

# Spaceport News

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



## LADEE ready for late-night launch

*By Butler Hine  
Ames Research Center*

NASA's Lunar Atmosphere and Dust Environment Explorer (LADEE) observatory, which has been encapsulated into the nose cone of the Minotaur V rocket at NASA's Wallops Flight Facility in Virginia is ready to launch when the window opens tonight.

After safely arriving at Wallops in June, the observatory went through final preparations and closeouts, which included checking the spacecraft's alignment after its cross-country shipment, checking the propulsion system for leaks, inspecting and repairing solar panels, and final electrical tests. After these activities were completed, spin testing and fueling followed.

Engineers mounted the LADEE observatory onto the fifth stage rocket motor and encapsulated it in the nose cone – or fairing, of the United States Air Force's Minotaur V launch vehicle, operated by Orbital Sciences Corp. of Dulles, Va.

The launch window opens at 11:27 p.m. EDT.

*NASA Ames Research Center*

Engineers from NASA's Ames Research Center successfully completed launch preparation activities for NASA's Lunar Atmosphere and Dust Environment Explorer (LADEE) observatory, which is targeted to launch tonight. The launch window opens at 11:27 p.m. EDT.

# Partnership bolsters multi-user spaceport

By Bob Granath  
Spaceport News

Kennedy Space Center recently established a partnership agreement with PaR Systems Inc. of Shoreview, Minn., for operation of the Hangar N facility and its nondestructive testing (NDT) equipment.

As the spaceport transitions from a historically government-only launch facility to a multi-user spaceport for both federal and commercial customers, partnerships between the space agency and other organizations will be a key element in that effort.

Hangar N is located at Cape Canaveral Air Force Station. The facility's unique inventory of nondestructive test and evaluation (NDE) equipment and the capability for current and future mission spaceflight support is a resource NASA wants to retain.

"This is a considerable asset not available anywhere else," said Amy Houts Gilfriche, Partnership Development manager in NASA's Center Planning and Development Directorate. "The partnership is about preserving our NDE capability."

Cliff Hausmann, technical integration manager in NASA's Program Control and Integration Office, noted that Hangar N was used extensively during the space shuttle era.

"It was a valuable capability during the 30-year history of the shuttle program, supporting NDE and diagnostics," he said.

With the end of the shuttle flights, NASA had no immediate need for the operations taking place there. As future programs start up however, Hangar N's capabilities likely will be required. The partnership means the facility will be



NASA/Dimitri Gerondidakis

PaR Systems development engineer Wayne Cheng, left, and operations engineer Jeff Elston operate the controller Aug. 6 for a robotic system used in nondestructive testing. The 11-axis robotic system takes X-ray images of hardware for evaluation.

retained, but as a mutually shared facility and resource.

"NASA doesn't give up ownership," Hausmann said. "In this case, a commercial company -- PaR Systems -- takes over what is now an underutilized resource to continue supporting our space industry."

This, explains Houts Gilfriche, is part of the transition to a commercial spaceport.

"Partnerships will be an important part of our future endeavors," she said. "Space Florida and the Economic Development Commission of Florida's Space Coast also had

integral roles in the development of the Hangar N partnership. We will see a mix of government and commercial operations here at Kennedy."

According to Tony Corak, manager of NDT Services for PaR Systems, there are differences and similarities in how Hangar N operates now under a partnership compared to a NASA contract.

"While the breadth of client opportunities will be broader, in many ways it is really the same," he said. "We are working with many of the same people here at Kennedy help-



NASA/Dimitri Gerondidakis

Bence Bertha, a PaR Systems development engineer, sets up a flash thermography system Aug. 6. This equipment uses thermal analysis to inspect hardware.

ing with the NDT testing of space-related applications. Our focus continues to be on the more difficult NDT opportunities which take advantage of our experience."

