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“The Southern Cross”

The Hermanus Astronomy Centre’s Monthly Newsletter

April 2026

MONTHLY MEETINGS

Our March Monthly meeting was rescheduled to **24th March** to accommodate Onrus Manor’s St Patricks Day celebrations on 17th. At the meeting, **Prof Kalevi Mursula**, spoke from Finland on Zoom. His topic was “*Space climate: How do the Sun and the near-Earth Space Change in Time?*”.

Prof Mursula spoke about the different ways whereby the Sun affects the Earth, how solar magnetic activity has changed in time and how this change has modified the near-Earth space and space weather conditions

This was a hybrid meeting and was attended by 19 members and 7 guests.

YouTube Link: <https://youtu.be/QNN053xiW3I>

The discussion link: <https://youtu.be/QNN053xiW3I?t=3170>

At our next meeting on **April 21st**, the presenter will be **Ian Glass**, His topic will be, “The History of Astronomy & Foundation for Astronomy Heritage” and will be given at the **Onrus Manor** activities hall. Invitations will be circulated to all current members.

SPECIAL INTEREST GROUP ACTIVITIES

Cosmology

The **March 3rd** meeting featured episode 37 of the Entire History of the Universe, ep. 37 “*The Eternal Landscape - What was there Before the Universe?*”

The concept of the Big Bang singularity (a point of infinite density) is not a physical reality but a sign that our current physics breaks down at that moment. This breakdown is the central mystery: what came before?

The YouTube link: <https://youtu.be/h6BdWzMbWzw>

The discussion link: <https://youtu.be/YrP4hMYiCWY>

Episode 38 follows on **April 7th**: “*The layers of Reality – What is Reality?*”

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

The Study Group

The topic discussed during the February meeting was, “Were the Neanderthals Human?”

For 150 years, Neanderthals have been classified as a separate species, a side branch of humanity that occasionally interbred with *Homo sapiens*. However, accumulating evidence from genetics, reproduction, physiology, and the fossil record increasingly blurs the boundary between Neanderthals and modern humans.

The YouTube link: <https://youtu.be/YVR88OdJeng>

The discussion link: <https://youtu.be/EqHD6kBoKok>

The topic for our next meeting, scheduled for **Tuesday March 31st**, will be, “*The Terrifying possibility of the Great Filter*”

What if humanity is the galaxy’s only advanced civilization? **Prof Brian Cox** examines why, despite billions of stars and trillions of planets, we have found no evidence of other intelligent life.

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

Observing.

No suitable evenings were available during March within the “moonless window”.

Optimal dates for **April 2026**:

SUGGESTED EVENING OBSERVATION WINDOWS *(Lunar observations notwithstanding)*

<i>Date</i>		<i>Moon</i>	<i>Dusk end</i>
April 7	Rise	21h36 (77%)	19h53
to April 21	Set	20h23 (18%)	19h37

Outreach

The schools are closing down for first term and emphasis is now on planning for terms 2 and 3. Lukhanyo Primary remains the most organised and we extend our sincere gratitude to Zimkhile for her help in co-ordinating the activities. They have plans for the sun dial for term 2 and for energy (wind and Eskom Palmiet). In term 3 they would like to do Cape Town tour with the Planetarium, museum and Observatory tour of the history and old telescopes.

Other activities planned for the near future include local outings for the planet model, the Gearings Point Astronomy Education display and telescope viewing of night sky, meteors, moon, planets and constellations.

ASSA

From Tim Cooper

CAMNotes2026 No.2, April to June, is not yet available. Members will be informed as soon as it is posted.

<https://assa.sao.ac.za/wp-content/uploads/sites/23/2025/12/ASSA-CAMnotes-2026-Number-1.pdf>

MNASSA

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

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

ASTRONOMY NEWS March 2026

Compiled by Pieter Kotzé

MARCH ASTRONOMY PICTURE

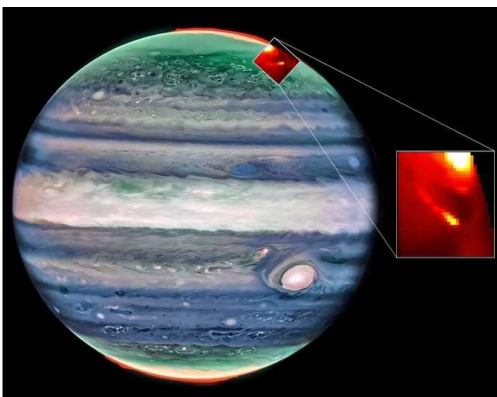


The Egg Nebula from the Hubble Telescope

Image Credit & Copyright: ESA/Hubble & NASA, B. Balick (U. Washington)

