

The Aerospace Update



Feb. 15, 2018

Falcon Heavy Animation

Video Animation Credit: SpaceX

Elon Musk's Tesla Will Have a Close Encounter with Earth in 2091

Even though it doesn't obey any earthly speed limit and has a space-suited mannequin for a driver, Elon Musk's Tesla Roadster won't drive up his insurance rates anytime soon. Researchers say the sports car won't have a really close encounter with Earth until 2091 and could last millions of years before getting totaled in a planetary crackup. But constant exposure to space radiation, micrometeoroid impacts and extreme temperatures will take their toll and the Roadster's resale value likely will take a beating. It will pass within about 68.7 million miles of Mars on June 10 and cross the red planet's orbit in July before reaching its farthest distance from the sun — 154.7 million miles — on Nov. 9. It will then fall back toward the inner solar system, picking up speed as they near the low point of the orbit, or perihelion, on Aug 15, 2019. Perihelion in this case roughly matches the distance of Earth's orbit from the sun, the Tesla's starting point. The Roadster then will head back out along the same path, traveling a now-familiar route over and over again for the foreseeable future.

Text Source: William Harwood @ CBS News

Photo Credit: SpaceX

The Most Interesting Thing Shot into Space Last Week Wasn't a Tesla



There was a second payload on board the SpaceX Falcon Heavy that launched Tuesday (Feb. 6), and (unlike the Tesla Roadster) it's built to last 14 billion years. It's a simple-looking object: a clear, thick disk of quartz crystal, about an inch across, with lettering across its face. Pronounced "ark" as in "archive," it's part of a very Silicon Valley plan to — as technology investor, self-described futurist and Arch Mission Foundation co-founder Nova Spivack explained it to Live Science — create "a self-replicating, meta-level process to perpetuate human civilization." Spivack explained that the etched quartz is part of a grand plan to seed the solar system with super-durable data-storage devices containing a vast cultural archive of human civilization.

Text Source: Rafi Letzter @ Space.com

Image Credit: The Arch Foundation

Soyuz Rocket Launches Cargo Freighter to ISS

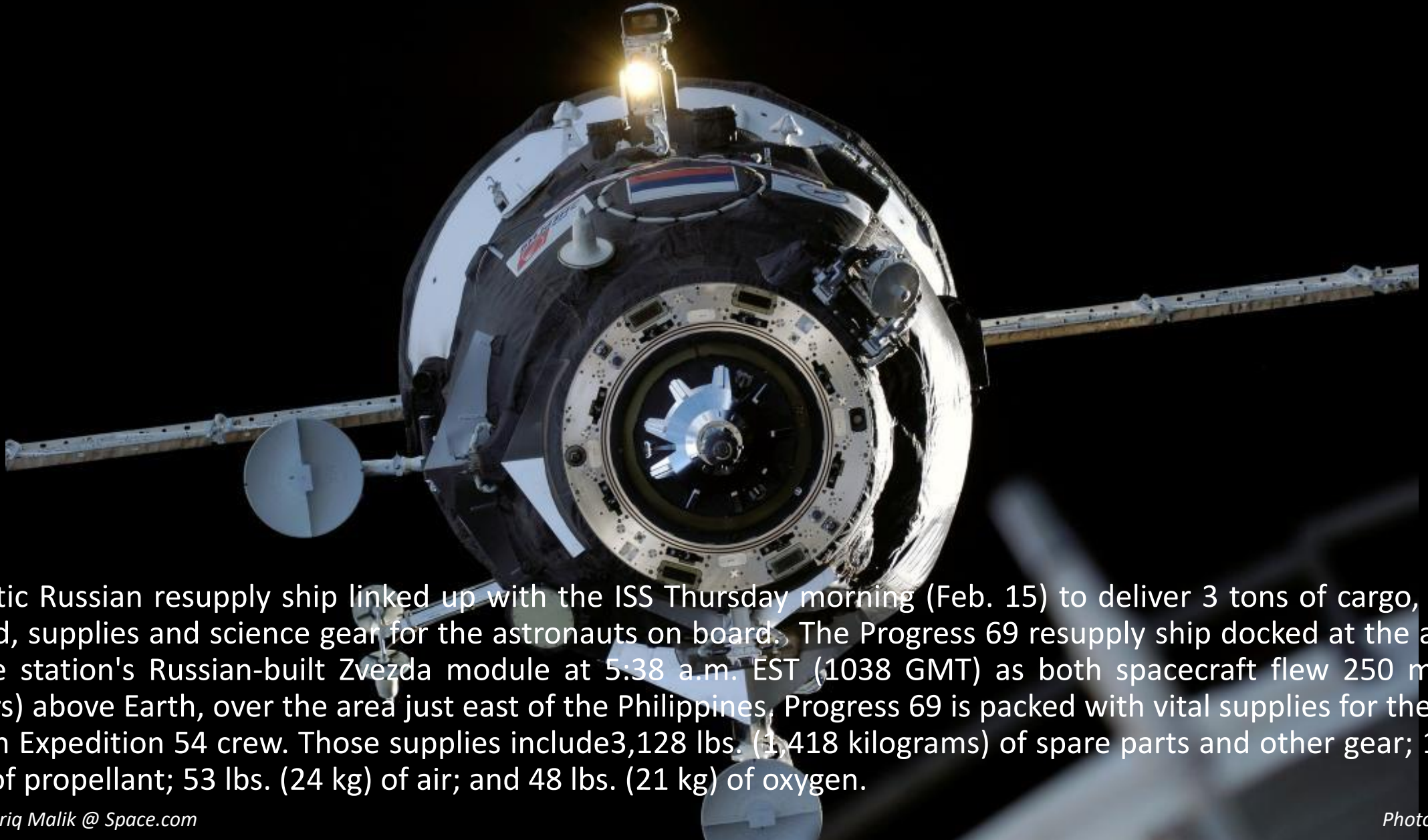


Running two days later after a last-minute abort Sunday, a Russian Progress resupply and refueling freighter lifted off in a blanket of fog Tuesday, Feb 13th from the Baikonur Cosmodrome to deliver three tons of cargo, propellant and water to the International Space Station. A launch attempt Sunday was halted with less than one minute remaining in the countdown thwarting plans to send the Progress MS-08 freighter on an expedited three-and-a-half hour approach to the space station. An abbreviated rendezvous requires the space station to be nearly directly overhead the Baikonur Cosmodrome at the time of launch, an orbital alignment that was not available Tuesday. Instead, the Progress took a more leisurely two-day flight to the research complex orbiting more than 250 miles (400 kilometers) above Earth.

Text Source: Stephen Clark @ SpaceFlightNow.com

Video Credit: Roscosmos

Progress Resupply Ship Delivers Three Tons of Cargo



The robotic Russian resupply ship linked up with the ISS Thursday morning (Feb. 15) to deliver 3 tons of cargo, including fresh food, supplies and science gear for the astronauts on board. The Progress 69 resupply ship docked at the aft end of the space station's Russian-built Zvezda module at 5:38 a.m. EST (1038 GMT) as both spacecraft flew 250 miles (400 kilometers) above Earth, over the area just east of the Philippines. Progress 69 is packed with vital supplies for the station's six-person Expedition 54 crew. Those supplies include 3,128 lbs. (1,418 kilograms) of spare parts and other gear; 1,940 lbs. (880 kg) of propellant; 53 lbs. (24 kg) of air; and 48 lbs. (21 kg) of oxygen.

China Adds 2 More Satellites to Navigation Network

A photograph of a Long March 3B rocket launching from the Xichang space base. The rocket is white with a red stripe and is ascending vertically, leaving a large plume of white smoke and a bright orange and red fire at its base. The launch is taking place in a valley with green hills in the background. Several tall, metal lattice towers are visible in the foreground and middle ground.

Two more Chinese Beidou navigation satellites successfully lifted off aboard a Long March 3B rocket Monday, Feb 11th on China's seventh space launch in five weeks. The Long March 3B rocket and a restartable Yuanzheng upper stage deployed the two Beidou navigation satellites — the 28th and 29th to join China's navigation network — nearly four hours after launch from the Xichang space base in Sichuan province, according to Chinese state media reports. The satellites launched Monday are the fifth and sixth members of China's third-generation Beidou fleet, joining four similar craft launched since early November.

