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Spaceport News

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

NPP, Delta II blast into Earth's orbit

By Steven Siceloff
Spaceport News

A technological trailblazer lifted off from a California launch pad early Oct. 28, to take a place in space to show us what is happening on Earth. Known as the NPP, for National Polar-orbiting Operational Environmental Satellite System Preparatory Project, the two-ton spacecraft reached an orbit 512 miles above the planet where it will be able to see every part of the Earth.

Because it is going into a polar orbit crossing both the north and south poles while the world spins beneath it, the NPP mission launched from NASA's Space Launch Complex-2 at Vandenberg Air Force Base in California.

NPP has two goals, according to James Gleason, NPP project scientist.

"One is to get the data for the weather forecasts, environmental observations and take a whole suite of observations that continue our satellite data records which span from measuring aerosols, you know, dust particles in the atmosphere, how

See **NPP**, Page 3

NASA/Bill Ingalls

A Delta II rocket launches with the NPOESS Preparatory Project (NPP) spacecraft payload from Space Launch Complex 2 at Vandenberg Air Force Base, Calif. on Oct. 28. NPP is the first NASA satellite mission to address the challenge of acquiring a wide range of land, ocean, and atmospheric measurements for Earth system science while simultaneously preparing to address operational requirements for weather forecasting.

CCP signs new unfunded SAA

For Spaceport News

NASA's Commercial Crew Program is entering into an unfunded Space Act Agreement with Excalibur Almaz, Incorporated (EAI) as part of the Commercial Crew Development Round 2 (CCDev2) activities.

The unfunded Space Act Agreement (SAA) with EAI establishes a framework to enable NASA to collaborate with EAI in furthering the development of Excalibur's spacecraft concept for low Earth orbit crew transportation. EAI's concept for commercial crew to the International Space Station is to use the company's planned tourist space vehicle in concert with an intermediate stage and fly the integrated vehicle on a commercially available launch vehicle to be determined in the near future.

"We are pleased to add Excalibur Almaz to the group of CCDev2 companies and look forward to a productive partnership," said Brent Jett, Commercial Crew Program deputy manager.

As part of this SAA, EAI will conduct several reviews. These will include reviews of systems requirements status, launch vehicle compatibility, testing plans and status, and overall status of the design, opera-

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Inside this issue ...

LSU students' visit sparks creation of mock flame trench

By Steven Siceloff
Spaceport News

A team of Louisiana State University students who volunteered to build a tabletop-sized flame trench to test flame-resistant materials took a look at the real thing at Launch Pad 39B on Oct. 14.

Luz Marina Calle, a materials researcher at Kennedy Space Center, posted the requirement for a lab-sized model of the flame trench and Christine Woodfield, Jacob Koch and Kevin Schenker, all mechanical engineering students at LSU, took on the assignment with their professor.

"The pictures are pretty accurate, but the size . . . and then seeing the effects the environment has that it's exposed to," Woodfield said.

"You can't understand it until you come and see it," Koch said as the group looked up from the bottom of the 40-foot deep trench.

Upgrading the flame trench is a high priority as the launch pad is modernized following the retirement of the space shuttle, said Jose Morales, project manager for the work at Pad 39B.

NASA/Jim Grossmann

A group of Louisiana State University students take a look at Launch Pad 39B on Oct. 14. The mechanical engineering students volunteered to build a tabletop-sized flame trench to test flame-resistant materials along with their professor.

"It's one of the most challenging projects we've got," Morales said.

The flame trenches were built when Pads 39A and 39B were constructed in 1966 to handle the Saturn V moon rocket. They were lined with thousands of fireproof bricks, many of which remain in place today. However, the fasteners holding some of the bricks in place occasionally gave way in the face of intense flame and the force of 7 million pounds of thrust during dozens of space shuttle launches.

"We have a unique condition here, so there are no commercial materials out there for this," Morales said. "The water deluge, the acid from the solid rocket boosters."

A cement-like compound called Fondue Fyre was used to cover suspect areas, but it required maintenance after each launch, Morales said.

