

Spaceport News



John F. Kennedy Space Center - America's gateway to the universe

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Explore. Discover. Understand.

Discovery rolover to VAB symbolizes milestone

The orbiter Discovery recently rolled into the Vehicle Assembly Building, marking a major milestone in the march to Return to Flight. Inside the VAB, Discovery was mated to the External Tank/Solid Rocket Booster assembly for mission STS-114.

Discovery is scheduled to roll out to Launch Pad 39B next week. The launch window for mission STS-114 is May 15 to June 3.



SPACE SHUTTLE Discovery enters the Vehicle Assembly Building early morning March 29.



DISCOVERY IN the transfer aisle of the VAB.

KSC News Center skyline receives makeover

By Kay Grinter
Reference Librarian

Visitors to Kennedy Space Center may be surprised to find that the skyline has changed at the Press Site, located across from the Vehicle Assembly Building.

Two longtime structures at the Press Site, the ABC Television Network's skybox and the media grandstand, have been removed. Several other temporary structures are being replaced with permanent facilities.

One of the victims of the 2004 hurricane season included the roof of the NASA Newsroom, a permanent structure at the Press Site completed in December 1995. The damage occurred

when part of the grandstand's awning flew off and impacted the roof of the newsroom.

As a result, a major effort began to eliminate potential sources of debris that could cause further damage to permanent KSC facilities in future storms by replacing temporary buildings with permanent ones.

The Press Site clean-up is but one part of the hurricane repairs funded by a \$125.5 million emergency supplemental authorization KSC received in November 2004. This effort is being led by Mike Sumner, deputy director of Spaceport Services and program manager for the supplemental authorization.

"External Relations made my
(See SKYLINE, Page 6)



THE NEWS CENTER media grandstand, built in 1967, had a seating capacity of 350. A total of 130 launches were viewed by the press from the grandstand, beginning with Apollo 4.



Jim Kennedy
Center Director

The Kennedy Update

Hi, everyone! I hope you're having a great April Fool's Day. If someone pulls "a fast one" on you, have some fun with it; we all need to take the time for a good laugh.

It is nice to finally turn the page on winter with spring's arrival. More importantly, it signals we are only about 45 days away from the opening of our Return to Flight launch window. I'm really starting to get excited.

Speaking of excitement, it was quite a week for our Space

Shuttle Program with the Discovery's rollover from OPF #3 to the VAB. This culminates more than two years of work preparing the orbiter with all the necessary Columbia Accident Investigation Board upgrades (as well as the "Raising The Bar" initiatives we imposed upon ourselves) to return Discovery safely to flight.

It was exciting to see this mighty ship start the process for launch. Thanks to everyone who came out to cheer her on; it was truly a significant emotional event in my life and in the lives

of our Shuttle employees. Congrats to Denny Kross, Mike Wetmore, Admiral Pickavance and the entire Shuttle team on a well deserved, "Super job!"

The hits keep coming next week, as well. At press time, Discovery (after mating with its External Tank and Solid Rocket Boosters) will rollout to Pad 39-B early next week. She'll stay perched there until she launches sometime during our launch window of May 15 - June 3.

We will carry portions of the rollout live on NASA TV. I'm

"Let me take a moment to say thanks for all you have done in service to NASA and this nation."

sure you'll hear all about it in the news, as this will not only be a great day for NASA and KSC, but a great day for America.

We'll get to celebrate all these success at the KSC All-American Picnic, which is now only eight days away. Tickets are currently on sale and I sincerely hope you and your family and loved ones come out for the day. Last year, more than 8,000 people attended and we had a tremendous time.

There are plenty of children's games, activities, food, drinks and a variety of music to keep you entertained all day. A

highlight is that we have astronauts coming who'll sign autographs. People can also take a windshield tour of the launch pads. I truly look forward to meeting your families or other special people in your lives. See you at KARS Park April 9!

I see several of you took the early retirement or early out offer and today is your final day with NASA. For many, this comes after years of faithful service to this Agency and our beloved KSC. Let me take a moment to say thanks for all you

have done in service to NASA and this nation.