Something Violent Happened to Our Solar System's First Interstellar Visitor



An interstellar object called 'Oumuamua has confounded astronomers ever since it passed through our solar system in October of last year. Scientists initially thought that the object — the first-ever visitor from another solar system spotted by Earth-based telescopes — was a comet. Later, they considered it an asteroid and even later described it as a possibly comet-like icy body with a rocky crust. When astronomers from Queen's University Belfast in Northern Ireland observed the changes in the object's brightness, they found that it is not spinning regularly, like the majority of known asteroids and small bodies in the solar system do. Rather, it is chaotically tumbling. 'Oumuamua's erratic motion might be a result of a collision with another asteroid, said Wes Fraser, one of the researchers behind the latest paper on 'Oumuamua, published Feb. 9 in the journal *Nature Astronomy*. This collision, in fact, may have been what thrust 'Oumuamua out of its native solar system and on a trajectory toward the sun.

Next Falcon Heavy Will Carry the Most Powerful Atomic Clock Ever Launched into Space



An ultra-precise atomic clock the size of a four-slice toaster is set to zip into outer space this summer, NASA said. This isn't your average timekeeper. The so-called Deep Space Atomic Clock (DSAC) is far smaller than Earth-bound atomic clocks, far more precise than the handful of other space-bound atomic clocks, and more resilient against the stresses of space travel than any clock ever made. According to a NASA statement, it's expected to lose no more than 2 nanoseconds (2 billionths of a second) over the course of a day. That comes to about 7 millionths of a second over the course of a decade.

