"The Southern Cross"

The Hermanus Astronomy Centre Newsletter

DECEMBER 2023

Please note that all our regular meetings are scheduled for **TUESDAYS** commencing at **18.00 (6 pm)** unless otherwise advised. The day and date may change from time to time according to the current Hermanus load shedding status and/or according to venue availability for a physical meeting; such changes will be notified via e-mail and on our website.

MONTHLY MEETINGS

Monthly Meetings are held on the **Third Tuesday** of each month. There will be no Monthly Meeting in December.

Our last meeting was held on **November 21st**.

Prof Martin Snow, of SANSA Hermanus, presented ***"the Enigma of Betelgeuse"***.

The brightest star in the constellation of Orion is a cool supergiant known as Betelgeuse. This star has been observed for centuries, and in recent years it has undergone some dramatic changes. In 2019, it dimmed to half of its previous brightness. Since then, its apparent brightness has returned to its previous level.

The YouTube link - https://www.youtube.com/watch?v=VVxz9ptUJBg

The next Monthly Meeting is scheduled for **Tuesday January 16th 2024** and will again be hybrid (physical and virtual), taking place at **Onrus Manor** clubhouse as well as on **Zoom**. Your physical attendance, requested by many members, will enable us to meet the presenter in person and to socialize with other centre members. We shall be commencing sharply at **18.00** (**6 pm**) in order to terminate by 19.00 at the latest.

Dr Jenny Morris will speak on ***"Southern Cross: Wobbly Earth"***

Embark on a captivating journey with **Jenny Morris** as she unveils the enchanting narrative behind the Southern Cross, a celestial marvel that has fascinated cultures throughout history. This celestial masterpiece is more than just a constellation; it holds the secrets of an earthly wobble and a starry icon.

SPECIAL INTEREST GROUP ACTIVITIES

Cosmology

These meetings are scheduled for the **First Tuesday** of each month, commencing at 18.00 (6 pm) with no meeting in January.

On **Tuesday November 14th**, in our series of videos entitled "THE ENTIRE HISTORY OF THE UNIVERSE", we watched episode 14– ***"What Happened to All the Neutrinos?"***

The YouTube link:

https://www.youtube.com/watch?v=SedW4SdXNHU&list=PLROBLlvnR7BEF9b1NOvRf_zhboibmywJb&index=14 (42 minutes).

.in order to accommodate

On **Tuesday November 28th**, in place of *Study Group,* we watched and discussed South African physicist **Neil Turok's** video ***"Secrets of the Universe – Hiding in Plain Sight?"***.

The YouTube video link- https://www.youtube.com/watch?v=rsI_HYtP6iU&t=318s

The discussion recording- https://www.youtube.com/watch?v=dYI2F3aOhcs

The transcript- please see separate attachment.

The next episode of the "THE ENTIRE HISTORY OF THE UNIVERSE" series is number 15 - ***"What Was The First Black Hole?*** which is scheduled for **Tuesday December 5th.** After which we have two episodes to complete the series.

For further information, please contact Derek Duckitt: derek.duckitt@gmail.com.

Astrophotography

This SIG is no longer scheduled but can be arranged as requested by group members.

On **Thursday November 23rd**, at Derek's house, we attended his presentation of his workflow of the **Hubble Space Telescope** image of *"The Pillars of Creation"*.

For further information, contact Deon Krige: krige.deon44@outlook.com and please keep an eye on our website calendar and our e-mail notices and invites.

Study Group

Scheduled for the **Last Tuesday** of each month.

On **Tuesday October 31st,** we watched and discussed the YouTube video - *"The Mystery of the Octopus"*.

Brainy, hearty, multiskilled, venomous and playful. Is this creature from outer space?

The video:

https://www.youtube.com/watch?v=pv3YRnHzfjI&pp=ygUadGhlIG15c3Rlcnkgb2YgdGhlIG9jdG9wdXM%3D

The discussion: https://www.youtube.com/watch?v=O-Y4wzRu9tI

Our last meeting was replaced by an extra **Cosmology**, see Cosmology above.

The next Study Group meeting is scheduled for Tuesday January 30th.

For further information regarding Study Group, please contact Peter Harvey

petermh@hermanus.co.za

Observing

This section includes recommended dates for **Stargazing**, **Moonwatch**, **Meteors**, **Solar observation** and whatever else deserves a close look.

For quick reference:

Optimal dates for **DECEMBER 2023**:

Stargazing –	**DECEMBER 1st** to **15th** (please refer to *Skynotes* page 2 for more detail).	
Moonwatch – (*Skynotes* on page 2).	a window a few days either side of **First Quarter** (**December 19th**)	
Eclipses –	**None observable in southern Africa**.	
The Sun -	**The Sun and Auroral Activity**: Daily solar activity and predictions for auroral activity can be found at the following website: https://www.spaceweatherlive.com/en/solar-activity.html .	
Meteors -	**Phoenicids -**	**2nd**
	Puppid-Velids –	**7th**
	Geminids –	**14th**
	(for more detail, please see the *Sky Guide* page 86 and *Skynotes* page 4)	

Future Trips

No outings are planned at present.

Website

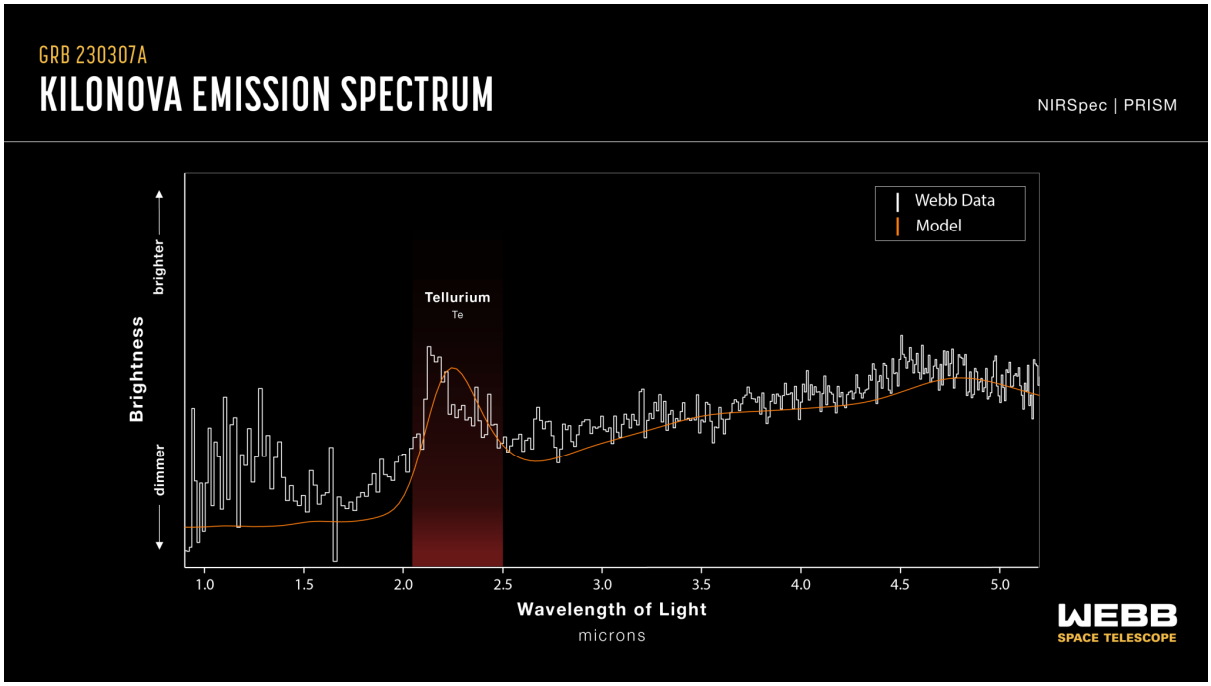
Please check our website calendar for HAC scheduled events:
https://www.hermanusastronomy.co.za

