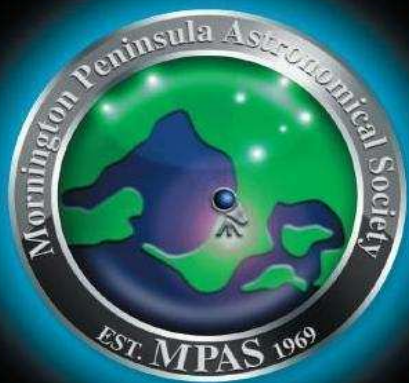


Cover image - Dolphin Head Nebula - Sh2-308. Mostly made up of oxygen 3 - made from a Wolf-Rayet star. *By Russell Smith*



SCORPIUS

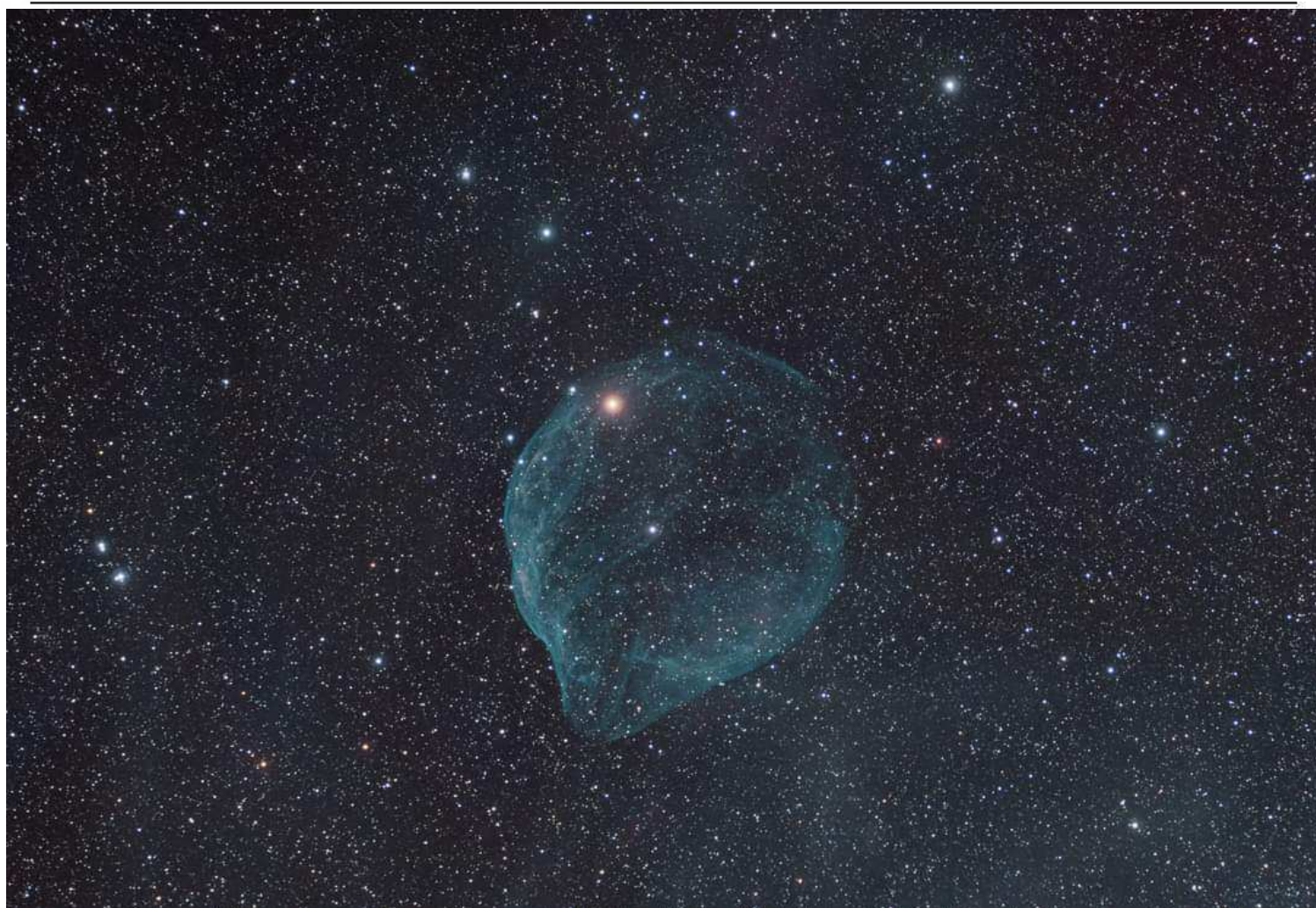
THE JOURNAL OF THE
MORNINGTON PENINSULA ASTRONOMICAL SOCIETY INC.

