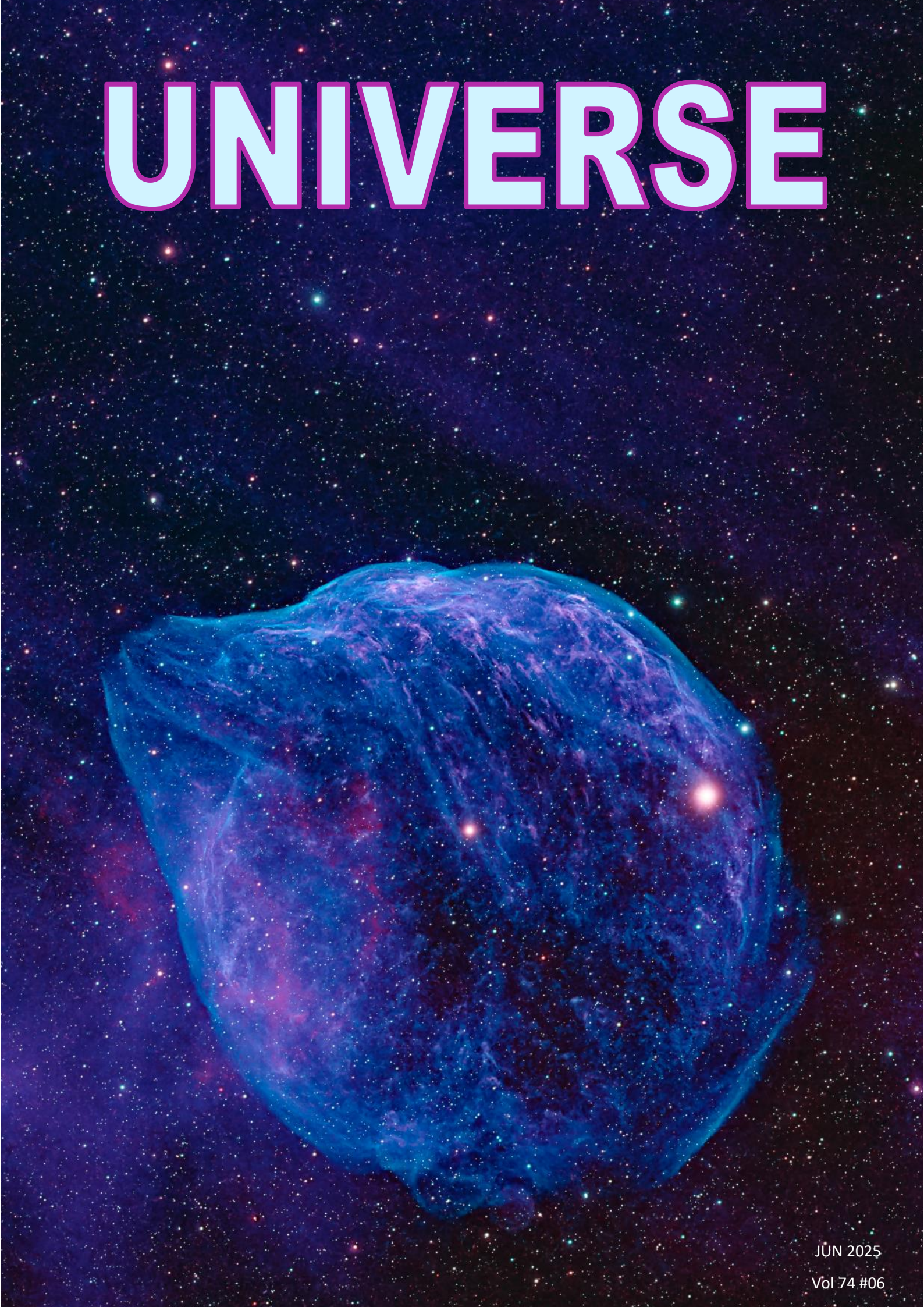
UNIVERSE



JUN 2025
Vol 74 #06

In This Issue

General Contact Details
ASNSW
PO Box 870, Epping NSW 1710
Email: secretary@asnsw.com
Web: https://www.asnsw.com
Universe: *eds@asnsw.com*

Copyright

Distribution

Universe is distributed to ASNSW members and it is kept on the ASNSW web site for member access only. Copies are sent to other astronomical societies, with the constraint that access is restricted to their members. Digital copies are also lodged with the State Library of NSW via National EDeposit (NED). No copies should be circulated in addition to these without written permission of the ASNSW.

Disclaimers

This publication is for general information purposes only. The views and opinions expressed herein are attributed to the author and are not necessarily those of the ASNSW. The ASNSW has taken reasonable measures to verify that the material contained herein is correct, but cannot guarantee its accuracy or completeness. Readers are advised not to rely solely on this information and should seek independent advice before making any decision. Any notice of goods, services or events that are not offered directly by the ASNSW are presented as a service to members. The ASNSW does not warrant their quality or suitability for any purpose.

The ASNSW reserves the right to make changes to its distribution and policies at any time as deemed necessary.

MEMBERSHIP CATEGORY	PDF UNIVERSE*	POSTED UNIVERSE
Joining Fee	$20-00 All memberships	
Full	$52-00	$95-00
Student	$26-00	$69-00
Associate (related to a full member)	$26-00	$69-00
Overseas members	As above	N/A

*PDF Universe price applies for: "Emailed Universe", "Download Universe" and "No Universe" members.
If you joined in Oct-Dec of one year, the first year's subscription extends to the end of the following year.

Life Members: Edward (Ted) Lumley*, Cyril Brown*, Shirley Rae*, O. Bruce Slee*, Eric Patston*, Ronald J. McNiven*, Bill Proudfoot*, Ken Beames*, Ken Wallace, Adrian Saw, Max Gardner AM*, Joe Cauchi, Don Whiteman, Les Sara, Harold Berman*, Janet Saw*, Eugene O'Connor*, Chris Ross, Scott Mellish*, Lesa Moore, Mick McCullagh, John Flavin, Richard Jaworski, Paul Hatchman. *Indicates member is deceased.

Team Space

Your Committee

President: Trevor Oates

Vice President **Wiruna**: Joe Cauchi for bookings & enquiries m: 0428 363 878 e: ***vp_wiruna@asnsw.com***

Vice President Crago: Mark Notary

Treasurer: Lesa Moore

Secretary: Greg Neilson

Committee member: Donna Burton

Committee member: Matt McKenzie

Committee member: Greg Priestley

Committee member: Chris Ross

Committee member: Don Whiteman

Contact your committee at ***committee@asnsw.com***

Your Editorial Team

Kendra Melson: Editor correspondence and submissions, layout of Universe, conversion to PDF, distribution to the "attachment" mailing list.

Trish Wilkins: Universe content supervisor, proof reading and corrections.

Lesa Moore: Distribution to ASNSW members via online database.

Anthony Maxwell: Upload to the State Library's National Electronic Database (NED).

Greg McCall: Compile contents list and upload to ASNSW Document Repository.

Donna Burton: Print and post to hard-copy recipients.

Please send all correspondence to ***eds@asnsw.com*** (seen by Kendra, Trish and Lesa).

July 2025 submissions required by 19 June.

UNIVERSE Correspondence and Contributions -

eds@asnsw.com

Front Cover by Chi Chan: Emission nebula Sh 2-308 Dolphin Head Nebula was captured in HOO from Sydney backyard over first two months of year 2025. The nebula is bubble-like and surrounds a Wolf–Rayet star named EZ Canis Majoris, which is in the brief pre-supernova phase of its stellar evolution. The nebula is about 4,530 light-years away from Earth. The striking resemblance of a dolphin head and the surrounding Ha and OIII nebulosity creates the scene of a dolphin pops its head out of the ocean. Equipment used: RedCat 71, ASI6200MM Pro, Chroma 3nm Ha and OIII filters, ASIAIR Plus, AM5. Total integration time: 14 hours 25 minutes. Processing: PixInsight 1.9.3 build 1644.

