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Front Page News

Red spider nebula photo taken by Webb

by Monika Luabeya, NASA edited by Gaby Clark, reviewed by Andrew Zinin Editors' notes
Credit: ESA/Webb, NASA & CSA, J. H. Kastner (Rochester Institute of Technology)

Using its Near-InfraRed Camera (NIRCam), NASA's James Webb Space Telescope captured never-before-seen details of the Red Spider Nebula, a planetary nebula, in this image released on Oct. 26, 2025.

NIRCam is Webb's primary near-infrared imager, providing high-resolution imaging and spectroscopy for a wide variety of investigations.

Webb's new view of the Red Spider Nebula reveals for the first time the full extent of the nebula's outstretched lobes, which form the "legs" of the spider. These lobes, shown in blue, are traced by light emitted from H₂ molecules, which contain two hydrogen atoms bonded together.

Stretching over the entirety of NIRCam's field of view, these lobes are shown to be closed, bubble-like structures that each extend about 3 light-years. Outflowing gas from the center of the nebula has inflated these massive bubbles over thousands of years.

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Telescope in Chile captures stunning new picture of a cosmic butterfly

by Marcia Dunn edited by Andrew Zinin

This image provided by NSF NOIRLab shows NGC 6302, a billowing planetary nebula that resembles a cosmic butterfly.

Credit: NSF NOIRLab via AP

A telescope in Chile has captured a stunning new picture of a grand and graceful cosmic butterfly.

The National Science Foundation's NoIRLab released the picture Wednesday.

Snapped last month by the Gemini South telescope, the aptly

named Butterfly Nebula is 2,500 to 3,800 light-years away in the constellation Scorpius. A single light-year is 6 trillion miles.

At the heart of this bipolar nebula is a white dwarf star that cast aside its outer layers of gas long ago. The discarded gas forms the butterflylike wings billowing from the aging star, whose heat causes the gas to glow.

Schoolchildren in Chile chose this astronomical target to celebrate 25 years of operation by the International Gemini Observatory.



Dec. 1, 2020: The Arecibo telescope collapses

Today in the history of astronomy, the storied observatory succumbs to structural failures.

By Elisa Neckar |

The largest radio telescope in the world for most of its life, the Arecibo Telescope lies in pieces after its platform came crashing down into its dish. Credit: Michelle Negron, National Science Foundation

On Dec. 1, 2020, the Arecibo telescope collapsed. The Puerto Rico facility had already suffered two cable failures – one in August and one in November – and engineers had predicted that the



increased load would be too much for the remaining cables. The National Science Foundation announced on Nov. 19, 2020, that, as the telescope could not be safely repaired, a “controlled decommissioning” would be carried out. Before that could happen, though, wires in the remaining cables began to break, and the 900-ton suspended receiving platform crashed into the dish below it. It was a devastating end for a groundbreaking telescope that had been one of the most powerful instruments on Earth for nearly six decades.

A 2024 report by the National Academies of Sciences, Engineering, and Medicine indicated that structural stress from Hurricane Maria contributed to the collapse, but also that signs of imminent cable failure were missed or ignored but engineers and inspectors.

Nov. 30, 1954: The first known human injury via a meteorite



By Elisa Neckar | Published: November 30, 2025

The meteorite that struck Ann Hodges is on display in the Alabama Museum of Natural History. Credit: Kai NeSmith, CC BY 4.0, via Wikimedia Commons

On Nov. 30, 1954, Ann Hodges was napping on the couch in the living room of her Sylacauga, Alabama, home. At 2:46 p.m., an 8.5-pound (3.85 kilograms) rock crashed through her roof, bounced off a console radio, and hit her hip, leaving a large bruise. The rock – which was at

first turned over to the Air Force and then the Smithsonian – was actually a chondrite meteorite, made up of iron and nickel. While Hodges didn’t suffer any lasting physical effects, she became an overnight celebrity – the first known person to be injured by a falling meteorite and survive.

It was an uncomfortable situation for the very private Hodges: She became entangled in a court case with her landlord over ownership of the meteorite, and in 1964, she and her husband divorced in part due to the stress the incident had put on their relationship. In 1956, ready to be done with the meteorite and the disruption it had brought to her life, Hodges donated it to the Alabama Museum of Natural History, where it is still on display.

NASA’s scramble to find a backup moon plan

A suggestion made last week by acting NASA administrator Sean Duffy that SpaceX could be booted from the agency’s upcoming moon-landing plans has rocked the space industry.

