

Spaceport News

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

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KSC helps NASA return to moon in 2009, looks beyond

By Allard Beutel
Spaceport News

Kennedy teams launched 14 missions in 2009 -- eight on expendable launch vehicles, five on space shuttles and the first new rocket to liftoff from the center in more than a quarter of a century, the Ares I-X.

The expendable launch vehicle mission that received the highest public attention was NASA's first moon flight in 10 years, the Lunar Reconnaissance Orbiter and Lunar Crater Observation and Sensing Satellite, or LRO/LCROSS. It launched June 18 aboard an Atlas V rocket from Cape Canaveral Air Force Station. LRO is designed to orbit the moon and relay the most detailed data about the lunar surface and environment. LCROSS' mission was to impact into the lunar surface to confirm the presence of frozen water in a permanently shadowed crater at the moon's south pole, which it did in October.

In March, NASA's exploration eyes looked deep into space with the launch of the Kepler mission aboard a Delta II rocket from Cape Canaveral. Kepler is designed to find the first Earth-size planets orbiting stars at distances where water could pool on

the surface.

Kennedy helped the National Oceanic and Atmospheric Administration with two launches in 2009. First in February, the NOAA-N Prime spacecraft launched from NASA's Space Launch Complex-2 at Vandenberg Air Force Base in California aboard a Delta II rocket. The new polar-orbiting satellite will improve weather forecasting and climate research. Then in June, the latest Geostationary Operational Environmental Satellite, GOES-O, soared into space on a Delta IV rocket from the Cape. NOAA's GOES-O satellite will improve weather forecasting and monitor environmental events around the world.

NASA's Launch Services Program at Kennedy also supported two launches for the U.S. Missile Defense Agency, the Space Tracking and Surveillance System-Advanced Technology Risk Reduction spacecraft, or STSS-ATRR in May from Vandenberg and the STSS-Demo mission in September from the Cape.

On Feb. 24, NASA's Orbiting Carbon Observatory, or OCO, failed to reach orbit after its liftoff aboard a Taurus XL launch vehicle from Launch Pad 576-E at Vandenberg. An investigation concluded the



Photo courtesy of Scott Andrews/Canon

An Atlas V rocket with NASA's Lunar Reconnaissance Orbiter, or LRO, and the Lunar Crater Observation and Sensing Satellite, or LCROSS, shoot toward the moon from Launch Complex-41 at Cape Canaveral Air Force Station on June 18 at 5:32 p.m.

OCO mission was lost when the payload fairing of the Taurus failed to separate during ascent.

Kennedy ended the year with the successful launch of NASA's Wide-field Infrared Survey Explorer, or WISE, spacecraft aboard a Delta II on Dec. 14 from Vandenberg. WISE will survey the entire sky in infrared light, picking up the glow of millions of objects never seen before.

Kennedy sent five shuttle missions safely and successfully on their way in 2009. First on March 15, space shuttle Discovery and its seven-member crew

lifted off from Launch Pad 39A on the STS-119 mission to deliver the final set of large power-generating solar array wings and a new crew member to the International Space Station.

Then on May 11, shuttle Atlantis and its seven-member crew lifted off on the fifth and final shuttle mission to repair and upgrade NASA's Hubble Space Telescope, leaving the world-famous orbiting observatory in better shape than ever before and extending its life at least five more years.

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NASA/Jim Grossmann

Center Director Bob Cabana, left, congratulates Roderick Roche, senior manager of SunPower Corp.'s Project Management Office of North America, for his part in the construction of NASA's first large-scale solar power generation facility. Eric Silagy, Florida Power & Light Company vice president and chief development officer, looks on. The facility is the first element of a major renewable energy project under construction as Kennedy continues to expand its environmentally friendly and recycling initiatives.

From KENNEDY, Page 1

Two months later in July, shuttle Endeavour and its seven-member STS-127 crew launched on a 16-day mission to deliver the final segment of the Japan Aerospace Exploration Agency's Kibo laboratory and a new crew member to the space station. On Aug. 28, shuttle Discovery and its seven-member crew launched on the STS-128 mission to deliver supplies, equipment and a new crew member to the station.

