



Human Space Exploration Update (March 28 – April 15, 2016)

2016 Elections

- **Stability is Message to Candidates from NASA Leadership:** [Bolden seeks stability for NASA in upcoming transition](#) NASA Administrator Charles Bolden hopes the change that comes with a new U.S. presidential administration will not disrupt a current civil space policy focused on resuming human deep space exploration and a goal of reaching Mars with astronauts in the 2030s. Bolden told a Space Transportation Association gathering earlier this week, the agency will reach out to the candidates and their transition teams after party nominating conventions this summer in a bid to explain NASA's direction. "If you want to change something, tweak it, but whatever you do, don't break it," he said. "That will be my message."
- **Candidates Must Commit to Space:** [Presidential candidates must commit on space](#) It's time for the most likely nominees to outline their position on NASA's future, according to Fred Humphries, president emeritus of Florida A&M University.
- **Space States Can Impact Election of President:** [How space could decide presidential race](#) John Byron offers his assessment of where the presidential candidates stand and suggests how voters with space exploration as an interest may be able to influence the election's outcome. "By showing the candidates and their campaigns the election virtue of making space a strong part of their message in those places where that position can sway votes that really count," he writes.

International Space Station

- **ISS and Commercial Space:** [Commercial competition finding way onto ISS](#) Aerospace Daily and Defense Report (4/11): Increasingly, commercial competition is making its way to the six-person International Space Station. Competitors Orbital ATK and SpaceX are providing access through their NASA resupply contracts. Made in Space, for instance, recently delivered the Additive Manufacturing Facility, a 3-D printing device that can produce components for hardware and equipment that does not have to be launched. A new habitat, the Bigelow Activities Experiment Module, arrived at the space station last Sunday and could provide a new kind of commercial space habitat for humans after a two-year trial. (See also: [A bouncy house heads to the International Space Station](#) and [The challenges of commercializing research in low Earth orbit](#))
- **Medical Research:** [Scientists are sending fungi into space in the hope of developing new medicines](#) NASA's next commercial re-supply mission to the International Space Station will include studies of fungi that may reveal how four strains respond to an absence of gravity as well as radiation. The stress responses may include the production of substances valuable as new medicines
- **Scott Kelly – My Year in Space:** [Scott Kelly will take readers along for a year in space in new memoir](#) Scott Kelly, recently returned to Earth from a U.S. record setting 340 days in space aboard the International Space Station, is writing a book about his adventure. *Endurance: My*

Year in Space and Our Journey to Mars, will address the effects of the long mission on the astronaut and how the experience was critical to future human space exploration.

- **Video of Earth from ISS:** [Time-lapse video from Space Station shows Earth's brilliant colors](#)
Video from the International Space Station displays the many colors of the Earth and its atmosphere.

Orion and Space Launch System

- **Orion Supports Deep Space Exploration:** [Moon or Mars? Lockheed preps Orion for deep space adventure](#)
Orion, the new human spacecraft NASA is developing with Lockheed Martin, will be capable of starting astronauts on deep space missions, whether their destination is the moon or Mars. Under NASA's Journey to Mars plan, astronauts would first journey to lunar orbit in the 2020s, then to Mars a decade later.
- **Astronauts Train Aboard Orion:** [NASA astronauts train on Orion spacecraft for trip to Mars](#)
NASA astronauts are donning space suits to train for flight operations aboard the Orion crew capsule now under development for future deep space missions. "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," according to the report.
- **Orion Far Exceeds Apollo:** [Looks aside, NASA's Orion is "light years ahead of what they had in Apollo"](#)
They may share a resemblance, but NASA's Orion spacecraft is designed to carry astronauts well beyond the moon, the destination of Apollo crews in the late 1960s and 1970s. From the thermal control system to the solar arrays and the appointments inside the capsule and its backups -- Orion is designed to carry more astronauts, further and for longer than its iconic predecessor.
- **SLS Video:** [Video: NASA releases new animation of super-heavy-lift SLS booster](#)
A new NASA-produced video displays the launch and performance of the Space Launch System exploration rocket, which is just over two years from its first scheduled test flight. The three-week flight will pair the big rocket with an uncrewed Orion spacecraft to send the capsule around the moon and back to Earth for an ocean splashdown and recovery. The first human launch on an SLS is planned for as early as late 2021.
- **SLS Science Missions:** [Grunsfeld: SLS/Spacewalkers could build space telescopes](#)
Spacewalking astronauts are capable of assembling a large space telescope in Earth orbit powerful enough to analyze the atmospheres of distant alien planets for signs of biological activity, according to John Grunsfeld, NASA's associate administrator for science. Grunsfeld was part of a panel that discussed possible science missions for the Space Launch System that NASA is building to launch future missions of human deep space exploration. Other panelists suggested SLS could cut the journey of a robotic spacecraft to Jupiter's ice- and ocean-covered moon Europa from seven to 2.5 years.
- **Exploration Upper Stage:** [MSFC propose Aerojet Rocketdyne supply EUS engines](#)
NASA's Marshall Space Flight Center will look to Aerojet Rocketdyne to advance the development of the Exploration Upper Stage, a more powerful second stage rocket engine for the Space Launch System exploration rocket. The proposal would have the more powerful version ready to fly on Exploration Mission-2, the first crewed test flight of NASA's SLS and Orion capsule.