I personally want to thank you for the

service and support you've given me during my tenure as director. You all will be missed but not forgotten, and I hope you will come and visit often. May God bless you all!

Finally, I appreciate those of you who came out to listen to Congressman Dave Weldon's words on March 24. As time rolls on, I promise to do my level best to keep you updated on the happenings in Washington relating to the Vision for Space Exploration and KSC.

Have a great week and see you at the picnic!

Spaceport officials address legislators at Florida Space Day

Senior management from NASA, the Air Force and other areas of the spaceport traveled to Tallahassee March 22 to discuss NASA's future with Florida Gov. Jeb Bush and the legislature during Florida Space Day.

An annual event for elected officials that spotlights space-related programs, this year's event provided a forum for discussing the next steps to achieve the Nation's space exploration vision, as well short-term milestones in the U.S. space program, including the safe return to flight of the Space Shuttle and continuing International Space Station assembly missions later this year.

During the daylong event, representatives from Florida's \$4.5 billion space industry briefed Governor Bush, Lt. Governor Toni Jennings and Florida legislative leaders at the state capitol. Space-focused hearings with officials also

discussed how the space exploration vision will present new opportunities across Florida.

There are more than 180 space-related businesses in 46 counties employing 23,000 Floridians.

For the sixth year in a row, officials from NASA, the Air Force, Florida Space Authority, ASRC Aerospace, Boeing, Delaware North Park Services, Jacobs Sverdrup, Lockheed Martin, SPACEHAB, Space Gateway Support, United Space Alliance and Wyle Labs participated in the event.



ABOVE, KSC Director Jim Kennedy addresses members of the legislature during Florida Space Day



CENTER DIRECTOR Jim Kennedy (left) discusses NASA's future with Florida Gov. Jeb Bush at Florida Space Day, along with Capt. Winston Scott, executive director of the Florida Space Authority (second from right), and Martin McLellan, vice president of ground operations at SPACEHAB.

Expert analysis team ensures mission success

By Jennifer Wolfinger
Staff Writer

The Mission Analysis Branch is the crucial team that dots the "I's" and crosses the "T's" for all Kennedy Space Center Expendable Launch Vehicle missions from liftoff through spacecraft separation and sometimes beyond.

Part of the Launch Services Program's Engineering Division, the branch comprises approximately 60 civil servants and support contractor engineers. They analyze the launch vehicle to verify that vehicle and payload requirements are satisfied.

"This directly relates to mission success by minimizing the likelihood of an issue arising during ascent and on orbit that could cause a launch vehicle failure," said Mike Carney, who's been branch chief since 1998. "We also work the advanced planning stage of a mission long before launch.

"This effort helps NASA payload customers understand vehicle performance and characteristics that can directly impact the design of the spacecraft."

The branch includes teams with considerable expertise in specific launch vehicle analysis disciplines. These include trajectory design, flight controls/software, structural dynamics, thermal and aerodynamics, stress/structures, and electro-

magnetic interference/compatibility. Additionally, the Information Technology team oversees several workstations, servers and simulation codes to fulfill the unique software and hardware needs.

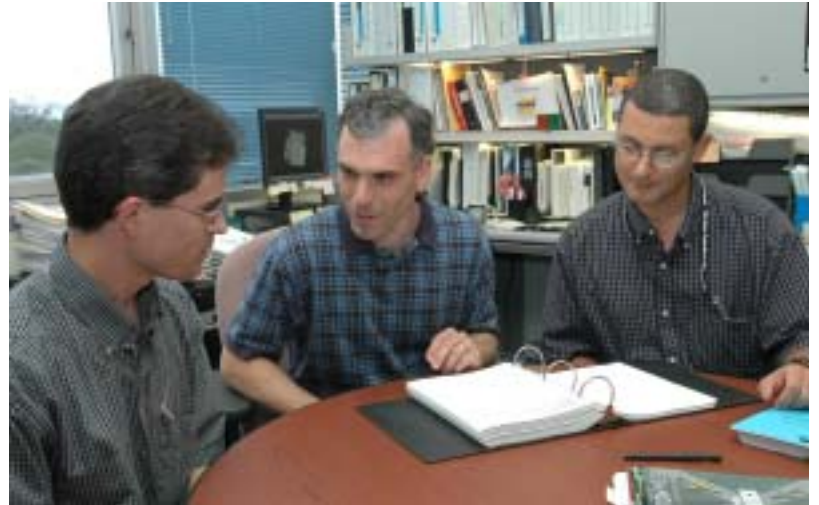
Launch vehicle contractor and branch engineers partner to review the results of detailed contractor analyses. If the issues are complex or high risk, branch experts may perform an independent analysis and then compare results with the launch vehicle contractor's data.

