

GENTLE.NEWS

In Today's Edition

Science & Discovery

NASA's TESS Mission Finds Planetary System in New Way

Nature & Environment

New high-resolution geophysics in the Outer California Borderland

Health & Wellness

FDA Approves First Gene Therapy for Young Children with Sickle Cell Disease

The World Today

Action! NSF-DOE Vera C. Rubin Observatory Begins Capturing the Greatest Cosmic Movie Ever Made

Animals & Wildlife

NOAA Fisheries Trains for Whale Entanglement Response with New York and New Jersey Partners

Activity Time

Word Search Puzzle

"That it will never come again is what makes life so sweet."

— Emily Dickinson

NASA's TESS Mission Finds Planetary System in New Way

5 Min Read NASA's TESS Mission Finds Planetary System in New Way

This artist's concept visualizes a super-Jupiter orbiting an orange dwarf star at a distance similar to Jupiter's distance from the Sun. Credits: NASA's Goddard Space Flight Center

For the first time, NASA's TESS (Transiting Exoplanet Survey Satellite) mission has identified a planet orbiting a distant star thanks to ripples in space-time. Unlike the star-hugging transiting planets TESS regularly reveals, the newfound world is a super-Jupiter orbiting far from its host star. "When TESS launched, no one expected it to ever be capable of finding this kind of planet," said Diana Dragomir, a professor at the University of New Mexico in Albuquerque and co-author of a paper describing the results. At 1.6 times Jupiter's mass and a similar orbital distance, it would be extremely unlikely to find such a planet via the primary detection method TESS was designed for. "The discovery implies that there are probably other so-called microlensing planets hiding in TESS's data that we hadn't previously thought to look for." This artist's concept visualizes Gaia23bra b, the first microlensing planet orbiting a distant star found by NASA's TESS (Transiting Exoplanet Survey Satellite). This super-Jupiter orbits an orange dwarf star at a distance similar to Jupiter's distance from the Sun. NASA's Goddard Space Flight Center Astronomers found the first hint of the planet, called Gaia23bra b, in 2023 using ESA's (European Space

Agency) now-retired Gaia space telescope. Gaia's alert system flagged a star that brightened — something that can happen when a foreground star passes in front of a more distant one and magnifies its light through gravitational microlensing. Researchers later looked back through archived TESS data and found TESS had caught it too. “Gaia’s observations were too sparse to pick up on the planet,” said Mallory Harris, a Ph.D. candidate at the University of New Mexico, who led the study. “The TESS spacecraft happened to be monitoring the same area of the sky during the event, and its denser time coverage showed extra features in the light curve caused by a planet.” The team’s analysis, published July 1 in *The Astrophysical Journal Letters* , revealed that Gaia23bra b, which orbits an orange dwarf star that’s about 80 percent of the Sun’s mass, is nearly 40,000 light-years away from Earth, far exceeding TESS’s usual search radius of about 150 light-years. Microlensing 101 Out of more than 6,000 known exoplanets (worlds outside our solar system), about three-fourths were discovered via the transit method, TESS’s typical planet-hunting technique. Astronomers monitor hordes of stars, watching for ones that periodically dim as orbiting planets cross in front of them — an event called a transit. This animation illustrates the concept of gravitational microlensing. When one star in the sky (shown in the center of the animation) appears to pass nearly in front of another (located in the dashed circle at the right) from our vantage point, the light rays of the background star become bent due to the warped space-time around the foreground star. This star acts like a virtual magnifying glass, amplifying the brightness of

the background star and causing its position to appear to slightly shift. If the nearer star harbors a planetary system, then those planets can also act as lenses, each one producing a short deviation in the brightness of the source. When astronomers find planets this way, they can measure their mass and orbital distance from their host star. NASA's Goddard Space Flight Center/CI Lab Microlensing has revealed less than 5% of known exoplanets. This light-bending phenomenon occurs when two stars align closely from our vantage point. Light from the more distant star curves as it travels through the warped space-time caused by the nearer star's mass. If the alignment is especially close, the nearer star acts like a cosmic lens, focusing and magnifying light from the background star. Planets orbiting the foreground star may also modify the distant star's light, acting as their own tiny lenses. Astronomers see the effect as a spike in the star's brightness. The transit method is best at finding large planets orbiting very close to their host stars; large planets block the most starlight, while close-in planets are more likely to pass in front of the host star. These gargantuan, steamy worlds are fascinating to scientists, but astronomers want to find planets like those in our solar system, too. That's microlensing's specialty. With microlensing, we can find smaller planets with greater orbital distances, including worlds in the habitable zone of their star and even farther away. Mallory harris Ph.D. candidate at the University of New Mexico Microlensing isn't well suited to finding huge, close-in planets because their gravitational signals would just blur together. "Transits and microlensing are complementary because they each