Astronomy News: November 2023

(Compiled By Pieter Kotzé)

NASA's Webb Makes First Detection of Heavy Element From Star Merger

A team of scientists has used multiple space and ground-based telescopes, including NASA's James Webb Space Telescope, NASA's Fermi Gamma-ray Space Telescope, and NASA's Neil Gehrels Swift Observatory, to observe an exceptionally bright gamma-ray burst, GRB 230307A, and identify the neutron star merger that generated an explosion that created the burst. Webb also helped scientists detect the chemical element tellurium in the explosion's aftermath.



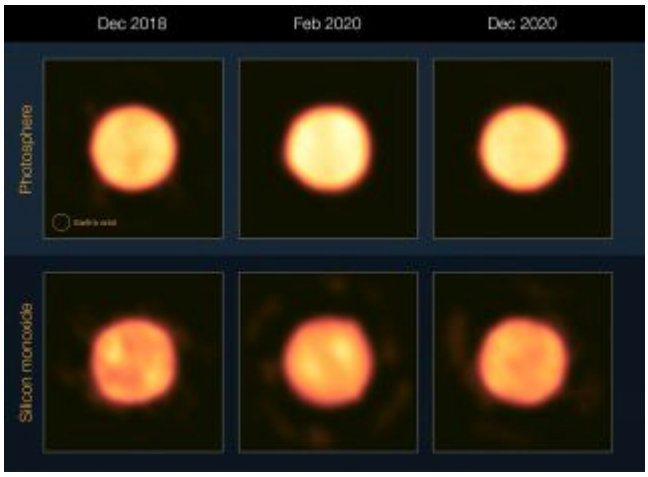
This graphic presentation compares the spectral data of GRB 230307A's kilonova as observed by NASA's James Webb Space Telescope and a kilonova model. Both show a distinct peak in the region of the spectrum associated with tellurium, with the area shaded in red. The detection of tellurium, which is rarer than platinum on Earth, marks Webb's first direct look at an individual heavy element from a kilonova. Illustration: NASA, ESA, CSA, Joseph Olmsted (STScI).

Other elements near tellurium on the periodic table – like iodine, which is needed for much of life on Earth – are also likely to be present among the kilonova's ejected material. A kilonova is an explosion produced by a neutron star merging with either a black hole or with another neutron star. "Just over 150 years since Dmitri Mendeleev wrote down the periodic table of elements, we are now finally in the position to start filling in those last blanks of understanding where everything was made, thanks to Webb," said Andrew Levan of Radboud University in the Netherlands and the University of Warwick in the UK, lead author of the study.

While neutron star mergers have long been theorized as being the ideal "pressure cookers" to create some of the rarer elements substantially heavier than iron, astronomers have previously encountered a few obstacles in obtaining solid evidence.

https://www.nasa.gov/missions/webb/nasas-webb-makes-first-detection-of-heavy-element-from-star-merger/

The mysterious dimming of supergiant star Betelgeuse may finally be explained (photo)



(Image credit: ESO/J. Drevon et al.)

Can a star bounce back from the verge of death? One star did — or at least appeared to.

In early 2019, the red supergiant Betelgeuse began to dim. Some observers predicted that the dimming was a harbinger of the star's end: That it was the first warning sign that Betelguese was about to go supernova.

Astronomers are now certain that isn't true. Images released by the European Southern Observatory (ESO) on Monday (Oct. 23) clearly show Betelguese returned to normal after the event. Although the star as a whole appeared to darken, Betelgeuse's photosphere seemed to actually brighten during the event. The Université Côte d'Azur astronomers say this observation is consistent with a likely theory, supported by observations, that Betelgeuse dimmed from our view due to a burst of dust, in the form of silicon monoxide, coming from the star. In turn, that burst might be related to a sudden cooling of the star's surface.

https://www.space.com/betelgeuse-photosphere-dimming-dust-cold-spot

Salts and organics observed on Ganymede's surface by NASA's Juno

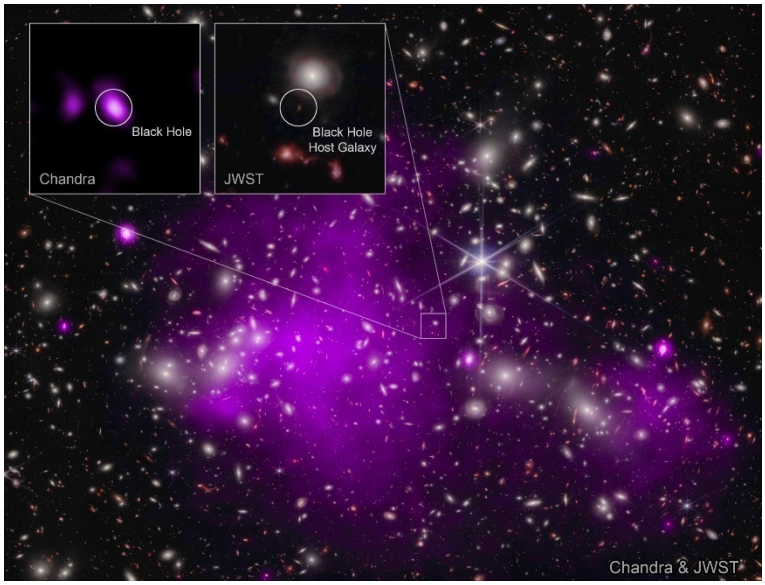
This enhanced image of the Jovian moon Ganymede was obtained by the JunoCam imager aboard NASA's Juno spacecraft during the mission's June 7, 2021, flyby of the icy moon. Credit: NASA/JPL-Caltech/SwRI/MSSS/Kalleheikki Kannisto, CC BY

