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“The Southern Cross”

The Hermanus Astronomy Centre’s Monthly Newsletter

October 2026

MONTHLY MEETINGS

At the monthly meeting held on TUESDAY 15TH our guest speaker **Leyya Stockenstroom** presented, “**THE UNIVERSE BEYOND WHAT THE EYE CAN SEE: ASTRONOMY ACROSS THE ELECTROMAGNETIC SPECTRUM.**”

Our eyes only see a tiny fraction of the light that fills the cosmos. Discover how astronomers use telescopes sensitive to different wavelengths to reveal features of the Universe. From cold clouds of hydrogen gas in radio waves to exploding stars in gamma-rays, this talk highlighted how we use light across different wavelengths to create a complete picture of the cosmos.

Follow the link below to access the full presentation.

The YouTube link: <https://www.youtube.com/watch?v=UGTju954yjA&t=2215s>

At our next meeting, scheduled for October, **Pieter Kotzé** will present, “**SPACE TELESCOPES: UNIQUE WINDOW TO THE SECRETS OF THE UNIVERSE**”. Space telescopes are astronomical observatories placed in outer space to view distant planets, stars, and galaxies without interference from Earth's atmosphere. This presentation will discuss some of the most important space telescopes contributing new knowledge to our understanding of the universe.

SPECIAL INTEREST GROUP ACTIVITIES

Cosmology

At the cosmology meeting held **1st September** ‘Brian Greene’ discussed, “**WHY IT'S IMPOSSIBLE FOR TIME TO HAVE A BEGINNING**”. What came before the Big Bang? Can time itself have a starting point — or does that question even make sense? In this mind-bending exploration, world-renowned theoretical physicist Brian Greene challenges one of the deepest assumptions in all of science: that time had a beginning.

See below for the links to the video and discussion:

The YouTube link: <https://youtu.be/xENJclsMazc>

The discussion link: <https://youtu.be/NNTapGxfrDc>

Our next cosmology meeting will be on **6th October** and will feature episode 39 from, The History of the Universe, “**WHERE IS EVERYTHING IN THE UNIVERSE GOING?**”. This episode explores how our galaxy is being pulled toward the Great Attractor, a hidden gravitational force. This examination of cosmic motion highlights the restless nature of the universe and upcoming galactic collisions.

For further information regarding the Cosmology Group, contact Derek Duckitt – derek.duckitt@gmail.com

Study Group

On **29th September** we watched a discussion from the World Science Festival, presented by Brian Greene and Edvard Moser, Nobel laureate and director of the Kavli Institute for Systems Neuroscience. “**HOW DOES THE BRAIN KNOW WHERE YOU ARE?**”

How does your brain know where you are, even in the dark? Brian Greene speaks with Edvard Moser, Nobel laureate and director of the Kavli Institute for Systems Neuroscience, about the discovery of grid cells, the brain's internal coordinate system for space. Moser explains how these cells fire in a precise hexagonal pattern that mathematically forms a torus, and why this internal map exists before an animal ever learns to use it. They trace the story from the discovery of place cells in the 1970s through evidence that the same system appears in flies, bats, and humans, and explore why Moser believes our sense of space itself may be a construct the brain imposes on the world. The conversation closes on what this internal mapping system reveals about memory, Alzheimer's disease, and the far edges of artificial intelligence.

YouTube link: <https://youtu.be/DB5YEPnyQA8>

The discussion link: <https://youtu.be/5pOclYeCknc>

The topic for the study group scheduled for **27th October** will be announced at a later date.

For further information regarding the Study Group, contact Peter Harvey petermh@hermanus.co.za

Observing.

Optimal dates for **Oct 2026**:

SUGGESTED EVENING OBSERVATION WINDOWS

(Lunar observations notwithstanding)

<i>Moonless windows</i>			<i>Astronomical night</i>
October 1 to	<i>Rises</i>	23h18 (72%)	20h10 - 05h25
October 13	<i>Sets</i>	22h01 (9%)	

Moonwatch: A few days either side of **First Quarter** (18th Oct).

Refer to Peter Harvey’s excellent “Skynotes” for a summary of Astronomical Phenomenon forecast for the month.

Outreach.