Reg No: A268 ABN: 34569548751 ISSN: 1445-7032

Vol. XXVII, No. 1 (January / February) 2022

The Mornington Peninsula Astronomical Society (formerly the Astronomical Society of Frankston) was founded in 1969 with the aim of fostering the study and understanding of astronomy by amateurs and promoting the hobby of amateur astronomy to the general community at all levels.

The Society holds a focused general meeting each month for the exchange of ideas and information. Regular public and private observing nights are arranged to observe currently available celestial objects and phenomena. In addition, the Society encourages the service of its members for on-site or off-site educational presentations and observing nights for schools and community groups.



MPAS - <https://www.facebook.com/mpas0/>

MPAS Members - <https://www.facebook.com/groups/MPAS1/>

Scorpius MPAS - <https://www.facebook.com/Scorpius-MPAS-1694951307446763/>

Mornington Peninsula Astronomical Society

facebook

WHAT'S ON



Our COVIDSafe Plan is in place, and therefore there are rules we must all follow when visiting the site.

Here are the basic rules which are required and are mandatory for all MPAS Members:

- 1) **BOOKING.** If visiting site outside of an organised event, please email your booking (welcome@mpas.asn.au) showing date/times, name and phone of all persons.
- 2) **SICK.** If slightly unwell or with cold/flu symptoms **DO NOT** enter the site any further. Go home.
- 3) **SIZE.** Currently no density limits indoors or outdoors.
- 4) **CHECK-IN.** All attendees must check-in using the MPAS QR code (or logbook as last resort) to assist in contact tracing, and (aged 12+) show a committee member your digital or printed certificate proof of full vaccination status or official medical exemption upon arrival.
- 5) **CLEANLINESS.** All touched surfaces and handles must be carefully cleaned after your use. Wipes and cleaning agents provided. Cleaning checklist on-site.
- 6) **DISTANCING.** Recommend minimum 1.5 metres between people anywhere on-site.
- 7) **HANDS.** Wash often. Never assume someone else has already cleaned the surface. Hand sanitiser provided.
- 8) **MASKS.** Masks must be worn inside at all times. **(NOTE - These rules may change at any time)**

With the imminent transition of COVID-19 restrictions for community groups such as ourselves, we have reopened the Briars observatory site in line with applicable government guidelines, and cognizant of the age and health of some of our members.

Members, vaccinated guests and public who are able to show they are fully vaccinated may attend the 2022 events below. Unvaccinated members will have to be patient and wait until the government eases restrictions even further once COVID-19 is considered endemic throughout the community. Regional members from outside metro Melbourne can only attend once boundaries are removed.

The 2022 timetable of public events.

JANUARY

Friday 7th, 8:00pm, Public viewing Night @ the Briars MPAS site.

Friday 14th, 8:00pm, Public viewing Night @ the Briars MPAS site.

Friday 21st, 8:00pm, Public viewing Night @ the Briars MPAS site.

Friday 28th, 8:00pm, Public viewing Night @ the Briars MPAS site.

FEBRUARY

Friday 4th, 8:00pm, Public viewing Night @ the Briars MPAS site.

Saturday 19th, 4pm, Telescope learning day & BBQ @ the Briars MPAS site.

MARCH

Friday 4th, 8:00pm, Public viewing Night @ the Briars MPAS site.

Saturday 19th, 6:00pm, Trivia Night @ the Briars MPAS site.

APRIL

Thursday 7th, 6:30pm, Essex Heights Primary at Iluka Retreat, 20 Shoreham Road, Shoreham. 75 Year-5 pupils. Speaker needed.



