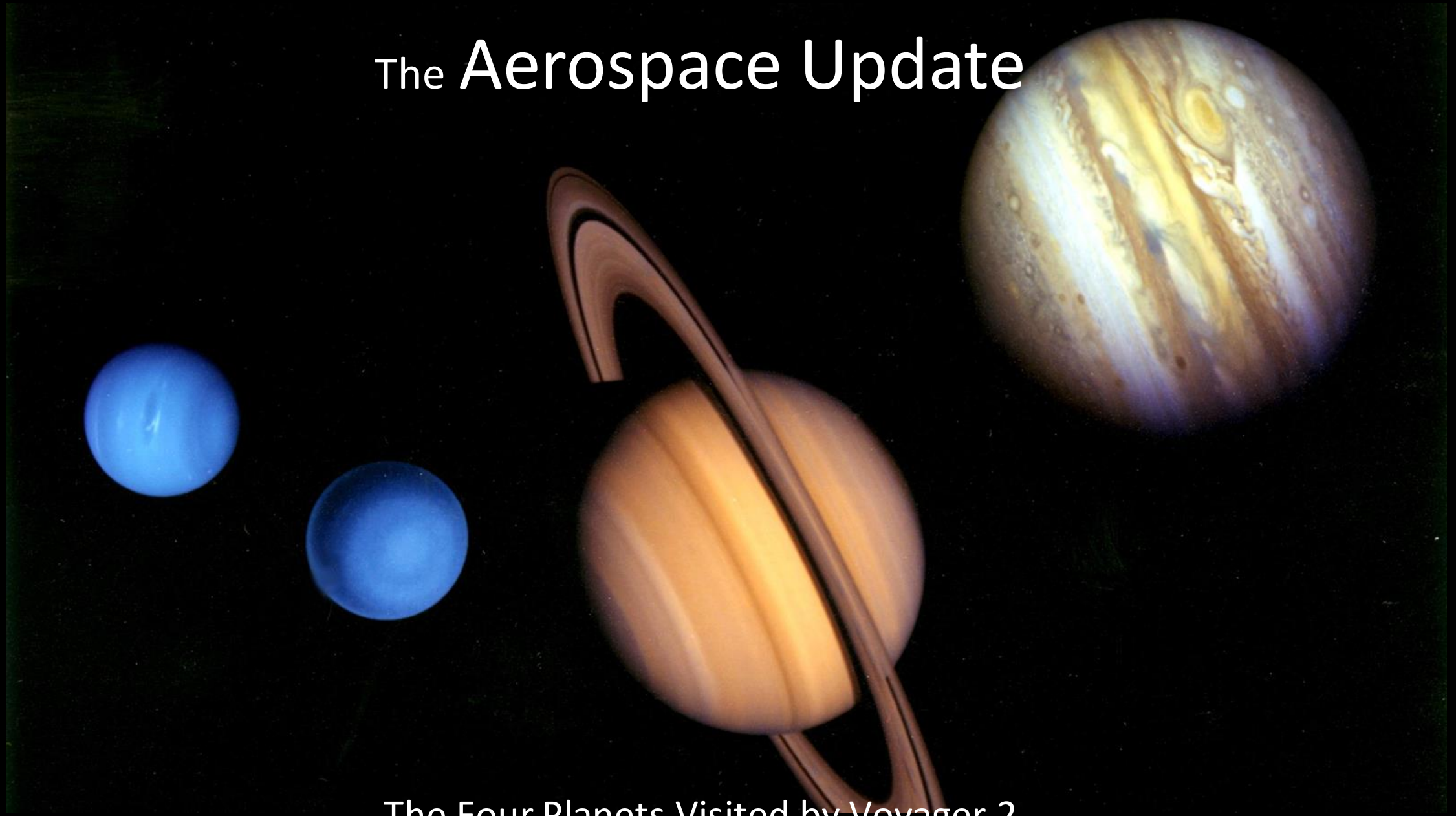
The Aerospace Update



The Four Planets Visited by Voyager 2

August 1, 2017

Image Credit: NASA /JPL

Voyager Spacecraft Still Setting Records After 40 Years

Humanity's farthest and longest-lived spacecraft, Voyager 1 and 2, achieve 40 years of operation and exploration this August and September. Despite their vast distance, they continue to communicate with NASA daily, still probing the final frontier.

