# The Aerospace Update


## Demise of Hurricanes Maria & Lee

Oct. 3, 2017

Video Credit: NASA/NOAA GOES Project

# Ariane 5 Rocket Deploys Satellites for Intelsat and B-SAT


Recovering from a last-second launch abort earlier this month, an Ariane 5 rocket climbed into space Friday night, Sept. 29th from Europe's spaceport in French Guiana to place two U.S.-built communications satellites in orbit for Intelsat and Broadcasting Satellite System Corp. of Japan. After a nine-minute delay, the Ariane 5 rocket took off with 2.9 million pounds of thrust at 2156 GMT (5:56 p.m. EDT; 6:56 p.m. French Guiana time), heading toward the east over the Atlantic Ocean with the Intelsat 37e and BSAT 4a communications satellites.

*Video Credit: Arianespace*

*Source: Stephen Clark @ SpaceFlightNow.com*

# Intelsat 37e to Provide Comm Services to Americas, Europe & Middle East

The 14,193-pound Intelsat 37e satellite, occupying the upper position in the Ariane 5's dual-payload stack, will beam broadband, wireless communications, television and government services across the Americas, the Atlantic Ocean, Europe and the Middle East from a perch in geostationary orbit at 18 degrees west longitude. Made by Boeing in El Segundo, California, Intelsat 37e was the fifth new-generation Epic-series satellite launched for Intelsat.

*Source: Stephen Clark @ SpaceFlightNow.com*

*Image Credit: Intelsat*

# BSAT 4a to Provide HD, 4K and 8K Ultra HD Television to Japan

BSAT 4a will provide HD, 4K and 8K Ultra HD television broadcasts over Japan for Broadcasting Satellite System Corp. The satellite was built by Space Systems/Loral in Palo Alto, California, and carries 24 Ku-band transponders. BSAT 4a is the world's first 8K satellite," said Lincoln Day, senior executive director for the BSAT 4a program at SSL. "It will provide advanced television services for Japan, and it will provide 4K and 8K satellite television for the 2020 Olympics that happen in Tokyo, as well as the Paralympics that happen in that summer."

*Source: Stephen Clark @ SpaceFlightNow.com*

*Image Credit: SSL*

# Proton-M Blasts Off from Baikonur with AsiaSat 9 Telecom Satellite

*Video courtesy of Space Videos*

International Launch Services (ILS) successfully conducted its third mission this year, launching its workhorse Proton-M rocket carrying the AsiaSat 9 communications satellite into orbit on Thursday, September 28th, from the Baikonur Cosmodrome in Kazakhstan. The launch was initially scheduled for November 2016; however, delays in the manufacturing of the satellite resulted in the postponement of the liftoff for almost one year. AsiaSat 9, a communications satellite built by Space Systems Loral (SSL), will provide additional capacity, enhanced power, and coverage for direct-to-home (DTH) television broadcast, video distribution, private mobile networks, and broadband services across the Asia-Pacific region. The new satellite will replace AsiaSat 4 operating at 122° E.

*Source: Tomasz Nowakowski @ SpaceFlightInsider.com*

# China Puts Secretive Satellite Trio into Orbit atop Long March 2C Rocket

China conducted a secretive launch from the Xichang Satellite Launch Center on Friday, Sept. 29th involving a Long March 2C rocket deploying a trio of satellites into orbit under the designation Yaogan-30 Group 01.

Friday's launch marked China's Return to Flight after the July 2nd failure of the Long March 5 rocket and likely opens a busy end-of-year salvo that has been observed with the Chinese space program for a number of recent years.

*Source: SpaceFlight101.com*

*Photo Credit: Xinhua*

# Elon Musk Revises Mars Plan, Hopes for Boots on Ground in 2024

SpaceX plans to begin construction of a new rocket and spacecraft next year that could lead to human landings on Mars as early as 2024, scaling up technologies currently being perfected with the company's Falcon 9 family of boosters to ensure reliability, reusability and, as a result, realistically low costs, founder Elon Musk said. The idea, he continued, is to make SpaceX's current fleet of Falcon 9 rockets, the yet-to-fly Falcon Heavy and its Dragon cargo/crew ships "redundant." "We want to have one system, one booster and ship that replaces Falcon 9, Falcon Heavy and Dragon," he said. "If we can do that, then all the resources that are used for Falcon 9 Heavy and Dragon can be applied to this system. That's really fundamental.

