



# The Aerospace Update



Amazing Colors of our Planet

May 23, 2017

Video Credit: Thomas Pesquet @ Thom\_astro

# Arianespace Soyuz Orbits SES-15 Carrying FAA Hosted Payload



00:40

Arianespace launched a Soyuz rocket May 18 from Europe's space center in French Guiana, carrying the electrically propelled SES-15 satellite to geostationary transfer orbit. To speed SES-15's arrival at its desired location some 36,000 kilometers above the equator, its Soyuz launcher completed two burns of its Fregat upper stage over five hours in order to place the satellite just 5,000 kilometers shy of the geostationary arc. The Russian rocket's extra effort shaved about a month off what would otherwise be a seven to eight month climb to geostationary orbit, according to Arianespace.

*Video Credit: Arianespace*

*Source Caleb Henry @ SpaceNews.com*

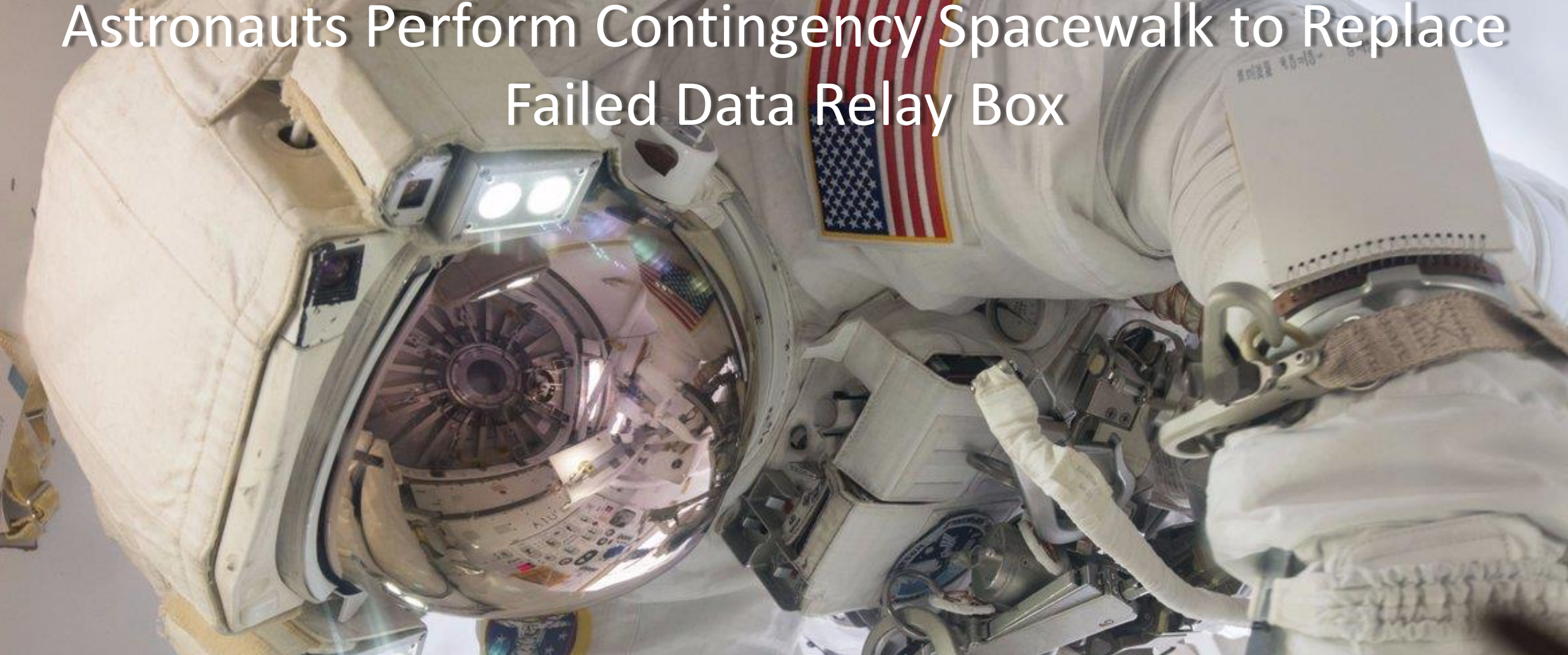
# SES-15 Will Help Airline Travelers Stay Connected and Improve Air Navigation Over the United States

SES 15, the fifth Boeing-made commercial satellite with all-electric propulsion, hosts hardware for multiple Ku-band communications missions, including a high-throughput payload designed to provide in-flight connectivity to airline passengers traveling across North America, Central America and the Caribbean. SES 15 also carries a hosted payload built by Raytheon to improve GPS navigation data over the United States. The navigation aid is part of the Federal Aviation Administration's Wide-Area Augmentation System, used by pilots and air traffic controllers to improve aircraft spacing and positioning near busy airports and in inclement weather.