If problems are discovered, the two organizations collaborate to determine its cause, and develop and execute a corrective plan.

"The analysts work very hard in the resolution of these problems," Carney shared. "Seeing how the excellent technical quality of their work contributes to the goals and objectives of the mission being met is very rewarding."

Some current projects include trajectory analysis for the Mars Reconnaissance Orbiter mission, in-depth thermal modeling of the Delta IV upper stage to help resolve an issue for the NOAA/GOES-O mission, and running several Atlas V simulations to verify unique requirements for an upcoming Pluto mission. Additionally, the team continues to support numerous Delta II and Pegasus missions.

Generating a launch vehicle data book when payloads carry



TIM WIDRICK (above left), Mike Carney and Ayman Abdallah of the Mission Analysis Branch discuss an upcoming mission. Below, co-workers Dawn Trout and Nick Billiris review payload requirements for a mission.



nuclear material is another branch responsibility. "These data books examine possible vehicle failures and analytically determine the probability of these failures," explained Carney.

"This information is used to help quantify risk of launch vehicle accidents, aid in minimizing risk to the public, and ultimately acquire launch approval for these payloads."

Congressman talks to employees about future



CENTER EMPLOYEES attended a meeting featuring Congressman Dave Weldon and KSC Associate Director Jim Hattaway March 24 at the Training Auditorium. The meeting addressed Return to Flight details and funding for the Vision for Space Exploration. A question and answer session followed.

Howard, Lovell launch Apollo 13 DVD



RON HOWARD (left), director of the film "Apollo 13," and Jim Lovell, commander of the mission, spoke to Visitor Complex guests March 22 for the release of the Apollo 13 anniversary edition DVD.

Return to Flight update: Raffaello results

The module that will deliver food, clothing, spare parts and research equipment to the International Space Station is being prepared for the Space Shuttle Return to Flight mission.

The Italian-built Multi-Purpose Logistics Module Raffaello is filled with cargo at KSC's Space Station Processing Facility. Raffaello will carry 12 large containers to the International Space Station (ISS). Included in the cargo is the Human Research Facility-2 (HRF-2), which will expand the ISS capability to support human life sciences research.

A similar facility, HRF-1, has conducted research since it was installed into the Destiny module in May 2001. The research includes using an ultrasound unit measuring bone loss and a gas analyzer system.

"This is a significant milestone for the Station," said Bill Gerstenmaier, ISS program manager. "With Raffaello's supply transport capabilities, we will be in a better posture onboard the Station after this first Shuttle mission."

"Raffaello will also deliver a unique biomedical research capability with the HRF-2. It will help us learn more about humans living in space."

Using the ISS to study human endurance and adaptation in space, and to test new technologies and techniques, NASA will prepare for the longer journeys to the Moon, Mars and beyond.

Biomedical instrumentation aboard HRF-2 includes a pulmonary function system for use in conjunction with exercise equipment to obtain measurements of aerobic capacity and cardiac output; a refrigerated centrifuge used to separate biological substances of differing densities; a space linear acceleration mass measurement device to determine the on-orbit mass of crewmembers; and an upgraded workstation used for data handling and storage.

Scientific data generated by the HRF will provide insight into how crewmembers adapt to long-duration space flight and will assist in developing procedures to ensure crew health for longer journeys through the Solar System.