reveal a category of planet the other may not be able to detect,” Dragomir said. “And they offer different details. Transits give us the size of a planet, and in concert with other methods we can determine its mass and density. Microlensing gives us masses and orbital distances for planets we’d otherwise never see.” This graphic highlights the search areas of three planet-hunting missions: NASA’s upcoming Nancy Grace Roman Space Telescope, the retired Kepler Space Telescope, and NASA’s TESS (Transiting Exoplanet Survey Satellite). While TESS discovers transiting planets within a 150-light-year radius of Earth, it recently detected a planet about 40,000 light-years away (marked by the star symbol) via another method, called microlensing. NASA’s Goddard Space Flight Center But microlensing observations are time-limited opportunities. Microlensing events happen once and they’re gone — they don’t repeat. I like to joke that we’ll probably find the first Earth analog with microlensing, and then wave at it as it goes by because we’ll never see it again. Mallory Harris Ph.D. candidate at the University of New Mexico That makes detailed observations of microlensing planets tough. However, the method can serve as a powerful demographics tool that offers broad information about planetary populations. “This is a bit like a preview of the microlensing NASA’s Nancy Grace Roman Space Telescope will do,” said Michael Fausnaugh, a professor at Texas Tech University in Lubbock and a co-author of the study. On track for launch on August 30, 2026, Roman will observe the center of the Milky Way galaxy for one of its core surveys , revealing an estimated 1,000 microlensing planets and around 100,000 transiting

planets . Roman will specifically target the heart of the galaxy because stars are packed so tightly together there, increasing the odds of seeing microlensing events. While that crowding would make many stars blend together in TESS's larger pixels, TESS looks at nearly the whole sky, where stars are more spread out. "Since TESS looks elsewhere in the galactic plane, it can naturally find microlensing planets in other parts of the galaxy, as demonstrated by this first microlensing planetary system," Dragomir said. "That means it could help us study planets in regions with different conditions." That could have implications for the search for habitable worlds. The bustling galaxy center is rife with radiation from more frequent supernova explosions, which could sterilize planets. And gravitational encounters between crowded stars may disrupt planetary systems. Observations from TESS focus on a milder part of the galaxy. "The key to Roman's microlensing survey is its dense time coverage targeting the galactic bulge," Fausnaugh said. "The TESS mission uniquely provides these rapid observations for stars in other parts of the galaxy, and pairing the two opens up prospects for understanding planet formation in a diverse population of stars. Since microlensing finds solar system-like planets, this offers a new chance to understand how planetary systems like our own vary in different regions of the galaxy." To learn more about the TESS mission, visit: <https://www.nasa.gov/tess> Media contact: Claire Andreoli NASA's Goddard Space Flight Center , Greenbelt, Md. 301-286-1940 About the Author Ashley Balzer Ashley is the lead science writer for NASA's Nancy Grace Roman Space Telescope. Share

Details Last Updated Jul 01, 2026 Editor Ashley Balzer Contact Ashley Balzer ashley.m.balzer@nasa.gov Location Goddard Space Flight Center Related Terms TESS (Transiting Exoplanet Survey Satellite) Exoplanets Goddard Space Flight Center The Universe Explore More 9 min read Citizen Scientists Spot Jupiter-like Planet in NASA TESS Data Article 4 years ago 3 min read NASA's Planet-Hunting TESS Reveals Dazzling Night Sky NASA's TESS has released its most complete view of the starry sky to date Article 2 months ago 7 min read Journey to Center of Milky Way With Upcoming NASA Roman Core Survey At the heart of our own galaxy, there is a dense thicket of stars with... Article 5 months ago 6 min read Why NASA's Roman Mission Will Study Milky Way's Flickering Lights NASA's Nancy Grace Roman Space Telescope will provide one of the deepest-ever views into the... Article 3 years ago 5 min read NASA's TESS Finds Intriguing World Sized Between Earth, Venus Article 2 years ago Keep Exploring Discover More Topics From NASA Missions Humans in Space Climate Change Solar System