The Voyagers have set numerous records in their unparalleled journeys. In 2012, Voyager 1, which launched on Sept. 5, 1977, became the only spacecraft to have entered interstellar space. Voyager 2, launched on Aug. 20, 1977, is the only spacecraft to have flown by all four outer planets—Jupiter, Saturn, Uranus and Neptune.

Voyager 1, now almost 13 billion miles from Earth, travels through interstellar space northward out of the plane of the planets. Voyager 2, now almost 11 billion miles from Earth, travels south and is expected to enter interstellar space in the next few years.

Source: Phys.org & Jet Propulsion Lab

Image Credit: JPL

Soyuz Launches at Sunset with Three International Crew Members

A Russian Soyuz rocket blasted off from Kazakhstan Friday, July 28th boosting a three-man crew into orbit for a six-hour flight to the International Space Station. The Soyuz rocket thundered to life at 11:41 a.m. EDT (GMT-4; 9:41 p.m. local time) and streaked away from the same pad at the Baikonur Cosmodrome that was used to launch Sputnik 60 years ago and Yuri Gagarin, the first man in space, in 1961. Aboard were commander Sergey Ryazanskiy, NASA flight engineer Randy Bresnik and Italian astronaut Paolo Nespoli.

Source: William Harwood @ SpaceFlightNow.com

Image Credit: NASA/Joel Kowsky

ISS Crew Size Increases to 6 With Soyuz MS-05 Docking

The full Expedition 52 meets in the *Zvezda* service module after Soyuz MS-05 docked with the *Rassvet* module. Top row, from left to right: Peggy Whitson, Fyodor Yurchikhin, and Jack Fischer. Bottom row, from left to right: Paolo Nespoli, Sergey Ryazansky, and Randy Bresnik. Docking took place at 5:54 p.m. EDT (21:54 GMT) on July 28th, while the spacecraft and station were flying over Germany. Two hours later, at 7:57 p.m. EDT (23:57 GMT), Russian cosmonaut Sergey Ryazansky, European Space Agency astronaut Paolo Nespoli, and NASA astronaut Randy Bresnik entered through the hatch of the *Rassvet* module where their spacecraft was docked.

Source: Derek Richardson @ SpaceFlightInsider.com

Photo Credit: NASA TV

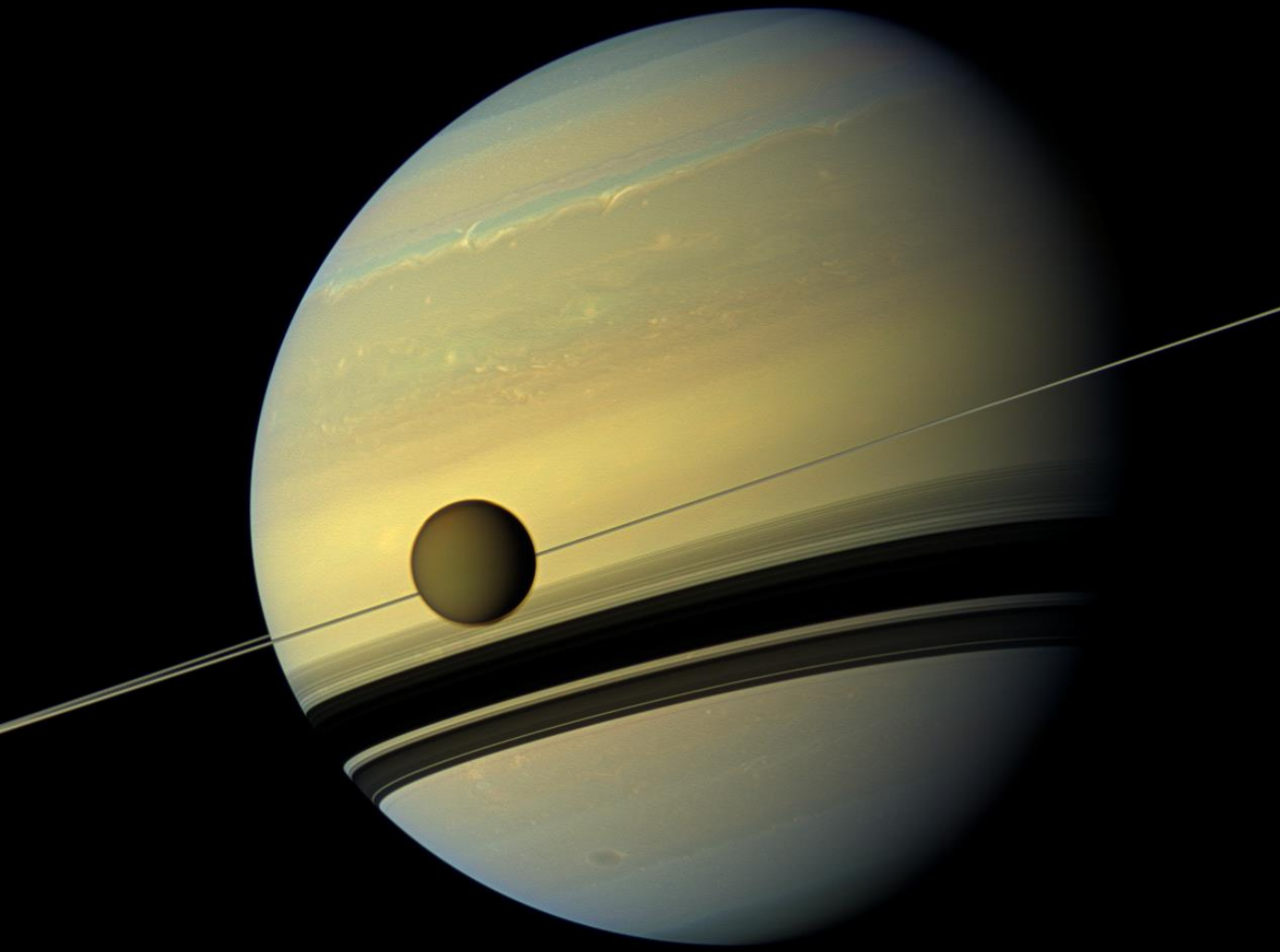
Iranian Rocket Launch Draws U.S. Complaint

