https://www.hermanus.astronomy@gmail.com

"The Southern Cross"

The Hermanus Astronomy Centre's Monthly Newsletter

May 2026

MONTHLY MEETINGS

At the April Monthly meeting held **21st April,** the HAC was privileged to have **Dr Ian Glass** present virtually via Zoom, "Astronomy in South Africa since 1971 – The Age of Astrophysics and Cosmology".

Known and respected internationally for his work in Astronomy, Dr Ian Glass's contributions to Astronomy in South Africa at the SAAO, have been considerable. In his presentation, Dr Glass spoke of his work in developing infrared astronomy at the Sutherland Observatory and some of the significant breakthroughs that his research led to: the use of Mira variables to calibrate the cosmic distance ladder; the IR mapping of the centre of the Milky Way; infrared observations of the Schoemaker-Levy collision with Jupiter in 1994, to name but few. He summarised the current status of the Astronomical Observatories in South Africa, how the field of research has grown and outlined plans for the future.

To listen to a recording of the presentation, please follow the link below:

The presentation and discussion link: https://www.youtube.com/watch?v=WVmkktus99s

Further details of Dr Ian Glass's career and achievements can be found on; Ian Glass astronomer home page

At our next meeting scheduled for on May **19th**, Prof Piet Meintjes will present, "A Southern Legacy Unfolds: Boyden Observatory and the Hunt for Cosmic Transients". This will be a Hybrid meeting. Invitations will be circulated shortly.

SPECIAL INTEREST GROUP ACTIVITIES

Cosmology

The **April 7th** meeting featured the first three parts 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://youtu.be/viOEf9UPFjk

Our next meeting on **May 5th** will cover Parts 4-5 of Episode 38: *"What is Reality?"*.

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

Study Group

On **31st March** the Study Group watched **Prof Brian Cox's** video, *"The terrifying possibility of the Great Filter"* - What if humanity is the galaxy's only advanced civilization? The Professor examined why, despite billions of stars and trillions of planets, we have found no evidence of other intelligent life (*The Fermi Paradox*).

The YouTube link: https://youtu.be/rXfFACs24zU

The discussion link: https://www.youtube.com/watch?v=Pa4DzRXF4GI

The Study Group session planned for April 28st was postponed owing to technical difficulties. The video of Prof Yuval Noah Harari's discussion of, *"Why advanced societies fall for mass delusion"* will now be presented on **May 12th**.

The topic for the study group scheduled for **26th May** will be, "Time lapse to the future of Earth." Sir David Attenborough asks; 'What if the end of Earth isn't in the distant future…but has already started?'

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

Observing.

Optimal dates for **May 2026**:

SUGGESTED EVENING OBSERVATION WINDOWS
(Lunar observations notwithstanding)

Date		*Moon*	*Dusk end*
May 7	*Rises*	**22h15 (69%)**	**19h22**
to **May 19**	*Sets*	**20h16 (13%)**	**19h14**

Moonwatch: A few days either side of **First Quarter** (23rd May). The lunar 'X' and Lunar 'V' are unlikely targets on May 24th, owing to the low altitude of the moon.

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

Outreach

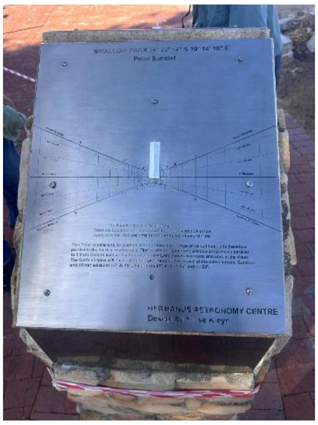
On Mon. 13th April, members of the HAC gathered at GPAED for an evening of star gazing. They were joined by 16 enthusiastic young learners and their teacher Zimkhitha from Lukhanyo Primary School, as well as several curious members of the public. And *St. Dominic - the patron Saint of Astronomers* – came too, for they were blessed with clear skies and a gentle breeze making for a delightful evening of viewing.

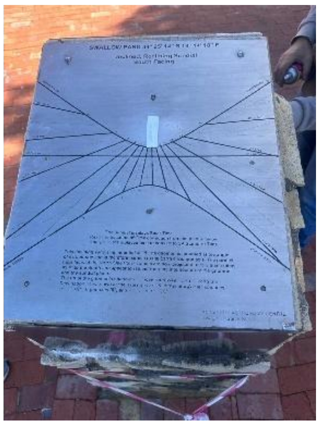
As always, Jupiter was a crowd favorite. Many of those present saw the planet ‘up close’ for the first time and were amazed to see several distinct cloud bands and 3 satellites. Other highlights included the double star Crux-A, the Trapezium in M42, the Jewel Box star cluster, the Southern Pleiades and the spectacular Omega globular cluster in Centaurus. The experience was of particular interest to the learners as they were set to participate in the NRF-SAASTA inter-schools AstroQuiz® on 16th April. Overall, the group spent 1½ hrs star gazing before heading home. The HACC wish to express their sincere thanks to Mick Fynn (HAC Outreach), to Zimkhitha Buyile for bringing the learners to the venue and to our members that participated, for making the whole evening worthwhile.

Above: “It’s all looking-up” at Gearings Point.