Now, behind the scenes, pitches for alternate paths to the lunar surface are quietly starting to take shape.

SpaceX currently has a \$2.9 billion contract to prepare its gargantuan Starship rocket system to ferry astronauts to the moon’s surface as part of NASA’s Artemis III mission. However, citing delays in Starship’s development and competitive pressure from China, NASA asked SpaceX and Blue Origin — which holds a separate lunar lander contract with the space agency — to submit plans to expedite development of their respective spacecraft by October 29. Both companies have responded.

But the space agency is also asking the broader commercial space industry to detail how they might get the job done more quickly, hinting that NASA leadership is prepared to sideline its current partners. Artemis III is currently slated to happen as early as mid-2027, and NASA has signaled that the current pace of Starship development is threatening to push that target months or years into the future.

Astronomers Spot a White Dwarf That's Still Consuming its Planets

When the Sun reaches the end of its main sequence, approximately 5 billion years from now, it will enter what is known as its Red Giant Branch (RGB) phase, during which it will expand and potentially consume Mercury, Venus, and possibly Earth. Not long after, it will undergo gravitational collapse and blow off its outer layers, leaving behind a dense remnant known as a white dwarf.

While this is how planet Earth will eventually meet its

end, it will not mark the end of the Solar System, as the white dwarf remnant of our Sun surrounded by clouds of trace elements.

Such is the nature of the Universe, where the only constant is change and nothing goes to waste. Nevertheless, an international team of astronomers was surprised when they were studying an ancient white dwarf that was actively accreting material from its former planetary system. Using the W. M. Keck Observatory on Maunakea in Hawaii, the team obtained spectroscopic evidence of 13 chemical elements commonly associated with rocky bodies. This discovery challenges our current understanding of the late stages of stellar evolution.



The Future of Propellantless Space Travel



For over a century, rocket propulsion has followed a simple principle; burn fuel, expel it backward, and Newton's third law pushes you forward. Since Konstantin Tsiolkovsky first formulated the rocket equation in 1903, spacecraft have carried their propellant with them, limiting mission capabilities by the mass ratios. The more fuel you carry, the heavier your rocket becomes, requiring even more fuel to lift that fuel, in a vicious cycle that makes interstellar travel seem impossibly distant. But what if spacecraft didn't need to carry propellant at all? That's the tantalising possibility explored in a comprehensive new review examining propellantless propulsion methods for space exploration. These systems tap into natural forces and external energy sources rather than chemical combustion, potentially enabling missions that would be completely impossible with conventional rockets.

The simplest propellantless technique has been flying spacecraft for decades, the gravity assist. By carefully timing a close approach to a planet, engineers can steal a tiny fraction of that world's orbital momentum, flinging the spacecraft to higher speeds without burning fuel. The Voyager probes used this manoeuvre to visit all four outer planets. The technique works brilliantly, but you need planets in

exactly the right positions, making mission opportunities rare and trajectories inflexible.

Solar sails offer more continuous and convenient propulsion by harnessing radiation pressure from sunlight. These enormous membranes reflect photons to generate thrust, accelerating slowly but persistently without fuel. Japan's IKAROS probe demonstrated the technology in 2010, successfully traveling to Venus on sunlight alone. However, solar sails require vast, gossamer thin materials that must survive harsh space conditions for years, and their performance drops dramatically with distance from the Sun.

Magnetic sails take a different approach, using superconducting loops to generate powerful magnetic fields that deflect the solar wind, the stream of charged particles constantly flowing from the Sun. By pushing against this plasma, magnetic sails create thrust without consuming propellant. They potentially offer better acceleration than solar sails and wouldn't degrade over time like reflective membranes. The catch? Creating the necessary magnetic field requires enormous superconducting coils, potentially 50 kilometres in radius, maintained at cryogenic temperatures. The technology to build and deploy such structures simply doesn't exist yet.

Why an interstellar comet has scientists excited

An ancient comet that entered our solar system this summer is offering a rare opportunity to learn more about distant planetary systems far beyond the reach of any spacecraft, researchers say.

The comet is special both because it is interstellar — meaning it came from outside our solar system — and also because nickel vapor was detected in the gas surrounding the comet.

This comet, called 3I/ATLAS, is only the third such interstellar object to enter our solar system in recorded history. Observing such a rare occurrence is "extremely valuable for us," because it's the only opportunity to look at this object before it moves out of our solar system, said Darryl Z. Seligman, an assistant professor of physics and astronomy at Michigan State University, who is coordinating international teams of scientists that are observing 3I/ATLAS.