Iran launched a rocket Thursday that it claimed could put a satellite into space but was criticized elsewhere as a missile test. The Simorgh rocket, reportedly based on North Korea's Unha vehicle, launched from a new facility, the Imam Khomeini Space Center. The Simorgh is described as being able to place satellites weighing up to 250 kilograms into low Earth orbit, but it was unclear if this launch intended to place a payload into orbit. The U.S. government criticized the launch, saying it violated a U.N. Security Council resolution that called on Iran to not develop ballistic missile technology.

Source: SpaceNews.com & Reuters

Photo Credit: Credit: Tasnim News Agency

Titan Has Chemical That Could Form ‘Membranes’



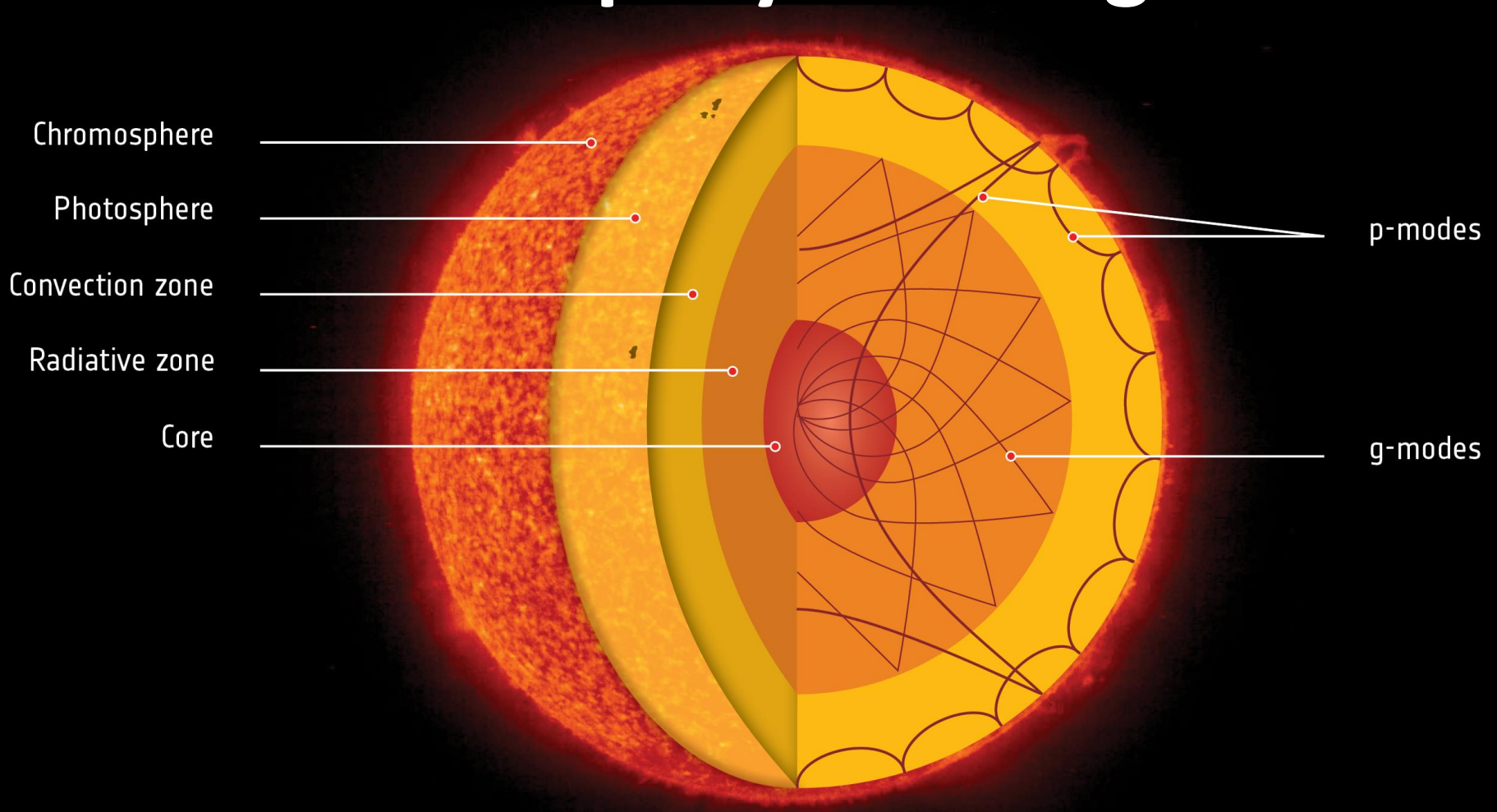
NASA scientists have definitively detected the chemical acrylonitrile in the atmosphere of Saturn’s moon Titan, a place that has long intrigued scientists investigating the chemical precursors of life.

On Earth, acrylonitrile, also known as vinyl cyanide, is useful in the manufacture of plastics. Under the harsh conditions of Saturn’s largest moon, this chemical is thought to be capable of forming stable, flexible structures similar to cell membranes. Other researchers have previously suggested that acrylonitrile is an ingredient of Titan’s atmosphere, but they did not report an unambiguous detection of the chemical in the smorgasbord of organic, or carbon-rich, molecules found there.

Photo Credit: NASA/JPL-Caltech/SSI

Source: NASA.gov

SOHO Reveals Rapidly Rotating Solar Core



Scientists have used data from ESA and NASA's Solar and Heliospheric Observatory, or SOHO, to detect a type of wave called g-modes on the Sun. The imprint of these g-waves (gravity waves) suggests that the solar core is rotating once every week, nearly four times faster than the Sun's surface and intermediate layers, which have rotation periods anywhere from 25 days at the equator to 35 days at the poles.

