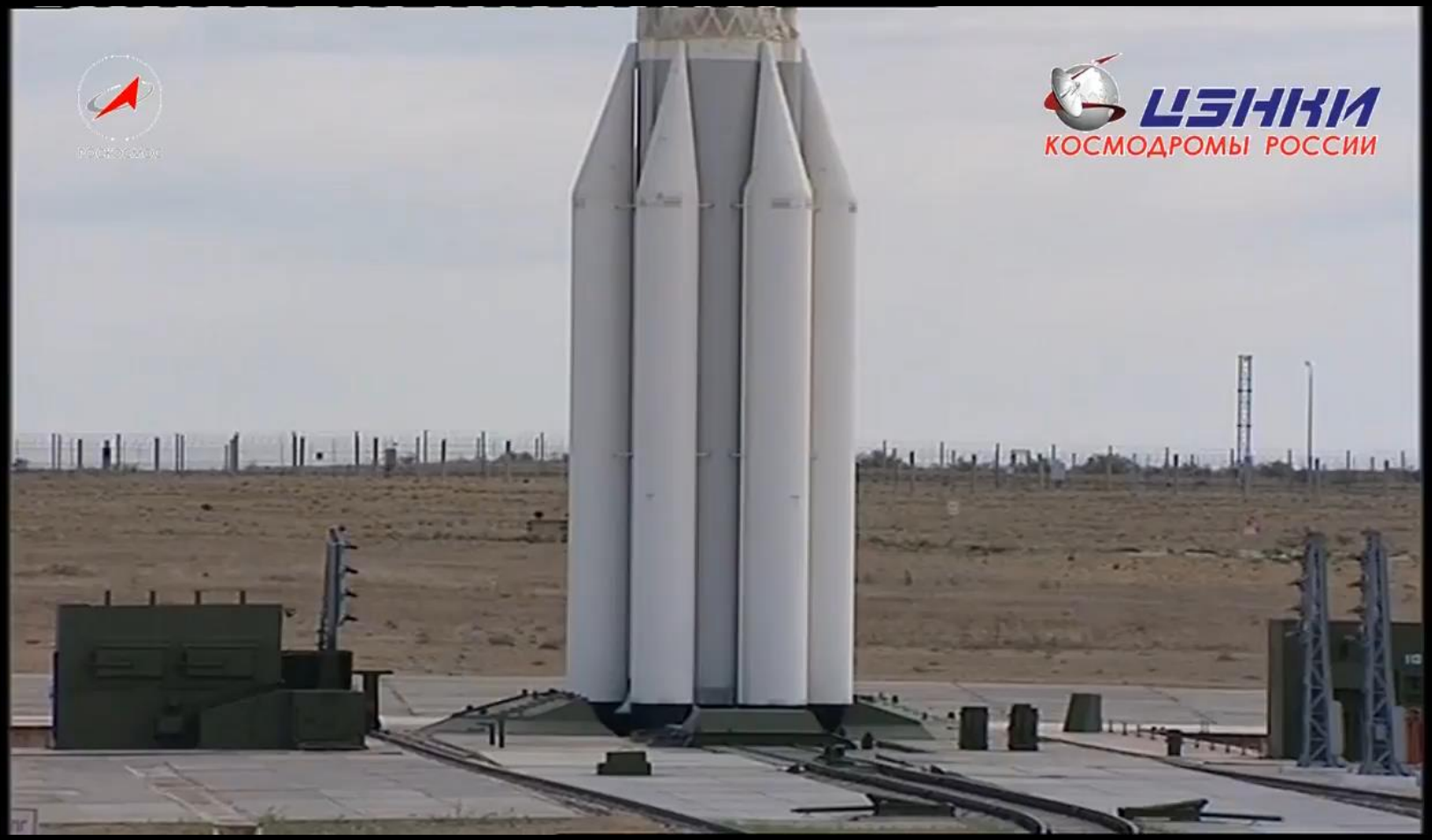
The Aerospace Update

June 13, 2017

Tim Peake's Amazing Photos of Earth from the ISS

Image Credit: Tim Peake/ESA

Proton-M Returns to Flight With Launch of EchoStar 21

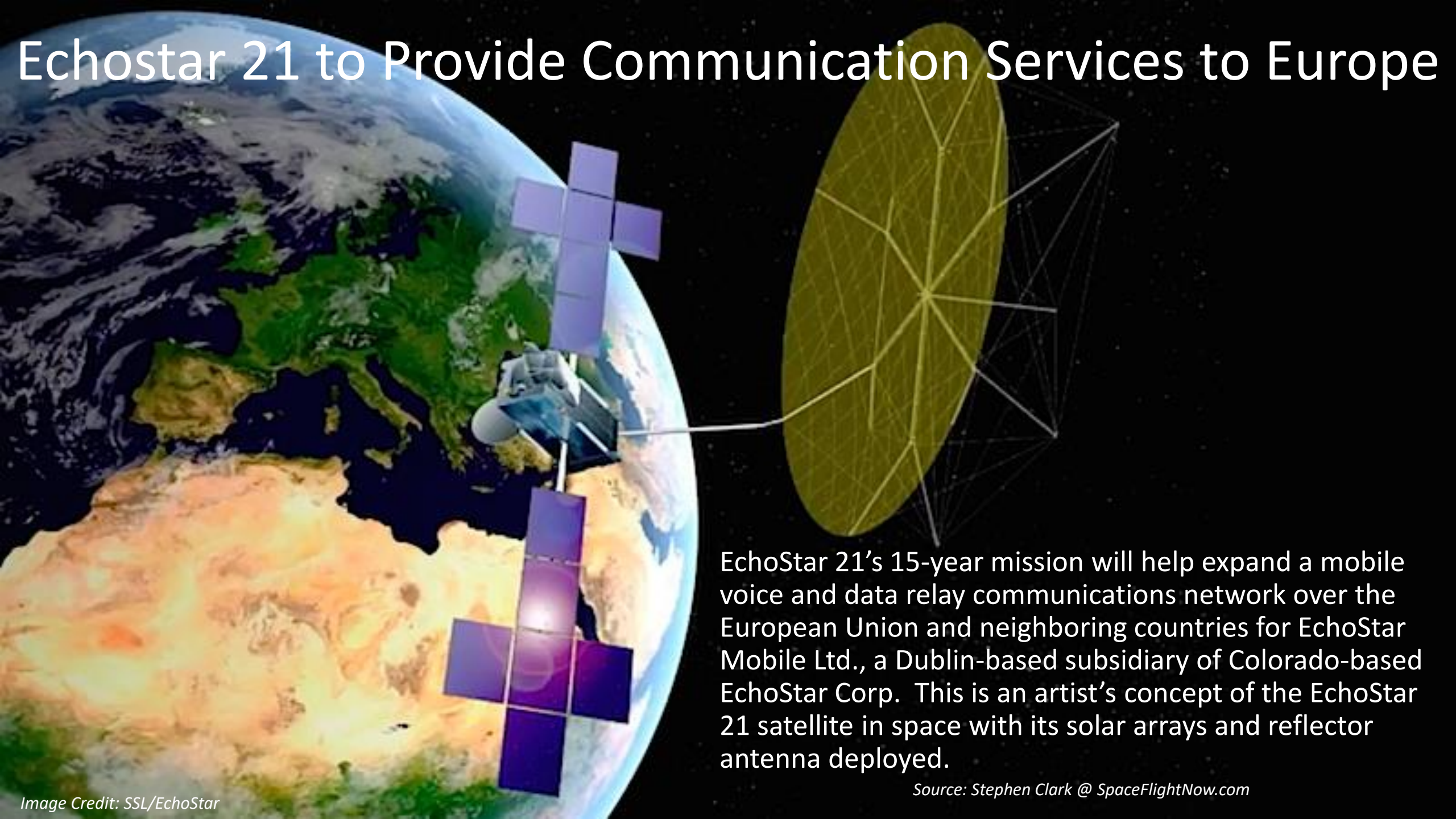


Video Credit: Roscosmos

An EchoStar communications satellite designed to link Europeans with voice and broadband data services rode into orbit on top of a Russian Proton rocket Thursday, June 8th deploying into an on-target orbit after nine hours of maneuvers by the launcher's Breeze M upper stage. Thursday's launch was the first by a Proton rocket since June 9, 2016, when the Intelsat 31/DLA-2 communications satellite launched from the Baikonur Cosmodrome. Russian officials grounded the Proton to study an upper stage engine problem, then the launcher's return to service was delayed several more months due to a recall of Russian rocket engines found to have defects.

