

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



Center Director's Holiday Message

As we pause to celebrate the holiday season with our families and friends, I wish you all a joyful Christmas and happy New Year.

While you are enjoying this special time of year, I hope you will take time to reflect on our phenomenal successes this year at KSC as we advanced space exploration and commerce for the National Aeronautics and Space Administration and the Nation. You are the reason for our accomplishments. Your hard work and dedication, and your commitment to excellence, teamwork and integrity, were the ingredients for success in our unforgiving and demanding business. You all know our Shuttle and expendable launch vehicle record this year. It was tops! We also made tremendous progress with difficult changes to pave the road toward a vibrant future.

In addition to your professional achievements, you demonstrated your commitment to caring by turning in the best Combined Federal Campaign in our history. Other outreach activities were equally successful and added tremendously to the fabric of our communities.

It is truly a pleasure for Benita and me to work and live with you. Congratulations to each of you on a fine year. Please celebrate the season safely and sensibly so that you and your loved ones return renewed and refreshed in both body and spirit.

May God's blessing be with each of you now and in the coming year.

— Roy D. Bridges Jr.
Director

Kennedy Space Center looked to past, present and future in 1997

In 1997, Kennedy Space Center paid allegiance to the past, retained a firm grip on the present, and positioned itself for a challenging future.

KSC's seventh center director, Roy Bridges Jr., came on board March 2, and wasted no time in putting together a top management team which developed a strategic plan and road map for KSC's future through 2025. Joining him in leading all aspects of center operations are Loren Shriver, deputy director for Launch and Payload Processing; James Jennings, deputy director for Business Operations; and JoAnn Morgan, associate director for Advanced Development and Shuttle Upgrades.

By year's end, eight Space Shuttles had lifted off, carrying 53 crew members into space, logging more than 34 million miles and taking several major payloads into orbit. In addition, KSC's Expendable Launch Vehicle team supported three missions carrying NASA payloads, including the Cassini spacecraft and attached Huygens probe to Saturn.

The diversity of tasks undertaken by the KSC work force reflected the center's commitment to keeping the Space Shuttle operational, while positioning itself to support future missions and launch vehicles. As one team of KSC employees began the meticulous process of developing a new launch processing and countdown system to replace the '70s-era original, another was taking steps to improve the efficiency of the nearly two-decade-old Shuttle transportation system. Yet another group welcomed the first U.S. element of the International Space Station to the center and initiated preflight processing for its launch in 1998.

At the same time, the center continued to make safety its top priority, while streamlining operations and the work force to prepare for the future.

"Kennedy Space Center is in a unique position to carry the U.S. space program



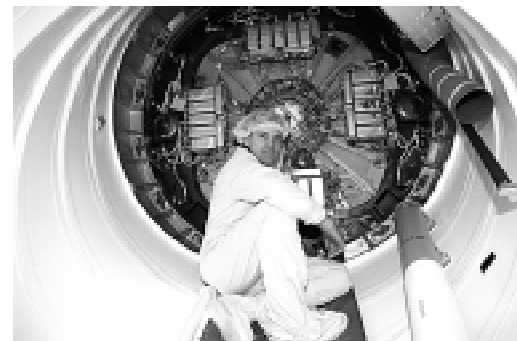
into the next century," said Bridges. "Our work force has no equal in the launch processing and countdown business, and our ability to look to the future and prepare for the natural evolution of missions and technology will stand us in good stead in the coming years. While we look forward to preparing for the on-orbit assembly and operation of the International Space Station (ISS) beginning next year, we also look forward to the challenge of what lies beyond, be it a return human mission to the moon or the first crewed expedition to Mars. We'll be ready."

Space Shuttle upgrades

Kennedy Space Center provides major contributions to NASA's four-phased plan to assure safe and continuous operation of the Shuttle fleet through the year 2012 and to incorporate major improvements through 2030.

Phase One prepared the program for the ISS and is well under way, with the only remaining projects being the new super lightweight tank and the Block II Shuttle main engines.

