



## **Human Space Exploration Update (Oct 5-9, 2015)**

### **International Space Station**

- **Meet the Crew:** [http://www.nasa.gov/mission\\_pages/station/expeditions/expedition45/index.html](http://www.nasa.gov/mission_pages/station/expeditions/expedition45/index.html)

### **Orion and Space Launch System**

- **Orion and Deep Space Habitat:** [NASA may fly habitat with first Orion](#) NASA's deep space mission planners point to an in-space habitat as the next major piece of hardware needed for astronauts launching to Mars. Lockheed Martin is among companies looking into the requirement. The module could be launched on the first deep space test flight of the Orion spacecraft planned for late 2018. A version of the habitat could be placed in lunar orbit for use by astronauts during test missions.
- **SLS Rocket Engines:** [NASA is recycling Space Shuttle engines for a very important purpose](#) NASA has long since retired its space shuttle fleet, but not the powerful rocket engines that helped to launch the winged orbiters. Four of the modified RS-25 engines will help to launch early versions of the Space Launch System exploration rocket now under development to start astronauts on future missions of deep space exploration.

### **Commercial Space Transportation**

- **Cygnus to Fly on Atlas 5:** [Cygnus supply ship takes weather satellite's slot in Atlas manifest](#) Orbital ATK will look to Dec. 3 and Mar. 10 for the launching of the company's first NASA contracted re-supply missions to the International Space Station since an Oct. 28, 2014 launch mishap involving its Antares rocket. Both cargo flights will substitute a United Launch Alliance Atlas 5 as the launch vehicle and lift off from Cape Canaveral, Fla., with upgraded Cygnus cargo capsules. Work to modify the Antares for future re-supply missions launched from Wallops Island, Va., continues. (See also: [Workers complete \\$15 million in repairs to Antares launch pad](#))
- **Dream Chaser Testing:** [Sierra Nevada plans to resume Dream Chaser flight tests](#) Sierra Nevada plans to start unpowered flight tests of its upgraded Dream Chaser in 2016, Mark Sirangelo, the company's corporate vice president, told the International Symposium for Personal and Commercial Spaceflight in Las Cruces, N.M. Sierra is competing for a NASA contract to launch supplies to the International Space Station with the winged reusable Dream Chaser. Damage to the test vehicle sustained two years ago at Edwards Air Force Base, Calif., has been repaired.

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

- **Journey to Mars:** [NASA releases 'Journey to Mars' primer](#) NASA presented a new 36 page primer on the agency's Mars exploration planning late Thursday. The three step advance starts with work aboard the International Space Station to study new technologies and issues affecting the physical and mental health of astronauts on long missions. Tests of deep space hardware

follow in cis-lunar space, followed by human missions to the Martian environs. (See also: [Lightfoot confident humans will be at Mars in 20 years](#) and [Orbiting first: A reasonable strategy for a sustainable Mars program](#))

- **Water on Mars:** [Mars rover finds Gale crater was once a big lake](#) Mars' Gale crater was host long ago to stable bodies of water, according to new research from more than 40 scientists associated with NASA's Curiosity rover mission. The findings are based on the rover's study of sediments on the floor of the large impact crater. The bodies of water in the crater lasted for hundreds to thousands of years, suggesting a warmer, wetter climate on Mars at about the same time life was emerging on Earth.
- **Mars Exploration and Communications:** [NASA Glenn developing enhanced communications for future Mars missions](#) At NASA's Glenn Research Center, engineers are working on an Integrated Radio and Optical Communications (IROC) system to enhance communications during future human deep space missions, including those to Mars. "But before humans go there, it is essential for their success and survival that we greatly enhance our ability to communicate data over interplanetary distances," according to the report.
- **NASA and Tech Patents:** [NASA is opening up hundreds of patents to inventors, for free](#) NASA's Technology Transfer Program offers a patent deal in exchange for access to three years of new product development. As well as exploring, NASA encourages the development of new technologies.
- **The Martian:** ['The Martian' technologies are not far off from NASA](#) NASA is at work on an advanced space suit for astronauts assigned to future deep space missions, a multi-mission rover for surface exploration, living quarters and a means of growing fresh food. (See also: <http://www.forbes.com/sites/erikkain/2015/10/07/three-reasons-to-read-the-martian-before-you-see-the-movie/>)

**Citizens for Space Exploration** – a pro-space, taxpayer, grassroots advocacy group ([http://www.bayareahouston.com/content/c\\_s\\_e/c\\_s\\_e](http://www.bayareahouston.com/content/c_s_e/c_s_e)) – 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.