The Aerospace Update

Sept. 26, 2017

Atlas 5 Powers NRO Payload into the Night

Image Credit: Alex Polimeni/Spaceflight Now

Atlas 5 Places NROL-42 Classified Payload into Orbit

Video Credit: United Launch Alliance

A United Launch Alliance (ULA) Atlas V 541 rocket successfully lifted off from Launch Complex 3 at the Vandenberg Air Force Base in California to deliver a classified satellite into orbit for the National Reconnaissance Office on Saturday, Sept 23rd. This was ULAs sixth launch of 2017, their twenty-fifth launch in support of the National Reconnaissance Office, and the seventy-third launch of the venerable Atlas V booster. The identity of the payload launched was not released to the public. But conventional wisdom said this was the second satellite in a new generation of electronic signals intelligence-gathering spacecraft, informally called Trumpet. It will operate in a Molniya-style orbit of approximately 1,000 by 24,000 miles, tilted 63 degrees to the equator.

Sources: *SpaceFlightInsider.com*
&
SpaceFlightNow.com

Replenishment Satellite Launched into Russia's Glonass Navigation Fleet

A Soyuz rocket added a new satellite to Russia's Glonass navigation network Friday, Sept 22nd with an on-target delivery nearly 12,000 miles above Earth. The fresh Glonass M spacecraft replaces a defunct satellite launched nearly 11 years ago, sustaining the Glonass system's near-global reach for the Russian military. With the arrival of the latest Glonass satellite, the system currently consists of 26 spacecraft, according to a Russian government website tracking the navigation fleet's operations. As of Friday, 23 of the satellites were operational. The newest Glonass spacecraft will go through around one month of in-orbit tests and commissioning before officially joining the network, restoring the fleet to a full complement of 24 operational satellites needed to maintain worldwide service.

Video Source: Russian Ministry of Defense

Source: Stephen Clark @ SpaceFlightNow.com

Hubble's Cool Galaxy with a Hot Corona

Galaxy NGC 6753, imaged here by the NASA/ESA Hubble Space Telescope, is a whirl of color — the bursts of blue throughout the spiral arms are regions filled with young stars glowing brightly in ultraviolet light, while redder areas are filled with older stars emitting in the cooler near-infrared. At 150 million light-years from Earth, astronomers highlighted NGC 6753 as one of only two known spiral galaxies that were both massive enough and close enough to permit detailed observations of their coronas. Galactic coronas are huge, invisible regions of hot gas that surround a galaxy's visible bulk, forming a spheroidal shape. Coronas are so hot that they can be detected by their X-ray emission, far beyond the optical radius of the galaxy. Because they are so wispy, these coronas are extremely difficult to detect.