The first of the supply racks and the HRF-2 rack was installed in Raffaello at KSC in early March. The HRF Project is managed by Johnson Space Center and implemented by Lockheed Martin in Houston. Raffaello was built by the Italian Space Agency for NASA under a

cooperative space agreement.

The astronauts of the Space Shuttle Discovery then got a chance to work with some of the equipment they will be taking to space. Flight commander Eileen Collins and her crew were at KSC for the Payload Crew Equipment Interface Test.

The astronauts performed tests to ensure the equipment for the mission's three spacewalks worked properly, and they inspected the cargo containers installed in Raffaello.

They performed fit checks on the Thermal Protection System (TPS) repair sample box, the Control Moment Gyro (CMG), and the External Stowage Platform-2 (ESP2).

The new gyroscope will replace an inoperable one on the International Space Station. CMGs provide attitude control for the Station, keeping it properly positioned in space.

The ESP2 will carry replacement parts to the Station. The platform will be deployed, attached to the station's airlock and used as a permanent spare parts facility.



TECHNICIANS WATCH as the Control Moment Gyroscope and Small Adapter Plate Assembly are lowered toward the Lightweight Multi-Purpose Experiment Support Structure Carrier. The CMGs provide altitude control for the outpost.



ABOVE, members of the STS-114 Crew Equipment Interface Test in the Space Station Processing Facility. Seen here looking at tile specialists Stephen Robinson (left) and Wendy Lawrence (right), who is with the Japanese Aerospace Exploration Agency.

AT LEFT, inside the Multi-Purpose Logistics Module Raffaello, Boeing specialists Lilita Villarreal (center), a Boeing specialist Wendy Lawrence (left) and a Boeing specialist Stephen Robinson (right) are working on the module.

Supply module ready for ISS visit



AT LEFT, in the Space Station Processing Facility, the Rack Insertion Device moves the Human Research Facility-2 science rack toward Raffaello (at left).

ABOVE, technicians begin moving resupply stowage bags into the Italian-built Raffaello. The bags will be placed in containers known as resupply stowage racks.



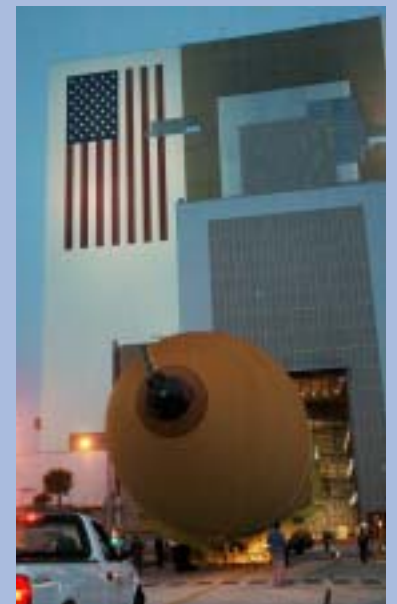
AT RIGHT, technicians in the Space Station Processing Facility place resupply stowage bags into containers known as resupply stowage racks inside Raffaello.



4 crew conduct a payload... the Space Station Processing... samples are mission... and Soichi Noguchi (right),... ce Exploration Agency.

Logistics Module Raffaello, ...g engineer, talks to mission ... and Soichi Noguchi (right).

Second redesigned External Tank arrives



THE SECOND redesigned External Tank (ET-121) moves slowly on the road from the Turn Basin to the Vehicle Assembly Building. The tank recently arrived at the Turn Basin aboard a barge after its 900-mile journey at sea from the Michoud Assembly Facility in New Orleans. In addition to the Return to Flight modifications, this tank has been outfitted with temperature sensors and accelerometers, used to measure vibration. These sensors will gather information about how the tank performs during flight.

New training institute slated for June opening

By Jennifer Wolfinger
Staff Writer

As Kennedy Space Center grows, so does the demand to train new and current employees. To meet these needs, the Center launched an effort to build a new training facility more than five years ago.

The design concept and its funding followed, and in April 2004 builders broke ground behind the Headquarters building to construct the core of the facility. The design allows for future expansion of at least four additional classrooms.