Left: Mick Fynn, Zimkhitha Buyile and the learners from Lukhanyo Primary School.

Projects and Maintenance





Swallow Park was upgraded in 2013 as a Ward Committee project utilising its discretionary budget. As a member of the Ward Committee, the HAC volunteered to design and erect a sundial. Steve Kleyn designed not only one but two sundials of unusual design: A Polar sundial on the North side and a 15˚Declining sundial on the South side. The sundials’ diagrams were laser engraved on natural marble with Stainless Steel information tablets (Equation of Time correction curves and analemma, as well as a description of the origin and components of the Equation of Time). The sandstone-dressed plinth was declared the standard design for all future municipal information plaques (Hermanuspietersfontein, Gearings Point, Swallow Park).

Unfortunately, the laser engraving faded distressingly fast, which rendered the sundial almost illegible. They were then redone with chemical etching on stainless steel, and purposefully thin gnomons of insignificant recycling value. This sadly did not deter vandals from breaking off the SS gnomons, which have subsequently been replaced by painted Perspex gnomons.

As an unintended consequence of Swallow Park's current upgrade by the Business Chamber, the sundials are now much more prominently visible near the Western entrance to the park. In response to this Derek Duckitt, Deon Krige and Pierre de Villiers gave the SS a "facelift" with Marine Shine paste.

Photos showing Derek and Deon busy polishing and also some photos of the SS sundials.

ASSA

From Tim Cooper

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

https://assa.saao.ac.za/wp-content/uploads/sites/23/2026/03/ASSA-CAMnotes-2026-Number-2.pdf

MNASSA

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

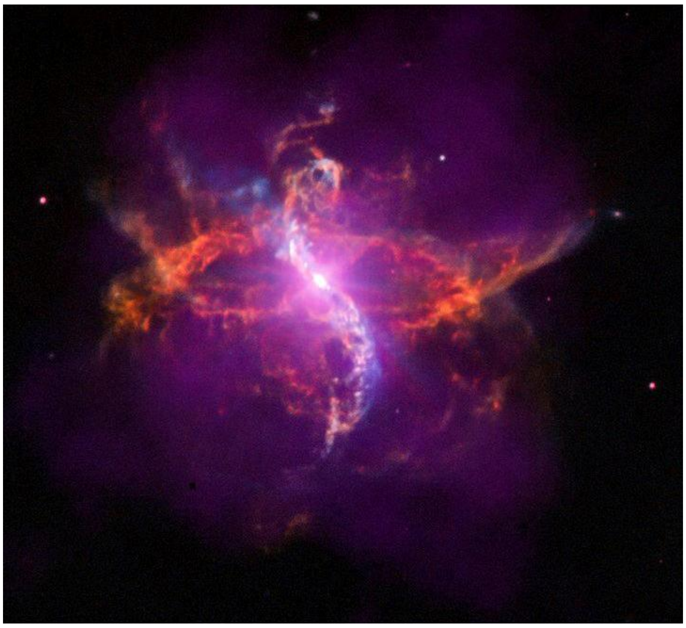
http://www.mnassa.org.za/

Astronomy News April 2026 continued overleaf…

ASTRONOMY NEWS April 2026

Compiled by Pieter Kotzé

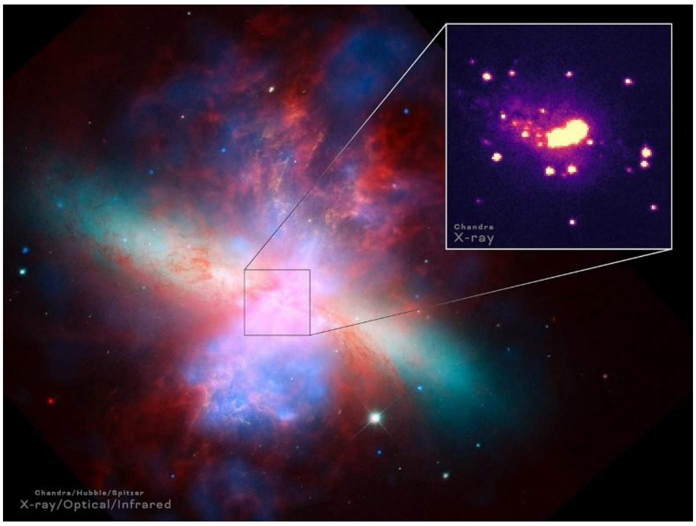
APRIL ASTRONOMY PICTURE



Credit: Image courtesy of J.A. Toalá, L. Sabin, M.A. Guerrero, G. Ramos-Larios, Y.-H. Chu, T. Liimets and ESA