*Image Credit: SpaceX*

*Source: William Harwood @ CBS News & SpaceFlightNow.com*

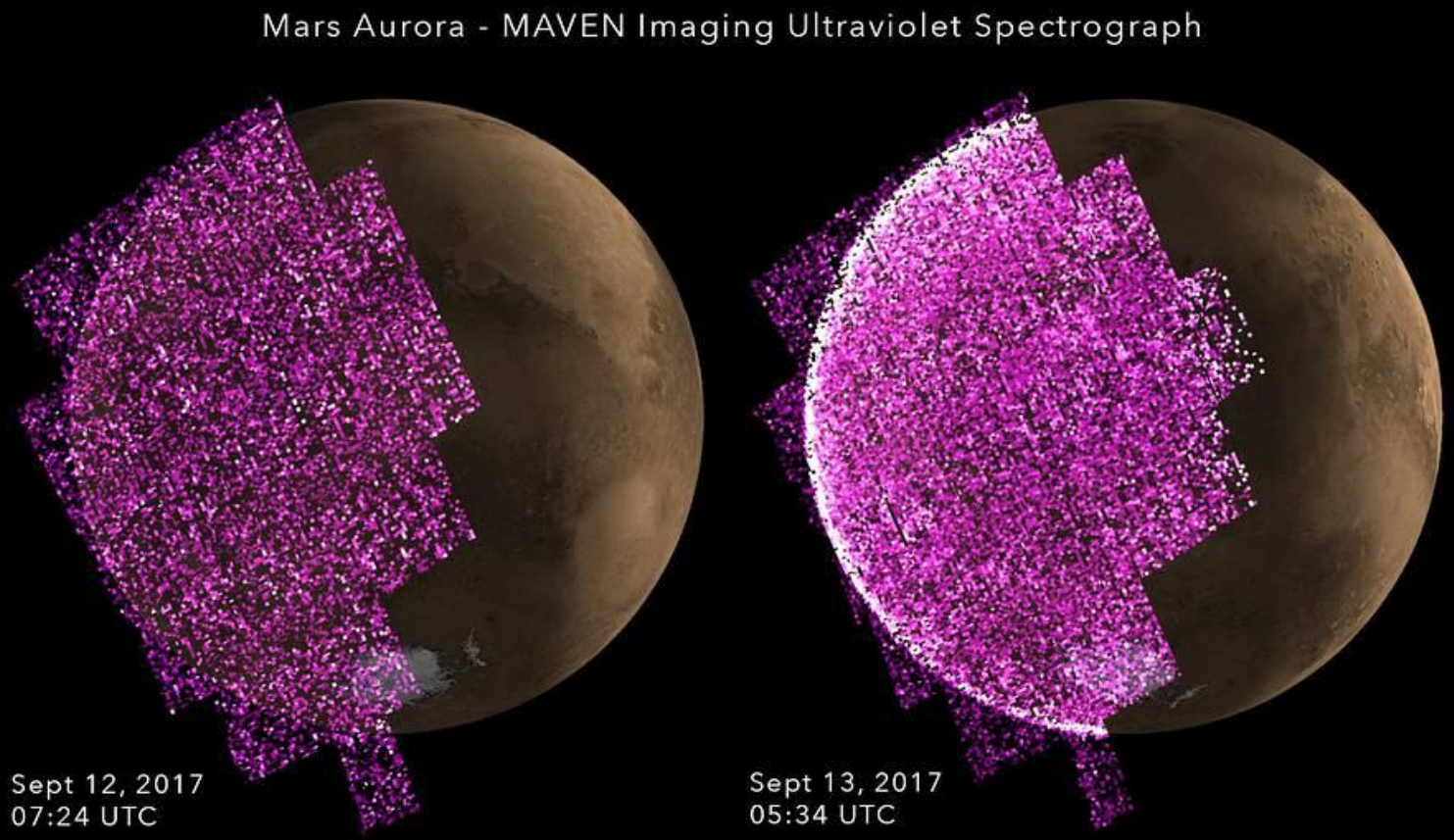
# Lockheed Martin Adds Lander to Mars Base Camp Concept

Lockheed Martin released an update to its Mars mission architecture Sept. 29, adding a reusable lander capable of making multiple trips between Mars orbit and the surface. The original architecture, which the company unveiled last year, called for the development of a modular spacecraft that could carry six people into Mars orbit and back. Lockheed believed that the system, which made use of the Orion spacecraft and other elements, could be ready to send people to Mars as soon as 2028. The company has now added to the system a lander, launched separately from the base camp spacecraft, that could transport crews from the Mars Base Camp spacecraft in orbit to the Martian surface.

*Source: Jeff Foust @ SpaceNews.com*

*Image Credit: Lockheed Martin*

# Solar Storm Triggers Whole-Planet Aurora at Mars




These images show the sudden appearance of bright aurora on Mars during a solar storm. The purple-white color scheme shows the intensity of ultraviolet light given off by aurora on Mars's night side before (left) and during (right) the event. A simulated image of Mars for the same time and orientation has been added, with the dayside crescent visible on the right. The auroral emission appears brightest at the edges of the planet where the line of sight passes along the length of the glowing atmosphere layer. The Imaging UltraViolet Spectrograph on the MAVEN spacecraft obtained these images on 12-13 September 2017.

Text & Image *Credit: NASA/Goddard/University of Colorado*

# LIGO and Virgo Observatories Detect Gravitational Wave Signals From Black Hole Collision

In August, detectors on two continents recorded gravitational wave signals from a pair of black holes colliding. This discovery, announced today, is the first observation of gravitational waves by three different detectors, marking a new era of greater insights and improved localization of cosmic events now available through globally networked gravitational-wave observatories. The detection by the LIGO Scientific Collaboration (LSC) and the Virgo collaboration is the first confirmed gravitational wave signal recorded by the Virgo detector located in the countryside near Pisa, Italy (photo). The detected gravitational waves—ripples in space and time—were emitted during the final moments of the merger of two black holes, one with a mass about 31 times that of our sun, the other about 25 times the mass of the sun. The event, located about 1.8 billion light-years away resulted in a spinning black hole with about 53 times the mass of our sun—that means about three solar masses were converted into gravitational-wave energy during the coalescence.

*Source: Phys.org*

*Photo Credit: The Virgo collaboration*

# World View Launches Inaugural Stratollite Mission from Spaceport Tucson

World View announced the successful execution of its first ever Stratollite launch from Spaceport Tucson. This milestone launch signals the operational opening of the global hub for commerce and science in the stratosphere - Spaceport Tucson. "Spaceport Tucson, the first-ever, purpose-built stratospheric launch facility in the world, is now open for business," said Jane Poynter, founder and CEO of World View, which operates the facility on behalf of Pima County. "The FAA recently provided a Certificate of Authorization to World View to launch Stratollite missions from Spaceport Tucson.

*Source: SpaceRef.com @ World View*

*Photo Credit: World View*

# Airship Aims to Provide a Better View of the Big Bang's Relic Radiation


Despite the universe being billions of years old, today we can still see the early stages of the its expansion through a phenomenon called cosmic microwave background radiation. NASA describes the CMB as "literally the remnant heat left over from the Big Bang." The energy is visible in microwave wavelengths, which means it can't be seen unless you're above the atmosphere somewhere, or in an area with thinner atmosphere, such as the high-altitude South Pole. Scientists have observed the CMB before with spacecraft, and even a specially adapted 747 called SOFIA (Stratospheric Observatory for Infrared Astronomy). A proposal published in the Monthly Notices of the Royal Astronomical Society suggests using an airship called Airlander 10, which is cheaper than a spacecraft, but allows for lengthy observations of up to weeks at a time.