Upgrades under Phase Two are high-value projects which don't change the vehicle configuration significantly. At KSC these include the development of the new Checkout and Launch Control



System (CLCS), which will reduce launch processing time while lowering some operational costs by 50 percent.

Other KSC development projects invest in systems design, technologies and concepts such as the Integrated Vehicle Health Monitoring (IVHM) flight technology demonstration, use of fiber optics in flight systems to reduce vehicle cycle time, and less toxic Thermal Protection System waterproofing materials for a safer workplace.

Phase Three includes replacing Auxiliary Power Units, hydraulics, fuel cells and avionics; eliminating toxic propellants; and adding a new IVHM system.

Phase Four would incorporate new flight elements such as a Liquid Flyback Booster. KSC engineers are contributing to all these efforts.

KSC also is leading an effort to develop methods for reduction of Shuttle payload bay reconfigurations between flights, allowing up to 15 flights a year. Most of these projects have application to potential new flight systems as well.

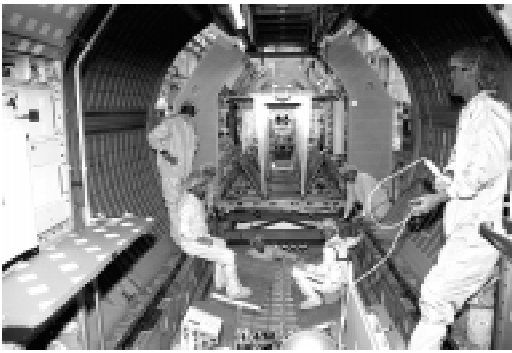
Shuttle mission highlights

Seven Shuttle missions were planned, but an eighth, STS-94, was added as a reflight of the STS-83 mission with the Microgravity Science Laboratory-1 payload. STS-83 was cut short by 12 days because of concerns about a fuel cell. The STS-94 mission three months later was



ROY Bridges Jr. became the seventh director of KSC in March. Here, the former Shuttle astronaut (at left) greets the STS-87 flight crew.

Editor's Note: Cover photo shows the launch of STS-87 in November.



GOOD YEAR — In 1997, KSC workers processed and launched eight Shuttles; helped flight crews train; supported checkout of payloads and experiments for flight on both the Shuttle and expendable launch vehicles, and geared up for on-orbit assembly of the International Space Station (ISS) in 1998. At far left, the orbiter Columbia in the Vehicle Assembly Building; above left, the white room closeout crew with an astronaut; above, workers inside the Neurolab in the Operations and Checkout Building; and left, STS-88 Commander Bob Cabana looking at Node 1, the first U.S. element of the ISS, in the Space Station Processing Facility.

the first reflight of the same payload and crew in Shuttle history.

The KSC launch team processed the orbiter Columbia for flight in 56 calendar days, a post-return-to-flight record. That quick turnaround was accomplished in part by reservicing the MSL-1 payload in Columbia, the first time a primary payload was reserviced in the orbiter.

The total flight time of the Space Shuttle program passed the two-year mark during STS-86, the seventh mission of the year.

Three missions with the SPACEHAB double module were among the nine planned dockings of the Space Shuttle with the Russian Space Station Mir. The second servicing of the Hubble Space Telescope took place in February during five spacewalks on the STS-82 mission.

Other major payloads flown included the Cryogenic Infrared Spectrometers and Telescopes for the Atmosphere-Shuttle Pallet Satellite (CRISTA-SPAS) on STS-85, and the United States Microgravity Payload-4 and Spartan-201 satellite on STS-87. Spacewalking astronauts retrieved the Spartan-201 when it failed to deploy properly.

All eight Shuttle missions landed at KSC in 1997. The orbiter Endeavour rejoined the fleet in March after returning from its first scheduled orbiter maintenance down period (OMDP) in California. Atlantis, veteran of 20 Space Shuttle flights, including all seven Mir dockings to date, departed in November for its second OMDP.

ELV program

KSC this year received lead center

responsibility for NASA's acquisition and management of expendable launch vehicle launch services.