*Source: Stephen Clark @ SpaceFlightNow.com*

*Artist's concept of the SES 15 satellite. Credit: Boeing*

# Astronauts Perform Contingency Spacewalk to Replace Failed Data Relay Box



Just three days after the failure of a key data relay box, a contingency spacewalk was planned by ground teams and executed by International Space Station astronauts Peggy Whitson and Jack Fischer to replace the component. Whitson traveled up to the S0 truss segment where the failed MDM was while Fischer went to the Destiny laboratory to install two antennas. The antennas were originally scheduled to be part of the previous EVA, but, because it was cut short, that task was taken out. These antennas will be used to route wireless data from various external equipment and high-definition cameras.

Source: Derek Richardson @ SpaceFlightInsider.com

Photo Credit: NASA/ESA

# Juno Spacecraft Completes Fifth Science Pass of Jupiter

NASA's Juno mission accomplished a close flyby of Jupiter on May 19, successfully completing its fifth science orbit. All of Juno's science instruments and the spacecraft's JunoCam were operating during the flyby, collecting data that is now being returned to Earth. Juno's next close flyby of Jupiter will occur on July 11, 2017, taking it over Jupiter's Great Red Spot. This enhanced color view of Jupiter's cloud tops was processed by citizen scientist Bjorn Jonsson using data from the JunoCam instrument on NASA's Juno spacecraft.

# Landsat Tracks Mount St. Helens Recovery



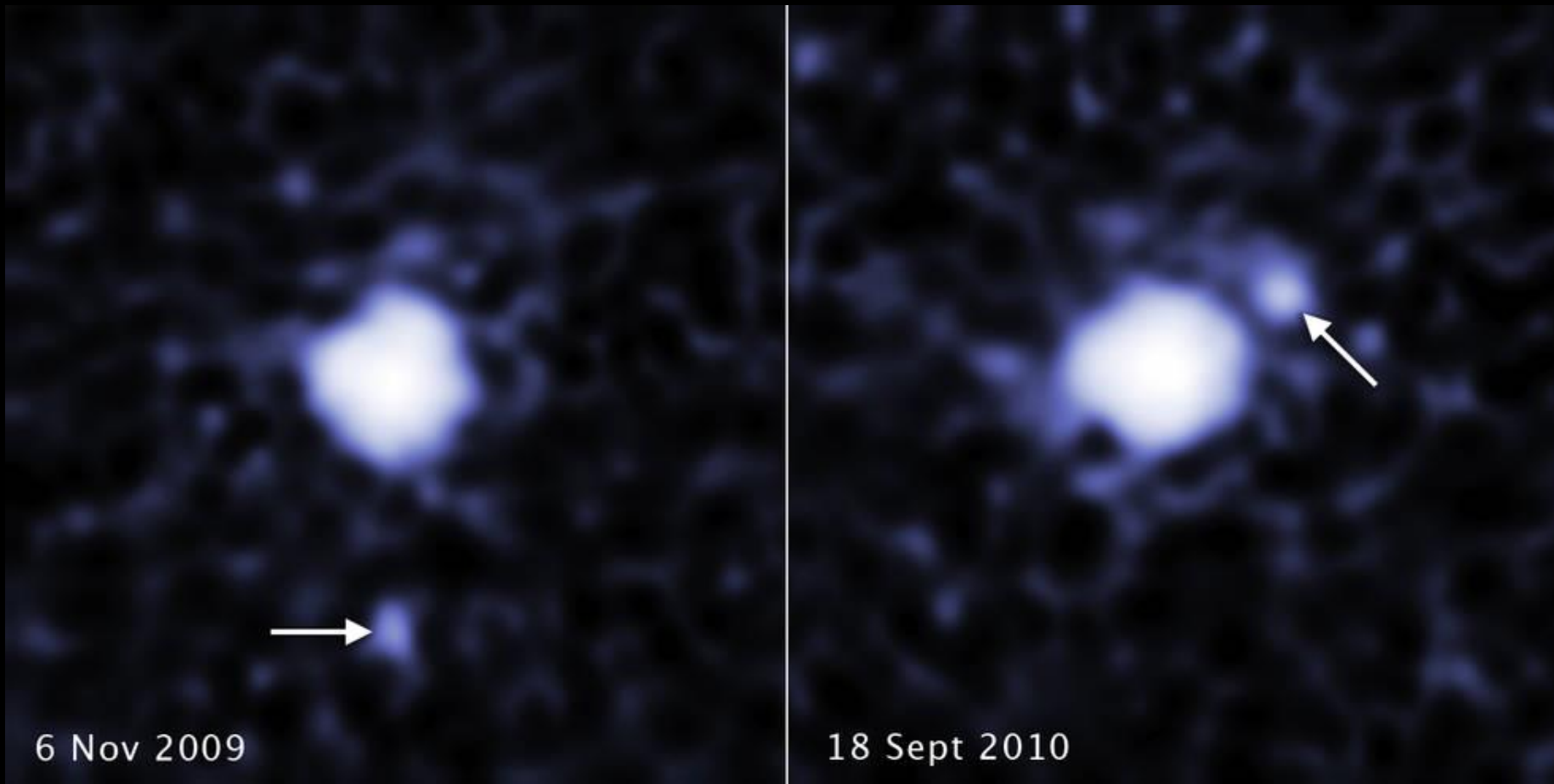
U.S. Forest Service, Mount St. Helens National Volcanic Monument