Data collected by NASA's Juno mission indicates a briny past may be bubbling to the surface on Jupiter's largest moon. NASA's Juno mission has observed mineral salts and organic compounds on the surface of Jupiter's moon Ganymede. Data for this discovery was collected by the Jovian InfraRed Auroral Mapper (JIRAM) spectrometer aboard the spacecraft during a close flyby of the icy moon. The findings, which could help scientists better understand the origin of Ganymede and the composition of its deep ocean, were published on Oct. 30 in the journal *Nature Astronomy*.

https://phys.org/news/2023-10-salts-ganymede-surface-nasa-juno.html

NASA Telescopes Discover Record-Breaking Black Hole

Astronomers have discovered the most distant black hole yet seen in X-rays, using NASA telescopes. The black hole is at an early stage of growth that had never been witnessed before, where its mass is similar to that of its host galaxy.This result may explain how some of the first supermassive black holes in the universe formed.By combining data from NASA's Chandra X-ray Observatory and NASA's James Webb Space Telescope, a team of researchers was able to find the telltale signature of a growing black hole just 470 million years after the big bang.



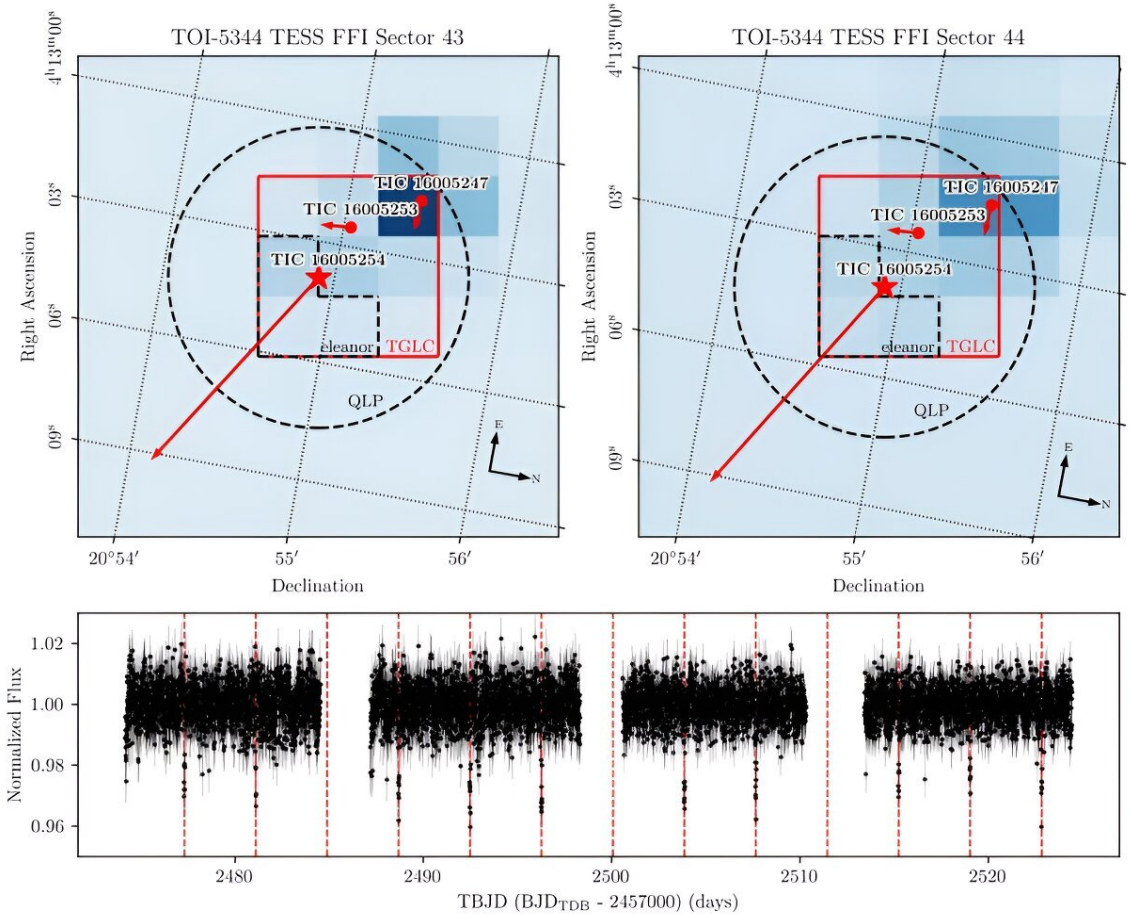
Astronomers found the most distant black hole ever detected in X-rays (in a galaxy dubbed UHZ1) using the Chandra and Webb space telescopes. X-ray emission is a telltale signature of a growing supermassive black hole. This result may explain how some of the first supermassive black holes in the universe formed. These images show the galaxy cluster Abell 2744 that UHZ1 is located behind, in X-rays from Chandra and infrared data from Webb, as well as close-ups of the black hole host galaxy UHZ1.
X-ray: NASA/CXC/SAO/Ákos Bogdán; Infrared: NASA/ESA/CSA/STScI; Image Processing: NASA/CXC/SAO/L. Frattare& K. Arcand

"We needed Webb to find this remarkably distant galaxy and Chandra to find its supermassive black hole," said Akos Bogdan of the Center for Astrophysics | Harvard & Smithsonian (CfA) who leads a new paper in the journal Nature Astronomy describing these results. "We also took advantage of a cosmic magnifying glass that boosted the amount of light we detected." This magnifying effect is known as gravitational lensing.Bogdan and his team found the black hole in a galaxy named UHZ1 in the direction of the galaxy cluster Abell 2744, located 3.5 billion light-years from Earth. Webb data, however, has revealed the galaxy is much more distant than the cluster, at 13.2 billion light-years from Earth, when the universe was only 3% of its current age.https://www.nasa.gov/missions/chandra/nasa-telescopes-discover-record-breaking-black-hole/

TESS discovers Saturn-like planet orbiting an M-dwarf star

Astronomers have discovered a new giant exoplanet orbiting an M-dwarf star using NASA's Transiting Exoplanet Survey Satellite (TESS). The newly detected alien world, designated TOI-5344 b is similar in size and mass to Saturn. The finding is reported in a paper published October 31 on the pre-print server *arXiv*. To date, TESS has identified nearly 6,900 candidate exoplanets (TESS Objects of Interest, or TOI), of which 398 have been confirmed so far.