Source: NASA/ESA

Image Credit: ESA

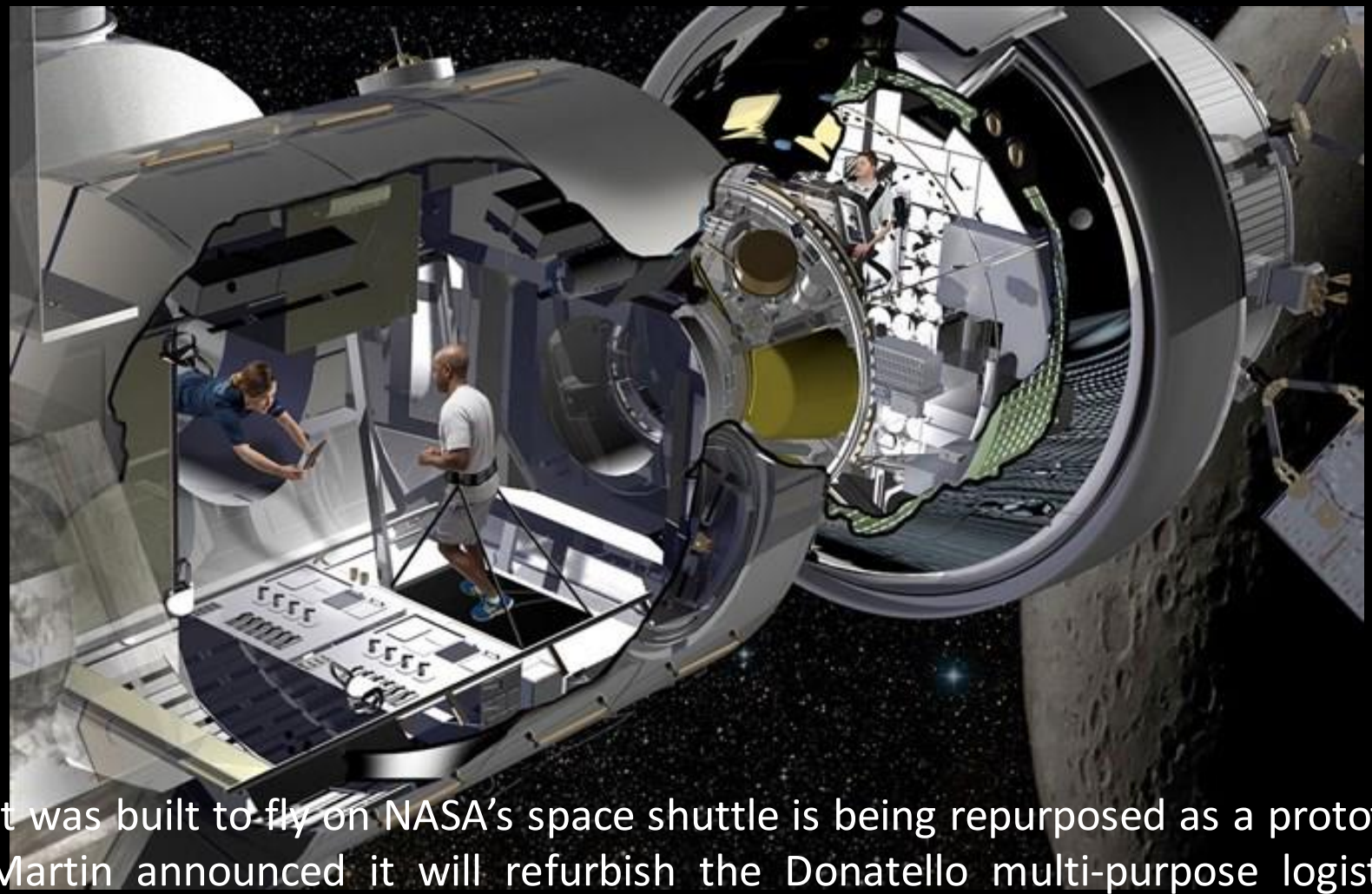
NASA Engineers Test Engine for World's Most Powerful Rocket

NASA engineers have tested the RS-25 rocket engine, which will play a crucial role in an eventual mission to Mars. The test at NASA's Stennis Space Center in Mississippi is the latest in a series of RS-25 firings. The forthcoming space launch system (SLS) rocket will be powered by four RS-25 engines. The RS-25s will provide 2 million pounds of thrust, according to NASA and will work in conjunction with a pair of solid fuel boosters which will provide an additional 6.8 pounds of thrust.