The final shuttle mission of 2009, STS-129, began on Nov. 16 with shuttle Atlantis launching with its six crew members. They delivered critical spare parts and equipment the space station will need after shuttles stop flying. Kennedy also held its first "Tweet up" event during the STS-129 launch, bringing in 101 Tweepers from 21 states and four countries with an estimated 150,000 followers. Atlantis brought back Expedition 21 Flight Engineer and Florida native Nicole Stott, the last station astronaut scheduled to return from or launch to the orbiting laboratory aboard a space shuttle.

Bad weather kept two shuttle missions from ending at Kennedy -- Atlantis' STS-125 flight and Discovery's STS-128. Both landed at Edwards Air Force Base in California and had to be flown back on top of NASA's modified 747 aircraft. One special passenger aboard Discovery's ferry flight to Florida was Disney's toy astronaut Buzz Lightyear. The space toy was

returned to Walt Disney World in Orlando for an Oct. 2 event that was the launching point for new NASA educational efforts to encourage students to pursue studies in science, technology and mathematics.

Currently, there are only five scheduled shuttle missions left for NASA before the program's scheduled retirement in 2010.

In April and May for what was expected to be the last time for the agency's Space Shuttle Program, two shuttles, Endeavour and Atlantis, stood poised on both Launch Complex 39 launch pads.

Pad B already had been undergoing modifications for the first flight of the new program. Three, 600-foot-tall lightning towers were assembled this year at the pad to accommodate the taller Ares next-generation rockets.

Going from the drawing board to the launch pad in just a few years, Ares I-X lifted off Launch Pad 39B on Oct. 28. The flight test lasted about six minutes from launch until splashdown in the Atlantic Ocean. Among the systems tested, the rocket's more than 700 sensors will provide ascent data for future flights. Other work at Kennedy for the Constellation Program included ongoing construction of a new, lighter and taller mobile launcher, renovations on Kennedy's historic Operations and Checkout Building high bay for use as the final assembly facility for the Orion crew exploration vehicle, and a test in April under real and simulated weather conditions off the coast of Kennedy that used a full-scale

mock-up of the Orion spacecraft.

Kennedy continued to expand its environmentally friendly and recycling initiatives this year. Five facilities are qualifying for the U.S. Green Building Council's Leadership in Energy and Environmental Design, or LEED, certification. The Life Support Facility already earned silver certification in 2009, and the Propellants North Facility is expected to receive the highest rating, platinum, when it is complete in the summer of 2010.

In May, NASA and Florida Power and Light, or FPL, held a groundbreaking ceremony for new solar power facilities at Kennedy. FPL will build and maintain two solar photovoltaic power generation systems on Kennedy property, a one-megawatt solar farm for Kennedy's use and a 10-megawatt one for Florida residents. The one-megawatt facility officially was commissioned in November and has been providing power to Kennedy for several months. The 10-megawatt facility is set to be complete in April 2010. At the ceremony, Center Director Bob Cabana announced plans to pursue a new renewable energy research and development facility at Kennedy's under development business center, Exploration Park.

In October, Kennedy and Starfighters Inc. of Tarpon Springs, Fla., signed a cooperative Space Act Agreement enabling the company

to become a tenant at Kennedy's Shuttle Landing Facility where it will launch a new business venture with a fleet of privately operated Lockheed F-104 Starfighter aircraft. The new venture also is enabled by Space Florida, which has entered into separate agreements with Starfighters to use a state-built hangar at Kennedy.

In July, Kennedy helped celebrate the 40th anniversary of the Apollo 11 launch to and first steps on the moon with a ceremony at the center's visitor complex. Several Apollo astronauts attended the event, which featured the opening of the Apollo Treasures Gallery.

On July 30, Kennedy helped support a public meeting in Cocoa Beach, Fla., of the Review of U.S. Human Space Flight Plans Committee, led by Norm Augustine. The blue-ribbon panel was requested by President Barack Obama's administration to conduct an independent review of America's human spaceflight plans and programs, as well as alternatives. The committee's report was issued in October to the White House and NASA.

While final decisions about future space exploration plans, including the Space Shuttle and Constellation programs, haven't been announced, NASA's Kennedy Space Center and its work force are expected to be a vital part of those endeavors in 2010, into the next decade and beyond.