New high-resolution geophysics in the Outer California Borderland

New high-resolution geophysics in the Outer California Borderland Data reveal repeated episodes of slope failure and earthquake activity over last 750,000 years By Pacific Coastal and Marine Science Center June 30, 2026 A new study focused on the Cortes Basin, located within the Outer California Borderland offshore of southern California, presents detailed evidence of numerous stacked submarine landslides on and beneath the seafloor. The research provides new insights into how offshore fault systems and changing sea levels have shaped this region. Read the study in JGR Solid Earth To investigate the basin's geologic history, scientists aboard the research vessel Sally Ride, operated by the Scripps Institution of Oceanography, used a hull-mounted sub-bottom profiler to collect new, high-resolution geophysical data that imaged the seafloor and the layers below it. These data revealed multiple landslide deposits stacked atop one another, indicating that slope failures have occurred repeatedly over hundreds of thousands of years. This study found that earthquakes likely triggered most of the identified landslides. Numerous active fault systems capable of generating strong shaking cross Southern California's offshore basins. When earthquakes occur beneath or near steep underwater slopes, the shaking can destabilize sediments and trigger submarine landslides, which may displace large volumes of seawater and generate tsunamis. Sea-level fluctuations also affect sediment delivery to offshore basins.

Over the past 750,000 years, Earth has experienced repeated cycles of glacial and interglacial periods, causing sea levels to rise and fall dramatically. These changes influence how sediment accumulates on the continental margin and can affect the stability of underwater slopes. In addition to being triggered by earthquakes, fluctuations in sea level also helped control when and where landslides occurred, by altering sediment supply and the conditions that made slopes more susceptible to failure.

Implications for Coastal Communities Southern California's coastline is home to millions of people and critical infrastructure, including ports, energy facilities, communication cables, and transportation networks. Understanding the long-term history of offshore earthquakes and submarine landslides can help scientists better evaluate: Tsunami hazards Seafloor instability Risks to offshore infrastructure Potential impacts on coastal communities These findings highlight the importance of continued research into offshore seismic hazards in the Cortes Basin and similar basins along the Southern California coast. Related Science October 15, 2021 Coastal and Marine Geohazards of the U.S. West Coast and Alaska Coastal and marine geohazards are sudden and extreme events beneath the ocean that threaten coastal populations. These underwater hazards include earthquakes, volcanic eruptions, landslides, and tsunamis. The tectonically active west coast of the Americas is prone to such hazards, as it lies along the boundaries of major tectonic plates that make up the Earth's crust—the North American, Caribbean... By Natural Hazards Mission Area , Coastal and Marine Hazards and Resources Program , Pacific Coastal and Marine

Science Center , Santa Cruz Core Scanning Laboratory , Santa Cruz Core Laboratories , Big Sur Landslides , Deep Sea Exploration, Mapping and Characterization , Subduction Zone Science Coastal and Marine Geohazards of the U.S. West Coast and Alaska October 15, 2021 Coastal and Marine Geohazards of the U.S. West Coast and Alaska Coastal and marine geohazards are sudden and extreme events beneath the ocean that threaten coastal populations. These underwater hazards include earthquakes, volcanic eruptions, landslides, and tsunamis. The tectonically active west coast of the Americas is prone to such hazards, as it lies along the boundaries of major tectonic plates that make up the Earth's crust—the North American, Caribbean... Learn More Related Science October 15, 2021 Coastal and Marine Geohazards of the U.S. West Coast and Alaska Coastal and marine geohazards are sudden and extreme events beneath the ocean that threaten coastal populations. These underwater hazards include earthquakes, volcanic eruptions, landslides, and tsunamis. The tectonically active west coast of the Americas is prone to such hazards, as it lies along the boundaries of major tectonic plates that make up the Earth's crust—the North American, Caribbean... By Natural Hazards Mission Area , Coastal and Marine Hazards and Resources Program , Pacific Coastal and Marine Science Center , Santa Cruz Core Scanning Laboratory , Santa Cruz Core Laboratories , Big Sur Landslides , Deep Sea Exploration, Mapping and Characterization , Subduction Zone Science Coastal and Marine Geohazards of the U.S. West Coast and Alaska October 15, 2021 Coastal and Marine Geohazards of the U.S. West Coast and Alaska Coastal and marine

geohazards are sudden and extreme events beneath the ocean that threaten coastal populations. These underwater hazards include earthquakes, volcanic eruptions, landslides, and tsunamis. The tectonically active west coast of the Americas is prone to such hazards, as it lies along the boundaries of major tectonic plates that make up the Earth's crust—the North American, Caribbean... [Learn More](#)