R Aqr Redux: Symbiotic stars are parasitic binary systems composed of an evolved red giant star bound together with a dead, compact companion, usually a white dwarf. Gas from the red giant falls upon the compact object, is crushed by the strong gravity and heated, finally igniting in a thermonuclear blast by conversion of hydrogen into helium. This rejuvenates the white dwarf for a while, and it once again produces energy. The variable star R Aquarii (R Aqr) is an intriguing example of stellar symbiosis where the history of past outbursts can still be seen as complex, spectacular structures surrounding the star. R Aqr is nearby (about 1200 lightyears away) so it's one of the best studied of all the symbiotic stars known. The image above is a composite false color image of the nebula around R Aqr seen in X-rays (from the XMM-Newton observatory) in purple along with an optical image from the Very Large Telescope. The optical image shows several bowl-shape cavities in the extended nebula around R Aqr. The X-ray emission seen by XMM is probably related to the wiggling jet from the white dwarf companion previously seen by the Chandra X-ray Observatory. Scientists believe that this jet is an ongoing feature emanating from the accretion disk around the white dwarf that helps clear out and heat up the outer ejecta, producing the extended X-ray emission seen by XMM-Newton. This is an important local case of how accreting systems "feedback" to their environments. Studying the ways in which R Aqr influences it environment helps astronomers understand the importance of feedback from accreting supermassive black holes at the centers of active galaxies on extragalactic scales.

NASA-JAXA's XRISM Telescope Clocks Hot Wind of Galaxy M82



The cool wind of galaxy M82 drives gas and dust up to 40,000 light-years from its core, as shown here using data from NASA's Chandra X-ray Observatory and Hubble and Spitzer space telescopes. The inset shows a Chandra view of the galaxy's central region, where a cauldron of stellar activity kick-starts the larger-scale outflow.

NASA's Goddard Space Flight Center; X-ray: NASA/CXC/JHU/D.Strickland; Optical: NASA/ESA/STScI/AURA/The Hubble Heritage Team; Infrared: NASA/JPL-Caltech/Univ. of AZ/C. Engelbracht; XRISM Collaboration et al. 2026

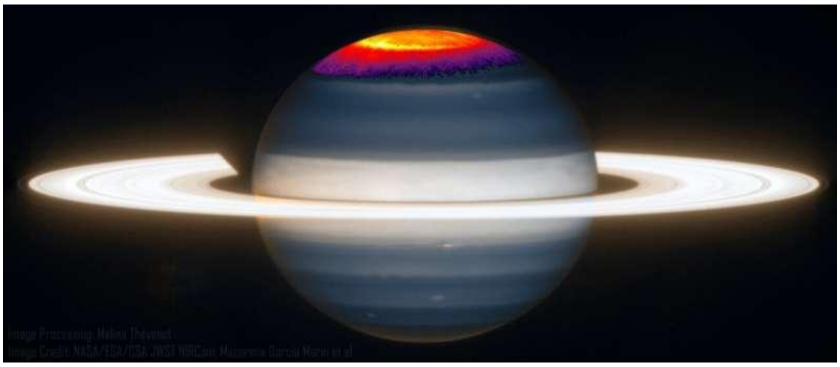
For the first time, astronomers have directly measured the speed of superheated gas billowing from a cauldron of stellar activity at the heart of M82, a nearby galaxy undergoing an extraordinary burst of star formation. The material is moving more than 2 million miles (over 3 million kilometers) per hour and appears to be the primary force driving a cooler, well-studied, galaxy-scale wind. Researchers made the calculations using data from the Resolve instrument aboard the XRISM (X-ray Imaging and Spectroscopy Mission) spacecraft. Sometimes called the Cigar galaxy, M82 is located 12 million light-years away in the northern constellation Ursa Major. Astronomers classify it as a starburst galaxy because it's forming stars at a much higher rate than typical for its size — about 10 times faster than the Milky Way. https://science.nasa.gov/missions/xrism/nasa-jaxas-xrism-telescope-clocks-hot-wind-of-galaxy-m82/

Young "Sun" Caught Blowing Bubbles by NASA's Chandra

These images show the star HD 61005 with X-rays from the Chandra X-ray Observatory as well as infrared data from Hubble Space Telescope. A view in optical light from a telescope in Chile shows the larger field that HD 61005 is located in. Astronomers recently used Chandra to discover an "astrosphere," a wind-blown bubble, around HD 61005, the first seen around a star like the Sun.

For the first time, a much younger version of the Sun has been caught red-handed blowing bubbles in the galaxy, by astronomers using NASA's Chandra X-ray Observatory. The bubble — called an "astrosphere" — completely surrounds the juvenile star. Winds from the star's surface are blowing up the bubble and filling it with hot gas as it expands into much cooler galactic gas and dust surrounding the star. The Sun has a similar bubble around it, which scientists call the heliosphere, created by the solar wind. It extends far beyond the planets in our solar system and protects Earth from damaging particles from interstellar space. This is the first image of an astrosphere astronomers have obtained around a star similar to the Sun. It shows slightly extended emission, rather than a single point of light as seen for other such stars. The star is called HD 61005 and is located about 120 light-years from Earth, making it relatively close. HD 61005 has roughly the same mass and temperature as the Sun, but it is much younger with an age of about 100 million years, compared to the Sun's age of about 5 billion years. Because it is so young, HD 61005 has a much stronger wind of particles blowing from its surface that travels about 3 times faster and is about 25 times denser than the wind from the Sun. This amplifies the process of astrosphere bubble-blowing and mimics how our Sun was behaving several billion years ago. https://www.cfa.harvard.edu/news/young-sun-caught-blowing-bubbles-nasas-chandra

JWST solves decades-long mystery about why Saturn appears to change its spin



The asymmetric temperature structure as it was observed from JWST. These are offset from where the currents flow into and out of the planet, but ultimately, the winds generated by this temperature offset are what drive those currents. Credit: Image/movie NASA/ESA/CSA, Tom Stallard (Northumbria University), Melina Thévenot, Macarena Garcia Marin (STScI/ESA).