NASA/Amanda Diller

An online enthusiast tweets during STS-129 mission preflight briefings. More than 100 Tweepers from 21 states and four countries with an estimated 150,000 followers took part in Kennedy's first Tweet up event.

Spaceport ERT takes third in top competition

Armed with an entirely new team of officers, Kennedy Space Center's Emergency Response Team, or ERT, won third place among 52 teams at the 27th annual SWAT Round-Up International 2009.

Taking a brief hiatus in 2008, the ERT, comprised of SGS employees, was back and ready for competition Nov. 29. They joined special operations teams from as far as Sweden and Germany in Orlando, Fla., for the five-day event that combined education and training seminars with competitions and a trade show.

"It is very prestigious to be in the top three of an international event of this magnitude," said Capt. Dan Magetteri. "The competition was incredibly difficult, in some cases the top five teams were separated by less than one second."

A crowd of about 2,000 spectators watched the teams go head-to-head in five team competitions -- hostage rescue, pritcher scramble, officer rescue, tower scramble and the obstacle course. Each competitive event was timed for speed, accuracy and attention to detail in performance.

For their protection, the names



Photo courtesy of Mark Weaver

Kennedy's Emergency Response Team, or ERT, carries an officer pretending to be injured out of a simulated chemical environment at the 27th annual SWAT Round-Up International 2009 event. The team traveled over a canal and engaged in several simulated threats during the officer rescue challenge.

of Kennedy's ERT members are being withheld.

"Of the nearly 416 competing individuals, our great team of eight displayed endurance, patience, resilience and teamwork in finishing third overall among the 'Best-of-

the-Best,'" said one team member.

The Lakeland (Fla.) Police Department finished first in "Best-of-the-Best," while the Alachua County Sheriff's Office in Florida came in second.

Kennedy has entered the event

More online

For more on the competition, go to:
www.swatroundup.org

25 of the 27 years it has been held. The group missed the event in 2001 after the 9-11 terrorist attacks and in 2008 because of a shortage of staff.

With poor weather conditions and a muddy course, the Kennedy team members performed flawlessly during the hostage rescue event. The obstacle course took them through 16 physically challenging obstacles, and the officer rescue competition took them over a canal and into a simulated chemical environment.

Two members of the Kennedy team competed in the individual competition called Super SWAT Cop., taking home 13th and 14th places. The team also supported the German team by loaning it weapons and equipment.

A team member said, "The real learning for these teams takes place in exchanging ideas and discussing techniques, which will keep people alive in times of crisis."

South Florida undergraduates launch weather balloon, future

Sixteen undergraduate students, who might someday invent a sustainable lunar outpost or launch rockets and groundbreaking research satellites into space, participated in a five-day Space Florida Academy program at Kennedy on Dec. 14-18.

The academy, sponsored by the Florida Space Grant Consortium in conjunction with Kennedy and Space Florida, provided the University of Miami, or UM, and Florida International University, or FIU, students an opportunity to get some hands-on experience in preparing meteorological balloon payloads for flight,

as well as educational and work force briefings at key Kennedy facilities.

Each South Florida student currently is working to obtain a degree in STEM-related fields, such as mechanical, environmental, electrical or aerospace engineering, computer science, physics or mathematics.

The group from FIU included Leslie Paredes, Natalia Posada, Marina Acevedo, Paul McCall, David Swait, Lester Marti, Philip Gregor, Kerim Dickson, Jorge Ramon Mesa and Raul Galindo. The students from UM were Marlo Wyant, Kimberly Reichel, Derek Schesser, Fernando Carrera,

Joshua Jeffreys and Blake Pico.

The group toured Kennedy's Applied Physics Laboratory, where physicists and chemists support NASA's many programs, as well as the Assembly and Refurbishment Facility where the shuttle's solid rocket boosters are refurbished and the Ares I-X forward assembly was put together.

"We met Dr. (Bob) Youngquist and his team at the Operations and Checkout Building and they set up several demonstrations at their physics labs. It was the highlight of the week for me," Reichel said. "This experience will help me refine

my career goals and have exposed me to fields I would not have considered before."

The activities culminated Dec. 18 with the release of the scientific balloon with GPS and a live camera payload from Kennedy. The balloon rose to almost 100,000 feet and allowed the students see the curvature of the Earth, while the GPS payload told them the direction in which the balloon was drifting.