Since its launch in April 2018, TESS, with its array of wide-field cameras, is conducting a survey of about 200,000 of the brightest stars near the sun with the aim of searching for transiting exoplanets—ranging from small and rocky, to giant alien worlds.



TESS photometry of TOI-5344. Credit: *arXiv* (2023). DOI: 10.48550/arxiv.2310.20634

https://phys.org/news/2023-11-tess-saturn-like-planet-orbiting-m-dwarf.html

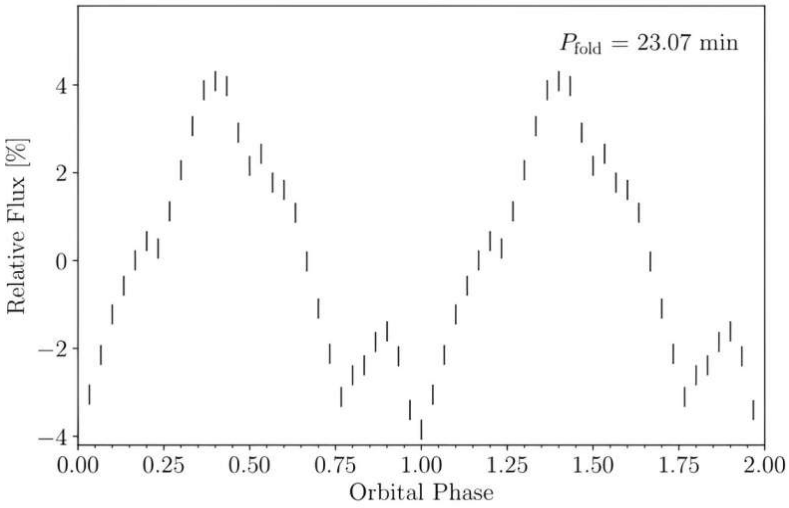
TESS detects new cataclysmic variable system of a rare type

An international team of astronomers reports the discovery of a new variable system using NASA's Transiting Exoplanet Survey Satellite (TESS). The newfound object, designated TIC 378898110, is an AM Canum Venaticorum binary star—a rare type of a cataclysmic variable. The finding was presented in a paper published November 2 on the pre-print server *arXiv*.

Cataclysmic variables (CVs) are close binary star systems consisting of a white dwarf (WD) primary that is accreting matter from (usually) a main sequence star. They irregularly increase in brightness, by a large factor, then drop back down to a quiescent state.

AM Canum Venaticorum (AM CVn) systems are a rare type of CVs named after AM Canum Venaticorum—a hydrogen-deficient cataclysmic variable binary in the constellation of Canes Venatici. In general, AM CVn-type systems are ultracompact, mass-transferring binaries with orbital periods between five and 68 minutes. They consist of a white dwarf accreting helium-

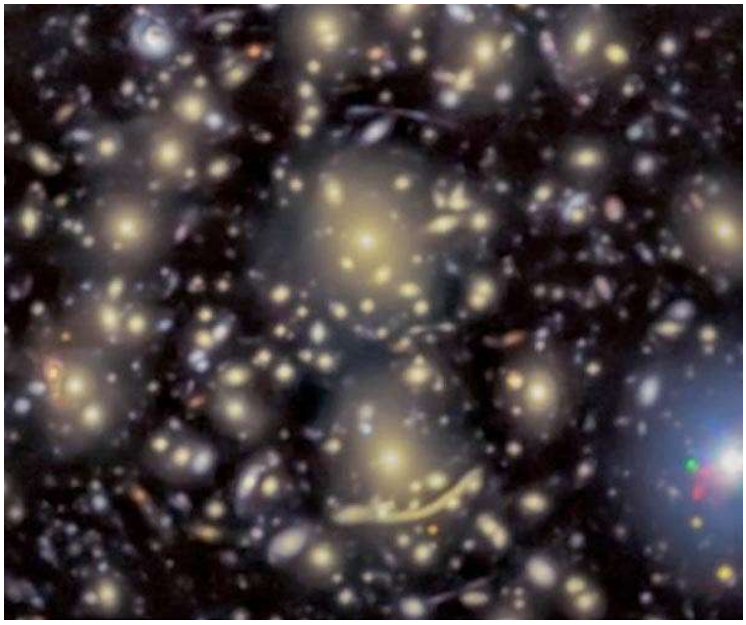
dominated matter from a degenerate or semi-degenerate donor star. To date, only 56 AM CVns have been discovered.



Phase-folded and binned TESS light curve of TIC 378898110, folded on the 23.07-minute period. Credit: *arXiv* (2023). DOI: 10.48550/arxiv.2311.01255

https://phys.org/news/2023-11-tess-cataclysmic-variable-rare.html#google_vignette

Milky Way-like galaxy found in the early universe



Using the James Webb Space Telescope, an international team, including astronomer Alexander de la Vega of the University of California, Riverside, has discovered the most distant barred spiral galaxy similar to the Milky Way that has been observed to date.

Until now it was believed that barred spiral galaxies like the Milky Way could not be observed before the universe, estimated to be 13.8 billion years old, reached half of its current age.