Source: Stephen Clark @ SpaceFlightNow.com

Echostar 21 to Provide Communication Services to Europe



EchoStar 21's 15-year mission will help expand a mobile voice and data relay communications network over the European Union and neighboring countries for EchoStar Mobile Ltd., a Dublin-based subsidiary of Colorado-based EchoStar Corp. This is an artist's concept of the EchoStar 21 satellite in space with its solar arrays and reflector antenna deployed.

Source: Stephen Clark @ SpaceFlightNow.com

Image Credit: SSL/EchoStar

NASA's Newest Astronaut Recruits to Conduct Research off the Earth, For the Earth and Deep Space Missions

NASA announced its 2017 Astronaut Candidate Class on June 7, 2017. The 12 candidates, pictured here at NASA's Ellington Field in Houston, are Zena Cardman, U.S. Marine Corps Maj. Jasmin Moghbeli, U.S. Navy Lt. Jonny Kim, U.S. Army Maj. Francisco "Frank" Rubio, U.S. Navy Lt. Cmdr. Matthew Dominick, Warren "Woody" Hoburg, Robb Kulin, U.S. Navy Lt. Kayla Barron, Bob Hines, U.S. Air Force Lt. Col. Raja Chari, Loral O'Hara and Jessica Watkins. The astronaut candidates will return to Johnson in August to begin two years of training. Then they could be assigned to any of a variety of missions, including: performing research on the International Space Station, launching from American soil on spacecraft built by commercial companies, and departing for deep space missions on NASA's new Orion spacecraft and Space Launch System rocket.