Afterward, a special career guidance panel talked with the undergraduates about gaining summer internships at Kennedy, as well as aerospace job opportunities. Frank DiBello,

president of Space Florida, presented each of the participants with graduating certificates.

"What you have accomplished this week will provide you with superb experiences toward your career in the aerospace business," said DiBello. "Preparing and designing payloads, strong teamwork and meeting strict launch deadlines, these are invaluable work force lessons for your future employment."

The hope is these lessons and hands-on experiences will keep Florida's talented students working and living in the state well after graduation.

Scenes Around Kennedy Space Center



NASA/Glenn Benson

Workers monitor NASA's GOES-P meteorological satellite at the Astrotech Space Operations facility in Titusville, Fla., on Dec. 17. GOES-P, the latest Geostationary Operational Environmental Satellite, was developed by NASA for the National Oceanic and Atmospheric Administration, or NOAA.



NASA/Jack Pfaller

A transportation case protecting the Russian-built Mini Research Module 1, or MRM1, awaits offloading from a Ukrainian/Russian aircraft at the Shuttle Landing Facility on Dec. 17. Rassvet, the second in a series of new pressurized components for Russia, will be permanently attached to the International Space Station's Zarya module during space shuttle Atlantis' STS-132 mission. Launch is targeted for May 14.



NASA/Jim Grossmann

Workers dressed in clean room attire, known as bunny suits, prepare to shut the hatch on the International Space Station's Tranquility module in the Space Station Processing Facility on Dec. 14. Hatch closure is the final major processing milestone before transportation to Launch Pad 39A, scheduled for Jan. 15.



NASA/Jack Pfaller

The tower on a new mobile launcher, or ML, for NASA's Constellation Program continues to grow behind the Vehicle Assembly Building as the seventh segment balances into position Dec. 21. When completed, the tower will be about 345 feet tall and have multiple platforms for personnel access.



NASA/Jim Grossmann

Center Director Bob Cabana welcomes sixth-grade students to the Kennedy Space Center Visitor Complex during Brevard Space Week 2009 in December. Space week events introduce students to space exploration activities at Kennedy, including hands-on projects and listening to an astronaut talk about spaceflight. Since 2004, more than 25,000 sixth-grade students have participated in this innovative program, with 5,200 more expected to participate this year. Space week events are sponsored by NASA Education, the Brevard Schools Foundation, Delaware North Parks and Resorts, and the Florida Chapter of the National Space Club.



CDC celebrates holiday season

Kennedy's Child Development Center hosted its annual Holiday Celebration on Dec. 11. Activities included a gift exchange and a party afterward. Infants, toddlers and pre-school classes had the opportunity to meet Santa Claus and share their holiday wish list. Kids, ages 3 and 4, left, put on a program for parents.



Spaceport News wants your input

Send photos of yourself and/or your co-workers in action for possible publication. Photos should include a short caption describing what's going on, with names and job titles, from left to right. Also, if you have a good story idea chime in. Send your story ideas or photos to:

KSC-Spaceport-News@mail.nasa.gov

Chemist earns title as Kennedy's best in 2009

By *Steven Siceloff*
Spaceport News

You may not know who Tracy Gibson is, but one day you might ride on an airplane he has made safer.

Gibson is a senior principal investigator for ASRC Aerospace



NASA/Jack Pfaller

Tracy Gibson is researching wire coverings that heal themselves, resulting in safer aircraft and space travel. Gibson was given Kennedy's first Engineer/Scientist of the Year award for contractor employees at a ceremony Dec. 1.

Corp's work at Kennedy.

The invention he hopes will revolutionize spaceflight and air travel is self-healing wiring. If he and his team of researchers can perfect the right compound, odds are a lot of people, from astronauts and pilots to aircraft passengers, will have him to thank for preventing a potentially catastrophic short circuit.

Because the wiring repair field is so fresh, many approaches are being examined. Some designs embed tiny capsules inside wiring insulation.

When the insulation rips open or tears, the capsules break and the material inside oozes out and then hardens to close the gap. But that method won't likely work for aerospace applications because spacecraft and airplanes require flexible wiring, Gibson said.

He basically is searching for a compound that pulls itself back together after a tear.