Text Source: Rafi Letzter @ Space.com

Twenty-five Years of Satellite Data Confirm Rising Sea Levels

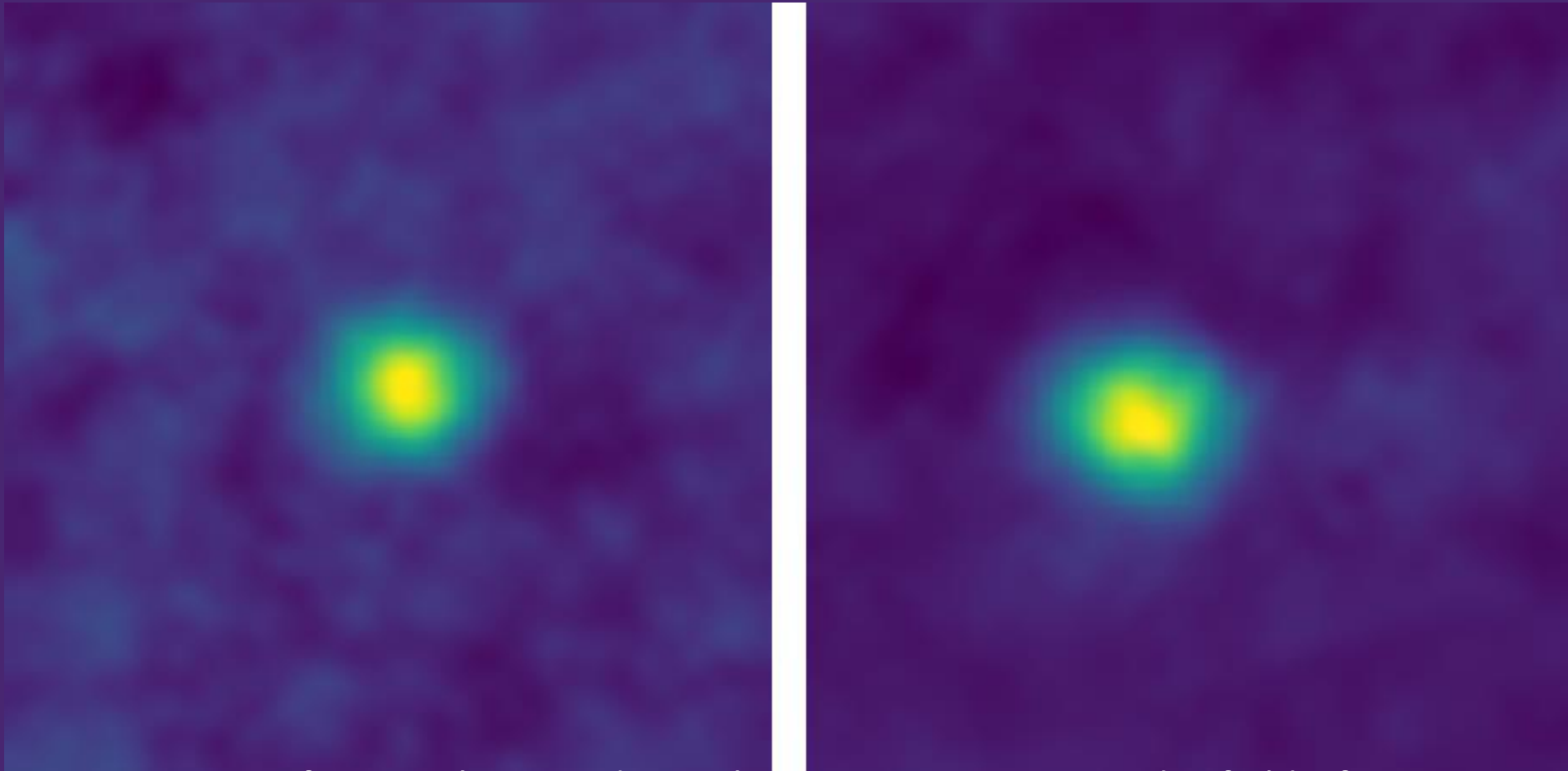


In a study published in the journal *Proceedings of the National Academy of Sciences*, researchers found that since 1993, ocean waters have moved up the shore by almost 1 millimeter per decade. That's on top of the 3 millimeter steady annual increase. This acceleration means we'll gain an additional millimeter per year for each of the coming decades, potentially doubling what would happen to the sea level by 2100 if the rate of increase was constant.

Source: University of South Florida

Photo Credit: NASA

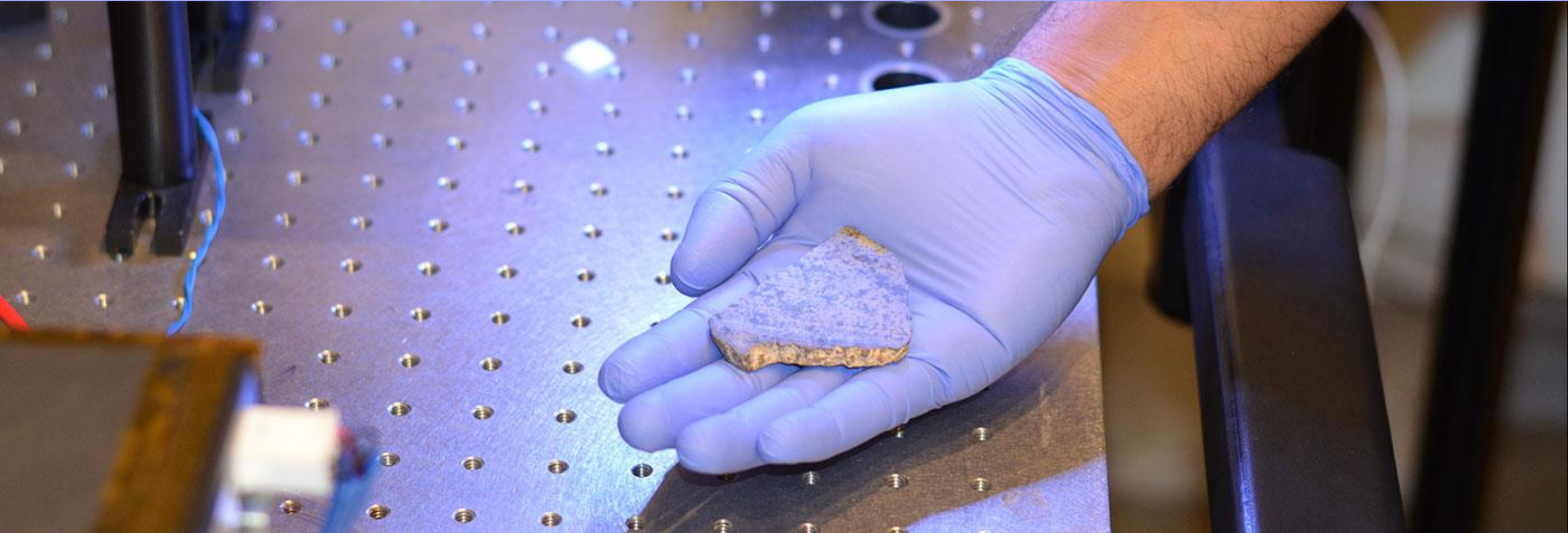
New Horizons Captures Record-Breaking Images in the Kuiper Belt



NASA's New Horizons spacecraft recently turned its telescopic camera toward a field of stars, snapped an image – and made history. The routine calibration frame of the “Wishing Well” galactic open star cluster, made by the Long Range Reconnaissance Imager (LORRI) on Dec. 5, was taken when New Horizons was 3.79 billion miles (6.12 billion kilometers, or 40.9 astronomical units) from Earth – making it, for a time, the farthest image ever made from Earth.