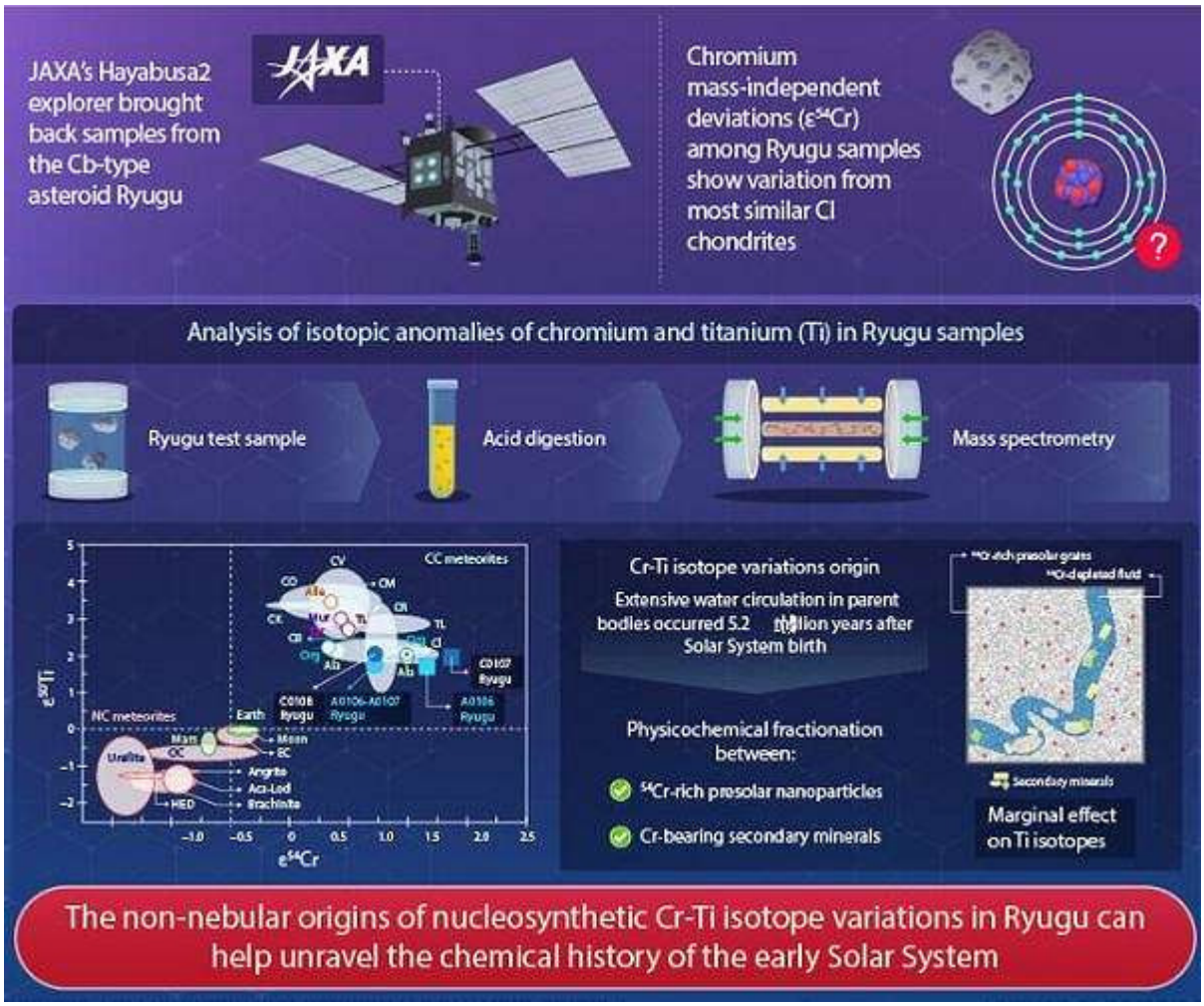
The research, published in Nature this week, was led by scientists at the Centro de Astrobiologia in Spain.

"This galaxy, named ceers-2112, formed soon after the Big Bang," said coauthor de la Vega, a postdoctoral researcher in the Department of Physics and Astronomy. "Finding ceers-2112 shows that galaxies in the early universe could be as ordered as the Milky Way. This is surprising because galaxies were much more chaotic in the early universe and very few had similar structures to the Milky Way."

Ceers-2112 has a bar in its center. De la Vega explained that a galactic bar is a structure, made of stars, within galaxies. Galactic bars resemble bars in our everyday lives, such as a candy bar. It is possible to find bars in non-spiral galaxies, he said, but they are very rare.

https://www.spacedaily.com/reports/Milky_Way_like_galaxy_found_in_the_early_universe_999.html

Hayabusa2 Unveils New Clues on Solar System's Beginnings from Asteroid Samples



The non-nebular origins of nucleosynthetic Cr-Ti isotope variations in Ryugu can help unravel the chemical history of the early Solar System.

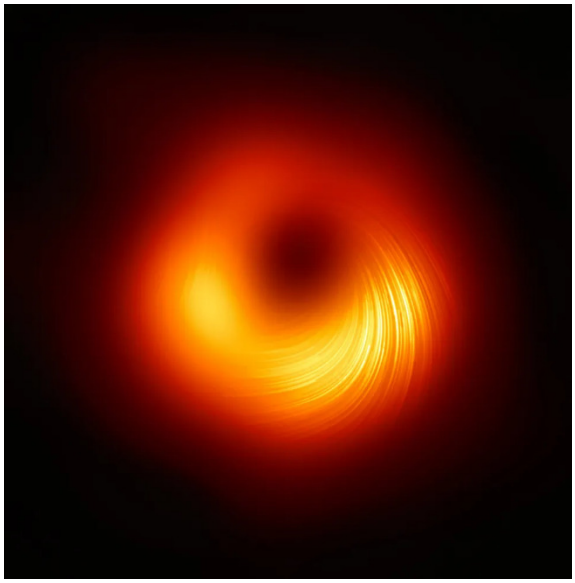
The Japan Aerospace Exploration Agency (JAXA)'s ambitious Hayabusa2 mission has once again brought to Earth not just asteroid samples but potential keys to unlock mysteries of our solar system's infancy. The mission, which daringly snagged samples from the asteroid Ryugu, has given scientists a pristine peek into the volatile and organic-rich materials that were present when the solar system was just a cosmic nursery.Ryugu, which meanders between Earth and Mars, is now confirmed to be akin to the Ivuna-type carbonaceous chondrites (CIs), meteorites that scientists prize for their ancient and unaltered nature. These CIs are like time capsules, believed to have conserved the primordial soup from which the planets emerged.

Anomalies in isotopic ratios, particularly chromium (54Cr/52Cr) and titanium (50Ti/47Ti), denoted as e54Cr and e50Ti, serve as cosmic fingerprints, leading scientists to the nucleosynthetic origins of these space-traveling materials. While Ryugu's overall isotopic

signature aligns with its meteorite cousins, the Cr isotopic variations hinted at a narrative more complex than a shared birthplace.

https://www.spacedaily.com/reports/Hayabusa2_Unveils_New_Clues_on_Solar_Systems_Beginnings_from_Asteroid_Samples_999.html

1st black hole ever imaged by humans has twisted magnetic fields and scientists are thrilled



Swirling golden gas and dust shows polarized magnetic fields around the supermassive black hole at the heart of M87, as seen in a composite image obtained by the Event Horizon Telescope in 2021. (Image credit: EHT Collaboration)

