

The Aerospace Update

InSight on its way to Mars

May 10, 2018

Image Credit: David Mcnew/Getty Images

Atlas 5 Launches NASA InSight Mars Lander

InSight Mission to Mars Launch May 5, 2018



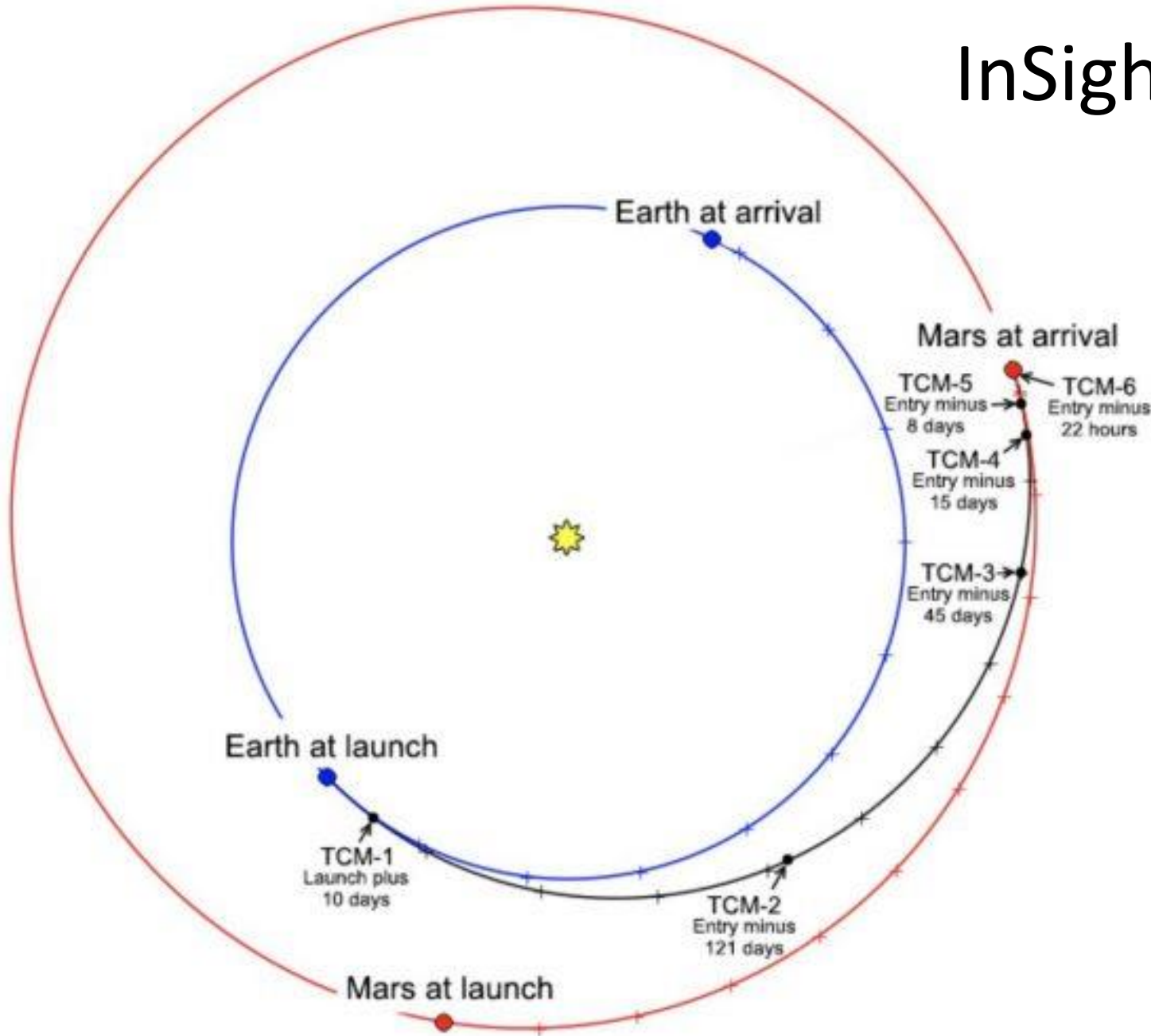
Jet Propulsion Laboratory
California Institute of Technology

An Atlas 5 rocket successfully launched InSight, a billion-dollar NASA mission to study the interior of Mars, from Vandenberg Air Force Base in California on May 5th. The Centaur upper stage entered orbit 13 minutes after launch. After a 65-minute coast, the Centaur fired again to inject the InSight spacecraft onto a Mars-bound trajectory. InSight separated from the upper stage 93 minutes after liftoff. Project officials said the spacecraft was in good health after launch.