Two successful image capturing sessions were conducted by the newly received Seestar S30 Pro: First of all, capturing images of the Sun (with a few Sunspots visible) and secondly observing and photographing the Lunar 'X' & 'V' at 19:30 of the First Quarter Moon on 18th September.



Demonstration of the Seestar S30 pro smart telescope to Learners from the Lukhanyo Primary School – Hermanus. Above left: Sun spot observation. Below left and above: Observation of the Lunar 'X' and 'V' 18-Sept-2026.

As further acknowledgement of the enthusiasm and dedication of the Lukhanyo Science Club members, it was decided to also include the LSC members in the Global Meteor Network Outreach Project even though this project was developed for use by secondary school learners. With this in mind, the weekly after-school sessions are kept as simple as possible with frequent recapping. The combination of the GMNOP and the Seestar S30 Pro is provided a lot of interest stimulation to the learners.

ASSA

From Tim Cooper

The link to the latest Comet, Asteroid and Meteor Section:

<https://assa.sao.ac.za/wp-content/uploads/sites/23/2026/09/ASSA-CAMnotes-2026-Number-4.pdf>

MNASSA

The Monthly Notes of the Astronomical Society of Southern Africa are available on:

<http://www.mnassa.org.za/>

ASSA Shallow Deep Sky Bulletin

The latest Shallow and Deep Sky Bulletin by the ASSA Director, Colin Steyn, is now available for download from <https://assa.sao.ac.za/publications/deep-sky>

Compiled by Pieter Kotzé

September Astronomy Picture

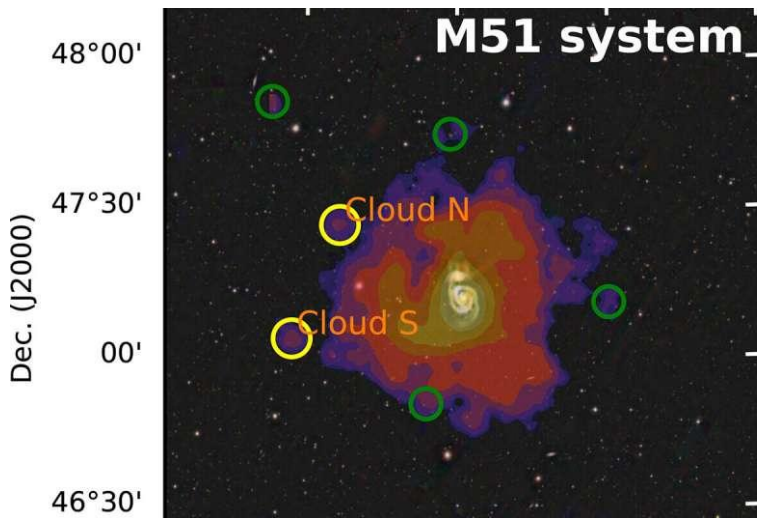


Credit: X-ray: NASA/CXC/GSFC/B. J. Williams et al.; Optical: NASA/ESA/STScI

A Disruptive Influence

[Supernovae explosions](#) occur in the deep vacuum of space, but not, so to speak, in a vacuum. Although even the densest clouds in space have fewer atoms on average per cubic centimeter than even the [best vacuum chambers that can be built on earth](#), these nebulae are large and can contain enormous amounts of matter, enough to form dozens of stars, sometimes hundreds or more. The blast wave from a star that explodes within this medium bulldozes its way into it, pushing the surrounding gas outwards from the center of the explosion. A good example is the supernova remnant, SNR 0519-69.0 (SNR 0519 for short), pictured above, a supernova which occurred in the [Large Magellanic Cloud](#). SNR 0519 is the remnant of the [explosion of a white dwarf star](#). This type of supernova occurs when a white dwarf accretes so much matter from a normal companion star that the white dwarf can no longer sustain itself, suddenly collapses, and ignites a thermonuclear fireball with the power of a small galaxy of stars. The image above shows a composite of optical imaging from the [Hubble Space Telescope](#) (in cyan and red) along with X-ray imaging from the [Chandra X-ray Observatory](#) (in green, blue and purple). The brightness of the X-ray emission around the remnant allows scientists to determine the overall variation in density around the explosion. Measurements suggest that density around the exploded star varies by about a factor of 10, and the faintest regions of X-ray brightness correspond to the regions with the lowest density, and vice-versa. Furthermore, comparison of images obtained over a decade or so allows scientists to study the motion of the blast wave in X-ray and optical light, and show that the fastest parts of the blast wave move at more than 10 million miles per hour. These images thus allow scientists to reconstruct how the blast from the explosion disrupts and interacts with the pre-existing material around the exploded white dwarf.

