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

"The Southern Cross"

The Hermanus Astronomy Centre's Monthly Newsletter

November 2026

MONTHLY MEETINGS

At the monthly meeting held on TUESDAY 20TH our guest speaker **Pieter Kotzé** presented, **"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. These space telescopes have the unique ability to capture electromagnetic radiation from distant objects in the universe without interference from Earth's atmosphere that would otherwise be invisible for ground-based observatories. Pieter discussed some of the most important space telescopes contributing new knowledge to our understanding of the universe.

Follow the link below to access the full presentation.

The YouTube link: https://youtu.be/xC0wSftWwjg

Our next Monthly Meeting is scheduled for **Wednesday 4th November**, by special arrangement with Onrus Manor, at which **Claire Bradshaw** will present in person**, "Hermanus and Horsham - Two Societies - One Universe."**

> Claire Bradshaw is a Horsham, West Sussex based Astronomer and Astrophotographer, plus a Fellow of the Royal Astronomical Society. She was nominated and awarded such for her role in outreach into the Community of all ages and abilities to ensure as many people as possible get to experience the Universe in terms they can understand. She is an experienced eLearning developer and her career has meant taking subjects people say they can't understand and turning it into a way they can.
>
> Claire's presentation is about Horsham itself, about the Horsham Astronomy Group (HoAG) in West Sussex, England, some of the talks they have had and a showcase of astronomy photos taken with amateur telescopes by their members - especially northern hemisphere objects too far North for South Africa.

SPECIAL INTEREST GROUP ACTIVITIES

Cosmology

At the cosmology meeting held **6th October,** we listened to episode 39 of **"The History of Everything – WHERE IS EVERYTHING IN THE UNIVERSE GOING?"**

> The History of the Universe video 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.

See below for the links to the video and discussion:

The YouTube link: https://www.youtube.com/watch?v=5mDn2oq9OV8

The post video discussion link: https://youtu.be/CMWHVpHPbYY

Our next cosmology meeting will be on **3rd November** during which we will watch the History of the Universe. Episode 40, **"Have we finally found the first planets?"**

> History of the Universe explores the chaotic formation of the early cosmos, where supernovas threatened nascent worlds. Through advanced telescopes, astronomers now search for biosignatures on distant rocky planets, revealing bizarre worlds like those with rain of glass or massive ring systems.

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

Study Group

On **27th October** we watched a YouTube video that explores, **"WHY DOES NORTH AMERICA RUN ON 60 HZ WHILE MOST OF THE WORLD USES 50 HZ?"**

> It sounds like a tiny technical detail, but that 10-cycle difference helped shape the modern world. This video explored the historical origins and long-lasting consequences of the global divide between 60 Hz and 50 Hz electrical frequencies. This split represents one of the most permanent features of modern infrastructure, rooted in choices made during the late 19th century. The video traced the history behind the global split in electrical frequency—from Edison, Tesla, and the War of Currents to Niagara Falls, AEG, and the reason Japan is still divided between two incompatible power grids today.

This very interesting video was the subject of a highly engaging and thought-provoking discussion. For those who wish to watch it again please follow the links below.

YouTube link: https://www.youtube.com/watch?v=7voH3cm2h1M

The discussion link: https://youtu.be/t_EPRAszQHU

Our final Study Group session for 2026 is scheduled for **24th November.** The topic for discussion 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 **Nov 2026**:

SUGGESTED EVENING OBSERVATION WINDOWS

(Lunar observations notwithstanding)

Moonless windows			*Astronomical dusk*
October 30 to	*Rises*	**23h21 (72%)**	**20h51**
November 13	*Sets*	**23h24 (14%)**	

Moonwatch: A few days either side of **First Quarter** (17th Nov).