Video Credit: NASA/JPL-CalTech

Source: Jeff Foust @ SpaceNews.com

InSight's Trajectory to Mars

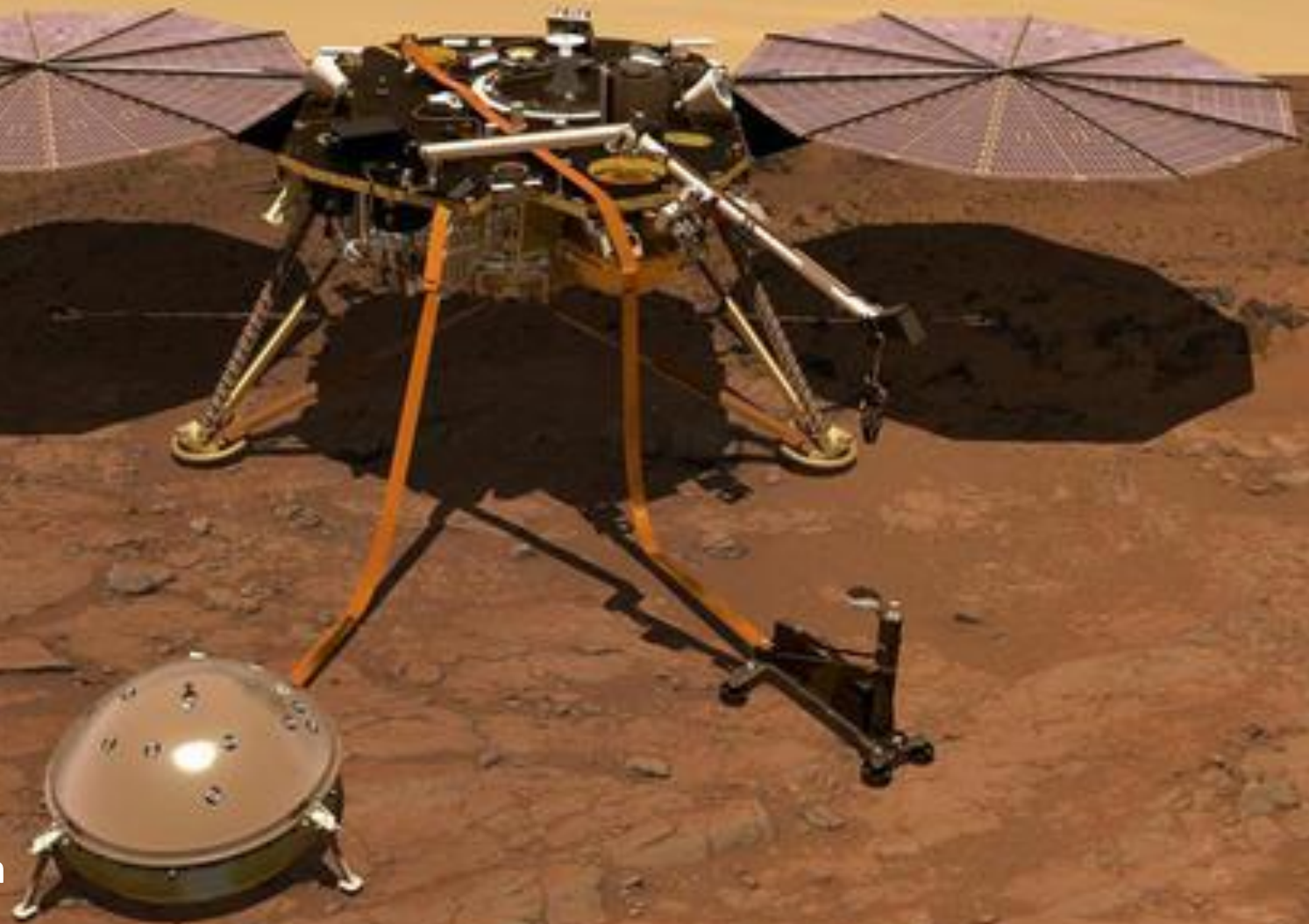


Taking nearly seven months to cover roughly 301 million miles, Mission planners at JPL in La Cañada Flintridge