Besides supporting the Air Force launch of NASA's Cassini mission on a Titan IVB/Centaur in October, the KSC ELV team also launched in August NASA's Advanced Composition Explorer (ACE) on a Boeing Delta II rocket to study low-energy particles of solar origin and high-energy galactic particles.

The third in a series of sophisticated weather satellites called Geostationary Operational Environmental Satellites (GOES) lifted off in April on an Atlas-Centaur rocket.

International Space Station

The past year saw the continuation of Phase I of the International Space Station effort, with seven Shuttle flights to dock with the Russian Space Station Mir now completed. In 1998, the last docking missions will occur and on-orbit assembly of the International Space Station will begin.

KSC already is preparing for the first U.S. assembly flight, STS-88, in July. The Shuttle Endeavour will carry into space the Node 1, with two pressurized mating adapters attached, to provide the interface between the U.S. and Russian-built elements of the station.

The node and adapters are already at KSC, undergoing preflight processing in the Space Station Processing Facility. More elements will follow as KSC becomes the final checkpoint for U.S.-launched ISS hardware in the coming months.

KSC signed a new customer agreement with JSC in December to support engineering development of the Space Station Crew Return Vehicle (CRV). The KSC tasks include instrumentation system design, secondary structural systems design and other developmental projects.

X-33/X-34 responsibilities

KSC has entered into a partnership with industry and other NASA centers in the development of the next-generation crewed launch vehicles. A team of KSC employees is working with the X-34 program, providing the capability to support X-34 operations at KSC, as well as the flight design.

KSC also designed and built hardware for the X-33 program, and is assessing further involvement in supporting flight test operations.

Mars exploration

During 1997, KSC formed an Exploration Think Tank to participate in integrated planning for future robotic and human missions to Mars.

KSC personnel are helping to define what needs to occur to make a human Mars mission a reality, and working on the technologies to enable such future missions.

Potential technology development research areas for KSC include cryogenic, in-situ propellant production; autonomous processing; bioregenerative plant growth; advanced instrumentation; electro-static discharge; and vehicle health management.

Contracts and added responsibilities

Besides becoming the lead NASA center for expendable launch vehicles, KSC took on a major new task by assuming agencywide responsibility for NASA's occupational health program in 1997.

1997 also was the first full year under the Space Flight Operations Contract (SFOC) awarded to United Space Alliance (USA) for consolidation of ground processing and operations.

As part of its continuing efforts to promote efficiency and quality, KSC also renegotiated the Payload and Ground Operations Contract (PGOC) and the Base Operations Contract (BOC) to performance-based contracts.

More changes in the BOC are expected next fall when Kennedy and the Air Force 45th Space Wing award a contract for joint base operations and support (JBOSC). The JBOSC contract is projected to lower costs and increase responsiveness of services for space customers at KSC, Cape Canaveral Air Station and Patrick Air Force Base.

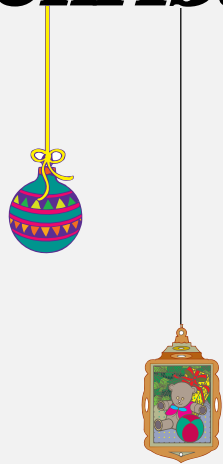
The contract will be managed by the new Joint Performance Management Office, a team of 40 KSC and 45th Space Wing personnel.

(See REVIEW, Page 8)

AT the end of the year and after 22 missions, Launch Director Jim Harrington (right) decided it was time to exchange a headset for a set of golf clubs and announced plans to retire from the space program. Dave King and Ralph Roe will replace him.

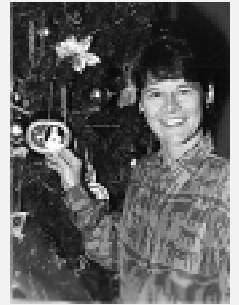


1997 KSC Christmas Coffees



CENTER DIRECTOR Roy Bridges and his wife Benita (far right) enjoy their first KSC Christmas coffee. With them in Headquarters are (left) NASA retiree Bill Martin, and Barbara Lockley, executive assistant to the center director.