Explanation: Ever wondered what it would look like to crack open the Sun? The Egg Nebula, a dying Sun-like star, can unscramble this question. Pictured is a combination of several visible and infrared images of the nebula (also known as RAFGL 2688 or CRL 2688) taken with the Hubble Space Telescope. The star has shed its outer layers, and a bright, hot core (or "yolk") now illuminates the milky "egg white" shells of gas and dust surrounding the center. The central lobes and rings are structures of gas and dust recently ejected into space, with the dust being dense enough to block our view of the stellar core. Light beams emanate from that blocked core, escaping through holes carved in the older ejected material by newer, faster jets expelled from the star's poles. Astronomers are still trying to figure out what causes the disks, lobes, and jets during this short (only a few thousand years!) phase of the star's evolution, making this an egg-cellent image to study!

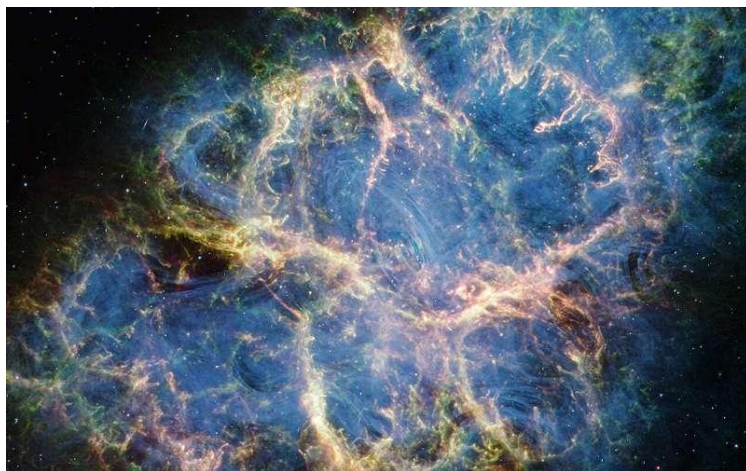
JWST reveals surprising secrets in Jupiter's northern lights



The NASA/ESA/CSA James Webb Space Telescope has captured the auroral footprints of Io and Europa, providing spectral measurements for the first time, and revealing extreme changes in the physical properties within Io's auroral footprint that are likely linked to the electrons crashing into the top of Jupiter's atmosphere. Webb/NIRCam Credit: NASA, ESA, CSA, Jupiter ERS Team; image processing by Judy Schmidt. Webb/NIRSpec Credit: Katie L. Knowles (Northumbria University).

An international team of scientists, led by a Ph.D. researcher from Northumbria University, has made further discoveries about a spectacular feature of Jupiter's northern lights, revealing a never-before-seen temperature structure and dramatic density changes within the top of the giant planet's atmosphere. The research, published in *Geophysical Research Letters*, provides the first detailed spectral measurements of the infrared auroral footprints of Io and Europa—brilliant glowing patterns in Jupiter's aurora caused by its Galilean moons interacting with Jupiter's powerful magnetic field. The images were captured using the **James Webb Space Telescope (JWST)**, an international partnership between NASA, the European Space Agency, and the Canadian Space Agency, which uses infrared radiation to look deep into space. Speaking about the findings, lead author Katie Knowles, a Ph.D. Researcher in Planetary Physics at Northumbria University, explains, "These emissions have been measured before at ultraviolet and infrared wavelengths, but only how brightly they shine. For the first time, we've now been able to describe the physical properties of the auroral footprints—the temperature of the upper atmosphere and the ion density, which has never been reported on before." <https://phys.org/news/2026-03-jwst-reveals-secrets-jupiter-northern.html>

Research reveals cosmic tug-of-war behind the Crab Pulsar's zebra stripes



Most pulsar radio emissions are spectrally broader and noisier—not banded so cleanly like the Crab Pulsar. An NASA image of the Crab Nebula seen by the James Webb Space Telescope. Credit: NASA.