The 6,600-square foot building, tentatively referred to as the Kennedy Learning Institute, consists of offices, an open meeting area, a kitchen and an amphitheater. Employees should be able to enjoy the amenities in a comfortable learning environment this June.

Jim Norman, chief of the Human Resources Development Office, said the facility's main classroom can accommodate an estimated 50 people, compared to KSC's standard meeting rooms that allow for approximately 30 people. According to Norman,



the facility is designed for traditional classroom learning and will be equipped for video teleconferencing and distance learning. Updated network communications will enhance the type of resources available to instructors and significantly increase the on-site learning opportunities for the evolving work force.

"I'm excited we're going to have a state-of-the-art facility in close proximity to the Headquarters and Operations and Check-

EMPLOYEES FROM the Human Resources office stand near the nearly completed training institute, including (from left) Loretta Dreier, Robert Hubbard, June Perez, Beckie Lewis, Pat Simpkins, Jim Norman and Mark Thompson. Simpkins is director of Human Resources.

out buildings that's able to handle a large group of employees," Norman said. "It's suitable for training and development activities, as well as conferences and meetings."

This facility does not replace the existing Training Auditorium, which has seating for more than 150 people and offers NASA TV capabilities.

If communication tools are available, a NASA conference will take place at the facility in May. To schedule the facility, contact Karen Milford at 867-2082.

Titusville's Jones, Edmunds and Associates serve as the architect engineers and Canaveral Construction is the general contractor.

SKYLINE . . .

(Continued from Page 1)

job much easier by their can-do attitude and cooperation in preparing for the next hurricane season in a timely manner," Sumner said. "The Press Site carries unique challenges, given the various arrangements for facility ownership and the fact that the supplemental funding can only be used for NASA-owned facilities."

The grandstand, built in 1967, had a seating capacity of 350.

A total of 130 launches from the twin pads at Launch Complex 39 - 17 of the Saturn V and 113 of the Space Shuttle - were viewed by the press from the grandstand beginning with Apollo 4, the first launch of an unmanned Saturn V rocket, on Nov. 9, 1967, and concluding with STS-107, Space Shuttle Columbia's final launch, on



The ABC Television Network skybox is demolished as part of the hurricane repairs funded by a \$125.5 million emergency supplemental authorization KSC received in November 2004.

January 16, 2003.

The ABC Television Network's skybox replaced a ground-level ABC newsroom and

was erected following the conclusion of the Apollo program to support network coverage of Space Shuttle launches.

Tell students how your career has evolved as a KSC engineer

The following student groups have requested a KSC engineer to speak to them regarding engineering as a career:

- April 13: Seventeen 11th and 12th grade students for approximately 30 minutes at Center for Space Education Building at the Visitor Complex
- May 4: Forty-five 8th grade students for 30 minutes at Center for Space Education Building.

Please contact patricia.j.gillis@nasa.gov if you are interested.

Rapid-growing radishes to help sustain explorers

By Cheryl Mansfield
Staff Writer

Radishes: you've probably never given them much thought, or respect, for that matter. They're crunchy, a little spicy, and add some color to your salad. But they're not exactly a dietary staple, and growing them certainly isn't rocket science - or is it? Surprisingly, at Kennedy Space Center, the two are related.

When NASA's astronauts venture into space, they need food. Aboard the International Space Station, the crew depends upon supplies ferried from Earth by the Space Shuttle and the Russian spaceships.

But on longer journeys to fulfill NASA's mission to the Moon, Mars and beyond, successfully growing food in space will be essential to supplementing their prepackaged diet. And the lowly radish, which gets so little respect, is actually an excellent candidate for the kind of experiments that will help our astronauts sustain themselves on long space flights.

The state-of-the-art Space Life Sciences Lab represents a partnership between NASA and the state of Florida. It's here that research is under way to perfect the methods for equipping our astronauts with the ability to become farmers in space.

"The overall goal of what we try to do with the plant research is looking at candidate crops to support long-duration space missions," says Dr. Gary Stutte, one of the principal investigators at the facility. "Then we look at the various environmental

factors and conditions affecting growth."