"We have spent a lot of money into the maintenance of the insulating material now," Morales said. "After every launch there's a lot of work that has to be refurbished."

Recognizing that there may not be a commercially available product that can stand the flame trench conditions and require little maintenance, Kennedy's scientists are working to come up with a formula to handle the job. Testing it on a small scale is critical to the development, Calle said. If it proves handy to another industry, then NASA can get a commercial company to produce it, too.

"One of the things we wanted to do was build a lab-scale simulation of the flame trench," she said.

If there is a potential material, we're going to need to test it in the lab."

The students also will build a system that simulates the flames of a rocket. Since the pad will be used for NASA's new Space Launch System heavy lift rocket, which currently is planned for four space shuttle main engines and two solid rocket boosters, the thrust will be on par with a Saturn V.

"Trying to make it as close to the real thing as possible is the objective," Koch said. "I think we're going to use a plasma torch or a plasma cutter."

The team expects to begin work on the project soon after returning to school.

"This semester we'll go into putting down a plan and then next semester we'll build it early and go through samples and prepare them with things like saltwater," Woodfield said.

While the trip has a scientific reason for it, the history of the area was not lost on the students.

"This has always seemed out of reach to me, so I never dreamed that I would get to come and tour a launch pad," Woodfield said.

NASA/Jim Grossmann

Kennedy Space Center Materials Researcher Luz Marina Calle, third from the right, poses with a group of Louisiana State University students at Launch Pad 39B on Oct. 14.

Visit brightens governor's vision of future space missions

By Steven Siceloff
Spaceport News

Florida Gov. Rick Scott got a firsthand look Oct. 18 at the facilities Kennedy Space Center will use to assemble and process the Orion spacecraft for launch on deep space missions.

"This is the future," Scott said. "We always have to look at all the changes and say, 'Look, we have a great opportunity.' We're going to continue to make things happen here. "

The governor, along with Lt. Gov. Jennifer Carroll and state Cabinet officers Jeff Atwater, chief financial officer, and Adam Putnam, Agriculture commissioner, toured the Operations and Checkout Building and visited the Vehicle Assembly Building as well.

Florida funded part of the refurbishment of the high bay at the Operation and Checkout Building so the Orion spacecraft can be assembled there. Scott got a close-up look at an Orion test article used for a launch abort system test in New Mexico in 2010.

A test flight without astronauts is scheduled for 2017, with the Orion flying on the first Space Launch System heavy-lift rocket, or SLS. A flight with astronauts would follow in 2021 on the SLS.

NASA/Jim Grossmann

Kennedy Space Center Director Bob Cabana, right, shakes hands with Florida Gov. Rick Scott, (left), following a tour of the Orion Multi-Purpose Crew Vehicle processing facility in the Operations and Checkout Building at Kennedy on Oct. 18. In the center is Florida Lt. Gov. Jennifer Carroll, chairwoman of Space Florida. The governor and other state officials were at Kennedy for a Florida cabinet meeting and a space industry roundtable at the Kennedy Space Center Visitor Complex's Debus Conference Center. They also toured selected facilities around the center.

With those complete, the stage would be set to dispatch crews into deep space to destinations such as an asteroid, the moon and eventually Mars.

"I think we have a clear path forward," said Kennedy Center Bob Cabana, pointing out some of the modifications that recently have taken place at some of the center's better-known facilities, including Launch Pad 39B and the rest of the Operations and Checkout Building.

The building hosted final processing of the Apollo modules during the moon program of the late 1960s and early 1970s. Now refurbished, the high bay is being set up for Orion. Some fixtures already are in place for handling the capsule-shaped spacecraft.

Exploration Park, a research area off Space Commerce Way, is in the early stages of construction, Cabana told Scott, showing him maps and drawings of what the science-focused facilities are expected to look like when completed. Cabana also noted that Kennedy has seen two new programs get under way, too, Commercial Crew Program and the 21st Century Ground Systems Program.

