

The Aerospace Update

Upgraded Falcon 9 Debuts



May 17, 2018

Image Credit: SpaceX

SpaceX Launches Bangladeshi Satellite on Debut Block 5 Falcon 9 Mission



SpaceX on May 11 successfully launched its most modern Falcon 9 rocket, delivering Bangabandhu-1, the first Bangladeshi telecom satellite, into geostationary transfer orbit. The Falcon 9 rocket, known as the Block 5 version, lifted off from Cape Canaveral Air Force Base at 4:14 p.m. Eastern. The 3,500-kilogram Bangabandhu-1 satellite separated from the rocket's upper stage about 34 minutes later. With the Block 5 Falcon 9, SpaceX envisions launching around 10 times with the same first stage and doing no refurbishment in between. After the tenth launch, refurbishment could prolong the vehicle's operational life to 100 missions, according to SpaceX. The rocket is the final design of Falcon 9, and features modifications for simpler manufacturing, to meet NASA commercial crew requirements, and to include Air Force requests.

Video Credit: SpaceX

Source: Caleb Henry @ SpaceNews.com

The First Stage of the Falcon 9 Block 5 Rocket After Landing on SpaceX's Drone Ship

After dropping away from the rocket's upper stage two-and-a-half minutes into the mission, the booster pulsed thrusters fed by pressurized nitrogen gas to flip around to fly tail first, then reignited a subset of its nine engines to steer toward the recovery barge and slow down for landing. Four titanium winglets extended from the top of the first stage to stabilize the cigar-shaped vehicle, and four landing legs unfurled at the bottom of the rocket just before touchdown. The on-target landing was the 25th time SpaceX has retrieved one of its Falcon rocket boosters intact after a space launch. Fourteen of the landings have come on one of the company's drone ships at sea, and SpaceX has returned 11 rockets to land for inspections or reuse.

Bangabandhu-1



Bangabandhu-1 is the first Bangladeshi geostationary communications satellite. Built by France-based Thales Alenia Space, the vehicle sports 14 standard C-band transponders and 26 Ku-band transponders. It has 2 deployable solar panels and batteries to produce some six kilowatts of power. Altogether, the vehicle is designed to last at least 15 years in geostationary orbit at the 119.1 degrees East orbital slot to provide services to Bangladesh and surrounding countries.

Source: Derek Richardson @ SpaceFlightInsider.com

Photo Credit: Thales Alenia Space

Spacewalking Astronauts Swap ISS Coolant Pumps



Two Expedition 55 NASA astronauts Drew Feustel and Ricky Arnold ventured outside the ISS May 16th for a 6.5-hour-long spacewalk. They were tasked with rearranging coolant pumps and replacing external cameras and antennas. The primary task of the spacewalk was to swap locations of a failed pump flow control subassembly called “Leaky” with a working spare named “Frosty” to make it more accessible should it be needed in the future.

Video courtesy of NASA

*Source: Derek Richardson @
SpaceFlightInsider.com*

Mars Helicopter to Fly on NASA's Next Red Planet Rover Mission



The Mars Helicopter, a small, autonomous rotorcraft, will travel with the agency's Mars 2020 rover mission, currently scheduled to launch in July 2020, to demonstrate the viability and potential of heavier-than-air vehicles on the Red Planet. The helicopter contains built-in capabilities needed for operation at Mars, including solar cells to charge its lithium-ion batteries, and a heating mechanism to keep it warm through the cold Martian nights. The full 30-day flight test campaign will include up to five flights of incrementally farther flight distances, up to a few hundred meters, and longer durations as long as 90 seconds, over a period. On its first flight, the helicopter will make a short vertical climb to 10 feet (3 meters), where it will hover for about 30 seconds. As a technology demonstration, the Mars Helicopter is considered a high-risk, high-reward project. If it does not work, the Mars 2020 mission will not be impacted. If it does work, helicopters may have a real future as low-flying scouts and aerial vehicles to access locations not reachable by ground travel.

Video Credit: NASA/JPL-Caltech

Source: NASA/JPL-Caltech

Curiosity Rover Aims to Get Its Rhythm Back



3/28/18

Footage sped up 50X

Engineers have been working for the past year to restore the rover's full drilling capabilities, which were hampered in 2016 due to a mechanical problem. Later this weekend, they'll be adding percussion to a new technique already in use on Mars. This new technique is called Feed Extended Drilling, or FED. It lets Curiosity drill more like the way a person would at home, using the force of its robotic arm to push its drill bit forward as it spins. The new version of FED adds a hammering force to the drill bit.