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

ASSA

From Tim Cooper

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

https://assa.saao.ac.za/wp-content/uploads/sites/23/2026/09/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

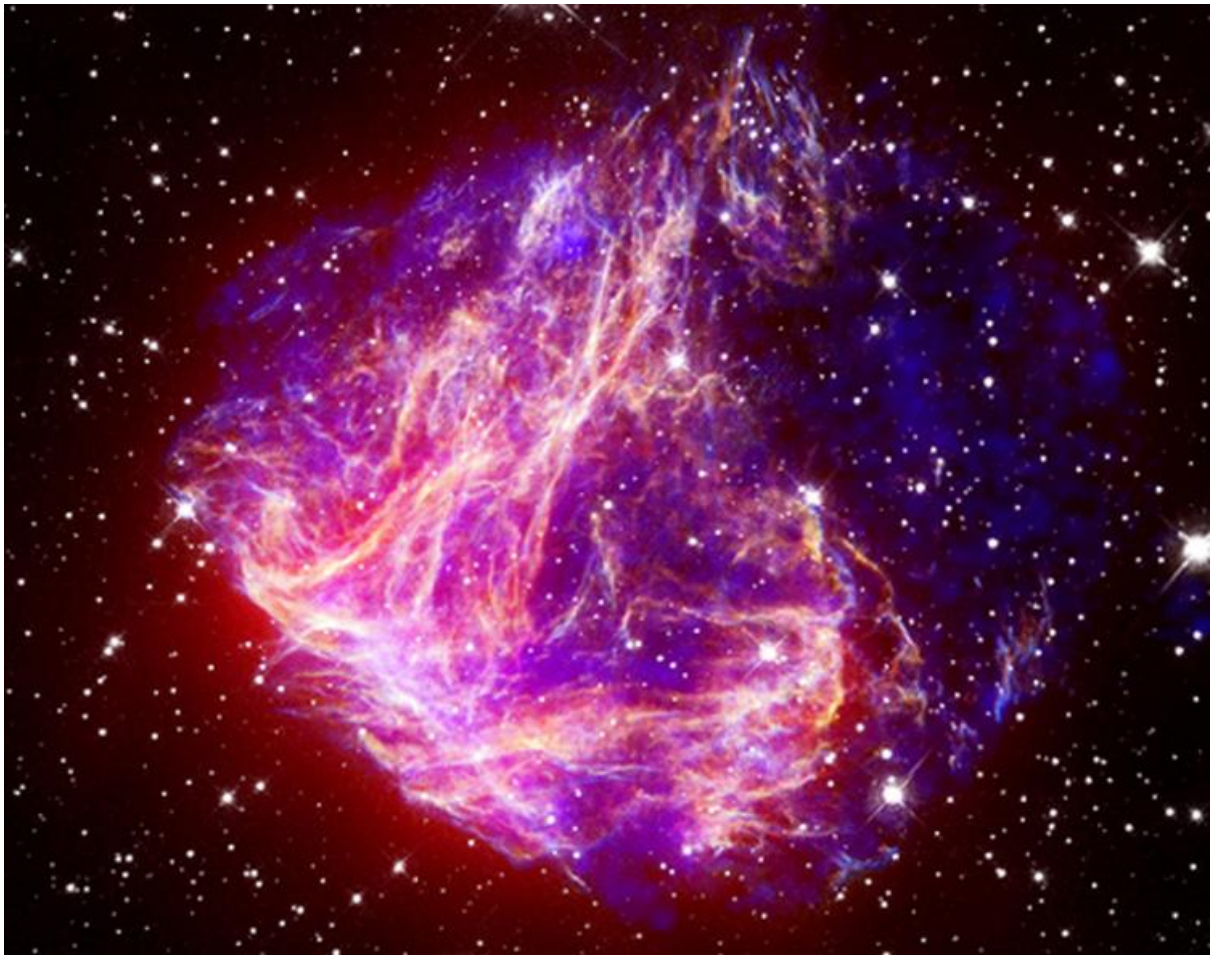
The latest Shallow and Deep Sky Bulletin by the ASSA Director, Colin Steyn, is now available for download from https://assa.saao.ac.za/publications/deep-sky