Commercial Space Transportation

- **Crewed Missions to ISS in 2017:** [Human space flight from Florida next year 'realistic,' experts say](#)
Boeing and SpaceX, partners in NASA's Commercial Crew Program, appear ready to

resume human launches from Central Florida by the end of next year. Boeing's CST-100 Starliner and SpaceX's Dragon crewed vehicle will transport international astronaut crews to the International Space Station.

- **Cygnus Mission to ISS:** [Traveling Cygnus pulls into port at International Space Station](#)
Astronauts aboard the International Space Station snagged and berthed Orbital ATK's latest cargo delivery. The Cygnus freighter delivered 7,500 pounds of crew supplies, science and technology gear and station hardware. The capsule is to remain berthed to the station's U.S. segment until May 20.
- **SpaceX Dragon Resupply to ISS:** <http://www.theverge.com/2016/4/8/11392312/spacex-launch-success-iss-cargo-falcon-9-rocket> (See also: [On fifth try, mission accomplished for SpaceX booster rocket](#); [Dragon arrives at Space Station with inflatable habitat in tow](#); [The science of expansion: NASA highlights SpaceX CRS-8 experiments](#))
- **Dream Chaser Looks to AL:** [Dream Chaser spaceship seems on a glide path to landing in Alabama](#) Sierra Nevada Corp. looks to Huntsville, Ala., as a possible landing site for Dream Chaser, the commercial spacecraft it is developing to carry cargo to and from the International Space Station under a NASA contract.

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

- **China to Beat US Back to Moon:** [China likely to beat NASA back to the moon](#) China's first visit to the moon with its astronauts could come within a decade, according to the report that examines assessments from U.S. lunar expert Paul Spudis, author of a new book, *The Value of the Moon: How to Explore, Live, and Prosper in Space Using the Moon's Resources*. The U.S. has abdicated a permanent presence in cis-lunar space, according to the report.
- **Deep Space Habitats:** [Lockheed Martin seeks additional uses for proposed NASA habitat module](#) Lockheed Martin's planning for a deep space human habitat suitable for use by NASA Orion astronauts on missions to lunar orbit in the 2020s may find utility among commercial space companies working far from Earth, according to Bill Pratt, the company's program manager for the development effort. (See also: [Private space habitat to launch in 2020 under commercial spaceflight deal](#))
- **Russian Lunar Base:** [Russia plans to build lunar base in 2030-2035 space corporation](#) Russia intends to establish a human base on the moon between 2030 and 2035, Sergey Krikalev, the executive director of Roscosmos, the Russian federal space agency, said Tuesday. Plans for the base include solar power, telecommunications, technological and scientific facilities as well as a long range research rover and provisions for landing and launch operations. A lunar orbiting satellite will furnish support as well.
- **Moon or Mars:** [Former NASA administrator discusses space with students](#) Former NASA administrator Mike Griffin addressed space exploration with students. "A huge debate within the space community is whether we should go to Mars or the moon, to which I respond with 'yes.'" said Griffin. "What I want is for the U.S. to be a space-faring nation, and a space-faring nation should be able to go wherever technology takes us."
- **Mars Matters:** ['Mars matters' for the future of space exploration, NASA chief says](#) According to NASA Administrator Bolden, a consensus of support is beginning to emerge within the scientific and policy communities around NASA's plans for sending U.S. astronauts to Mars in the 2030s. (See also: [British scientist Hawking says Mars will be colonized by humans in next 100 years](#))
- **Space Renaissance Act:** [Bridenstine releases American Space Renaissance Act, welcomes comment](#) Rep. Jim Bridenstine will introduce legislation, the American Space Renaissance Act, a