Source: www.news.com

Photo Credit: NASA

Space Shuttle Relic to be Resurrected as Deep Space Habitat

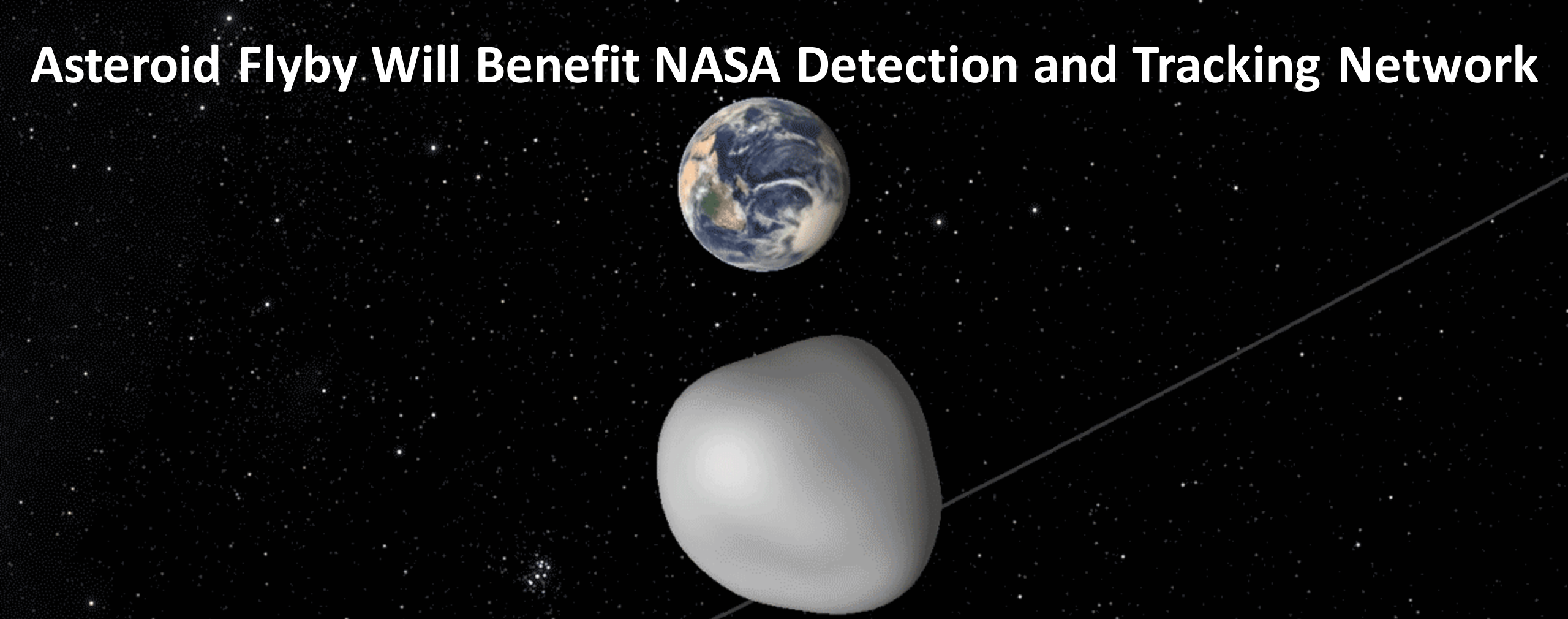


A cargo container that was built to fly on NASA's space shuttle is being repurposed as a prototype for a deep space habitat. Lockheed Martin announced it will refurbish the Donatello multi-purpose logistics module (MLPM), transforming it from its original unrealized role as a supply conveyor for the ISS to a test and training model of a living area for astronauts working beyond Earth orbit. The work is being done under a public-private partnership between the aerospace company and NASA.

Source: www.nbc.com

Photo Credit: Lockheed Martin/NASA via collectSPACE.com

Asteroid Flyby Will Benefit NASA Detection and Tracking Network



NASA scientists are excited about the upcoming close flyby of a small asteroid and plan to use its upcoming October close approach to Earth as an opportunity not only for science, but to test NASA's network of observatories and scientists who work with planetary defense. The target of all this attention is asteroid 2012 TC4 -- a small asteroid estimated to be between 30 and 100 feet (10 and 30 meters) in size. On Oct. 12, TC4 will safely fly past Earth. Even though scientists cannot yet predict exactly how close it will approach, they are certain it will come no closer than 4,200 miles (6,800 kilometers) from the surface of Earth. The asteroid has been out of range of telescopes since 2012.

Source & Image Credit: NASA/JPL-Caltech

Chasing the Total Solar Eclipse from NASA's WB-57F Jets

For most viewers, the Aug. 21, 2017, total solar eclipse will last less than two and half minutes. But for one team of NASA-funded scientists, the eclipse will last over seven minutes. Their secret? Following the shadow of the Moon in two retrofitted WB-57F jet planes. Amir Caspi of the Southwest Research Institute in Boulder, Colorado, and his team will use two of NASA's WB-57F research jets to chase the darkness across America on Aug. 21. Taking observations from twin telescopes mounted on the noses of the planes, Caspi will capture the clearest images of the Sun's outer atmosphere — the corona — to date and the first-ever thermal images of Mercury, revealing how temperature varies across the planet's surface.