Text & Image Credits: NASA

Return to Sender!



A chunk of Mars will soon be returning home. A piece of a meteorite called Sayh al Uhaymir 008 (SaU008) will be carried on board NASA's Mars 2020 rover mission, now being built at the NASA'S Jet Propulsion Laboratory in Pasadena, California. This chunk will serve as target practice for a high-precision laser on the rover's arm. Earth has a limited supply of Martian meteorites, which scientists determined were blasted off Mars' surface millions of years ago. These meteorites aren't as unique as the geologically diverse samples 2020 will collect. But they're still scientifically interesting -- and perfect for target practice.

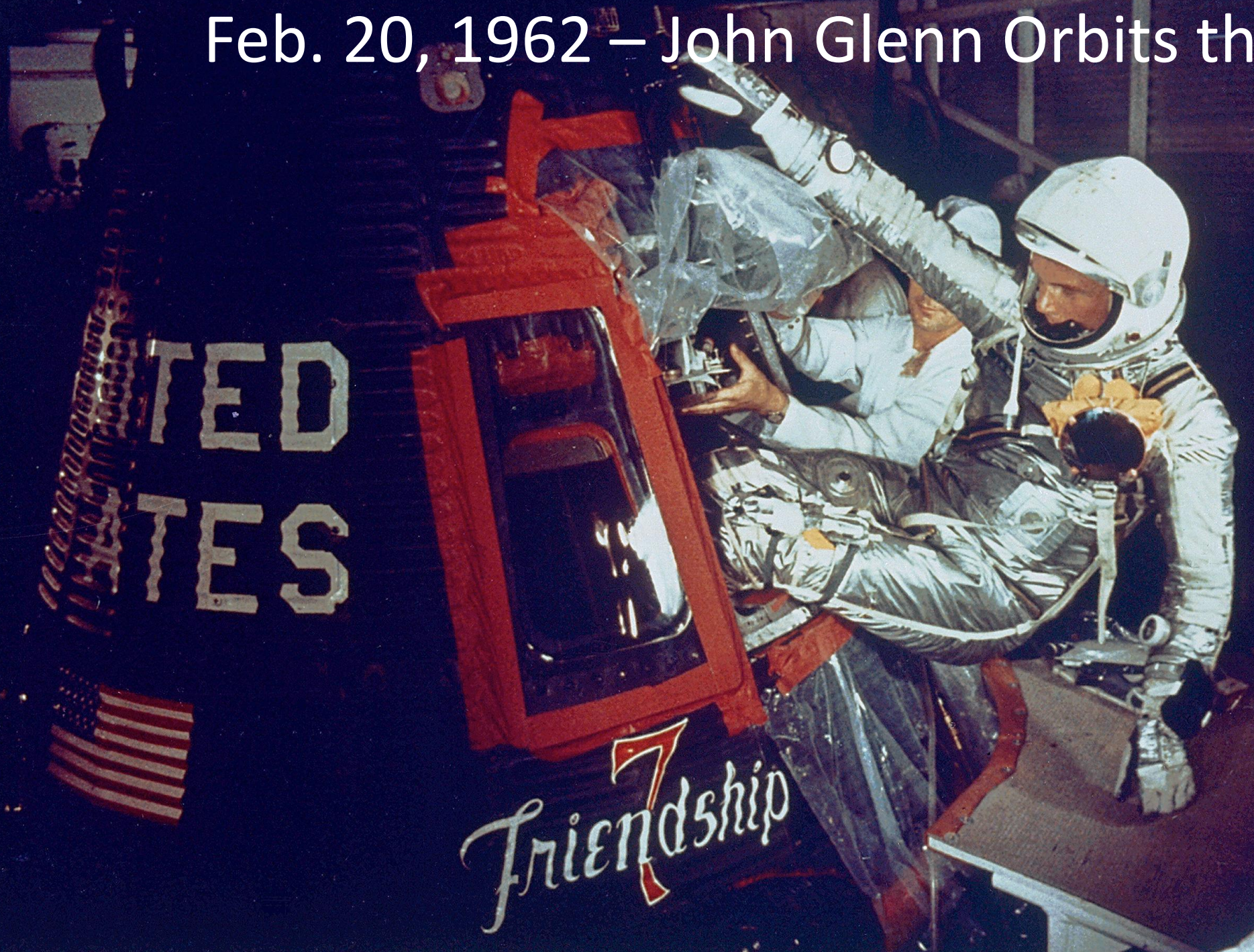
Text & Photo Credits: NASA/JPL-Caltech

USAF Plans to Consolidate Bomber Fleet to B-21 and B-52



The US Air Force has confirmed plans to re-engine the Boeing B-52H fleet and retire the Northrop Grumman B-2 and the Rockwell B-1 as Northrop's next-generation B-21 stealth bomber ramps up deliveries. The proposals in the Trump Administration's Fiscal 2019 budget request will consolidate the Air Force's strategic bomber fleet to the B-21 and a re-engined B-52 fleet after around 2040.

Feb. 20, 1962 – John Glenn Orbits the Earth



On February 20, 1962, NASA launched one of the most important flights in American history. The mission? Send a man to orbit Earth, observe his reactions and return him home safely. The pilot of this historic flight, John Glenn, became a national hero and a symbol of American ambition. He became the third American in space and the first to orbit Earth. The historical flight was no easy feat. At the end of his first orbit, a yaw attitude jet clogged, forcing Glenn to abandon the automatic control system and use the manual electrical fly-by-wire system. In 4 hours and 56 minutes, John Glenn circled the globe three times, reaching speeds of more than 17,000 miles per hour. The successful mission concluded with a splashdown and recovery in the Atlantic Ocean, 800 miles southeast of Bermuda.

Source & Image Credits: NASA

In The News



