



## **2016 Spaceport Magazine Summary**

The 2016 Spaceport Magazine used the above banner for the year, with different background graphics.

### **Introduction**

The first issue of the Spaceport News was December 13, 1962. The 1963, 1964 and 1965 Spaceport News were issued weekly. The Spaceport News was issued every two weeks, starting July 7, 1966, until the last issue on February 24, 2014. Spaceport Magazine, a monthly issue, superseded the Spaceport News in April 2014, until the final issue, Jan./Feb. 2020. The two 1962 Spaceport News issues and the issues from 1996 until the final Spaceport Magazine issue, are available for viewing at [this website](#). The Spaceport News issues from 1963 through 1995 are currently not available online.

In this Summary, black font is original Spaceport Magazine text, blue font is something I added or someone else/some other source provided, and purple font is a hot link.

All links were working at the time I completed this Spaceport Magazine Summary. The Spaceport Magazine writer is acknowledged, if noted in the Spaceport Magazine article.

These Summaries are just that, a Summary, a portion, a small highlight of sorts!

## From The January 2016 Spaceport Magazine

On page 3, “**I am KENNEDY SPACE CENTER - PRITAL THAKRAR**”. Part of the feature says “I am a mechanical design engineer at the Prototype Development Laboratory within the Structures and Launch Accessories group. I work with a small, specialized team that provides design, analysis and fabrication support for everything from quick-turnaround technology projects to large ground support equipment. My career at Kennedy began with an internship the summer of 2011 in the Structures and Mechanisms Design group. I then became a co-op student with Safety and Mission Assurance before moving to the Prototype Lab...

Outside of my everyday job, I’m helping to coordinate the yearly Innovation Expo. I also chair Launching Leaders, an early career group in which we connect and train young professionals on center and in the community. I love meeting new people across the center and learning how we can change the face of the space industry through our words and actions. I can’t wait to see where the exciting work at Kennedy leads me in my career!...”.

Pri ☺



[This is a recent video/panel discussion with Charlie Blackwell-Thompson, Hibah Rahmani and Pri, moderated by Antonia Jaramillo, with NASA Communications.](#)

On pages 6 and 7, “**A New Era - Kennedy firmly established as a 21st century spaceport**”, by Bob Granath. In part, the article reads “For more than 30 years, Kennedy Space Center was a hub of activity supporting processing, launch and landings during America’s Space Shuttle Program... Following the conclusion of shuttle flights and reductions in the size of the workforce, a new approach was required...”

Existing historic buildings and launch sites in use for more than 50 years are being converted to support a modern spaceport equipped with state-of-the art technology meeting the diverse needs of another half-century. Ongoing improvements over the past few years include upgrades to facilities such as the Vehicle Assembly Building, mobile launcher, crawler–transporter and Launch Complex 39B — a historic pad that will launch astronauts aboard the Orion spacecraft, atop an SLS rocket...



Other center facilities no longer needed are being turned over to industry partners to take advantage of their unique capabilities... During the past year, NASA signed a 30-year property agreement with Space Florida for the operations and management of the Shuttle Landing Facility... In September, Blue Origin announced they plan to build rockets at Exploration Park on Kennedy property. The company also leased Launch Complex 36 at Cape Canaveral Air Force Station where they plan to launch their orbital launch vehicle...

Through NASA’s Commercial Crew Program, commercial partners SpaceX and Boeing are developing safe, reliable and cost-effective access to and from low-Earth orbit with American-built rockets... To prepare for these next steps in crew transportation, Bay 3 of the space shuttle era’s Orbiter Processing Facility now is being modernized by Boeing as the Commercial Crew and Cargo Processing Facility. There, Boeing plans to prepare its Starliner spacecraft under development. In 2014, NASA signed a property agreement with SpaceX for the use and operation of Launch Complex 39A where it will launch the Falcon 9 Heavy rocket with its Crew Dragon spacecraft.

These are all tangible steps toward meeting the president’s challenge and firmly establishing that Kennedy has become a 21st century, multi-user spaceport regularly launching to low-Earth orbit and beyond...”.

On pages 12 and 13, “**Mods**”. A portion of the feature says “In High Bay 4 inside the Vehicle Assembly Building at Kennedy Space Center, a 325-ton crane has been attached to the first half of the K-level work platforms for lifting above the transfer aisle and lowering into High Bay 3. The work platform will be lowered into High Bay 3 and secured into position on tower E, about 86 feet above the floor. The K work platforms will provide access to NASA’s Space Launch System (SLS) core stage and solid rocket boosters during processing and stacking operations on the mobile launcher... A total of 10 levels

of new platforms, 20 platform halves altogether, will surround the SLS rocket and Orion spacecraft and provide access for testing and processing.”



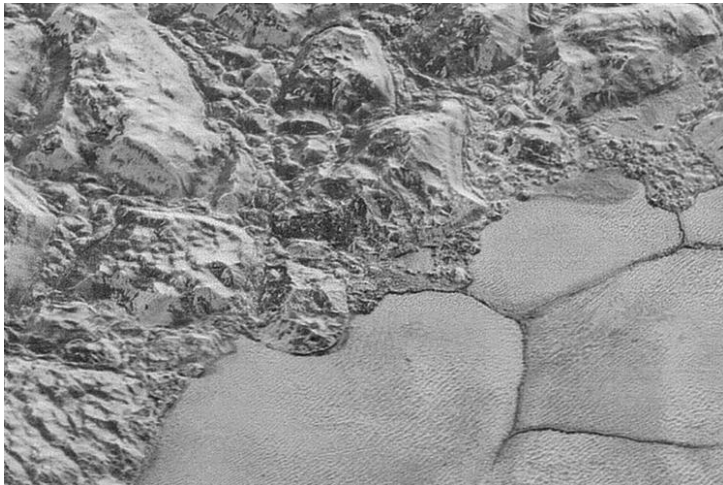
On pages 18 through 21, **“In the White Room - Future crew boarding area under construction”**, by Steven Siceloff. In part, the article states “The Crew Access Arm and White Room that astronauts will use... to board Boeing’s CST-100 Starliner saw some of their first visitors Dec. 10 during a tour of the structures by the first four astronauts selected to train for Commercial Crew Program flight tests... “The White Room is the last place on Earth you see before you get onboard the ship,” said Commercial Crew astronaut Eric Boe, “so it really makes a big difference how it’s outfitted because you’re thinking about the last things before you lift off the planet and it’s obviously a place where you make the transition from being on Earth to getting ready to go into space.”... The steel Crew Access Arm and aluminum White Room together reach about 50 feet and weigh about 90,000 pounds...”

The other new, critical component of the launch pad also enjoyed time in the spotlight when the astronauts joined employees and managers from several companies for a “topping off” ceremony for the Crew Access Tower which is nearing completion at SLC-41. Standing about 200-feet-tall, the Crew Access Tower which is nearing completion at SLC-41... Following a long-held tradition in building construction, employees and guests were asked to sign the last beam before it was lifted into place and bolted to the top of the tower... Workers continue adding more steel platforms to the side of the tower to complete the design that was tailored from the start to the unique needs of astronauts who will traverse the structure wearing pressure suits and who may have their vision hindered by helmets and visors. That means walkways are wider than usual, corners are not as sharp on stairwells and all the edges on the structure are sanded smooth to prevent snagging spacesuits...”