expect the lander to touch down in Elysium Planitia on November 26th. Once there, InSight will begin a two-year primary mission to study the planet's deep interior.

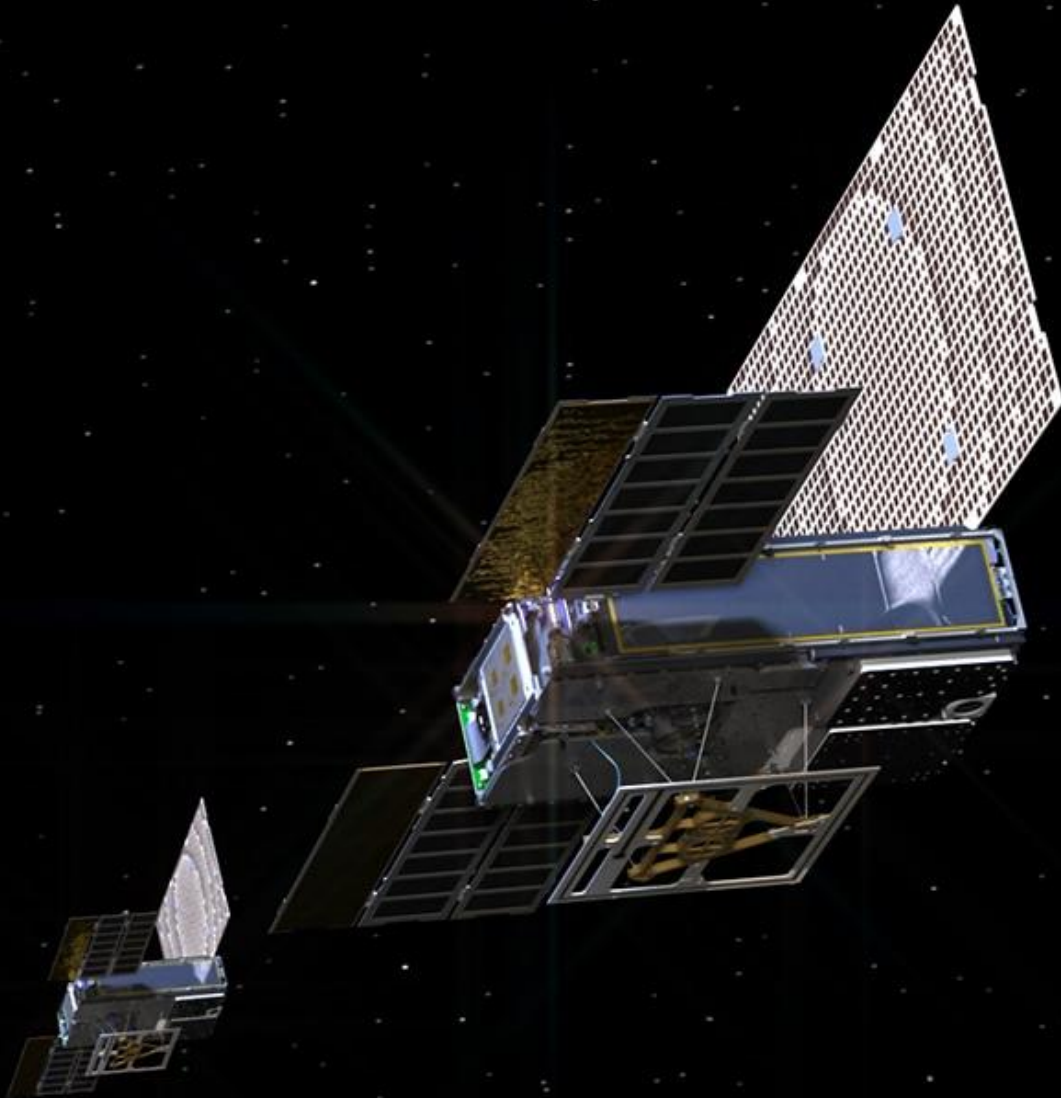
Source: Karen Kaplan and Amina Khan @ LATimes.com