Astronomy News October 2026 continued overleaf…

ASTRONOMY NEWS October 2026

Compiled by Pieter Kotzé

October Astronomy Picture

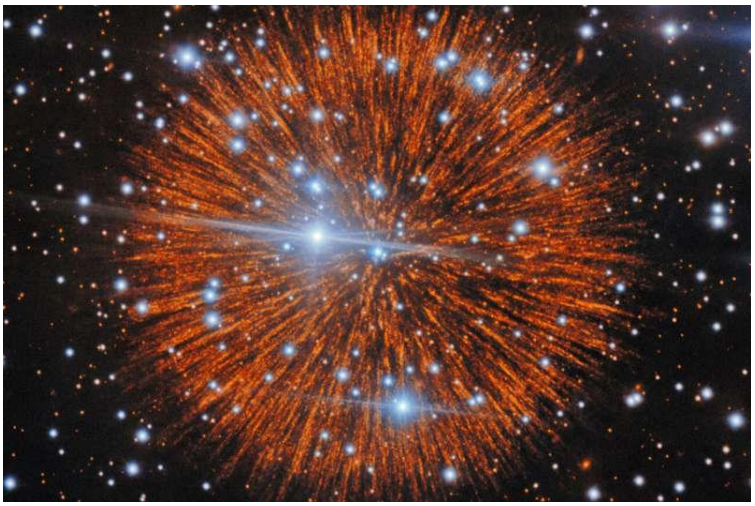


Credit: X-ray: NASA/CXC/Caltech/S.Kulkarni et al.; Optical: NASA/STScI/UIUC/Y.H.Chu & R.Williams et al.; IR: NASA/JPL-Caltech/R.Gehrz et al.

Remnant of Destruction

A strange nebula haunts the Milky Way's companion galaxy, the Large Magellanic Cloud. Known as N49, it marks the location of the explosive death of a massive star. In visible light, N49 has an unusual, highly distorted, filamentary shape; however, X-ray emission from million-degree gas in N49 shows a more symmetric, nearly complete spherical shell. A new study of N49 using optical imaging from the Hubble Space Telescope, infrared images from the Spitzer Space Telescope, and X-ray data from the Chandra and XMM X-ray Observatories has helped scientists construct a more complete picture of the evolving physical processes occurring in this supernova remnant. The image above shows the composite of the infrared (in red), visible (in white and yellow) and X-ray (in blue) images of N49. These images help scientists understand the relative contribution of hot gas and dust in the nebula, to determine where heating and cooling occurs and to determine where and how fast-moving gas from the supernova explosion crashes into pre-existing material around the star.

Striking new images of unique supernova remnant reveal pearl-like chains



Pa 30, the likely remnant of the historical supernova witnessed in the year 1181, now captured in unprecedented detail by NOIRLab's Gemini North telescope. This image, obtained with the Gemini Multi-Object Spectrograph (GMOS), shows that the remnant's unmistakable firework-shaped ejecta take on a cascading knot-like structure. Credit: International Gemini Observatory/NOIRLab/NSF/AURA,

T. Cunningham (Center for Astrophysics—Harvard & Smithsonian)

The only known supernova remnant of its kind in the Milky Way has an unexpectedly intricate structure: chains of gas knots resembling pearls on a string, each wide enough to fit the solar system multiple times. Using the Gemini North telescope, an international team co-led by Ilaria Caiazzo, assistant professor at the Institute of Science and Technology Austria (ISTA), captured the most detailed view yet of Pa 30, revealing striking new features of the remnant associated with a historical supernova witnessed nearly 850 years ago. Is this a fireworks display? Described as a dandelion-shaped remnant of a massive stellar explosion, this object shows us the aftermath of the blast. Adding to its unusual character is a surviving "zombie star" at its core—the stellar remnant of an incomplete explosion. First identified in 2013 by a citizen scientist, the supernova remnant nebula Pa 30 was later linked to a historical stellar explosion witnessed and recorded independently in Japanese, Chinese and Arabic historical sources in 1181. This has connected Pa 30 to one of just five supernovae recorded before the telescope era whose remnants had long remained unidentified. https://phys.org/news/2026-10-images-unique-supernova-remnant-reveal.html