Source: Mara Johnson-Groh @ NASA's Goddard Space Flight Center

Photo Credits: NASA/Faroe Islands/SwRI

July 28, 1851: 1st Ever Photo of a Total Solar Eclipse

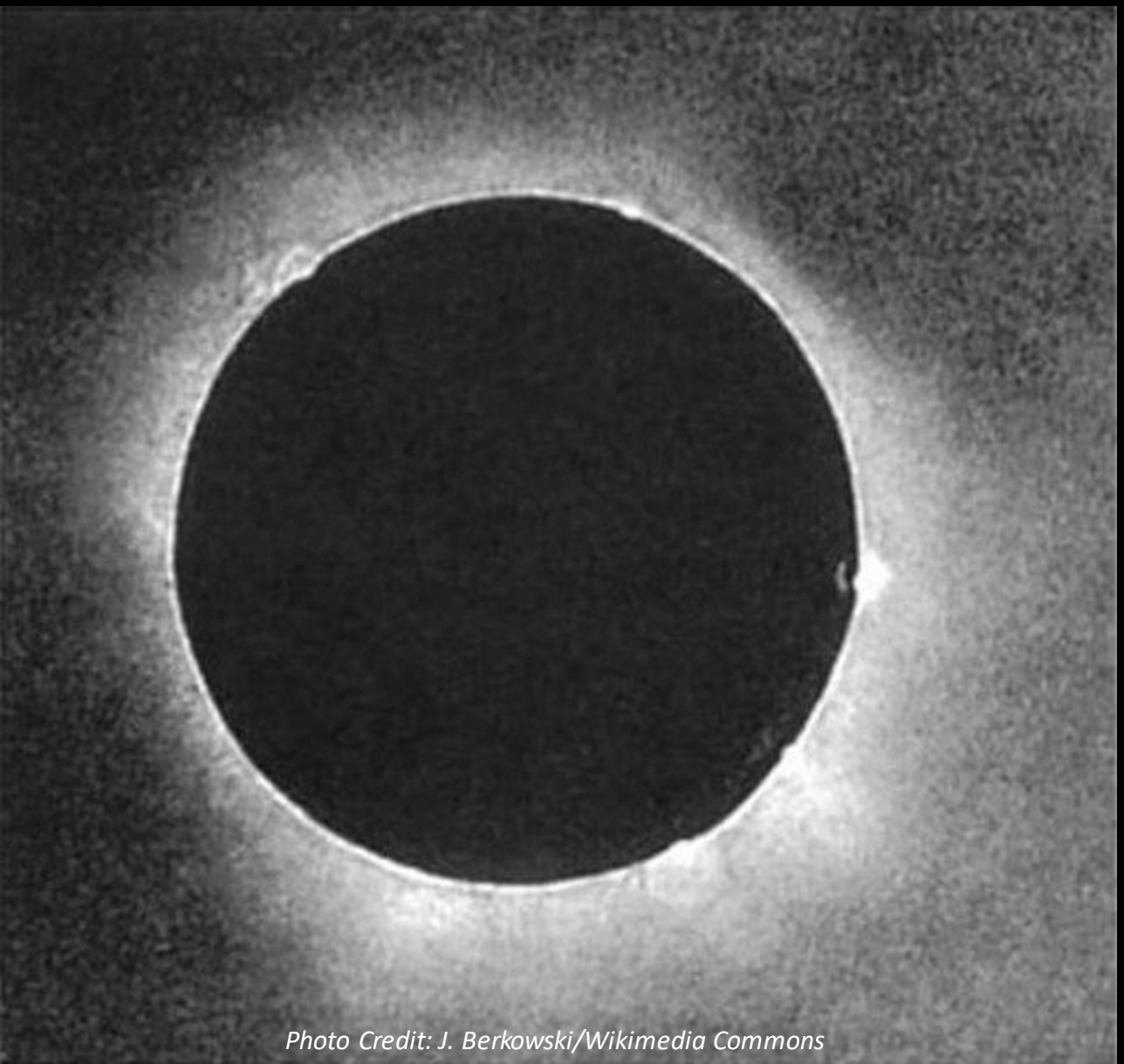


Photo Credit: J. Berkowski/Wikimedia Commons

The first photo of a total solar eclipse was taken on July 28, 1851, by Johann Julius Friedrich Berkowski, who was said to be the most skilled daguerreotypist in the Prussian city of Königsberg (now Kaliningrad, Russia).