For the past two decades, scientists have wondered about a bright, distinct striped pattern seen in radio waves emanating from the Crab Pulsar, the remnant of a supernova observed by Chinese and Japanese astronomers in the year 1054. In 2024, a contemporary theoretical astrophysicist from the University of Kansas published work largely solving the mystery of its zebra pattern, but now he has fine-tuned his analysis, finding gravity's lensing effects to be the last piece of the zebra-stripe puzzle. "Gravity changes the shape of spacetime," said Mikhail Medvedev, KU professor of physics & astronomy, who will present his findings at the American Physical Society's 2026 Global Physics Summit taking place March 15–20 at the Colorado Convention Center in Denver. "Light doesn't travel in a straight line in a gravitational field because space itself is curved," he said. "What would be straight in flat spacetime becomes curved in the presence of strong gravity. In that sense, gravity acts as a lens in curved spacetime." According to Medvedev, while gravitational lensing has been discussed extensively in the context of black holes, this is the only case where astronomers see a "tug-of-war" between plasma and gravity shaping the observed signal. <https://phys.org/news/2026-03-reveals-cosmic-war-crab-pulsar.html>

MeerKAT discovers record-breaking cosmic laser halfway across the universe

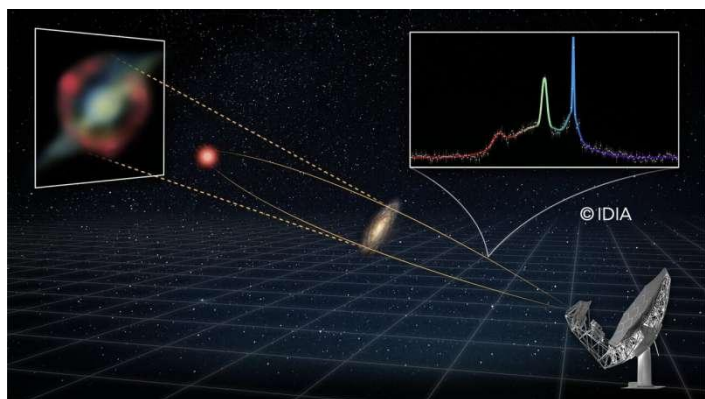
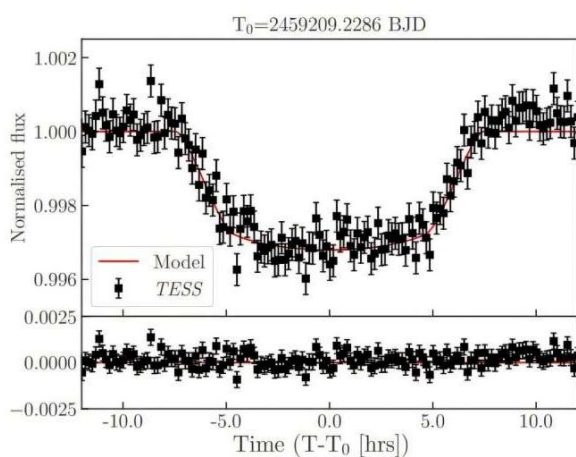


Illustration of the distant galaxy 8 billion light-years away (red), magnified by an unrelated foreground disk galaxy, resulting in a red ring. Splitting up the radio light into different colors, as a prism does, reveals the hydroxyl gigamaser (top-right rainbow-colored line). Credit: Inter-University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

Astronomers using the MeerKAT radio telescope in South Africa have discovered the most distant hydroxyl megamaser ever detected. It is located in a violently merging galaxy more than 8 billion light-years away, opening a new radio astronomy frontier. Hydroxyl megamasers are natural "space lasers"—extremely bright radio-wavelength emissions produced when hydroxyl molecules in gas-rich, merging galaxies crash into one another. These cosmic collisions compress gas and stimulate large reservoirs of hydroxyl molecules to amplify radio emission. The physical mechanism is very similar to lasers on Earth, but operates at a much longer wavelength of light of about 18 centimeters, rather than the optical light that our eyes can see. When this special radio light is exceptionally bright, it is termed a megamaser—a "cosmic beacon" that can be seen across vast stretches of the universe. This newly discovered system, HATLAS J142935.3–002836, is so distant that we are seeing it as it was when the universe was less than half its present age. It is both the most distant and luminous known. In fact, it is so luminous that it warrants the classification gigamaser, instead of megamaser. Despite its distance, it produced a surprisingly strong signal, which is thanks to the combined power of MeerKAT and a phenomenon known as strong gravitational lensing, which was theorized by Einstein. <https://phys.org/news/2026-03-meerkat-cosmic-laser-halfway-universe.html>