Researchers at Northumbria University have used the most powerful space telescope ever built to answer one of the longest-standing puzzles in planetary science—why does Saturn appear to spin at a different speed depending on how you measure it? The findings, published in the *Journal of Geophysical Research: Space Physics*, reveal for the first time the complex patterns of heat and electrically charged particles in Saturn's aurora, and show that the entire system is driven by a self-sustaining feedback loop powered by the planet's own northern lights. Saturn has puzzled scientists for many years. Measurements taken by NASA's Cassini spacecraft in 2004 suggested the planet's rotation rate was slowly changing over time—yet this should not have been possible, as a planet cannot simply speed up or slow down its spin. In 2021, a study led by Tom Stallard, Professor of Planetary Astronomy at Northumbria University, showed that the mystery did not actually involve Saturn's rotation at all. Instead, the apparent changes were being driven by winds in the planet's upper atmosphere, which were producing electrical currents that created the misleading auroral signal. However, the findings raised a further question for the research team—if atmospheric winds were responsible for the effect, what was causing those winds? New research by Professor Stallard and colleagues across the UK and US has now provided the first direct evidence of the answer. Using the James Webb Space Telescope (JWST), the team observed Saturn's northern auroral region. Saturn's aurora is not just a visual display—it is actively heating the atmosphere in a specific location. That localized heating drives winds, which in turn generate the electrical currents responsible for the aurora. The aurora then heats the atmosphere again, sustaining the whole cycle. https://phys.org/news/2026-03-jwst-decades-mystery-saturn.html

Webb reveals hidden details of W51 star formation

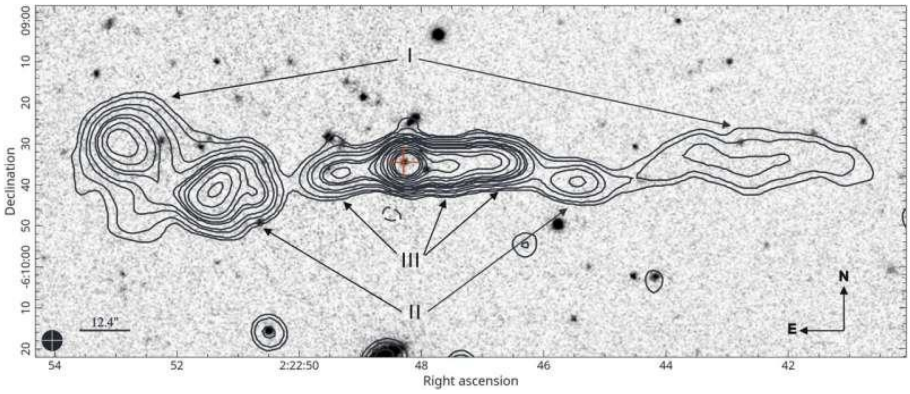
This three-color image in the mid-infrared shows glowing gas illuminated by ultraviolet light. In this image, red gas is hotter than blue. Credit: Ginsburg & Yoo

A team of University of Florida researchers used the James Webb Space Telescope to capture photos of a star-forming region known as W51 with never-before-seen clarity and resolution. The long wavelengths of JWST's infrared technology allowed astronomers to see the stars clearly and show what was previously hidden. Stars in the W51 region are very young and massive, and using the telescope gave the team the ability to view the early stages of star formation. The telescope's infrared technology revealed that the stars in the area started forming relatively recently, roughly within the past million years, and are still forming. This isn't the first time this region has been photographed and observed. But it may as well be. Before gaining access to this technology, these stars were difficult to see. They are still wrapped in the dust of their birth environment, which obscured the view provided by most other telescopes. The telescope revealed young stars, including those still growing to their birth weight, that couldn't be seen before and atoms and molecules that are invisible at other wavelengths. "With optical and ground-based infrared telescopes, we can't see through the dust to see the young stars," said Adam Ginsburg, Ph.D., a professor of astronomy at UF. "Now we can." https://phys.org/news/2026-03-webb-reveals-hidden-w51-star.html

A rare 'triple-double' radio galaxy discovered using MeerKAT

Astronomers have discovered an exceptionally rare radio galaxy that has three distinct pairs of radio lobes. This system falls into a subpopulation of radio galaxies known as "triple-double" radio galaxies (TDRGs). Located nearly 7.5 billion light-years away, this unique system, catalogued as J022248−060934, is only the seventh known example of its kind. Radio galaxies are powered by accreting supermassive black holes that launch powerful jets of charged particles in opposite directions. As these jets crash into the surrounding interstellar medium, they form large-scale lobes of magnetized plasma. Within these jets and lobes, relativistic electrons spiral around magnetic field lines and emit synchrotron radiation, which is observed at radio wavelengths. These extended regions of emission on either side of the host galaxy are known as radio lobes.