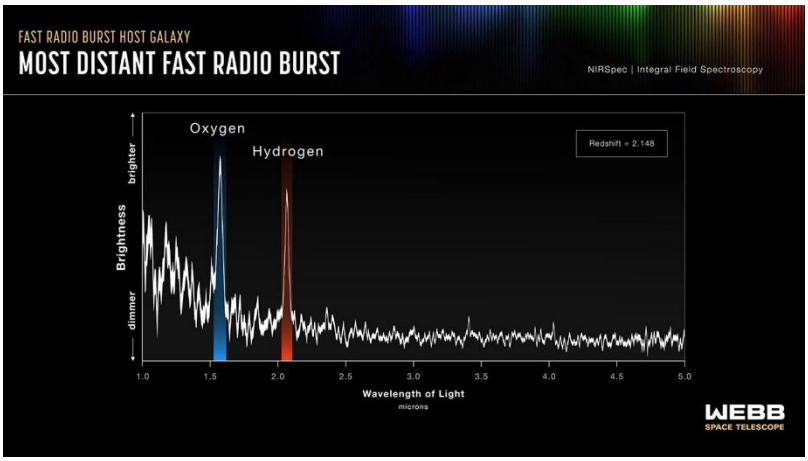
Astronomers discover the lowest-mass double neutron star system to date

Artist's impression of PSR J1856–0039, a pair of neutron stars that orbit each other every 2.36 hours. One is a pulsar that emits beams of radio waves, which astronomers tracked using the FAST telescope. The illustration is schematic and not to scale. Credit: Yang et al.

Neutron stars, the extremely dense remains of massive stars that exploded at the end of their lives, are widely studied astrophysical objects. Some of these stars, known as pulsars, spin and send out beams of radio waves, making them appear to pulse as the beams sweep past Earth. According to Einstein's theory of general relativity, orbiting neutron stars should emit ripples in spacetime known as gravitational waves. The resulting loss of energy should gradually draw pairs of neutron stars closer together, shortening the time they take to complete each orbit. PSR J1856−0039, first detected by FAST in 2020, has a remarkably compact orbit and measurable effects predicted by general relativity. These features make it a valuable system for testing the theory.