Astronomers discover rare super-Jupiter orbiting distant star



Discovery transit light curve of TIC-65910228 b. Credit: arXiv (2026). DOI: 10.48550/arxiv.2602.12977

Using NASA's Transiting Exoplanet Survey Satellite (TESS), an international team of astronomers has discovered a new exoplanet orbiting a distant star known as TIC-65910228. The newfound alien world is slightly larger and nearly five times more massive than Jupiter. TIC-65910228, or NGTS-38, is a bright metal-rich star of spectral type F6V-F7V, located some 864 light years away. The star, which is estimated to be 2.2 billion years old, is nearly two times larger than the sun, has a mass of about 1.46 solar masses, and its effective temperature is 6,310 K. TIC-65910228 has been observed with TESS several times in recent years, and

a single transit signal was detected in December 2020. Now, a group of astronomers led by Toby Rodel of the Queen's University Belfast, UK, has conducted follow-up photometric observations of TIC-65910228 with the Next Generation Transit Survey (NGTS) and spectroscopic radial velocity monitoring with CORALIE spectrograph and High Accuracy Radial Velocity Planet Searcher (HARPS). Their observational campaign allowed them to confirm the planetary nature of this transit signal. https://phys.org/news/2026-02-astronomers-rare-super-jupiter-orbiting.html#google_vignette

ALMA reveals Milky Way's core in largest-ever mosaic, tracing cold gas filaments

Astronomers have captured the central region of our Milky Way in a striking new image, unveiling a complex network of filaments of cosmic gas in unprecedented detail. Obtained with the Atacama Large Millimeter/submillimeter Array (ALMA), this rich dataset—the largest ALMA image to date—will allow astronomers to probe the lives of stars in the most extreme region of our galaxy, next to the supermassive black hole at its center. "It's a place of extremes, invisible to our eyes, but now revealed in extraordinary detail," says Ashley Barnes, an astronomer at the European Southern Observatory (ESO) in Germany who is part of the team that obtained the new data.

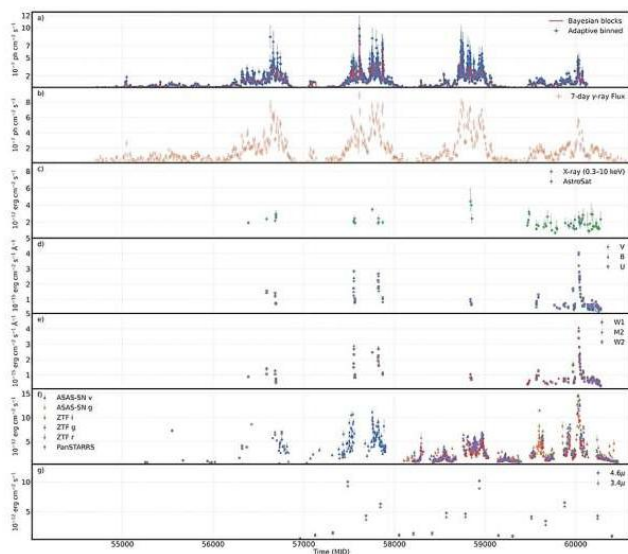


The complex distribution of molecular gas in the Central Molecular Zone (CMZ) of the Milky Way. It was obtained with the Atacama Large Millimeter/submillimeter Array. Credit: ALMA(ESO/NAOJ/NRAO)/S. Longmore et al. Background: ESO/D. Minniti et al.

The observations provide a unique view of the cold gas—the raw material from which stars form—within the so-called Central Molecular Zone (CMZ) of our galaxy. It is the first time the cold gas across this whole region has been explored in such detail. The region featured in

the new image spans more than 650 light-years. It harbors dense clouds of gas and dust, surrounding the supermassive black hole at the center of our galaxy. "It is the only galactic nucleus close enough to Earth for us to study in such fine detail," says Barnes. The dataset reveals the CMZ like never before, from gas structures dozens of light-years across all the way down to small gas clouds around individual stars. The gas that ACES—the ALMA CMZ Exploration Survey—specifically explores is cold molecular gas. The survey unpacks the intricate chemistry of the CMZ, detecting dozens of different molecules, from simple ones such as silicon monoxide to more complex organic ones like methanol, acetone or ethanol. https://phys.org/news/2026-02-largest-image-kind-hidden-chemistry.html#goog_rewarded