A spacecraft has its own self-contained environment. This research will help produce guidelines for maintaining a safe and healthy atmosphere for both plant growth and the crew that will share this setting. Researchers want to determine how the continuous exposure to common contaminants in the spacecraft might affect the growth and development of the space veggies.

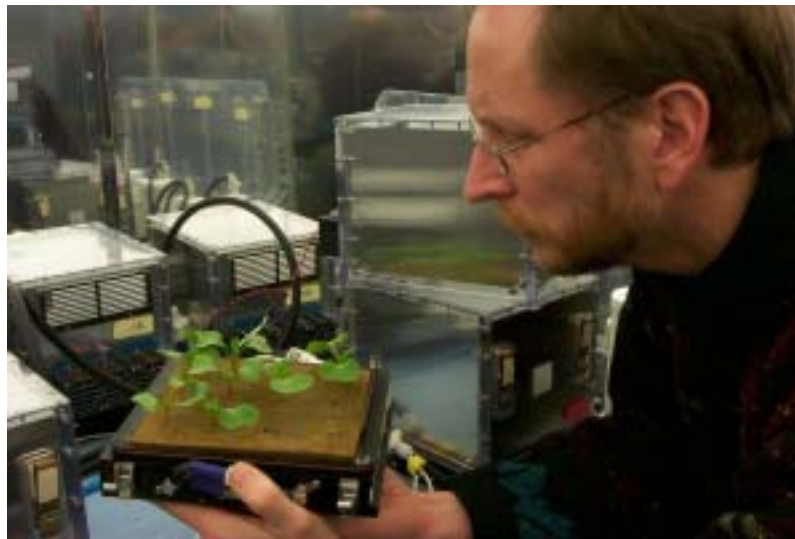
So why choose the radish as the focus of the experiments? The easy-to-grow vegetable has been identified as a salad crop for space missions because it is small, grows rapidly, provides essential nutrients and gives variety to the diet.

The experiments under way are conducted in specially designed plant-growth chambers. Within that closed environment, it's possible to measure the effects of different levels of the common contaminants present in a spacecraft on plant growth, while controlling other factors like temperature, water, light and nutrients.

The goal is finding safe, allowable levels of these contaminants within the plant-growth chambers that will be used to raise crops aboard long-term space missions.

But just what kinds of contaminants are present in a spacecraft that could affect these plants? There are many, and some come from surprising sources. The current radish experiment at KSC is focused on one common by-product.

Since water floats in space,



DR. GARY STUTTE, a principal investigator at the Space Life Sciences Lab, examines radishes grown in a specially designed plant-growth chamber. At left is an up-close view of the radishes.

astronauts depend heavily upon moist wipes similar to those you might use to wash your hands when traveling. These wipes contain alcohol that evaporates into the spacecraft's air and is maintained at a level safe for humans.

But this airborne alcohol - in just a small percentage of the allowable safe limit for the crew - can kill the radish plants and affect even the soil they grow in. Grown in air with just 10 percent of the allowable alcohol limit, the radishes are undersized.

With 25 percent of the limit,

the plants die.

Multiply this problem with other contaminants present in a spacecraft - benzenes, isoprenes, aldehydes, to name a few - and the researchers have their jobs cut out for them.

"It's something we need to worry about if (the salad crops being studied) are going to be a life support," says Stutte. "The levels may be healthy for humans but harm the plants. Other things might be very harmful to humans but be safe for the plants. These are the kinds of questions we look at."

ISS traveling exhibit stops at Visitor Complex

NASA RECENTLY brought the excitement of human space flight to the Kennedy Space Center Visitor Complex, offering a new interactive exhibit that puts visitors "inside" the International Space Station. Visitors boarded "Space Station Imagination" to catch a glimpse of how astronauts live and work in space. The exhibit is comprised of two 48-foot trailers linked to form two modules of the Space Station: the Habitation Module, or living quarters, where the astronauts sleep and tend to personal hygiene, and the Laboratory Module where multiple microgravity experiments are



Return to Flight is theme of 2005 All American Picnic

This year's picnic will have a Return To Flight theme and many special events. The day will start with a parade and RTF Rally, which will include several cheerleading squads showing the RTF spirit throughout the day.