Rear Cover by Chi Chan: Globular cluster NGC 5139 Omega Centauri was captured from my backyard on 13 April 2025. It is located in the constellation Centaurus, at about 17,090 light-years away and having an apparent magnitude of 3.9. Omega Centauri is the largest and most massive globular cluster in the Milky Way. The cluster spans about 150 light-years in diameter and contains approximately 10 million stars.

Unlike most globular clusters, Omega Centauri exhibits a wide range of stellar ages and chemical compositions, leading astronomers to believe it may be the core remnant of a disrupted dwarf galaxy that was absorbed by the Milky Way. It rotates much faster than other clusters and has a flattened shape, with some of its fastest-moving stars traveling at 21 km/s.

Equipment: Esprit 120 ED, ASI6200MM Pro, Chroma LRGB filter set, Falcon Rotator, Wave 150i. Processing: PixInsight 1.9.3 build 1646.

June Observer

==========

By Geoff Smith

==========

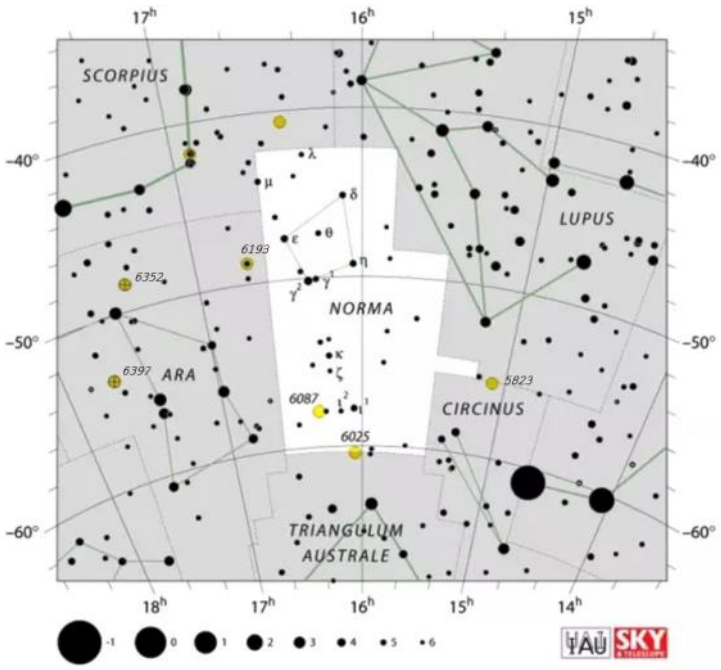
Planets in June

In June we have **Mercury** returning to the evening sky after its solar conjunction in late May. Late June to mid-July marks an excellent period for evening observation of the planet. **Venus** reaches its greatest eastern elongation of 45° west of the Sun on the 1st. There is a good opportunity to see the planet in a dark sky well before the arrival of civil dawn. **Jupiter** now lost in the glare of the Sun deserts last month's companionship with **Mars** in the early evening sky. **Saturn**—rising around midnight in the middle of the month—and **Neptune** are creeping closer together and at month's end they will only be 1° apart, a separation they will maintain until early August.

Moon Cycles

First Quarter	Full Moon	Third Quarter	New Moon
3 Jun 1:40 pm	11 Jun 5:43 pm	19 Jun 5:19 am	25 Jun 8:31 pm

Looking South— Norma, Ara and Circinus



Norma is a small constellation between Ara, Lupus and Circinus and is one of the twelve constellations depicting scientific instruments introduced by Nicolas-Louis de Lacaille. Its name is Latin for normal, referring to a right angle, and is variously considered to represent a rule, a carpenter's square, a set square or a level. Four of Norma's brighter stars—γ, δ, ε and η—make up a square in a field of faint stars. γ^2 Normae is the brightest star with an apparent magnitude of 4.0. μ Normae is one of the most luminous stars known, with a luminosity between a quarter million and one million times that of the Sun. Four star systems are known to harbour planets. Norma has eight open clusters visible to observers with binoculars. Due to its location on the Milky Way, Norma contains many galactic deep-sky objects. **NGC 6087** is the brightest open cluster in Norma with a magnitude of 5.4. It lies in the south-eastern corner of the constellation between α Centauri and ζ Arae. Thought to be around 100 million years old, it is about 3300 light-years away and about 14 light-years in diameter.

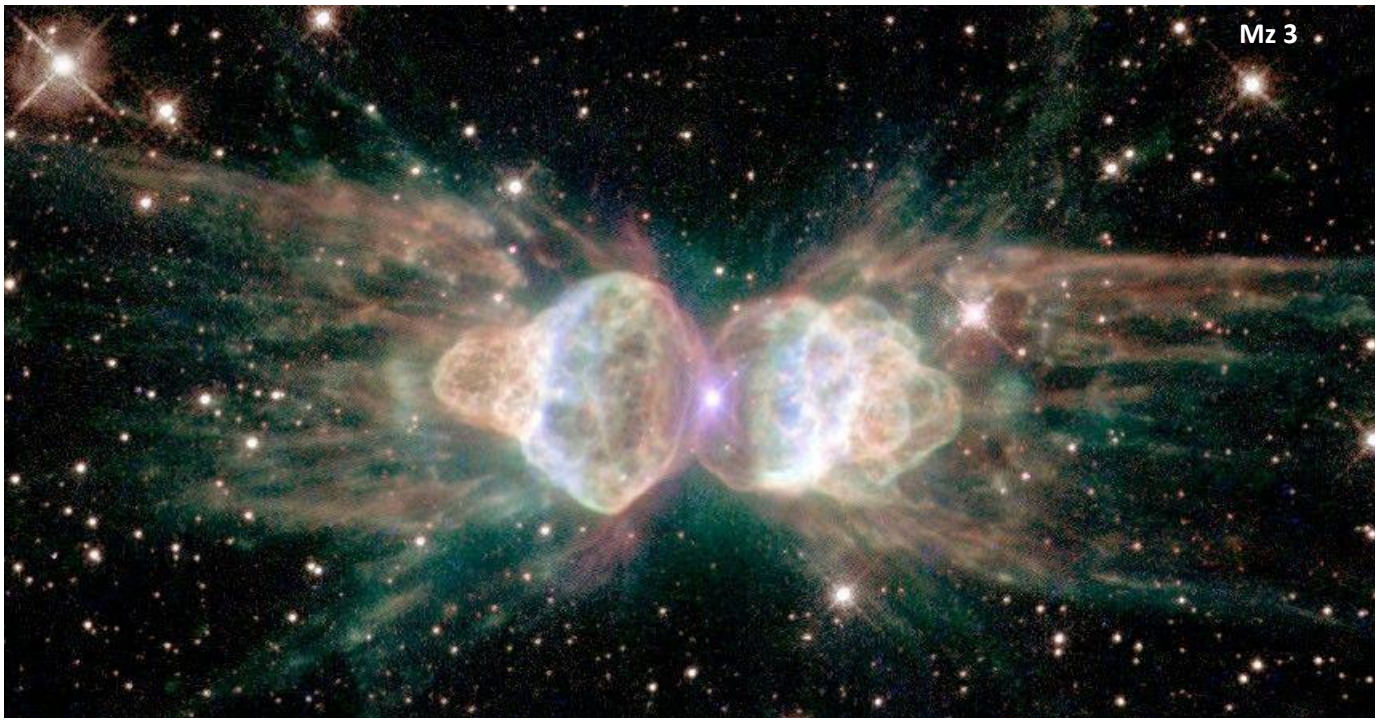
Mz 3 (**Menzel 3**) is a young bipolar planetary nebula in Norma that is composed of a bright core and four distinct high-velocity outflows. Mz 3 is often referred to as the **Ant Nebula** for obvious reasons.