Multi-wavelength observations track bright gamma-ray blazar's three-year cycle



Multiwavelength light curve of S5 1044+71. Credit: arXiv (2026). DOI: 10.48550/arxiv.2602.23309

By analyzing the data from various space observatories and ground-based telescopes, European astronomers have performed a multiwavelength study of a bright gamma-ray blazar known as S5 1044+71. The new study, published Feb. 26 on the arXiv pre-print server, delivers a comprehensive view of this blazar, which could help us better understand its nature. Blazars are very compact quasi-stellar objects (quasars) associated with supermassive black holes (SMBHs) at the centers of active, giant elliptical galaxies. They are the most luminous and extreme subclass of active galactic nuclei (AGNs). The characteristic features of blazars are highly collimated relativistic jets pointed almost exactly toward

Earth. Astronomers divide blazars into two classes, based on their optical emission properties: flat-spectrum radio quasars (FSRQs) that feature prominent and broad optical emission lines, and BL Lacertae objects (BL Lacs), which do not. At a redshift of 1.15, S5 1044+71 is a distant FSRQ with an estimated black hole mass of about 3.5 billion solar masses. It is a bright blazar associated with the gamma-ray source designated 4FGL 1048.4+7143. Previous observations of S5 1044+71 have found that it experiences quasi-periodic oscillations (QPOs) in its gamma-ray light curve, with a periodicity of about three years.

<https://phys.org/news/2026-03-multi-wavelength-track-bright-gamma.html>

An interstellar comet packed with alcohol? What ALMA found in 3I/ATLAS



An artist's impression of 3I/ATLAS is shown as it passes near the sun, illuminating one side of the comet. On the side of the comet closer to the sun, the methanol gas is shown in blue, with icy dust grains still present in the gas. On the dark side of the comet, the hydrogen cyanide is shown in orange. Credit: NSF/AUI/NSF NRAO/M.Weiss

Comet 3I/ATLAS continues to make astonishing headlines, thanks to new findings from astronomers using the Atacama Large Millimeter/submillimeter Array (ALMA). This new research reveals that 3I/ATLAS is packed with an unusually large amount of the organic molecule methanol—more than almost all known comets in our own solar system.

"Observing 3I/ATLAS is like taking a fingerprint from another solar system," shares Nathan Roth, lead author on this research, and a professor with American University. "The details reveal what it's made of, and it's bursting with methanol in a way we just don't usually see in comets in our own solar system." Using ALMA's Atacama Compact Array in Chile, on multiple dates in late 2025, the team observed 3I/ATLAS as it approached our sun. As sunlight warmed its icy surface, 3I/ATLAS released gas and dust, forming a glowing halo (or coma) around its core. By analyzing this coma, astronomers revealed the chemical fingerprints of the material it is composed of, allowing them to study how objects might be made in another planetary system, without leaving our own. https://phys.org/news/2026-03-interstellar-comet-alcohol-alma-3iatlas.html#google_vignette

XRISM identifies gamma Cas X-ray origin, solving a 50-year-old stellar mystery

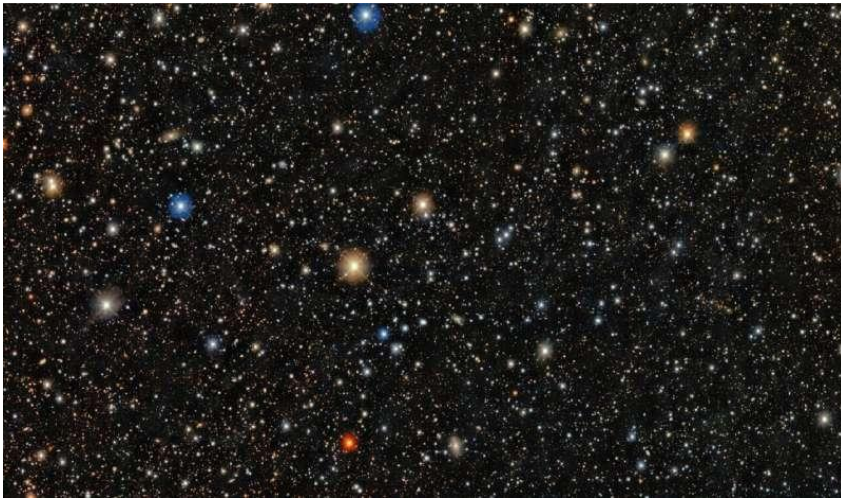


This artist's impression visualizes the massive star gamma-Cas and its small-but-dense white dwarf companion. Credit: ESA / Y. Nazé

