



Human Space Exploration Update (Nov 24 - Dec 5, 2014)

International Space Station

- **3-D Printer:** [The First 3-D Printer in Space Makes Its First Object: A Spare Part](#) Aboard the International Space Station, NASA's Butch Wilmore shepherds the production of the first spare part in space. Additive manufacturing, when mature, could alter the way space missions are prepared for flight and spacecraft far from Earth deal with component breakdowns.
- **Italian Astronaut:** [Italy's first woman in space arrives on board ISS](#) Italian Air Force Capt. Samantha Cristoforetti becomes Italy's first female astronaut and the European Space Agency's first woman assigned to a long duration mission aboard the International Space Station.
- **Astronaut Twins:** [With An Eye To Mars, NASA is Testing its Astronaut Twins](#) In March, NASA astronaut Scott Kelly is to embark on a year-long mission aboard the International Station with a Russian colleague. The spaceflight will be the longest by an American. Scott Kelly's twin, retired NASA astronaut Mark Kelly, will participate as a ground based medical test subject. A series of medical investigations may reveal how spaceflight alters genetic factors.

Orion and Space Launch System

- **Exploration Flight Test-1 and What's Next:** [What's next for NASA's Orion spaceship after historic 1st flight?](#); [Orion aces first flight test](#); [New NASA spaceship successfully completes debut test run](#); [NASA's exploration road map to Mars starts with flawless Orion launch and landing](#); [NASA's Orion spacecraft due to arrive in San Diego](#); <https://www.youtube.com/watch?v=pJZve8nQlnQ>
- **Engineers Working on Orion:** [More on the cover story: NASA's Orion is the job of a lifetime for these Lockheed engineers \(video\)](#) Developing the next U.S. human spacecraft quickly became the job of a lifetime for Lockheed Martin's Denver area workforce.
- Orion Highlights: http://www.nasa.gov/sites/default/files/files/Orion_Monthly_Newsletter_11-2014.pdf
- **SLS Highlights:** [Space Launch System Monthly Highlights: November 2014](#)
- **Orion and SLS Spin-offs:** http://technology.nasa.gov/media/Orion_SLS_flyer.pdf
<http://www.nasa.gov/exploration/systems/sls/index.html>

Commercial Space Transportation

- **Boeing Completes First Milestone for Commercial Crew:** <http://www.nasa.gov/press/2014/december/boeing-completes-first-milestone-for-nasa-s-commercial-crew-transportation/> The Certification Baseline Review is the first of many milestones, including flight tests from Florida's Space Coast, that will establish the basis for certifying Boeing's human space transportation system to carry NASA astronauts to the space station. The review established a baseline design of the Crew Space Transportation (CST)-100

spacecraft, United Launch Alliance Atlas V rocket, and associated ground and mission operations systems.

- **Sierra Nevada Completes Program Milestone:** [Sierra Nevada Corp. completes Dream Chaser's milestone 15A for prior phase of Commercial Crew](#) Sierra Nevada Corp. completes a development milestone in the reaction control system of its lifting body design for a NASA-nurtured commercial spacecraft that could transport U.S. astronauts to and from low Earth orbit. The company is appealing NASA's September contract awards to Boeing and SpaceX for the final development of the CST-100 and crewed Dragon spacecraft.

Space Budgets, Policy, Missions, Benefits, International ...

- **Commercial Space:** [Pointing the way to the future](#) Commercial spaceflight is pressing boundaries that hold promise for significant economic growth. Those strides involve risks similar to those faced by the shipping, rail, automobile and aviation industries, writes Eric Stallmer, president of the Commercial Spaceflight Federation.
- **Astronaut Food:** [NASA is Working on a 700-Calorie Breakfast Bar](#) NASA's food lab experts hope to keep astronauts assigned to future deep space missions adequately fed. One promising option is a breakfast bar filled with the calories and nutrition needed to start the day. Explorers assigned to destinations like the asteroids and Mars, where it will be difficult to send a steady stream of new supplies, will need foods that are small in volume and lightweight with a long shelf life.
- **Moon Missions:** [Why we should mine the Moon](#) Space resources for life support, propellant and construction materials await on the moon. "In this way, gradually increasing access to lunar resources may help 'bootstrap' a self-sustaining space-based economy from which the global economy will ultimately benefit," writes Ian Crawford, English professor of planetary science and astrobiology.
- **Asteroid Redirect Mission:** [NASA homing in on mission design for Asteroid Relocation Excursion](#) NASA is nearing key mid-December decisions for its proposed Asteroid Retrieval Mission, one that would either attempt to corral a small asteroid or a piece of a larger asteroid and steer it into lunar orbit as a potential destination for Orion astronauts.

Ground System Development & Operations

- **GSDO Highlights:** http://www.nasa.gov/sites/default/files/files/GSDO_October2014_final.pdf

Florida Highlights

- **KSC Countdown Clock to Visitors Complex:** [KSC's countdown clock: A new look -- for a new era](#) NASA goes large flat screen for its new countdown clock at the Kennedy Space Center. The new timer replaces an iconic digital display for the launchings of late Apollo through shuttle era missions.
- **RD-180 Rocket Engine:** [House-Senate conference measure to end Pentagon use of RD-180](#) A House/Senate consensus would ban future imports of Russia's RD-180 rocket engine. The National Defense Authorization Act would also specify a U.S. replacement by 2019. The RD-180 is in use by United Launch Alliance's Atlas 5 for missions boosting U.S. national security payloads. A U.S. House vote is expected this week.

Citizens for Space Exploration – a pro-space, grassroots advocacy group, supported by the Melbourne Regional Chamber of Commerce, travels to Washington, D.C. to meet face-to-face with Members/staff of Congress to discuss the value of America's investment in space exploration. To sustain that dialogue on

a regular basis, Citizens distributes "Human Space Exploration Update" to Congressional offices on a weekly basis and makes it available to our Chamber members as a quick-and-easy way to stay informed on developments impacting NASA and Space Coast Florida.

http://www.bayareahouston.com/content/c_s_e/c_s_e