Source: Andrew Good @ NASA/JPL

Chinese Private Firm Launches First Space Rocket

A white suborbital rocket is being hoisted by a crane at night. The rocket is suspended by several thick cables and is being moved vertically. The background is dark blue, suggesting a night sky. The rocket has a conical nose and a cylindrical body. The crane's structure is visible in the upper right corner.

A suborbital rocket was launched into space Thursday by a start-up in China's burgeoning commercial aeronautics industry, as private firms snap at the heels of their dominant American rivals. OneSpace, the Beijing-based company behind the launch, is one of dozens of Chinese rivals jostling for a slice of the global space industry, estimated to be worth about \$339 billion by Bank of America Merrill Lynch and currently dominated by SpaceX and Blue Origin in the US. Its nine-metre (30-foot) "Chongqing Liangjiang Star" rocket took off from an undisclosed test field in China's northwest and reached an altitude of 273 kilometres (170 miles) before falling back to Earth, the company said in a statement. The launch aimed to demonstrate an early working model of the company's OS-X series of rockets, designed to conduct research linked to suborbital flights.

Source: Poornima Weerasekara @ Phys.org

Photo Credit: OneSpace

The Largest Parachute Ever Built for Mars Aces Its First Test

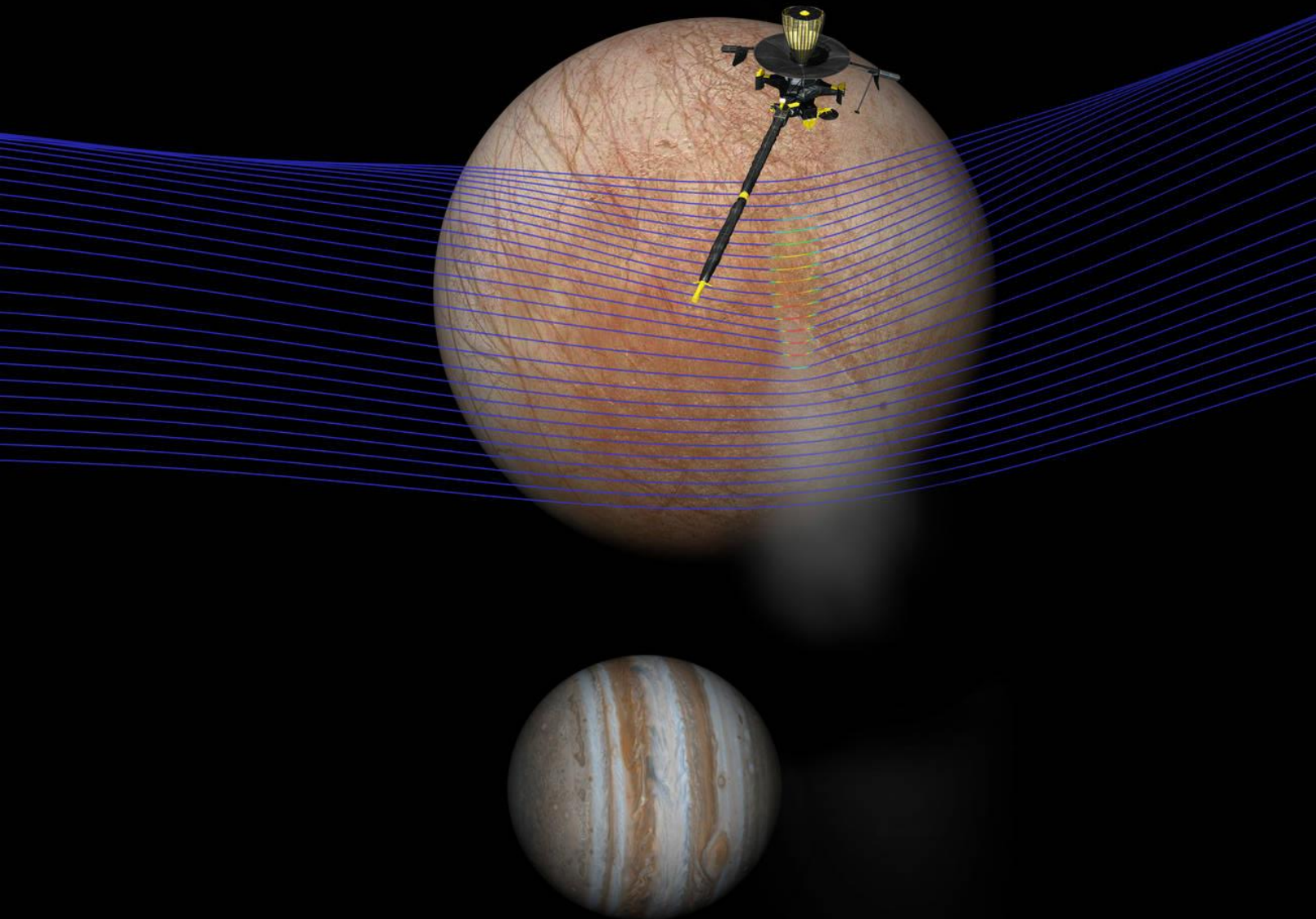


The largest-ever parachute bound for Mars, which will land Europe's ExoMars rover on the surface of the Red Planet in 2021, passed the first in a series of tests in Sweden. The ring-slot parachute is 115 feet (35 meters) across, weighs almost 200 lbs. (90 kilograms) and is equipped with 3 miles (5 kilometers) of cords. It takes five working days to prepare and fold the parachute into its correct configuration.

Source: Tereza Pultarova @ Space.com

Photo Credit: I.Barel/ESA