https://phys.org/news/2026-09-astronomers-lowest-mass-neutron-star.html

The Most Distant FRB Tells The Story Of Its Origin

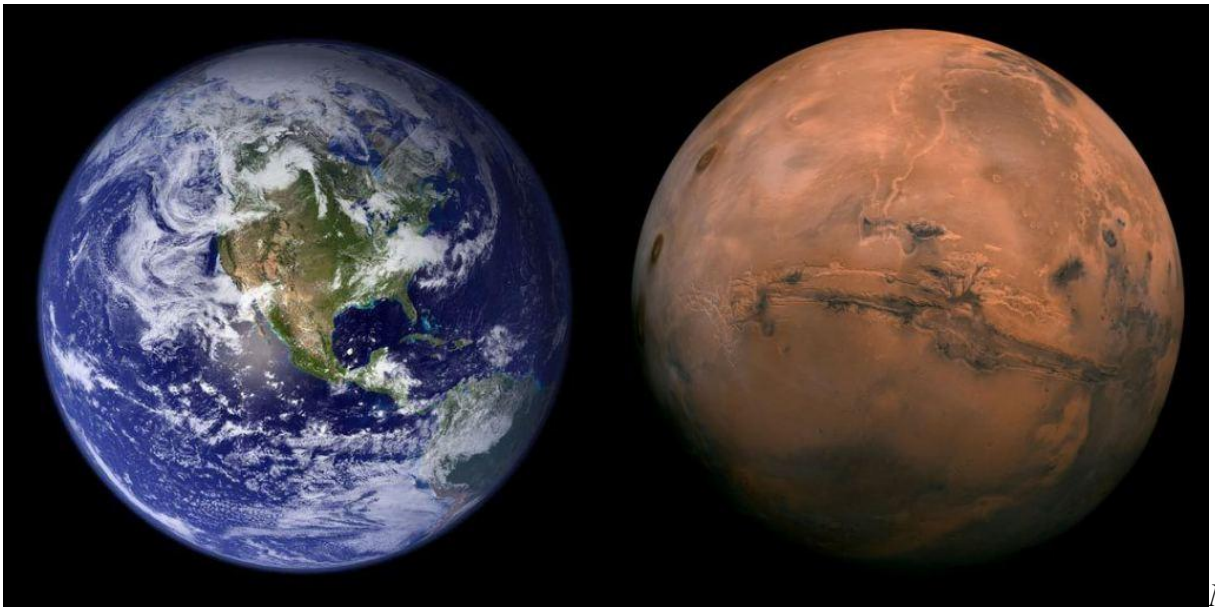


Astronomers using NASA's James Webb Space Telescope were able to study the host galaxy of the most distant known fast radio burst (FRB). Credit: NASA, ESA, CSA, Joseph Olmsted (STScI); Science: Manisha Caleb (SIfA)

Fast Radio Bursts (FRBs) are notoriously difficult to study. They are bright radio chirps that only last just milliseconds. When FRBs were first observed, it was difficult to distinguish them from terrestrial noise sources. Back in 2024 the MeerKAT radio array observed a burst designated FRB 20240304B. The MeerKAT data was able to pin down the FRB's location very precisely, but optical observations of the area didn't reveal an object in that location. So recently a team tried again using the James Webb Space Telescope. The Webb is particularly good at observing faint and distant galaxies, and sure enough the team found a small galaxy. By taking spectrum observations of the galaxy, the authors determined we see it at a time when the Universe was only about 3 billion years old. This would make FRB 20240304B the most distant burst observed. The galactic spectrum also suggests that most of its stars formed with about 30 million years. In other words, we see the galaxy at a time when it is filled with relatively young stars.

Reference: Caleb, Manisha, et al. "A fast radio burst from the first 3 billion years of the Universe." *arXiv preprint* arXiv:2508.01648

New Study Shows That Earth and Mars Had Different Origins



New research indicates that Earth and Mars formed through different processes, a finding that could help in the search for habitable exoplanets. Credits: NASA

According to Nebula Theory, the Solar System formed about four and a half billion years ago from a massive accretion disk of gas and dust that orbited our Sun. Alas, there are still questions about how they formed, with scientists favouring one of two possible pathways. Either they emerged from collisions between larger rocks (planetesimals), or from the gradual accumulation of pebbles by planetesimals. New research from the University of Copenhagen has offered new evidence that could settle the debate. Using a novel approach, they have reconstructed the earliest stages of the planets' formation by analyzing their chemical composition. Their

results suggest that a hybrid model that merges the two pathways could explain how rocky planets like Earth and Mars formed, which could have implications in the study of exoplanets. Based on their relative abundance on Earth and Mars, this suggests that the two planets formed in different ways: Mars formed primarily through planetesimals colliding while Earth began largely as two protoplanets that grew through pebble accretion. At least 75 percent of Earth's mass appears to originate from two young planets, known as protoplanets, that grew large by accreting pebbles, while planetesimals contributed up to 25 percent. In contrast, roughly three-quarters of Mars' mass appears to come from planetesimals, with the remaining quarter originating from pebble accretion.

https://www.universetoday.com/articles/new-study-shows-that-earth-and-mars-had-different-origins

Perseverance Reveals How Complex Water Systems Shaped the Jezero Crater on Early Mars