Source: NASA.gov

Photo Credit: NASA/Robert Markowitz

New Confirmation of Einstein's General Theory of Relativity

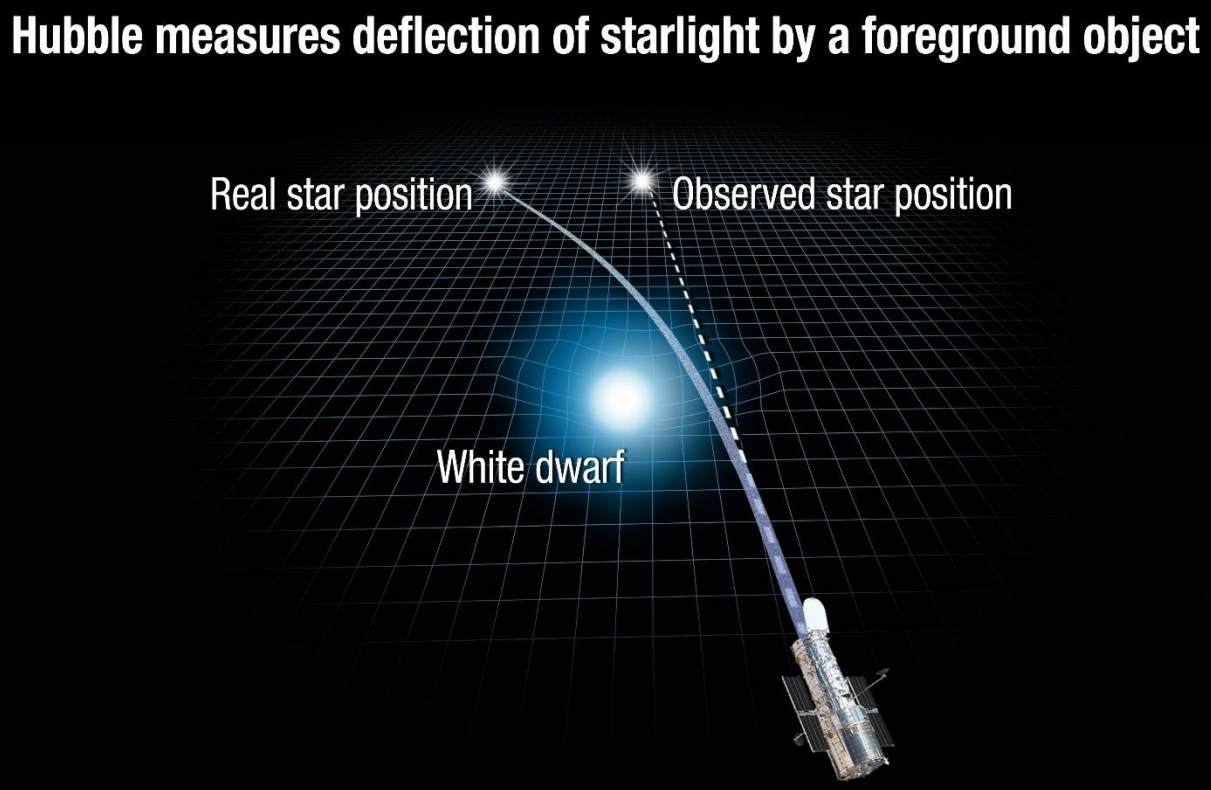
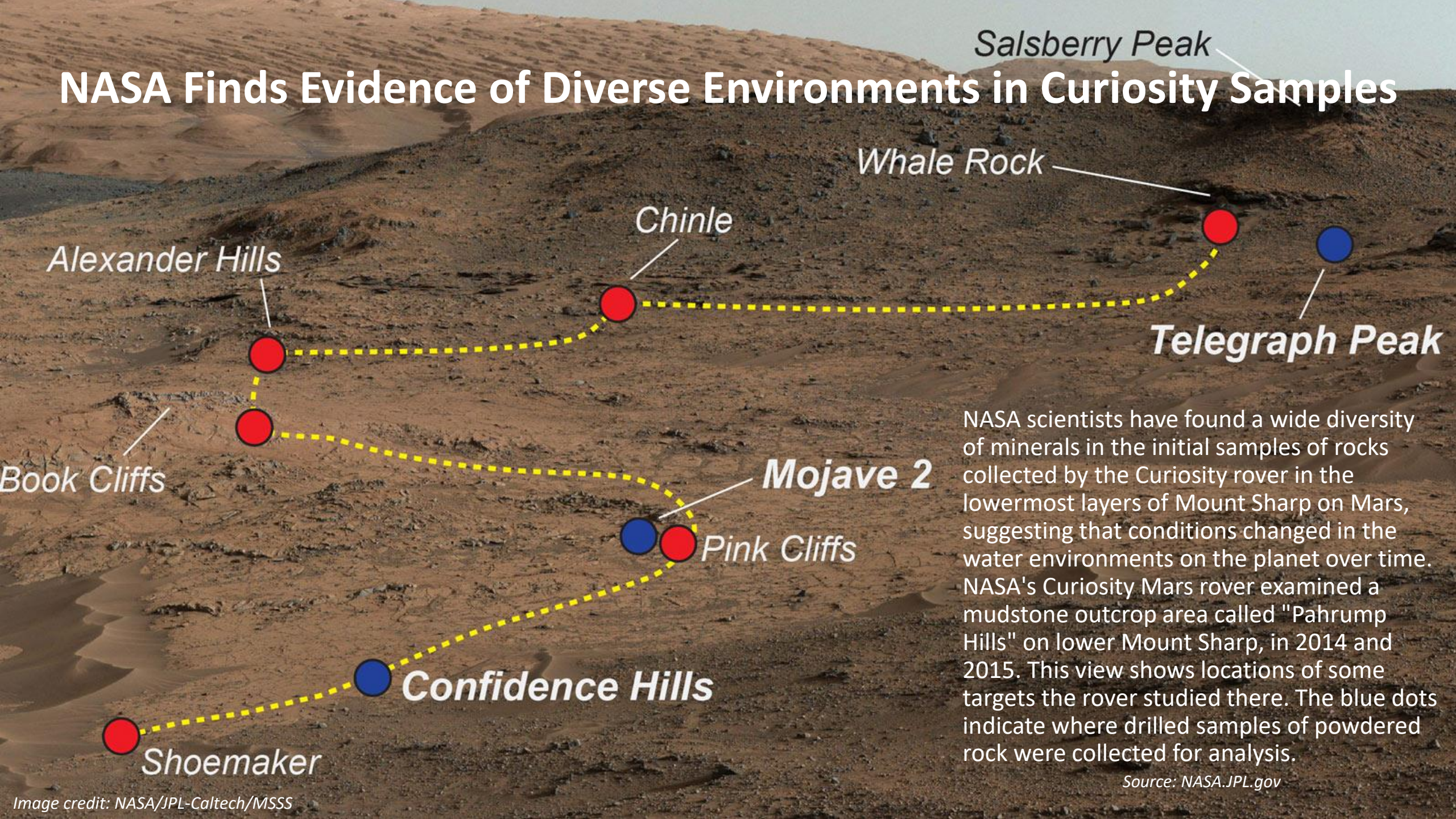