FDA Approves First Gene Therapy for Young Children with Sickle Cell Disease

FDA News Release FDA Approves First Gene Therapy for Young Children with Sickle Cell Disease State-of-the-art gene therapy provides new treatment option for children 2 years and older with life-threatening blood disorder For Immediate Release: July 01, 2026 The U.S. Food and Drug Administration today issued a supplemental approval for Casgevy (exagamglogene autotemcel) for patients aged 2 years and older with either sickle cell disease (SCD) with recurrent vaso-occlusive crises (VOCs) or transfusion-dependent β thalassemia (TDT). This is the first gene therapy approved for patients aged 2 years and older with SCD. Casgevy has been previously approved for the treatment of patients aged 12 years and older with SCD with recurrent VOCs or TDT. “With today’s decision, pediatric patients as young as 2 years of age can now access a critical additional treatment option to treat these debilitating, life-threatening diseases,” said Karim Mikhail, B. Pharm., M.S., Acting Director of the Center for Biologics Evaluation and Research (CBER) . “The FDA is committed to prioritizing and speeding up the review of products that address critical U.S health priorities through expedited review programs, including the FDA Commissioner’s National Priority Voucher (CNPV) Pilot Program. These initiatives are designed to advance therapies for diseases with significant unmet medical needs, enabling faster access to innovative

treatments while upholding the FDA’s rigorous gold-standard requirements for safety and effectiveness.” SCD affects red blood cells (RBCs), which contain hemoglobin, a protein that transports oxygen throughout the body. SCD can cause various symptoms and health issues, including episodes of severe pain called sickle cell crises or VOCs. Thalassemia is a genetic blood disorder that causes the body to have an abnormally low level of hemoglobin, resulting in reduced oxygen delivery to the body’s tissues. In some cases, individuals require regular blood transfusions to maintain adequate levels of functional hemoglobin. Casgevy is a gene therapy consisting of the patient’s own (autologous) hematopoietic (blood) stem cells, administered as a one-time single dose for intravenous infusion. The cells are edited using CRISPR/Cas9, a type of genome editing technology, and then engrafted in the body’s bone marrow. CRISPR/Cas9 can be directed to a specific spot in DNA, where it cuts the genetic material so that DNA can be accurately removed, added, or replaced. In patients with severe SCD, this treatment increases a type of hemoglobin which is called fetal hemoglobin (HbF). This helps prevent RBCs from forming into abnormal sickle shapes and addresses the underlying cause of disease, thereby eliminating VOCs. In patients with TDT, treatment increases HbF levels and total hemoglobin levels, hence eliminating dependence on regular RBC transfusions. Full myeloablative conditioning, a high-intensity preparatory treatment given to patients before they receive a stem cell transplant or gene therapy, is administered prior to treatment with Casgevy. “These disorders carry a heavy burden for

children and their families, affecting growth, development, and long-term health in profound ways,” said Megha Kaushal M.D., MSc, Acting Deputy Director of the Office of Therapeutic Products in CBER and pediatric hematologist . “Grounded in the scientific evidence that earlier treatment reduces the risk of lasting end-organ damage, making this therapy available to younger patients opens a critical window for intervention and gives these children a meaningful chance at a healthier future.” The safety and effectiveness of Casgevy in patients aged 5 years to less than 12 years with SCD were evaluated in a clinical trial which included 11 patients. All eight patients who were evaluable for efficacy achieved the primary efficacy outcome of VF12 (no protocol-defined severe VOCs for at least 12 consecutive months within the first 24 months after infusion with Casgevy). The efficacy and safety of Casgevy in patients 5 years to less than 12 years of age with TDT were evaluated in a trial of 15 patients. Eight of the nine efficacy evaluable patients with TDT achieved transfusion independence for 12 consecutive months, with a median duration of transfusion independence of 20.1 months. Based on product characteristics and clinical study data, extrapolation to the younger pediatric age population was granted to expand the indication to 2 years of age and above for both conditions. The most common adverse reactions were mucositis (inflammation of mucous membranes) and febrile neutropenia (fever associated with low levels of a type of white blood cell called neutrophils) in patients with SCD and in patients with TDT, and decreased appetite in patients with SCD. Additionally, the prescribing information