Photo taken by Nerida Langcake on 3rd December 2021

Those attending must QR code on arrival and, if aged 12 or older, show their proof of vaccination electronically, or on paper, or be carrying a medical exemption certificate. Compliance is still necessary with all public health orders. Bookings aren't necessary, however we must ensure required attendance caps on the night if they look like being exceeded.

To attend the school events and scout/girl guide events, these days you need to have a Working With Children check done first. It takes about a fortnight from the time you apply online to when you get the card in the mail. For volunteers it is free. It's essentially a check of police and justice records over the decades that sees if there might be anything in the past that would preclude participating in these sorts of outreach events involving kids.

Once you receive your card, let the Secretary know your card number and expiry details as we are required as an organisation to record them.

<https://www.workingwithchildren.vic.gov.au/>

Regards, Peter Skilton

2022 SPECIAL EVENTS



Saturday 22nd January, 8PM - Observatory & Telescope Training Day

Starts after the Members' BBQ

Saturday 19th February, 4PM - Telescope Learning Day (Bring Your Telescopes)

Day starts at 4PM followed by a BBQ at 6pm. **This is a Public event.** The aim is to go through the very basics of everything to do with telescopes/binoculars and their sky use for beginners.

Saturday 19th March, 6PM - Trivia Night (see below)

Starts after the Members' BBQ.

Saturday 18th June, 4PM - Solstice BBQ

Starts before the Members' BBQ. Details being finalised.

Saturday 13th to Sunday 21st August - National Science Week

Saturday 17th September, Astrophotography Workshop, 1PM

Day starts at 1PM followed by a BBQ at 6pm.

This is a Public event. Bookings Required. (See MPAS website)

Saturday 22nd October, 4PM - Telescope Learning Day (Bring Your Telescopes)

Day starts at 4PM followed by a BBQ at 6pm. **This is a Public event.** The aim is to go through the very basics of everything to do with telescopes/binoculars and their sky use for beginners.

Saturday 17th December - MPAS Xmas Dinner

Starts at 6pm - bookings required for catered meal.

SC&G - Combined Scouts, Cubs & Guides @ the Briars 8pm to 10pm (Help required)

April 8th

June 10th

August 12th

October 28th

Other special events are also possible during the year; just not firm enough in planning to show yet.



Mega Musical Trivia Night



The **MEGA MUSICAL TRIVIA NIGHT 2022** will be held on 19th March 2022 - 6PM @ The Briars.

- Sausage sizzle, raffle and auctions throughout the evening.
- Live music from our event partners at the Cranbourne Lions Concert Band, Telescope Viewing & Astronomy Talk
- BYO Picnic blanket, drinks and nibbles
- Dress in a space themed outfit for a chance to win spot prizes!

Door Prize - Celestron 76mm Signature Series Reflector Telescope & Accessories



Bookings: <https://www.trybooking.com/BWEES>

Code: use code MPASMEMBER for a 25% discount!

Entry Price: Adults: \$20, Members: \$15, Kids Under 16 Free!

Covid Vaccination Certificate and QR required as per government directive.



SOCIETY NEWS



Members-only stargazing Night November 5th - Was good to see new members taking advantage of the clear sky with no Moon. Manfred Berger gave an interesting talk on the solar system to a small group of new members, while other members operated the telescopes in the observatory. Venus high in the west outshone everything in the sky, while Saturn and Jupiter were also worthy targets. A few members set up their own telescopes on the upper slab. We also had the 18-inch Dobsonian running showing great views of the Tarantula nebula and 47 Tucana globular cluster. The night finishing up around 11pm. *By Greg Walton*



Time-lapse of the Members Viewing Night. **Briars stargazing** <https://vimeo.com/642718738>
Nice mostly clear night, with good viewing. Hope all that attended enjoyed the night! *Jamie Pole*