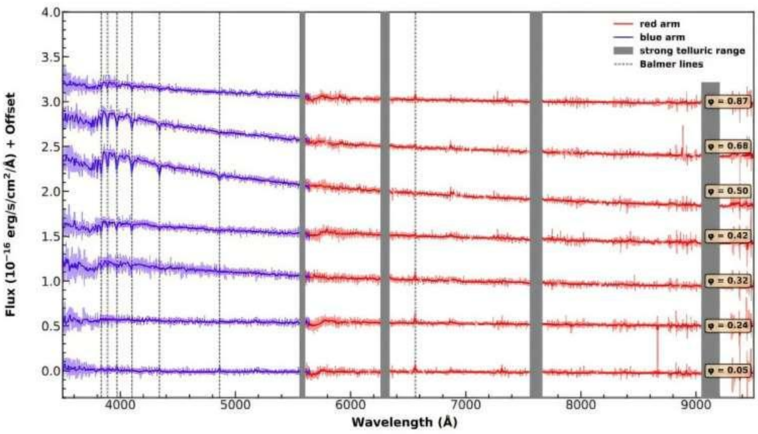
Using observations from the MeerKAT International GigaHertz Tiered Extragalactic Exploration (MIGHTEE) survey, researchers found that J022248−060934 has three radio lobes, with distinct peaks of radio emission, located on either side. The presence of three pairs of lobes indicates that the central black hole has switched on and off at least three times. The radio emissions extend roughly 5 million light-years across, classifying it as a giant radio galaxy.



Radio continuum image of the TDRG showing its morphology as well as the position of its host galaxy, as indicated by the central cross. The three pairs of lobes are indicated by I (outermost), II (middle) and III (innermost). Credit: Monthly Notices of the Royal Astronomical Society (2026). DOI: 10.1093/mnras/stag378

https://phys.org/news/2026-03-rare-triple-radio-galaxy-meerkat.html#google_vignette

ZTF discovers a new mass-transferring brown dwarf binary system

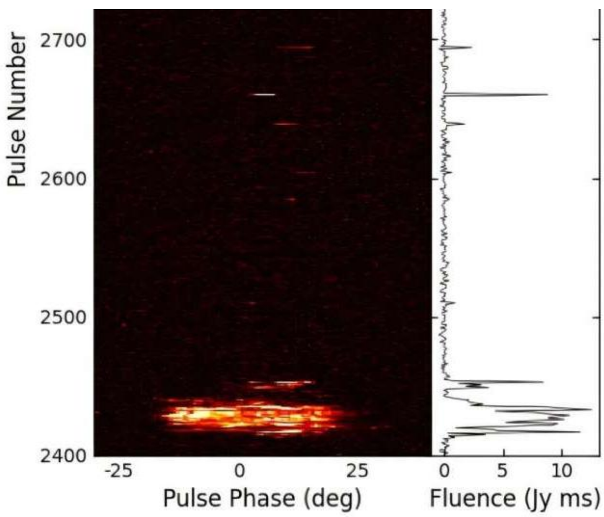


Phase resolved spectra of ZTF J1239+8347 obtained with the Low-Resolution Imaging Spectrograph (LRIS). Credit: Whitebook et al., 2026.

Astronomers from the California Institute of Technology (Caltech) and elsewhere report the discovery of a binary system consisting of two brown dwarfs undergoing stable mass transfer. The detection of the system, designated ZTF J1239+8347, was made with the Zwicky Transient Facility (ZTF). Brown dwarfs (BDs) are intermediate objects between planets and stars, occupying the mass range between 13 and 80 Jupiter masses (0.012 and 0.076 solar masses). Although many BDs have been detected to date, these objects orbiting other stars or each other in binary systems are a rare find. Recent observations with ZTF, conducted by a team of astronomers led by Caltech's Samuel Whitebook, have revealed the presence of a new system of this rare type. The new BD binary was found at a distance of some 1,100 light years and received designation ZTF J1239+8347. https://phys.org/news/2026-03-ztf-mass-brown-dwarf-binary.html#goog_rewarded

FAST observes a peculiar rotating radio transient that also switches to pulsar states

Using the Five-hundred-meter Aperture Spherical Radio Telescope (FAST), Chinese astronomers have explored the behavior of a rotating radio transient (RRAT) known as RRAT J1574+4703. The new observations found that this object switches between RRAT and normal pulsar states.. Rotating radio transients (RRATs) are a subclass of pulsars characterized by sporadic emission. The first objects of this type were identified in 2006 as sporadically appearing dispersed pulses, with frequencies varying from several minutes to several hours. However, the nature of these transients is still unclear. In general, it is assumed that they are ordinary pulsars that experience strong pulses.