Old Data Reveal New Evidence of Europa Plumes



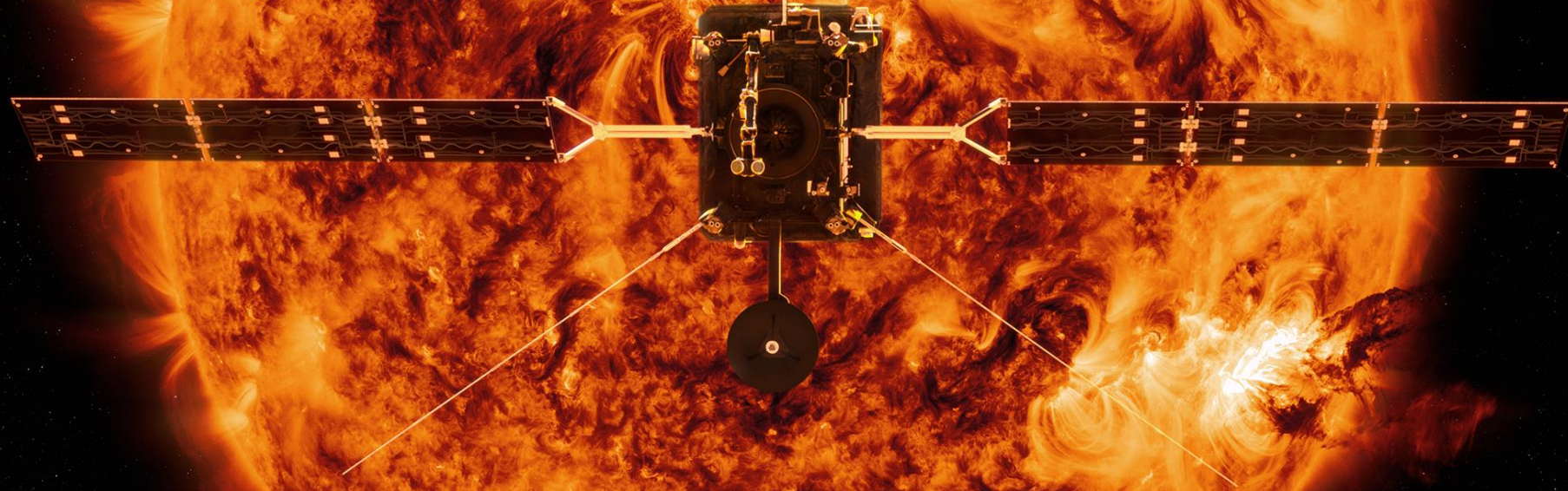
Scientists re-examining data from an old mission bring new insights to the tantalizing question of whether Jupiter's moon Europa has the ingredients to support life. The data provide independent evidence that the moon's subsurface liquid water reservoir may be venting plumes of water vapor above its icy shell. Data collected by NASA's Galileo Spacecraft through new and advanced computer models to untangle a mystery -- a brief, localized bend in the magnetic field -- that had gone unexplained until now. Previous ultraviolet images from NASA's Hubble Space Telescope in 2012 suggested the presence of plumes, but this new analysis used data collected much closer to the source and is considered strong, corroborating support for plumes. This artist's illustration of Jupiter with Europa (in the foreground) shows the Galileo spacecraft after its pass through a plume erupting from Europa's surface. The magnetic field lines (depicted in blue) show how the plume interacts with the ambient flow of Jovian plasma. The red colors on the lines show more dense areas of plasma.

Asteroid Passed Between The Earth And The Moon




Asteroid 2010 WC9 was lost, then it was found — and now the small space rock that is hundreds of feet wide made a close but safe pass on Tuesday, May 15th when it flew roughly halfway between our planet and the moon. Asteroid 2010 WC9 was first discovered by the Catalina Sky Survey in Arizona back in 2010. But weeks after it was spotted, astronomers lost track of the small asteroid – and because of the short exposure time, they couldn't predict its orbital path. The asteroid popped back up one week ago, and scientists quickly realized that it was about to make, as EarthSky reports, "one of the closest approaches ever observed of an asteroid of this size."