The May 18, 1980, eruption of Mount St. Helens came after two months of small earthquakes. During the eruption, an avalanche of debris and mud spread for miles from the former summit, and a blast of steam and hot ash covered an area of about 600 km<sup>2</sup> (230 mi<sup>2</sup>). In the decades since scientists have studied the recovery of the ecosystem around the mountain using the Landsat series of satellites. By observing different wavelengths of light reflected off the surface, Landsat data can identify different types of land cover.

*Video Credit: NASA Goddard*

*Source: [nasa.gov/goddard](https://nasa.gov/goddard)*

# Hubble Spots Moon Around Third Largest Dwarf Planet



Hubble spots a moon around the dwarf planet 2007 OR10. These two images, taken a year apart, reveal a moon orbiting the dwarf planet 2007 OR10. Each image, taken by the Hubble Space Telescope's Wide Field Camera 3, shows the companion in a different orbital position around its parent body. 2007 OR10 is the third-largest known dwarf planet, behind Pluto and Eris, and the largest unnamed world in the solar system. The pair is located in the Kuiper Belt, a realm of icy debris left over from the solar system's formation.

*Source & Image Credit: NASA, ESA, C. Kiss (Konkoly Observatory), and J. Stansberry (STScI)*

# Mars Rover Opportunity Begins Study of Valley's Origin



NASA's Mars Exploration Rover Opportunity has reached the main destination of its current two-year extended mission -- an ancient fluid-carved valley incised on the inner slope of a vast crater's rim. The process that carved Perseverance Valley into the rim of Endeavour Crater billions of years ago has not yet been identified. Among the possibilities: It might have been flowing water, or might have been a debris flow in which a small amount of water lubricated a turbulent mix of mud and boulders, or might have been an even drier process, such as wind erosion. The mission's main objective with Opportunity at this site is to assess which possibility is best supported by the evidence still in place. Wheel tracks from NASA's Mars rover Opportunity descending and departing the "Cape Tribulation" segment of Endeavour Crater's rim are visible in this April 21, 2017, view from the rover's Panoramic Camera (Pancam). The rover looked back northward during its trek south to "Perseverance Valley."

*Credits: NASA/JPL-Caltech/Cornell/Arizona State Univ.*





# AR1 Engine Clears Milestone in Step Toward Ending U.S. Reliance on Russian Propulsion

A rocket engine that could power United Launch Alliance's next-generation rocket has passed a major design review, clearing the way for full-scale hotfire testing starting next year and certification for test flights in 2019, according to Aerojet Rocketdyne, the powerplant's developer. In this photo, Aerojet Rocketdyne tests its AR1 engine preburner, which was built using a proprietary alloy and 3-D printing technology, at NASA's Stennis Space Center.