Gibson's research into that burgeoning field and his scientific work on other projects has been recognized with Kennedy's first Engineer/Scientist of the Year

award for contractor employees.

Gibson's other projects range from a chemical analyzer that can fit on a rover to refining hazardous materials detectors. NASA's Bob Youngquist earned the honor for the agency's researchers at Kennedy.

Scientists here note that research at Kennedy is expected to produce a tangible product that can be applied to a spacecraft, ground support equipment or another aspect of launch, processing or operations. For Gibson, the payoff of applying his work is one of the many rewards of his post.

"I feel pretty privileged with the work I get to do and at the end you get to see how it might impact the future of space and aerospace," he said. "It's exciting work, it keeps me on my toes. I'm not sure I could ask for anything more."

Gibson and his team spend considerable time in labs at Kennedy, whether at the Space Life Sciences Laboratory or inside the Operations and Checkout Building's facilities. Sometimes, the field work takes him far off-center.

For example, his team took a trip to Hawaii last year to evaluate

a very small mechanism that could analyze moon dust looking for signs of chemicals which could be turned into water or used as rocket fuel for astronauts living on the moon.

Gibson praises the team approach employed at the center, saying there aren't many trouble spots his group isn't willing to delve into.

"What I view our group as is problem solvers," Gibson said. "We've got very talented folks here at Kennedy. We can sit and brainstorm and overcome the problem."

At 39, Gibson has plenty more time for research and development. Even if he doesn't revolutionize wiring, he and his team are gaining expertise in a variety of areas that he thinks will pay off for the agency and public at some point.

"I just hope that by the time my career ends, I will have developed technologies that will have been utilized by NASA or by some industrial use that's made a difference," Gibson said. "I just would like to know that I've worked hard at what I've done and I've helped push technology forward."

Engineers the foundation of space exploration

By *Steven Siceloff*
Spaceport News

Engineering and research performed at Kennedy can get overshadowed at times by the spectacle of launches, but that doesn't mean the work is any less ground-breaking.

"We've had some technology development expertise for many, many years that many people joke is the best kept secret in the agency," said Karen Thompson, chief technologist in Kennedy's Engineering Directorate.

Working in a variety of specialized laboratories and offices at Kennedy, about 550 engineers support

all of NASA's programs and projects, said Miguel Rodriguez, the deputy director for management of Kennedy's Engineering Directorate.

A sample of some of the current work by Kennedy's Engineering Directorate includes continuing improvements to the space shuttle, improving water and air recycling systems on the International Space Station and researching self-healing wiring. Kennedy engineers also are designing ground support equipment for the Constellation Program and working with other centers to develop habitation modules astronauts can live

in on other worlds.

Unlike research into fundamental questions of science, such as what far-off galaxies look like, the work by Kennedy's scientists and engineers is focused on turning out a product that improves spaceflight. Some development improves current technology while other work establishes brand-new designs. Still other innovations come from using existing technology in new ways.

"We're not looking to do basic research," Thompson said. "We look for how our areas of expertise can be used to solve problems and meet

technology needs."

The passion for working for the space program is one of the reasons engineers and scientists turn away lucrative offers to work elsewhere.

"The typical engineer who comes to Kennedy came because of what Kennedy does," Rodriguez said. "They are attracted by the excitement of flying, of going into space. Once they're here, they typically build a career that lasts generations."

Through the years, the directorate also emphasized advanced education for its staff.

"In the past, advanced

degrees weren't that important," Rodriguez said. "Starting in 1989, we started programs to get master's and advanced degrees."

The center also gets its share of younger engineers, providing a mix of capabilities. The more experienced staff gets to pass on expertise, while those new to the field can teach about new design programs and tools.

The directorate has gone through intense changes in recent years.

Created in 2006, the organization drew in agency engineers who

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Remembering Our Heritage

Retrieval of LDEF provided resolution, better data

By **Kay Grinter**
Reference Librarian

Lists of resolutions are traditional as each new year approaches. NASA's "resolve" to retrieve the Long Duration Exposure Facility was rewarded in January 1990 when the crew of STS-32 grappled the orbiting laboratory and hauled it back to Earth aboard space shuttle Columbia.