Image Credit: NASA, ESA, and A. Feild (STScI)

Astronomers scanning the skies with NASA's Hubble Space Telescope have pulled off a feat that even Albert Einstein had declared all but impossible: they've witnessed the subtle bending of one star's light by another star's gravity and used that distortion to measure a star's mass. The findings, unveiled Wednesday at a meeting of the American Astronomical Society and published in the journal Science, confirm a key tenet of Einstein's landmark general theory of relativity and introduce a new tool with which to explore a fundamental property of stars.

Source: Amina Khan @ OrlandoSentinel.com

NASA Finds Evidence of Diverse Environments in Curiosity Samples

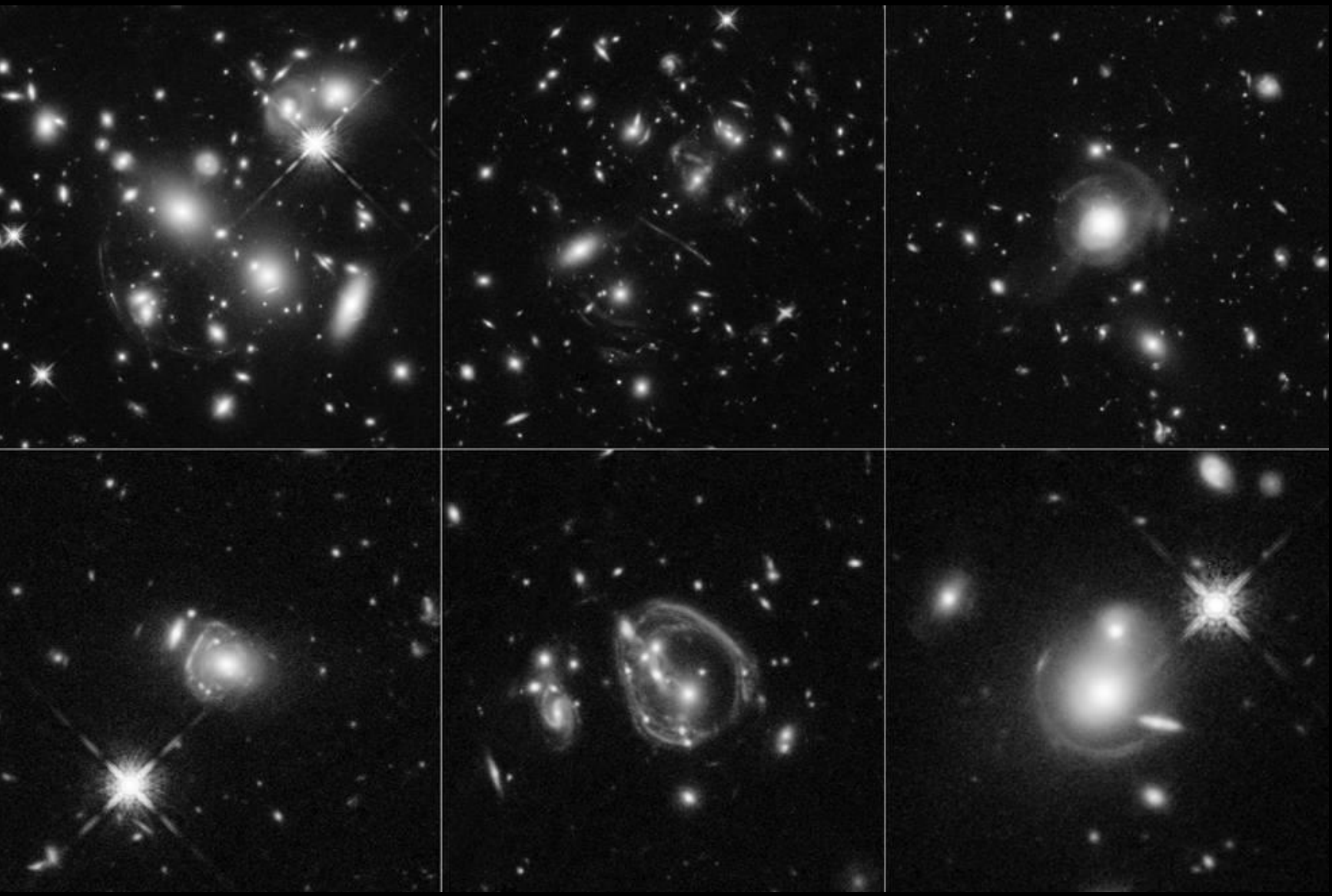


NASA scientists have found a wide diversity of minerals in the initial samples of rocks collected by the Curiosity rover in the lowermost layers of Mount Sharp on Mars, suggesting that conditions changed in the water environments on the planet over time. NASA's Curiosity Mars rover examined a mudstone outcrop area called "Pahrump Hills" on lower Mount Sharp, in 2014 and 2015. This view shows locations of some targets the rover studied there. The blue dots indicate where drilled samples of powdered rock were collected for analysis.

Source: NASA.JPL.gov

Image credit: NASA/JPL-Caltech/MSSS

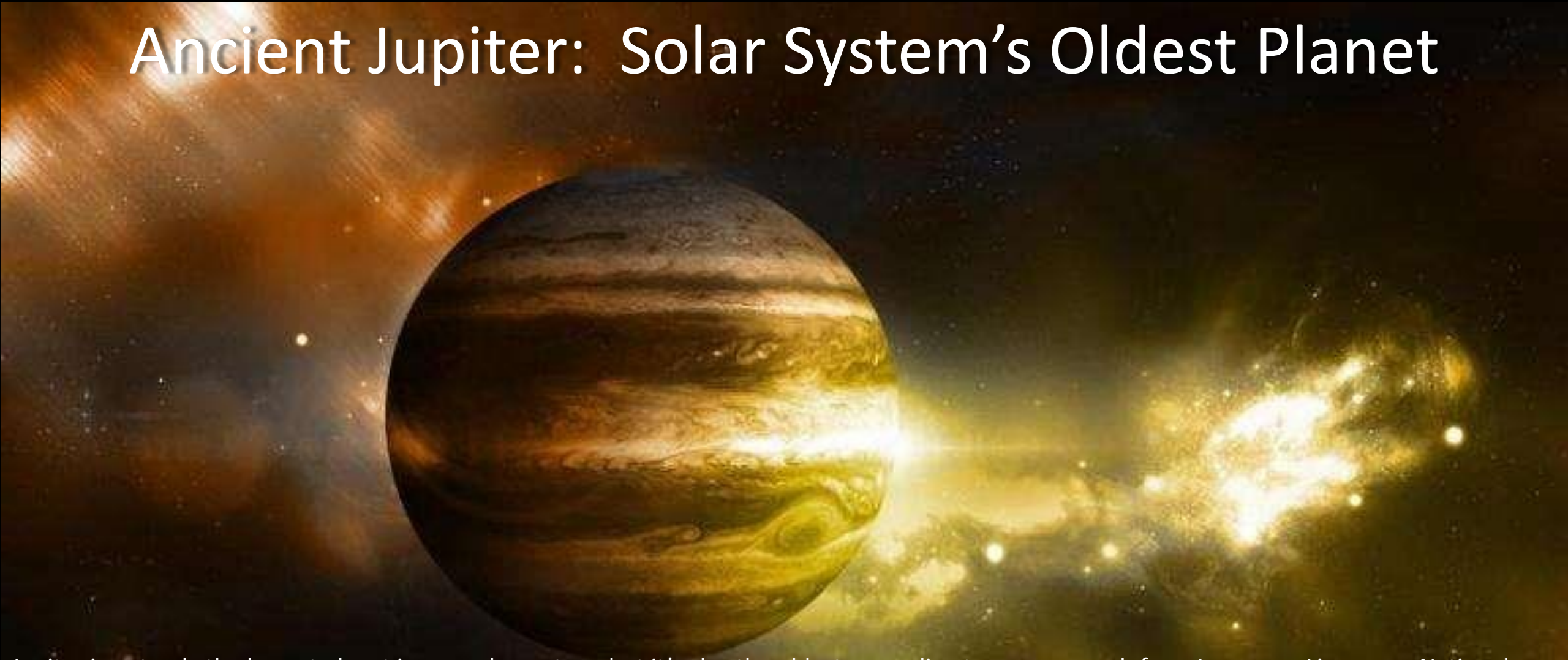
Cosmic Magnifying-Glass Effect Captures Universe's Brightest Galaxies