Source: Stephen Clark @ SpaceFlightNow.com


Photo Credit: Aerojet Rocketdyne

# Aerojet Rocketdyne Successfully Test 3-D Printed Engine



Aerojet Rocketdyne announced that it successfully tested its 3-D printed Bantam engine in a series of 17 experiments. The engine “is a liquid oxygen/kerosene, regenerative cooled, liquid rocket thrust chamber assembly design,” built of nickel-based super alloy and has a potential 200,000 pounds of thrust, although its currently being tested up to only 30,000. The development of the engine was funded by DARPA.

# Exploring Underground With a Colliding Drone




ESA astronaut Luca Parmitano last weekend helped to explore the caverns under Sicily using a drone that deliberately bumped into its surroundings in order to build a map. ESA has been testing equipment, techniques and working methods for missions with astronauts in inner space for many years. Delving inside Earth and exploring caves often parallels the exploration of outer space, from a lack of sunlight to working in cramped spaces and relying on equipment for safety.

Source: [ESA.com](https://www.esa.com) & [SpaceRef.com](https://www.spaceref.com)

Photo Credit: ESA/NASA

# Boeing Pushes 737 as JSTARS Replacement for the USAF

A Boeing 737-700 commercial airliner is shown from a low-angle perspective, flying through a sky filled with large, white, fluffy clouds. The aircraft is white with dark accents on the engines and tail. The sun is low on the horizon, creating a warm, golden glow on the clouds and the aircraft's fuselage. The aircraft is positioned in the center of the frame, flying towards the viewer.

Boeing is pushing its commercial 737-700 airliner as a solution for the US Air Force's (USAF's) Joint Surveillance Target Attack Radar System (JSTARS) recapitalisation effort, ahead of an expected service platform decision later this year. "The size of the 737 is about right for a [command and control] C2 mission crew that would be spending upwards of 12 hours on an aircraft. It also offers tremendous growth potential in terms of power, size, weight, cooling, and aircraft performance. We think the 737-700 is the right solution for the air force's [C2 and intelligence, surveillance and reconnaissance] C2ISR recapitalisation," Jamie Burgess, Vice-President and Program Manager for Boeing Military Aircraft's (BMA's) Mobility Surveillance and Engagement division said on 16 May.

# 21 May 1927

## Spirit of St. Louis

After a 33 hour, 30 minute flight from Roosevelt Field, Long Island, New York, Charles A. Lindbergh lands his Spirit of St. Louis at Le Bourget Aerodrome, Paris, France. He is the first pilot to fly solo, non-stop, across the Atlantic Ocean. Over 100,000 people came to Le Bourget to greet Lindbergh. He has flown the Spirit of St. Louis into aviation history.

Source: [www.thisdayinaviation.com](http://www.thisdayinaviation.com)

Credit: San Diego Air and Space Museum Archives



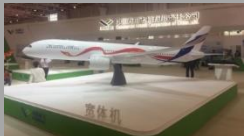
# In The News



**Boeing Delivers its First 737 MAX.** Boeing delivered the first of its new 737 MAX jets on May 16, handing the aircraft over to Malaysian low-cost carrier Malindo Air. Malindo took delivery of the jet at a handover ceremony at Boeing Field. In total, Boeing's MAX family of 737s has already recorded nearly 3,700 orders from 87 customers around the world. *(Ben Mutzabaugh @ USAToday.com)*



**Virgin Galactic says suborbital spaceflights are full until 2021.** Stephen Attenborough, commercial director of Virgin Galactic, said that anyone buying a ticket today for a SpaceShipTwo suborbital spaceflight is unlikely to fly until 2021 because of the backlog of about 650 customers already holding tickets. Attenborough said that estimate was based on starting commercial flights in 2018. *(Jeff Foust @ SpaceNews.com)*



**UAC and Comac Developing Widebody Aircraft.** United Aircraft Corp. (UAC) of Russia and China's Comac on May 22 launched full-scale development for a commercial widebody aircraft, setting up a joint company in Shanghai with an aim of delivering the first aircraft no later than 2027. *(Maxim Pyadushkin | Aviation Daily)*



**White House Proposes \$19.1 Billion NASA Budget, Cuts Earth Science and Education.** The White House's fiscal year 2018 budget proposal seeks to cancel five NASA Earth science projects and confirms plans to shut down the agency's education office as part of more than \$560 million in cuts from 2017. The proposal, released May 23, offers \$19.092 billion for NASA, \$561 million less than what the agency received in a fiscal year 2017 omnibus spending bill enacted earlier this month. *(Jeff Foust @ SpaceNews.com)*