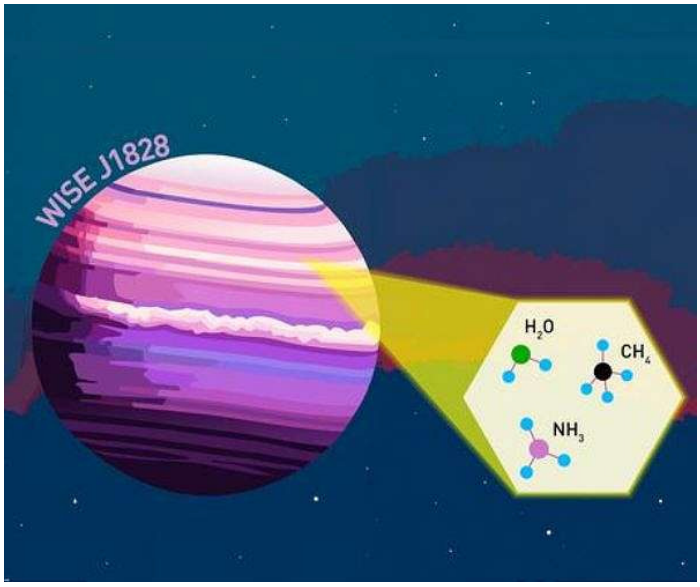
The supermassive black hole of M87— also known as M87*— has a mass equal to around 6.5 billion suns. It especially came to the public's attention in 2019 when an image of M87*, captured by the Event Horizon Telescope (EHT), was the first glimpse of the surrounding environment of a black hole ever obtained by humanity. Now, the EHT Collaboration, who was behind that historic image, have modeled the way the electric fields of light rotate around the supermassive black hole, which is located around 54 million light-years away from Earth. This polarized light, whose waves vibrate on a single plane, carries with it information about the magnetic field and the particles that are accelerated to near-light-speeds around the black hole. Two years after the release of the image of the supermassive black hole in M87, in 2021, the EHT Collaboration released a second stunning look. The newer image showed, for the very first time, polarized light around a black hole. (Polarized light has a different orientation and brightness than unpolarized light.) The 2021 data also revealed the direction of oscillating (vibrating) electric fields, providing the first hint that magnetic fields around M87* are strong and ordered. Researchers next took a closer look using the Atacama Large Millimeter/submillimeter Array (ALMA) located in Northern Chile, which provided calibration by acting as a reference antenna for the EHT. ALMA is an array of 66 antennas in the Chilean desert that can peer through cosmic dusty environments, like black holes, to seek longer wavelengths of light.

https://www.space.com/supermassive-black-hole-twisted-magnetic-fields-m87

An ammonia trail to exoplanets

They reveal the origin of wine, the age of bones and fossils, and they serve as diagnostic tools in medicine. Isotopes and isotopologues - molecules that differ only in the composition of their isotopes - also play an increasingly important role in astronomy. For example, the ratio of carbon-12 (12C) to carbon-13 (13C) isotopes in the atmosphere of an exoplanet allows scientists to infer the distance at which the exoplanet orbits its central star.

Until now, 12C and 13C bound in carbon monoxide were the only isotopologues that could be measured in the atmosphere of an exoplanet. Now a team of researchers has succeeded in detecting ammonia isotopologues in the atmosphere of a cold brown dwarf. As the team has just reported in the journal Nature, ammonia could be measured in the form of 14NH3 and 15NH3

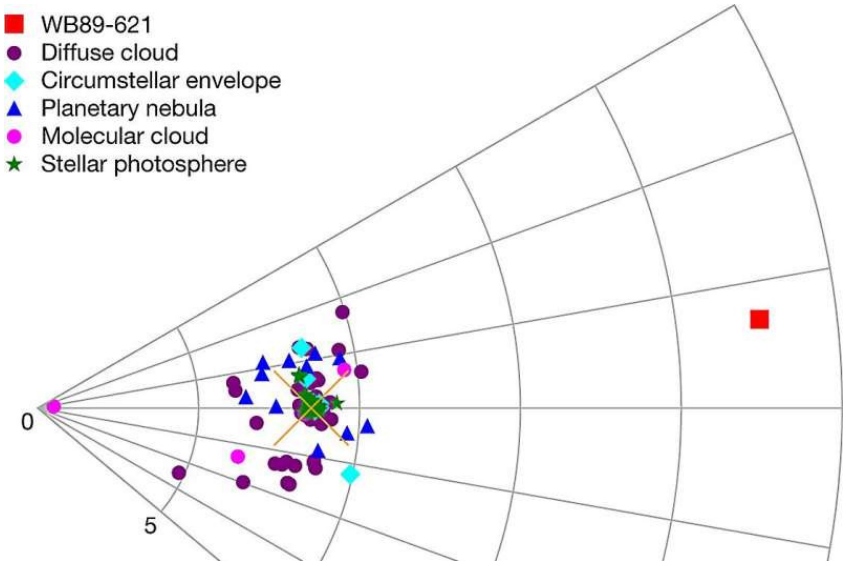


Artistic impression of brown dwarf WISE J1828, one of the coldest gas giants know outside of our Solar System. Its atmosphere is dominated by the absorption from water, methane and ammonia vapour.

The Mid-InfraRed Instrument (MIRI), an infrared detector installed on board the JWST, made it possible to reveal the ammonia isotopologues on WISE J1828. In the wavelength range between 4.9 and 27.9 um, the Medium Resolution Spectrometer (MRS) of MIRI recorded a spectrum of the brown dwarf where, in addition to ammonia, the researchers observed water and methane molecules, each with characteristic absorption bands. In particular, ammonia causes an attenuation of the signal arriving at the detector in the wavelength range between 9 and 13 um.