contains warnings for neutrophil engraftment failure, delayed platelet engraftment, hypersensitivity reactions, and off-target genome editing risk (refers to the possibility that the CRISPR/Cas9 editing process may make unintended edits to parts of the genome other than the intended target site). The approval decision was granted just 53 days after filing and represented the eighth approval selected for the Commissioner's National Priority Voucher (CNPV) pilot program . The FDA granted Casgevy Orphan Drug , regenerative medicine advanced therapy (RMAT) , and Fast Track designations. The FDA granted the approval to Vertex Pharmaceuticals, Incorporated. Media: FDA Request for Comment 202-690-6343 Consumer: 888-INFO-FDA ### Boilerplate The FDA, an agency within the U.S. Department of Health and Human Services, protects the public health by assuring the safety, effectiveness, and security of human and veterinary drugs, vaccines and other biological products for human use, and medical devices. The agency also is responsible for the safety and security of our nation's food supply, cosmetics, dietary supplements, radiation-emitting electronic products, and for regulating tobacco products.

Action! NSF–DOE Vera C. Rubin Observatory Begins Capturing the Greatest Cosmic Movie Ever Made

Action! NSF–DOE Vera C. Rubin Observatory Begins Capturing the Greatest Cosmic Movie Ever Made The 10-year Legacy Survey of Space and Time has officially started, marking the beginning of a new era in astronomy and astrophysics June 30, 2026 enlarge This 1.7-gigapixel image of a field of stars in the constellation Lupus showcases the unprecedented view of the Universe that NSF–DOE Vera C. Rubin Observatory gives us. Equipped with the LSST Camera — the largest digital camera in the world — Rubin combines a wide view of the sky with the ability to detect extremely faint objects. With this capability, Rubin can reveal details of the cosmos across an enormous range of scales, from distant galaxies, to individual stars, to the wispy clouds of dust spread throughout our galaxy. The faint, glowing clouds spread across this image are galactic cirrus: clouds of interstellar gas and dust that can be seen in the foreground of the Milky Way. Rubin's ability to capture scenes like this in unmatched detail will open new windows into the structure of our galaxy and the Universe beyond it. Credit: NSF–DOE Vera C. Rubin Observatory/NOIRLab/SLAC/AURA Editor's note: The following news release was originally issued by NOIRLab. Scientists, engineers, and technicians at the U.S. Department of Energy's Brookhaven National Laboratory played key roles in developing the Rubin Observatory, such as

creating the 3,200 megapixel sensor array for the telescope's camera. To learn more about this sensor array — the largest charge-coupled device array ever built — and the world-leading capabilities at Brookhaven Lab that made this achievement possible, visit Brookhaven's Rubin Observatory website . For additional information on Brookhaven's ongoing contributions to the Rubin Observatory, including analyses of data collected through the Legacy Survey of Space and Time, please contact Stephanie Rucco (srucco@bnl.gov). The wait is over: NSF–DOE Rubin Observatory, funded by the U.S. National Science Foundation and the U.S. Department of Energy's Office of Science, is now capturing the cosmos in unprecedented detail, transforming the way we study the dynamic Universe. From a mountaintop in Chile, under clear dark skies, NSF–DOE Vera C. Rubin Observatory has begun the revolutionary Legacy Survey of Space and Time (LSST). The ten-year survey is Rubin's signature campaign to create the most comprehensive, cinematic record of the Universe in history. Rubin Observatory is a U.S. government facility jointly operated by NSF NOIRLab and DOE's SLAC National Accelerator Laboratory. NOIRLab is managed by the Association of Universities for Research in Astronomy (AURA). Over the next ten years, Rubin will relentlessly observe the entire southern sky every few nights to create an ultra-wide, ultra-high-definition time-lapse record of our Universe. This long-awaited milestone is the culmination of years of effort by thousands of people around the world. It follows the celebratory Rubin First Look event that took place in June 2025, which was followed by final commis-