Text credit: European Space Agency

Image Credit: Credit: ESA/Hubble & NASA

NASA’S OSIRIS-REx Spacecraft Slingshots Past Earth

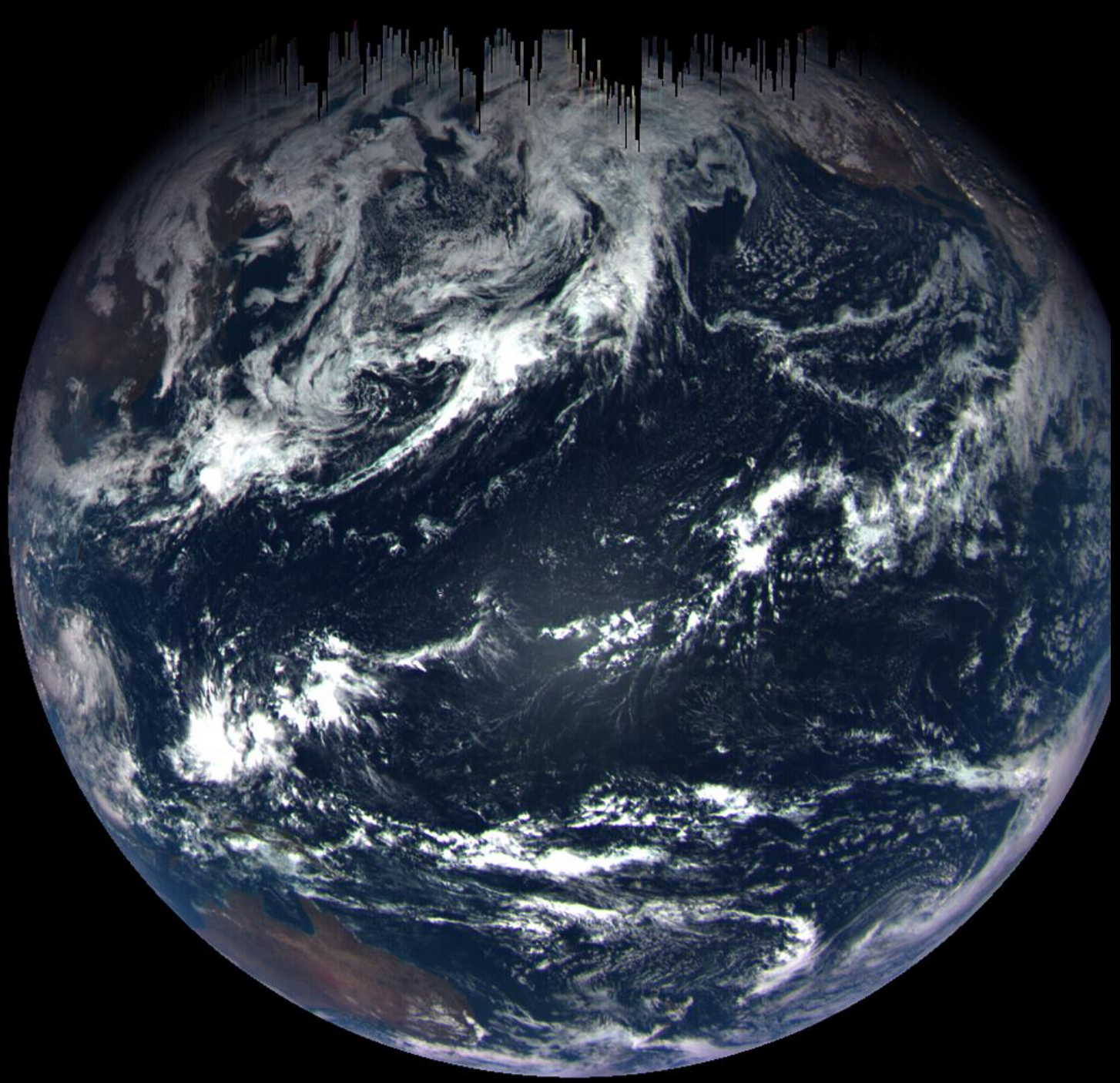
Video Credit: NASA's Goddard Space Flight Center

OSIRIS-REx launched from Cape Canaveral Air Force Station in Florida on Sept. 8, 2016, on an Atlas V 411 rocket. Although the rocket provided the spacecraft with the all the momentum required to propel it forward to Bennu, OSIRIS-REx needed an extra boost from the Earth’s gravity to change its orbital plane. Bennu’s orbit around the Sun is tilted six degrees from Earth’s orbit, and this maneuver changed the spacecraft’s direction to put it on the path toward Bennu.

Source:

Erin Morton @ University of Arizona, Tucson

Nancy Neal Jones @ NASA’s Goddard Space Flight Center



OSIRIS-REx Views the Earth During Flyby

A color composite image of Earth taken on Sept. 22 by the MapCam camera on NASA's OSIRIS-REx spacecraft. This image was taken just hours after the spacecraft completed its Earth Gravity Assist at a range of approximately 106,000 miles (170,000 kilometers). Visible in this image are the Pacific Ocean and several familiar landmasses, including Australia in the lower left, and Baja California and the southwestern United States in the upper right. The dark vertical streaks at the top of the image are caused by short exposure times (less than three milliseconds). Short exposure times are required for imaging an object as bright as Earth, but are not anticipated for an object as dark as the asteroid Bennu, which the camera was designed to image.

Source & Image Credit:

NASA's Goddard Space Flight Center/University of Arizona

Solving the Mystery of Pluto's Giant Blades of Ice

Video Credit: NASA's Ames Research Center

NASA's New Horizons mission revolutionized our knowledge of Pluto when it flew past that distant world in July 2015. Among its many discoveries were images of strange formations resembling giant knife blades of ice, whose origin had remained a mystery. Now, scientists have turned up a fascinating explanation for this "bladed terrain": the structures are made almost entirely of methane ice, and likely formed as a specific kind of erosion wore away their surfaces, leaving dramatic crests and sharp divides. They are one of the most puzzling feature types on Pluto, and it now appears the blades are related to Pluto's complex climate and geological history.

Source: Frank Tavares, NASA's Ames Research Center

What Looks Good on Paper May Look Good In Space

An ancient art form has taken on new shape at NASA's Jet Propulsion Laboratory in Pasadena, California. Origami, the Japanese tradition of paper-folding, has inspired a number of unique spacecraft designs here. It's little wonder that it fascinates NASA engineers: origami can seem deceptively simple, hiding complex math within its creases. Besides aesthetic beauty, it addresses a persistent problem faced by JPL engineers: how do you pack the greatest amount of spacecraft into the smallest volume possible?