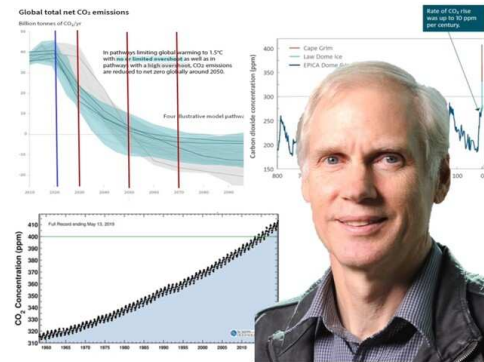
Society meeting November 17th - For those of you who are not yet subscribed (it's free) to the MPAS YouTube channel, this month's meeting has been uploaded for viewing. The meeting features Dr. Robert Colman, recently retired Head of Climate Research at the Bureau of Meteorology speaking about "The Science of Climate Change: What Has Happened So Far, And What Does The Future Hold?" If subscribed, you should be notified of this automatically, all being well with YouTube of course. You can also watch it here by clicking on this link and going to the most recent video on the channel:

<https://www.youtube.com/channel/UCm6XOKIcIfl4y0XRBXpXuW>

or watch it on the MPAS site once it's refreshed for this month:

<https://www.mpas.asn.au/meeting-recordings/>

The video is not posted to e-Scorpius as it is too large. *Regards, Peter Skilton*



Telescope Learning day & members BBQ November 20th - There was a film shoot at the Briars Outdoor Education Camp and a huge wedding near the top of the hill, with traffic marshals making it difficult to access the MPAS site. Once sorted, Telescope Learning day started with a working bee. The Rolfe family dealt with the long grass, Dave operated the ride-on while Jamie and Landon used the push mower around the trees, also snapping a photo of a Blue-tongued lizard which came out to see what all the commotion going on. Bob Heale whipper-snipped around the paths and observatory. A big thanks to Jamie Pole and Nerida Langcake who did the cooking and ran the kitchen. Mark Stephens did a talk on the different types of telescopes to a small group of newer members. I cleaned the telescopes in the observatory then washed the walls, as with almost 2 years of Covid restrictions the spiders had made a big mess. We had a glitch with the power to the observatory, which kept tripping the safety switch. We eventually got it running, but this will need checking out to find the cause. Mark Hillen dropped off 8 boxes of books and magazines donated by Dave Girling's family, which we will need to sort out at a future working bee. Many members set up a range of different telescopes on the concrete slabs. But as the sky darkened the clouds rolled in from the south as the almost full moon rose in the east. We all got to see Venus, Jupiter and Saturn which were on their best behaviour as the seeing conditions were reasonable. About 20 members in attendance. *Greg Walton*



School viewing Night November 30th - Under comfortably warm conditions last night at the Briars, and mercifully few mosquitos, we had 90 year-3&4 pupils and teachers from Glenferrie Primary School attend for our first school night after the lockdown ended. Peter Skilton gave the talk inside, with the attendees being very well behaved, very alert and all masked up. A high proportion of questions, and there were a lot, arose around what's inside the Earth and about meteorites. It was quite a challenge to hear them at times, given it was through a surgical mask and with the air conditioners operating. The group then moved out to the telescopes under cloud-free conditions, enabling great views in the Moonless sky of Venus, Saturn and Jupiter, and a high number of Summer deep-sky objects across the sky. Helping outside with the telescopes were Nerida Langcake, Fred Crump, Jamie Pole, Ben Claringbold, Connor Mathieson, Guido Tack, Mark Stephens, and David Rolfe. Both students and teachers appeared absolutely rapt at the evening, which was their last night on camp, and we seemed to be the icing on the cake for them. A great night was had by all, and it was fantastic to see so many enthusiastic and excited learners at the observatory again. *Regards, Peter Skilton*



Members-only stargazing Night December 3rd

We had about 25 members in attendance and Trevor Hand presented his special "mature audience" talk for the first time, which was quite humorous and very interesting. So many facts you have probably never even considered...