FLIGHT crew nurse Deborah Ghiotto (right) will receive a master of science degree in nursing from the University of Florida this month. Note that the O&C Christmas tree is decorated with mission crew patches.



NASA current



LEFT — KSC DEPUTY Director for Business Operations (right) Jim Jennings and his former worker, retiree Darwin Brown, share a light moment at the Headquarters coffee.

FORMER KSC senior manager George English (from left) visits with space program father-and-son retirees John Miley Jr., and his father, John Miley, at the LCC coffee.



OLD FRIENDS from the payloads world were glad for an ad hoc reunion at the O&C coffee. From left are Jeri Smith, former Payload Operations Director John Conway, current Payload Processing Director Bobby Bruckner, and Elliott Zimmerman of Payload Processing.



Headquarters



PUBLIC AFFAIRS Secretary Arden Belt of NASA served as a hostess at the Headquarters coffee. Enjoying the refreshments are (from left) United Space Alliance (USA) employees Linda Daniel, Jennifer Hall and Carl McManus.



IAN Owens (from left), Cynthia Van Valkenburgh and Charles See — all of USA — share some punch in front of the long row of mission plaques hanging in the LCC lobby.



HOSTESSES Karroll Purer (from left), Cathy Penny Young and Sandy Walsh served refreshments and cheer at the LCC coffee.

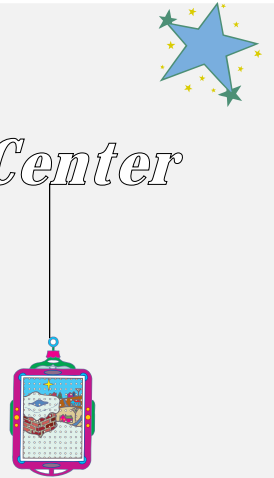


retiree Ed Rock (left) chats with Leon Wichmann, a NASA employee, at the Headquarters coffee.



COFFEES' organizer Barbara McCoy of NASA and Center Director Bridges were present at all three to welcome current and former employees.

Launch Control Center



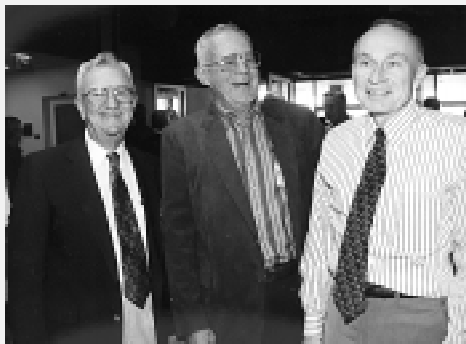
JEAN Rhodes of NASA and NASA retiree Ann Watson reminisce together. Behind them at left is Warren Wiley, deputy director of Engineering Development.



NASA retirees Renate Trantham and former Launch Director George Page attended the Headquarters coffee.



BIOMEDICAL Office Director Dr. Irene Long (left) accepts refreshments from hostess Mary Conklin at the LCC coffee.



RETIREEES Chester Wasileski (from left) and Jim Phillips, and Shuttle Processing Director Bob Sieck were glad to share some memories at the Headquarters coffee.



CHIEF Financial Officer Dave Flowers (from left) and Quality Assurance Director Chris Fahey were present at the Headquarters festivities.



JOY Huff (left) and Suzanne Cunningham, both of NASA, enjoy the LCC coffee.



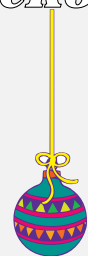
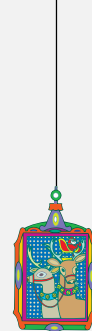
y Pope, Chris Weaver, refreshments and good



BOEING North American executive Lee Solid, KSC Deputy Director for Launch and Payload Processing Loren Shriver and NASA retiree Muriel Jernigan visit at the LCC coffee.