sioning work, an operational readiness review, and the beginning of the alert stream . Credit: NSF–DOE Vera C. Rubin Observatory/NOIRLab/SLAC/AURA “Today, we begin filming the greatest cosmic movie ever made,” says Brian Stone, performing the duties of the NSF Director. “This moment reflects decades of vision, innovation, and the power of federal investment in science through the U.S. National Science Foundation and the Department of Energy. Every night, NSF–DOE Rubin Observatory will expand the frontiers of knowledge and strengthen America's global leadership in science and innovation.” “With the launch of the ten-year Legacy Survey of Space and Time, NSF–DOE Rubin Observatory is opening a new window on the Universe. It is embarking on a mission that will redefine modern cosmology and astrophysics,” says Darío Gil, Under Secretary for Science at the U.S. Department of Energy. “With its world-class design and tools, Rubin Observatory will capture the dynamic nature of our cosmos and reveal unimagined insights into our Universe’s biggest mysteries, from our own Solar System to the very structure of the Universe. By seeking to understand the enigmatic phenomena of dark energy and dark matter, we are not just observing the stars; we are striving to grasp the fundamental laws that govern our existence.” “It is amazing and humbling to be here at this time and place as we start the Legacy Survey of Space and Time, after more than two decades of incredible work by our dedicated team,” says Bob Blum, Director of Rubin Observatory at NSF NOIRLab. “Rubin Observatory is for everyone; the LSST will change how we do astronomy and astrophysics, allowing researchers

anywhere to participate in cutting-edge science.” “It’s taken 20 years of hard science, engineering, and more to get to the point where we can call ‘action’ as we start rolling on this blockbuster movie of the Universe,” says Phil Marshall, Deputy Director of Rubin Operations for SLAC . “ Millions of alerts in just the last couple of months show that Rubin is up and running as a discovery machine. Now we’re putting it all together. ” “The decision to officially begin the LSST was made after a period of system optimization and a careful operational review of technical readiness, data system performance, and scientific validation,” says Željko Ivezić, Head of LSST. Important factors that played a role in this decision included image quality, effective survey speed, system uptime and reliability, and calibration accuracy. Rubin Observatory’s unique design combines enormous light-collecting power, the ability to move rapidly across the sky, and a wide field of view. Its 3200-megapixel camera — the largest digital camera in the world — is now capturing a new, detailed image approximately every 40 seconds. Operating with this speed and sensitivity, Rubin functions as a unified, well-tuned system capable of catching faint objects and fleeting events with remarkable reliability and consistency every night. Visit rubinobservatory.org to follow the status of the Rubin in real time (and visit the real-time Alert Dashboard). Quotes from Brookhaven Lab contributors “Dozens of scientists, engineers, and skilled technicians at Brookhaven Lab contributed to the Rubin Observatory over the past two decades. Many of them, alongside a new generation, are now eagerly awaiting the chance to analyze the survey images and

make discoveries that will change the face of fundamental physics. For me, it was a once-in-a-lifetime opportunity to participate in designing, fabricating, and testing the core elements of the LSST Camera, the 21 Science Rafts. Each of these ultra-sensitive imaging modules we assembled capture 17 times as many pixels, and hundreds of times more colors, than a 4K monitor can display. The jaw-dropping images that have been released thus far confirm my sense that our work was well worth the effort.” – Paul O’Connor, senior scientist, Instrumentation Division “I’m grateful to the team at Brookhaven who developed the LSST Camera’s sensor array, as well as the rest of the collaboration who built the camera and telescope. After years of preparing to extract information from this amazing hardware, I’m excited to explore its full potential for science.” — Erin Sheldon, physicist, Physics Department Rubin is bringing the Universe to life, illuminating a treasure trove of discoveries: pulsating stars, supernova explosions, the fossil record of galaxies, clues to the mysteries of dark energy and dark matter, and entirely new phenomena we’ve never seen before. Some cosmic processes unfold slowly, unpredictably, or incredibly rarely, which is why a ten-year survey is essential. By returning to each point in the sky about 800 times over a decade, Rubin data is providing the scientific community with deep, time-rich views needed to uncover subtle events, capture moving objects, and study the accelerating expansion of the Universe. Not only is Rubin helping to unlock the mysteries of the distant Universe, it is also the most powerful Solar System discovery machine ever built. By taking about a thousand

images every night, Rubin is compiling an astonishingly detailed census of our Solar System, including millions of asteroids and comets. In just a month and a half, during early optimization surveys, Rubin discovered over 11,000 never-before-seen asteroids , including 33 near-Earth objects and 380 trans-Neptunian objects [1] . Rubin will also advance opportunities for multi-messenger astronomy , which is the study of cosmic events using multiple signals such as light, gravitational waves, and cosmic rays. The observatory's rapid, color-rich observations of transients such as stellar explosions, actively feeding black holes, and collisions between compact objects will guide telescopes around the world to follow up on these fleeting events. Each night, Rubin is collecting approximately ten terabytes of data and producing as many as seven million alerts of changes in the night sky. These alerts stream to alert brokers — automated systems that sort and classify these changes so scientists can act quickly. When the LSST is complete, the final dataset will contain billions of objects with trillions of measurements, all accessible through regular data releases. This is the first time so much astronomical data will be available to so many people, opening the door to new kinds of discovery by both scientists and the public. Rubin invites anyone in the world to engage with its data and explore the dynamic Universe in ways never before possible. Notes [1] One of the newly discovered asteroids is the fastest-spinning asteroid larger than 500 meters (0.3 miles) ever found, and it resides in the main asteroid belt. More information NSF–DOE Vera C. Rubin Observatory, funded by the U.S. National Science Foundation and the U.S. Department