Text & Image Credit: NASA/JPL-Caltech

NASA's Dragonfly Project Demonstrates Robotic Satellite Assembly Critical to Future Space Infrastructure Develop

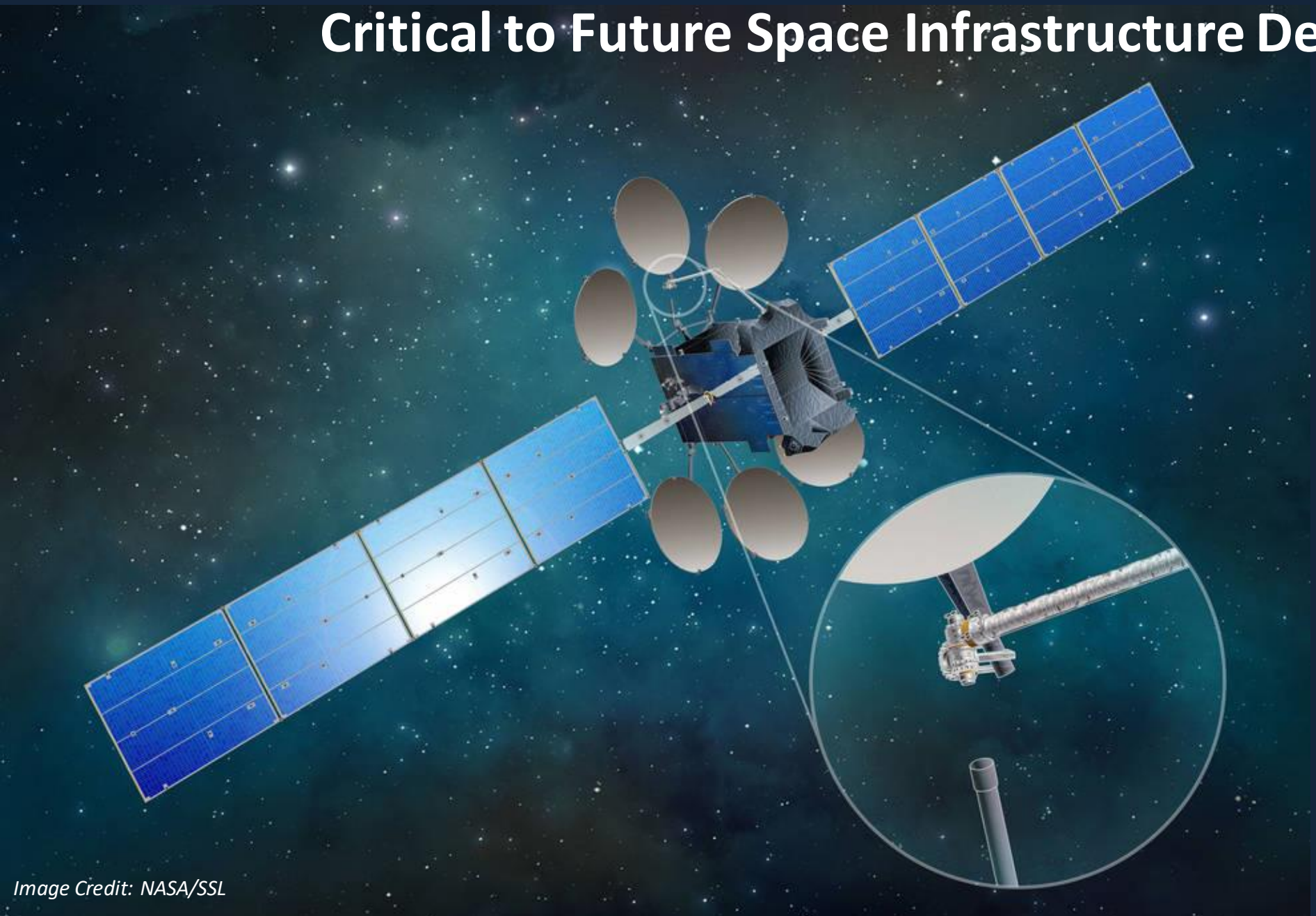


Image Credit: NASA/SSL

A revolutionary NASA Technology Demonstration Mission project called Dragonfly, designed to enable robotic self-assembly of satellites in Earth orbit, has successfully completed its first major ground demonstration. A lightweight robotic system with a dexterous 3.5-meter arm that's able to clamp down, carry items or operate controls -- from either end of the "limb" -- Dragonfly can install delicate satellite antenna, yet also assemble satellites too massive to be launched to space in their final flight-ready state. These disassembled satellites may be stowed more efficiently or even launched in pieces via multiple flights, enabling mission planners to maximize cargo space and reduce mass. That shift would dramatically reduce launch costs and lead to less expensive, higher-performing satellites.