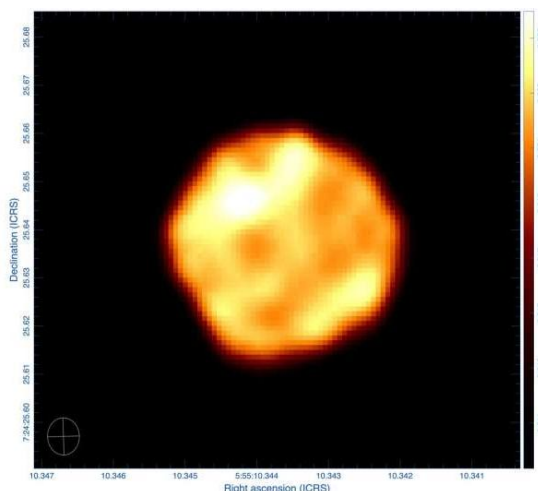
FAST finds two mysterious hydrogen clouds with no visible stars



HI distribution in the vicinity of M51 overlaid on a Pan-STARRS1 DR1 optical image. The yellow circles indicate the locations of the two RELHIC candidates: Cloud N and Cloud S. The color shows the HI column density (moment 0) map. The green circles indicate other HI components identified by SoFiA. The blue dot in the bottom-left corner represents the 3.24' FAST beam (FWHM) at 1.42 GHz. A physical scale bar of 50 kpc (assuming a distance of 8 Mpc) is provided in the bottom-right corner. Credit: Astronomy & Astrophysics (2026). DOI: 10.1051/0004-6361/202661166

Astronomers have found two clouds of hydrogen near the Whirlpool galaxy that appear to contain almost no stars. The clouds, discovered with China's FAST radio telescope, each contain roughly 3 million times the mass of the sun in hydrogen but have no detectable optical counterpart. According to the standard Lambda Cold Dark Matter (LCDM) model of the universe, structure forms hierarchically: Small dark-matter halos form first, then merge to build larger halos and galaxies. But not every dark-matter halo is expected to become a galaxy because several processes can suppress star formation at sufficiently low masses. If a halo's gravitational potential is weak, stars may not form. If the gas is not dense and cold enough, it cannot collapse into stars. Gas may be heated by the ultraviolet (UV) background, which is made up of diffuse radiation from quasars and stars throughout the universe. This leads to a population of dark-matter halos containing neutral hydrogen gas but few or no stars. In this work, led by Qingze Chen of the National Astronomical Observatories, Chinese Academy of Sciences, researchers tested this idea: a small dark-matter halo that retained some gas after cosmic reionization but whose gas never became cold and dense enough to form stars because it was heated by UV radiation. They call it the reionization-limited H I cloud, or RELHIC. <https://phys.org/news/2026-09-fast-mysterious-hydrogen-clouds-visible.html>

Betelgeuse's atmosphere is becoming spotty and asymmetric—and a nearby companion could be shaping the pattern



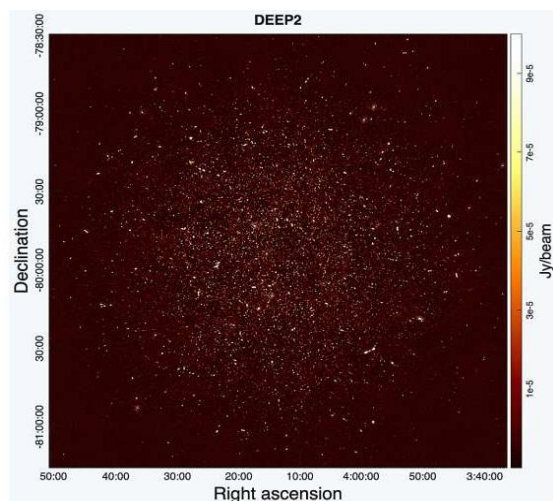
Observations from ALMA reveal vast hotspots emerging on Betelgeuse's surface. Credit: Bill Dent et al.