Operations and Checkout Building

Building



King, Roe named to succeed retiring Launch Director Harrington

Shuttle Launch Director Jim Harrington has announced his retirement effective Jan. 2. He will be succeeded in the launch director's position by Shuttle Processing Deputy Director David King and Process Engineering Director Ralph Roe.



Harrington

launch director makes the final determination to launch. He also oversees prelaunch preparations at the space center as well as KSC landing operations.

Since being named launch director effective Jan. 22, 1995, Harrington has overseen 22 successful Space Shuttle launches.

The naming of two people to



King

succeed Harrington will provide needed depth to the launch director function, noted Sieck, himself a former launch director. "To put it in football terms," he said, "we want to have more depth on the bench." King will have the assignment for a period of about six months to a year — enough to encompass at least three or four Shuttle launches



Roe

— after which Roe will serve in the position for a similar length of time. The first launch which King will oversee will be STS-89, the eighth Shuttle-Mir docking flight, set to launch in January next year.

Assessments will then begin to determine if a third person should also be trained in the position, or whether two is enough. Imposing a time frame on the assignment does not mean King or Roe are serving in an acting capacity, Sieck noted.

New Fuel Cell Monitoring System exceeds expectations on first flight

Following an expedited design and KSC implementation process, enhancements to the Shuttle's fuel cell instrumentation system are on a fast track to completion. In fact, Shuttle Columbia's modifications are complete and were flown on the just-completed STS-87 mission.

"The system worked like a champ on its first flight," reported Jack Fox, KSC Fuel Cell Monitoring System (FCMS) integration lead. "The prelaunch, on-orbit and post-landing fuel cell shutdown data was successfully acquired and looked fine. The FCMS now provides the launch team with an increased capability for assessment of fuel cell health prior to commitment to launch as well as increased visibility during on-orbit operations."

Orbiters Discovery and Endeavour are undergoing their upgrades at KSC, and Atlantis will see the same fuel cell monitoring modifications performed at the Palmdale, Calif., orbiter maintenance facility during its almost 10-

month Orbiter Maintenance Down Period.

Prior to the shortened flight of Columbia on STS-83, KSC Shuttle engineers were already studying ways to improve vehicle health monitoring with a focus on fuel cells. When STS-83 mission controllers saw what would later be defined as unclear voltage readings from Columbia's fuel cells, they erred on the side of caution and brought the Shuttle home early.

A subsequent Shuttle program desire for more refined fuel cell data before and after launch led to the

installation of off-the-shelf hardware and configuration changes in the crew module and orbiter midbody.

Managers will now be able to see beyond a general voltage measurement of the orbiter's three fuel cells and more accurately diagnose fuel cell health with insight into each cell's 96 substacks.

Early involvement of KSC engineers and technicians was critical to the success of this Shuttle enhancement, and the quick implementation on Columbia will serve as a prototype for timely execution of future orbiter upgrades, Fox observed.



JIM KING, United Space Alliance mechanic, prepares to tighten a bracket to hold a PCM unit in the midbody bay 1 area of Discovery, undergoing preflight preparations in Orbiter Processing Facility Bay 2. All four orbiters will be outfitted with the new monitoring system.

Lunar Prospector nears Jan. 5 launch

The Lunar Prospector spacecraft is now at the Astrotech spacecraft processing facility in Titusville, undergoing final preparations for a Jan. 5 launch from Complex 46 on Cape Canaveral Air Station.

Lunar Prospector will circle the moon in polar orbit for a full year, mapping the entire lunar surface from an altitude of about 62 miles. By contrast, the highly successful Clementine mission orbited Earth's nearest celestial neighbor at an altitude of about 249 miles.

Lunar Prospector carries five science instruments and

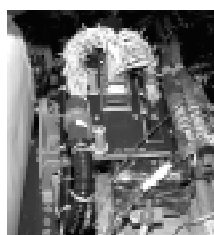
six experiments. It will map the moon's composition, gravity fields, magnetic fields and resources. It will confirm whether there is water-ice on the moon, a finding suggested by recently published Clementine radar data.