The Hangar N facility will continue to be used for inspection of large structures and small commercial and aerospace components. The facility's location at Cape Canaveral positions PaR Systems to be able to provide support for NASA's Space Launch System and Orion Programs, as well as commercial launch customers.



NASA/Dimitri Gerondidakis

PaR Systems operations engineer Lu Bell conducts a phase array ultrasonic inspection Aug. 6.

For the complete story, go to  
<http://www.nasa.gov/kennedy>

# Kennedy's Innovation Expo ready to launch

The 2013 KSC Innovation Expo is fast approaching. Next week's program, scheduled Sept. 10-13, will feature innovative efforts around the center and will include several events such as a showcase, talks and tours.

Another highlight of the Expo is the Kick-Start event, which is similar to the popular television series "Shark Tank." KSC Kick-Start is a centerwide innovation maturation program geared toward increasing exposure of ideas from any domain and increasing the chances those ideas will make a positive difference at Kennedy.

The KSC Innovation Expo Finale will finish the week by providing employees with a forum to interact with one another and form relationships that may lead to future collaborative efforts.

A list of guest speakers and coordinators, as well as a full event schedule, can be found at <http://innovationexpo.ksc.nasa.gov>.

For specific tour information, visit <http://go.nasa.gov/17O3M5N>.



**KSC Innovation Expo**

**Schedule of events**

Sept. 10	8:30 a.m. 1 p.m.	KSC Showcase begins KSC Showcase ends	Lobbies (OSB I&II, HQ, O&C, SSPF)
Sept. 11	9:30 a.m. 12:30 p.m. 1:30 p.m. 4 p.m.	KSC Talks begin KSC Talks end KSC Tours begin KSC Tours end	KSC Training Auditorium Various Locations
Sept. 12	10 a.m. 12:30 p.m. 1:30 p.m. 4 p.m.	KSC Kick-Start begins KSC Kick-Start ends KSC Tours begin KSC Tours end	KSC Training Auditorium Various Locations
Sept. 13	11:30 a.m. 1:30 p.m.	KSC Innovation Expo Finale begins KSC Innovation Expo Finale ends	O&C Mission Briefing Room

# CASIS names former shuttle pilot to exec role

For Spaceport News

Former NASA astronaut Greg Johnson assumed the role of executive director for the Center for the Advancement of Science in Space (CASIS) Sept. 1.

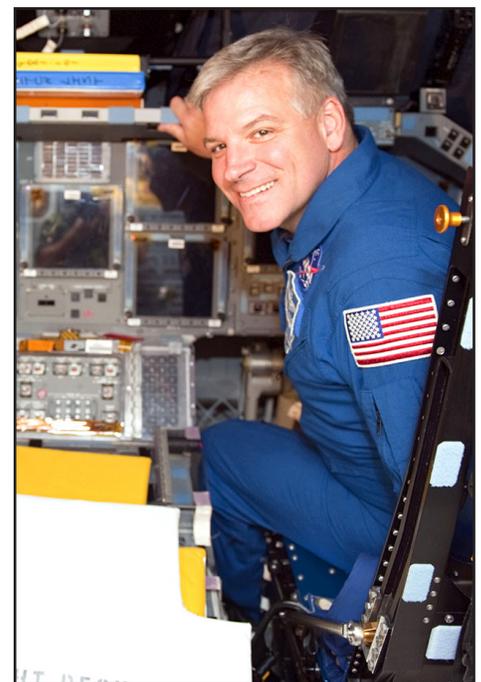
The nonprofit entity selected by NASA manages the utilization of the International Space Station (ISS) U.S. National Laboratory.

As executive director, Johnson will lead the CASIS organization to identify novel applications and new partnership opportunities advancing use of our nation's orbiting laboratory.

"It is an honor to accept the role of executive director with CASIS and promote the benefits of conducting research on the ISS," Johnson said. "To see the strides this organization has made in less than two years of existence is highly encouraging. I look forward to working alongside the CASIS staff as we continue to enhance the scope of spaceflight research and enable groundbreaking innovations for the benefit of humankind."