For the first time since its dramatic dimming in 2020, a team of astronomers has observed the inner atmosphere of Betelgeuse using the Atacama Large Millimeter Array (ALMA). Led by Bill Dent at the University of Manchester, the team found that the giant star's inner atmosphere has become increasingly uneven and asymmetric, in a way that could be connected to a far smaller companion star. Soon to be published in *Astronomy & Astrophysics*, [their results](#) could ultimately reveal deeper insights into the dramatic changes taking place at the sky's 10th-brightest star as it approaches the end of its life. For astronomers, Betelgeuse is one of the most familiar objects in the night sky.

Today, its light has been intensively studied across the electromagnetic spectrum—but in the past few years, the aging star has been changing rapidly. "Betelgeuse is one of the closest red supergiants—stars which will inevitably explode as supernovae but, in the meantime, are polluting interstellar space with strong stellar

winds," Dent explains. One particularly dramatic change occurred in 2020, when the star suddenly became [around 2.5 times fainter](#), an event since dubbed the "Great Dimming." In its aftermath, many questions have remained about the changes now rapidly unfolding at Betelgeuse's surface and inner atmosphere. https://phys.org/news/2026-09-betelgeuse-atmosphere-spotty-asymmetric-nearby.html#google_vignette

MeerKAT directly detects faint hydrogen signal from the distant universe

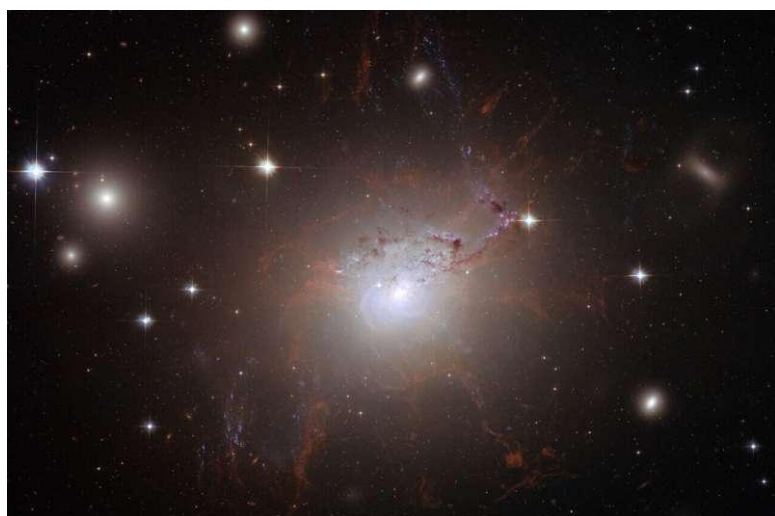


This radio image shows the patch of sky observed with MeerKAT as part of the study. The bright points are radio-emitting galaxies and other compact sources, whose emission is much stronger than the faint hydrogen signal the team set out to measure. Credit: University of Manchester

Astronomers from the University of Manchester and the University of the Western Cape have directly detected an extremely faint radio signal from hydrogen gas billions of light-years away, opening a powerful new way to map the large-scale structure of the universe. Using South Africa's MeerKAT radio telescope, the international team measured radio emissions from neutral hydrogen dating back to a time when the universe was several billion years younger than it is today. The findings demonstrate the potential of a technique known as hydrogen intensity mapping, which allows astronomers to study vast regions of the cosmos more efficiently than ever before. Neutral hydrogen naturally emits a faint radio signal known as the 21-centimeter line. As the universe expands, this [signal is stretched to longer wavelengths](#), allowing astronomers to observe hydrogen at different stages of cosmic history. Rather than detecting individual galaxies one by one, hydrogen intensity mapping measures the combined radio emission from many unresolved galaxies. This makes it possible to study enormous volumes of the universe and build a three-dimensional picture of its structure. <https://phys.org/news/2026-09-meerkat-faint-hydrogen-distant-universe.html>

A supermassive black hole erupted in X-rays, and its radio jets followed 300 days later

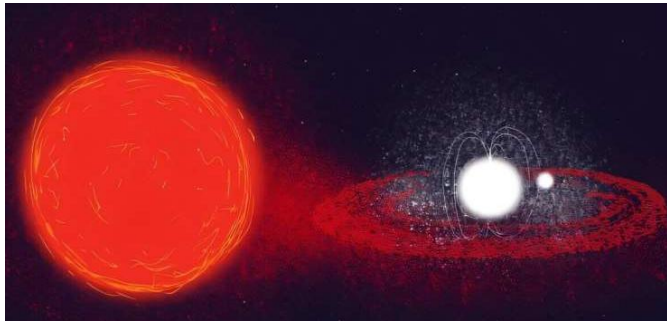
Hubble Space Telescope captures the active galaxy NGC 1275, revealing its long gaseous filaments. Credit: NASA, ESA, and the Hubble Heritage (STScI /AURA)-ESA /Hubble Collaboration; Acknowledgment: A. Fabian (Institute of Astronomy, University of Cambridge, UK)



By combining roughly two decades of observations from NASA's Swift X-ray Telescope with radio monitoring, astronomers have caught a supermassive black hole at the heart of the Perseus Cluster suddenly flaring in X-rays, and about 300 days later, its powerful radio emission flared too. Their paper describing the connection between this black hole's accretion disk and the jets it launches. The supermassive black hole in question sits inside NGC 1275. At the center of the Perseus Cluster, NGC 1275 is its brightest member. It's a chaotic and complicated galaxy, showing signs of an ongoing merger and glowing filaments of gas trailing behind bubbles blown outward by the galaxy's central black hole. It is considered an ideal natural laboratory for studying how a black hole's feeding behaviour connects to and drives its jet—a relationship astronomers call disk-jet coupling. This behaviour is

also critical to understanding how black holes limit galaxy growth. https://phys.org/news/2026-08-supermassive-black-hole-erupted-rays.html#google_vignette

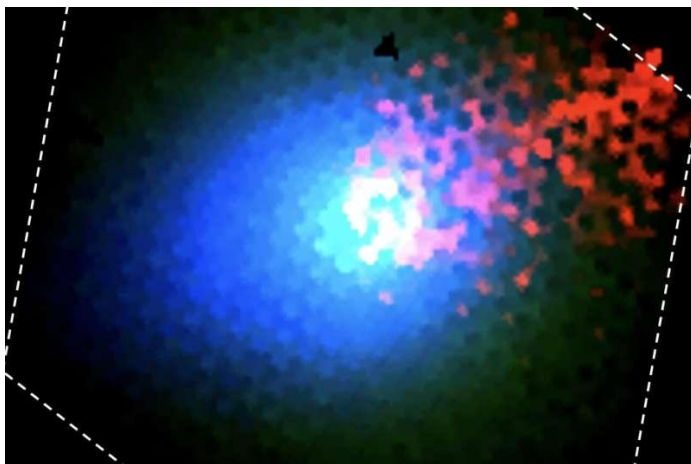
Rare pulsar unleashes 114 giant pulses in a single hour



This illustration shows another transitional millisecond pulsar, PSR J1023+0038 (depicted in white, on the right). The pulsar is also part of a binary stellar system, sucking in matter from its companion star (depicted in red, on the left) via an accretion disk (also depicted in red). It periodically switches between two different modes of emission—in X-rays and radio waves. The illustration is not to scale; in reality, the neutron star is much smaller than the companion star. Credit: ESA

Astronomers have detected extreme, never-before-seen behavior from a rare kind of pulsar and stumbled on a surprising link to one of astronomy's biggest current mysteries. Using 174 hours of radio observations, researchers detected PSR J1227-4853, a rapidly spinning neutron star known as a "transitional millisecond pulsar," which unleashes hundreds of ultrashort, ultrapowerful "giant pulses." Neutron stars that rapidly rotate, completing one rotation in less than about 30 milliseconds, are called millisecond pulsars (MSPs). Among them is a rare class of neutron stars called transitional millisecond pulsars that swing between two different observational states: an accretion-powered state in a low-mass X-ray binary system and a radio-powered millisecond pulsar state. So far, only three transitional MSPs have been confirmed to exhibit this switching behaviour. What made it an exciting target was its unusually strong magnetic field at the pulsar's "light cylinder"—an imaginary cylinder centered on the pulsar with a radius at which material co-rotating with the star's spin would have to move at the speed of light. It also showed a high spin-down luminosity, which is the rate of its kinetic-energy loss as its rotation slows down. These properties are linked to a rare phenomenon called giant pulses (GPs)—extremely brief, extraordinarily bright radio flashes reaching up to 10,000 times brighter than the pulsar's normal signal. To date, only 19 pulsars have been found that produced them. None of the transitional millisecond pulsars have shown this behaviour, so the team was motivated to check whether this rare pulsar also produces such giant pulses. <https://phys.org/news/2026-08-rare-pulsar-unleashes-giant-pulses.html>

Interstellar visitor 3I/ATLAS carries clues from the frozen outskirts of another star system



The different distributions of dust (blue), gas (green) and ions (red) in 3I/ATLAS. Credit: Lea Ferellec. Attribution (CC BY 4.0)

UK astronomers have uncovered new clues about the origin of 3I/ATLAS—only the third known object from beyond the solar system ever spotted. In a new paper published in [Monthly Notices of the Royal Astronomical Society](#), researchers reveal that the comet formed in extremely cold conditions, far from any star. Dr. Lea Ferellec, a research fellow based in Northumbria University's School of Engineering, Physics and Mathematics, led the study, which looked at the [ionized gases streaming off 3I/ATLAS](#) as it moved away from the sun. The observations were obtained using the Large Integral Field Unit (LIFU) mode of a new instrument, the WHT Enhanced Area Velocity Explorer (WEAVE), developed with the support of the Science and Technology Facilities Council (STFC) and installed on the Isaac Newton Group's 4.2-meter William Herschel Telescope. By combining WEAVE's LIFU imaging spectroscopy with the WHT's new non-sidereal guiding capabilities, the team identified five different

ions in the comet's stream simultaneously. This is a rare achievement for any comet and a remarkable first for an interstellar object of this nature. https://phys.org/news/2026-09-interstellar-visitor-3iatlas-clues-frozen.html#google_vignette

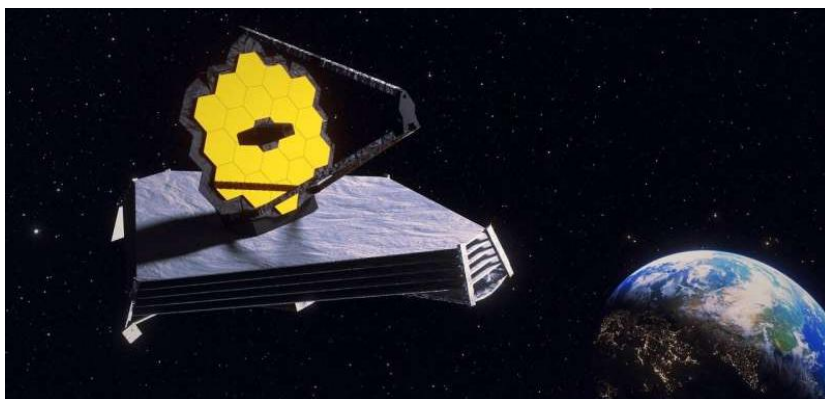
A 42-light-year X-ray tail links a pulsar to previously 'orphan' gamma rays



Red shows the partial X-ray tail of the pulsar wind nebula measured with the XMM-Newton satellite (left), and blue shows the complete X-ray tail of the pulsar wind nebula observed with Einstein Probe (right). Although XMM-Newton's observing time was more than six times that of Einstein Probe, it detected only a small fraction of the tail. Credit: Y.-H. Chi et al.

Understanding the origin, acceleration and propagation of high-energy cosmic rays has been a century-old mystery in astrophysics. Recently, joint observations from China's Einstein Probe (EP) satellite and the Large High Altitude Air Shower Observatory (LHAASO) showed an extraordinarily long X-ray tail near a pulsar about 4,600 light-years (27 quadrillion miles) from Earth—one that had never before been seen in full. The tail extends about 42 light-years (250 trillion miles) and stretches in the same direction as ultrahigh-energy gamma-ray emission detected by LHAASO, with the two showing a close spatial match. This finding indicates that high-energy particles produced in the pulsar wind nebula do not immediately diffuse isotropically after leaving their source; instead, they can travel in a preferred direction for tens of light-years. It provides new observational evidence for understanding how high-energy particles escape their acceleration sites and propagate through interstellar space. It also offers a new way to explain some ultrahigh-energy gamma-ray sources that lack clear astronomical counterparts. <https://phys.org/news/2026-09-year-ray-tail-links-pulsar.html>

Webb measures extreme gas outflows from distant 'dead' galaxies



Credit: Pixabay/CC0 Public Domain

Astronomers using the James Webb Space Telescope have measured the most powerful gas outflow ever recorded from a "dead" galaxy outside our cosmic neighborhood and found that even outflows this extreme may not be enough to permanently shut down star formation. Studying 23 massive, quiescent galaxies from roughly 11–13 billion years ago, researchers traced neutral gas being blown outward using a specific absorption signature in their light, detecting outflows in many of them. <https://phys.org/news/2026-09-webb-extreme-gas-outflows-distant.html>

Webb reveals dynamic panorama of star formation, including smallest known brown dwarfs

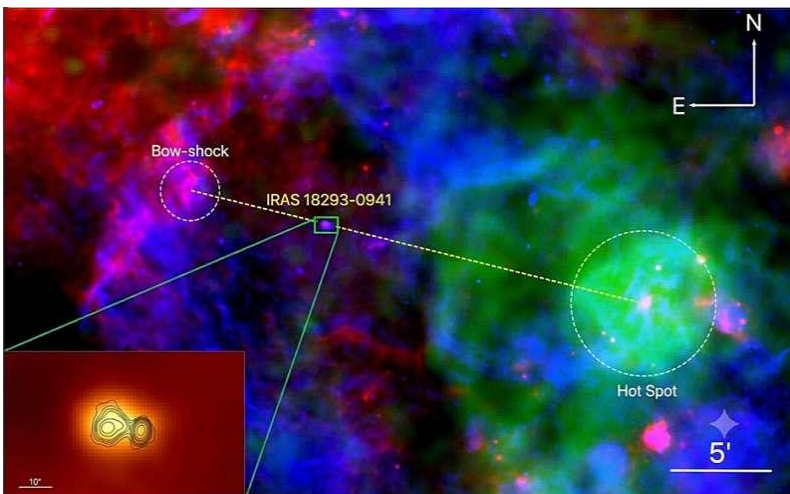


NASA's James Webb Space Telescope recently observed IC 348, a star-forming region just 1,000 light-years away from Earth. Webb's sharp vision revealed tiny brown dwarfs, some just twice Jupiter's mass, and young stars ejecting powerful jets crashing into surrounding gas and dust. Credit: NASA, ESA, CSA, Kevin Luhman (PSU), Catarina Alves de Oliveira (ESA), Mahdi Zamani (ESA/Webb)

This starry view of the nearby star-forming region IC 348 is one of the largest images released to date from NASA's James Webb Space Telescope. Using Webb, astronomers

searched IC 348 for brown dwarfs, which are less massive than the smallest stars. The researchers discovered brown dwarfs just twice the mass of Jupiter, bringing the study of these curious objects into a new mass range and revealing new insights about the star-formation process. The star-forming region IC 348 is located just 1,000 light-years (5.9 quadrillion miles) away in the constellation Perseus. In regions like IC 348, cold clouds of molecular hydrogen gas collapse to form new stars, creating glowing, sculpted scenes like this one. The star-formation process can create widely varied objects, from massive stars that expire after only a few million years in core-collapse supernova explosions to the smallest and most common stars, which are long-lived and produce powerful stellar storms. <https://phys.org/news/2026-09-webb-reveals-dynamic-panorama-star.html>

Milky Way's first microblazar may produce fastest particles in the galaxy

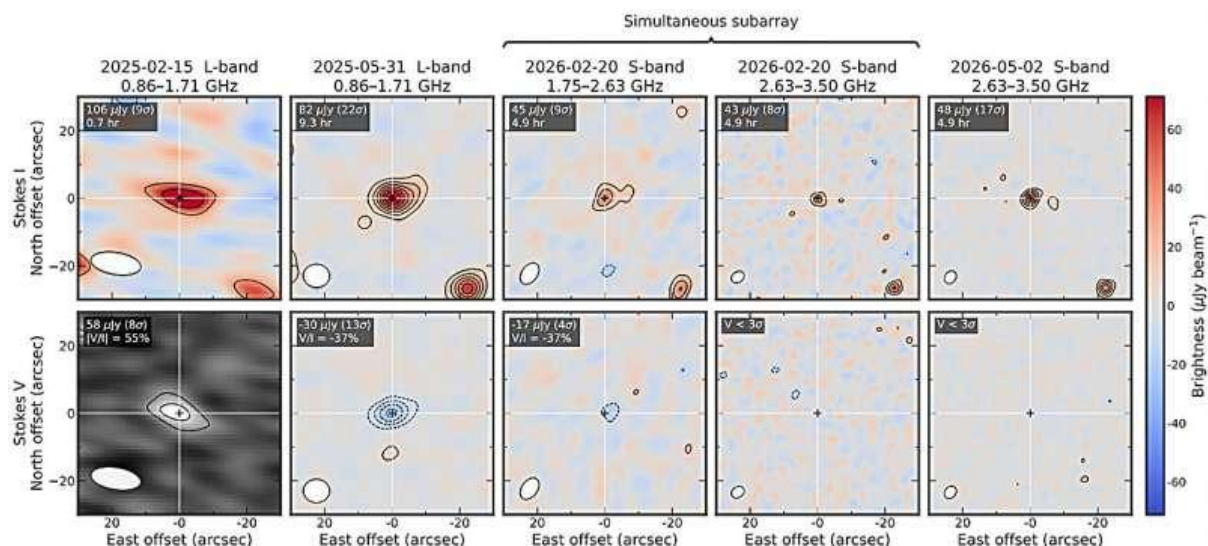


Jet-environment interaction in IRAS 18293-0941 on multiple spatial scales. Credit: Astronomy & Astrophysics (2026). DOI: 10.1051/0004-6361/202661105

An international team of astronomers from ASTRON, JIVE, the University of Amsterdam and other institutions has found the first so-called "microblazar" in the Milky Way. This stellar system is composed of a massive star and a black hole with a jet that is pointed toward Earth. The researchers also identified the region where the jet hits a molecular cloud as a place where particles are

accelerated to ultra-high energies, likely up to petaelectronvolts. This would make microblazars one of the most powerful particle accelerators in the galaxy. Black holes can attract matter from their surroundings, powering jets of matter and radiation that escape from their poles with extremely high energies. When such a jet is pointed toward Earth, it makes the object appear much brighter. In the case of supermassive black holes—which are found at the center of many galaxies—such blazars have been studied for a long time. Now, for the first time, astronomers have identified a stellar-sized black hole in the Milky Way whose jet is pointed toward Earth. It is the first microblazar found. <https://phys.org/news/2026-09-milky-microblazar-fastest-particles-galaxy.html>

Astronomers detect radio signals coming from an exoplanet for the first time



Radio detections of β Pic b in four observing sessions and at two frequency bands. Credit: arXiv (2026). DOI: 10.48550/arxiv.2609.16720

Exoplanets are exotic worlds orbiting distant stars far beyond our solar system. Ever since the first ones were discovered in the 1990s, astronomers have turned their attention to these distant worlds to understand more about them. Now, for the first time, scientists have detected radio signals coming directly from one of these planets, a massive gas giant named β Pictoris b. Previous radio detections from exoplanetary systems couldn't be traced directly to the planet itself because astronomers couldn't tell whether the signal came from the star or the planet. And no, this isn't evidence of alien life communicating with each other. The radio waves come from auroras linked to the planet's powerful magnetic field. [Auroras](#) can occur when high-energy charged particles travel along a planet's magnetic field lines and interact with its upper atmosphere. On Earth, for example, this produces the northern lights. A team of scientists led by Kevin Ortiz Ceballos at the Center for Astrophysics | Harvard & Smithsonian used South Africa's MeerKAT radio telescope to study the β Pictoris planetary system, about 64 light-years from Earth. <https://phys.org/news/2026-09-astronomers-radio-exoplanet.html>

COMMITTEE MEMBERS

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Non-committee members with portfolio:

Peter Harvey	(“Skynotes”, Study Group SIG co-ordinator)
Deon Krige	{GPAED project, Astro-photography SIG coordinator}

