

The Aerospace Update

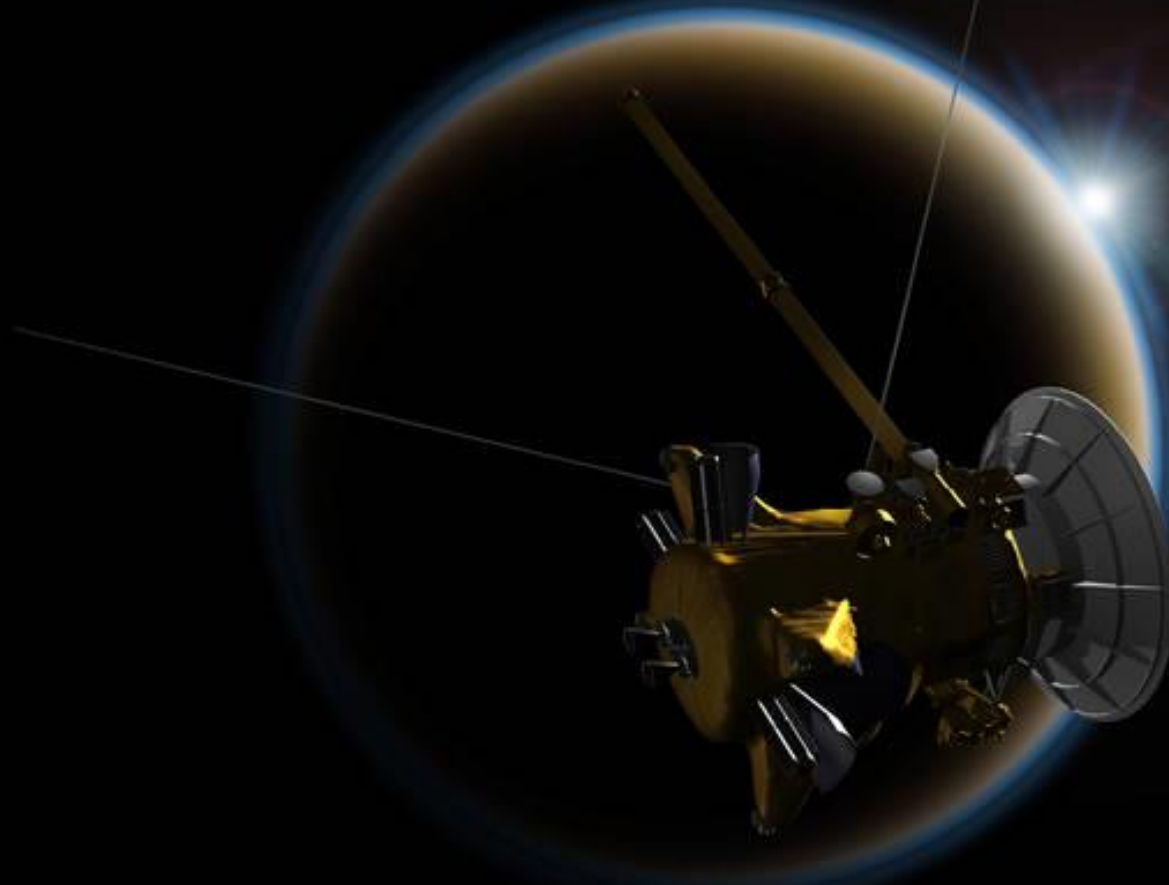


Sept. 12, 2017

Cassini's Grand Finale

Video Credit: NASA/JPL-Caltech

Cassini Spacecraft's Fiery Farewell In Saturn's Atmosphere



After 13 years in orbit around Saturn, NASA's Cassini spacecraft is about to plunge itself into the planet's atmosphere and disintegrate. NASA decided to put an end to the mission on Friday, Sept 15th because the probe is almost out of fuel. Depicted here is Cassini's "Good-Bye Kiss" with Titan on Sept. 11th using Titan's gravitational field to align itself for its final plunge. The back story is that mission managers were worried that without fuel to change its orbit, the probe could crash into one of Saturn's moons sometime in the future. The space agency was loath to let that happen, because it can't be certain that Cassini isn't carrying some hardy microbial spores from Earth. There's good reason to believe that some bacteria could survive 20 years in space.