comprehensive bill structured to back U.S. pre-eminence in space on a range of fronts. One legislative theme would encourage pioneering with a policy that calls upon NASA to arrive first at new space destinations. (See also: [Why Congress's newest space advocate says the U.S. faces a 'Sputnik moment'](#))

- **European role in Lunar Exploration:** [A major role for the EU in lunar development](#) NASA's efforts to reach Mars with humans in the 2030s creates a large incentive for European powers to lead a lunar development initiative, according to four experts who are part of the International Lunar Decade Working Group.
- **Last Man on the Moon:** [The Last Man on the Moon...](#) A new documentary, *The Last Man on the Moon*, portrays the life of Gene Cernan, who commanded Apollo 17, the most recent mission to venture into deep space with human explorers. Cernan, now 82, symbolizes the sort of stoic, self-made American whose way of life embodies the nation's pioneering spirit.

Florida

- **Launch Support Upgrades at KSC:** [NASA trumpets milestone in potential Mars travel: System reviews](#) NASA announced new strides in the agency's efforts with key contractors to develop the ground systems at the Kennedy Space Center to support future Space Launch System exploration vehicle launches of the Orion space capsule with astronauts on mission of deep space exploration. "Modernizing the ground systems for our journey to Mars also ensures long-term sustainability and affordability to meet future needs of the multi-use spaceport," said Bill Hill, NASA's deputy associate administrator of the Exploration System Development Division.
- **ULA's Vulcan Rocket:** [Reviewers approve early design work on new Vulcan rocket](#) A new generation work horse rocket, the Vulcan Centaur, under development by United Launch Alliance, has completed its Preliminary Design Phase, and could launch for the first time in three years. Vulcan would replace the venerable Atlas V and Delta 4 rockets used for U.S. national security, science and commercial spacecraft missions.
- **Green Propellant Launch from CCAFS:** [Spacecraft powered by 'green' propellant to launch in 2017](#) NASA's Green Propellant Infusion Mission spacecraft could launch on a test flight from Cape Canaveral Air Force Station, Fla., in the spring of 2017, according to the agency's contractor, Ball Aerospace & Technologies Corp. The nontoxic green propellant would fill the role normally assigned to highly toxic hydrazine during a series of orbital spacecraft maneuvers.
- **Lynx Space Plane:** [Private Lynx space plane could take off in early 2017](#) XCOR's Lynx suborbital winged launch vehicle could begin suborbital flights next year, according to Harry van Hulten, the company's director of flight testing and one of two test pilots for the company.
- **RD-180 Engine:** [U.S. needs up to 18 more Russian rocket engines](#) The Department of Defense will require 18 more Russian-built RD-180 rocket engines for United Launch Alliance Atlas V missions launching U.S. national security payloads, according to Deputy Defense Secretary Robert Work. U.S. lawmakers are seeking a domestic alternative to the RD-180 in response to Russian interference in the Ukraine.

Citizens for Space Exploration – a pro-space, taxpayer, grassroots advocacy group (www.citizensforspace.org) – has travelled to Washington, D.C. the past 24 years to meet face-to-face with Members/staff of Congress to discuss the value of America's investment in space exploration. In order to sustain that dialogue on a regular basis, Citizens distributes "Space Exploration Update" to Congressional offices on a weekly basis. The intent is to provide an easy, quick way to stay abreast of key human space exploration program and policy developments.