Prior to their afternoon visit, the state officials, including Florida Attorney General Pam Bondi, held a Cabinet meeting at the Kennedy Space Center Visitor Complex and approved a resolution recognizing the center's numerous contributions to exploration and technology and calling for increased support to help Kennedy adapt for future missions.

"We've got to make sure it continues to prosper," Scott said. "We have all the talent. If you look at the quality of individuals who work here, their dedication, their training, they've done it."

After the tour, Cabana gave Scott a Florida flag that flew on the final shuttle flight, Atlantis' STS-135 mission, along with a Kennedy Space Center coin that went into space on shuttle Endeavour's STS-126 mission in 2008.

"Seeing the prototypes is helpful," Scott said. "But it's really the passion of the people and how committed they are to getting this done and getting this done in a manner that is good for our country that really excites you. It's inspiring."

From **NPP**, Page 1

have they changed over the past decade?," Gleason said. "Is the ground greener or browner over time? Has the sea surface temperature changed? Has the ozone changed? We just want to keep adding to that so we can answer the question, is the climate changing?"

Members of NASA's Launch Services Program, based at Kennedy Space Center, have been working at Vandenberg to get the spacecraft ready to launch on a United Launch Alliance Delta II rocket.

"We began build-up of the vehicle in July of this year, erecting first stage, the nine solid rocket motors, the second stage, putting the payload fairing into the mobile service tower," NASA Launch Director Tim Dunn said.

From orbit, the NPP spacecraft will scan the world with five instruments that track their development through the sensors used on previous Earth-observation missions.

"NPP data will be used by virtually all of the national weather services for all the nations of the world," Gleason said. "And then there are the scientific users who are trying to understand the individual phenomena both at home and abroad."

From **SAA**, Page 1

tional and facilities plans, and integration status. NASA will participate in these reviews by providing expert feedback based on 50 years of spaceflight experience. NASA and EAI plan to kick-off these activities this month, and milestones are planned to continue through May 2012.

Under this unfunded SAA, NASA will provide limited technical support to EAI but no funding. NASA will not receive any deliverables under this Space Act Agreement.

EAI is an independent, wholly U.S. owned company in Houston, Texas. The Commercial Crew Program is managed by the Kennedy Space Center.

The goal of CCDev2 is to accelerate the availability of U.S. commercial crew transportation capabilities and reduce the gap in American human spaceflight capability by advancing concepts and maturing the design and development of elements of the systems. NASA believes this new partnership with EAI supports this goal. Through this activity, NASA also may be able to spur economic growth as potential new space markets are created. Once developed, crew transportation capabilities could become available to commercial and government customers.

Scenes Around Kennedy Space Center

NASA/Gianni Woods

Business leaders visit exhibitor booths at the annual Business Opportunities Expo 2011, in Cruise Terminal 4 at Port Canaveral in Florida on Oct. 18. The trade show was sponsored by NASA Kennedy Space Center's Prime Contractor Board, the 45th Space Wing and Canaveral Port Authority. The event featured about 175 business and government exhibitors from across the nation and Brevard County and is geared toward business leaders who are interested in learning more about government contracting and what local and national vendors have to offer.

CLICK ON PHOTO NASA/Jim Grossmann

Preparations are under way to enclose NASA's Mars Science Laboratory (MSL) in an Atlas V rocket payload fairing on Oct. 25 in the Payload Hazardous Servicing Facility at Kennedy Space Center. The blocks on the interior of the fairing are components of the fairing acoustic protection (FAP) system, designed to protect the payload by dampening the sound created by the rocket during liftoff. The fairing will protect the spacecraft from the impact of aerodynamic pressure and heating during ascent Launch of MSL aboard a United Launch Alliance Atlas V rocket. Launch is planned for Nov. 25 from Space Launch Complex-41 on Cape Canaveral Air Force Station. For more information, click on the photo.

NASA/Glenn Benson

Sparky the Fire Dog, a fire prevention mascot at Kennedy Space Center, visits with the children at the Child Development Center on Oct. 14. Sparky gave each student a firefighter helmet and shared the potential dangers of fire.