https://www.spacedaily.com/reports/An_ammonia_trail_to_exoplanets_999.html

Phosphorous discovered in outskirts of the Milky Way for the first time



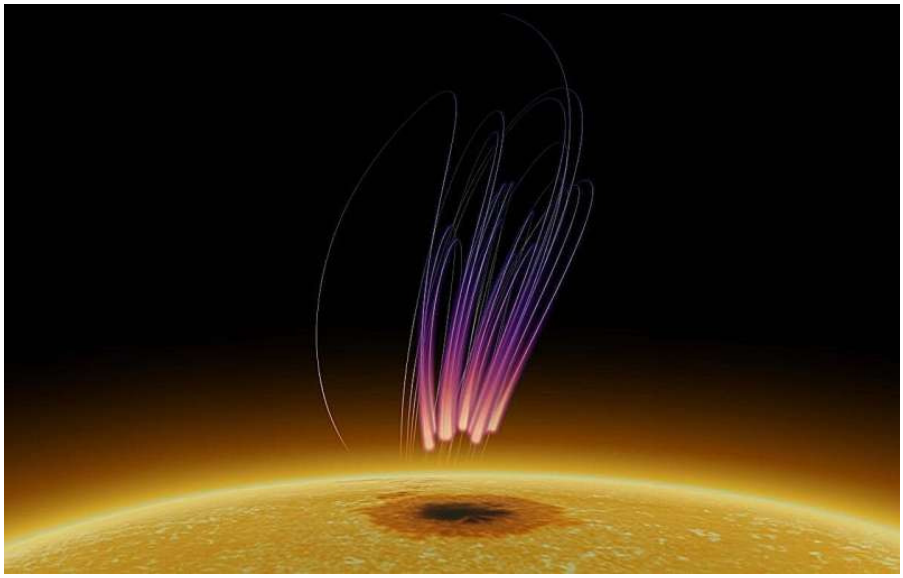
Currently known Galactic distribution of phosphorous. Credit: Nature (2023). DOI: 10.1038/s41586-023-06616-1

A trio of chemists at the University of Arizona, with an affiliation to the University of Arizona's Department of Astronomy and Steward Observatory has discovered phosphorous in the outskirts of the Milky Way galaxy for the first time. In their project, reported in the journal *Nature*, Lilia Koelemay, Karlie Gold and Lucy Ziurys studied the gas cloud WB89-621.

Prior research has shown that phosphorous exists near the sun and also other inner parts of the Milky Way galaxy, but until now, it had not been observed in its outer parts. Prior findings have not been surprising, as other research has shown that phosphorous is created when silicon atoms in stars (such as the sun) bond with neutrons. Such stellar nucleosynthesis is believed to be responsible for observed phosphorous.

https://phys.org/news/2023-11-phosphorous-outskirts-milky.html#google_vignette

Scientists uncover aurora-like radio emission above a sunspot

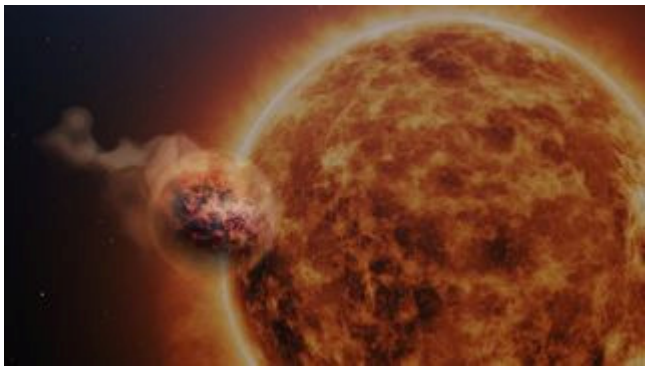


Scientists uncover prolonged radio emissions above a sunspot, akin to those previously seen in the polar regions of planets and certain stars, which may reshape our understanding of intense stellar radio bursts. Credit: Sijie Yu

In a study published in *Nature Astronomy*, astronomers from New Jersey Institute of Technology's Center for Solar-Terrestrial Research (NJIT-CSTR) have detailed radio observations of an extraordinary aurora-like display occurring 40,000 km above a relatively dark and cold patch on the sun, known as a sunspot. Researchers say the novel radio emission shares characteristics with the auroral radio emissions commonly seen in planetary magnetospheres such as those around Earth, Jupiter and Saturn, as well as certain low-mass stars. The discovery offers new insights into the origin of such intense solar radio bursts and potentially opens new avenues for understanding similar phenomena in distant stars with large starspots, according to the study's lead author and NJIT-CSTR scientist Sijie Yu."We've detected a peculiar type of long-lasting polarized radio bursts emanating from a sunspot, persisting for over a week," said Yu. "This is quite unlike the typical, transient solar radio bursts typically lasting minutes or hours. It's an exciting discovery that has the potential to alter our comprehension of stellar magnetic processes."

https://phys.org/news/2023-11-scientists-uncover-aurora-like-radio-emission.html

James Webb Space Telescope reveals sandy surprise in distant planet



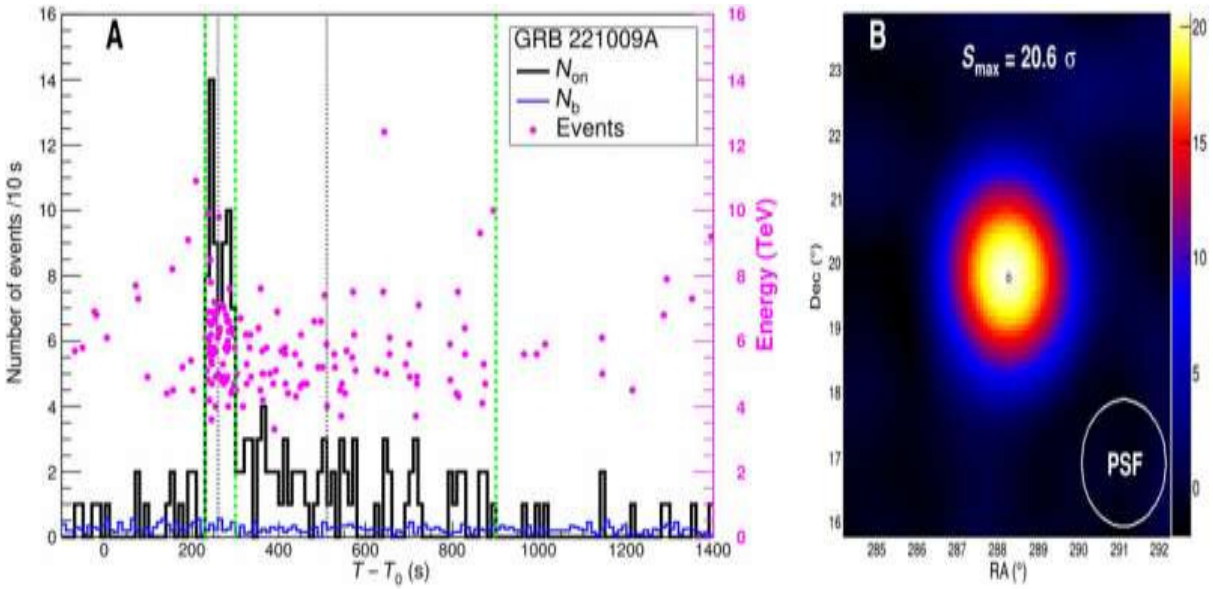
Artist's impression of WASP-107b and its parent star.(Image credit: Illustration: LUCA School of Arts, Belgium/ KlaasVerpoest (visuals), Johan Van Looveren (typography). Science: Achrène Dyrek (CEA and Université Paris Cité, France), Michiel Min (SRON, the Netherlands), Leen Decin (KU Leuven,