The ISS is focused on accelerating basic discoveries and innovation in areas that require microgravity and other extreme conditions uniquely provided by space. The facility offers opportunities for basic and applied research in the biological sciences, biotechnology, human health, physical and materials science, Earth and space imaging, as well as engineering research and development that will both advance our efforts in space and contribute to improving life on our planet.

"Col. Johnson's combination of experience within our nation's space program, leadership skills and familiarity with the aerospace industry make him an ideal fit for CASIS," said CASIS board of directors chair Dr. France Cordova, who from 1993 to 1996 was the youngest person and first woman to hold the position of NASA chief scientist. "He will drive forward the mission of CASIS, which is to enable and maximize use of the ISS National Laboratory as a unique resource for scientific discovery, technology development and education."



NASA file/2011

Former astronaut Greg Johnson was selected as a NASA astronaut in 1998 and piloted STS-123 and STS-134, where he spent nearly 32 days in orbit and contributed to the assembly of the International Space Station.

# Chandra: Giant black hole rejects material

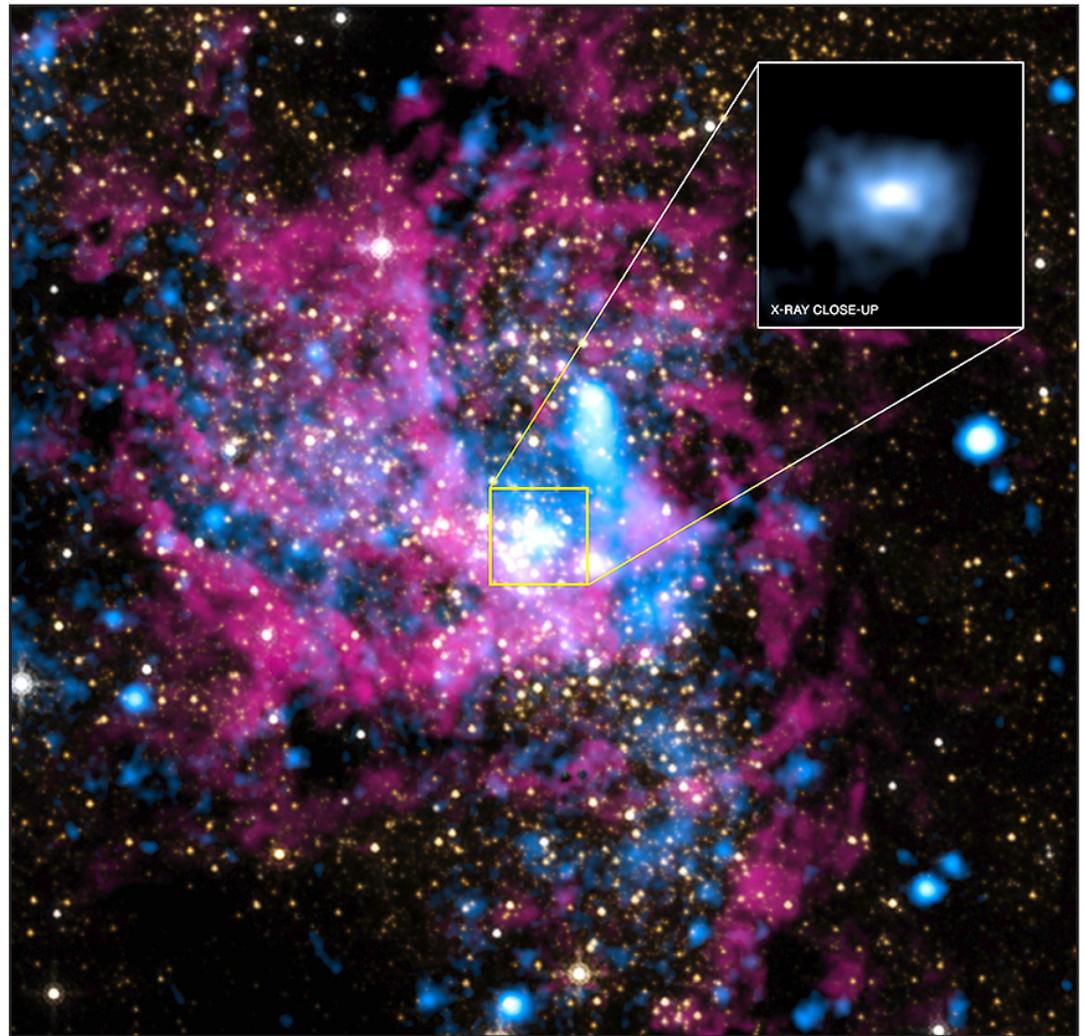
NASA News Report

Astronomers using NASA's Chandra X-ray Observatory have taken a major step in explaining why material around the giant black hole at the center of the Milky Way galaxy is extraordinarily faint in X-rays. This discovery holds important implications for understanding black holes.

New Chandra images of Sagittarius A\* (Sgr A\*), which is about 26,000 light-years from Earth, indicate that less than 1 percent of the gas initially within Sgr A\*'s gravitational grasp ever reaches the point of no return, also called the event horizon. Instead, much of the gas is ejected before it gets near the event horizon and has a chance to brighten, leading to feeble X-ray emissions.

These new findings are the result of one of the longest observation campaigns ever performed with Chandra. The spacecraft collected five weeks worth of data on Sgr A\* in 2012. The researchers used this observation period to capture unusually detailed and sensitive X-ray images and energy signatures of super-heated gas swirling around Sgr A\*, whose mass is about 4 million times that of the sun.