Visible to the naked eye in the constellation Cassiopeia, the star γ Cas has puzzled astrophysicists for half a century. It emits X-rays of an intensity and temperature incompatible with what one would expect from an ordinary massive star. Observations, carried out using the Resolve

instrument aboard the Japanese XRISM telescope, now allow us to attribute this emission to the white dwarf orbiting γ Cas. This also confirms the existence of a family of binary systems long predicted to exist but never identified. γ Cassiopeia was the first Be-type star to be identified as such by the Italian astronomer Angelo Secchi in 1866. Be stars are fast-rotating massive stars that regularly eject matter. This matter forms a disk around the star, the presence of which is revealed by characteristic emissions in their optical spectrum. In 1976, it became apparent that γ Cas emitted X-rays with a luminosity approximately 40 times greater than that of comparable massive stars, with plasma heated to over 100 million degrees and unusually rapid variability. <https://phys.org/news/2026-03-xrism-gamma-cas-ray-year.html>

Extremely rare second-generation star discovered inside ancient relic dwarf galaxy



Pictor II ultra-faint dwarf galaxy. Credit: CTIO/NOIRLab/DOE/NSF/AURA.

Image Processing: T.A. Rector (University of Alaska Anchorage/NSF NOIRLab), M. Zamani & D. de Martin (NSF NOIRLab) Acknowledgment: PI: Anirudh Chiti, Alex Drlica-Wagner

Discovered in the Pictor II dwarf galaxy, star PicII-503 has an extreme deficiency in iron—less than 1/40,000th of the sun. This signature makes it the clearest example of a star within a primordial system that preserves the chemical enrichment of the universe's first stars.

PicII-503 also has an extreme overabundance of carbon, providing the missing link to connect carbon-enhanced stars observed in the Milky Way halo to an origin in ancient dwarf galaxies. Astronomers have discovered one of the most chemically primitive stars ever identified—an ancient stellar relic that preserves the chemical imprint of the very first stars in the universe. This star, named PicII-503, resides in the tiny, ultra-faint dwarf galaxy Pictor II. The discovery was enabled by the U.S. Department of Energy-fabricated Dark Energy Camera (DECam), mounted on the U.S. National Science Foundation Víctor M. Blanco 4-meter Telescope, at NSF Cerro Tololo Inter-American Observatory (CTIO) in Chile, a Program of NSF NOIRLab. <https://phys.org/news/2026-03-extremely-rare-generation-star-ancient.html>

Physicists trace the sun's magnetic engine, 200,000 kilometers below its surface

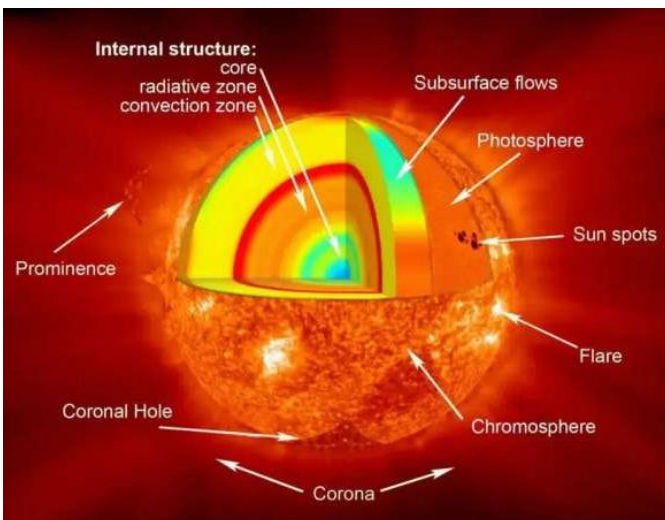
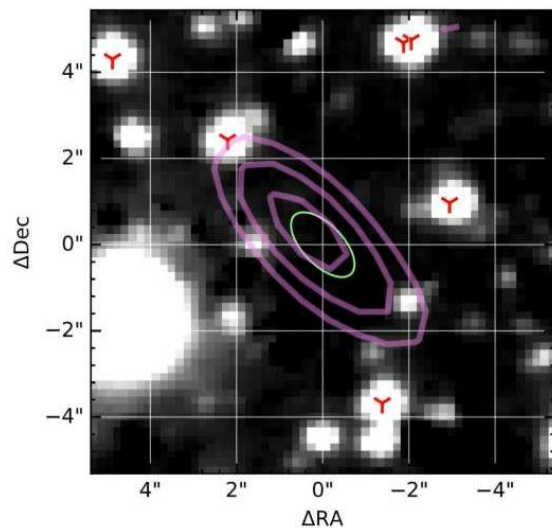