Belgium) / European MIRI EXO GTO team / ESA / NASA)

An exoplanet hosts strange, sandy clouds high in its atmosphere, a new study reveals. While the James Webb Space Telescope (JWST or Webb) may spend a lot of its time observing the farthest reaches of the early universe when galaxies were only just starting to form, it also spends plenty of its time focused on objects a lot closer to home — such as the atmospheres of exoplanets in our galactic neighbourhood. A team of European astronomers used observations from the JWST to detail the atmospheric composition of a nearby "fluffy" exoplanet, called WASP-107b. Researchers found water vapor, sulfur dioxide and even silicate sand clouds residing within the exoplanet's dynamic atmosphere. The new study may also have implications for our understanding of the chemistry of distant planets.

https://www.space.com/james-webb-space-telescope-exoplanet-sand-clouds-atmosphere

Gamma-rays with energies of up to 13 teraelectronvolts measured for brightest burst of all time

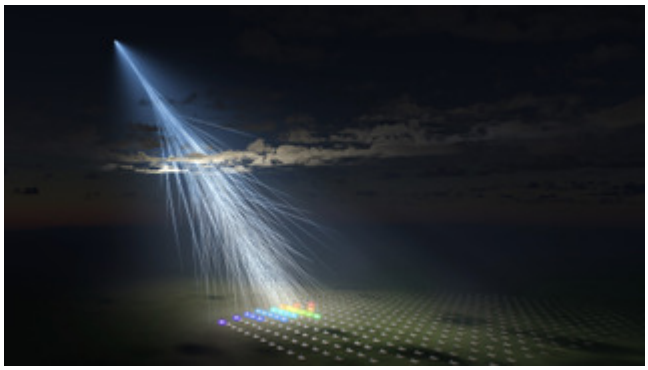


*The light curve and significance map of GRB 221009A obtained by KM2A.(**A**) The gamma-ray–count light curve obtained by KM2A with each time bin of 10 s. The black curve indicates the events from the angular cone centered on the GRB, and the blue curve indicates the number of events due to cosmic ray background estimated from 20 similar angular cones at off-source directions with the same zenith angle. The gray dashed lines indicate the peak times of the multipulsed emission observed by GECAM-C in the MeV band. The green dashed lines indicate the times of T_0 + 230 s, T_0 + 300 s, and T_0 + 900 s. The pink points indicate the energy marked by the right label and the arrival time of each event. (**B**) The significance map around GRB 221009A as observed by KM2A. The plus sign and corresponding length denote the position and error determined by KM2A. The black circle denotes the position of the GRB reported by Fermi-LAT. The white circle shows the size of the PSF that contains 68% of the events. Credit: Science Advances (2023). DOI: 10.1126/sciadv.adj2778*

Astronomers with The LHAASO Collaboration have found that last year's GRB 221009A gamma-ray burst, subsequently nicknamed the Brightest of All Time (BOAT), carried with it 13 teraelectronvolts of energy. In their study, reported in the journal *Science Advances*, the group analyzed data from the LHAASO-KM2A detector located in in Sichuan, China, to learn more about the burst.Gamma ray bursts result in the brightest explosions seen from

Earth and there are many theories regarding their source. Some suggest they're caused by neutron star collisions; others suggest they are due to mergers between neutron stars and black holes or the collapse of a massive star into a black hole. https://phys.org/news/2023-11-gamma-rays-energies-teraelectronvolts-brightest.html

High-energy 'sun goddess' particle opens possibilities for new physics, exciting scientists



An illustration shows streams of high-energy particles streaking through Earth's atmosphere from the heavens.(Image credit: Osaka Metropolitan University/L-INSIGHT, Kyoto University/Ryuunosuke Takeshige)

Over the years, scientists have managed to unveil the existence of quite a view intriguing particles, pushing the entire field of physics forward with each discovery. There's the "God Particle" for instance, aka the Higgs Boson that grants all other particles their masses. There's also the so-called "Oh My God!" particle, an unimaginably energetic cosmic ray. But now we have a new particle in town. It's named the "sun goddess" particle — and is fittingly extraordinary. This particle has an energy level one million times greater than what can be generated in even humanity's most powerful particle accelerators; it appears to have fallen to Earth in a shower of other, less energetic particles. Like the "Oh My God!" particle, these bits come from faraway regions of space and are known as cosmic rays. The particle has been dubbed "Amaterasu" after Amaterasu Ōmikami, the goddess of the sun and the universe in Japanese mythology, whose name means "shining in heaven."

https://www.space.com/mysterious-sun-goddess-particle-new-physics

'Teenage' galaxies from the early universe contain mysterious heavy elements, James Webb telescope reveals

A sample of galaxies dating to the first 2 to 3 billion years of the universe contain much heavier elements, and appear to be far hotter, than scientists expected.

Young galaxies from the early universe as seen by the James Webb Space Telescope.(Image credit: NASA/ESA/JWST)

The deeper we look into space, the further back in time we see. Light emanating from some of the younger galaxies in our universe has to travel for billions of years to reach us, getting picked up by our instruments, rich with information from the cosmic dawn. And not only can this light tell us where we have come from, but where we might be headed.To understand the evolution of several of these early universe, "teenage" galaxies, a Northwestern University-led team of astrophysicists have inspected data from the James Webb Space Telescope (JWST), which gazed back to realms that formed just two-to-three billions years after the Big Bang.

https://www.livescience.com/space/astronomy/teenage-galaxies-from-the-early-universe-contain-mysterious-heavy-elements-james-webb-telescope-reveals

COMMITTEE MEMBERS

Derek Duckitt	(Chairman, website editor, "Southern Cross" editor, Cosmology SIG co-ordinator)	082 414 4024 derek.duckitt@gmail.com
Pierre de Villiers	(Vice-chairman, Projects leader)	082 854 2277
Elaine Sykes	(Treasurer)	083 286 2683
Peter Harvey	(Secretary, "Skynotes", "Southern Cross", Study Group SIG coordinator)	081 212 9481 petermh@hermanus.co.za
Mick Fynn	(Educational outreach)	082 443 0848
Pieter Kotzé	(Events co-ordinator, "Southern Cross" Astronomy News)	082 581 3233

Non-committee members with portfolios:

Deon Krige	(GPAED project, Astro-photography SIG coordinator)	
Johan Retief	(Membership)	028 315 1132