of Energy's Office of Science, is a groundbreaking new astronomy and astrophysics observatory on Cerro Pachón in Chile. It is named after astronomer Vera Rubin, who provided the first convincing evidence for the existence of dark matter. Using the largest camera ever built, Rubin will repeatedly scan the sky for 10 years to create an ultra-wide, ultra-high-definition, time-lapse record of our Universe. NSF-DOE Vera C. Rubin Observatory is a joint initiative of the U.S. National Science Foundation (NSF) and the U.S. Department of Energy's Office of Science (DOE/SC). Its primary mission is to carry out the Legacy Survey of Space and Time, providing an unprecedented data set for scientific research supported by both agencies. Rubin is operated jointly by NSF NOIRLab and SLAC National Accelerator Laboratory. NSF NOIRLab is managed by the Association of Universities for Research in Astronomy (AURA) and SLAC is operated by Stanford University for the DOE. France provides key support to the construction and operations of Rubin Observatory through contributions from CNRS / IN2P3 . The Science and Technology Facilities Council supports the wide range of UK contributions to Rubin operations provided through the LSST:UK Science Centre programme. Rubin Observatory is privileged to conduct research in Chile and gratefully acknowledges additional contributions from more than 40 international organizations and teams. The U.S. National Science Foundation (NSF) is an independent federal agency created by Congress in 1950 to promote the progress of science. NSF supports basic research and people to create knowledge that transforms the future. The DOE's

Office of Science is the single largest supporter of basic research in the physical sciences in the United States and is working to address some of the most pressing challenges of our time. NSF NOIRLab , the U.S. National Science Foundation center for ground-based optical-infrared astronomy, operates the International Gemini Observatory (a facility of NSF , NRC–Canada , ANID–Chile , MCTIC–Brazil , MINCyT–Argentina , and KASI–Republic of Korea), NSF Kitt Peak National Observatory (KPNO), NSF Cerro Tololo Inter-American Observatory (CTIO), the Community Science and Data Center (CSDC), and NSF–DOE Vera C. Rubin Observatory (in cooperation with DOE ’s SLAC National Accelerator Laboratory). It is managed by the Association of Universities for Research in Astronomy (AURA) under a cooperative agreement with NSF and is headquartered in Tucson, Arizona. The scientific community is honored to have the opportunity to conduct astronomical research on I’oligam Du’ag (Kitt Peak) in Arizona, on Maunakea in Hawai‘i, and on Cerro Tololo and Cerro Pachón in Chile. We recognize and acknowledge the very significant cultural role and reverence of I’oligam Du’ag to the Tohono O’odham Nation, and Maunakea to the Kanaka Maoli (Native Hawaiians) community. SLAC National Accelerator Laboratory explores how the Universe works at the biggest, smallest and fastest scales and invents powerful tools used by researchers around the globe. As world leaders in ultrafast science and bold explorers of the physics of the Universe, we forge new ground in understanding our origins and building a healthier and more sustainable future. Our discovery and innovation help

develop new materials and chemical processes and open unprecedented views of the cosmos and life's most delicate machinery. Building on more than 60 years of visionary research, we help shape the future by advancing areas such as quantum technology, scientific computing and the development of next-generation accelerators. SLAC is operated by Stanford University for the U.S. Department of Energy's Office of Science . Forty-three international teams outside the U.S. and Chile are contributing to Rubin Observatory and LSST Science through the In-kind Program , in exchange for LSST data rights. These contributions are recognized in the International Data Rights Holder list, which includes all individuals nominated by their respective international programs. Links Press release on rubinobservatory.org Press release from SLAC Vera C. Rubin Observatory website Vera C. Rubin Observatory image gallery More Rubin images More Rubin videos Check out other NOIRLab Organization Releases Contacts Bob Blum Director for Operations NSF-DOE Vera C. Rubin Observatory/NSF NOIRLab Email: bob.blum@noirlab.edu Phil Marshall Deputy Director of Operations SLAC National Accelerator Laboratory Email: pjm@slac.stanford.edu Lars Lindberg Christensen Head of Communications, Education & Engagement NSF NOIRLab Email: lars.christensen@noirlab.edu Manuel Gnida Head of External Communications SLAC National Accelerator Laboratory Email: mgnida@slac.stanford.edu Tags: cosmology high energy physics instrumentation LSST physics 2026-23016 | INT/EXT | Newsroom