*Source: Elizabeth Howell @ Space.com*

*Photo Credit: Hybrid Air Vehicles*

NASA ARMSTRONG FLIGHT RESEARCH CENTER

# 50TH ANNIVERSARY



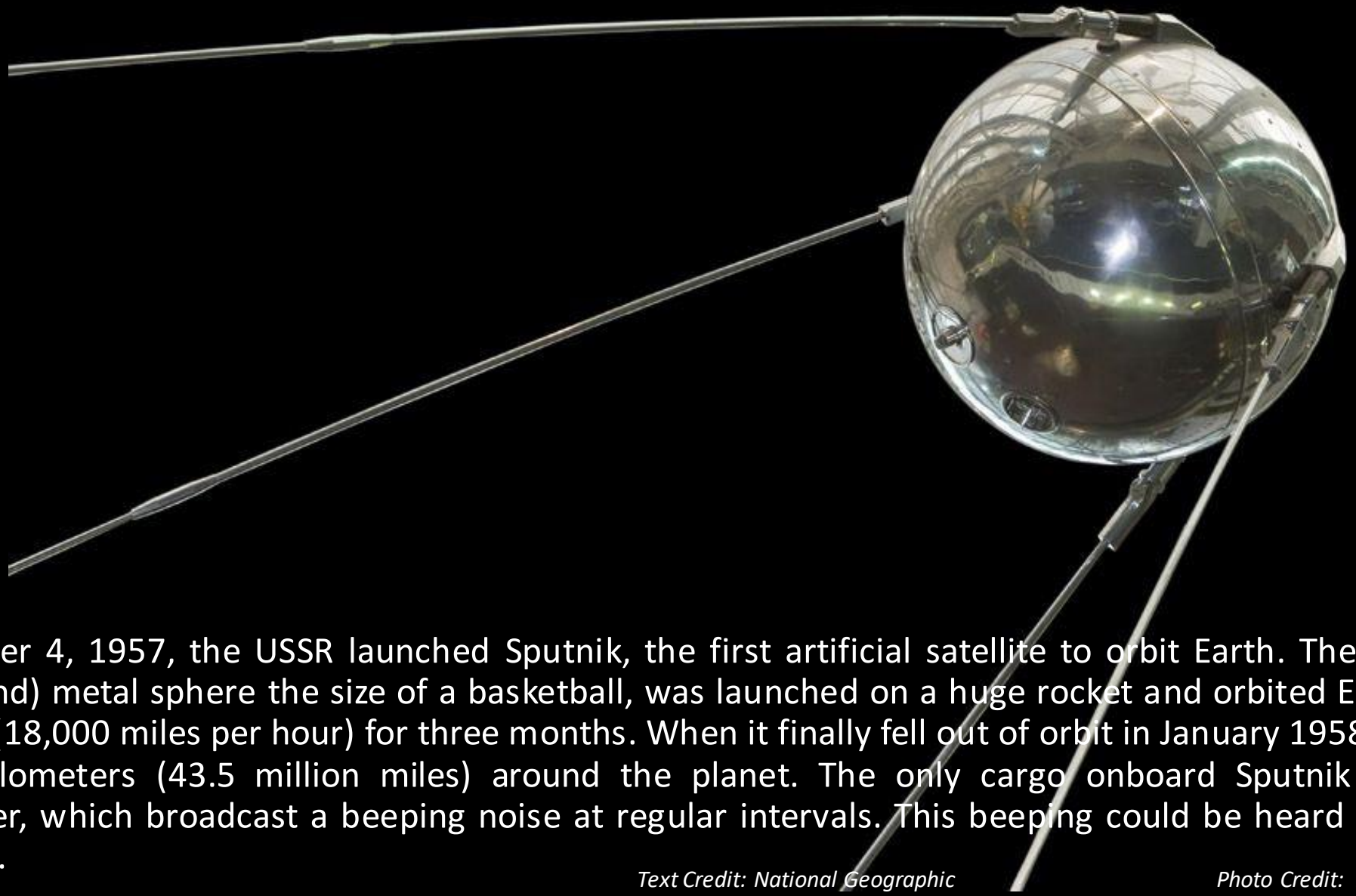





Major William J. "Pete" Knight flew the hypersonic X-15A-2 to 4,520 mph (Mach 6.7), the highest speed ever attained in a piloted aircraft.