The facility, known as LDEF, was designed to glean information vital to the development of NASA's future space station and other spacecraft, especially the reactions of various space building materials to radiation, extreme temperature changes and collisions with space matter.

Its 57 experiments, self-contained in 86 desktop-sized, open trays mounted on the LDEF framework, included optical fibers and pure crystals for use in electronics, designed to study the effects of prolonged space exposure. Interstellar gases and cosmic radiation also would be trapped in an attempt to find clues into the formation of the Milky Way and the evolution of heavier elements.

More than 200

WORD ON THE STREET

NASA resolved to retrieve the Long Duration Exposure Facility in 1990. What is your New Year's resolution?

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principal investigators from 33 private companies, 21 universities, seven NASA centers, nine Department of Defense laboratories and eight foreign countries were involved in the project.

Fabricated at NASA's Langley Research Center, LDEF was delivered to Kennedy's now defunct Spacecraft Assembly and Encapsulation Facility-2, or SAEF-2, for final prelaunch processing in June 1983.

The 11-ton satellite was released into the space environment April 7, 1984, during space shuttle Challenger's STS 41-C mission, with former astronaut and Kennedy Director Bob Crippen at the helm.

Attitude control of LDEF was achieved with gravity gradient and inertial distribution to maintain three-axis stability in orbit. Therefore, propulsion or other attitude control systems were not required, making LDEF free of acceleration forces and contaminants from jet firings.

NASA's intent when the lab was set in orbit was to retrieve it 10 months later, in February 1985. However, scheduling problems and the loss of Challenger in 1986 caused a nearly five-year delay. With its orbit decaying, entry into Earth's atmosphere was expected by March 1990.

LDEF was captured by Columbia's STS-32 crew Jan. 12, 1990, after completing



NASA file/1990

NASA's Long Duration Exposure Facility, or LDEF, was deployed in orbit April 7, 1984, by space shuttle Challenger. Retrieval was scheduled for March 19, 1985, 11 months after deployment. LDEF eventually was retrieved Jan. 12, 1990, by space shuttle Columbia. Above is an overall side view of bays A through E on rows 2 through 5 with the LDEF on the remote manipulator system arm and the Earth in the background Jan. 12, 1990.

32,422 Earth orbits. With LDEF stowed in its payload bay, Columbia was the heaviest shuttle at that time to return from orbit, landing on a concrete runway at Edwards Air Force Base in California on Jan. 20.

Columbia was ferried back to Kennedy where LDEF was removed from its cargo bay in an orbiter processing facility, placed in a special payload canister, and transported to the Operations and Checkout Building, or the O&C, on Jan. 31.

In the O&C, LDEF was placed in the LDEF Assembly and Transportation System, or LATS, and moved back to SAEF-2 where Langley technicians began to remove the experiment

trays Feb. 23.

The protocol for tray removal was painstaking in its protection of scientific data. As each tray was removed, it was placed on a workbench where the principal investigator could perform closer inspections and take basic measurements. These measurements included detailing the sizes of micrometeoroid and orbital debris impacts.

The first experiment removed was the Space Exposed Experiment Developed for Students, or SEEDS, sponsored by the George W. Park Seed Co. Perhaps receiving the most publicity of any experiment on board, these tomato seeds would later be distributed to students across the United

States for use in school science projects. It was the first time students were offered the opportunity to do primary research using spaceborne material.

The photo-documentation and deintegration of all 86 experiment trays were complete by the end of March.

Although LDEF could have flown on another shuttle mission, it was not to be. However, seeing any good resolution through to completion is cause for celebration. LDEF's 69 months in space provided scientific data on the long-term effects of space exposure on materials, components and systems that has benefited NASA spacecraft designers to this day.

worked at Kennedy but were assigned to individual programs, such as the space shuttle or space station. Within the last year, the directorate also incorporated Applied Technology.

"Now we have the critical skills throughout the directorate to perform work ranging from (early) development through implementation," Thompson said.

As the agency's lead launch site, Kennedy handles missions from throughout NASA's network of field centers. So Kennedy's engineers are used to working closely with counterparts throughout the nation, sometimes all over the world for international projects.

"Kennedy has a great reputation for how well we partner with other centers, other agencies, industry, and academia," Thompson said.