NASA Photo of Comet ATLAS

Monthly Club Calendar of Events

STEM Nights

School	Date	City	Volunteers
White Pine Elementary	November 11, 2025	Richmond	Randy Jost & Dell Vance
North Park Elementary	January 22, 2026	North Park	Clark Salisbury & Randy Jost
Wellsville Elementary	January 28, 2026	Wellsville	Bruce Horrocks & Dell Vance
Canyon Elementary	February 5, 2026	Hyrum	Randy Jost & Dell Vance
Sunrise Elementary	March 24, 2026	Smithfield	Randy Jost & Dell Vance

Recent Deep Sky observations
by Blaine Dickey



Comet C/2025 A6 (Lemmon) has not disappointed. This comet orbits the sun in 1335 years. I first observed it in September in the morning sky. In October it moved from the morning sky to the northwestern evening sky and brightened to naked eye visibility. A pair of binoculars was all that was needed to see this celestial wanderer. The above image was taken on the evening of October 18, around 8:10 pm in the northwestern sky. It will be observable until November 10 at which time it will move too low in the southwestern sky to see easily. Moonlight will also begin to interfere in early November and it will become more difficult to observe.



As if one comet wasn't enough another comet **C/2025 R2 (SWAN)** recently appeared in the southwestern sky. It is not as bright as comet Lemmon, but has a very noticeable green color as seen in the accompanying photo. This comet orbits the sun every 670 years. In November it can be observed high in the southeast all the way into December when it will grow become quite dim.



The next object **NGC 7635** is a deep-sky cloud I have been wanting to image because of the interesting bubble shape that is obvious in the image. Thus it is named the Bubble Nebula. The bubble is about 10 light years in diameter and about 11,000 light years distant. A centralized hot young massive star is pushing out a strong stellar wind forcing the material into a bubble shape.

plan for those rare nights when the clouds magically disappear.



Finally an exquisite gas cloud SH2-142 known also as the Wizard Nebula in the Constellation Cepheus is brightened by a young star cluster NGC 7380 that lies within it. The accompanying image was taken with my SeeStar S-50 with an exposure time of 40 minutes.

Many other objects are just waiting for one to see and capture this fall and winter. During these seasons the darkness falls much earlier so it's pretty easy to get enough sleep as well as get in some celestial observing. Cloudiness also increases in the fall and winter months so there are not as many nights available to observe. Having more time between observing sessions allows one to better



Heart Nebula - Bruce Horrocks 150mm with ZWO 2600MC camera



Orion's Shoulder – Bruce Horrocks – Redcat 51 and ZWO 2600MC camera.

What's up in the night sky: November 2025

Welcome to our night sky monthly feature, where we focus on easy and fun things to see in the night sky, mostly with just your eyes. This month: planets throughout the month, and a mostly mediocre, sometimes great, meteor shower with a good publicist.

All month: Yellowish Saturn is up in the east in the early evening, moving west and setting in the wee hours of the morning.

All month: Very bright Jupiter rises in the late evening in the east, and is high overhead before dawn.

Early in the month: Super bright Venus is very low in the predawn east, but still visible early in the month if you have a clear view of the eastern horizon.

Nov. 1, 2025 night sky snapshot You might be able to see super bright Venus shortly before dawn if you have a clear view to the eastern horizon.

Nov. 2: The Moon is near yellowish Saturn

Nov. 5: Full Moon. This will be the biggest so-called [supermoon](#) of 2025. The Moon will appear about 8 percent bigger and 16 percent brighter than an average full Moon. The Moon's brightness and size in the sky vary from one full Moon to the next because the Moon's orbit is not totally circular, so the Moon appears bigger when it is in the closer part of its orbit.

Nov. 10: The Moon is near very bright Jupiter.

Nov. 10, 2025 night sky snapshot In the middle of the night east and high overhead before dawn, the Moon is near very bright Jupiter as well as the 'twin' stars of Gemini: Pollux and Castor.

Nov. 14, 2025 night sky snapshot In the early to mid-evening, look high overhead for the constellation Pegasus (the Flying Horse), including the Great Square of Pegasus. You'll need a very clear view to the western horizon. (Pasadena, California. Latitude: about 34 degrees north.