Diagram of the sun's interior and outer atmosphere, showing the core, radiative and convection zones—separated by the tachocline—and surface features such as sunspots, flares, the chromosphere and corona. Credit: NASA

Every eleven years, the sun's magnetic field flips. Sunspots—dark, cooler regions on the sun's surface that mark intense magnetic activity and often trigger solar eruptions—appear at mid-latitudes and migrate toward the star's equator in a butterfly-shape pattern before fading as the cycle resets. While this spectacle on the star's surface has long been visible to astronomers, where this powerful cycle begins inside the star has remained hidden until now. Researchers at

the New Jersey Institute of Technology (NJIT) have analyzed nearly three decades of solar oscillation data to trace the sun's interior dynamics, and have now pointed to the likely location of the star's magnetic engine deep beneath its surface: roughly 200,000 kilometers down, about the length of stacking 16 Earths end to end. The findings, published in *Scientific Reports*, provide one of the clearest observational windows yet into the sun's magnetic engine—the solar dynamo—shedding light on hidden forces shaping space weather patterns linked to the solar cycle, not only on Earth's nearest star, but potentially on other stars across the galaxy. <https://phys.org/news/2026-03-physicists-sun-magnetic-kilometers-surface.html>

Astronomers discover long-period radio transient of unknown origin



Ks-band Gemini observation of ASKAP J1424 with Stokes I radio contours from ATCA C3363 observation overlaid. Credit: arXiv (2026). DOI: 10.48550/arxiv.2603.07857

Using the Australian SKA Pathfinder (ASKAP), astronomers have discovered a new long-period radio transient source, which received the designation ASKAP J142431.2–612611 (ASKAP J1424 for short). The newfound transient has a period of approximately 36 minutes and its nature is unknown. The finding was reported in a paper published March 9 on the *arXiv* preprint server. Long-period radio transients (LPTs) are a new class of periodic radio emitters, with ultralong rotation periods (ranging from minutes to hours) and strong magnetic fields. Although some observations have suggested that these transients may originate from rotating neutron stars with extremely strong magnetic fields (magnetars) or magnetic white dwarfs, their true nature remains elusive. <https://phys.org/news/2026-03-astronomers-period-radio-transient-unknown.html>

This isn't just another rocky world orbiting a red dwarf—this one's special



This artist's illustration shows an exoplanet orbiting a dim red dwarf star. There are many unanswered questions about the survival of atmospheres on rocky world around M-dwarfs like this. Astronomers have found a red dwarf with an orbiting rocky exoplanet that is so well-understood it can serve as a benchmark for studies of exoplanet atmospheres. Credit: NASA/ ESA/ CSA/ Joseph Olmsted (STScI)/ Webb Space Telescope

Astronomers have found an exoplanet that could serve as a benchmark in future studies. It's a rocky planet orbiting an M-type star, and though these planets are plentiful, this one could serve as a benchmark for understanding other M-dwarf exoplanets and their atmospheres. According to the authors of a new study, this new exoplanet could serve as "a reference system for highly irradiated rocky planets." The new research is titled "TOI-4616 b: a benchmark Earth-sized planet transiting a nearby M4 dwarf," and it's been submitted to the *Monthly Notices of the Royal Astronomical Society*. The lead author is Francis Zong Lang, a doctoral researcher at the Center for Space and Habitability at the University of Bern in Switzerland. With more than 6,000 confirmed exoplanets, our understanding of the exoplanet population is becoming more complete. There are still observational biases in the results, but some trends are emerging. One thing that's becoming clear is the relationship between M dwarfs and rocky exoplanets. Research shows that M dwarfs are the most prolific hosts for terrestrial exoplanets. In fact, many of these stars host multiple rocky planets, with the TRAPPIST-1 system being the most well-known example: it hosts seven rocky planets. <https://phys.org/news/2026-03-isnt-rocky-world-orbiting-red.html>

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Pieter Kotzé	“Southern Cross” Astronomy News (Speaker Selector)