Stop by the RTF tent highlighting the excellent work done by the KSC team. Attendees can take advantage of the Pad B drive-by for a look at Space Shuttle Discovery.

Tickets will be offered at a discount if purchased before April 6. The cost is \$5 for adults and \$3.50 for children ages 3 through 12, and ages 2 and under are free. Although children 2 and younger are free, tickets must still be obtained for them.

Everyone entering the park is required to obtain a ticket. If purchased after the discount period, the regular cost is \$7 for adults and \$5 for children ages 3 through 12.

The admission fee includes the children's carnival and rides, children's games, fishing tournament for kids, entertainment, the wild cats, sport games,

pony rides, K-9 show, displays, a car show, and lunch and drinks; however, ethnic food booths will be offering additional selections for a small fee.

Tickets will be available at the following locations: The sundry store of the Headquarters Building, Operations and Checkout Building, Space Station Processing Facility and Operations Support Building; Hangar I Annex, room 204 (see Peggy Parrish); KARS Country Store; and NSLD, cube 659 (see Debbie Doyle).

Some of the bands scheduled to perform include Saturn 5 ('50s-70s rock and roll), Proximity Effect ('70s-90s rock and roll), Roughouse (classic rock and blues) and RockIt (classic rock, alternative and funk).

A variety of family sports will be offered, including a closest-to-the-pin contest, bingo, a 3-legged race, egg toss, pie eating, a fishing tournament and much more. Children will enjoy a carousel, pony rides, two jumping tents, free cotton candy, popcorn, snow cones and face painting.



TICKETS ARE on sale for the 2005 KSC All American Picnic, including a discount offer until April 6. Kicking off the ticket sale are, from left, Dr. Woodrow Whitlow, deputy director; Bob Gerron, picnic publicity co-chairman; Jim Kennedy, Center director; Phil Bennardo, picnic chairman; and Jim Hattaway, associate director.



In addition, groups such as the KSC Barracudas Scuba Diving Club, Spaceport Rocketry Association, Military Vehicle Preservation Association and

others will offer information about their activities. Visit www.kscpicnic.ksc.nasa.gov for information.

Environmental and Energy Awareness Week celebrates progress

The annual KSC Environmental and Energy Awareness Week activities will take place April 20-21 with the theme "Progress and Challenges since the initial Earth Day Celebration in 1970."

There will be more than 35

exhibitors, six tours and various alternative-fueled vehicles on display. The event kicks off with a breakfast April 20 at 8:30 a.m. in the Space Station Processing Facility Cafeteria (tickets cost \$4), followed by the opening of an exhibition tent in the Opera-

tions and Checkout Building parking lot from 11 a.m. to 2 p.m. On April 21, an exhibit area will be set up in the Vehicle Assembly Building parking lot E.

"This is an excellent time to learn about our successes and what you can do to continue to

foster environmental stewardship, energy conservation and continual improvement through increased awareness," Center Director Jim Kennedy said.

Visit <http://eeaw.ksc.nasa.gov> for details.

Debus Award Banquet to honor aerospace achievers

The National Space Club Florida Committee will present the Dr. Kurt H. Debus Award honoring significant contributions to the advancement, awareness and improvement of aerospace in Florida. This award will be presented at the 16th annual Debus Award Banquet on April 16 at the Kurt H. Debus Center at the Kennedy Space Center Visitor Complex. KSC Director Jim Kennedy will be the keynote speaker.

Cost is \$75 for members or \$85 for non-members and corporate tables of 10 cost \$800. Attire is black-tie optional.

Reservations must be received no later than April 8. Make reservations with Sandy Andre at sander@cfl.rr.com or 867-5194. The winners of the 2003 and 2004 Debus Awards were Adrian Laffitte with Lockheed Martin and John "Tip" Talone with NASA.



John F. Kennedy Space Center

Spaceport News

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