The following description is taken from the Hubble Site (Link in References):

From ground-based telescopes, the so-called "ant nebula" (Menzel 3, or Mz 3) resembles the head and thorax of a garden-variety ant. This dramatic NASA/ESA Hubble Space Telescope image, showing 10 times more detail, reveals the "ant's" body as a pair of fiery lobes protruding from a dying, Sun-like star.

The Hubble images directly challenge old ideas about the last stages in the lives of stars. By observing Sun-like stars as they approach their deaths, the Hubble Heritage image of Mz 3—along with pictures of other planetary nebulae—shows that our Sun's fate probably will be more interesting, complex, and striking than astronomers imagined just a few years ago.

Though approaching the violence of an explosion, the ejection of gas from the dying star at the centre of Mz 3 has



intriguing symmetrical patterns unlike the chaotic patterns expected from an ordinary explosion. Scientists using Hubble would like to understand how a spherical star can produce such prominent, non-spherical symmetries in the gas that it ejects.

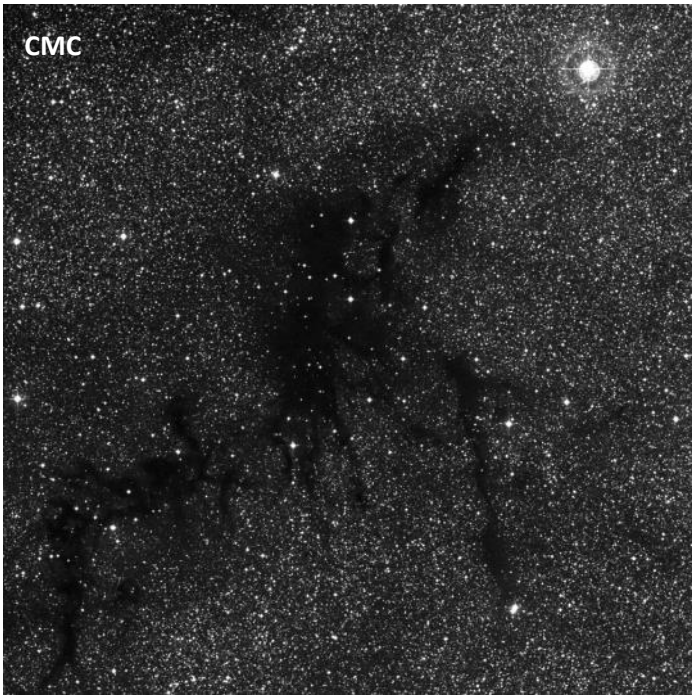
One possibility is that the central star of Mz 3 has a closely orbiting companion that exerts strong gravitational tidal forces, which shape the outflowing gas. For this to work, the orbiting companion star would have to be close to the dying star, about the distance of the Earth from the Sun. At that distance the orbiting companion star wouldn't be far outside the hugely bloated hulk of the dying star. It's even possible that the dying star has consumed its companion, which now orbits inside of it, much like the duck in the wolf's belly in the story "Peter and the Wolf."

A second possibility is that, as the dying star spins, its strong magnetic fields are wound up into complex shapes like spaghetti in an eggbeater. Charged winds moving at speeds up to 1000 kilometres per second from the star, much like those in our Sun's solar wind but millions of times denser, are able to follow the twisted field lines on their way out into space. These dense winds can be rendered visible by ultraviolet light from the hot central star or from highly supersonic collisions with the ambient gas that excites the material into fluorescence.

No other planetary nebula observed by Hubble resembles Mz 3 very closely. M2-9 comes close, but the outflow speeds in Mz 3 are up to 10 times larger than those of M2-9. Interestingly, the very massive, young star, Eta Carinae, shows a very similar outflow pattern.

Abell 3627, also called the Norma Cluster, is approximately 200 million light-years from Earth with a redshift of 0.016. Unfortunately, it is difficult to observe because it is located in the Zone of Avoidance, a region near the plane of the Milky Way. Consequently, it is severely obscured by interstellar dust at optical wavelengths. It is one of the most massive galaxy clusters known to exist, at ten times the average cluster mass. Abell 3627 is thus theorized to be the Great Attractor, a massive object that is pulling the Local Group, the Virgo Supercluster, and the Hydra–Centaurus Supercluster towards its location at 600–1000 kilometres per second.

Circinus is a small, faint constellation introduced by Lacaille. Its name is Latin for compass, referring to the tool used for drawing circles, rather than the tool for navigation. Two sun-like stars in Circinus have planetary systems: HD 134060 has two small planets, and HD 129445 has a Jupiter-like planet. Supernova SN 185 appeared in Circinus in 185 AD and was recorded by Chinese observers. Although Circinus is a nondescript naked-eye object, it harbours many interesting photographic objects. Not to be missed is the **Circinus Molecular Cloud (CMC)**, also known as **vdBH 65a** or **Sandqvist 169**. This dark molecular cloud complex makes a fine wide-field imaging opportunity silhouetted by the starry backdrop of the Milky Way. The view here from the DSS shows a 1° x 1° field.



The Milky Way runs through the constellation, highlighting prominent open clusters and many dark nebulae. There is also a tiny (5") planetary nebula **NGC 5315**; the Hubble Space Telescope picture shown here illustrates its remarkably intricate structure.

Circinus also hosts the notable **Circinus Galaxy** (**ESO 97-G13**), discovered in 1977; it is the closest Seyfert galaxy to the Milky Way. For more details see ***https://www.constellation-guide.com/circinus-galaxy/*** .

Ara (The Altar) is one of the original 48 constellations described by the 2nd-century astronomer Ptolemy. The orange supergiant β Arae is its brightest star at magnitude 2.85. Sunlike μ Arae hosts four known planets. Gliese 676 is a binary red dwarf system with four known planets.

Ara contains **Westerlund 1**, a compact young super star cluster in a field abounding in dark nebulae. It is about 3.8 kpc (12,000 ly) away from Earth and is thought to be the most massive young star cluster in the Milky Way. It contains a large number of hot blue stars but appears red as the light is filtered through vast amounts of gas and dust as it travels towards us. These dust particles scatter blue and ultraviolet light more effectively than red light. As a result, the blue light is scattered away, leaving only the red light to reach us. It was discovered by Bengt Westerlund in 1961 but remained largely unstudied for many years due to high interstellar absorption in its direction. The cluster contains the red supergiant Westerlund 1-26. It is one of the largest stars known and is one of the most luminous supergiant stars discovered so far with a radius calculated to be in excess of a thousand times the solar radius and a luminosity of over 200,000 times the solar luminosity. If placed at the centre of the Solar System, its photosphere would engulf the orbit of Jupiter. The area around Westerlund 1 is an interesting one, showing many dark nebulae. The cluster contains a large number of rare, evolved, high-mass stars, including: 6 yellow hypergiants, 4 red supergiants 24 Wolf-Rayet stars, a luminous blue variable, many OB supergiants, and an unusual supergiant sgB[e] star which has been proposed to be the remnant of a recent stellar merger. In addition, X-ray observations have revealed the presence of the anomalous X-ray pulsar CXO J164710.20-455217, a slow rotating neutron star that must have formed from a high-mass progenitor star. Westerlund 1 is believed to have formed in a single burst of star formation, implying the constituent stars have similar ages and compositions.

Aside from hosting some of the most massive and least-understood stars in our galaxy, Westerlund 1 is useful as a relatively nearby and easy to observe super star cluster that can help astronomers determine what occurs within extragalactic super star clusters.

A popular photographic target in Ara is the nebula complex **NGC 6188**, known as the **Firebird Nebula** or the **Fighting Dragons of Ara**. At the top centre of the accompanying picture is **NGC 6193**, a sparse open cluster. Two O-type stars HD 150135 and HD 150136, just 10" apart dominate the cluster. In the picture they appear as a single star in the top centre. The X-ray emission from HD 150136 is so intense that it ranks as one of the most X-ray luminous stars known. Together, these two stars are responsible for the ionising radiation that is eroding the eastern edge of NGC 6188 and that is the likely trigger for star formation in the nebula.