Spirit AeroSystems ships 10,000th 737 fuselage. The 10,000th Boeing 737 is close to entering final assembly in Renton, Washington. A train carrying the 10,000th 737 fuselage left Spirit AeroSystems' factory in Wichita, Kansas on 13 February, the supplier says. Spirit AeroSystems builds 70% of the 737, including the fuselage. The milestone aircraft is a 737 Max 8 scheduled for delivery to Southwest Airlines. *(Stephen Trimble @ FlightGlobal.com)*



Trump Budget Aims to Kick-Start Lunar Exploration, Cancels Space Telescope. The White House's \$19.9 billion NASA budget outline released Monday would continue development of NASA's heavy-lift Space Launch System rocket and Orion crew capsule and begin the deployment of a mini-space station around the moon as soon as 2022, but the proposal would cancel WFIRST, a flagship-class astronomy mission planned for launch in the mid-2020s. *(Stephen Clark @ SpaceFlightNow.com)*



NASA Budget Proposal Plans end of NASA Funding of ISS, Seeks Commercial Transition. NASA's fiscal year 2019 budget proposal will include plans to end funding for the International Space Station in 2025, but leaves open the possibility of handing part or all of the station over to private operators. *(Jeff Foust @ SpaceNews.com)*



Lockheed Sees Demand For Additional 400 F-16 Jets Over 10 Years. Lockheed Martin Corp is anticipating demand for an additional 400 F-16 fighter jets globally over the next decade, a senior executive at the U.S. defense contractor said Feb. 7. Randall Howard, who leads F-16 business development at Lockheed Martin, made the comments on the sidelines of the Singapore Airshow. *(Reuters.com)*



New Drone Ship Under Construction for SpaceX Rocket Landings. SpaceX will deploy a new rocket landing platform off Florida's Space Coast to enter a rotation with another drone ship stationed at Cape Canaveral, company founder Elon Musk said Monday. Named "A Shortfall Of Gravitas", it will be stationed in Florida to support high flight rates of SpaceX's Falcon 9 rocket, and allow for dual ocean landings of the two side boosters carried on the Falcon Heavy rocket. *(Stephen Clark @ SpaceFlightNow.com)*