NASA/Jim Grossmann

Technicians assist as a large crane lowers space shuttle Atlantis' left orbital maneuvering system (OMS) pod onto a carrier on Oct. 21 inside Orbiter Processing Facility-2 at Kennedy Space Center. The work is part of the Space Shuttle Program's transition and retirement processing of shuttle Atlantis. The OMS pods will be sent to White Sands Space Harbor in New Mexico where they will undergo a complete deservicing and cleaning and then be returned to Kennedy for reinstallation on Atlantis. Atlantis is being prepared for display at the Kennedy Space Center Visitor Complex.

CLICK ON PHOTO NASA/Dimitri Gerondidakis

Lined up in a row, Pratt Whitney Rocketdyne space shuttle main engines (SSMEs) sit on stands inside the Engine Shop at Kennedy Space Center on Oct. 10. For the first time, all 15 main engines are in the Engine Shop at the same time. They are being prepared for shipment to NASA's Stennis Space Center in Mississippi for storage following the completion of the Space Shuttle Program. The engines are being repurposed for use on NASA's Space Launch System heavy lift rocket. For more on the SSMEs, click on the photo.

CLICK ON PHOTO NASA/Charisse Nahser

Workers unwrap the latest Space Exploration Technologies Corp. (SpaceX) Dragon capsule inside a building at Cape Canaveral Air Force Station on Oct. 23 so it can be processed and attached to the top of a Falcon 9 rocket on Space Launch Complex-40 for the company's next demonstration test flight for NASA's Commercial Orbital Transportation Services (COTS) program. For more information, click on the photo.

Starfighters test commercial jet-launched vehicle

By Melanie Carlson
Spaceport News

NASA/Gianni Woods

A Starfighters, Inc. F-104 supersonic jet is being fueled before conducting a high speed taxi test at the Shuttle Landing Facility (SLF) at Kennedy Space Center on Oct. 27. On the right side of the jet is the Star Lab suborbital launch vehicle developed by 4Frontiers Corporation. 4Frontiers is testing the Star Lab suborbital launch vehicle which has the potential to carry payloads into low earth orbit. Tests are being conducted to verify the aeronautical conditions of the Star Lab suborbital launch vehicle.

Plans to launch small satellites into orbit from the wings of a supersonic jet are moving along following a taxi test on the runway at NASA's Kennedy Space Center.

The Starfighters, Inc. F-104 rolled to a stop Oct. 27 at the Shuttle Landing Facility (SLF) after the supersonic aircraft conducted a high-speed taxi test. Piloted by Rick Svetkoff, the F-104 reached speeds of 150 mph as it taxied up and down the runway. The test was carried out to evaluate a newly developed suborbital vehicle that has the potential to carry nanosatellites into low Earth orbit. Commercial carriers like Starfighters, Inc., want to provide a convenient, reasonably-priced option for universities and scientific institutions to build and launch missions.

Starfighters, Inc. of Clearwater, Fla., through a cooperative Space Act Agreement, is based at the SLF. This business partnership furthers the research and development of commercial space industries at Kennedy. Starfighter's fleet of F-104 supersonic jets, similar to those NASA started using in the 1960's with the Project Mercury, are helping usher in a new age of commercial spaceflight.

The taxi test was conducted to verify the aeronautical conditions of Star Lab. This is the first of eight tests the launch vehicle will undergo. The final flight test will use a simulated mock-up vehicle and will be flown over the Atlantic Ocean. After the booster separates, a parachute will carry the payload for splashdown. Sensors and recorders are encapsulated in each launch vehicle tested and data will be analyzed for the build up to the next test. 4Frontiers is aiming for tests to be completed by early 2012, with commercial flights starting mid-2012.

Star Lab has the potential to carry four to 13 payloads per flight. 4Frontiers is hoping to launch 10 rockets per year with multiple payloads, or more than 100 payloads per year. The company is trying to keep the costs as low as possible and charges will include flight integration and return of payload to owner.