These six Hubble Space Telescope images reveal a jumble of misshapen-looking galaxies punctuated by exotic patterns such as arcs, streaks, and smeared rings. These unusual features are the stretched shapes of the universe's brightest infrared galaxies that are boosted by natural cosmic magnifying lenses. Some of the oddball shapes also may have been produced by spectacular collisions between distant, massive galaxies. The faraway galaxies are as much as 10,000 times more luminous than our Milky Way. The galaxies existed between 8 billion and 11.5 billion years ago. We have hit the jackpot of gravitational lenses," said lead researcher James Lowenthal of Smith College in Northampton, Massachusetts. "These ultra-luminous, massive, starburst galaxies are very rare. Gravitational lensing magnifies them so that you can see small details that otherwise are unimaginable. We can see features as small as about 100 light-years or less across. We want to understand what's powering these monsters, and gravitational lensing allows us to study them in greater detail."

Source & Image Credits: NASA, ESA, and J. Lowenthal (Smith College)

Ancient Jupiter: Solar System's Oldest Planet



Jupiter is not only the largest planet in our solar system, but it's also the oldest, according to new research from Lawrence Livermore National Laboratory. By looking at tungsten and molybdenum isotopes on iron meteorites, the team, made up of scientists from Lawrence Livermore National Laboratory and Institut für Planetologie at the University of Münsterin Germany, found that meteorites are made up from two genetically distinct nebular reservoirs that coexisted but remained separated between 1 million and 3-4 million years after the solar system formed.. The most plausible mechanism for this efficient separation is the formation of Jupiter, opening a gap in the disc (a plane of gas and dust from stars) and preventing the exchange of material between the two reservoirs.

Source: Phys.org

Image Credit: Lawrence Livermore National Laboratory

Skunk Works Hints At SR-72 Demonstrator Progress

Image Credit: Lockheed Martin

Four years after revealing plans to develop a Mach 6 strike and reconnaissance aircraft, Lockheed Martin says hypersonic technologies are now sufficiently mature to enable progress towards a flight demonstrator. Rob Weiss, Lockheed Martin's executive vice president and general manager for Advanced Development Programs, hints that work on a combined cycle propulsion system and other key advances needed for a viable hypersonic vehicle are reaching readiness levels sufficient for incorporation into some form of demonstrator. Following critical ground demonstrator tests from 2013 through 2017, Lockheed Martin is believed to be on track to begin development of an optionally piloted flight research vehicle (FRV) starting as early as next year. The FRV is expected to be around the same size as an F-22 and powered by a full-scale, combined cycle engine.

Source: Guy Norris @ Aerospace Daily & Defense Report

SpaceX Aims to Restore Damaged Launch Pad to Service by End of Summer

Construction crews at Cape Canaveral's Complex 40 launch pad are busily repairing and upgrading the facility after a SpaceX Falcon 9 rocket exploded there last year, with the pad's return to service scheduled before the end of the summer, clearing the way for final preparations for the triple-core Falcon Heavy's maiden flight late this year. Once pad 40 is ready for launches again, SpaceX will have two active pads in Florida to help the company ramp up its launch rate.