After Landing...

After landing, the lander's 7-foot-long arm will extract two instruments and place them on the surface in front of it. A seismometer will track quakes, which on Mars are called, appropriately, Marsquakes. Scientists believe quakes could be produced by meteorites hitting the surface or tectonic activity beneath the surface. A "heat probe" will measure the planet's interior temperature. Back on the spacecraft, two radio antennas will track how the interior affects the planet's motion around the sun. There will also be a camera, ready to capture the lander's little workspace million miles away from Earth.



NASA's First Deep-Space CubeSats Say: 'Polo!'



NASA has received radio signals indicating that the first-ever CubeSats headed to deep space are alive and well. The first signal was received at 12:15 p.m. PST (3:15 p.m. EST) today; the second at 1:58 p.m. PST (4:58 p.m. EST). Engineers will now be performing a series of checks before both CubeSats enter their cruise to deep space. Mars Cube One, or MarCO, is a pair of briefcase-sized spacecraft that launched along with NASA's InSight Mars lander. The twin MarCO CubeSats are on their own separate mission: rather than collecting science, they will follow the InSight lander on its cruise to Mars, testing out miniature spacecraft technology along the way. A couple of weeks will be spent assessing how the MarCO CubeSats are performing. If they survive the radiation of space and function as planned, they'll fly over the Red Planet during InSight's entry, descent and landing in November. They each have a special antenna to relay InSight's vital signs during the infamous "Seven Minutes of Terror," the crucial phase which has claimed the majority of humanity's probes sent to land on the Red Planet.

Reused Dragon Returns Experiments, Hardware to Earth

A photograph of the SpaceX Dragon cargo capsule in space. The capsule is illuminated by a bright red light source, likely the Sun, creating a strong lens flare effect. The capsule is oriented vertically, with its nose pointing towards the bottom right. The background is the dark void of space, with some faint stars visible. The capsule's solar panels and various instruments are visible on its exterior.

On Saturday, May 5th, the SpaceX Dragon supply ship undocked from the International Space Station after a month long stay and parachuted into the Pacific Ocean, bringing more than 3,800 pounds of cargo — including a NASA robot requiring repair — back to Earth. The Dragon cargo capsule splashed down at about 3 p.m. EDT (12 p.m. PDT; 1900 GMT) in the Pacific around 400 miles (650 kilometers) southwest of Long Beach, California, where a SpaceX recovery team was in position to retrieve the spacecraft, pull it onto a boat, and return it to the Port of Los Angeles. The successful splashdown Saturday marked the conclusion of SpaceX's 14th resupply mission to the ISS.