The Star Lab suborbital launch vehicle tested Oct. 27 was developed by 4Frontiers Corporation, a Florida company founded in 2005. 4Frontiers has commercially partnered with Starfighters, Inc., which will provide F-104 jets as flight platforms to air launch Star Lab. 4Frontiers is an emerging space commerce business focused on developing fundamental space-related capabilities and resources essential for long-duration space flight.

The design and building of Star Lab is a collaborative effort between 4Frontiers and students from Embry-Riddle Aeronautical University and the University of Central Florida. The launch vehicle was designed using funds awarded by the Florida Space Grant Consortium. Star Lab supports scientific education for students by offering a physical, hands-on learning environment. The launch vehicle is designed by students and built by students.

The success of the launches of Star Lab has the potential to open new avenues of research and education for scientists and universities as demand for suborbital launch capability is expected to grow.

And, the ultimate success of commercial flight projects like Starfighters and 4Frontiers paves the way for expanding future use of the Shuttle Landing Facility and furthers commercial research flights from Kennedy.

500 take on Tour de KSC for CFC

By Stephanie Covey
Spaceport News

NASA/Amanda Diller

About 500 Kennedy employees, families and guests came out for the third annual Tour de KSC to kick-off the Combined Federal Campaign (CFC) on Oct. 15. The event raised $7,500 for the CFC.

This year's annual Tour de KSC on Oct. 15 may not have gone over mountains or through the country-side like the Tour de France, but it allowed hundreds of cyclists a chance to ride through the past, present and future of NASA's human spaceflight programs at the Kennedy Space Center. And more importantly, it was the kick-off event for the center's Combined Federal Campaign (CFC) season, which has the potential to help tens of thousands of people through their daily lives.

About 500 Kennedy employees, families and guests came out for the third annual Tour de KSC, which included ride-bys of the industrial area, Launch Pad 39B and stops at the Vehicle Assembly Building (VAB). Cyclists were even able to get an up-close view of space shuttle Endeavour, which is being temporarily stored in the VAB's High Bay 4. Some riders took additional loops around the center that extended their trip from 12 to 37 miles.

Science Applications International Corporation (SAIC) Informational Manager, Kelly Hunter, has participated in the tour each of the past three years.

This year she rode all 37 miles of the tour with 12 friends. She said that it was nice riding by pad 39B and the VAB since the facilities have been evolving lately.

"I was awestruck being so close to Endeavour; most people never get to see it, so to be that close was amazing," Hunter said. "I had a lot of people with me that had never seen the shuttles before, so seeing their faces was special."

The organizers of this year's event were able to collect $7,500 for the CFC, which will be divided among more than 2,800 charities.

"The best part of the tour is the coming together of the people in support of such a great cause," said Yves Lamonthe, Assistant Aerospace Engineer and CFC chairman.

Through the support of civil servants and contractors, the campaign raises money to support local and international charities that include Habitat for Humanity, the Patrick Air Force Base Youth Center and the Second Harvest Food Bank of Central Florida.

This year marks the 50th anniversary of the CFC at Kennedy. This year's goal is $490,000 and the theme is "A History of Giving, A Legacy of Hope."

Avid cyclist and Kennedy Center Director Bob Cabana kicked-off the tour with a few words about the need for such a campaign before riding.

"We have had some tough times in the community right now, and we will do anything we can to help," Cabana said. "I can't think of a more worthy cause."

Remembering Our Heritage

First asteroid flyby 20 years ago 'rocked' space world

By Kay Grinter
Reference Librarian

Before NASA's Galileo probe reached its final destination -- the planet Jupiter -- in 1995, it already had found its way into the history books.

Galileo cruised past the S-type asteroid 951 Gaspra on Oct. 29, 1991, snapping the world's first close-up image of an asteroid. The picture was captured from about 10,000 miles and was one of a dozen taken during the flyby.

Asteroids are leftovers formed from the cloud of gas and dust -- the solar nebula -- that collapsed to form our sun and the planets about 4.5 billion years ago.