NOAA Fisheries Trains for Whale Entanglement Response with New York and New Jersey Partners

Entanglement of large whales in fishing gear and marine debris is a significant threat to recovering whale populations. In the Greater Atlantic region, an average of 26 large whale entanglements were reported each year between 2007 and 2025. This accounts for more than a third of the average of 73 reported nationwide. While some whales are successfully disentangled by trained responders, preventing entanglement is our first priority. To improve rapid reporting and potential responses to large whale entanglement cases, NOAA Fisheries staff recently led a large whale disentanglement workshop at the James J. Howard Marine Sciences Laboratory in Sandy Hook, New Jersey. The area has become a hotspot for juvenile humpback whale sightings. "This workshop demonstrates NOAA Fisheries' commitment to protected species. The Howard Lab at Sandy Hook was an ideal place to bring partners from the New York/New Jersey area together because of our location in the mid-Atlantic Bight and the recent increase in humpback whale activity in the area," explained Jim Vasslides , director of the Howard Lab. Howard Marine Science Lab Hosts Disentanglement Workshop The workshop, held on May 19, gathered 26 participants representing 12 federal, state, and non-profit agencies from across the New York and New Jersey metro area. David Morin, the Greater Atlantic Regional Fisheries Office's Large Whale Disentangle-

ment Coordinator, and Ainsley Smith, Marine Mammal Stranding Coordinator, led the group through the basics of documenting and reporting an entangled whale. Attendees familiarized themselves with the unique tools used to disentangle a whale. They reviewed case studies in which local agencies assisted trained specialists from the national marine mammal entanglement response networks during an entanglement response. The national marine mammal entanglement response networks safely and effectively respond to reports of entangled marine mammals and provide response coverage in all coastal states. For example, in July 2020, authorized responders successfully disentangled a humpback whale . It had been anchored in place by thousands of pounds of fishing gear in a busy shipping channel into the Port of New York and New Jersey. Attendees spanned a robust network of regional collaborators, including: U.S. Coast Guard Station Sandy Hook, Sector Delaware Bay, Station Manasquan Inlet and Station Barnegat Light New York State Department of Environmental Conservation Law Enforcement officers New York Police Department Emergency Services Unit New Jersey Division of Fish and Wildlife Law Enforcement officers Gateway National Recreation Area National Park Service rangers The Marine Mammal Stranding Center Marine Academy of Science and Technology Disentanglement Drills Provide On-the-Water Experience On May 20, trained and authorized NOAA Fisheries staff practiced on-water entanglement response drills. They worked closely with New Jersey Division of Fish and Wildlife Law Enforcement officers, who trailed a mock entanglement behind their

vessel. To keep authorized responders ready for an event, we conduct training to practice skills. One drill includes throwing a specialized grapple—a metal tool with a working line attached—into gear that is entangling a whale. Responders can use that working line to apply buoys, creating drag. This is a technique modified from whaling times, known as “kegging,” which slows down the whale and allows responders to work on removing gear. Responders also practiced maneuvering a small boat called a zodiac around trailing gear. These drills help responders follow NOAA’s best practices . All entanglement responses conducted in the United States are authorized under NOAA’s Marine Mammal Health and Stranding Response Program (Permit #24359). What to Do If You See an Entangled Whale Only experienced, trained, knowledgeable people with proper support and equipment—working under NOAA Fisheries permit—may respond to entangled whales. Reporting an entangled whale quickly is essential because even some entangled whales can travel miles within a few minutes. To report a live, entangled whale between Maine and Virginia, call NOAA’s 24-hour stranding hotline at (866) 755-6622 or hail the U.S. Coast Guard on Channel 16. Whale entanglements are complex and dangerous for the responders, as well as for the animal. NOAA and trained responders assess each case individually. Each report may contain valuable clues on the whales’ health, the configuration of the entanglement, and how rescue teams can best assist the whale while remaining safe.

Activity Time - Word Search

Find the words below in the puzzle. Words go across or down only.

Words to Find:

