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"The Southern Cross"

The Hermanus Astronomy Centre's Monthly Newsletter

July 2026

MONTHLY MEETINGS

At the monthly meeting held on **WEDNESDAY 24TH JUNE,** the HAC was honoured to host **Prof Roger Deane** as guest speaker. The subject of his speech was, ***"MeerKAT: A Giant African Eye and Ear on the Universe"*** and was presented in person in the Onrus Manor Activities Room and virtually via zoom. A synopsis of his speech is as follows:

South Africa's MeerKAT radio telescope is a precursor to the billion-dollar-class SKA Observatory. The coherent confluence of a strategic vision, engineering excellence, and a pioneering human capacity development programme has delivered a state-of-the-art telescope and a diverse community of young African scientists to unlock its full potential. Prof Deane gave an overview of some of the scientific highlights achieved thus far, from a transformed view of the centre of our own Milky Way to the detection of Einstein's gravitational waves, and look ahead towards the exciting discoveries that lie ahead, driven by telescopes on African soil.

Follow the link below to watch the full presentation and subsequent discussion:

The YouTube link: https://youtu.be/-hSij65qXAI

At our next meeting, scheduled for **July 21st, Jenny Morris** will be our guest speaker. Her topic will be, "SOLVING THE LONGITUDE PROBLEM: A MATTER OF TIME".

Finding longitude was a challenging and lengthy technical and human undertaking. It spanned over four centuries, but its ultimate success was fundamental in creating the modern world. But this is more than a tale of science; it is also about people. It's a story of determination and perseverance, of self-doubt and arrogance, of open-mindedness and prejudice, of snobbery and pride, of vested interests and power-play, of manipulation and justice, and of loyalty and honour.

SPECIAL INTEREST GROUP ACTIVITIES

Cosmology

The **Jun 2nd** meeting featured parts 6 to 8 of episode 38 of the Entire History of the Universe, *"What is Reality?"* - The concept of reality is probed by cutting matter into ever smaller pieces leading to radical possibilities with unexpected consequences.

The YouTube link: https://youtu.be/ji2KKU5NfoY?list=PLROBLlvnR7BEF9b1NOvRf_zhboibmywJb

The discussion link: https://www.youtube.com/watch?v=Xjawa_W9QGA

Our next cosmology meeting will be on **Jul 7th**. The topic of the study will be announced shortly.

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

Study Group

On **30th June** we watched a documentary titled, "Time lapse to the future of Earth." What if the end of Earth isn't in the distant future…but has already started?

"Our planet is 4.5 billion years old. It has survived mass extinctions, asteroid impacts, and extreme climate shifts. But for the first time in its history, one species—*Homo sapiens*—has changed everything. This documentary took us on a journey from today… to the final moment of Earth itself. This is Earth's timeline—written by physics, chemistry, and time itself. Some of these events will happen within our lifetime. others will unfold over billions of years. But all of them are already set in motion. The real question is not how Earth ends… It's whether humanity survives long enough to witness even a fraction of it."

This video was narrated by an AI generated voice of Sir David Attenborough.

A link to the video and the group discussion are as follows:

YouTube link: https://www.youtube.com/watch?v=cYe4tF6NZco

The discussion link: The discussion link will be posted when available.

The topic for the study group scheduled for **28th July** 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 **July 2026**:

SUGGESTED EVENING OBSERVATION WINDOWS
(Lunar observations notwithstanding)

Date		*Moon*	*Dusk end*
Jul 4	*Rises*	**22h03 (79%)**	**19h15**
to **Jul 18**	*Sets*	**22h36 (20%)**	**19h22**

Moonwatch: A few days either side of **First Quarter** (21st Jul).

There is an excellent chance of seeing the **lunar 'X' and Lunar 'V'** this month - weather permitting! These phenomena are optical illusions on the Moon, visible for a few hours around the first quarter, formed by sunlight illuminating specific crater rims. Look for them on **21 Jul** from 21h00 onward. They should be fully formed by about 22h00.

Refer to Peter Harvey's excellent "Skynotes" for a summary of Astronomical Phenomenon forecast for July.

Outreach

Zimkhitha Buyile (Lukhanyo Primary's Science Educator), with able and enthusiastic encouragement from Mick Fynn (HAC Outreach Coordinator), have managed to perpetuate the outreach activities of the Hermanus Science & Technology Club of 2024 during 2025 at Lukhanyo Primary School in the guise of the Lukhanyo Science Club (LSC). This successful weaning of the LSC constitutes the pinnacle of learning empowerment for any outreach activity of project and warrants as much support as can be given by the HAC and ASSA. (ASSA's Mission is to stimulate and encourage the study and practise of Astronomy.)

As a more challenging support for the LST Pierre de Villiers (Vice-chairman) and Mick Fynn (Education Outreach) have therefore decided to involve the learners of the LST in the activities of the Global Meteor Network Outreach Program and have also applied to the ASSA requesting funds to purchase a ZWO Seestar S30 PRO Smart Telescope for Lukhanyo Primary School. It is intended that they remain custodians of the equipment for as long as they provide proof of its effective use in the promotion of science education at Lukhanyo as well as other local schools through the use of state-of-the-art technology. Zimkhitha hopes to use the LST as a kernel to establish a Zwelihle Science Club which would be open to learners of all grades and will hopefully raise awareness of astronomy and science in general.

ZWO S30 Pro Smart Telescope

ASSA

From Tim Cooper

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

https://assa.saao.ac.za/wp-content/uploads/sites/23/2026/06/ASSA-CAMNotes-2026-Number-3.pdf

MNASSA

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

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

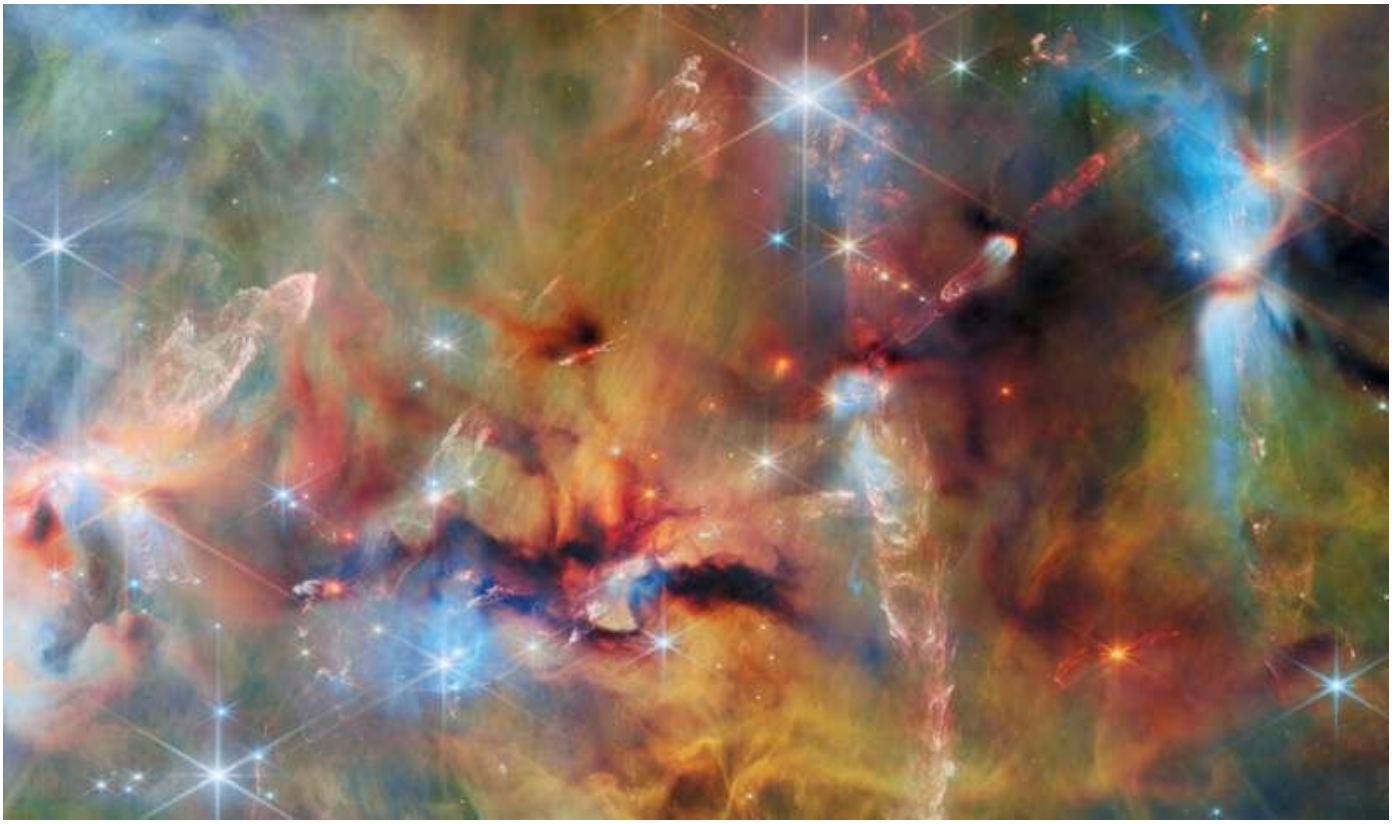
ASSA Shallow Deep Sky Bulletin

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

Astronomy News June 2026 continued overleaf…

Compiled by Pieter Kotzé

JUNE ASTRONOMY PICTURE

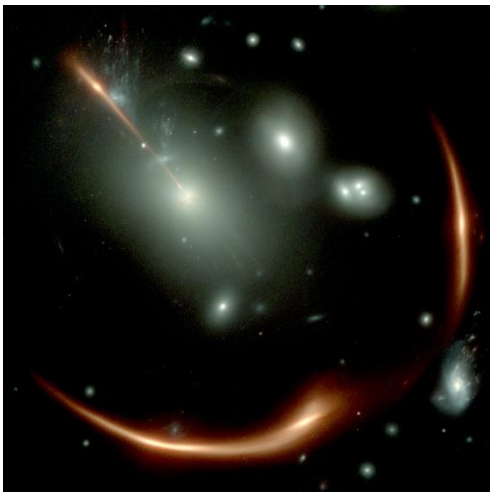


Webb unveils young stars across every stage of formation

For this NASA/ESA/CSA James Webb Space Telescope Picture of the Month, we return to the constellation Orion (the Hunter), a location familiar to Webb. This area of the sky is replete with star-forming clouds that make up a complex hundreds of light-years across. We find ourselves in the giant molecular cloud Orion A, of which the familiar Orion Nebula (also known as M42) is just a part. This image shows just a small, northern portion of OMC-2, located 1280 light-years from Earth and a little north of the Orion Nebula. Every stage of star formation—from the youngest stellar embryos, to protoplanetary disks, to newly-minted pre-main sequence stars—is contained within just this scene, which stretches 150 light-years across. The intense star-forming activity has produced an impressive display of billowing outflows and sparkling stars atop swirling layers of gas and dark, obscuring clouds. Molecular clouds such as OMC-2 are vast clumps of gas much denser than the rest of interstellar space. This density allows complex molecules to form, protected from the radiation given off by other stars, and it means that gravity can cause the cloud to collapse and form stars. The earliest stage of this process is a protostar—a growing star that is being fed gas from the surrounding cloud through a spinning disk of gas. As gas falls onto the protostar, it heats up, powering the glow of the protostar. The immense amount of energy acquired during this process is unleashed in fierce jets of gas from the poles of the star, frequently seen as twin glowing outflows that mark the location of a protostar. Orange, brown and some of the red colours mark warmer dust that absorbs some light and emits some of its own. The yellow to green gradient is largely emission from polycyclic aromatic hydrocarbons (PAHs), while light from stars and protostars scattered by dust grains is seen here primarily as blue and cyan hazes. Gas heated by the outflows creates the detailed, glowing red ridges.

JWST 'weighs' dormant black hole 10 billion light-years away

The most distant, nearly invisible dormant black hole has been detected and "weighed" by an international team of astronomers that includes researchers from UCL. The study, published in *Science*, identified a dormant black hole at the heart of a galaxy known as MRG-M0138 located over 10 billion light years away. It is the most distant dormant black hole yet detected, 15 times farther away than the previous record.

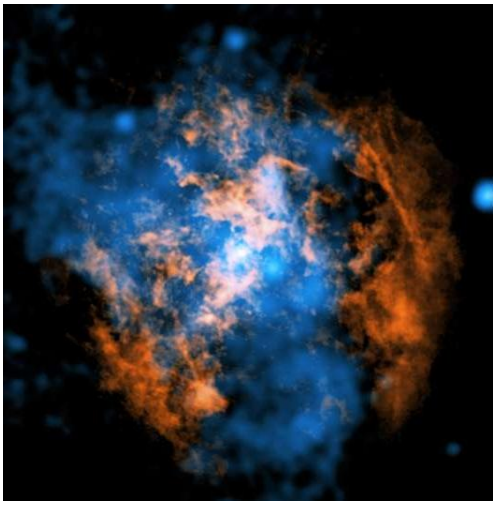


A clean, high-resolution version of Image 1. Credit: NASA/JWST

The black hole's mass is about 6 billion times that of the sun, and is being observed at a time when the universe was only about 3 billion years old, about a quarter of its current age, offering unprecedented details into black holes in the early universe. To find this, the team used data from NASA's James Webb Space Telescope to track the motion of stars orbiting around the otherwise invisible black hole to measure its mass. Though the technique—known as stellar dynamics—has been used to measure dormant black holes in galaxies much closer to Earth, this is the first time it has been used to weigh one located such a great (cosmological) distance away. Senior author, Professor Richard Ellis (UCL Physics & Astronomy) said, "Determining how stars collectively move within the core of this distant galaxy has allowed us to measure the mass of its otherwise undetectable supermassive black hole. "By demonstrating the feasibility of such a technique for galaxies in the early universe, we can now undertake a more complete census of how black holes develop over time and infer their role in shaping galaxy evolution."

https://phys.org/news/2026-06-jwst-dormant-black-hole-billion.html#goog_rewarded

Milky Way black hole's missing wind finally found after a half-century-long search



This composite image shows evidence for a wind blowing away from Sagittarius A (Sgr A*), the supermassive black hole in the center of our galaxy. The white dot in the center of the image shows Sgr A*. In orange is data from the Atacama Large Millimeter/Submillimeter Array (ALMA) radio telescopes in Chile, mapping the location of cold gas composed of carbon monoxide in the image. In blue is X-ray data from NASA's Chandra X-ray Observatory. Credit: X-ray: NASA/CXC/Northwestern Univ./M. Gorski; Radio: ESO/NAOJ/NRAO/ALMA; processing: NASA/CXC/SAO/K. Arcand and P. Edmonds*

The hunt is over. After more than 50 years of searching, astrophysicists at Northwestern University have finally discovered evidence of a powerful wind blowing from the Milky Way's central supermassive black hole, Sagittarius A* (Sgr A*). According to theoretical physics and a long-accepted understanding of galaxies' evolution, as black holes consume materials, they should produce wind or jets. Even a small amount of gas falling into a black hole should generate enough energy to push material outwards. Without wind, Sgr A* would be a unique outlier. By providing the most detailed view yet of how Sgr A* interacts with and transforms its surrounding environment, the scientists resolved one of the longest-standing mysteries in astronomy. It also opens a new window into the physics at play in the center of the Milky Way.
https://phys.org/news/2026-06-milky-black-hole-century.html

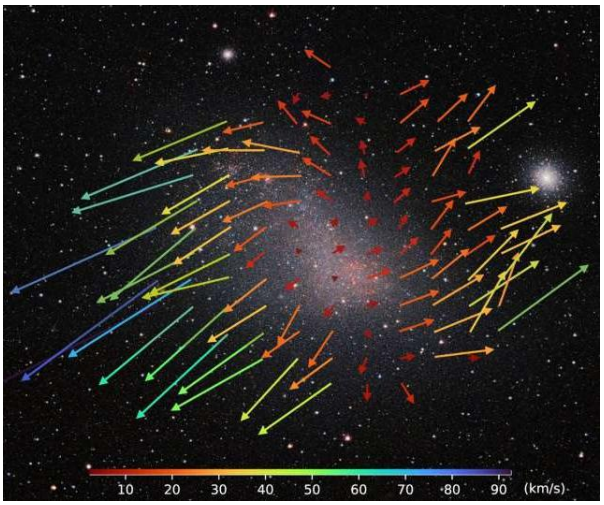
Most detailed map of the universe's hidden magnetic fields released

The largest magnetic map of the universe ever produced—five times larger than all previous efforts combined—marks the beginning of a new generation of research into intergalactic magnetism. Magnetic fields influence how galaxies grow, how matter moves through space, and how the universe has evolved over billions of years.

This new map, called SPICE-RACS, works on the principle that light twists as it travels through magnetic fields. It was produced with CSIRO's ASKAP radio telescope on Wajarri Yamaji Country. Credit: CSIRO/Alec Thomson et al./Alex Cherney/Sam Moorfield

The new map was produced by an international team led by researchers at CSIRO, Australia's national science agency, and the SKA Observatory, an intergovernmental organization building two of the world's largest radio telescopes. It was the advanced capabilities of CSIRO's ASKAP radio telescope that enabled this research. Lead researcher Alec Thomson, a commissioning scientist with the SKA Observatory, said the scale and density of the map help researchers better understand the way energy is distributed across the universe. "For the first time, we can investigate fine details of the material between nearby stars, and study a huge number of distant galaxies," he said. CSIRO's ASKAP radio telescope, a precursor to the international SKA telescopes under construction in Australia and South Africa, can see huge areas of the sky at once and at greater depth than many other telescopes. https://phys.org/news/2026-06-universe-hidden-magnetic-fields.html

Small Magellanic Cloud is being pulled apart, reshaping how astronomers read its past



Small Magellanic Cloud observed with the VISTA Telescope. The arrows show the motion of stars away from the center of the galaxy, revealing a large-scale expansion pattern. The color scale indicates the velocities of the stars. Credit: ESO/VISTA VMC/ AIP/ S. Vijayasree

Using more than a decade of observations from the VISTA Survey of the Magellanic Clouds (VMC), researchers measured the motions of millions of stars across the Small Magellanic Cloud with unprecedented precision. The new study, published in *Astronomy & Astrophysics*, provides direct evidence of a galaxy-wide tidal disruption of the Small Magellanic Cloud from its interaction with the Large Magellanic Cloud. Rather than showing coherent rotation typical of stable galaxies, stars across the Small Magellanic Cloud show large-scale outward motion, indicating the system is dynamically disturbed even in the inner regions. "The results reveal large-scale tidal expansion throughout the Small Magellanic Cloud galaxy and challenge long-standing assumptions that the Small Magellanic Cloud behaves like a rotating disk," says Sreepriya Vijayasree, doctoral student at the Leibniz Institute for Astrophysics Potsdam (AIP). "The study shows that the internal motions of stars in the Small Magellanic Cloud are dominated not by orderly rotation, but by gravitational disturbances caused by repeated encounters with the LMC over billions of years." The Small Magellanic Cloud is one of the Milky Way's closest galactic neighbors, located about 200,000 light-years from Earth. https://phys.org/news/2026-06-small-magellanic-cloud-reshaping-astronomers.html

South African telescope detects record-breaking signal from the early universe

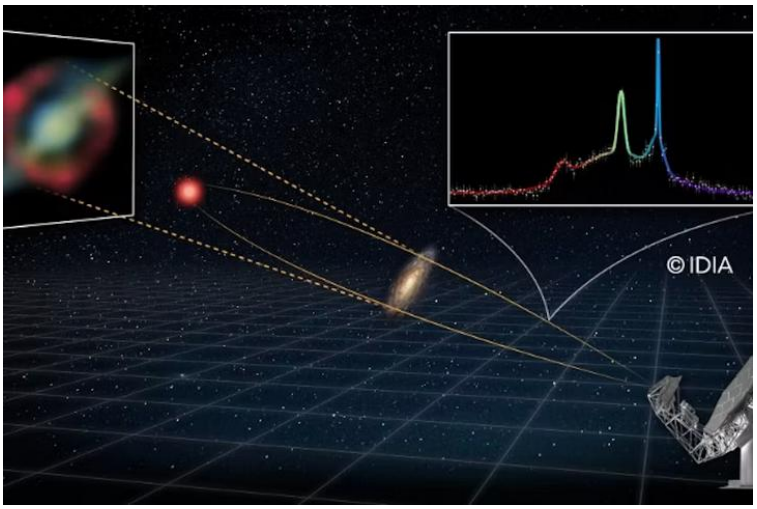


Illustration of the distant galaxy 8 billion light-years away (red), magnified by an unrelated foreground disk galaxy, resulting in a red ring. Splitting up the radio light into different colours, as a prism does, reveals the hydroxyl gigamaser (top-right rainbow-coloured line). Inter-University Institute for Data-Intensive Astronomy (IDIA)

Astronomers using the MeerKAT radio telescope in South Africa have discovered the most distant hydroxyl megamaser ever detected, opening a new radio astronomy frontier. A hydroxyl megamaser is a natural space laser, and this one is located in a violently merging galaxy more than 8 billion light-years away. This discovery is extraordinary because of the record distance at which we've detected it, over eight billion light-years away. That places it deep into the early universe. This means that we aren't seeing the galaxy as it exists today. We are seeing it as it was 8 billion years ago. Since the Big Bang happened about 13.8 billion years ago, we are looking at a "toddler" version of the universe. At that stage where the maser signal was transmitted by the host galaxy, galaxies were much more "chaotic", they collided more often and were much more active than the stable, mature galaxies we see nearby today. It gives us a rare glimpse of galaxy interactions and extreme star-forming environments when the cosmos was less than half its current age. Think of light like a letter in the mail. If a friend sends a letter from overseas, by the time you read it, the news is old. In space, light is the letter. The "news" from this galaxy took 8 billion years to reach us. We see the galaxy as a "toddler" even though, in its own time, it has already grown up or changed. https://theconversation.com/south-african-telescope-detects-record-breaking-signal-from-the-early-universe-280060

https://phys.org/news/2026-06-south-african-telescope-recordbreaking-early.html

Cosmic acceleration holds up as new analysis rebuts slowdown claim

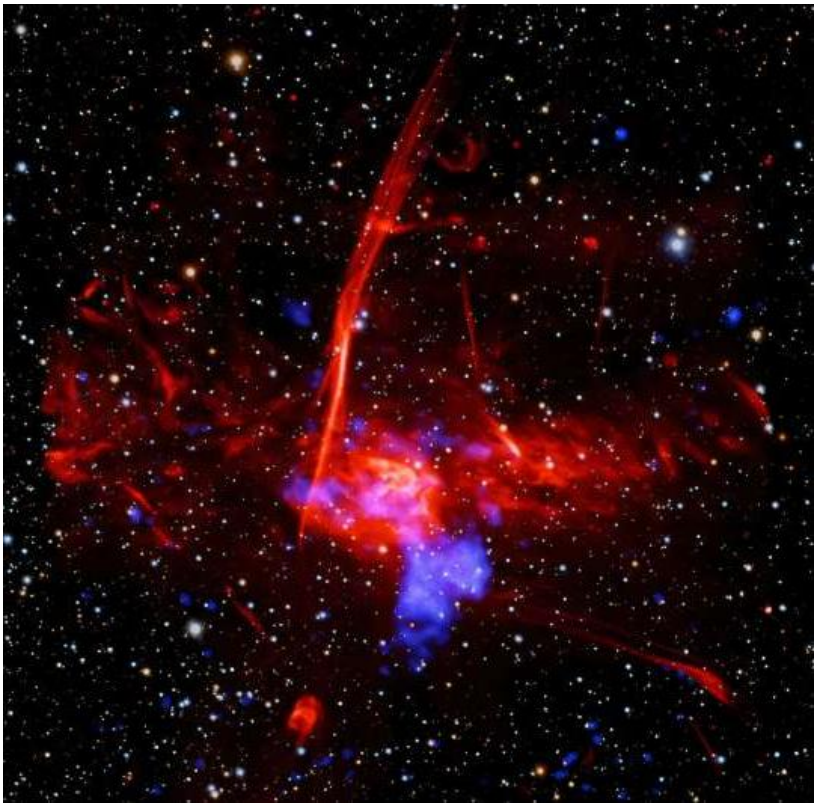
Studying Type Ia supernovae—violent, luminous white dwarf star explosions—led to the Nobel Prize-winning discovery that the universe's expansion is accelerating. This image combines data from four space telescopes to create a multi-wavelength view of all that remains of RCW 86, the oldest documented example of a supernova. Credit: X-ray: NASA/CXC/SAO & ESA; Infrared: NASA/JPL-Caltech/B. Williams (NCSU)

Our universe's expansion is still accelerating despite recent claims suggesting otherwise, an international team of astrophysicists says. They refuted a study published last year claiming the growth of the universe is slowing and insist there is no flaw in the widely accepted theory that a mysterious force known as dark energy is driving the expanding cosmos. The researchers, who include two Nobel laureates and represent institutions worldwide, say the debate that followed last November's revelations was the result of a scientific misunderstanding rather than a cosmic grenade threatening to blow apart everything we know about the universe. It is a direct rebuttal of a study by a team of South Korean researchers that made the erroneous claim the universe's expansion may have entered a deceleration phase, caused by the influence of dark energy—which acts as a kind of antigravity—weakening over time. "The previous and well-accepted measurements were, in fact, fine and our current understanding of the fate of the universe remains robust," said lead author Dr. Phil Wiseman, from the University of

Southampton. "By proving our measurements are correct, we can get back to trying to understand what this dark energy actually is, rather than wondering if it exists at all."

https://phys.org/news/2026-06-cosmic-analysis-rebuts-slowdown.html

NASA's Chandra discovers possible supernova remnant in galactic center

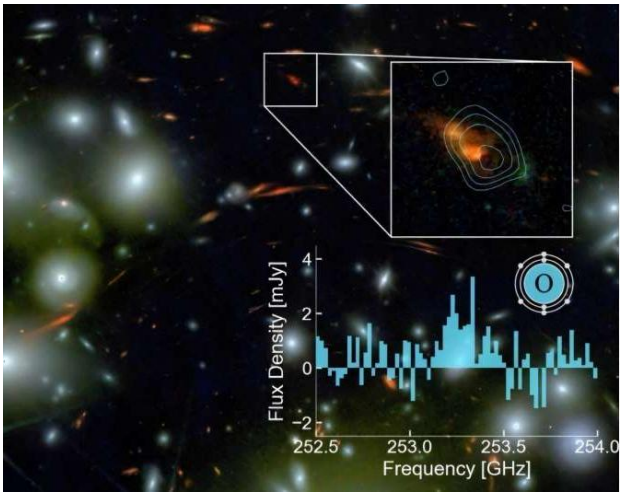


Astronomers may have uncovered a supernova remnant in a star-forming region near the center of the Milky Way galaxy using data from Chandra and XMM-Newton. If confirmed, this would be one of the closest supernova remnants to the supermassive black hole in the Galactic Center. This composite image shows the region where the evidence was found, which contains X-rays from Chandra and XMM-Newton (blue), radio data from the MeerKAT telescope (red) in South Africa, and an optical image from the Pan-STARRS telescopes in Hawaii (red, green and blue). Credit: X-ray: NASA/CXC/UCLA/Z. Zhu et al.; ESA/XMM-Newton; Optical: PanSTARRS; Radio: MeerKAT; Image Processing: NASA/CXC/SAO/L. Frattare and P. Edmonds

Using data from NASA's Chandra X-ray Observatory, astronomers may have found a supernova remnant in an intriguing neighborhood in the middle of our galaxy. A paper describing these new findings was published in *The Astrophysical Journal*. Supernova remnants are the expanding remains of exploded stars and provide elements—like iron, oxygen and silicon—that are critical for the formation of planets and for life as we know it to form and flourish. This new supernova remnant, if confirmed, would be one of the closest ever discovered to the supermassive black hole at the central region of the Milky Way galaxy, an exotic region crammed with massive stars, long threads of magnetic fields, and dense clouds of gas orbiting rapidly around the Galactic Center. https://phys.org/news/2026-06-nasa-chandra-supernova-remnant-galactic.html

ALMA makes first direct detection of star-forming gas in early galaxies

In the early universe, the first galaxies began to take shape roughly a million years after the Big Bang. Within these young systems, stars formed from vast reservoirs of cold gas, gradually building the structures we see in the cosmos today. Understanding this star-forming gas is key to explaining how galaxies grew, but directly tracing its neutral component has remained challenging, especially at great distances. In this study, the researchers overcame this challenge by detecting the [O I] 145 μm emission line, a direct tracer of neutral gas, enabling a detailed investigation of star-forming conditions in early galaxies. Despite its importance, neutral gas has remained difficult to study. Modern telescopes, such as the James Webb Space Telescope (JWST) and the Hubble Space Telescope (HST), can observe stars and hot gas in distant galaxies with remarkable clarity. However, they cannot directly detect the neutral gas that feeds star formation.



A1689-zD1, a galaxy seen 700 million years after the Big Bang (background), with the ALMA-detected [O I] line shown as contours and a spectrum. This is one of four galaxies studied in this paper. Credit: Assistant Professor Yoshinobu Fudamoto, Chiba University, Japan

To overcome this challenge, the researchers targeted the [O I] 145 μm emission line, a direct tracer of neutral gas that provides a clearer view of star-forming material within galaxies. In contrast, commonly used signals, such as the [C II] emission line, can originate from both neutral and ionized regions, making them harder to interpret. By also analyzing the [N II] emission line, which traces only ionized gas, the team was able to disentangle these contributions and isolate the neutral gas component. Now, an international research team led by Assistant Professor Yoshinobu Fudamoto and Professor Masamune Oguri from the Center for Frontier Science, Chiba University, Japan, has addressed this challenge. https://phys.org/news/2026-06-alma-star-gas-early-galaxies.html

Euclid captures 60 million stars in sharpest broad view of Milky Way's core

This is the largest high-resolution photo ever made of our Milky Way galaxy's centre in visible light. It was taken on 23 March 2025 by the European Space Agency's Euclid space telescope. Packed with more than 60 million stars, this image opens the door for scientists to confirm the existence of any exoplanet found in this region and measure its mass using tiny changes in starlight over time. The galactic bulge—the central region of our galaxy—is a vast, tightly packed structure filled mainly with old, cooler stars, giving it its characteristic yellow colour. Seen from some 26 000 light-years away, Euclid observes the galaxy's centre through a complex foreground of material along its line of sight. This ultra-wide view towards the bulge reveals not only stars, but also seemingly empty dark regions. The dark patches are not devoid of stars: they mark dense, dust-rich molecular clouds that absorb and scatter light from the bulge behind them. As Euclid looks through two of the Milky Way's spiral arms, it also encounters regions of active star formation, traced by newly formed, massive blue stars. Their intense ultraviolet radiation ionises surrounding hydrogen gas, producing the faint red glow clearly visible in one of the cutouts. Credit: ESA/Euclid/Euclid Consortium/NASA, CFHT, image processing by J.-C. Cuillandre and E. Bertin (CEA Paris-Saclay). https://phys.org/news/2026-06-euclid-captures-million-stars-sharpest.html

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Elaine Sykes	(Treasurer)	083 286 2683
Pete Kogel	(Secretary, Membership, "Southern Cross", Observing co-ordinator)	082 708 0049 pkogel@mweb.co.za
Mick Fynn	(Educational outreach)	082 443 0848

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Peter Harvey	("Skynotes", Study Group SIG co-ordinator)
Deon Krige	{GPAED project, Astro-photography SIG coordinator)
Pieter Kotzé	("Southern Cross" Astronomy News, Speaker Selector)