Table of Deep Sky Objects for June

In the table below all times are AEST, transit times are for 15 June at Wiruna, the Society's premier dark sky site (longitude 149° 46' 49'' E). MA denotes the altitude of the object at transit time

Object	Type	Const	RA	Dec	Mag	Size	Transit	MA(°)	Notes
NGC 5288	OC	Cir	13h 48m 46s	-64° 40' 48"	11.8	5.3'	20:12	58	
NGC 5315	PN	Cir	13h 53m 57s	-66° 30' 51"	9.8	5"	20:17	56	Photographic challenge
PGC 50779	Gxy	Cir	14h 13m 10s	-65° 20' 20"		7.4'	20:36	58	Circinus Galaxy. Nearest Seyfert 2 galaxy
NGC 5715	OC	Cir	14h 43m 26s	-57° 34' 41"	9.8	7.8'	21:06	65	Sparse OC in a busy starfield
Sandqvist 165	MolCld	Cir	14h 48m 29s	-65° 15' 54"		9'	21:12	58	
Sandqvist 166	MolCld	Cir	14h 54m 12s	-63° 44' 00"		5'	21:17	59	
Sandqvist 169	MolCld	Cir	15h 00m 00s	-63° 10' 00"		1° x 1°	21:23	59	Great photographic object
NGC 5823	OC	Cir	15h 05m 28s	-55° 36' 29"	7.9	16'	21:28	67	
Sandqvist 174	MolCld	Cir	15h 25m 30s	-59° 02' 00"		48'	21:48	64	Good photograpic object
NGC 5946	GC	Nor	15h 35m 29s	-50° 39' 35"	8.4	7.1'	21:58	72	Compact in a starry field
NGC 6067	OC	Nor	16h 13m 12s	-54° 13' 37"	5.6	13'	22:36	69	Framed by 4 bright stars
RCW 101	PN	Nor	16h 17m 13s	-51° 59' 11"		25"	22:40	71	Ant Nebula
NGC 6169	OC	Nor	16h 34m 07s	-44° 01' 00"	6.6	12'	22:57	79	μ Nor Cluster
NGC 6188	BN	Ara	16h 40m 00s	-48° 30' 00"		20'	23:03	74	Fighting Dragons
NGC 6193	OC	Ara	16h 41m 17s	-48° 46' 37"	5.2	19'	23:04	74	Lights up NGC 6188
NGC 6200	OC	Ara	16h 44m 06s	-47° 28' 00"	7.4	14'	23:07	76	Sparse cluster
NGC 6221	Gxy	Ara	16h 52m 46s	-59° 13' 01"	9.9	4.6'	23:15	64	Galaxy NGC 6215 in the same field
NGC 6250	OC	Ara	16h 57m 59s	-45° 57' 06"	5.9	13'	23:21	77	
NGC 6300	Gxy	Ara	17h 17m 00s	-62° 49' 14"	10.2	5.6'	23:40	60	Barred spiral with inner ring
NGC 6326	PN	Ara	17h 20m 46s	-51° 45' 15"		17"	23:43	71	Tiny PN
IC 4651	OC	Ara	17h 24m 51s	-49° 55' 01"	6.9	28'	23:47	73	
NGC 6352	GC	Ara	17h 25m 29s	-48° 25' 20"	7.8	7.1'	23:48	75	
NGC 6362	GC	Ara	17h 31m 55s	-67° 02' 54"	8.1	11'	23:55	56	
NGC 6397	GC	Ara	17h 40m 42s	-53° 40' 28"	5.2	26'	00:03	69	Closest GC after M4

References:

1. *Astronomy 2025 by Wallace, Dawes and Northfield*
2. *NGC/IC webpage http://www.ngcicproject.org/*
3. *Double Stars for small telescopes by Sissy Haas*
4. *Annals of the Deep Sky by Jeff Kanipe and Dennis Webb*
5. *The constellation charts are from http://www.iau.org/public/themes/constellations/ and were produced by the IAU in collaboration with Sky & Telescope magazine. Their use here is permitted under the creative commons licence http://creativecommons.org/licenses/by/3.0/*
6. *Hartung's Astronomical Objects for Southern Telescopes by David Malin and David Frew*
7. *Information on Mz3 from https://science.nasa.gov/asset/hubble/the-ant-nebula-menzel-3-fiery-lobes-protrude-from-dying-sun-like-star/*
8. *Photographs of Westerlund 1 and NGC 6188 by Geoff Smith, Circinus Molecular Cloud from the DSS, NGC 6315 and the Ant Nebula from HST.*

June Comets

By Greg Bryant

Comet 29P/Schwassmann-Wachmann 1: In the April column, I mentioned this periodic visitor discovered back in 1927. Orbiting the Sun every 14 years beyond the orbit of Jupiter, it has an outburst of several magnitudes every month or so. During June, it's moving slowly through the southeastern corner of Leo, setting late evening, so try for it as soon as twilight has ended.

In addition to its outburst behaviour, the most regular of any known comet, Schwassmann-Wachmann 1 is the first identified of the class of objects known as Centaurs, icy bodies that once resided in the Kuiper Belt and are transitioning in towards the Sun. As to whether or not Schwassmann-Wachmann 1 will venture much closer for distant descendants is unclear.

Comet 29P/Schwassmann-Wachmann 1

Date	R.A.	Dec.	Delta (au)	R (au)	Elong. (°)	Mag.
7 Jun	9^h 46.1^m	+9° 55'	6.568	6.281	69	~13
14 Jun	9^h 49.2^m	+9° 38'	6.670	6.282	63	~13
21 Jun	9^h 52.6^m	+9° 19'	6.768	6.283	58	~13
28 Jun	9^h 56.2^m	+8° 59'	6.860	6.284	52	~13
5 Jul	10^h 00.1^m	+8° 37'	6.944	6.285	46	~13

Comet C/2025 F2 (SWAN): Alas, this comet (highlighted in last month's column) did crumble as it approached perihelion in early May and there was little to see for observers after it became a target of opportunity in the southern hemisphere.

==========

By Alessandro Spina

==========

I was particularly looking forward to the April weekend away to Wiruna. This weekend would mark the first time I would have my 10-inch Meade LX200 (affectionately known by some as "The Coffee Grinder") up and running in many years. Living in Europe for the last 9 years, meant the LX200 remained in Australia in storage, patiently waiting for my return. Upon returning to Australia in late 2024, I set myself the project of rejoining the society and getting the LX200 electronics and optics up and running again.

As owners of classic Meade telescopes know, the older telescopes can be plagued by a few electronic issues. In particular, five insufficiently rated capacitors that have a tendency to blow at any time and take whole circuit boards with them. So with the help of YouTube and friends, I managed to swap out four of the five offending capacitors for a higher rated capacitor. This weekend would be the first in-field test of the telescope to see if my mediocre soldering skills had done a sufficient job.

My wife and I arrived at Wiruna on Thursday afternoon at 1.30pm to a blue sky dotted with clouds. We proceeded to setup the campsite and we set up the LX200 near the Club's 17-inch Dob. A pair of Black Cockatoos stood watch over the main observing field as I set up the telescope. Several members were on-site already. As sunset approached, the sky completely cleared for one of those beautiful Wiruna sunsets.

The Coffee Grinder

I was eager to test out The Coffee Grinder, so by 6pm I had the scope's 2-star alignment complete, and slewed to the first object to test the alignment. I was relieved to hear the drone of the RA and DEC drives as the telescope slewed. The "magic smoke" that powers the electronics appeared to stay in the telescope for now. Omega Centauri was the first test object I choose; it was a little off centre but happily in the field of view. With the scope behaving itself it was time to get stuck into some visual observing. Normally I would have some sort of list of observing targets prepared, but a hectic week meant I had nothing prepared. So with my copy of Wil Tiron's ***The Cambridge Sky Atlas*** in hand, I proceeded to hop across the sky on a unplanned tour of some old favourites and some new discoveries.

The constellations of Centaurus, Crux and Carina placed perfectly to the south, so this was where I began. I started with another globular in Centaurus, **NGC 5286**. At 7.6 magnitude and 9' across, this globular is no comparison to its more illustrious neighbour, but I could begin to resolve some of the brighter stars in the core. A bright yellow-orange star dominated the field of view beneath the cluster. What makes **NGC 5286** particularly intriguing is it is among one of the oldest globular clusters in our galaxy. Astronomers speculate that **NGC 5286** is remnant of a dwarf galaxy that collided with our own galaxy millions of years ago.[1]

From there I hopped over to **NGC 4945**, an edge on barred spiral galaxy with a supermassive black hole in its centre.[2] Through the 10inch it appears as a diagonal, cigar-shaped luminous haze, lying at a 45-degree angle. It appears to have an even brightness, although images reveal dust clouds mottled along the spiral arms. I was quite surprised by the size of the galaxy, 20' x 4' taking up half the field of view in the 26mm eyepiece.

Next came **NGC 5138**, a 7.6 magnitude open cluster in Centaurus. This cluster presented as a large, sparsely populated cluster of ~40 stars, with no structured core. It would probably have benefited from a larger field of view, but the 26mm eyepiece was the widest I had on me. This was closely followed by a nearby 9th magnitude open cluster, **NGC 4852**. Again, this cluster would probably have benefited from a wider field of view. However, it appeared to have more structure than **NGC 5138**, with chains of stars creating a pleasant field of view.

Next, I moved into Crux, where most attention is given to **NGC 4755** aka "The Jewel Box", so I decided to try my luck on something new, **NGC 4337**. At 9th magnitude this open cluster was significantly fainter and smaller than my earlier targets. Although I could easily resolve the brighter stars in the core, averted visions reveals more stars around the core. The field of view is framed by a side-on parabola of stars, and **NGC 4337** sits at the top of this parabola. A unique fact about **NGC 4337** is its age, with it being one of a handful of older open clusters in the high-density regions of the inner galactic disk.[3]

From Crux, I wandered into Carina and the open cluster **NGC 3590**. This open cluster sits at 8.2 magnitude but appear very disperse with several smaller pockets of stars. This led me to **NGC 2808** a 6.3 magnitude globular cluster in Carina. **NGC 2808** is one of the Milky Way's most massive clusters, containing more than a million stars.[4] Although relatively bright, the cluster's dense core resisted resolution, even at higher magnifications.

I then hopped over to the constellation of Musca, a constellation I have often overlooked but sits at the foot of Crux and is easily identified by its distinctive shape with the naked eye. I centred on **NGC 4833** a 7.3 magnitude globular cluster. Even without a Go-To telescope, this one is easy to find as it is close to Delta Muscae. With Delta Muscae in the viewfinder, I can just make a faint fudge in the 9x50 viewfinder. **NGC 4833** appeared as a relatively bright cluster, with chains of brighter stars resolved. Also in Musca is another larger, but fainter globular cluster **NGC 4372**. **NGC 4372** can be found by pointing the telescope at Gamma Muscae, and the viewfinder should pick it up.

Throughout the night I could feel a significant layer of dew starting to coat everything. My dew shield (with no dew heater) was starting to struggle. While spending so much time focusing on getting the electronics working, I had neglected to get a working dew heater. Sensing the end was near, I swung the telescope low in the eastern horizon into Scorpio, to try keep the corrector plate dry as long as possible. From here I hopped around a few globular clusters dotted around the galactic centre.

Despite best efforts, the dew had built up significantly, and I could no longer ignore the large halos around the brighter stars. I decided to call the night around 11pm. So even though it was a shortened night, I was glad to have the telescope up and running again under the dark skies of Wiruna.

I woke up the next day to clear skies and a beautiful sunrise. Although the Wiruna working bee was scheduled for Saturday several jobs in the kitchen were started and occupied us until the afternoon. The day brought some threatening grey clouds in the distance, but as the afternoon wore on these seemed to melt away. Throughout Friday afternoon more scopes arrived in anticipation of a clear night. With no threat of rain, I though it safe to pull out The Coffee Grinder from the car and set it up again. Although the forecast was for a slightly warmer night, I was still at risk of my mirror dewing up. However, Greg Priestly came to my rescue and lent me his dew heater and controller.

I wandered onto the field at about 6.15pm and aligned the scope. A small group of members began congregating around The Coffee Grinder, no doubt drawn in by its siren call of slewing. We proceeded to hop around a few targets suggested by the assembled crowd.

Trevor Oates suggested **M99**, a face-on spiral galaxy in Coma Berenices, as he was currently imaging it. So, I wandered over to compare the view in my eyepiece to that through his camera. Alas, my eyes were no comparison to the camera's 5-minute exposures. Where the camera clearly revealed three bright spiral arms, the 10-inch could only uncover a bright uniform core with a surrounding halo roughly 5.4' x 4.8', but with no further details apart from a slight elongated shape. We then hopped over to **M104** in Virgo, the Sombrero Galaxy. This bright galaxy with its characteristic bulbous core was clearly visible. A dark band of dust clearly visible through the length of the galaxy. Continuing the galaxy theme, I centred on **NGC 5128** in Centaurus, otherwise known as the 'Hamburger Galaxy'. This galaxy displays a bright 6.8 magnitude core, with its characteristic thick dusty spiral arm cutting across its galactic

core clearly visible.

With an enthusiastic audience gathered around, I swung to the south to catch the last views of the Small Magellanic Cloud before it was lost to the tree line. The perennial crowd pleaser, **47 Tuc** at 4.0 magnitude and 30' in size, is always a treat no matter how many times you have seen it. From there up to Large Magellanic Cloud and **NGC 2070**, the Tarantula Nebula. I am always amazed to how much detail there is in the nebulosity of this intense star forming region. The 15mm at 167x happily accommodated it in the field of view and reveals lovely details in the strands of gas and dust.

At this point I noticed the Dew Heater had given out; a quick check of the power cable revealed a severely melted cigarette lighter. A further post-mortem the morning revealed the culprit, a faulty dew heater. But with a replacement on hand, we were able to continue observing.

By 9pm, some fast moving low-level clouds appeared from the south. In between the odd cloud we continued. I jumped into Musca to find **NGC 4372**, a 7.8th magnitude globular cluster. This is a slightly larger but dimmer globular than its neighbour **NGC 4833** I had visited the night before. While in the area I dropped into **NGC 3372**, Eta Carina, which is one of my favourites. With 26mm, the FOV captures a starry field, with swirls of nebulosity, intersected by dirty clouds of darkness.

By this time Scorpio and Ara has risen above the trees and muck in the east, so I swung over to **M4** in Scorpio. Sitting 1.3 degrees from Antares makes this globular cluster easy to spot in the viewfinder. I was easily able to resolve chains of bright stars around the core of this 5.6 magnitude cluster. Next, I hopped over to **NGC 6397**, a globular cluster in Ara. It appeared as a similar size and brightness to M4, with the bright core resolving well, into lovely chains of stars. Interestingly, **NGC 6397** contains about 400,000 stars and has undergone a "core collapse," which makes its central area very dense.

Around this time the RA drive decided to pack it in. This was a problem I had been expecting. The Coffee Grinder having been sitting stationary in storage for many years, had probably developed patches of dried grease which can strain the RA drive and eventually cause it to become unresponsive. So, I switched the scope off and went to manual mode. An easy nearby target was **NGC 6231**, an open cluster in the tail of Scorpio visible to the naked eye. The 10-inch showed a bright cluster of 20-30 stars in a compact formation

By this point low clouds started drifting in with more frequency and speed. By 10pm a thick band moved over and threatened to cover most of the sky. Pushing my luck, I switched the scope back on and did a quick 2-star alignment. At this point Canis Major and Puppis, low in the west, were the only spots free from cloud.

I started with **M46**, one of my favourites in this constellation. It is a bright open cluster with an even dispersion of stars across the whole field of view. But what stands out to me is the ghostly greyish disk of a planetary nebulae, **NGC 2438**, floating amongst the stars of the open cluster. Next was, **NGC 2432** another open cluster in Puppis. But much fainter collection of 10-20 stars in a dense elongated pattern, but even with higher magnification, could not make out much. I proceeded to hop around several smaller open clusters that dot Puppis. One particularly enjoyable discovery was **NGC 2477**. This is bright 5.8 magnitude cluster, appeared densely populated with 100-200 stars in a compact circle, resembling a very loose globular cluster.

By then the sky had begun to completely cloud over, with the odd sucker hole tempting me to leave the telescope out. However, with the forecast not looking promising, and a few hours of happy observing, I was content to retreat to the warmth of the fire in the kitchen.

Until next month. Clear skies.

Footnotes:

1. *https://science.nasa.gov/mission/hubble/science/explore-the-night-sky/hubble-caldwell-catalog/caldwell-84/*
2. *https://www.eso.org/public/news/eso0931/#:~:text=NGC%204945%20appears%20cigar%2Dshaped,this%20stage%20in%20galactic%20development*.
3. *https://academic.oup.com/mnrasl/article/441/1/L36/2889079*
4. *https://en.wikipedia.org/wiki/NGC_2808*
5. *https://ui.adsabs.harvard.edu/abs/2001ApJ...563L..53G/abstract*

Comino's Comment

Crux Quiz

The Questions:

1. How fast does the lunar terminator travel across the surface of the moon?
2. Is declination used to calculate conjunctions?
3. How many days do ISS astronauts wear their shirts for? 2, 5 or 10 days?
4. What is the name of the optical aberration that fast Newtonian telescopes suffer from?
5. Does the term 'Ritchey-Chrétien' describe an eyepiece design, a telescope or a mount?
6. What is the name for a comet that has passed close to the Sun so many times that it has lost its volatile components?
7. Is it possible to see meteors hitting the lunar surface from Earth?
8. Who discovered the precession of the equinoxes and compiled the first star catalogue?
9. What is the Bepi Colombo mission's object of enquiry?
10. Who developed the on-board in-flight software for Apollo 11, later becoming Director of NASA's Software Engineering Division?

With thanks to Markus Stone, Astronomical Society of Victoria

Questions, comments and corrections can be directed to ***astroquiz@markusstone.com*****.**

June Sky Events

By Kendra Melson

GMT Date	GMT Time	Sydney Date	Sydney Time		Event
1	2:00	1	12:00pm	12:00	**Venus** at Greatest Elong: 45.9°W
1	9:49	1	7:49pm	19:49	**Mars** 1.4°S of Moon
2	1:30	2	11:30am	11:30	**Regulus** 1.8°S of Moon
3	3:41	3	1:41pm	13:41	FIRST QUARTER MOON
4	1:33	4	11:33am	11:33	Moon at Descending Node
6	14:15	7	0:15am	0:15	**Spica** 0.5°N of Moon
7	10:42	7	8:42pm	20:42	Moon at Apogee: 405553 km
10	10:25	10	8:25pm	20:25	**Antares** 0.3°N of Moon
11	7:44	11	5:44pm	17:44	FULL MOON
12	3:00	12	1:00pm	13:00	**Venus** at Aphelion
17	2:05	17	12:05pm	12:05	**Mars** 0.7°N of Regulus
18	9:41	18	7:41pm	19:41	Moon at Ascending Node
18	19:19	19	5:19am	5:19	LAST QUARTER MOON
19	3:47	19	1:47pm	13:47	**Saturn** 3.4°S of Moon
21	2:42	21	12:42pm	12:42	**Summer Solstice**
21	19:51	22	5:51am	5:51	**Mercury** 4.8°S of Pollux
23	2:59	23	12:59pm	12:59	**Pleiades** 0.6°S of Moon
23	4:43	23	2:43pm	14:43	Moon at Perigee: 363178 km
24	15:00	25	1:00am	1:00	**Jupiter** in Conjunction with Sun
25	10:31	25	8:31pm	20:31	NEW MOON
26	19:14	27	5:14am	5:14	**Pollux** 2.5°N of Moon
27	6:02	27	4:02pm	16:02	**Mercury** 2.9°S of Moon
29	10:26	29	8:26pm	20:26	**Regulus** 1.5°S of Moon
30	1:05	30	11:05am	11:05	**Mars** 0.2°S of Moon: Occn.

Adapted from Astropixels.com - 2025 Sky Event Almanac page
http://astropixels.com/almanac/almanac21/almanac2025gmt.html

Meetings & Dates

ASNSW Events

Recordings from Ordinary Meetings link: ***https://www.asnsw.com/ordinary***

Astroimaging ZOOM Meetings: 11 Jun, 9 Jul, 6 Aug, 10 Sep, 8 Oct, 5 Nov, 3 Dec

Ordinary Meetings—Epping: 13 Jun, 11 Jul, 29 Aug, 10 Oct, 14 Nov

Committee Meetings: 18 Jun, 16 Jul, 13 Aug, 17 Sep, 15 Oct, 12 Nov

Wiruna Weekends: 20-21 Jun, 25-26 Jul, 22-23 Aug, 19-20 Sep, 17-18 Oct, 21-22 Nov, 19-20 Dec

For Wiruna bookings and enquiries contact Joe Cauchi on m. 0428 363 878 or e. ***vp_wiruna@asnsw.com***

Mudgee Caravan Hire has opened on the corner of Sofala Road and Castlereagh Highway, just 8 kms from Wiruna. Joe Cauchi (Wiruna Vice President) has spoken to the owner and he offers small, medium and large caravans at $50 / $75 / $100 per night respectively. He can tow a caravan to and from Wiruna on request giving you the convenience of staying onsite in a private caravan, without needing to own a caravan or managing the logistics.

If this appeals to you, please contact Warren Cramond m: 0417029047 e: ***hot_spud2006@yahoo.com.au*** for more information. Note this is an independent business and the ASNSW will not be involved in your commercial arrangement with this business. The normal Wiruna camping fees would remain payable to the ASNSW. As this is a new business and no one has utilised them so far, we're keen for any feedback from anyone who utilises this service.

Annual General Meeting: 8 Aug

Wiruna Happenings

June Solstice Dinner

The next new moon Wiruna weekend is 20-22 June 2025. This also coincides with the Winter Solstice which is on the Saturday 21 June at 12.42pm.

A communal solstice dinner of Bangers and Mash will be held on Saturday evening. Further details including the full menu and booking details will be sent out via email in the lead up to the weekend.

Unidentified boxes and eskies in the kitchen

At the working bee last month, all unidentifiable boxes and eskies in the kitchen were removed. Some of these boxes have not been used for a significant period of time based on the accumulated dust and dirt.

If you are the owner of one of these boxes (see photos), then please contact me ASAP. Any items that remain unclaimed will be disposed of in due course.

PSA: It is critical that **all** items that you take to Wiruna and use in any communal area are labelled with your name and contact details. This includes baskets and eskies in the kitchen area and batteries and battery chargers in the hall. Any unlabelled items left at Wiruna will be subject to disposal.

Ord. Meeting Guest Speaker —Follow Up

==========

By Don Whiteman

==========

After the talk on the 16th May that I gave on eyepieces, I had a couple of email requests on some of the gadgets I spoke of. The first was a pupil gauge which is a simple tool used to measure your pupil dilation, especially when dark adapted. The reason I mentioned this tool is because when you know you pupil dilation, you can then figure which low power eyepiece to choose. Remembering it changes with age.

So here is my quick solve to the first question.

How to make a Pupil Gauge (diagram overleaf)

Making this gauge is easy. You will need the following items:

- a piece of black card 120mm high x 100mm wide
- a good quality ruler
- a sharp pencil and a pencil sharpener to keep it sharp.
- a sharp pin

On the black card, rule a straight line horizontally across the width of the card, about 20mm from the bottom. Now, draw a vertical line from the middle of the horizontal line to the top of the card.

Starting about 20mm down make a pin hole 1mm each side of the line.

Move down 10mm and make a pin hole 1.5mm each side of the line

Move down 10mm and make a pin hole 2mm each side of the line

Move down 10mm and make a pin hole 2.5mm each side of the line

Move down 10mm and make a pin hole 3mm each side of the line

Move down 10mm and make a pin hole 3.5mm each side of the line

And finally move down 10mm and make a pin hole 4mm each side of the line

You have just made yourself a pupil gauge that is accurate enough to use when choosing your eyepiece.

How to use the Pupil Gauge: Hold the gauge up to one of your eyes and starting at the top, bring the gauge up to the next set of holes and continue to do so until the two holes touch one another. This will be what your

dilated pupil size will be. Try it at night and then in daylight to see the difference.

So which eyepiece should I use? Use an eyepiece whose exit pupil closely matches your own now-measured exit pupil for lower powers. Higher powers will always be smaller anyway. Oh! by the way, the exit pupil of an any eyepiece is the eyepiece focal length divided by the telescope focal ratio.

DIY Cleaning Solution

The second thing I spoke of was a cleaning solution for eyepieces, and optics in general, like corrector plates.

Every optics lab in the world uses this solution or a very close approximation to it.

I make litres of it every month at work, as we use loads when we are servicing scopes and binoculars. I even clean my eyeglasses with it.

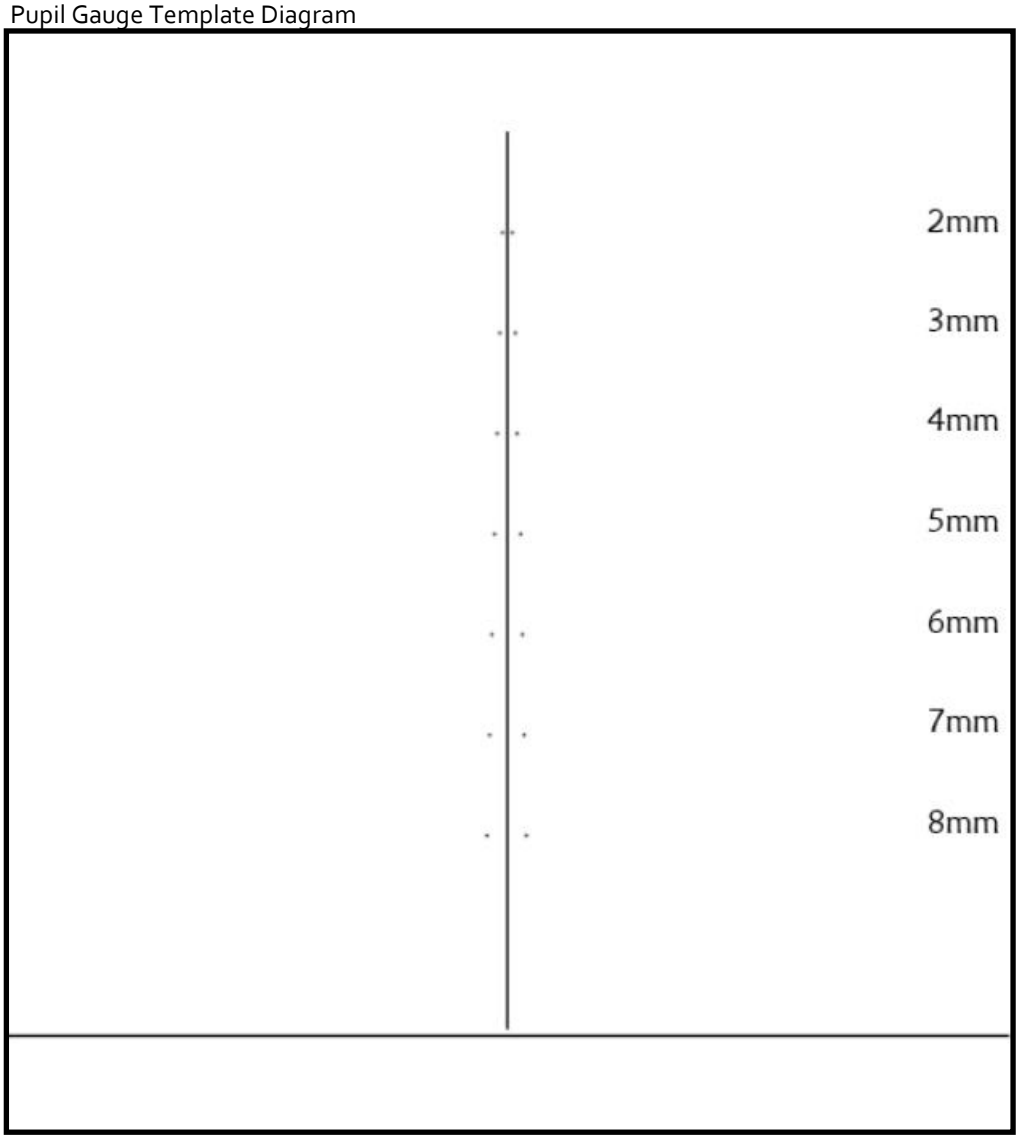
You will need the following ingredients:

- 45mls of pure Isopropyl alcohol (not rubbing alcohol)
- 30mls of Blue Windex (must be Blue as it has the right formula in it)
- 150mls of filtered water (reverse osmosis if you have it)
- 2 eyedrops of Kodak Photoflow 200 (this is an additive that keeps the water flowing - you could use the same amount of dishwashing liquid as it will also allow water to flow)

Easiest way to do this at home is to mix everything in a large clean glass (600mls capacity) and run the whole lot through a coffee filter. Now, pour it in to a spray bottle and us it in conjunction with clean, unscented facial tissue. Hold the tissue up and give the bottle two pumps. That should be wet enough to get a corrector plate clean. Maybe just 1 squirt will do an eyepiece. Be sure to use a tissue to dry the glass after you have cleaned it and a small hurricane blower will blow any tissue dust away.

Knock yourselves out.

Pupil Gauge Template Diagram



ASNSW Member News

==========

By Lesa Moore

==========

Since last issue, two new members have joined the ASNSW. The society welcomes: Jennie Young and Biljana Jovchevska.

These members, listed to the right, celebrate the following significant anniversaries this month (5, 10, 15, 20+ yrs):

David	Collis Bird	38
Trevor	Compton	38
Adrian	Saw	37
Ross	Pogson	34
Brian	Crowley	27
Stephen	Tornquist	26
Greg	Christie	24
Mark	Boylan	21
Rebecca	Defina	21
Brian	Lane	21
Young Su	Cho	5

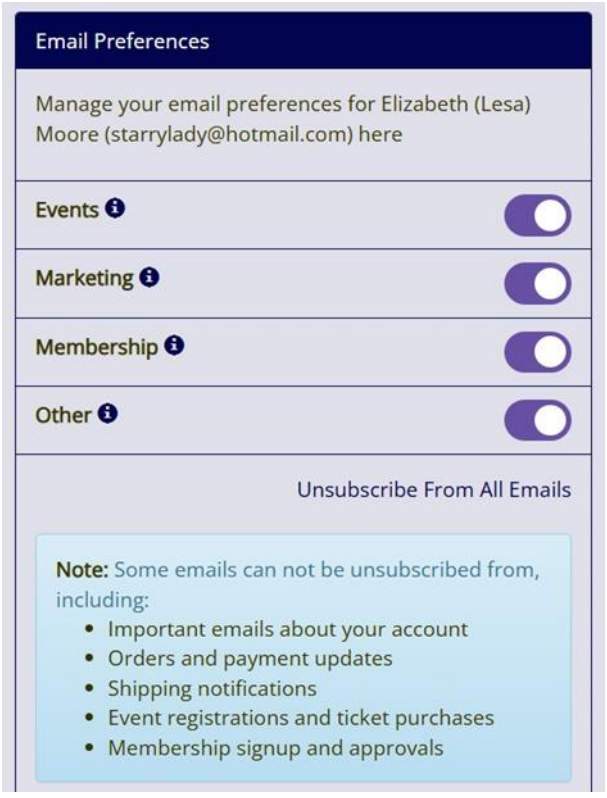
Congratulations to these members!