Gaspra resides in the asteroid belt between the orbits of Mars and Jupiter. The largest body in the belt, the dwarf planet Ceres, has a diameter of 590 miles; the smallest is the size of a dust particle.

S-type asteroids account for about 17 percent of known asteroids and are normally composed of metallic iron mixed with iron- and magnesium-silicates.

Before the close encounter with Galileo, Gaspra was no stranger to the spotlight, having been discovered by the Ukrainian astronomer Grigory Neujmin in 1916. Neujmin named his discovery for a then-popular resort on the Black Sea.

A visit to Gaspra, though, would be no vacation. The potato-shaped rock was determined to be about 12-miles long, heavily covered in impact craters and fractures, with no spa in view.

Galileo then flew past a larger asteroid, the 32-mile long Ida, in 1993, and found that Ida had its own moon, another first.

The instruments aboard Galileo collected scientific measurements from the asteroids, as well, but returning the data to Earth did not go according to plan. As Galileo approached Gaspra, its high-gain antenna failed to deploy to its full extent. The images and other data were transmitted at a slower rate using its low-gain antenna.

Today, scientists continue to re-analyze the spectral observations returned from the Gaspra flyby. James Granahan, a planetary scientist at Science Applications International Corp., which conducted the asteroid research on contract to NASA, shared his findings in an abstract presented at the 42nd Lunar and Planetary Science Conference in March 2011.

NASA file/1991

This first image of asteroid 951 Gaspra was taken by the Galileo spacecraft on Oct. 29, 1991, from about 10,000 miles away. The sun is shining from the right. The illuminated part of the asteroid is about 10 miles by 7.5 miles. The surface shows many craters; two large facets about 5 miles across appear on the limb of the asteroid at top and bottom right. The smallest craters in this view are about 1,000 feet across. Gaspra rotates in a counter-clockwise direction in slightly more than 7 hours; its north pole is near the upper left corner of the lighted part of the asteroid.

"A key result of this study is that 951 Gaspra does not appear to be made of ordinary chondrite-type material," Granahan wrote. "The relative abundance of olivine (89 percent) with respect to orthopyroxene (11 percent) is different from earlier findings."

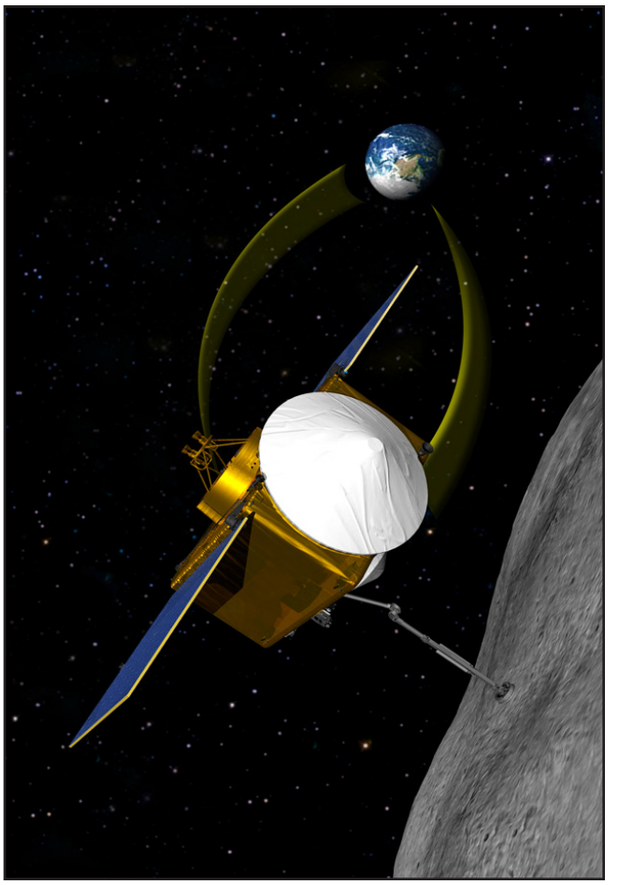
"This indicates that this asteroid has spectra that are distinct from most S-type asteroids," Granahan concluded.