Source & Photo Credits: Stephen Clark @ SpaceFlightNow.com

Boeing Reveals Plan For Autonomous Flight Research

Boeing plans to flight-test an autonomous civil aircraft in the next two years, as part of a broad study aimed at proving whether or not aircraft with reduced crew, single or even no pilot could be operated for passenger and freight missions with the same levels of safely and integrity as current manned aircraft. The study, which Boeing is disclosing for the first time, is already underway at Moses Lake, Washington, with ground tests of a modified vehicle designed to test autonomous taxiing, to be followed soon after by tests of autonomous flight algorithms in a simulator. Initial flight tests of the same artificial intelligence-based system will take place in 2018 using a pair of modified Cessna Caravans believed to have been obtained by Boeing for the program.

Source: Guy Norris @ Aviation Week & Space Technology

Image Credit: Sikorsky

Diesel-powered Cessna Skyhawk Certified in U.S. & Europe

Textron Aviation has received U.S. and European regulatory approval for the Cessna Turbo Skyhawk JT-A. The turbocharged single-piston engine airplane burns Jet-A fuel using a diesel-powered Continental CD-155 engine. The company says the diesel engine lowers per-hour fuel burn by 25 percent. In addition, Textron Aviation identified improved performance measures on the Turbo Skyhawk JT-A over earlier estimates. The airplane's range has increased 78 nautical miles to 963 nautical miles. Its takeoff distance has improved to 1,320 feet with a maximum climb rate of 767 feet per minute.

Source: Jerry Siebenmark @ The Wichita Eagle

Photo Credit: Textron Aviation

12 June 1979 - Gossamer Albatross Flew the Channel

The human-powered airplane, Gossamer Albatross, built by AeroVironment, Inc., of Simi Valley, California, flew across the English Channel from The Warrens, near Folkstone, Kent, England, to Cap Griz-Nez, France 22.26 miles (35.8 kilometers) in 2 hours, 49 minutes. The pilot/powerplant of the Gossamer Albatross was a long distance bicyclist Bryan Lewis Allen. Allen pedaled at a constant 75 revolutions per minute. The aircraft was designed by Paul MacCready, Jr., Ph. D., and weighed just 70 pounds (31.8 kilograms), empty.

Source: www.thisdayinavation

Photo Credit: Don Monroe via Bryan Allen

In The News

SpaceX Will Launch Next Secret X-37 Air Force Mission. The Air Force is preparing to launch its secret X-37B spaceplane aboard a SpaceX Falcon 9 rocket later this year, the service said June 6th. It will be the first time Elon Musk's company will carry the X-37 into orbit, and is possibly the biggest national security launch SpaceX has been responsible for to date. *(Phillip Swarts @ SpaceNews.com)*

Boeing, DARPA to Base XS-1 Spaceplane at Cape Canaveral. A reusable suborbital spaceplane the size of a business jet being developed by Boeing and the Defense Department's research and development arm could be launching and landing at Cape Canaveral in 2020, officials said after the defense contractor won a competition last month to design and test the vehicle. *(Stephen Clark @ SpaceFlightNow.com)*

OA-7 Cygnus Re-enters Earth's Atmosphere After 2-Month Mission. Burning up in a blaze of glory, Orbital ATK's OA-7 Cygnus cargo ship re-entered Earth's atmosphere over the Pacific Ocean on June 11, 2017, ending its nearly two-month-long flight. After separating from the ISS with a load of trash and unneeded equipment on June 4th, Cygnus conducted a fire experiment called SAFFIRE and released two pairs of Lemur-2 CubeSats which will join its larger constellation of ship-tracking and remote sensing satellites. *(Derek Richardson @ SpaceFlightInsider.com)*

Antares to Resume Cygnus Launches Later this Summer. Orbital ATK plans to resume using its Antares rocket instead of ULA's Atlas 5 for launches of the Cygnus cargo spacecraft later this summer, as the company continues to seek additional government and commercial customers for the launch vehicle. That launch will be the second Cygnus mission to use an upgraded version of the Antares rocket, known as the Antares 230. That version uses RD-181 engines from Russian company NPO Energomash in the rocket's first stage, replacing the AJ26 engines from Aerojet Rocketdyne. *(Jeff Foust @ SpaceNews.com)*