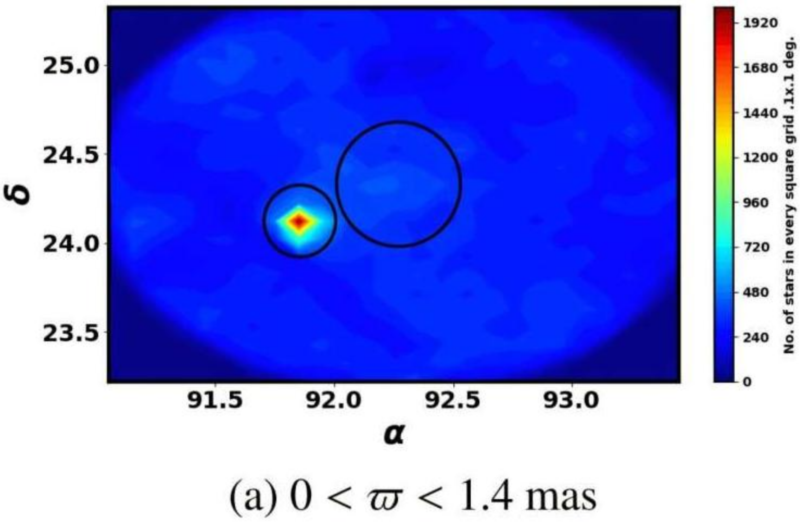


Single pulse stack of 500 consecutive pulses from RRAT J1541+4703, exhibiting both RRAT and pulsar emission states. The right panel shows the fluence for each pulse, with distinct null pulses observed in both states. Credit: arXiv (2026). DOI: 10.48550/arxiv.2603.24001

Given that so far only slightly more than 100 RRATs have been found, astronomers are interested in studying them in detail in order to improve our knowledge about their still largely unknown nature.Discovered in 2023, RRAT J1574+4703 has a period of approximately 0.28 seconds and a characteristic age of some 21 million years, therefore older than typical pulsars. Its surface magnetic field strength was measured to be 244 billion Gauss, which means that it is stronger than the magnetic field of normal pulsars. Previous observations of RRAT J1574+4703 have found that it exhibits subpulse drifting, extremely narrow pulses, and also often displays double peaks. In order to further explore these unique emission phenomena, a team of astronomers led by Xin Xu of the Guizhou Normal University in China, have observed RRAT J1574+4703 with FAST at a center frequency of 1,250 MHz.

https://phys.org/news/2026-04-fast-peculiar-rotating-radio-transient.html

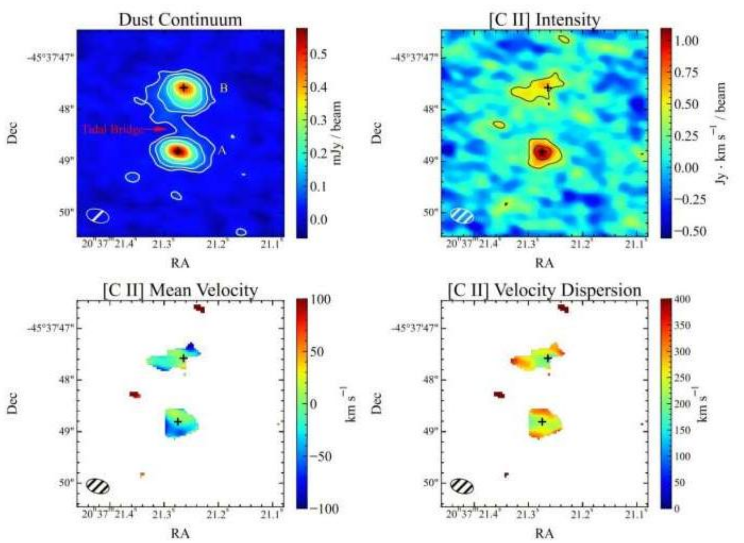
Gaia analysis finds Messier 35 is larger and older than earlier estimates



Surface number density map in the field of NGC 2168 under different astrometric selection criteria. Two stellar overdensities are visible, corresponding to NGC 2168 (larger circle) and the more distant background cluster NGC 2158 (smaller circle). Credit: arXiv (2026). DOI: 10.48550/arxiv.2603.22410

Astronomers from Egypt and Turkey have conducted a comprehensive analysis of kinematic, structural, and astrophysical parameters of a nearby open cluster known as NGC 2168. Results of the new study, published March 23 on the *arXiv* preprint server, put more constraints on the properties of this cluster. In general, open clusters (OCs) are groups of stars formed from the same giant molecular cloud and loosely gravitationally bound to each other. Studying these clusters in detail could be crucial for improving our understanding of the formation and evolution of our galaxy. NGC 2168, also known as Messier 35 (or M35), is a galactic OC located some 3,000 light years away in the Gemini constellation. It has an age of about 100–150 million years and some studies estimate that it hosts more than 4,000 stars, which makes it one of the most populous and well-studied intermediate-age OCs in the solar neighbourhood. Due to its proximity and intermediate age, NGC 2168 serves astronomers as a critical template for studying stellar properties at the transition between young and intermediate-age populations. https://phys.org/news/2026-03-gaia-analysis-messier-larger-older.html