During the past 20 years, other NASA missions have followed these first close asteroid encounters, including NEAR, the Near-Earth Asteroid Rendezvous with the asteroid Eros; the Deep Space 1 flyby of the asteroid Braille; and the Dawn orbiter of asteroids Ceres and Vesta.

Next, in 2016, NASA will launch the Origins-Spectral Interpretation-Resource Identification-Security-Regolith Explorer, or OSIRIS-REx, to a near-Earth asteroid, designated 1999 RQ36, which will use a robotic arm to pluck samples that could better explain our solar system's formation and how life began since asteroids contain the original material from the solar nebula. OSIRIS-REx will be the first U.S. mission to carry samples from an asteroid back to Earth.

RQ36 is about 1,900 feet in diameter or roughly the size of five football fields. The asteroid, little altered over time, is likely to represent a snapshot of our solar system's infancy. The asteroid also is likely rich in carbon, a key element in the organic molecules necessary for life.

After traveling three years, OSIRIS-REx will approach RQ36 in 2019. Once within three miles of the asteroid, the spacecraft will begin six months of comprehensive surface mapping. The science team then will pick a location to take a two-ounce sample for return to Earth.



NASA/Artist image

This image shows the spacecraft NASA will launch to an asteroid in 2016 and use a robotic arm to pluck samples that could better explain our solar system's formation and how life began. The mission, called Origins-Spectral Interpretation-Resource Identification-Security-Regolith Explorer, or OSIRIS-REx, will be the first U.S. mission to carry samples from an asteroid back to Earth.

The sample will be stored in a capsule that will land at Utah's Test and Training Range in 2023. The capsule's design will be similar to that used by NASA's Stardust spacecraft, which returned the world's first comet particles from comet Wild 2 in 2006. The OSIRIS-REx sample capsule will be taken to NASA's Johnson Space Center in Houston for precise analysis that cannot be duplicated by spacecraft-based instruments.

"This is a critical step in meeting the objectives outlined by President Obama to extend our reach beyond low-Earth orbit and explore into deep space," said NASA Administrator Charlie Bolden in March. "It's robotic missions like these that will pave the way for future human space missions to an asteroid and other deep space destinations."

Track latest flyby

NASA scientists will track asteroid 2005 YU55 with antennas of the agency's Deep Space Network at Goldstone, Calif., as the space rock safely flies past Earth slightly closer than the moon's orbit on Nov. 8.
For more information, go to **http://www.jpl.nasa.gov/news/news.cfm?release=2011-332&cid=release_2011-332**

NASA Employees of the Year

NASA/Sandra Joseph

Employees of the Year are from left, Marcelo C. Dasilva, Human Resource Office; Brian S. Burns, Information Technology and Communications Services; Mary E. Hanson, Chief Financial Office; Maria H. Bland, Education and External Relations; Amy C. Canfield, Safety and Missions Assurance Directorate; Debra A. Preston, Launch Vehicle Processing Directorate; Margaret R. Dutczak, Engineering Directorate; Helena J. Wilkas, Procurement Office; Brian G. Graf, Center Operations; and Michael D. Dininny, Engineering Directorate. Not pictured are Amber M. Hufft, Chief Counsel; Michelle C. Green, Commercial Crew Program; Matthew R. Jolley, 21st Century Ground Systems Program Office; and Dawn H. Trout, Launch Services Program.

Looking up and ahead . . .

*** All times are Eastern**

2011

No Earlier Than Nov. 7	Launch/CCAFS: Delta IV, WGS 4; Launch window: TBD
Nov. 25	Launch/CCAFS: Atlas V, Mars Science Laboratory; Launch: 10:25 a.m. EST
Under Review	Launch/CCAFS: SpaceX Falcon 9, Dragon C2/C3; Launch window: TBD
No Earlier Than December	Launch/Wallops Flight Facility, Pad 0A: Orbital Sciences Corporation, Taurus II, Launch window: TBD