Two Missions Will Go Closer to the Sun Than Ever Before



Two upcoming missions will soon take us closer to the Sun than we've ever been before, providing our best chance yet at uncovering the complexities of solar activity in our own solar system and shedding light on the very nature of space and stars throughout the universe. Together, NASA's Parker Solar Probe and ESA's (the European Space Agency) Solar Orbiter may resolve decades-old questions about the inner workings of our nearest star. Parker Solar Probe is slated to launch in the summer of 2018, and Solar Orbiter is scheduled to follow in 2020. Both missions will take a closer look at the Sun's dynamic outer atmosphere, called the corona.

Astronomers Find Fastest-Growing Black Hole Known in Space



Astronomers at the ANU Research School of Astronomy and Astrophysics have found the fastest-growing black hole known in the Universe, describing it as a monster that devours a mass equivalent of our sun every two days. The astronomers have looked back more than 12 billion years to the early dark ages of the Universe, when the supermassive black hole was estimated to be the size of about 20 billion suns with a one per cent growth rate every one million years. The SkyMapper telescope at the ANU Siding Spring Observatory detected this light in the near-infrared, as the light waves had red-shifted over the billions of light years to Earth.

Source: www.phys.org

Image Credit: NASA

Franco-German C-130J Squadron Now a Reality

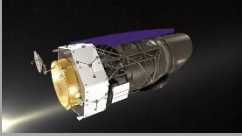


The German air force is buying six C-130J Super Hercules that will become part of a joint Franco-German squadron at Evreux airbase, France. Both air forces have now said that the Airbus A400M airlifter that was previously supposed to replace all of their C160 Transalls cannot perform all of the required missions. France received the first of four Super Hercules last December, two years after agreeing to a deal with Lockheed Martin worth \$650 million.

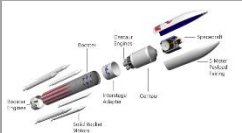
Source: Chris Pocock @ AINonline.com

Photo: German Air Force

In The News



House Appropriations Bill Partially Restores WFIRST Funding. A spending bill to be marked up by the House Appropriations Committee would provide some funding for a NASA space telescope proposed for cancellation, but not necessarily enough to keep the mission on schedule. It's not clear what a reduced funding level like that proposed in the bill would do to WFIRST's development, but it could potentially stretch out its development and increase its overall cost. *(Jeff Foust @ SpaceNews.com)*



ULA Selects Aerojet to Provide Vulcan Upper Stage Engine. United Launch Alliance has picked Aerojet Rocketdyne's RL10 engine to power the upper stage of its next-generation Vulcan rocket, the second such contract Aerojet has secured in as many months. ULA did not disclose who Aerojet beat out for the Vulcan upper stage contract. However, the leading competitor is widely thought to be Blue Origin, which offered the BE-3U, an upper-stage version of the BE-3 engine currently used on its New Shepard suborbital vehicle. *(Jeff Foust @ SpaceNews.com)*



Bell V-280 Makes First Cruise Flight. Bell's V-280 Valor military tiltrotor prototype flew in cruise mode for the first time last week during a test flight at the company's facility in Amarillo, Texas. The proprotors were moved to the zero-degree setting for forward flight. Airspeed was limited to 190 knots. A Bell spokesman said the company will gradually expand the V-280's flight envelope to achieve its performance goal of a maximum speed of 280 knots. *(Mark Huber @ AINonline.com)*



Russia Unveils New Missile-armed UCAVs. The Russian defense ministry unveiled two UCAVs during the May 9 military parade in Moscow to mark the 73rd anniversary of the victory over fascist Germany. A couple of each type were shown on their truck-transporters. The same trucks also carried transport-and-launch canisters for Ataka anti-tank missiles, signifying that they can be carried by the two UCAVs. "All weapon systems demonstrated are in service with the Russian armed forces or undergoing operational trials. Most have passed combat trials in Syria," the defense ministry said in a statement. *(Vladimir Karnozov @ AINonline.com)*



After 50 Years, Boeing's Chinook Sales Appeal Is Undiminished. More than 50 years after entering service, the CH-47 is likely to serve the U.S. Army for another 30 years in the Block II upgrade configuration, which is now in engineering and manufacturing development (EMD). Spain is the latest international customer for the current-production CH-47F version, and both Israel and the UK are prospects. The Chinook will compete later this year with the larger Sikorsky CH-53K as a replacement for Germany's CH-53Ds. *(Chris Pocock @ AINonline.com)*