Berkowski was commissioned by the Royal Prussian Observatory at Königsberg to create a still image of the total solar eclipse using the daguerreotype process, in which the image was directly exposed onto a polished copper plate.

According to a paper in the journal Acta Historica Astronomiae, Berkowski's daguerreotype was the first correctly exposed image of the sun's corona. Berkowski used a small refracting telescope and captured an 84-second exposure that he initiated as soon as the moon had moved completely in front of the sun, the paper explains. Not only did his photo show the contrast between the corona and the moon, but it even revealed a few solar prominences extending from the sun's disk.

Source: Hanneke Weitering @ Space.com

One Plant at a Time

Precision farming is set to become even more precise with a new camera drawing on satellite imaging. Thanks to research with ESA on new cameras, hyperspectral cameras flying on drones are now able to see details as small as 4–5 cm. Three customers are already using the first version of the ButterflEYE LS camera: in Denmark for biological diversity studies, in Australia for agricultural research, and in Italy for providing commercial data to farmers.

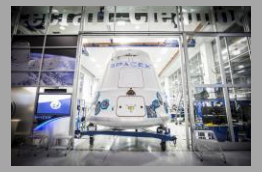
Source & Photo Credit: ESA

28 July 1935:
First Flight of Boeing Model 299

At Boeing Field, Chief Test Pilot Leslie Tower and Louis Waite took off on the maiden flight of the Boeing Model 299, NX13372, a prototype four-engine long range heavy bomber. The Boeing Model 299 was designed to meet a U.S. Army Air Corps proposal for a multi-engine bomber that could carry a 2,000 pound bomb load a distance of 2,000 miles at a speed of greater than 200 miles per hour. Design of the prototype began in June 1934 and construction was started 16 August 1934. The Air Corps designated it B-299, and later the XB-17. Later designated as the YB-17, pre-production models that followed would undergo several years of testing and improvement before entering production as the B-17 Flying Fortress, a legendary airplane of World War II. By the end of the war 12,731 B-17s had been built by Boeing, Douglas and Lockheed Vega.

Source: www.thisdayinaviation.com Photo Credit: Boeing

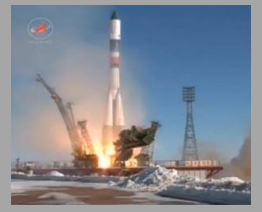
In The News



SpaceX Builds Final First-Generation Dragon Cargo Craft. The Dragon supply ship set for liftoff from Florida next month was the last of SpaceX's first-generation cargo capsules off the production line, meaning future logistics deliveries to the International SpaceStation will fly on recycled spacecraft until a new Dragon variant is ready. SpaceX launched a reused Dragon cargo craft on its last commercial supply shipment to the space station in June, and officials said then that the next Dragon mission — now scheduled for launch next month — will use a newly-manufactured capsule. *(Stephen Clark @ SpaceFlightNow.com)*

SpaceX aims for November debut of Falcon Heavy. SpaceX aims to launch the first Falcon Heavy rocket in November, company chief Elon Musk said Thursday, the latest in a series of schedule targets for the heavy-lift launcher's delayed debut. Musk shared the updated schedule on social media late Thursday, a week after he tempered expectations for the Falcon Heavy's maiden flight in remarks at an industry conference in Washington. *(Stephen Clark @ SpaceFlightNow.com)*

Spaceport Schedule Conflict Could Delay JWST Launch. NASA's James Webb Space Telescope is facing a schedule conflict in October 2018 for its Ariane 5 launch from Kourou, French Guiana with a European planetary science mission that could delay the telescope's launch by several months. ESA is also planning an October 2018 launch of BepiColombo, its first mission to Mercury, in cooperation with the Japanese space agency JAXA, which will also use an Ariane 5 launching from Kourou. Because of it's narrow launch window, BepiColombo could take precedence. *(jeff Foust @ SpaceNews.com)*



Sea Launch to be Modernized for Russia's Soyuz-5 Rocket. The Sea Launch international spacecraft launch service and the Baikonur launch site will be modernized to be suited for launches of Soyuz-5 medium-launch carrier rocket. The Soyuz-5 is expected to deliver to orbit Russia's new Federation spacecraft, designed to deliver up to four people and cargo to the Moon and space stations in low Earth orbits. *(SpaceDaily.com*)