Lunar Prospector is a NASA Discovery Program mission, aimed at implementing NASA Administrator Dan Goldin's philosophy of faster, better, cheaper planetary missions.

Lift-off aboard a Lockheed Martin Athena 2 rocket currently is scheduled for 8:31 p.m. It will be the first launch from Spaceport Florida's newly refurbished Pad 46.



WORKERS at the Astrotech plant uncrate Lunar Prospector, a compact spacecraft which will weigh only 660 pounds when fully fueled.



ONE of three FCMS Pulse Code Modulation (PCM) units as installed near a fuel cell in midbody bay 2 on Columbia.

Center happenings



EMPLOYEES of the Month — Honored in December were, from left, Juan Busto, Checkout and Launch Control System Office; Dorothea Worthy, Administration Office; Nicole Scarborough, Safety and Mission Assurance; Henry Schwarz, Shuttle Processing; Laura Thayer, Chief Financial Officer's Office; Terry Taylor, Public Affairs Office; Tracey Federickson, Engineering Development; Ann Gary, Installation Operations; and LaVerne Woodard, Logistics Operations. Not shown are Albert Mariano, Payload Processing; Cynthia Jarvis, Procurement Office; and Tammy Belk, Space Station Hardware Integration Office.

KSC FOREIGN OBJECT DEBRIS (FOD) PREVENTION employee of the quarter — United Space Alliance Supervisor Tim Miller presents a commemorative plaque to Mary Repass-Friend for her FOD prevention efforts at KSC. A member of the FOD Prevention Board for a little more than a year, she was praised for her cost-reducing initiatives and timely efforts to support the board's function.



NEW ADDITION — The Air Force missing man formation flies overhead in tribute as family and guests gather at the Space Mirror located at the KSC Visitor Complex, where U.S. Air Force Maj. Robert Lawrence's name was added during a ceremony Dec. 8. A veteran pilot who had logged more than 2,500 flying hours, Lawrence lost his life in a training accident 30 years ago. He already had been accepted to the Air Force Manned Orbital Laboratory Program (MOL) in June of that year. His name becomes the 17th added to the Mirror, a memorial to those who have given their lives in the quest to explore space. The Astronauts Memorial Foundation oversees the Mirror as well as the adjacent Center for Space Education.



INTERNATIONAL VISITORS — A delegation from India visited KSC in November in honor of STS-87 Mission Specialist Kalpana Chawla's flight on Columbia. From left are L.S. Satyamurthy, Indian Space Research Organization (ISRO) counsellor, Embassy of India; T. P. Srinivasan, Hon. Deputy Ambassador, Embassy of India; Shirish Patel, KSC/NASA Payloads Processing; Center Director Roy Bridges; Bobby Bruckner (partly hidden, in light shirt), Payloads Processing Director; and Dr. Ashok Jain, Science and Technology Counsellor, Embassy of India. The delegation presented the center director with a bronze lamp called a Lakshmi-Dweepa, lit on special occasions to mark the beginning of a journey. The gift honored Chawla and her spaceflight, as she became the first woman of Indian birth to fly in space. Chawla was born in Karnal, India, but is now a U.S. citizen. KSC Engineering Development Director Sterling Walker, Larry Schultz of the NASA Advanced Programs Office at KSC, and Ravi Margasahayam of DYNACS Engineering Co. were instrumental in arranging the delegation's visit.



WHIRLING WINGS — A flock of Purple Martins munch on holly berries near the northwest corner of the Merritt Island National Wildlife Refuge. Purple Martins are the largest members of the swallow family. Erecting Martin houses to attract the birds is a custom dating back to the earliest European settlers who settled in this country and before them to the Indian tribes already here.



SPECIAL THANK YOU — KSC senior managers, including Center Director Roy Bridges, paid tribute to civil service employees' generosity and caring during the 1997 Combined Federal Campaign. The center exceeded its dollar goal in the most successful fund drive ever. To make their thank-you fun for everyone, the managers donned ponytails, gold earrings and other unusual garb. Is that the center director in those dark glasses and ponytail?