2012

Early 2012	Launch/CCAFS: Atlas V, AEHF 2; Launch window: TBD
Early 2012	Launch/CCAFS: Delta IV-Heavy, NROL-15; Launch window: TBD
No Earlier Than February	Launch/Wallops Flight Facility, Pad 0A: Orbital Sciences Corporation, Cygnus/Taurus II, Launch window: TBD
No Earlier Than Feb. 3	Launch/Kwajalein Atoll: Pegasus XL, NuSTAR; Launch window: TBD
February	Launch/CCAFS: Atlas V, MUOS; Launch window: TBD
June	Launch/CCAFS, LC-41: Atlas V, Tracking and Data Relay Satellite-K (TDRS-K); Launch window: TBD
No Earlier Than Aug. 23	Launch/CCAFS, LC-41: Atlas V-401, RBSP; Launch window: TBD

Kennedy Space Center Activities

2011 KSC Fall Flag Football League Standings and Upcoming Schedule

TEAM	RECORD	POINTS SCORED	POINTS ALLOWED
Predators	6-0	143	37
Rowdies	4-2	119	58
Dog and Bone Crushers	4-2	130	56
Stuffers	3-3	113	75
Team Ram Rod	1-5	42	140
Bacalao	0-6	13	162

Week 7 Results (Oct. 25)
Crushers 14, Bacalao 0
Rowdies 21, Stuffers 3
Predators 20, Ram Rod 6

Week 8 Schedule (Nov. 1)
5:30 p.m. - Ram Rod @ Bacalao
6:30 p.m. - Rowdies @ Predators
7:30 p.m. - Crushers @ Stuffers

Games are played Tuesdays at KARS Park I. For more information, contact Matt Jimenez at 321-867-4509 or **matthew.j.jimenez@nasa.gov**.

2011 KSC Tennis League Rankings, Leaders and Upcoming Schedule

Singles

Group 1 Rankings	Group 2 Rankings	Group 3 Rankings	Group 4 Rankings
Billy Specht	Norm Hosan	Calvert Staubus	Teresa Bolig
Art Shutt	Ken Young	Bob Ingram	Kate Liu
Alan Wheeler	Ed Bertot	Kevin Panik	Lashelle McCoy
Miguel Rodriguez	Scott DeWitt	Jorge Rivera	Laura Scott

Nov. 3 Schedule
Specht vs. Rodriguez
Shutt vs.Wheeler
Hosan vs.DeWitt
Young vs. Bertot
Staubus vs. Rivera
Ingram vs. Panik
Bolig vs. Scott
Liu vs. McCoy

The league seeks new players and is open to all Kennedy civil service and contractor personnel and dependents. Matches are played Thursdays at KARS Park I and II. For more information, contact Alan Wheeler at 321-867-3565 or **alan.j.wheeler@nasa.gov**.

Doubles

Court leaders from Oct. 25

Court 9 - Chip Hooper	Court 7 - Ray Jones	Court 4 - Jay Hebert	Court 2 - Mike Lietzen
Court 8 - Miguel Rodriguez	Court 6 - Tom Li	Court 3 - Jane Mosconi	Court 1 - TBD

Court groups for Nov. 1

Court 9	Court 8	Court 7	Court 6
Chip Hooper	Ron Feile	Alan Wheeler	Tom Li
Scott Schilling	Miguel Rodriguez	Teresa Bolig	Amy Lombardo
Dave Davies	Norm Ring	Ted Moore	Laura Rochester
Art Shutt	Ray Jones	Lenny Corack	Jim Fitzgerald

Court 4	Court 3	Court 2	Court 1
Jay Hebert	Jane Mosconi	TBD	TBD
Pat Hadden	Scott DeWitt		
Damien Boos	Laura Scott		
Mike Lietzen	Bill Shockley		

The league seeks new players and is open to all Kennedy civil service and contractor personnel and dependents. Matches are played Tuesdays at KARS Park I and II. For more information, contact Teresa Bollig at 321-264-8575 or **teresa.e.bollig@nasa.gov**.

John F. Kennedy Space Center

Spaceport News

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