or early-out retirement,

preferably serving in technical positions; having a degree in engineering, math or science or

with a strong background in these fields. For more information, call Jim Quinn, 867-2508.



Center Director Jay Honeycutt (right) holds the commemorative painting, *Cape Winds*, that symbolizes the J. Tal Webb award, with J. Tal Webb himself at left. Honeycutt received the award at the Canaveral Council of Technical Societies annual banquet on Feb. 21 in Cocoa Beach.

Goldin praises stable budget outlook

NASA Administrator Dan Goldin said the budget picture for NASA over the next five years is stable, showing White House commitment to the U.S. space program and recognizing NASA's efforts to do more with less.

The Fiscal Year (FY) 1998 NASA budget request from the White House is \$13.5 billion, compared to \$13.7 billion in FY 1997. Projected figures for the following years are \$13.4 billion for 1999 and \$13.2 billion for 2000 and beyond.

"This budget will allow NASA to get on with the job of opening the air and space frontiers to enrich the lives of all Americans," Goldin said at the Feb. 6 briefing on the FY '98 budget. "I thank you, Mr. President, for your confidence in NASA and your commitment to future generations of Americans. We will deliver on the promise."

Goldin said the stable budget will allow NASA to accelerate the Origins program, designed to answer questions about the universe. "Origins will look at many facets of the universe, its creation, the formation of chemical elements and of galaxies, stars and planets," Goldin explained. "We will unravel the mystery of what it took to get from the creation of the universe to life on Earth."

The Origins program includes:

- An accelerated pace for the Mars Surveyor program, assuring a sample mission return by 2005;

- A program to develop a new generation of high-tech, low-cost, intelligent spacecraft and science instruments to explore Europa, fly close by Pluto and the Sun, and return samples from a comet;

- A Space Infrared Telescope Facility (SIRTF) launch in 2001 to examine galaxy, star and planetary system formation, and to make measurements on how to observe planets around other stars with future space telescopes;

- A program to develop the technologies to build the Next Generation Space Telescope to observe the universe to its very beginnings, and to build a Space Interferometer to search for planets around other stars;

- A major program in astrophysics for research into the chain of processes leading to the formation and early evolution of the simplest forms of life in the universe.

Goldin also had high praise for efficiencies achieved in the Space Shuttle program. "This program is continuing to live up to its commitments and give the taxpayers more for their money," Goldin observed. "Since 1993, inflight hardware problems have decreased by 50 percent."

"The Shuttle is spending more time on orbit to conduct science," he continued. "Our new prime contractor for Shuttle operations, United Space Alliance, is four months into its contract and the transition is going extremely well. All of this has been accomplished while the Shuttle budget has been reduced by 24 percent over four years. The bottom line is — the Shuttle program is not only much safer, but significantly more capable."

The Space Shuttle request of \$2.97 billion includes \$2.49 billion for Shuttle operations and \$483 million for safety/performance upgrades, compared with \$3.15 billion for Space Shuttle in FY '97 and \$2.5 billion and \$636 million, respectively, for Shuttle operations and upgrades.

Goldin did note that when the FY '94 budget was being proposed, NASA expected the FY '98 budget would be \$16.8 billion — \$3.3 billion more than what is actually being proposed now.

Hearings are already under way in Congress to review the budget request, and Goldin pledged to work closely with Capitol Hill to achieve a final markup close to or matching the original request.

Fiscal Year 1998 NASA Budget Request FY '98 Estimates (in millions of dollars)