Kennedy's role in the partnerships usually touches on several areas depending on a mission, but it almost always involves making sure a spacecraft's delicate sensors and systems can handle the vibration, acceleration and other conditions unique to launch.

"The difference is that we get those elements ready to go into space," Rodriguez said. "We are very good at integration, we're very good at problem-solving such that we can complete the process and fly."

NASA offers lunar exploration competition for students

NASA's Exploration Systems Mission Directorate is accepting proposals until Feb. 28 from teams of undergraduate and graduate students for its inaugural Lunabotics Mining Competition. The event will be at the Astronaut Hall of Fame near Kennedy on May 25-28.

Teams will design and build excavation systems that could be used for future lunar exploration. Designs will be tested in a head-to-head challenge to see which can excavate the most simulated lunar regolith, or dirt, during a specific timeframe. The competition also involves submittal of a systems engineering paper, as well as an educational outreach project.

The competition is designed to engage and retain students in the science, technology, engineering and mathematics, or STEM, disciplines critical to NASA's missions.

For information on the competition and how to register, go to: <http://www.nasa.gov/offices/education/centers/kennedy/technology/lunabotics.html>

For information about NASA's education programs, go to: <http://www.nasa.gov/education>

Space club calls for Debus award nominations

The National Space Club is requesting nominations for the Dr. Kurt H. Debus Award. It will be presented at the NSC's annual Debus Dinner on April 17, in the Debus Conference Center at the Kennedy Space Center Visitor Complex.

The award is presented annually in recognition for significant contributions to the advancement, awareness and improvement of aerospace in Florida.

Nominations must be made in writing and mailed by Jan. 22 to:
**Attention: Debus Award Selection Committee, P.O. Box 21243
Kennedy Space Center, FL 32815-0243**

Looking up and ahead . . .

No earlier than Feb. 2	Launch/CCAFS: Falcon 9, Window 11 a.m. to 3 p.m. EST
No earlier than Feb. 3	Launch/CCAFS: Atlas V, SDO; 10:53 to 11:53 a.m. EST
Targeted for Feb. 7	Launch/KSC: Endeavour, STS-130; 4:39 a.m. EST
No earlier than Feb. 25	Launch/CCAFS: Delta IV, GOES-P; Window 6:28 to 7:18 p.m. EST
Targeted for March 18	Launch/KSC: Discovery, STS-131; 1:34 p.m. EDT
Targeted for April 19	Launch/CCAFS: Atlas V, OTV; TBD
Targeted for May	Launch/CCAFS: Delta IV, GPS IIF-1; TBD
Targeted for May 14	Launch/KSC: Atlantis, STS-132; 2:28 p.m. EDT
Targeted for July 29	Launch/KSC: Endeavour, STS-134; 7:51 a.m. EDT
Targeted for Sept. 16	Launch/KSC: Discovery, STS-133; 11:57 a.m. EDT
No earlier than Oct. 1	Launch/VAFB: Taurus, Glory; TBD
Aug. 5, 2011	Launch/CCAFS: Atlas V, Juno; TBD
Aug. 15, 2011	Launch/Reagan Test Site: Atlas V, NuSTAR; TBD
Sept. 8, 2011	Launch/CCAFS: Delta II Heavy, GRAIL; TBD
To Be Determined	Launch/VAFB: Delta II, Aquarius / SAC-D Satellite; TBD
To Be Determined	Launch/VAFS: Delta II, NPP; TBD
No Earlier Than October 2011	Launch/CCAFS: Atlas V, Mars Science Laboratory; TBD

WORD ON THE STREET

NASA resolved to retrieve the Long Duration Exposure Facility in 1990. What is your New Year's resolution?



"I just want to lose weight, get healthy and improve my golf game."

**John Knight,
with NASA**

"Workout, because my family bugs me about it all the time . . . and find the right woman."

**Eric Crickon,
with Brevard Achievement Center**



"Get skinny . . . it was my wife's idea. And I've been successful so far . . . I've lost a pound already."

**Jeppie Compton,
with NASA**

"I am going to attend every Georgia Tech home football game next season."

**Lowell Primm,
with ASRC Aerospace Corp.**



"Didn't make any New Year's resolutions at all because I was too busy trying to think of one."

**Larry Third,
with NASA**



John F. Kennedy Space Center

Spaceport News

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