"We think most large galaxies have a supermassive black hole at their center, but they are too far away for us to study how matter flows near it," said Q. Daniel Wang of the University of Massachusetts in Amherst, who led a study published Aug. 30 in the journal *Science*. "Sgr A\* is one of very few black holes close enough for us to actually



NASA

NASA's Chandra X-ray Observatory's view of the supermassive black hole Sagittarius A\* at the heart of the Milky Way galaxy. For an additional interactive image, podcast, and video on the finding, click on the photo.

witness this process."

The researchers found that the Chandra data from Sgr A\* did not support theoretical models in which the X-rays are emitted from a concentration of smaller stars around the black hole. Instead, the X-ray data shows the gas near the black hole likely originates from winds produced by a disk-shaped distribution of young massive stars.

"This new Chandra image is one of the coolest I've ever seen," said co-author Sera Markoff of the University of Amsterdam in the Netherlands. "We're watching Sgr A\* capture hot gas ejected by nearby

stars, and funnel it in toward its event horizon."

To plunge over the event horizon, material captured by a black hole must lose heat and momentum. The ejection of matter allows this to occur.

"Most of the gas must be thrown out so that a small amount can reach the black hole," said Feng Yuan of Shanghai Astronomical Observatory in China, the study's co-author. "Contrary to what some people think, black holes do not actually devour everything that's pulled toward them. Sgr A\* is apparently finding much of its food hard to swallow."

The gas available to Sgr A\*

is very diffused and super-hot, so it is hard for the black hole to capture and swallow it. The gluttonous black holes that power quasars and produce huge amounts of radiation have gas reservoirs much cooler and denser than that of Sgr A\*.

The event horizon of Sgr A\* casts a shadow against the glowing matter surrounding the black hole. This research could aid efforts using radio telescopes to observe and understand the shadow. It also will be useful for understanding the effect orbiting stars and gas clouds may have on matter flowing toward and away from the black hole.

## More online

For Chandra images, multimedia and related materials, visit: <http://www.nasa.gov/chandra>

# Scenes Around Kennedy Space Center



NASA/Ken Thornsley

Nearly 50 years ago on Aug. 28, 1963, NASA and the Department of Interior signed an agreement establishing the National Wildlife Refuge on what now is Kennedy. The refuge encompasses 140,000 acres that are a habitat for more than 330 species of birds, such as this hawk. In the background is the 12,300-square-foot NASA logo painted on the side of the Vehicle Assembly Building.



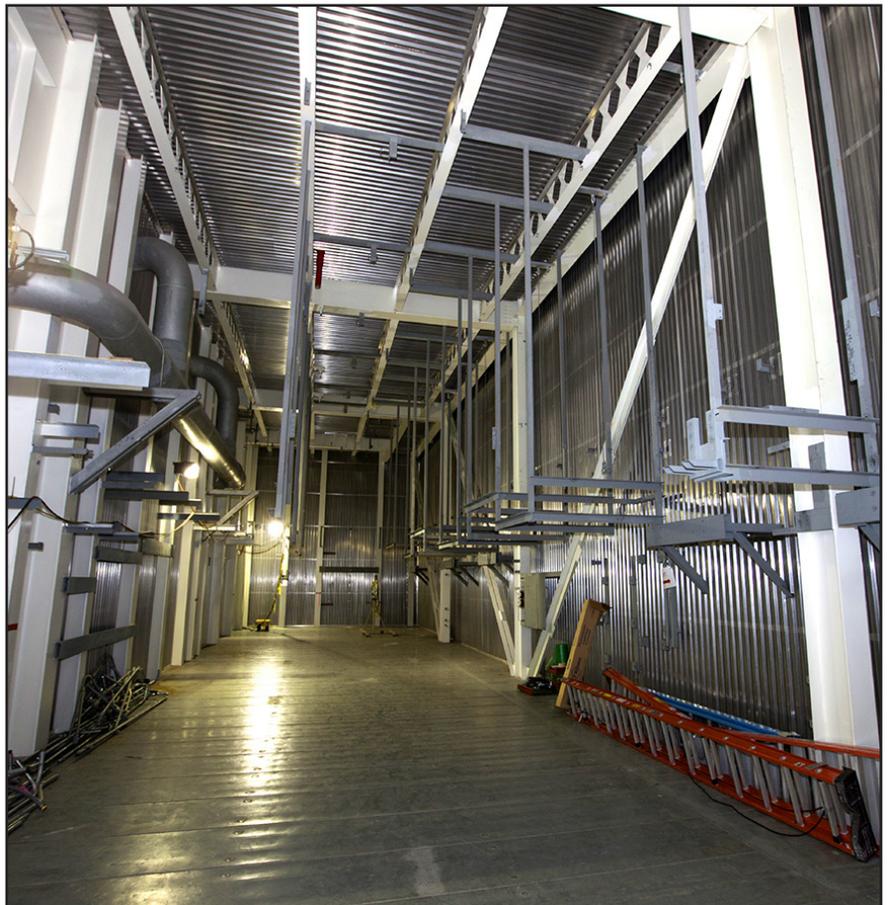
NASA/Daniel Casper

A construction crew uses heavy machinery to take apart the flame deflector Aug. 28 at Launch Pad 39B. The flame trench is refurbished for future rocket launches at Kennedy.



NASA/Kim Shifflett

Workers install a flame deflector at Kennedy's Shuttle Landing Facility (SLF) for the Project Morpheus lander. The flame trench is being added to help mitigate the harsh vibra-acoustic launch environment. For more information on Project Morpheus, click on the photo.



NASA/Kim Shifflett

All is quiet and orderly inside the base of the mobile launcher (ML) at the park site adjacent to the Vehicle Assembly Building at Kennedy Aug. 30 as modifications to the inside are set to begin this fall on the 355-foot-tall ML structure. NASA's Ground Systems Development and Operations Program (GSDO) is preparing the ML to support NASA's Space Launch System (SLS), the heavy-lift rocket that will launch astronauts into deep space on future exploration missions. For more information about GSDO, click on the photo.



NASA/Jim Grossmann

Inside Kennedy's Payload Hazardous Servicing Facility technicians clean the electricity-producing solar arrays for the Mars Atmosphere and Volatile Evolution (MAVEN) spacecraft Aug. 28. MAVEN is being prepared for its scheduled launch atop a United Launch Alliance Atlas V rocket in November from Cape Canaveral Air Force Station. Positioned in an orbit above the Red Planet, MAVEN will study the upper atmosphere of Mars in unprecedented detail. For more information, click on the photo.

## MAVEN paces through prelaunch prep

By Anna Heiney  
Spaceport News

The Mars Atmosphere and Volatile Evolution spacecraft, better known as MAVEN, is slated for launch Nov. 18 atop a United Launch Alliance Atlas V rocket. Upon its arrival at Mars in September 2014, MAVEN will spend a year seeking clues into the disappearance of atmospheric gases believed to have resulted in climate change on the Red Planet.

A U.S. Air Force C-17 cargo aircraft delivered MAVEN to Kennedy Aug. 2, kicking off prelaunch preparations. Shortly after the spacecraft arrived in Kennedy's Payload Hazardous Servicing Facility, its parabolic

high gain antenna and science instrumentation were installed.

On Aug. 13, MAVEN was powered on for the first time since reaching the Florida spaceport.

With launch only 11 weeks away, the pace of prelaunch activities has intensified. The MAVEN spacecraft and its two sets of power-producing solar arrays have been going through a series of checkouts and tests. Each solar cell was examined, cleaned and repaired if necessary. Testing of the arrays continues, leading up to reintegration with the spacecraft later this month.

Once in space, MAVEN must be able to orient itself, aim its instruments in the right

direction, carry out steering maneuvers to communicate with Earth and stay on its Mars-bound course. Before sending the spacecraft on its way, the processing team must verify critical systems to ensure the spacecraft will be able to perform these tasks during its journey. MAVEN's steering thrusters and star-tracker guidance system have been tested and the final flight software is installed.

While MAVEN continues through its prelaunch paces, its ride to space is undergoing its own preparations for liftoff. The first and second stages of the Atlas V rocket arrived at Florida's Port Canaveral on Aug. 26 aboard United Launch

Alliance's barge, the Delta Mariner.

Both stages were trucked from the port to a hangar at the Atlas Spaceflight Operations Center, or ASOC, on Cape Canaveral Air Force Station. In late September, the stages will be moved to nearby Space Launch Complex 41 for stacking, and the protective payload fairing will arrive from its manufacturing location in Harlingen, Texas.

When the MAVEN spacecraft is fully tested and ready for flight, it will be tucked into the payload fairing, transported to the launch complex and placed atop the Atlas V to await the start of NASA's next mission to Mars.

# Feds Feed Families food drive a success



NASA



NASA

Innovative Health Applications held an in-house competition between five groups that required them to set up displays of the food donations. The winning team was named the Bounty Hunters.

Xavian Raymond of the NASA Exchange prepares some of the 31,099 pounds of food workers contributed to the food drive.

From July 15 to Aug. 23, Kennedy Space Center organizations competed to collect the most weight in donated food and personal hygiene items for the Central Brevard Sharing Center ([sharingcenter.org](http://sharingcenter.org)) during the 2013 Feds Feed Families food drive. The Launch Services Program gave the most food, totaling 6,113 pounds. Kennedy exceeded its goal of 18,000 pounds with 31,099 pounds of food.



NASA photos

Trucks (above, left and below) were filled with food collected from around the center.



# Looking up and ahead . . .

*\* All times are Eastern*

**Sept. 6**

**Mission:** Lunar Atmosphere and Dust Environment Explorer (LADEE)  
**Launch Vehicle:** Minotaur V  
**Launch Site:** Wallops Flight Facility, Va.  
**Launch Time:** 11:27 p.m.  
**Launch Pad:** Mid-Atlantic Regional Spaceport Pad 0B  
**Description:** LADEE will gather detailed information about conditions near the surface and environmental influences on lunar dust. A thorough understanding of these influences will help researchers understand how future exploration may shape the lunar environment and how the environment may affect future explorers.

**Sept. 17**

**Mission:** Orbital Sciences Demonstration Flight  
**Launch Vehicle:** Antares  
**Launch Site:** Wallops Flight Facility, Va.  
**Launch Time:** 11:16 a.m.  
**Launch Pad:** Mid-Atlantic Regional Spaceport Pad 0A  
**Description:** Orbital Sciences will launch a demonstration mission to the International Space Station, testing out the Cygnus cargo vehicle as part of NASA's Commercial Orbital Transportation Services Program.

**Sept. 25**

**Mission:** Expedition 37/38  
**Launch Vehicle:** Soyuz 36 (TMA-10M)  
**Launch Site:** Baikonur Cosmodrome, Kazakhstan  
**Launch Time:** TBD  
**Description:** Soyuz TMA-10M will carry three Expedition 37/38 crew members to the International Space Station. They are NASA Flight Engineer Michael Hopkins, Soyuz Commander Oleg Kotov and Flight Engineer Sergey Ryzansky.

**Nov. 6**

**Mission:** Expedition 38/39  
**Launch Vehicle:** Soyuz 37 (TMA-11M)  
**Launch Site:** Baikonur Cosmodrome, Kazakhstan  
**Launch Time:** TBD  
**Description:** Soyuz TMA-11M will carry three Expedition 38/39 crew members to the International Space Station. They are NASA astronaut Rick Mastracchio, Japan Aerospace Exploration Agency astronaut Koichi Wakata and Russian cosmonaut Mikhail Tyurin.

**Nov. 18**

**Mission:** Mars Atmosphere and Volatile Evolution (MAVEN)  
**Launch Vehicle:** Atlas V  
**Launch Site:** Cape Canaveral Air Force Station  
**Launch Pad:** Space Launch Complex 41  
**Launch Time:** TBD  
**Description:** MAVEN is the first mission devoted to understanding Mars' upper atmosphere. The mission's goal is to determine the role that loss of atmospheric gas to space played in changing the Martian climate through time.

**Nov. 20**

**Mission:** ISS Resupply  
**Launch Vehicle:** ISS Progress 53  
**Launch Site:** Baikonur Cosmodrome, Kazakhstan  
**Launch Time:** TBD  
**Description:** Progress 53 will carry supplies, hardware, fuel and water to the International Space Station.

To watch a NASA launch online, go to <http://www.nasa.gov/ntv>.

## NASA Employees of the Month: September



NASA/Tom Farrar

Employees of the Month for September are, from left, Christopher J. Comstock, Ground Processing; Dustin E. Dyer, Launch Services Program; Janice M. Nieves, Procurement; Bart A. Pannullo, ISS and Spacecraft Processing (Employee of the Quarter); Raquel P. Lumpkin, Human Resources (Employee of the Quarter); Angela G. Krenn, Engineering and Technology; and John "Tim" Moore, Center Operations. Not pictured are James "Trey" Reilly, Ground Systems Development and Operations; John K. Trautwein, Engineering and Technology; and John E. Newport, Safety and Mission Assurance.

### NASA Spinoffs: Did You Know?

## NASA's water treatment technologies inspire healthy, tasty beverages



NASA

The dog days of summer have everyone looking for a cold beverage to drink. Mike Johnson, a former technician at Johnson Space Center, drew on his expertise as a wastewater engineer to create a line of kombucha-based probiotic drinks. Unpeeled Inc., is based in Minneapolis-St. Paul, Minn.

For more about NASA Spinoffs, go to <http://www.nasa.gov/spinoffs>.



John F. Kennedy Space Center

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