Nov. 17-18: The Leonids meteor shower peaks. Though it tends to get a lot of publicity, this shower is usually pretty mediocre with 10 to 15 meteors per hour from a dark site. Once in a while, when Earth passes through a dense part of the debris left by Comet 55P/Tempel-Tuttle, this shower can produce hundreds of meteors per hour. Next predicted meteor storm like that is 2099 — bummer. But 2031 and 2064 may reach 100 meteors per hour, or there is always the possibility we'll be surprised even this year. But if you're going to meteor watch once during the next couple of months, make it the Geminids in mid-December.

Nov. 20: New Moon

Nov. 29: The Moon is somewhat near Saturn.



Comet Lemmon - Bruce Horrocks



Saturn's Rings (Almost) Disappear

It takes Saturn roughly 30 years to orbit the Sun, and for much of that time, the planet's rings are clearly visible. However, every 15 years or so, when the Earth crosses Saturn's orbital plane, the rings appear edge-on to us, and for a brief time they disappear.

The ring plane crossing itself actually occurred on March 23rd, but the planet appeared too close to the Sun in the sky at that time. Thanks to the Earth's orbital inclination, the gap has been closing again, and on November 23rd, we'll get the next best thing - the rings won't quite be edge-on, but they'll appear so narrow that they'll all but disappear, with only larger amateur scopes being able to detect them.

Image Credit: ESA/HUBBLE, CC BY 4.0/WIKIMEDIA

OUR NEAREST NEIGHBORS

Mercury appears in both the evening and morning sky this month. It's briefly visible in the evening sky until the 10th at about 15 minutes after sunset, very low towards the west-southwest. If you have binoculars, try looking for faint **Mars**, which appears five degrees to Mercury's right. **Saturn & Neptune** remain visible for much of the night, separated by four degrees, with the waxing gibbous Moon appearing to the right of Saturn on the 1st and 29th. **Uranus** is at opposition on the 21st (see below) while **Jupiter** is observable after midnight, close to Castor and Pollux in Gemini. A waning gibbous Moon appears between Pollux and Jupiter in the early hours of the 10th. **Venus** is low over the east-southeastern horizon at about 30 minutes before dawn at the start of the month. Spica, the brightest star in Virgo, appears to its right at that time, and a thin crescent Moon to its upper right on the 18th. Step outside at around 15 minutes before sunrise on the 24th and 25th, and you might also see dim Mercury, just 1.5 degrees to the left of Venus. Lastly, there's a Full Beaver **Moon** in Aries on the 5th, and the Moon turns new on the 20th.

Uranus at Opposition: Uranus reaches opposition on the 21st and is at its best for the year. 10x50 binoculars will show the planet as a starlike point, within the same field of view as the Pleiades star cluster. A telescope and a magnification of ~100x will show the planet as a tiny, aquamarine disc.

The Leonid Meteor Shower: Step outside on the evening of the 16th or the early hours of the 17th, and you might see a shooting star or two. You could see up to 15 meteors an hour under ideal conditions - but the waning crescent Moon won't be causing any interference.

Messier 33 - The Triangulum Galaxy: While being a little tricky for visual observers, M33 is a treat for astrophotographers. Through binoculars, it appears as a faint, oval patch of light, but you'll need a large telescope to see anything of its spiral arms.

The Double Cluster: The Double Cluster can be glimpsed with the naked eye under dark skies and provides an attractive view through binoculars. Telescopically, you'll need a magnification of around 70x or less to fit them both within the same field of view.

The Leonid Meteor Shower



Source: Luo Hongyang

STELLAR CONCEPTS

Retrograde & Prograde Motion: As confusing as it sounds, sometimes a planet will appear to move backwards through the sky. This is due to the orbital motions of the Earth and planets: a planet appears to have backwards (retrograde) motion across the sky as it passes, or is passed by, the Earth. Mercury will be retrograde for about 3 weeks, Venus for about 6 weeks, and the outer planets will each be retrograde for several months at a time. When the planet is moving normally (ie, forwards) across the sky, this is called prograde motion.

MEMBERSHIP APPLICATION FORM

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How did you learn about CVAS?

_____ Website _____ Star Party _____ CVAS Member _____ Other _____

Membership: \$20 lifetime membership

Tell us about yourself: Do you have a special interest in astronomy? Do you have special skills? Are you willing to volunteer on CVAS projects or attend public outreach star parties? Astro equipment owned.

By signing this application, I acknowledge I have access to the CVAS website, cvas-utahskies.org , and the CVAS constitution. I agree to abide by the constitution.

Signature: _____ Date: _____

Bring this form to the meeting or contact **Dell Vance, Membership Coordinator** at avteam.dell@gmail.com.