On the left, “Commercial Crew astronauts Bob Behnken and Suni Williams, along with employees of United Launch Alliance and other companies, watch as a crane lifts a 15-foot-long, 650-pound beam to the top of the Crew Access Tower during a “topping off” ceremony Dec. 10, 2015, at Space Launch Complex 41 at Cape Canaveral Air Force Station.” On the right, “Commercial Crew astronaut Eric Boe signs a 15-foot-long, 650-pound beam before it was lifted to the top of the Crew Access Tower during a “topping off” ceremony Dec. 10, 2015, at Space Launch Complex 41 at Cape Canaveral Air Force Station. Employees were asked to sign the beam before it was lifted into place and welded to the top of the 200-foot-tall tower.”

On pages 32 and 33, “**Pluto Pic**”. Part of the story reads “NASA’s New Horizons spacecraft has sent back the first in a series of the sharpest views of Pluto it obtained during its July flyby — and the best close-ups of Pluto that humans may see for decades...”.



“The Mountainous Shoreline of Sputnik Planum: In this highest-resolution image from NASA’s New Horizons spacecraft, great blocks of Pluto’s water-ice crust appear jammed together in the informally named al-Idrisi mountains.”

[This is Wikipedia’s read about New Horizons.](#)

## From The February 2016 Spaceport Magazine

On pages 14 and 15, **“Rising Up”**.



“A new headquarters building begins to take shape at Kennedy Space Center. When it is complete, the seven-story, 200,000-square-foot facility will house about 500 employees. The construction is part of Kennedy’s master plan to transform from a single-user federal entity to a 21st-century spaceport supporting a multitude of users and operations. The current headquarters is pictured behind the new building.”

On pages 16 and 17, **“Launch director chosen to oversee world’s most powerful rocket”**, by Steven Siceloff. Part of the story reads “The first flight of a Space Launch System, or SLS, rocket carrying the Orion spacecraft on an uncrewed mission to lunar orbit and back now has its launch director. Veteran spaceflight engineer Charlie Blackwell-Thompson will helm the launch team at Kennedy Space Center for the first flight test of a space system designed to carry astronauts into deep space before making a landmark journey to Mars. Her selection as launch director means she will be the first woman to oversee a NASA liftoff and launch team...”

“I remember when I walked into Firing Room 1 during a tour before I was hired many years ago, and one of the guys said if you take this job you will sit here at this console,” Blackwell-Thompson said. “I was amazed at even being in the firing room, and the thought of being on the launch team then was unbelievable. So take that feeling and fast forward to getting the opportunity to walk into Firing Room 1 as the launch director for the SLS/Orion vehicle; that is something very special.”...



That tour led to a post with The Boeing Company as a payload flight software engineer that saw Blackwell-Thompson lead test and avionics checkouts for numerous spacecraft and systems that were later launched on the space shuttle. She joined NASA as a test director in 2004 and oversaw different aspects of the launch countdown for launches from 2005 until the shuttle fleet was retired in 2011...

As launch director, Blackwell-Thompson is responsible for making sure the rocket and

spacecraft are ready for flight. Ultimately, she will make the final decision for whether the mission is “go for launch.” Her seat on the top row, closest to the angled wall of windows looking out toward Launch Pad 39B, will give her a direct view to see the SLS engines roar and the boosters lift the 32-story-tall rocket into space...”

On pages 42 and 43, **“Fallen astronauts honored on Day of Remembrance”**, by Bob Granath. A portion of the story says “Each year, Kennedy Space Center employees and guests join others throughout NASA to honor and celebrate the contributions of those astronauts who have perished in the exploration of space... This year’s ceremony took place on Jan. 28 in the Space Shuttle Atlantis facility at the Kennedy Space Center Visitor Complex. The date marked the 30th anniversary of the loss of the shuttle Challenger and her crew.

Center Director Bob Cabana, a former space shuttle commander, emphasized that flight safety must remain paramount embracing the experiences from Apollo 1, Challenger and Columbia. “We learned many lessons from the loss of Challenger,” he said. “The vehicle that returned to flight two and a half years later may have looked the same, but it had hundreds of changes, making it safer and more reliable.”...



“Following the Day of Remembrance ceremony, a wreath was placed at the Space Mirror Memorial by, from the left, U.S. Air Force Brig. Gen. Richard Scobee, son of Dick Scobee; Alison Smith Balch, daughter of Michael Smith; Kathie Scobee Flugham, daughter of Dick Scobee; Sheryl Chaffee, daughter of Roger Chaffee; and Scott McAuliffe, son of Christa McAuliffe.”

Also participating in the ceremony were state Sen. Thad Altman, president and chief executive officer of the Astronauts Memorial Foundation, or AMF, and former shuttle astronaut Jon McBride, chairman of the AMF board of directors...”

[This is video from the January 28th ceremony.](#)

## From The March 2016 Spaceport Magazine

On pages 6 through 9, “**Orion crew module processing begins for first mission atop Space Launch System**”, by Linda Herridge. Part of the article says “...The pressure vessel portion of the Orion crew module arrived at Kennedy Space Center in early February in preparation for an uncrewed trip around the moon... The pressure vessel arrived Feb. 1 aboard NASA’s Super Guppy aircraft from the Michoud Assembly Facility in New Orleans to Kennedy’s Shuttle Landing Facility, operated by Space Florida... “At Kennedy, we are going to turn the pressure vessel into a fully operational spacecraft,” Scott Wilson said... The main goal of the first integrated launch of the SLS rocket and Orion spacecraft will be to demonstrate NASA’s new capability to launch future crewed, deep-space missions...”.



“Scott Wilson, manager of Orion Production Operations at Kennedy, speaks to members of the news media inside the Neil Armstrong Operations and Checkout Building high bay at Kennedy Space Center. To his right is NASA astronaut Stan Love. To his left are Mark Geyer, deputy director of NASA’s Johnson Space Center in Houston, and Mike Hawes, Lockheed Martin’s Orion Program manager.”

On page 14, “**Dream Chaser**”. A portion of the feature says “A full-scale engineering test article of Sierra Nevada Corporation’s Dream Chaser spacecraft is nearing completion leading to a second round of atmospheric evaluations at NASA’s Armstrong Flight Research Center in Edwards, California. The flight testing, which calls for the Dream Chaser to be released high over California’s Rogers Dry Lakebed and glide to a safe landing, will build upon an earlier free-flight test...”.





On page 19.



# Going Vertical

A critical piece of large equipment was tested in February at Launch Complex 39A as SpaceX raised and lowered the transporter erector that will be used to move the Crew Dragon spacecraft atop a Falcon 9 rocket to the launch pad for missions. Standing 212 feet high — more than 20 stories — the TE, as SpaceX calls the machine, will move launch-ready rockets and spacecraft from the processing hangar at the base of the pad up to the pad surface and into a vertical position over the flame trench.

The lift and lowering of the transporter erector are part of routine tests conducted on the pad to ensure all ground systems are prepared to launch astronauts to the International Space Station. The TE is a much larger and stronger version of the erector the company uses at Space Launch Complex 40, as it will also be used for processing and launching future Falcon Heavy rockets. Photo credit: SpaceX

On pages 22 and 23, “**Lap in an MRAP**”. The feature states “NASCAR driver Carl Edwards visited Kennedy Space Center and slid behind the wheel of an entirely different kind of car: a Mine-resistant, Ambush-protected vehicle better known as MRAP. The agency’s Ground Systems Development and Operations Program selected the MRAP to

serve as an upgraded version of an armored escape vehicle that would allow astronauts to evacuate the launch pad in the event of an emergency. While at Kennedy, Edwards stopped by the massive Vehicle Assembly Building and Launch Pad 39B...”.



[This is a video of Carl's visit to the Space Center.](#)

On pages 28 and 29, **Tour de KSC**.



“More than 650 employees and their guests came out to Kennedy Space Center on Feb. 27 to take a bike tour of the multiuser spaceport. During the event, bike riders could choose from three different routes of varying length. All routes had unique photo stops where riders could see, firsthand, what is being worked on at the center.”

On pages 30 and 31, **Commercial Crew astronaut Suni Williams shares her insight**. In part, the feature says “...Astronaut Suni Williams talked recently about some of the expectations of the Commercial Crew Program, which is working with Boeing and SpaceX on their CST-100 Starliner and Crew Dragon spacecraft... Williams also talked about some of the things that make her career enjoyable and what it takes to become an astronaut...”

**WHY USE TEST PILOTS FOR THE FIRST COMMERCIAL CREW MISSIONS?** This will be the first time in a generation that we are going to launch a new spacecraft... Part of that is putting test pilots on the first couple missions. As part of the test pilot curriculum, we learn a lot about the rigors and the methodology of testing in a very stepwise fashion... I think part of the methodology of selecting test pilots for the first couple flights is based on the rigors that we learned in test pilot school...

**WILL ONLY TEST PILOTS BE ABLE TO FLY THESE SPACECRAFT?** After the first couple missions of each spacecraft, I don't think we're going to have to have test pilots as the prime operator of either of the commercial crew vehicles...



**WHAT DO YOU TAKE WITH YOU WHEN YOU GO TO SPACE?** So I've been to space two times and I always like to take something that reminds me of home. My first mission I wasn't sure how much stuff I could take or what I could take, you know it's always the first time, so I took a little paper cutout of my dog and I had him inside of my crew notebook. My second time I knew a little more about how much space I had so I had a little stuffed animal of him... For the next mission, I don't know, I don't think I can take anything bigger than the stuffed animal I already had so I might have to get one more stuffed animal. I actually left my little stuffed guy up there with one of my crewmates who was staying on the space station so this time if I take a stuffed Gorby I think I might have to bring him back home with me...

**WHAT DOES IT MEAN TO WORK AT NASA AND BE AN ASTRONAUT?** Working for NASA and being an astronaut is really exciting, and it's fun, first and foremost. I have never felt like I have "a job." I go to work every day and it's something new and exciting and sometimes it means actually getting on a rocket and going to space...

**WHEN DID YOU BEGIN TO THINK YOU WANTED TO BE AN ASTRONAUT?** When I was a kid I was thinking about what I wanted to do when I grow up, I think everybody thinks about that... I really just didn't know, honestly, when I was a little kid. I didn't even really know when I was graduating from high school. So I had the opportunity to go to the Naval Academy, and after that I learned how to fly airplanes and helicopters. That led me to be interested in engineering and being interested in learning how to test fly aircraft. Later, test pilot school brought me down to NASA's Johnson Space Center and that's the first time I ever met an astronaut, John Young. He talked about landing on the moon and I thought, wow, he had to fly something like a helicopter to land on the moon and maybe I have those skills too. That was the very first time I thought about being an astronaut..."

## From The April 2016 Spaceport Magazine

On page 6, "**Orion Suited Crew Testing**".



"Engineers at NASA's Johnson Space Center in Houston are evaluating how crews inside a mockup of the Orion spacecraft interact with the rotational hand controller and cursor control device while inside their Modified Advanced Crew Escape spacesuits. The controllers are used to operate Orion's displays and control system, which the crew will use to maneuver and interact with the spacecraft during missions to deep space destinations. The testing aims to provide data that teams need to make sure astronauts who ride to space in Orion can appropriately interact with the control system while in their suits."

On page 8.



"Astronaut Anne McClain rehearses egress procedures for the SpaceX Crew Dragon spacecraft in a mockup at the company's headquarters in Hawthorne, California..."

On pages 14 and 15.



“A 250-ton crane is used to lower the second half of the K-level work platforms for NASA’s Space Launch System rocket into High Bay 3 inside the Vehicle Assembly Building... The platform will be secured about 86 feet above the VAB floor, on tower E of the high bay. The K work platforms will provide access to the SLS core stage and solid rocket boosters during processing and stacking operations on the mobile launcher...”

On pages 16 and 17, **“Pathfinder operations will pave way for Space Launch System processing”**, by Linda Herridge. A portion of the article states “...A team of NASA engineers and Jacobs Engineering technicians and crane operators on the Test and Operations Support Contract are preparing for Exploration Mission 1 (EM-1), now Artemis I, processing activities... Experienced personnel are leading the preparation effort using pathfinders, or test versions, of an aft skirt and two inert segments of a solid rocket booster (SRB) inside the Rotation, Processing and Surge Facility (RPSF)... These pathfinder operations are performed to help verify that the upgrades and modifications completed in the RPSF will support processing requirements for the aft skirt, SRB segments and the integrated aft booster assembly...”.



“Two cranes are used in tandem to lift the first of two pathfinders, or test versions, of solid rocket booster segments for NASA’s Space Launch System rocket away from a railcar inside the Rotation, Processing and Surge Facility high bay at Kennedy Space Center on Feb. 25. The booster segment will be raised into the vertical position. The Ground Systems Development and Operations Program and Jacobs Engineering, on the Test and Operations Support Contract, are conducting a series of lifts, moves and stacking operations using the booster segments, which are inert...”.

On pages 8 and 9.



“NASA’s upgraded crawler-transporter 2 exited the Vehicle Assembly Building at Kennedy Space Center for its trek along the crawlerway to Launch Pad 39B to test recently completed upgrades and modifications...”.

## **From The May 2016 Spaceport Magazine**

On pages 8 and 9, “**Simulators give astronauts glimpse of future flights**”. In part, the story reads “NASA’s commercial crew astronauts Suni Williams and Eric Boe tried out a new generation of training simulators at the Boeing facility in St. Louis Tuesday that will prepare them for launch, flight and returns aboard the company’s CST-100 Starliner spacecraft... The part-task trainers, each large enough for one person at the controls and programmed to run through all the phases of a mission, are part of a suite of cloud-based and hands-on trainers that Boeing has built to prepare astronauts and mission controllers. The trainers will be shipped to NASA’s Johnson Space Center in Houston this year so astronauts can use them...”.



“Commercial Crew astronaut Suni Williams practices docking operations for Boeing’s CST-100 Starliner using a simulator designed to mimic the controls and behavior of the spacecraft...”.

On pages 44 and 45, **“Prospective partners attend Partnership Landscape Forum”**, by Linda Herridge. A portion of the article states “More than 20 partners and prospective partners participated in a Partnership Landscape Forum hosted by the Center Planning and Development Directorate (CPD) at Kennedy Space Center on April 7...

Government and academia forum participants included the U.S. Air Force 45th Space Wing, FAA, Florida Department of Transportation, Space Florida, the Space Coast Economic Development Commission and Embry-Riddle Aeronautical University. Industry attendees included Blue Origin, Boeing, Ensco, Gilmour Space Corp., Greenboard Enterprise, Masten, Micro Aerospace Solutions, Orbital ATK, Rocket Crafters Inc., Rocket Lab USA, Space Systems Alliance, SpaceX, TrailBlazer Technologies, United Launch Alliance and Virgin Galactic...”.



“Scott Colloredo, director of the Center Planning and Development Directorate at Kennedy Space Center, listens to a question from one of the participants during the Partnership Landscape Forum V on April 7.”

On pages 46 and 47, **“STS-1 Team Members inspire, share experiences learned with workforce”**, by Linda Herridge. Part of the feature says “The first space shuttle mission, STS-1, launched April 12, 1981, at 7 a.m. EST, 35 years ago, from Launch Pad 39A at Kennedy Space Center. Space shuttle Columbia carried two American heroes, Commander John Young and Pilot Bob Crippen, on a two-day mission to test the new launch vehicle’s capabilities...

One of those heroes, Bob Crippen, was the keynote speaker during the STS-1 Legacy and Lessons Learned event April 8 at Kennedy. Crippen shared memories of his selection as the pilot for the first space shuttle mission, overall mission highlights and lessons learned from that mission and subsequent shuttle flights. “Serving as the pilot on the STS-1 mission was one of the highlights of my life,” Crippen said...

Kennedy Center Director Bob Cabana led an informal discussion with several STS-1 team members who shared stories and lessons learned from the early days of the shuttle program. Participants were John Tribe, chief engineer for Boeing/Rockwell Launch Support Services; Dick Lyon, director of Shuttle Logistics Operations; Roy Tharpe, Shuttle Test Support manager; Jim Harrington, STS-1 vehicle manager; John Conway, director

of Information Systems; and Bob Seick, STS-1 Shuttle Project engineer and launch director for 52 flights beginning in February 1984...

The event was coordinated by NASA engineer Mike Ciannilli, who is the manager for the Apollo, Challenger, Columbia Lessons Learned program at Kennedy. "A great measure of our current success rests on the giants who came before us," Ciannilli said. "Our mission is to innovatively share the missions from the past to achieve more mission success in the future."



"Kennedy Space Center Director Bob Cabana, far left, stands with STS-1 team members at the conclusion of the STS-1 Legacy and Lessons Learned event April 8 at the Training Auditorium at Kennedy. To his right, are Roy Tharpe, STS-1 shuttle test support manager; Jim Harrington, STS-1 vehicle manager; John Conway, STS-1 director of Information Systems; John Tribe, STS-1

chief engineer for Boeing/Rockwell Launch Support Services; STS-1 Pilot Bob Crippen; Dick Lyon, STS-1 director of shuttle logistics operations; Bob Seick, STS-1 shuttle project engineer; and Hugh Harris, STS-1 launch commentator with public affairs..."

[Video of the event is at this site!](#)

## **From The June 2016 Spaceport Magazine**

On pages 4 through 7. "**OSIRIS-REx Spacecraft arrives**", by Frank Ochoa-Gonzales. In part, the article states "The spacecraft that will perform NASA's Origins Spectral Interpretation Resource Identification Security – Regolith Explorer mission, known as OSIRIS-REx, arrived at Kennedy Space Center from Buckley Air Force Base near Denver on May 20 aboard an Air Force C-17 at the Shuttle Landing Facility... OSIRIS-Rex is scheduled to launch Sept. 8 at 7:05 p.m. EDT aboard an Atlas V rocket from Space Launch Complex 41 at Cape Canaveral Air Force Station, Florida..."

As planned, the spacecraft will reach its near-Earth asteroid target, called Bennu (formerly 1999 RQ36), in 2018... 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 where the spacecraft's arm will take a sample. The spacecraft gradually will move closer to the site, and the arm will extend to collect at least a 2.1-ounce sample for return to



Earth in 2023... Bennu is about 1,900 feet in diameter or roughly the size of six football fields...”.



“NASA’s OSIRIS-REx spacecraft is revealed after its protective cover is removed inside the Payload Hazardous Servicing Facility at Kennedy Space Center.”

[This is Wikipedia’s read about OSIRIS-REx.](#) OSIRIS-REx successfully touched-down on Bennu on October 20, 2020, retrieved a sample and is currently on its way back to Earth.

On pages 30 and 31, **“Starliner test article joined to complete first hull”**, by Steven Sicheloff. [Part of the feature states](#) “The first CST-100 Starliner hull stands in one piece inside Boeing’s Commercial Crew and Cargo Processing Facility at Kennedy Space Center after engineers bolted together the upper and lower domes May 2 as completion nears of the Structural Test Article. It is the first spacecraft to come together inside the former shuttle hangar since shuttle Discovery was moved out of the facility following its retirement... The Starliner structural test article will go through final outfitting before it is moved to Huntington Beach, California, where it will be subjected to loads and separation testing...”.



“...A Boeing CST-100 Starliner... is connected to the lower dome to complete the first hull of the Starliner’s Structural Test Article, a prototype spacecraft that is identical to the operational versions but not meant to fly in space...”.

On pages 36 and 37, “**Students trade school day for workday at Kennedy Space Center**”, by Anna Heiney. A portion of the story says “...Kennedy held its Take a Child to Work Day in conjunction with the national Take Our Sons and Daughters to Work Day. The April 28 event allowed children across the country to accompany their parents, relatives or other sponsors into the workplace to see firsthand the connection between what they’re learning in school today and where it could lead their careers...”

“I hope they learn how fun it is to work out here, and how important the work we do here is for everyone on Earth,” said Matthew English, a NASA configuration management specialist in Kennedy’s Exploration Research and Technology Programs office. English was stationed in the Space Station Processing Facility’s high bay, where he chatted with kids and pointed out a floor marker that helped visitors get a feel for the 361-foot length of the orbiting laboratory. “I love seeing the look on their faces when they learn how big the station is,” he said... One of the long-term goals of Take a Child to Work Day is to spark an “aha” moment in the minds of children...”



“Kennedy Space Center Director Bob Cabana, right, watches as children prepare to launch air rockets at the Florida spaceport on Take a Child to Work Day.”

On pages 44 through 47, “**Hall of Fame welcome pair of space shuttle astronauts**”, by Bob Granath. In part, the feature states “Space shuttle astronauts Brian Duffy and Scott Parazynski joined an elite group of American space heroes as they were inducted into the U.S. Astronaut Hall of Fame... during a May 14 ceremony at the Kennedy Space Center Visitor Complex... Former CNN reporter and veteran space correspondent John Zarrella, served as master of ceremonies and introduced the 20 attending members of the Astronaut Hall of Fame...”

After graduation from the U.S. Air Force Academy, Duffy gained extensive experience as a test pilot, including over 5,000 hours in more than 25 different aircraft, before becoming an astronaut... Duffy began putting these experiences to work on his first flight assignment in 1992 as pilot of STS-45 and STS-57 the following year. In 1996, he was commander of the STS-72 flight of the shuttle Endeavour. In 2000, Duffy commanded the STS-92 crew of Discovery on a mission to the International Space Station... Today, Duffy

is Orbital ATK's vice president and program manager, leading the company's human space exploration activities at Kennedy and the Johnson Space Center in Houston...

Kent Rominger, also a hall of fame astronaut, introduced Parazynski, noting that he is not only an astronaut, but also the first person to orbit the Earth and later climb to the summit of Mount Everest... Parazynski flew five space shuttle missions and participated in seven spacewalks. His shuttle missions include serving as a mission specialist on STS-66 in 1994 and STS-86 three years later, including a rendezvous with the Russian space station Mir... Following his fifth spaceflight, Parazynski retired from NASA in 2009 to work in industry and to pursue other interests, such as scaling Mount Everest. He also served as honorary captain of the U.S. Olympic Luge Team during the 2010 winter games in Vancouver, Canada...

In the 1980s, the six surviving Mercury Seven astronauts and Gus Grissom's widow, Betty Grissom, conceived the idea of a place where U.S. space travelers could be remembered and honored. The Mercury Seven Foundation and Astronaut Scholarship Foundation were formed and have a role in operations of the Hall of Fame...".



"At NASA's Kennedy Space Center Visitor Complex, space shuttle astronauts Brian Duffy, left, and Scott Parazynski, congratulate each other after being inducted into the U.S. Astronaut Hall of Fame."

[This is video of the 2016 U.S. Astronaut Hall of Fame induction ceremony.](#)

[The following is a good video with Scott Parazynski, comparing climbing Mount Everest to a spaceflight.](#)

## From The July 2016 Spaceport Magazine

On pages 4 and 5, “**SLS booster passes major milestone**”. A portion of the feature says “The second and final qualification motor (QM-2) test for the Space Launch System’s booster is seen June 28 at Orbital ATK Propulsion Systems test facilities in Promontory, Utah... The booster was tested at a cold motor conditioning target of 40 degrees Fahrenheit — the colder end of its accepted propellant temperature range. When ignited, temperatures inside the booster reached nearly 6,000 degrees. The two-minute, full-duration ground qualification test provided NASA with critical data on 82 qualification objectives that will support certification of the booster for flight...”.



[This is video of the QM-2 qual test.](#)

On pages 15 and 16, “**CRS-9 Carrying Crucial Port to Station**”, by Steven Sicheloff. In part, the article states “A metallic ring big enough for one or two people to fit through at a time will fly to the International Space Station in mid-July as part of the cargo aboard an unpiloted SpaceX Dragon spacecraft loaded with materials for the orbiting laboratory and its crew. The ring is known as an International Docking Adapter, or IDA, and its main purpose is to provide a port for spacecraft bringing astronauts to the station in the future as part of NASA’s Commercial Crew Program... The IDA stands about 42 inches tall and is 63 inches in diameter on the inside. Sensors and other fittings ring the perimeter of the adapter and give it an overall diameter of about 94 inches...”.



“Engineers in the Space Station Processing Facility at Kennedy Space Center, Florida, recently tested the mechanisms that will connect future commercial crew spacecraft with the second International Docking Adapter... It will be one of two connection points for commercial crew spacecraft visiting the orbiting laboratory...”.

On pages 24 and 25.



“Commercial Crew astronauts, left to right, Bob Behnken, Suni Williams, Eric Boe, and Doug Hurley stand on the Crew Access Arm leading to the White Room at a construction yard near NASA’s Kennedy Space Center in Florida.”

This is the Crew Access Arm to be installed at LC41.

## From The August 2016 Spaceport Magazine

On pages 16 and 17, “**Partnerships key to Commercial Crew success**”, by Stephanie Martin. In part, the article says “...For NASA and the Commercial Crew Program, partnerships are essential. This concept was underscored Tuesday as NASA, Boeing and Bastion Technologies announced a new Mentor-Protégé Program agreement through the agency’s Small Business Office. “Small business partnerships are key not only to the success of the Commercial Crew Program, but also to NASA as an agency,” said Joyce McDowell, a small business specialist in NASA’s Kennedy Space Center Office of Small Business Programs...



“NASA and industry leaders sign an agreement for Boeing to mentor a small business called Bastion Technologies, which is building some of the training mock-ups and ground support equipment for Boeing’s CST-100 Starliner spacecraft. From left are Ellen Lamp, Kennedy Space Center contracting officer; Gary Beatovich, Commercial

Crew Program contracting officer representative; Kathryn Lueders, manager of NASA’s Commercial Crew Program; John Mulholland, vice president and program manager of Boeing Commercial Programs; Jorge Hernandez, president of Bastion Technologies; Kennedy Space Center Director Bob Cabana; Glenn Delgado, associate administrator of NASA’s Office of Small Business Programs; and Joyce McDowell of NASA Kennedy Space Center’s Small Business Office.”

Following the announcement, Boeing unveiled its clean-floor factory that serves as the hub for the Starliner spacecraft as they are manufactured, prepared for flight and refurbished for the next mission. The facility, formerly known as Orbiter Processing Facility 3, is now modernized and ready to support Boeing's CST-100 Starliner program... Today, the facility contains several pieces of flight hardware and a mock-up that are key to Boeing's and NASA's efforts to launch astronauts from Florida's Space Coast through the Commercial Crew Program...".



"NASA, industry and news media representatives visit the modernized high bay in Boeing's Commercial Crew and Cargo Processing Facility at Kennedy Space Center."

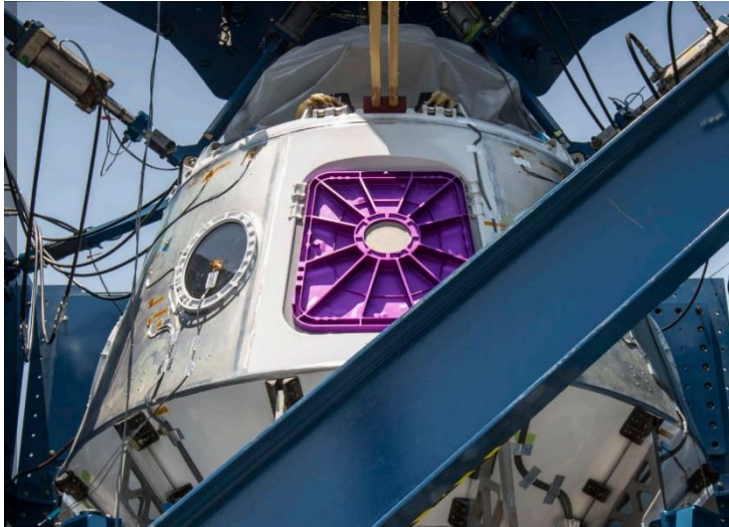
On pages 18 through 21, "**Heat shield install begins for Orion's first mission atop Space Launch System rocket**", by Bob Granath. A portion of the article says "A crucial part of preparing NASA's next Orion spacecraft for flight now is underway. Technicians recently began the process of bonding thermal protection system (TPS) tiles to panels that will be installed on Orion. The tiles will protect the spacecraft from the searing heat of re-entry when it returns from deep space missions..."



"Technicians have begun bonding thermal protection system tiles to the nine panels that will cover the Orion crew module for the agency's first uncrewed flight test with the Space Launch System (SLS)... in the Neil Armstrong Operations and Checkout Building at Kennedy Space Center."

According to Joy Huff, a thermal protection system engineer in the Materials Science Branch of Kennedy Engineering, Orion's back shell panels and forward bay cover, which helps protect the spacecraft during re-entry, will be protected by silica tiles similar to those used for more than 30 years on the space shuttle... Orion will need about 1,300 tiles to protect it. On average, the tiles are 8-inches by 8-inches and many are standard in size...".

On pages 30 and 31.



"Pressure vessels built by SpaceX to test its Crew Dragon designs are going through structural testing, so engineers can analyze the spacecraft's ability to withstand the harsh conditions of launch and spaceflight... SpaceX completed two pressure vessels that will be used for ground tests...".

On page 40.



"The NASA Extreme Environment Mission Operations (NEEMO) 21 mission began July 21, as an international crew of aquanauts splashed down to the undersea Aquarius Reef Base, 62 feet below the surface of the Atlantic Ocean in the Florida Keys National Marine Sanctuary. The NEEMO 21 crew will perform research both inside and outside the habitat during a 16-day

simulated space mission. During simulated spacewalks carried out underwater, they will evaluate tools and mission operation techniques that could be used in future space missions. Inside the habitat, the crew's objectives include testing a DNA sequencer, a medical telemetry device, and HoloLens operational performance for human spaceflight cargo transfer. Pictured at the end of Mission Day 1 are the NEEMO 21 aquanauts, clockwise from top: Matthias Maurer (ESA),

Marc O Griofa (Teloregen/VEGA/ AirDocs), NASA astronaut Megan McArthur, NASA astronaut Reid Wiseman, Dawn Kernagis (Institute for Human & Machine Cognition), and Noel Du Toit (Naval Postgraduate School). Inside the Aquarius habitat are Florida International University Habitat Technicians Hank Stark (left) and Sean Moore (right).” [Matthias Maurer is not shown, above the upper center portion of the photo.](#)

[This is Wikipedia’s read about NEEMO.](#) The first NEEMO mission, NEEMO 1, took place in October 2001.

## **From The September 2016 Spaceport Magazine**

On pages 14 and 15, “**Engine test shows design ready for new era**”, by Steven Siceloff. [A portion of the article states](#) “A trio of NASA astronauts watched Friday as engineers and technicians from Aerojet Rocketdyne fired one of the RL10 engines that will help power... Boeing’s CST-100 Starliner... Steam billowed from the test stand in West Palm Beach, Florida, for about six minutes as the engine burned a combination of liquid hydrogen and liquid oxygen to produce some 22,300 pounds of thrust...

After verifying the test was good and the information complete, Aerojet Rocketdyne will ship the same engine tested Friday to ULA’s Decatur, Alabama, plant where it will be bolted... to the upper stage of an Atlas V booster. That stage, called Centaur, will take over once the first stage is spent and falls away during the climb into space... RL10 engines also are slated for use on the Space Launch System rocket in development to lift astronauts to deep-space destinations aboard Orion spacecraft. A single RL10 will power the Interim Cryogenic Propulsion Stage during the first test flight of SLS and Orion...”.



“NASA astronauts Barry “Butch” Wilmore, from left, Eric Boe and Suni Williams survey an RL10 engine as it stands in a vacuum chamber at Aerojet Rocketdyne’s test stand in West Palm Beach, Florida.”

[The following is Wikipedia’s read about the RL10 engine.](#) Per Wikipedia, “...The RL10 was the first liquid hydrogen rocket engine to be built in the United States... and was first tested on the ground in 1959, at Pratt & Whitney's Florida Research and Development Center in West Palm Beach, Florida. The first successful flight took place on November



27, 1963. For that launch, two RL10A-3 engines powered the Centaur upper stage of an Atlas launch vehicle...”.

On pages 22 and 23, **“NASA, Boeing simulate return from low-earth orbit Commercial Crew mission”**, by Sasha Ellis. In part, the article states “Boeing and NASA engineers at NASA’s Langley Research Center in Hampton, Virginia, kicked off an initial series of six land landing qualification tests to simulate what the actual spacecraft and crew may experience after returning to Earth from the International Space Station. The spacecraft is being developed in collaboration with NASA’s Commercial Crew Program...”.



“Dirt flies out as the mock-up of a Boeing CST-100 Starliner lands as part of testing on the spacecraft’s landing system including airbags designed to absorb the shock of impact.”

On pages 24 and 25, **“Commercial Crew astronauts discuss progress, training with employees”**, by Steven Sicheloff. A portion of the feature says “There are few days that are the same for NASA’s Commercial Crew Program astronauts as they train for flight tests aboard the next generation of human-rated spacecraft, astronauts Eric Boe and Suni Williams told an audience at NASA’s Kennedy Space Center on Thursday. “One of the things I like about being an astronaut is that you’re always doing different things,” Boe said. “I don’t think I have a day or week that’s been the same since we started this.” Williams said the constant changes involved in training are similar to what happens during a space mission, so the daily differences are valuable for the crews. “This is not work, this is fun,” Williams said. “It’s pretty spectacular the stuff we get to do, but it’s not all the same. It’s not routine and I think that’s good training...”

Taking questions from around the agency during the Kennedy event, Boe and Williams were joined by Bob Cabana, director of Kennedy and a former space shuttle commander, and Kathy Lueders, manager of the Commercial Crew Program...



“The panelists took questions from the audience and from other NASA centers during the event.”

**What opportunities do you have working on a developmental program?** **Boe:** We haven’t worked on a new manned program in the United States in more than 30 years, so it’s a great honor for all of us... **Williams:** Now is a good time to try new things. We’re really taking advantage of 22 years of technological advances...

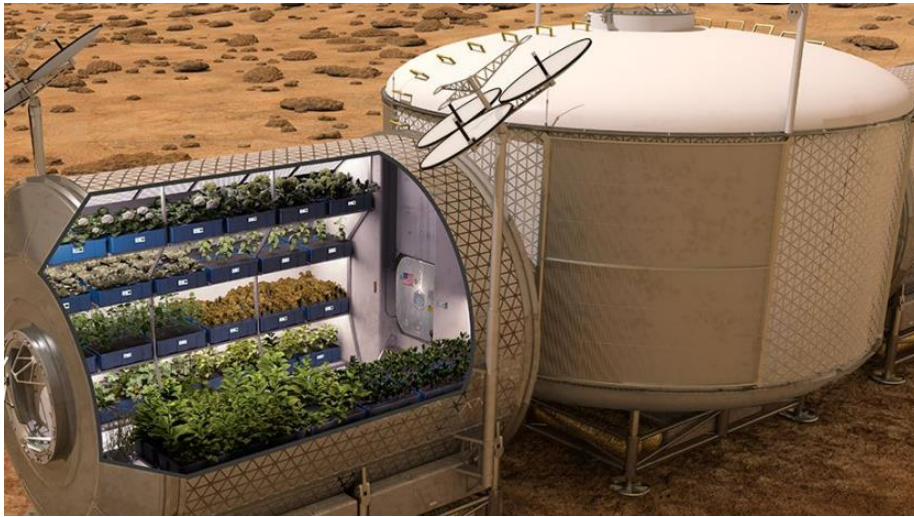
**What do you think of the changes you are seeing at Kennedy?** **Boe:** It’s amazing to see Pad 39A getting modified by SpaceX. It’s hardware and to me it show we are moving right along... It’s really amazing to see an old building like the Commercial Crew and Cargo Processing Facility completely remade on the inside like Boeing did to make it into a Starliner factory. **Williams:** To me this is not a museum, it’s an active spaceport... It’s just not where shuttles used to fly, it’s where new vehicles are getting ready to fly. It’s happening and it’s happening quickly...”

## **From The October 2016 Spaceport Magazine**

On pages 8 and 9, “**Farming in Martian Gardens**”, by Anna Heiney. [Part of the feature says](#) “Of the many challenges involved in sending humans on the journey to Mars, figuring out how to pack enough food for such a lengthy trip looms large... Kennedy Space Center is partnering with the Florida Tech Buzz Aldrin Space Institute in Melbourne, Florida, to collaborate on research studying the performance of crop species grown in a simulated “Martian garden” — a proving ground for a potential future farm on the Red Planet...”

The 100 pounds of Martian soil simulant being used at Florida Tech comes from Hawaii and was chosen based on spectral data from Mars orbiters. It will be a common simulant used for testing the performance of the hardware systems used to grow plants. The Florida Tech team will experiment with which and how much nutrients should be added to the simulant for optimal plant growth of various crops...

Discoveries made in these Earth-based “Martian gardens” will pave the way for future studies and technology development in terms of reliable, efficient food production a long way from the home planet...”.



“NASA plans to grow food on future spacecraft and on other planets as a food supplement for astronauts. Fresh food, such as vegetables, provide essential vitamins and nutrients that will help enable sustainable deep space pioneering.”

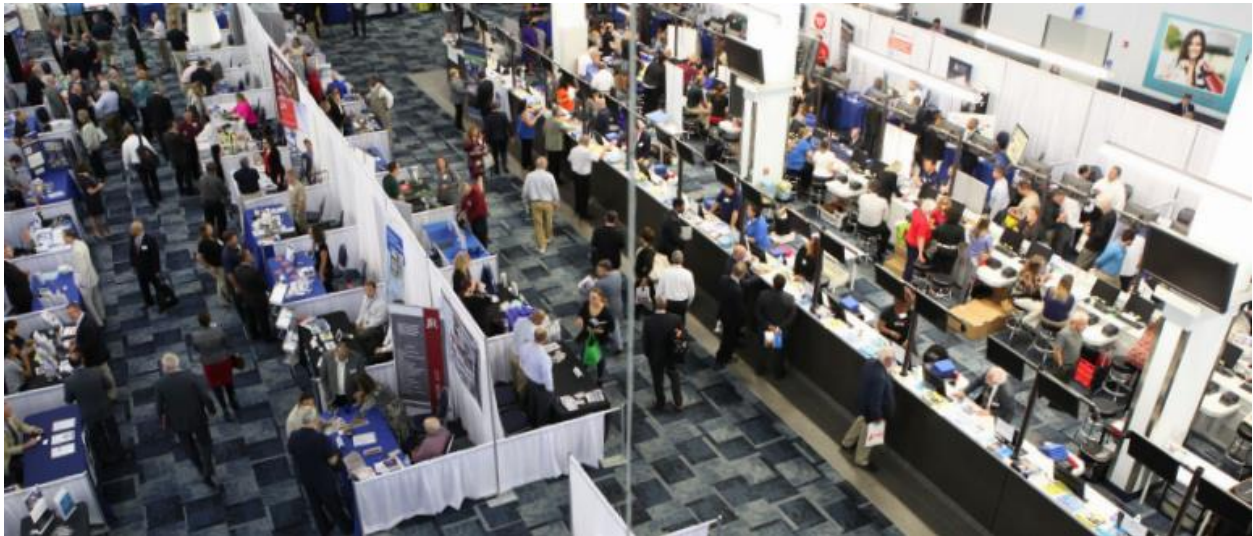
[On page 32.](#)



“A group of U.S. Navy divers, Air Force pararescuemen and Coast Guard rescue swimmers practice Orion underway recovery techniques in the Neutral Buoyancy Laboratory at NASA’s Johnson Space Center in Houston on Sept. 21. The uncrewed Orion spacecraft will splashdown in the Pacific Ocean off the San Diego coast at the end of its test flight with the agency’s Space Launch System (SLS) rocket...”.

## From The November 2016 Spaceport Magazine

On pages 12 and 13.



“Hundreds of businesses and government exhibitors were on hand Oct. 25 to share ideas, information and opportunities at the NASA/KSC Opportunities Expo 2016 at Port Canaveral, in Florida. A variety of product and service areas from across the nation were on display at the event, in its 26th year.”

On pages 16 and 17 **“Trainers prepare NASA’s astronauts, flight controllers for the next era of human spaceflight”**, by Noah Michelsohn. In part, the article states “...hallways within NASA Johnson Space Center’s Jake Garn Mission Simulator and Training Facility are lined with history. Since 1965, the facility, known to Johnson team members simply as Building 5, has trained the world’s greatest explorers for Gemini, Apollo, Space Shuttle and International Space Station Program missions...”



“Sunita Williams takes the helm at the Crew Part-Task Trainer, which simulates Boeing’s CST-100 Starliner Spacecraft.”

Building 5 is now home to a new innovation—the Crew Part-Task Trainers—which are spaceflight training simulators for Boeing’s CST-100 Starliner spacecraft... The Starliner Crew Part-Task Trainers, each a scale replica of the spacecraft’s control area, create a realistic simulation of spaceflight for comprehensive training. The trainers use technology similar to F-15 simulators that Boeing developed for the U.S. Air Force...”.

On pages 20 and 21, **“President touts advances in commercial crew spacecraft”**. Part of the feature states “...President Barack Obama talked Oct. 13 with the two companies developing the next generation of American spacecraft designed to take NASA astronauts into orbit and to the International Space Station. Touring exhibits by Boeing and SpaceX during the Frontiers Conference at Carnegie Mellon University and University of Pittsburgh in Pittsburgh, Obama discussed the immediate future of space exploration and touted the advances made in the public-private partnerships between the companies and NASA’s Commercial Crew Program...”

Obama even took the controls of a simulator designed to mimic the flight of Boeing’s CST-100 Starliner spacecraft. He conducted a Starliner docking maneuver similar to the one astronauts will actually fly in the future during crew rotation missions to the orbiting laboratory... “I’m not sure who had more fun today – the president or me,” said NASA astronaut Serena Aunon-Chancellor, who helped demonstrate how the simulator worked... The president also inspected SpaceX’s Crew Dragon design up-close and talked at length with Aunon-Chancellor and a company official...”.



## From The December 2016 Spaceport Magazine

On pages 4 through 7 “**BASALT Mars Tool Test**”, by Frank Ochoa-Gonzales. In part, the article states “NASA researchers spent 18 days in Hawaii recently “test-driving” many of the tools, techniques and processes astronauts may employ in the future during a Journey to Mars. Trying out backpacks designed and built at NASA’s Kennedy Space Center in Florida, researchers hope to gather data to understand the habitability of terrestrial volcanic terrains as simulated environments for early and present-day Mars...

The soil at Mauna Ulu in Hawaii Volcanoes National Park is blanketed with a thin, crumbly lava rock known as shelly pahoehoe — thought to be similar to the mostly basalt terrain of Mars... Kennedy contributed the backpack, communications and networks, and some of the logistics...”.

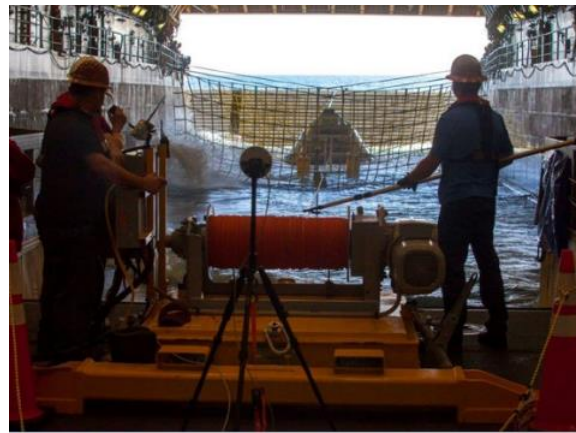


“The NASA BASALT (Biologic Analog Science Associated with Lava Terrain) simulation astronauts with their field support team are shown during a traverse to start a two-week Mars analog science and exploration mission. This photo was taken at Mauna Ulu, the Big Island of Hawaii, on Nov. 12.”

On pages 20 and 21, “**NASA, U.S. Navy practice Orion recovery procedures for Exploration Mission 1**”, by Linda Herridge. A portion of the feature states “NASA’s Ground Systems Development and Operations Program (GSDO), the U.S. Navy, U.S. Air Force and contractor employees recently wrapped up in late October a successful rehearsal of Orion recovery, called an Underway Recovery Test, aboard the USS San Diego in the Pacific Ocean off the coast of California. The USS San Diego is an amphibious ship with a landing platform/dock used to pull the Orion spacecraft into the ship... This is the fifth such test with Orion...

During the recovery test, the team demonstrated and evaluated in open water new recovery processes, procedures, hardware and personnel that will be necessary to recover the Orion crew module... The recovery team headed out to sea aboard the ship, along with a test version of the Orion crew module and recovery support equipment secured in the ship’s well deck. During a series of tests over several days, the well deck

was flooded with water and the test vehicle was allowed to float out to open water to rehearse various segments of recovery procedures, including attaching a collar and various lines on the module and pulling, or guiding it back into the ship...”.



On the left, “U.S. Navy divers and other personnel in a small Zodiac boat secure a tether line to an attach point on a test version of the Orion crew module Oct. 31 during Underway Recovery Test 5 in the Pacific Ocean off the coast of California.”. On the right, “Winch team operators help guide a test version of the Orion crew module into the flooded well deck of the USS San Diego on Oct. 29 during Underway Recovery Test 5...”.

On pages 16 through 19, “**KSC innovation Expo November 1-3 2016**”.



“Visitors stop by a NASA booth in the Space Station Processing Facility conference center at NASA’s Kennedy Space Center during the 2016 Innovation Expo. Now in its fifth year, the purpose of the Innovation Expo is to help foster innovation and creativity among Kennedy employees who are encouraged to look for ways to do their work better and to propose concepts for tackling future mission needs.”



“Employees also were given an up-close look at... Parker Brothers Neutron bike, featured in the movie Tron. After the talk, the Parker Brothers gave employees an up-close during the 2016 Innovation Expo...”.

[This is an article about the Neutron bike.](#)

On pages 26 and 27.



“...A new liquid hydrogen (LH2) liquid separator tank has arrived at NASA’s Kennedy Space Center in Florida. It will be used to support the agency’s Space Launch System rocket and all future launches from Launch Pad 39B. The tank was lifted by crane, rotated, and then lowered on the transporter for the move to the pad. The existing hydrogen vent system that terminates at a flare stack was designed for gaseous

hydrogen. New requirements for Exploration Mission 1 and future launches include the need to address liquid hydrogen in the vent system. The new LH2 separator/ storage tank will be added to the existing hydrogen vent system to assure gaseous hydrogen is delivered downstream to the flare stack... The 60,000 gallon tank was built by INOXCVA, in Baytown, Texas, a subcontractor to Precision Mechanical Inc. in Cocoa, Florida. It is about 56 feet long, with a 14-foot diameter...”

On page 30, “**Mike Curie, Greg Pallone honored for excellence in telling the space story**”. In part, the feature states “Longtime NASA spokesman and launch commentator Mike Curie, and Greg Pallone, veteran Brevard County correspondent for News 13, were selected by the National Space Club Florida Committee (NSCFL) for the 2016 Harry Kolcum News & Communications Award...”



Curie is a NASA Public Affairs Officer at Kennedy Space Center. His is one of the voices frequently heard describing launch countdowns for NASA missions originating from the Space Coast. His space career began in 1985, with stints at Johnson Space Center and NASA Headquarters before becoming Kennedy’s news chief in 2012. Pallone is Brevard County Bureau Chief for News 13 on Florida’s Space Coast and since 2007 has been a fixture covering all launches and the space program in general for Central Florida...”



On pages 46 through 51, “**HEROES AND LEGENDS - Attraction honors pioneers of spaceflight**”, by Bob Granath. A portion of the feature says “...In ceremonies on Nov. 11, 2016, Kennedy Space Center Visitor Complex in Florida opened its doors to the Heroes and Legends attraction that includes the new home of the U.S. Astronaut Hall of Fame. In addition to displays honoring the 93 Americans currently enshrined in the hall, the facility looks back to the pioneering efforts of Mercury, Gemini and Apollo...”

The Astronaut Hall of Fame exhibit is housed in a rotunda. It intimately connects visitors to each of the astronaut inductees through state-of-the-art interactive technology. A 365-degree video cylinder with five interactive kiosk stations provide access to stories about each of the Hall of Fame astronauts... Interactive features also include the original consoles of the Mercury Mission Control room with the world map that was used to follow the path of capsules between tracking stations. Also on display are the Sigma 7 Mercury spacecraft piloted by Wally Schirra during his six-orbit mission in October 1962 and the Gemini IX capsule flown by Tom Stafford and Gene Cernan for three days in June 1966...”



“A statue of astronaut Alan Shepard, America’s first person in space, stands just inside the doors to the U.S. Astronaut Hall of Fame.”

[This is video of the November 11, 2016, HEROES AND LEGENDS grand opening ceremony.](#)

On page 52.



“The six Expedition 50 crew members celebrate Thanksgiving in space Nov. 24, with rehydrated turkey, stuffing, potatoes and vegetables.”

In the photo, from left to right, are Oleg Novitskiy, Sergey Ryzhikov, Andrey Borisenko, Thomas Pesquet, Peggy Whitson and space station Commander Shane Kimbrough.