	1996 Past Year	1997 Current Year	1998 Budget Year	1999	2000	2001	2002
Human Space Flight	5,710.4	5,674.8	5,326.5	5,306.3	5,077.0	4,831.5	4,675.3
Space Station	2,143.6	2,148.6	2,121.3	2,109.2	1,914.6	1,596.8	1,515.8
U.S. /Russian Cooperative Program	100.0	100.0					
Space Shuttle	3,143.8	3,150.9	2,977.8	3,018.5	2,978.6	3,053.6	2,977.6
Payload & Utilization Programs	323.0	275.3	227.4	178.6	183.8	181.1	181.9
Science, Aeronautics & Technology	5,670.4	5,453.1	5,642.0	5,626.2	5,750.1	5,951.2	5,989.4
Space Science	2,175.9	1,969.3	2,043.8	2,025.4	2,155.9	2,219.9	2,219.9
Life & Microgravity Sciences & Applications	304.2	243.7	214.2	249.8	256.9	266.3	264.1
Mission to Planet Earth	1,360.8	1,361.6	1,417.3	1,446.3	1,575.7	1,543.3	1,492.0
Aeronautics & Space Transportation Technology	1,270.1	1,339.5	1,469.5	1,366.4	1,147.0	1,173.4	1,194.3
Mission Communication Services	449.5	418.6	400.8	436.1	438.3	437.5	432.9
Academic Programs	109.5	120.4	96.4	102.2	102.2	102.2	102.2
Future Planning					74.1	208.6	284.0
Mission Support	2,487.3	2,564.3	2,513.2	2,458.9	2,354.0	2,398.3	2,516.0
Safety, Reliability & Quality Assurance	39.0	38.8	37.8	43.0	42.6	42.4	42.2
Space Communications Services	255.4	277.7	245.7	204.4	139.5	147.5	175.5
Research & Program Management	2,047.9	2,092.5	2,070.3	2,022.6	1,968.1	2,011.3	2,101.2
Construction of Facilities	145.0	155.3	159.4	188.9	203.8	197.1	197.1
Inspector General	15.9	17.0	18.3	18.6	18.9	19.0	19.3
Total	13,844.0	13,709.2	13,500.0	13,410.0	13,200.0	13,200.0	13,200.0

NASA Distribution of Workyears by Installation (in millions of dollars)

	FY 1997	FY 1998
Goddard Space Flight Center	3,495	3,472
Johnson Space Center	3,294	3,065
Marshall Space Flight Center	2,964	2,779
Langley Research Center	2,475	2,450
Kennedy Space Center	2,036	1,824
Lewis Research Center	2,170	2,022
Ames Research Center	1,466	1,436
Headquarters	1,224	1,143
Dryden Flight Research Center	575	616
Stennis Space Center	237	238
Fulltime Permanent Workyears	19,936	19,045
Other than Fulltime Permanent Workyears	565	514
Total	20,501	19,559
Inspector General	198	198

Pioneer 10 began historic journey 25 years ago from Cape

Pioneer 10, the most remote manmade object in the universe, began its unprecedented journey with a liftoff 25 years ago on March 2, 1972, from Launch Complex 36 on the Cape.

Richard Nixon was president, the Vietnam War hadn't yet ended, and Cape Canaveral Air Station was called Cape Kennedy.

Catapulted into space aboard an Atlas-Centaur with a Delta third stage attached to provide additional boost, the compact 570-pound spacecraft is now hurtling through the nether regions of the universe nearly seven billion miles from Earth. It takes nearly 18 hours for a signal to travel roundtrip from Earth to the spacecraft.

The journey of this interstellar Energizer bunny has been nothing short of harrowing, and stands as a testament to American engineering at its best.

The challenges began even before liftoff, recounted Launch Director John Neilon and Jim Johnson, NASA project engineer, both of the Unmanned Launch Operations Directorate.

The launch marked the first time the Atlas-Centaur was used in the Pioneer program as



GENERAL Dynamics provided the Atlas-Centaur launch vehicle while McDonnell Douglas supplied the third stage. The 132-foot tall vehicle is shown here at Launch Complex 36, Pad A, undergoing preflight checkout. Ames Research Center managed the Pioneer program for NASA.

well as the first time it was configured as a three-stage vehicle, with a Delta rocket third stage added to the stack. The combination was needed to accelerate the spacecraft to the highest velocity ever for a spacecraft leaving the Earth: 32,400 miles per hour, fast enough to pass the Moon in just 11 hours and speed by Mars some 50 million miles away in just 12 weeks.