ALMA confirms rare quasar pair at redshift 5.7 in merging galaxies

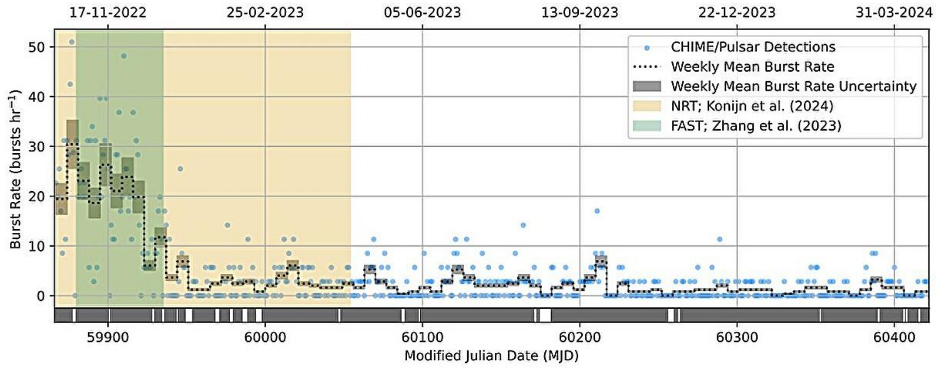


The ALMA observation of J2037–4537. The images are cleaned with natural weighting. Credit: arXiv (2026). DOI: 10.48550/arxiv.2604.06504

Using the Atacama Large Millimeter/ submillimeter Array (ALMA), astronomers have discovered a close pair of quasars, which is a result of a distant massive galaxy merger. The detection of the quasar pair was detailed in a research paper published April 7 on the *arXiv* pre-print server. Quasars, or quasi-stellar objects (QSOs), are active galactic nuclei (AGN) in the centers of active galaxies, powered by supermassive black holes (SMBHs). They showcase very high bolometric luminosities (over one quattuordecillion erg/s), emitting electromagnetic radiation observable in radio, infrared, visible, ultraviolet and X-ray wavelengths. Galaxy mergers can sometimes ignite SMBHs in both merging galaxies, producing a close pair of quasars. Such systems are relatively rare and usually found at redshifts below 4.0, which is consistent with cosmological simulations suggesting that their abundance peaks at cosmic noon. However, in 2021, astronomers led by Minghao Yue of the Steward Observatory in Tucson, Arizona reported the identification of a first candidate close quasar pair at a redshift of above 4.0. The system, which received designation J2037–4537, was detected at a redshift of 5.7. https://phys.org/news/2026-04-alma-rare-quasar-pair-redshift.html

CHIME tracks a hyperactive repeating fast radio burst source

Using the Canadian Hydrogen Intensity Mapping Experiment (CHIME), an international team of astronomers has performed radio observations of FRB 20220912A—a highly active source of repeating fast radio bursts. Results of the monitoring campaign, published April 10 on the preprint server *arXiv*, could help us better understand the nature of these enigmatic sources. Fast radio bursts (FRBs) are intense bursts of radio emission lasting milliseconds showcasing the characteristic dispersion sweep of radio pulsars. The physical nature of these bursts is yet unknown, and astronomers consider a variety of explanations ranging from synchrotron maser emission from young magnetars in supernova remnants to cosmic string cusps. FRB 20220912A is a hyperactive repeating fast radio burst discovered in 2022 with CHIME's FRB instrument. It is located in the active galaxy PSO J347.2702+48.7066, at a redshift of 0.077. Previous observations of this source have detected burst rates of up to 390 bursts per hour and found that the estimated total emitted energy may challenge some FRB progenitor models involving magnetars.



Burst rate versus time for FRB 20220912A. The blue points show the mean burst rate from each CHIME/Pulsar observation. The black dotted line shows the mean burst rate observed by CHIME/Pulsar over week-long intervals with uncertainties. The highlighted regions show the periods where FAST (green) and NRT (yellow) observed the source. The gray bar along the bottom of the plot shows days on which CHIME/Pulsar tracked the source for a full 21.2-minute transit (gray) versus days where CHIME/Pulsar was down or did not track the source for the nominal 21.2-minute transit (white). Credit: arXiv (2026). DOI: 10.48550/arxiv.2604.09098

https://phys.org/news/2026-04-chime-tracks-hyperactive-fast-radio.html

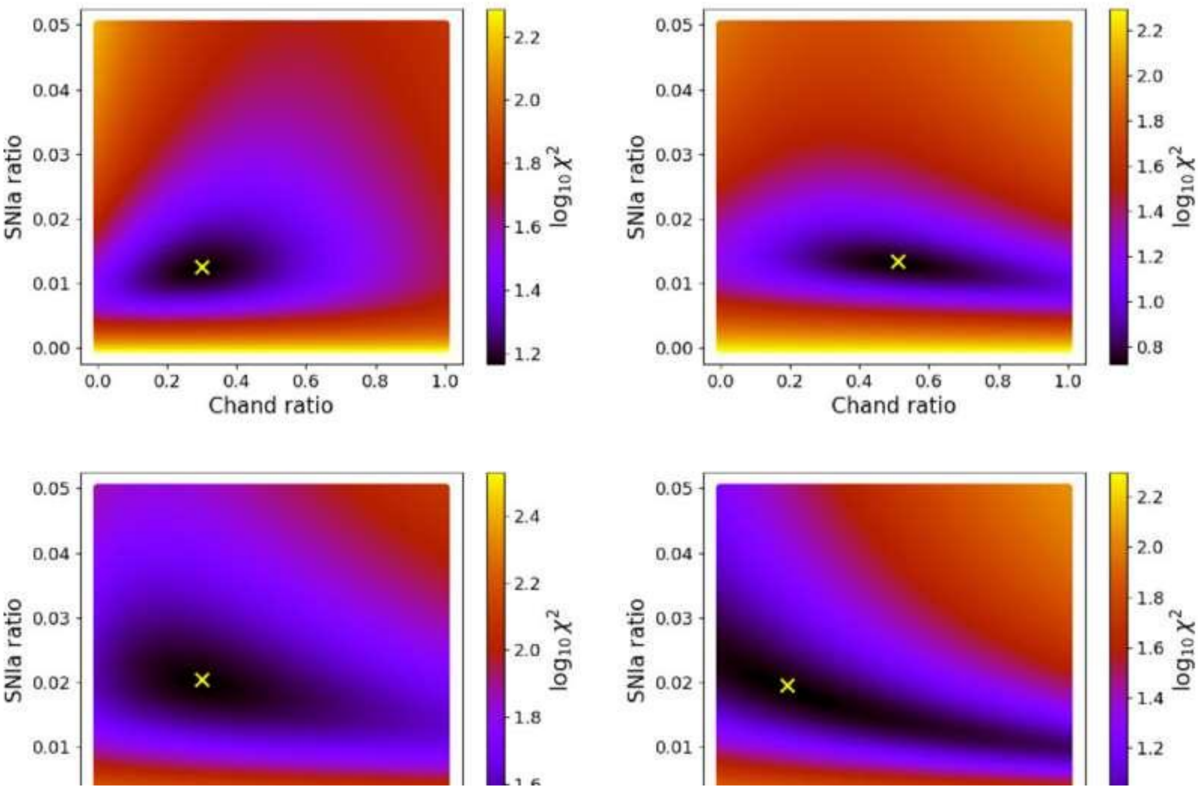
The edge of the Milky Way's star-forming disk revealed