The Perseverance rover captured the data used in this panorama of the "Margin Unit," a geologic area that hugs the inner edge of Jezero Crater's rim, between Oct. 8 and Oct. 16, 2023. Credit: NASA/JPL-Caltech/MSSS

In Mars' Jezero Crater, a geologic area known as the "Margin Unit" stretches along the shoreline of a lake that filled the region billions of years ago. When the *Perseverance* rover reached there in September 2023, mission scientists expected to find sedimentary rocks that formed from sand deposits, which are good at preserving past microbial life. Instead, they were surprised to find olivine-rich igneous rock, which typically forms from underground magma or by volcanic activity on the surface. These rock deposits are also excellent record-keepers, preserving details about their precise moment of formation through their mineral crystals. The minerals *Perseverance* detected with its SuperCam, which determines the mineralogy of geologic features based on reflected light, preserved a very complex record of water activity in the region when Mars was young. Specifically, they revealed how the rocks interacted with water on three separate occasions, each altering their chemistry and appearance.

https://www.universetoday.com/articles/perseverance-reveals-how-complex-water-systems-shaped-the-jezero-crater-on-early-mars

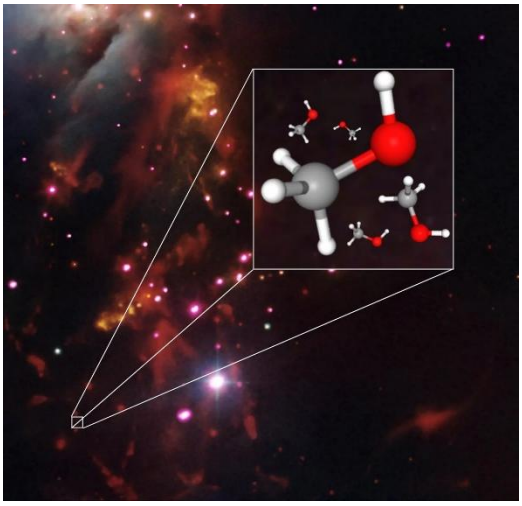
Primordial helium further confirms our understanding of the Big Bang

In the early moments of the big bang, two elements were forged: hydrogen and helium. Technically, the tiniest traces of light elements such as lithium were produced as well, but nothing of consequence. The early universe was about three parts hydrogen to one part helium. All the heavier elements, from the oxygen in your lungs to the iron in your blood, were created through astrophysical processes—fused in stars, formed in supernovae or scattered by the collisions of neutron stars. Even in the present cosmos, heavier elements are so cosmically rare that astronomers group them all as metals.

Hubble Space Telescope image of a vast nebula called NGC 604, which is rich in helium. Credit: Hui Yang (University of Illinois) and NASA/ESA

One of the ways astronomers study the big bang is through the relative abundance of different elements, particularly the primordial abundance of hydrogen and helium. That might seem easy, since they were the two elements formed by the big bang, but there is a catch. Although all the hydrogen we observe was formed during the big bang, not all the helium we observe was. Most of the helium was formed way back in the beginning, but helium is also the most common byproduct of stellar fusion. So while stars are producing all the atoms we need to make data centers and Labubu dolls, they are also producing lots of helium. This means that over billions of years, the relative abundance of helium has been increasing, and this skews the data. The Large Binocular Telescope Primordial Helium Abundance (LBT Y_P) Project is trying to overcome this issue and has recently published a series of results. Based on a sample of interstellar gas regions within 54 galaxies, the team found that primordial helium makes up 24.58% of the initial matter of the cosmos by mass. This agrees well with the estimate from Planck observations of the cosmic microwave background, which gave a result of 24.67%. https://phys.org/news/2026-10-primordial-helium-big.html

Scientists Detect Rare Type of Wood Alcohol in Space



A rare form of the organic alcohol methanol is present around at least one of the very young stars in the Perseus molecular cloud. Credit ©: Ekaterina