Source: Joe Palca @ NPR.com

Image Credit: NASA/JPL-Caltech

Cassini's Ringside Seat At Saturn Comes To An End



When NASA's Cassini and the European Space Agency's Huygens spacecraft lifted off aboard a Titan IVB-Centaur rocket 20 years ago, scientists hoped the mission would answer questions raised about Saturn and its entourage of rings and moons by the twin Voyager flybys of the early 1980s. Of particular interest was Saturn's largest moon, Titan, which is about the size of Mercury and the only known moon in the Solar System with a thick atmosphere. Despite vastly different temperatures and environmental conditions—Titan receives only about 1% as much sunlight as Earth—scientists discovered a remarkably Earthlike world with river channels, rounded icy cobbles, lakes, dunes and even rain, a place where hydrological cycles run on methane instead of water. Titan, however, was not Cassini's biggest surprise. With the mission ending on Sept. 15, several scientists say that distinction falls to tiny Enceladus, an ostensibly frozen moon that was not even among Cassini's original top 10 targets but which has emerged as a key contender in the search for life beyond Earth.

Source: Irene Klotz @ Aviation Week & Space Technology

Image Credit: NASA/JPL

Enceladus, Cassini's Biggest Surprise



“We were absolutely shocked to learn that tiny, tiny Enceladus has a global liquid water ocean underneath a relatively thin ice crust that is warmed by hydrothermal activity at the bottom of the ocean, and has jets of the water from that ocean shooting out into space through cracks in the south pole,” says Curt Niebur, Cassini program scientist at NASA headquarters in Washington. “Enceladus may have all the ingredients for life as we know it to currently exist right now, this very second.” Scientists spent nearly a decade piecing together Enceladus’s story, beginning in 2005 with Cassini magnetometer data indicating an atmosphere or an emission coming from the moon. Until then, scientists believed Enceladus, which is about 310 mi. (500 km) in diameter, or about 1/10th the size of Titan, was completely frozen solid.

Source: Irene Klotz @ Aviation Week & Space Technology

SpaceX Launches X-37B Ahead of Hurricane Irma



With Hurricane Irma looming off the Florida coast, SpaceX beat unfavorable weather odds Thursday, Sept. 7th to send the U.S. Air Force's X-37B reusable spaceplane back into orbit for its fifth classified mission. A Falcon 9 carrying the Boeing-built X-37B hidden inside its protective shroud lifted off at 10:00 a.m. Eastern from NASA Kennedy Space Center's Launch Complex 39A. By noon, the Air Force had declared the launch a success. This was the first X-37B launched on board a Falcon 9.

Video Credit: SpaceX

Source: Mike Fabey @ SpaceNews.com

1st Stage Lands at Cape Canaveral



Because this was a classified mission, there was no coverage of the second stage flight and subsequent separation of the X-37B. SpaceX did, however, continue to follow the first stage all the way back to the ground. After the boostback burn, the first stage again pitched around to point its engines toward the direction of travel. Meanwhile, four grid fins on the interstage of the rocket deployed. These fins help steer the booster in while traveling through the atmosphere. Six minutes, 34 seconds after leaving Florida, the first stage performed an entry burn to ease itself back into the atmosphere over Florida. This lasted just under a minute. About a minute later, the center Merlin 1D engine ignited to begin slowing the first stage down just above Landing Zone 1 at Cape Canaveral Air Force Station, just several miles south of where it launched from. Seconds before touchdown, four landing legs deployed to allow for a safe landing, which occurred 8 minutes, 14 seconds after initially taking off.