Credit: CC0 Public Domain

How far the Milky Way's disk extends has long been difficult to define—it doesn't end sharply, but fades away gradually at its outer edges. Now, for the first time, an international team of astronomers has identified the edge of the Milky Way's star-forming disk by studying the ages of stars, revealing that the bulk of our galaxy's star formation occurs within 40,000 light-years of the Galactic Center. The researchers employed a new approach combining analysis of the ages of bright, giant stars with advanced computer simulations of galaxy evolution. This method unveiled a "U-shaped" pattern in the distribution of the ages of stars, which pinpoints the edge of the Milky Way's star forming regions. "The extent of the Milky Way's star-forming disk has long been an open question in galactic archaeology; by mapping how stellar ages change across the disk, we now have a clear, quantitative answer," said the paper's lead author, Dr. Karl Fiteni, now based at the University of Insubria. Galaxies do not form stars uniformly across their disks. Instead, they build themselves from the center outward. Star formation began in their dense central regions and gradually extended outward over billions of years, a process astronomers call "inside-out" growth. This means that, in general, on average, stars are younger the further they are from the center, since the outer disk is where star formation has only recently reached. The research revealed that in the Milky Way, the average age of stars does indeed decrease away from the center, which is exactly what is expected from inside-out. https://phys.org/news/2026-04-edge-milky-star-disk-revealed.html

Theoretical models of supernova chemistry overhauled after X-ray data from Perseus Cluster reveal key discrepancies

The Perseus Cluster is a massive galaxy cluster located in the constellation Perseus. It is one of the largest structures in the observable universe, comprising more than a thousand galaxies—equivalent to roughly a thousand trillion times the mass of the sun. Hot gases within the cluster, known as the intracluster medium (ICM), emit powerful X-rays detectable by telescopes. These gases are produced by billions of supernova explosions, and their chemical composition reveals how typical supernovae have exploded throughout cosmic history. Observational data from the legacy Hitomi telescope (also known as Astro-H) indicate that theoretical models predict too much silicon and sulfur, and too little argon and calcium. These elements are abundantly produced by massive stars—those with masses 10 times that of the sun or greater—suggesting that current models of massive stars and their supernova explosions need to be revised to align with these observations. https://phys.org/news/2026-04-theoretical-supernova-chemistry-overhauled-ray.html



The left column shows the best-rate models, represented by the three models with SNe Ia fractions f_{Ia} and f_{Chand} closest to the empirical values of 0.007 and 0.33, respectively. Credit: The Astrophysical Journal (2026). DOI: 10.3847/1538-4357/ae4979

3I/ATLAS contains 30 times more semi-heavy water than comets in our solar system

New observations of the interstellar comet 3I/ATLAS include the first measurement of the abundance of deuterated water relative to ordinary water in an interstellar object. Astronomers using the Atacama Large Millimeter/submillimeter Array (ALMA) discovered that the interstellar comet 3I/ATLAS is made of an astonishingly high ratio of semi-heavy water relative to water, indicating that its system of origin likely formed under conditions far colder than our own.

This team of researchers at the University of Michigan, led by Ph.D. student Luis E. Salazar Manzano, working with assistant professor Teresa Paneque-Carreño, made this discovery just six days after 3I/ATLAS was closest to our sun using ALMA's Atacama Compact Array. "Our new observations show that the conditions that led to the formation of our solar system are much different from how planetary systems evolved in different parts of our galaxy," said Salazar Manzano.

The interstellar comet must have formed in a system far colder than our own solar system's history, and under very specific radiation conditions, before it was ejected into interstellar space.

https://phys.org/news/2026-04-3iatlas-semi-heavy-comets-solar.html

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