KSC workers, wearing emergency rescue suits, served as extras for a scene filmed at the Shuttle Landing Facility.

Message from Touchstone Pictures

Editor's Note: Jim Van Wyck, executive producer of the upcoming film, *Armageddon*, sends the following message to the employees of KSC:

We, the cast and crew of Armageddon, wish to thank you for your gracious hospitality while we were recently filming at Kennedy Space Center.

It was wonderful for us to be allowed to work in your facilities and to see the work that you all do. We are in awe. Perhaps our favorite moment was when the actual crew of STS-87 had



STS-87 Commander Kevin Kregel (left) explains the mission crew patch to *Armageddon* executive producer Jim Van Wyck.

lunch with us and met our "astronauts" led by Bruce Willis. It was one of many incredible memories for all of us.

On behalf of Michael Bay, Jerry Bruckheimer, Bruce Willis, Touchstone Pictures, and all of us at Armageddon — we are very grateful and we wish all of you happy holidays.

National Space Club to host spring run/walk in Launch Complex 39 area

The National Space Club's Florida Chapter will host for the first time a spring run at KSC that is open to both KSC employees and the public.

The 5-K and 10-K competition will be held in the Launch Complex 39 area. Employees and their dependents are invited to submit their ideas for a name for the competition, as well as

concepts for artwork for the competition T-shirt.

The prize for the winning entry in each category will be a \$50 gift certificate to the Chart House Restaurant and a one-year membership in the National Space Club.

Submission deadline is Jan. 8, 1998. Mail entries to: Mitch Varnes, P.O. Box 510514, Melbourne Beach, Fla., 32951.

4th Florida Space Launch Symposium to be held Feb. 24-26

The fourth Florida Space Launch Symposium will be held Feb. 24-26 in Melbourne.

The theme for this year's conference is *Capabilities and Policy*. Featured speakers will include Florida state Sen. Daryl Jones — the nominee for

Secretary of the Air Force.

The registration fee is \$325 per person. Deadline for reservations is Feb. 19, 1998. For immediate reservations call Florida Tech, 407 729-9774, fax 407 951-7694, or e-mail fair@fit.edu.

Visitor complex offers discount

The KSC Visitor Complex is offering all KSC and Cape

Canaveral Air Station employees a Christmas discount of 25 percent on souvenirs. The discount extends through Dec. 24.



Review...

(Continued from Page 3)

Along with other NASA centers, KSC this year launched a major effort to obtain certification in ISO 9001, an international standard for quality management systems.

Facilities

A major new tour attraction featuring a restored Saturn V rocket opened in January. Construction was completed on two other new tour sites for visitors — a 60-foot-high observation gantry located in the heart of Launch Complex 39 and an International Space Station exhibit facility.

Construction also started on the Space Shuttle Main Engine Processing Facility, while work was completed on the Component Refurbishment and Chemical Analysis Facility.

Other facility improvements begun or completed this year included extensive modifications to Launch Pad 39B; a major upgrade of the gaseous nitrogen pipeline

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*— Roy Bridges Jr.
Director*

which supplies KSC and Cape Canaveral Air Station; and installation of new runway centerline lights.

Community outreach

The space center and its employees expanded on a long tradition of reaching out to the community and youth, in particular, during 1997. New partnerships were formed with universities, K-12 schools and the state.

KSC engineers and scientists used desktop video technology to bring mentors and science students together in the kickoff of the Virtual Science Mentor Program.

The new NASA Minority Partnership Awards program is designed to provide students and faculty exposure to high-technology small businesses.

A KSC-led student team participated in the *For Inspiration and Recognition of Science and Technology (FIRST)* national engineering contest in which competing teams of high school students conceive, design and construct robotic devices. The team placed 14th nationally and was the top NASA team.

Also, the engineering cooperative student program was reactivated at the space center.

NASA employees reached out to the community at an unprecedented level through record donations to the Combined Federal Campaign.



John F. Kennedy Space Center

Spaceport News

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