Video Credit: SpaceX

Source: Derek Richardson @ SpaceFlightInider.com

Proton-M Launches From Baikonur with Amazonas 5 Telecom Satellite

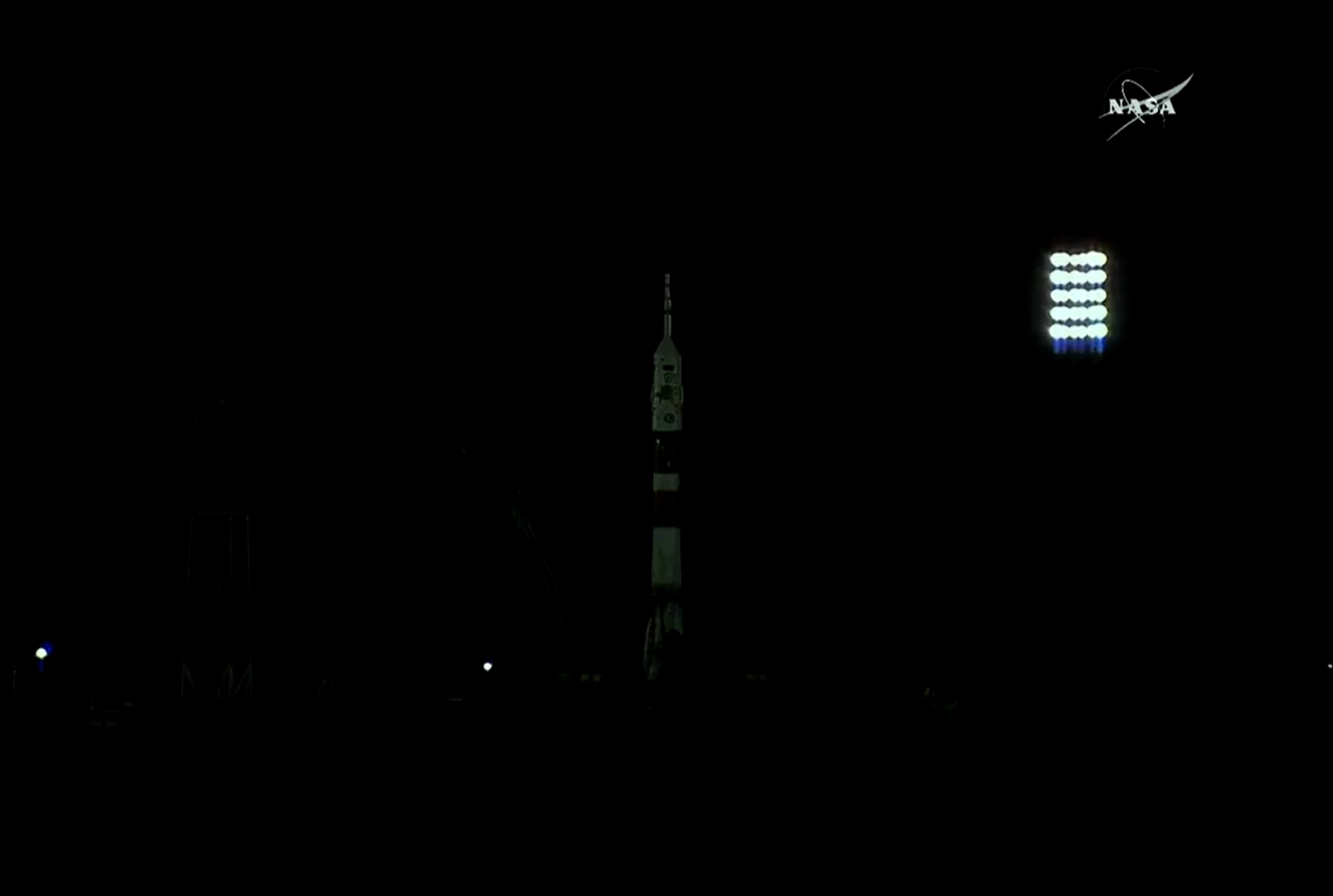


Video Credit: Roscosmos

A Russian Proton rocket hauled a U.S.-built, Spanish-owned communications satellite into orbit Monday, Sept. 11th from the Baikonur Cosmodrome in Kazakhstan, kicking off a 15-year mission to relay video signals and broadband connectivity across a swath of Latin America from Mexico to Patagonia. Amazonas 5, built by Space Systems/Loral in Palo Alto, California, will use its own engine to circularize its orbit nearly 22,300 miles over the equator in the next few weeks. At that altitude, Amazonas 5 will circle Earth at the same rate of the planet's rotation, appearing to hover over a fixed location. Amazonas 5' will broadcast communications services and provide Internet connectivity to Hispasat customers in Brazil and other parts of Latin America. It will also offer 500 new TV channels, including 4K Ultra HD broadcasts, over Central and South America.

Source: Stephen Clark @ SpaceFlightNow.com

Expedition 53 Successfully Launched to ISS



Russian Soyuz commander Alexander Misurkin and two U.S. astronauts — flight engineers Mark Vande Hei and Joe Acaba — lifted off Tuesday, Sept. 12th from the Baikonur Cosmodrome in Kazakhstan. The trio began their six-hour journey to the International Space Station with a launch aboard a Soyuz rocket at 2117 GMT (5:17 p.m. EDT), and docking occurring at 0257 GMT (10:57 p.m. EDT). A miniature model of Sputnik, the world's first artificial satellite, was on board the Soyuz MS-06 spacecraft, serving as the "zero-g indicator" in honor of the 60th anniversary of the launch of Sputnik.

*Video Credit: NASA/ROSCOSMOS
Video courtesy of Space Videos*

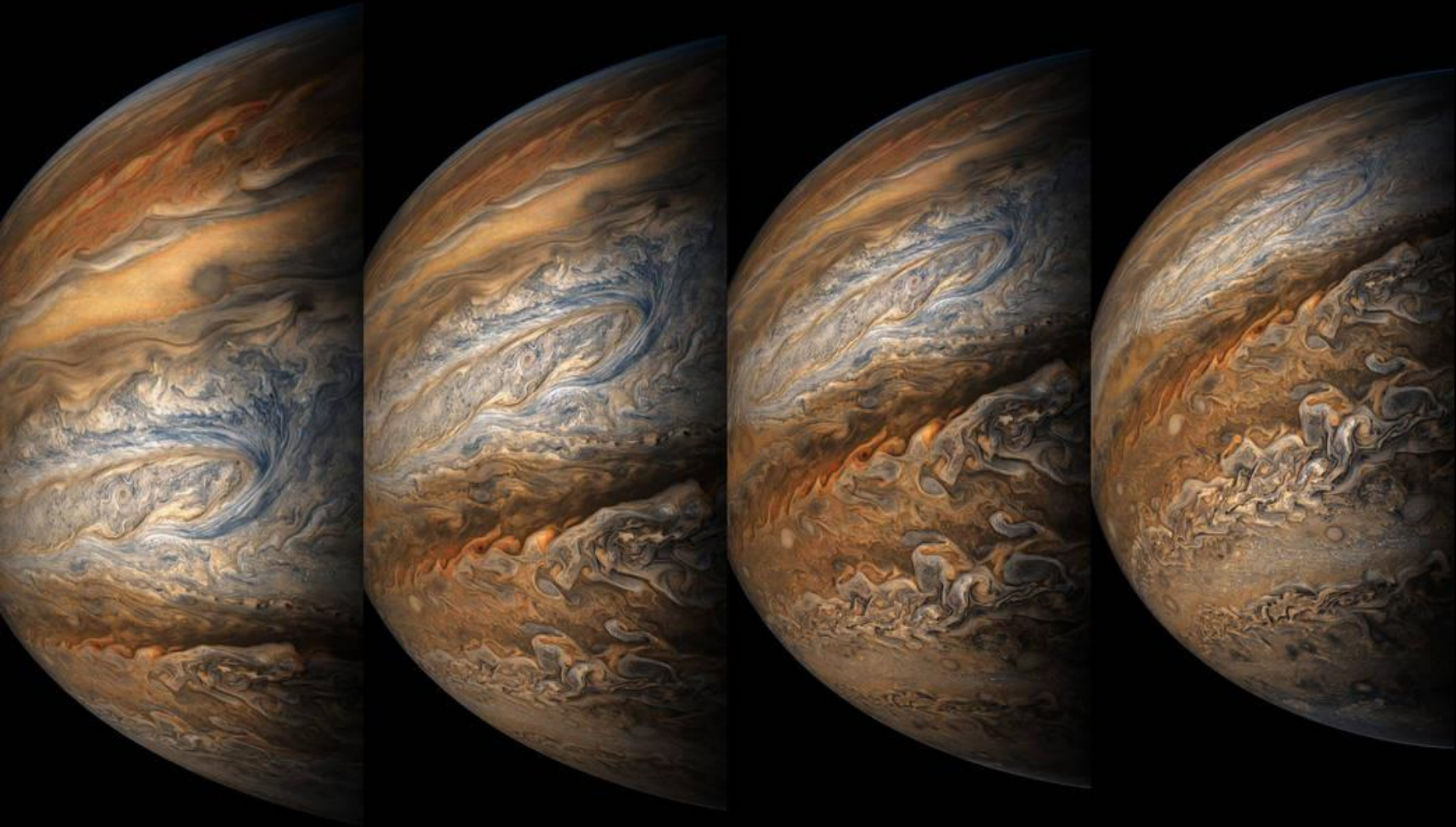
Source: SpaceFlightNow.com

Expedition 53 Crew



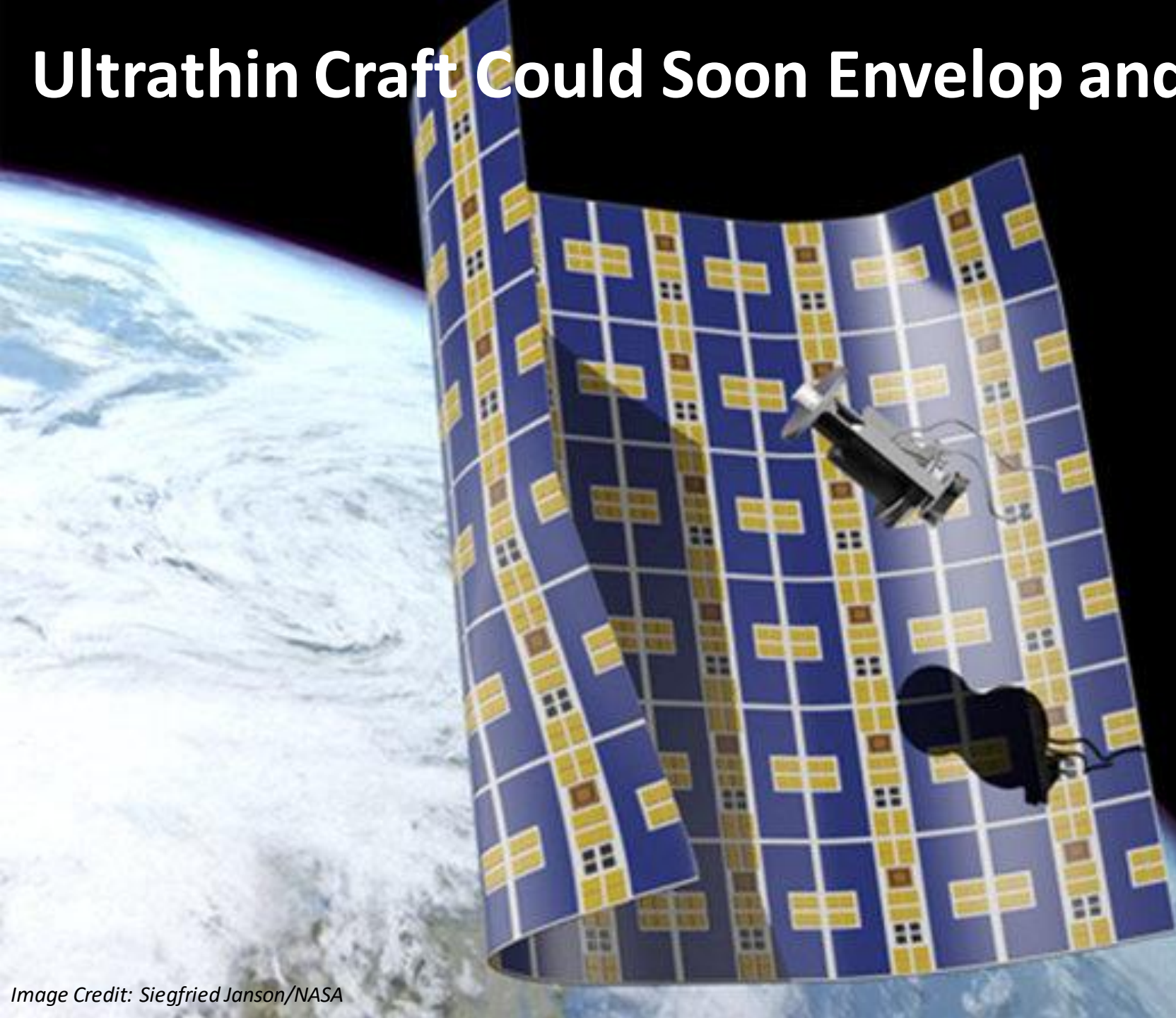
Expedition 53-54 crewmembers are Joe Acaba of NASA (left), Alexander Misurkin of Roscosmos (center) and Mark Vande Hei of NASA (right). Acaba was selected by NASA in 2004 and has logged a total of 138 days in space during two missions. Vande Hei, selected by NASA in 2009, is making his first space flight. Misurkin, appointed a cosmonaut in 2006, is making his second space flight logging 166 days as a member of Expeditions 35, 36.

Juno Completes 8th Scientific Flyby of Jupiter



This series of enhanced-color images shows Jupiter up close and personal, as NASA's Juno spacecraft performed its eighth flyby of the gas giant planet. The images were obtained by JunoCam. From left to right, the sequence of images taken on Sept. 1, 2017 from 3:03 p.m. to 3:11 p.m. PDT (6:03 p.m. to 6:11 p.m. EDT). At the times the images were taken, the spacecraft ranged from 7,545 to 14,234 miles (12,143 to 22,908 kilometers) from the tops of the clouds of the planet at a latitude range of -28.5406 to -44.4912 degrees.

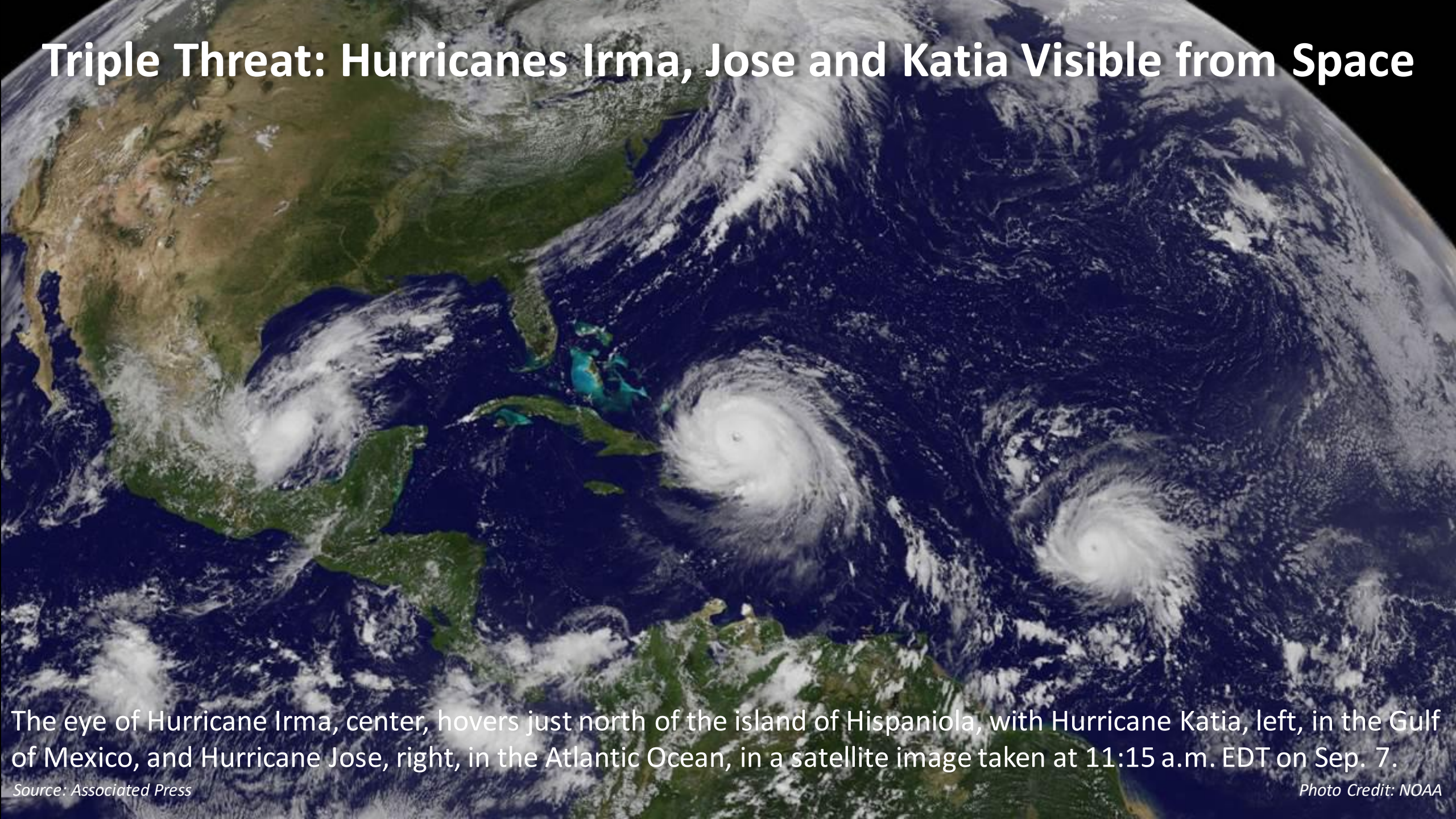
Ultrathin Craft Could Soon Envelop and Destroy Space Junk



Aerospace Corporation says its Brane Craft will wrap itself around debris orbiting Earth and drag it back down through the atmosphere, causing it to burn up and never again threaten satellites or astronauts. The Brane Craft is a yard across, flexible, and less than half the thickness of a human hair. This makes it difficult to protect the spacecraft's electronics from radiation, or even micrometeorites. The spacecraft is designed to be resilient. If one solar cell is whacked by a micrometeorite, only that cell will fail. Same goes for the craft's microprocessor and digital electronics — if one fails, others will keep working. Even the propellant tank, which is sandwiched between two thin sheets, is split into multiple segments. In the case of a micrometeorite strike or an electrical short, other segments are designed to remain operable.

Source: Elizabeth Howell @ Space.com

Triple Threat: Hurricanes Irma, Jose and Katia Visible from Space



The eye of Hurricane Irma, center, hovers just north of the island of Hispaniola, with Hurricane Katia, left, in the Gulf of Mexico, and Hurricane Jose, right, in the Atlantic Ocean, in a satellite image taken at 11:15 a.m. EDT on Sep. 7.

Source: Associated Press

Photo Credit: NOAA

Absolute World Speed Record for Piston Engine Propeller Driven Airplane Set by Steve Hinton Jr.



At a remote location in Central Idaho on a private airport on Saturday 09/02/2017 at 5:30PM Steve Hinton became the fastest pilot on the planet ever in a Piston Engine Propeller Airplane. Four laps over a three-kilometer course at an average speed of 531.53/MPH- the fastest lap was 554/MPH in a highly modified P51 Mustang. Aerodynamic wing modifications by Aviation Partners, Inc. (headquartered in Seattle) played a key role in achieving the absolute world speed record over the 3-kilometer course. Aviation Partners, is known worldwide for its Blended and Split Scimitar Winglets TM, on Business Jets and Commercial Aircraft used highly sophisticated computational fluid dynamics (CFD) methods to redesign the P51's wing surface airfoils and to reduce and eliminate the strong shock waves created at Mach number 0.75 and 0.80. The modification thereby delayed the drag rise Mach number, allowing the P-51 to achieve higher speeds.

In The News



Virgin Galactic Nearing Powered SpaceShipTwo Test Flights. The chief executive of Virgin Galactic said Sept. 7 that the company's second suborbital spaceplane was "at the edge" of beginning powered test flights, after at least one more glide flight. A timetable for beginning commercial flights was not given. *(Jeff Foust @ SpaceNews.com)*



Boeing Re-Inserts Orders for Air Force One Aircraft into Backlog. Boeing confirms that two passenger-carrying 747-8s added to the order backlog a week ago will be delivered to the US Air Force for the Air Force One replacement. The USAF ordered two 747-8s that Boeing previously built for defunct Russian carrier Transaero, which filed for bankruptcy in 2015 before it could take delivery. Boeing finally removed the Transaero orders from the backlog in June. *(Stephen Trimble @ FlightGlobal.com)*



Elon Musk releases image of full SpaceX spacesuit. On Sept. 8, 2017, SpaceX Founder and CEO Elon Musk teased a full body image of the current SpaceX spacesuit concept next to a Crew Dragon capsule. It was the first official image showing the entire front side of the suit. A previous post showed just the helmet and torso, but not the bottom half. *(Paul Knightly @ SpaceFlightInsider.com)*



New Horizons Planning Additional Extended Missions. While still more than a year away from a flyby of a distant object in the solar system's Kuiper Belt, the team running NASA's New Horizons mission is already looking ahead to future extended missions that could include a flyby of an other object in the Kuiper Belt. New Horizons completed its primary mission with the July 2015 flyby of the dwarf planet Pluto. *(Jeff Foust @ SpaceNews.com)*



Biggest rocket in Britain launches from Northumberland. The usual peace and quiet of Northumberland National Park was interrupted after a huge rocket was launched by a space tourism company today. Starchaser Industries, founded by Steve Bennett, fired the eight metre-long Skybolt 2 missile almost a mile into the sky before it broke into three pieces and returned to Earth. Mr Bennett, who set up the company 25 years ago, claims he is just a few years away from launching people to the edge of space and said the tests today will help him achieve that. *(Shivali Best @ DailyMail.com)*