Communications Satellite Launched From China to Connect Asia-Pacific

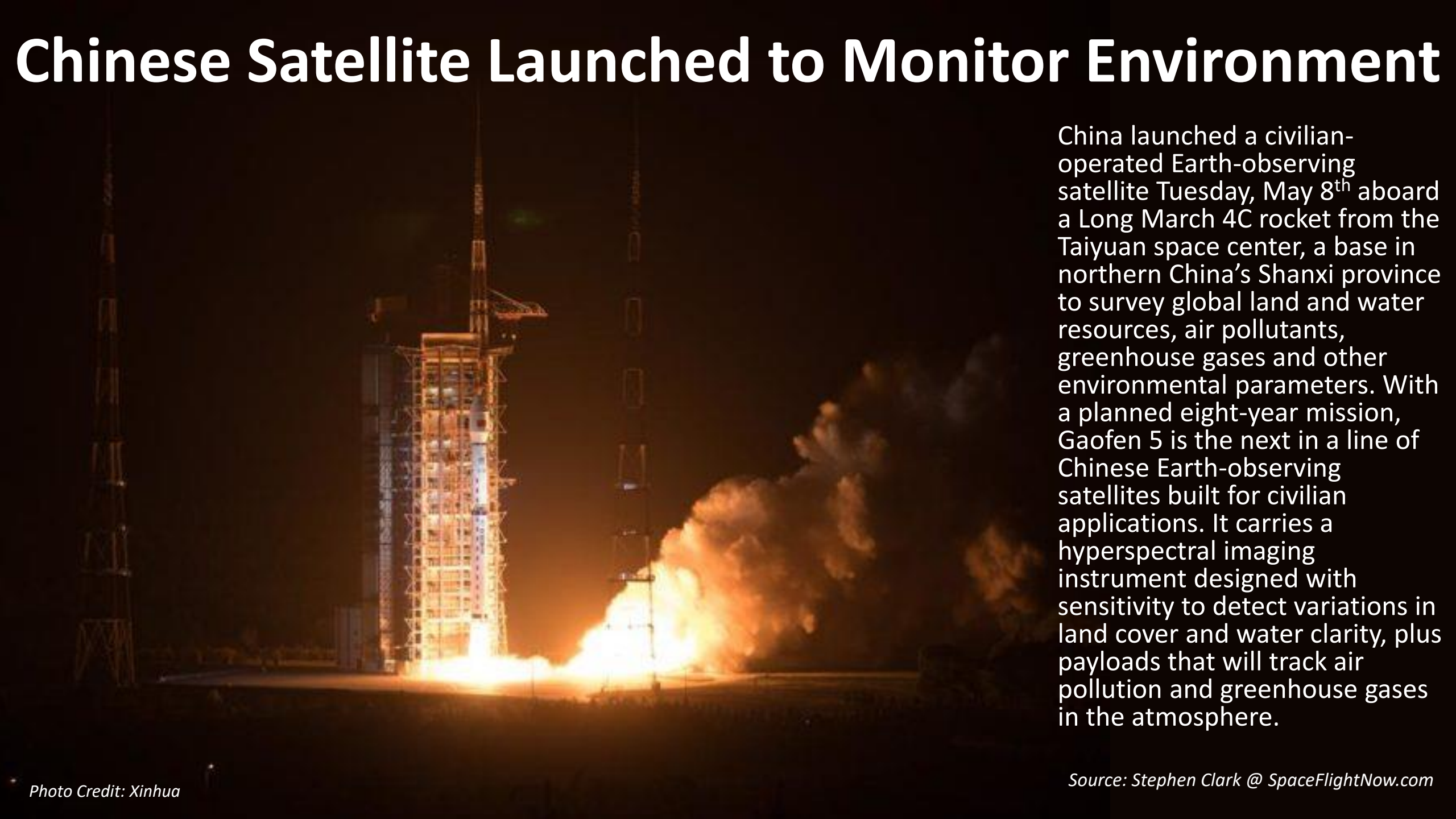
A Chinese-built communications satellite owned by Hong Kong-based operator launched Thursday, May 3rd aboard a Long March 3B rocket from the Xichang space base in southwest China. The 184-foot-tall (56-meter) Long March 3B rocket, powered by a core stage and four liquid-fueled boosters, departed Xichang toward the east-southeast to propel the Apstar 6C satellite toward its perch in geostationary orbit more than 22,000 miles over the equator. Apstar 6C will enter service at 134 degrees east longitude for a planned 15-year mission, providing in-flight connectivity for airliners, video distribution services, direct-to-home television broadcasts, and cellular backhaul capacity across China, Mongolia and Southeast Asia.

Source: Stephen Clark @ SpaceFlightNow.com



Photo Credit: Xinhua

Chinese Satellite Launched to Monitor Environment



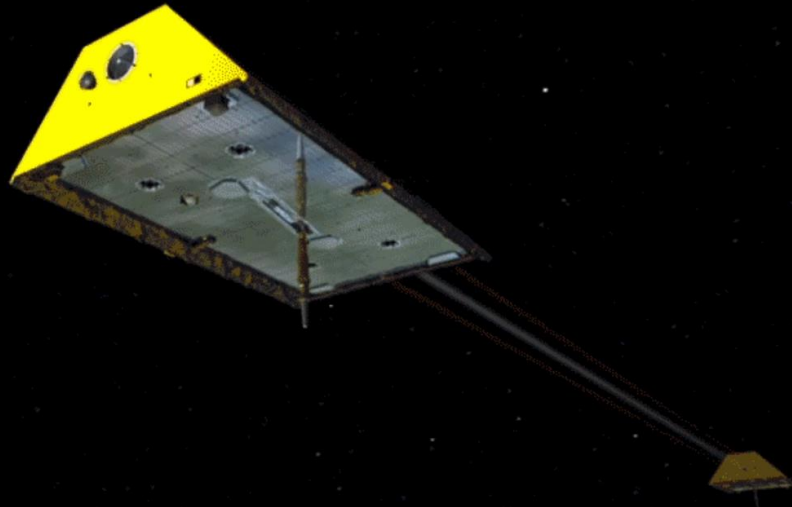
China launched a civilian-operated Earth-observing satellite Tuesday, May 8th aboard a Long March 4C rocket from the Taiyuan space center, a base in northern China's Shanxi province to survey global land and water resources, air pollutants, greenhouse gases and other environmental parameters. With a planned eight-year mission, Gaofen 5 is the next in a line of Chinese Earth-observing satellites built for civilian applications. It carries a hyperspectral imaging instrument designed with sensitivity to detect variations in land cover and water clarity, plus payloads that will track air pollution and greenhouse gases in the atmosphere.

Block 5 Falcon 9 Debut Launch



After a successful static fire test last week, SpaceX had a launch abort of the first flight of the Block 5 version of the Falcon 9 rocket at T-58 seconds on May 10th. A new launch date has yet to be scheduled. The booster is scheduled to send the Bangabandhu-1 geostationary communications satellite into orbit. The Block 5 version of the 229-foot (70-meter) tall Falcon 9, is the final major upgrade of the vehicle that debuted nearly eight years ago in 2010. Block 5 sports a number of upgrades, including increased engine thrust, more thermal protection around the nine Merlin 1D engines at the base of the rocket, a thermal protection coating of the first stage to help it during reentry during recovery maneuvers, among others. Additionally, the “octoweb,” the section where the first stage’s nine Merlin 1D engines reside, is bolted on instead of welded as it was in previous versions. SpaceX is expecting that vehicle will be able to be reused for 10 flights or more. It is this version of the Falcon that is scheduled to launch the crewed version of the Dragon capsule.

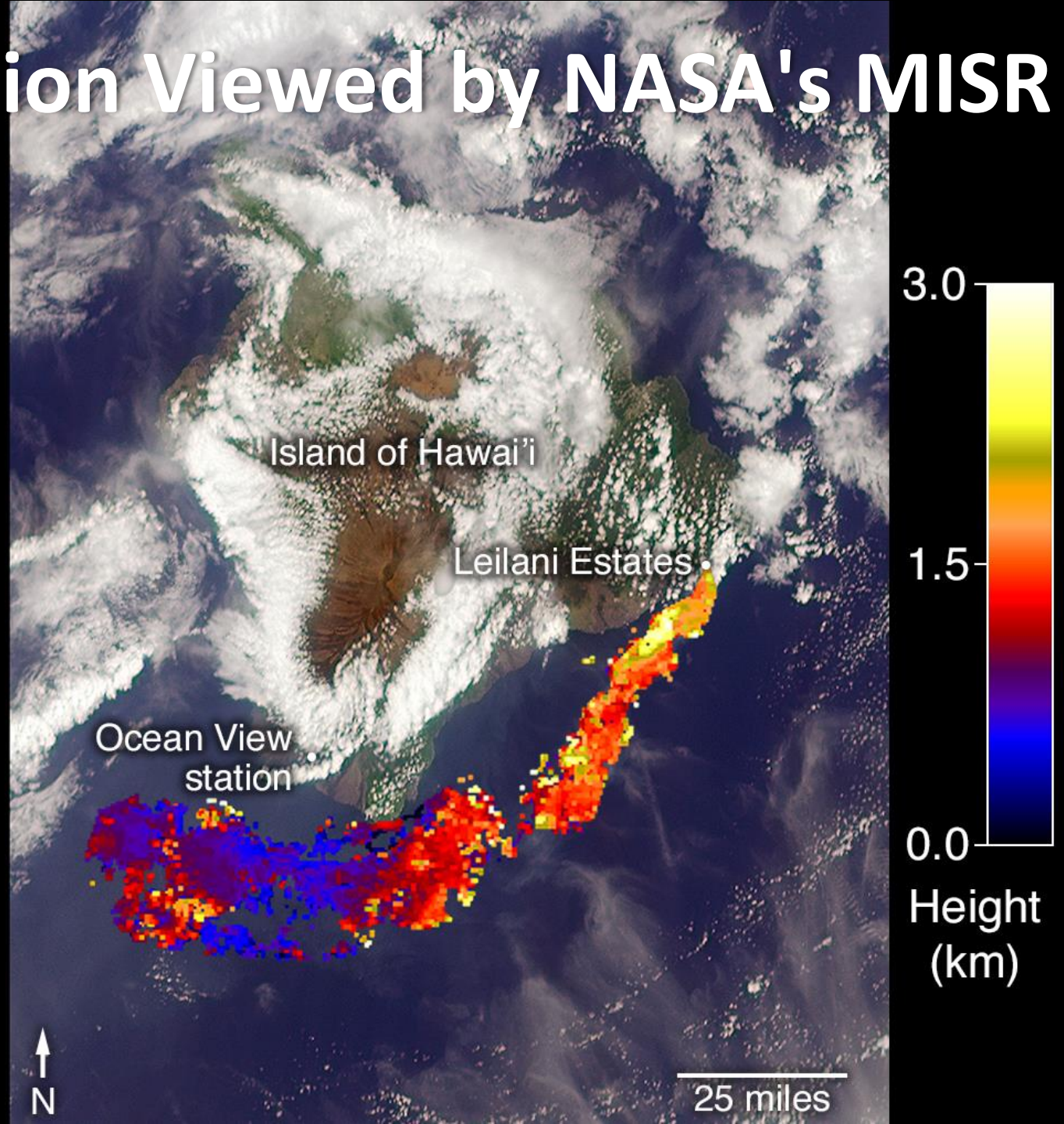
Lasers in Space: Earth Mission Tests New Technology



For the first time, a promising technique called laser ranging interferometry will be tested between two satellites. GRACE-FO will demonstrate the effectiveness of using lasers instead of microwaves to more precisely measure fluctuations in the separation distance between the two spacecraft, potentially improving the precision of range fluctuation measurements by a factor of at least 10 on future GRACE-like missions.

Source & Animation Credits: NASA/JPL-Caltech

Ash from Kilauea Eruption Viewed by NASA's MISR

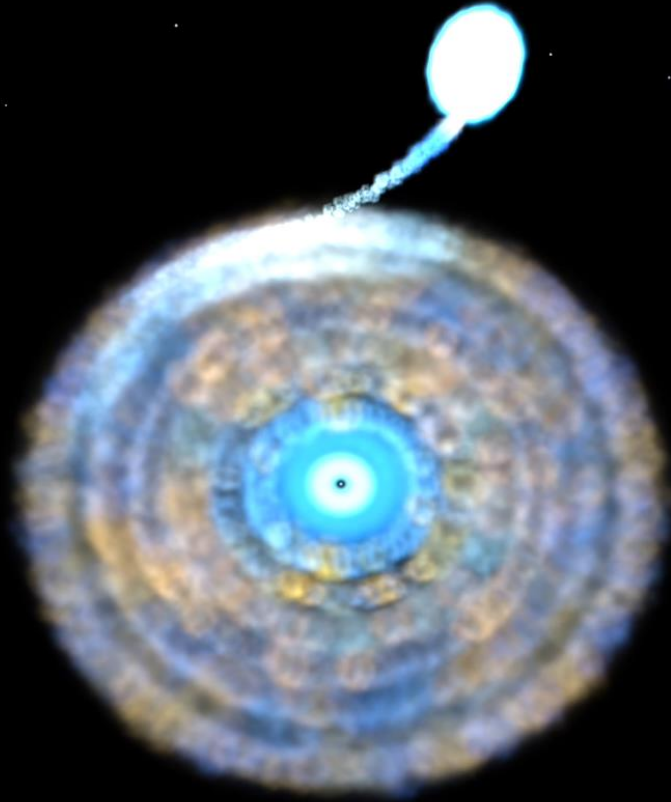


Lockheed Martin Prepares to Turn On U.S. Air Force Space Fence on Kwajalein Atoll



Lockheed Martin is completing the Air Force Space Fence on Kwajalein Atoll. This image depicts coverage that would be provided and a second site in Western Australia. The S-band radars detect objects passing through the RF "fence" and begins tracking them. The Space Fence will send out a curtain of radio frequency energy wider than the continental United States. As satellites and debris pass through the curtain, the system will detect them and determine whether the objects are already in the Space Surveillance Network's catalog. In addition to keeping tabs on low Earth orbit, the Space Fence is designed to create smaller "micro-fences" in every orbit up to geostationary orbit.

NICER Finds X-ray Pulsar in Record-fast Orbit



Scientists analyzing the first data from the Neutron Star Interior Composition Explorer (NICER) mission have found two stars that revolve around each other every 38 minutes. One of the stars in the system, called IGR J17062–6143 (J17062 for short), is a rapidly spinning, superdense star called a pulsar. The other is probably a hydrogen-poor white dwarf. The discovery bestows the stellar pair with the record for the shortest-known orbital period for a certain class of pulsar binary system.

In The News



SBIRS GEO Flight-4 Beams Back First Images. The first images from the fourth of the United States Air Force's Space Based Infrared System (SBIRS) have been sent back to the ground in what has been dubbed "first light" – marking a milestone for the most-recently launched SBIRS spacecraft. The SBIRS GEO satellites were constructed by Lockheed Martin and the system is designed to serve as an early warning system against the threat of missile launches. Mission managers are very pleased with the high quality and definition of the images received thus far. *(Jason Rhian @ SpaceFlightInsider.com)*



James Webb Space Telescope Suffers New Problem During Spacecraft Testing. Greg Robinson, the JWST program director at NASA Headquarters, said some "screws and washers" appear to have come off the spacecraft during recent environmental testing at a Northrop Grumman facility in Southern California. "Right now we believe that all of this hardware — we're talking screws and washers here — come from the sunshield cover," he said. "We're looking at what this really means and what is the recovery plan." *(Jeff Foust @ SpaceNews.com)*



Airbus, Boeing: Sales To Iran Now Off Limits. Airbus expects to be bound by the Trump administration's prohibitions against selling U.S. aircraft and parts to Iran, even if Europe maintains a more business-friendly approach to Iran, a top executive told Aviation Daily. "In this case, [the U.S. and Europe] are two opposing forces, but the fact of the matter is we will follow the rules and that means we're going to follow the sanctions and regulations," Airbus Americas CEO Jeffrey Knittel said after President Donald Trump's May 8 announcement that the U.S. would be exiting the nuclear accord with Iran. *(Michael Bruno @ Aviation Daily)*



NASA Looking For Rides To The Moon. With an upcoming solicitation for commercial flight services to the lunar surface, NASA is kicking off a return to the Moon, with instruments and payloads possibly ready to fly as early as next year. We are interested in buying a ticket on a ride that's being provided by industry. We're not telling industry how to do that or what their design needs to be ... We're looking to engage with whoever is going to the Moon," according to David Schurr, deputy director of NASA's Planetary Science Division. *(Irene Klotz @ Aerospace Daily & Defense Report)*

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