EDWARDS AFB

# Oct. 4, 1957 – USSR Launches Sputnik

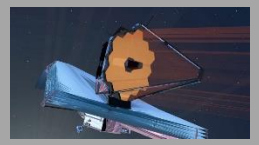


On October 4, 1957, the USSR launched Sputnik, the first artificial satellite to orbit Earth. The satellite, an 85-kilogram (187-pound) metal sphere the size of a basketball, was launched on a huge rocket and orbited Earth at 29,000 kilometers per hour (18,000 miles per hour) for three months. When it finally fell out of orbit in January 1958, Sputnik had traveled 70 million kilometers (43.5 million miles) around the planet. The only cargo onboard Sputnik was a low-power radio transmitter, which broadcast a beeping noise at regular intervals. This beeping could be heard by radio listeners around the world.

*Text Credit: National Geographic*

*Photo Credit: by Mark Thiessen, National Geographic*

# In The News

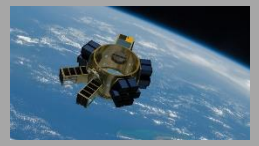


**JWST launch slips to 2019**. NASA announced Sept. 28 that the launch of the James Webb Space Telescope mission, which had been planned for next fall, will now be delayed until the spring of 2019. In a statement posted on the agency's website, NASA said that an assessment of overall work needed to complete integration and testing of the $8 billion spacecraft led to the decision to postpone the launch by about half a year. *(Jeff Foust @ SpaceNews.com)*

**NASA and Roscosmos to study Deep Space Gateway**. NASA and its Russian counterpart signed a joint statement Sept. 27 supporting research that could lead to a cislunar habitat, but the two are far from a final agreement to cooperate on developing it. NASA announced it signed the joint statement with the Russian state space corporation Roscosmos during 68th International Astronautical Congress here regarding research for deep space exploration that "reflects the common vision for human exploration" of the two agencies. *(Jeff Foust @ SpaceNews.com)*

**Crewed Boeing Starliner Test Flight Could Slip to 2019**. Boeing says it is making good progress on the development of its CST-100 Starliner commercial crew vehicle, but acknowledged the first crewed test flight of the spacecraft might not take place until early 2019. Chris Ferguson, director of Starliner crew and mission systems at Boeing, said the company was in the middle of a wide-ranging development program with development of flight hardware and testing of many different vehicle systems. "We're in the thick of testing right now, with the intent of flying at least our uncrewed test flight next year, and ideally both our uncrewed and our crewed test flight," he said. *(Jeff Foust @ SpaceNews.com)*

**NASA May Extend BEAM's Time on the International Space Station**. NASA is exploring options with Bigelow Aerospace to extend the life of the privately owned Bigelow Expandable Activity Module. Known as BEAM, the module is attached to the International Space Station and continues to perform well during its technology demonstration mission. NASA has issued a synopsis of an intended contract action to partner with Bigelow Aerospace to extend the life of the expandable habitat and use it for long-term in-orbit storage. *(NASA.gov)*



**NASA launching up to 72 smallsats with Spaceflight for $5.5 million**. NASA signed its first contract with small satellite rideshare company Spaceflight to launch as many as 72 cubesats between now and 2020 for a total price of up to $5.5 million. Seattle-based Spaceflight provides rideshare opportunities on U.S. rockets from SpaceX, Orbital ATK and Rocket Lab, as well as India's Polar Satellite Launch Vehicle, Russia's Soyuz and the Russian-Ukrainian Dnepr. NASA's launch policy, however, will restrict the 72U to ride solely on American rockets.
*(Caleb Henry @ SpaceNews.com)*