Apologies for the typo in last month's issue. The anniversaries published in the May 2025 Universe were, of course, May anniversaries (not December and January as it had snuck through).

Memberships

Current membership stands at 398 members, including 382 paid-up members, 5 honorary members and 11 life members.

Email Preferences and Muting of Emails



A couple of members who missed renewing their ASNSW membership complained of not receiving any reminders before the system told them that their membership had expired. It turned out that they had MUTED membership emails. If you wish to receive renewal reminders, it is important NOT to mute membership emails. Check your email preferences by logging in to the website: ***https://www.asnsw.com/***. If not already seeing your "Account" tab, click on "My Account" in the drop-down menu below your name (in the top right corner). Click on the "Emails" tab.

On the left, you'll see the list of recent emails that have been sent to you. On the right is where you can update your preferences. Refer screenshot at right, which shows all emails are ON (not muted).

- Events emails relate to events that you may have registered for on the website, such as MQ observing nights (free tickets) or Wiruna weekends (where you've paid in advance). You won't want to mute these in case an event is cancelled and we try to notify the registered participants.
- Marketing emails – we don't actually send any "marketing" emails, so there is no reason to mute these.
- Membership emails – these are the all-important renewal reminders, plus announcements about the availability of Universe magazine, and other general announcements.

If you find you are receiving too many emails, it is best to contact the treasurer or secretary in the first instance. If you have muted any emails, it may mean you are missing out on member benefits and important reminders.

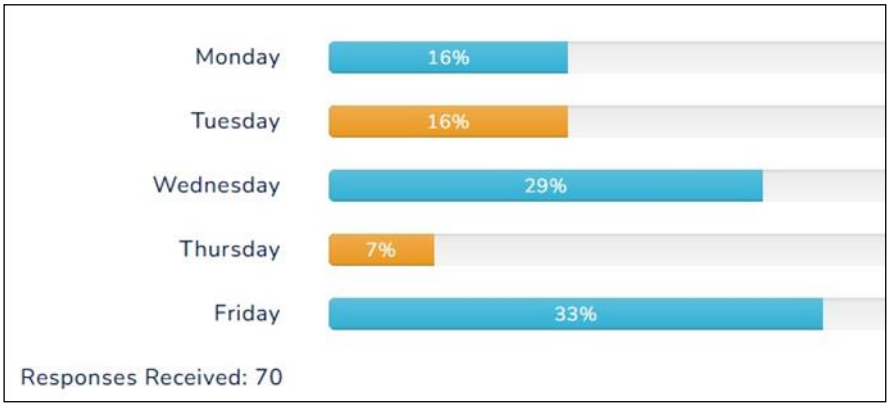
Saved Credit Card Details – No Automatic Renewal

Some members may have saved their credit card details in the Stripe payment gateway. Please be clear that this is NOT an automatic renewal system. At renewal time, you need to log into the website and click "Renew" to activate your renewal. At that point, you will have the option to use saved credit card details for your payment.

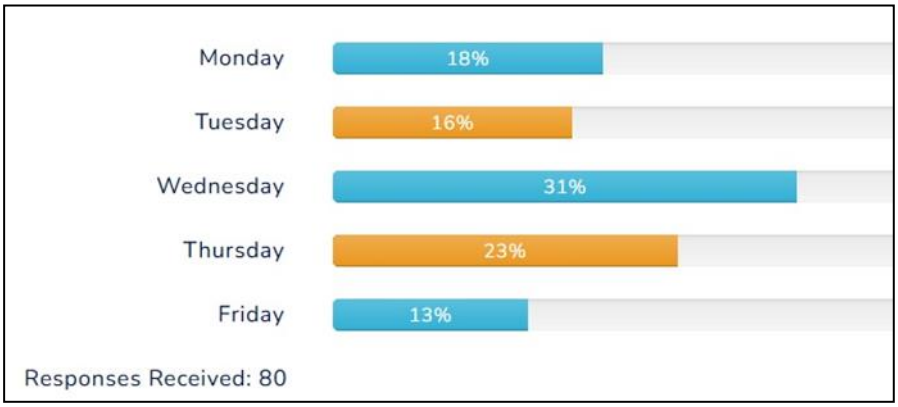
Meeting Nights Poll

The outcome of the poll so far has been mixed, with first choice still dominated by Friday night and second choice looking like Wednesday. So far (as at time of writing on 24 May), 70 people lodged a first choice and 80 people lodged a second preference (go figure). The results are shown below.

First choice:



Second choice:



MACQUARIE University
SYDNEY·AUSTRALIA

Night Sky Discovery

Observing at Macquarie University Observatory: 10 June - Free for ASNSW members and their families, bookings essential. We've attempted to have these Macquarie observing nights twice before (March and April) but, both times, the nights were cancelled due to weather. Hopefully, it will be third time lucky! Register here: ***https://www.asnsw.com/index.cfm?module=event&pagemode=indiv&page_id=2902516***

Macquarie University Astronomy Open Night

The date for this year's Astronomy Open Night will be **Saturday 27th September.** Please spread the word to any fellow astronomers whom you think might be interested in participating.

Telescopes

For those interested in being a part of the telescope park component of the night (as a telescope operator or assistant), please complete the ***Expression of interest*** form.

The Telescope Volunteer registration deadline is **COB Wednesday 20 August 2025.**

ASNSW Information Table

The ASNSW will have an information table in the exhibitors' hall, as usual. If you could spare an hour or two to relieve the regulars, or are happy with a longer shift, this would be much appreciated. You do not need to be a long-standing member to do this! The perspective of a new member is always appreciated and I'll happily give you on-the-job training (i.e., I'll show you how to set up the banner without ripping a hole in it). We hand out free magazines, including copies of Universe, and answer questions about the ASNSW – much information is on our website for reference. The bonus is that you get free entry to the event, a snack provided by MQ, and some free time to browse the rest of the exhibits, events and telescopes.

Please email ***treasurer@asnsw.com*** if you would like to help out on the information table.

Astronomical Sun and Moon alignments at Stonehenge

Tuesday 24 June, 1-2pm. Free talk. Discover how astronomy, when applied to archaeology, can reveal the new thoughts on past and human understanding of the cosmos around us.

www.sydney.edu.au

Astronomical Sun and Moon alignments at Stonehenge by Emeritus Professor Clive Ruggles from Leicester University

This is a free lunch-time talk at the University of Sydney Chau Chak Wing Museum on Tuesday 24 June 1-2pm. It is essential to register as seating is limited. Book here:

Astronomical Sun and Moon alignments at Stonehenge

About Clive Ruggles:

As Emeritus Professor of Archaeoastronomy at the University of Leicester, Clive Ruggles has spent a lifetime investigating ancient people's perceptions of the sky and the uses they make of what they see there. Archaeoastronomy is an interdisciplinary field prone to misinterpretation and speculation and Clive's particular concern is to find the best ways to combine approaches from "hard science" and anthropology in order to reach sensible and robust conclusions. In 2017 he was awarded the Royal Astronomical Society's Agnes Mary Clerke Medal for a "lifetime of distinguished work in the overlapping areas of archaeology, astronomy and the history of science". He is a former President of the Prehistoric Society as well as the History of Astronomy and World Heritage and Astronomy Commissions in the International Astronomical Union. While much of Clive's career has focused on Neolithic and Bronze Age Britain and Ireland, studying the design, landscape setting and orientation of ancient buildings and monuments in relation to the sky, he has also worked extensively on Hawaiian and Pacific star knowledge and in Peru, where in 2005 he co-discovered the 2200-year-old monumental solar observatory at Chankillo, which became a UNESCO World Heritage Site in 2021.