Today, the question of where life's building blocks come from is largely settled. Thanks to numerous discoveries in recent decades, scientists have confirmed that the organic molecules are found in space. In addition, recent research has also confirmed that amino acids can be found in Near-Earth Asteroids (NEAs) and proteins can form entirely on their own. Alas, some pieces of the puzzle are still missing, which are crucial to finding how these building blocks come together. This includes Methanol (CH_3OH), also known as wood alcohol, an organic molecule that plays an essential role in the formation of complex organic molecules in space. However, new research from the ALMA COMPASS Large program has detected fully deuterated methanol (aka. "heavy methanol") (CD_3OD) around the protostar IRAS4A2. The abundance of this molecule around this very young star challenges current chemical models, which cannot reproduce the amount observed.

https://www.universetoday.com/articles/scientists-detect-rare-type-of-wood-alcohol-in-space

Chandra breaks down 'Treble Clef's' galaxy cluster collision

Credit: X-ray: NASA/CXC/INAF-IRA/A. Botteon et al.; Infrared: UKIDSS-GPS; Radio: ASTRON/LOFAR; Image processing: NASA/CXC/SAO/N. Wolk

Astronomers have used NASA's Chandra X-ray Observatory to break down the cause of a remarkable formation of radio waves they have nicknamed the "Treble Clef" because its distinct shape strongly resembles the musical symbol. The researchers discovered the Treble Clef is likely caused by an outburst from a supermassive black hole, followed by a collision of two galaxy clusters. The authors concluded that the Treble Clef likely formed in a two-stage process. First, an earlier outburst from a supermassive black hole in the galaxy cluster's center drove clouds of charged particles and magnetic fields away at close to the speed of light. This led to a type of cosmic crescendo and initially produced bright radio waves that later faded as the particles lost energy. https://phys.org/news/2026-10-chandra-treble-clef-galaxy-cluster.html

Webb captures stars in the early stages of life in a nearby stellar nursery

The NASA/ESA/CSA James Webb Space Telescope has revealed many protostars and stars within the glowing gases of NGC 7129. Credit: NASA/ESA/CSA/STScI/Alyssa Pagan

The NASA/ESA/CSA James Webb Space Telescope continues to reveal hidden parts of the cosmos with its advanced suite of infrared instruments. In a newly released image, Webb revealed many stars previously hidden by the dust clouds of NGC 7129, a stellar nursery about 3,300 light-years from Earth in the constellation Cepheus. The image is already improving our understanding of how new stars are born and evolve with time. The life cycle of stars begins in dense molecular clouds of cold dust and gas, otherwise known as nebulae. Within these cocoons, the gas and dust slowly coalesce and build up mass, eventually triggering gravitational collapse and the birth of a new star. Because of the dusty environment, young stars are often impossible to see with telescopes that cannot capture infrared light. Thanks to Webb's sensitivity to the near- and mid-infrared parts of the spectrum, astronomers could peek inside NGC 7129 and see many stars less than 1 million years old. Over 130 stars have been identified in this cluster. They are in different stages of development based on their mass, with the more massive stars evolving faster and exiting their main sequence sooner. The most massive and mature is the region's central star, LkH(alpha) 234, a pre-main-sequence star of about 5 to 8 solar masses. As the name suggests, stars at this stage have largely finished gathering mass and begin fusing hydrogen in their interiors shortly thereafter. https://phys.org/news/2026-10-webb-captures-stars-early-stages.html

COMMITTEE MEMBERS

Derek Duckitt	(Chairman, Speaker Selector, website editor, Cosmology SIG co-ordinator)	082 414 4024 derek.duckitt@gmail.com
Pierre de Villiers	(Vice-chairman, Speaker Selector, Projects and Outreach)	082 854 2277
Elaine Sykes	(Treasurer)	083 286 2683
Pete Kogel	(Secretary, Membership, "Southern Cross", Observing co-ordinator, Beginner's Astronomy)	082 708 0049 pete.kogel@outlook.com
Mick Fynn	(Educational outreach)	082 443 0848

Non-committee members with portfolio:

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