But the biggest prelaunch challenge was Pioneer 10's power source: RTGs, or radioisotope thermoelectric generators. The basic mission called for Pioneer 10 to traverse the Asteroid Belt and then encounter Jupiter, the largest and most massive planet in the solar system.

Because the Sun's energy at Jupiter is only 4 percent of energy received at Earth and grows weaker beyond the planet, mission planners opted for a nuclear power source — RTGs — over solar cells. Pioneer 10 marked the first time nuclear power provided the sole energy source for a spacecraft, and was considered a test case for similar future missions.

"The RTGs were installed the day before launch," said Johnson. There were four RTGs, two each located at the ends of two booms extending from the spacecraft. The heat from the plutonium-238 dioxide power source was converted into electricity. The internal temperature of the RTGs was several hundred degrees Fahrenheit, and they would start to melt if they heated up any further.

"There was no cooling system on the spacecraft itself to keep the RTGs cool enough," Johnson said, so there were special cooling ducts in the payload fairing to perform this function.

Launch was originally set for Feb. 27, but was scrubbed a frustrating three times before liftoff on March 2, Neilon said.

Once on its way, Pioneer 10 faced still more perils. "The big unknown was whether the spacecraft would make it

Another significant anniversary...



35 YEARS AGO — On Feb. 20, 1962, John Glenn became the first American to orbit the Earth in Friendship 7. The cramped capsule provided just 55 feet of cubic space, compared to 2,525 cubic feet for the Shuttle orbiter. It took about five hours for Glenn to orbit the Earth three times. Re-entry became a tense drama when a faulty switch incorrectly indicated that the capsule's heat shield had been prematurely released. Now a U.S. senator, he recently announced his retirement on the 35th anniversary date.

through the Asteroid Belt," Johnson and Neilon recalled.

Looming like an impenetrable barrier between Pioneer 10 and Jupiter, the Asteroid Belt measures roughly 175 million miles across. The Belt is too thick to fly over or under, and all outer planetary missions must fly through it. The material in the belt whizzes about at speeds averaging 12 miles a second. Rock chunks can be as big as the state of Alaska.

Survive Pioneer did, blazing through the Asteroid Belt undeterred in July 1972. The next hurdle was Jupiter, second only to the Sun in size in our solar system and with a mass more than 300 times the mass of Earth. Its radiation belts — as much as one million times more intense than Earth's Van Allen radiation belts — could cripple or destroy a spacecraft approaching too closely.

Pioneer 10 passed within 81,000 miles of Jupiter's cloudtops Dec. 3, 1973 and escaped with no damage. The spacecraft obtained the first closeup images of Jupiter, charted the radiation belts, and discovered that the planet is predominantly liquid in composition.

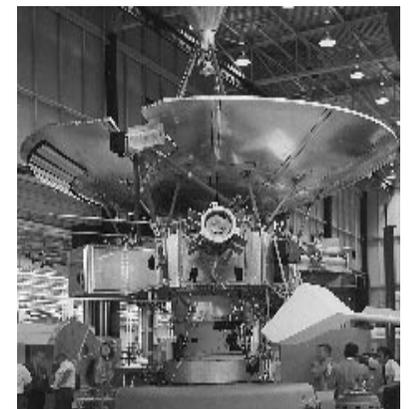
By the time Pioneer 10's 8-Watt signal reached Earth from the environs of Jupiter, its strength was a piddly

1/100,000,000,000,000,000 watts. Collected for 19 million years, this energy would light a 7.5-watt Christmas tree bulb for one-thousandth of a second.

On June 13, 1983, Pioneer 10 performed its most amazing feat yet, becoming the first manmade artifact to leave the Solar System. It is now exploring the region where the solar wind meets the region of interstellar space.

Only 5 of its 11 scientific instruments are still operating. When a targeting maneuver was performed in January, the spacecraft's transmitter had to be turned off to provide enough power for the procedure.