Source: Shannon Ridinger @ NASA's Marshall Space Flight Center

NASA Langley's Katherine Johnson Computational Research Facility Officially Opens

NASA has opened its Katherine G. Johnson Computational Research Facility at Langley Research Center in Virginia, "named for a mathematician whose calculations helped put the first Americans in orbit and onto the moon." Johnson was one of NASA's "human computers" who calculated trajectories early in the space program, including for the Apollo 11 mission, and was depicted along with her colleagues in the book and film "Hidden Figures." Langley Director David Bowles said that with "this new facility, we will continue to advance the same techniques that [Johnson] used to such spectacular effect, and I can't imagine a better tribute to Mrs. Johnson's character and accomplishments than this building that will bear her name."

Source: Sarah Lewin, Space.com

Photo Credit: David C. Bowman/NASA

Upcoming KC-46 Tests To Focus On Key Deficiencies

Flight testing with the KC-46 Pegasus tanker next month will help the U.S. Air Force and Boeing determine a way forward on three key deficiency reports. The two most concerning issues are uncommanded boom extensions when disconnecting from a receiver aircraft with fuel flowing; and the boom operator's inability to detect when the probe has missed the receiver aircraft's receptacle and causes damage to the coating or worse. the Air Force says it also needs to gather more data on another potential issue related to the aircraft's high-frequency (HF) radios that was first noticed in late 2016. HF radios use the skin of the aircraft as an antenna, which sometimes causes electrical sparks and arcs.

Source: James Drew @ Aerospace Daily & Defense Report

Photo Credit: Boeing

United Airlines Set to Retire Iconic Boeing 747 Fleet on Nov. 7 With Vintage Honolulu Flight

Boeing's 747 jumbo jet has been a staple of long-haul flight for more than 50 years, but as new, more efficient aircraft have reached the market, the one time Queen of the Sky is slowly being replaced. This year Delta Air Lines and United Airlines are retiring the aircraft within their liveries, effectively winding down the entire commercial fleet of 747s owned by domestic commercial carriers. On Sept.7, Delta flew its last flight and now United has scheduled its own final flight.

Source: www.forbes.com
Photo Credit: United Airlines

1 October 1942 – P-59 Airacomet 1st Flight

The P-59 Airacomet made its first flight from Edwards AFB on October 1, 1942. Designed and built in great secrecy during World War II, the P-59 was America's first jet aircraft. Although it never saw combat, the Airacomet provided training for USAAF personnel and invaluable data for the development of higher performance jet airplanes. The P-59 was powered by two General Electric turbojets developed from the British Whittle engine. Unfortunately, the relatively low thrust of the XP-59's engines and its heavy, conventional airframe design resulted in disappointing performance.

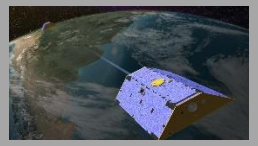
Source: National Museum of the US Airforce

Photo Source: U.S. Air Force

In The News

Australia to Establish National Space Agency. Australia, one of the few major countries without a national space agency, has decided to establish an agency to support the country's space industry. Space advocates in the country had long sought to establish an agency, arguing the country had failed to capitalize on achievements it made early in the Space Age, such as being one of the first countries after the United States and former Soviet Union to launch a satellite. *(Jeff Foust @ SpaceNews.com)*

China's Tianzhou 1 Supply Vehicle Re-enters Atmosphere. The Chinese Tianzhou 1 resupply and refueling freighter re-entered Earth's atmosphere Friday, burning up as designed after a five-month mission demonstrating servicing techniques for China's future space station. The nearly 35-foot-long (10.6-meter) robotic cargo carrier fired its thrusters two times to slow down and drop out of orbit, according to China's state-run Xinhua news agency. (*Stephen Clark @ SpaceFlightNow.com)*



GRACE Satellites to End Research mission in November, Before Replacements Launch. Two U.S.-German satellites launched more than 15 years ago to measure Earth's changing gravity field will stop collecting data in November, a few months before a pair of replacement craft will launch to resume gravity measurements, NASA officials said. *(Stephen Clark @ SpaceFlightNow.com)*

SpaceX sets October Target Launch Dates for Back-to-Back Flights. SpaceX engineers are readying two Falcon 9 rockets for launches Oct. 7 and Oct. 9 from Florida and California, setting up another quick turnaround to first deploy a large TV broadcasting satellite for SES and EchoStar over the United States with a previously-flown booster, then add 10 more spacecraft to Iridium's fleet of new-generation voice and data relay network. *(Stephen Clark @ SpaceFlightNow.com)*

Long March 5 Failure to Postpone China's Lunar Exploration Program. A leading official of China's space program confirmed Sept. 25 that the July failure of the country's largest launch vehicle will lead to delays to upcoming lunar missions, including one to return samples. Long March 5 delays are also expected to push back the launch of Tianhe, the core module of China's first space station. (*Jeff Foust @ SpaceNews.com)*