In a matter of years, the RTG power will dwindle to a level that signals to Earth will cease, and Pioneer 10 will coast silently through interstellar space forever, gone but never forgotten.



The TRW-built Pioneer 10 spacecraft was prepared for flight in Hangar AO on the Cape. Its spin-stabilization design was chosen for its simplicity and effectiveness.

USA...

(Continued from Page 1)

he was planning to retire from his previous position as executive vice president and chief operating officer of Rockwell International after a 34-year career with the company.

Prior to heading the

Rocketdyne unit Smith had been Rockwell's corporate senior vice president of operations. He is a strong proponent of management concepts supporting continuous process improvement. Smith has bachelor and master of science degrees in electrical engineering from the University of California at Berkeley.

Runway...

(Continued from Page 1)

tion aids such as the Xenon searchlights at the end of the runway and edgelights along each side of the landing strip are an invaluable help to the spacecraft commander, along with electronic aids.

However, astronauts had reported that centerline visual cues became less distinct during the final phase of a landing when the spaceplane rolls down the runway, making it difficult to detect a possible orbiter drift away from the centerline.

The new lighting system features a series of 52 lights positioned every 200 feet in the center section of the 15,000-foot long runway. They begin at 2,475 feet down the runway, the



Centerline light closeup view

optimum touchdown point for an end-of-mission landing. The system has redundant circuits allowing centerline lighting even with a single-circuit failure. The lights are FAA-approved 80-Watt Halogen bulbs with the added benefit of adjustable intensity.

Providing adequate lighting is only half the challenge of installing centerline lights on a runway used by the Space Shuttle program. Making sure the surface remains as smooth as possible is the other. The SLF was originally equipped with centerline lights located 50 feet apart, but they were removed prior to STS-1 because of concerns about damage to the orbiter tires as they rolled over the three-quarter-inch high bump presented by the old-style lights.



ALL SEVEN STS-82 crew members took a walk around Discovery after landing. From left are Mission Specialist Steve Hawley; Mission Commander Ken Bowersox; Mission Specialist Joe Tanner; Pilot Scott Horowitz; Mission Specialist Greg Harbaugh; Payload Commander Mark Lee; and Mission Specialist Steve Smith. Bowersox gave the new centerline lights high marks, calling them "beautiful."

International students welcomed to KSC



THREE international students are spending several months of their academic careers at the space center. Seated are (from left) Kahraman Vural of The Netherlands; Lai Zhai from the Peoples Republic of China and Henk Bergsma, also of The Netherlands. Behind them are (from left) Gregg Buckingham, KSC University Programs Manager; John Levy, Dynamac Corp. and Zhai's supervisor; Acting KSC Deputy Director Jim Jennings; and Mike Wilhoit, chief, Shuttle Main Propulsion Branch, and Vural and Bergsma's supervisor. The two Dutch students are attending Haarlem University of Professional Education, and will spend their six-month stay working in the propulsion area of the Shuttle Directorate. Zhai is a chemistry student at Bethune-Cookman College. Originally from Peking, she is working in the Biomedical Office for four months.

A landing Shuttle orbiter travels considerably faster than a commercial aircraft — 200-220 miles per hour for the spaceplane versus 120-140 miles per hour for commercial jets — which means any bumps can tear a tire to shreds. The critical time of tire spin-up — the instant the tire touches the runway and begins turning at a very high rate — is an especially vulnerable phase.

"New design and manufacturing methods have allowed us to obtain and install a low-profile light without the height hazard of the original system," said Ron Feile, SLF coordinator. The

current SLF standard for any height variation is one-eighth inch or less — considerably more stringent than civilian airport standards — and the new fixtures extend to just the one-eighth-inch mark above surface level.

The minimal elevation is necessary in order to provide directional lighting to the aircraft pilot or orbiter commander, Feile added.

Advanced Electrical Installations Inc., Titusville, FL, completed the installation using the Halogen lights supplied by Hughey & Phillips Inc., Simi Valley, CA.



John F. Kennedy Space Center

Spaceport News

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