Image: Looking out of the MPAS observatory last night with the Large and Small Magellanic Clouds above. Right before the cloud drifted in.
Nerida Langcake



Members-only Xmas party December 11th - The Briars was buzzing yesterday evening, with about 60 double- and triple-vaxxed members attending the informal annual Christmas roast and dessert. It was wonderful to see so many there again, including families with kids, and several faces I've not seen for a long time, plus some recent new arrivals as well. As planned, of course, the clouds vanished by dark, enabling the observatory and telescopes on the slabs to swing into action for those who stayed on with belly full. Thank you to all the hardworking elves who toiled behind the scenes to make it magically happen, both on the night and in the lead up to it with all the preparations, planning and cleaning up afterwards. It simply wouldn't happen so well without you. Next year's is already in my diary for December 17th. *Regards, Peter Skilton*

We had an awesome night. Fantastic to catch up with old members and meet new ones. Big thank you to the Committee and volunteers on the night for the hard work. *Paul Albers*



Just before dark we opened the observatory and had good views of the planets, which were lined up nicely in the sky. We also looked at different nebulae, M42 looked spectacular in the 14 inch Meade. *Greg Walton*

Xmas photos by *Steward Gangell*

Unwanted lights march closer to the MPAS site.

Unfortunately about 20 new solar powered LED lights have been installed at the Briars. They start near the front gate and march across the paddocks all the way to the first car park near the Visitor Centre. Hopefully that's where they will stop. A light was put next to the old tractor on the hill, yes the tractor which photographers like to use in the foreground of their Milky Way shots. See image below.



OBSERVATORY UPDATE

By Greg Walton



The wooden handrail on the fence to the public car park has been replaced and painted. The fence was also strengthened with 7 extra star picket posts hammered in on an angle and secured to the handrail. The red LED lights were reattached and tested.



★ New Members Welcome ★

Matthew Leslie
Doug Gaze

Amanda Booker and family

Joshi Nikhil & Juie Godbole

James & Rebecca Karmis and family

Michael Lynch & Emma Lewis

MPAS SUBSCRIPTIONS 2022

Each ticking over of the New Year also means that Society fees are due to be paid. The committee has worked hard to ensure that 2022 fees are still the same as the previous many years' prices. So to assist the society in maintaining the facilities and services we provide and share, we appreciate your prompt payment for each and every year ahead. As a reminder, the following structure of the 2022 fees is:

Subscriptions can be paid in a number of ways:

- On-line (preferred, see at right)
- Cash payments to a committee member
- Send a cheque, made out to "Mornington Peninsula Astronomical Society", to MPAS, P O Box 596, Frankston 3199
- Make a direct electronic payment into the society working bank account (state your name clearly).

The account details are BSB 033-272 Account 162207. Remember to add your name and details to the transfer so we can identify the payment in the bank records. If you have any concerns please talk to a committee member.

SOCIETY FEES

- \$50 – Full Member
 - \$45 – Pensioner Member
 - \$65 – Family Membership
 - \$60 – Family Pensioner Membership
- See more options on-line*



\$30.00 joining fee

You can renew your membership online using the link included in the annual mailout email, which is sent near the end of each year. Please ensure to renew before Feb 1. Any late renewals may be required to re-join as a new membership.

CALENDAR		January / 2022					Red Days indicate School Holidays
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	
30 Mars above Moon Venus below dawn Moon at 362,252km	31 Comet 19P near NGC520					1 Mars below a thin crescent Moon dawn	
2 Moon at 358,033km	3 New Moon NYD Holiday	4 Saturn right of the Moon with Mercury below	5 Earth is at it closest point to the Sun at 147,105,121 km	6 Jupiter below the Moon	7 Public night 8pm Neptune near Moon	8	
9	10 First Quarter	11	12	13 Saturn and Mercury 3.4 degrees apart	14 Public night 8pm Moon at 405,805km	15	
16	17	18 Full Moon	19 Society Meeting 8pm	20	21 Public night 8pm	22 Working bee 4pm Members BBQ 6pm OT 8pm	
23	24	25 Last Quarter	26 Australia Day	27 Comet 19P near NGC428	28 Public night 8pm	29	

Monthly Events

Public night - 8pm to 10pm on the 7th, 14th & 21st @ the Briars

Society Meeting - 8pm to 10pm on the 19th @ the Briars

Working Bee - 4pm on the 22nd @ the Briars. Members only

Members Night BBQ - 6pm on the 22nd @ the Briars. Members only

OT = Observatory/telescope Training - 8pm on the 22nd @ the Briars. Members only

Watch your emails, as on any clear nights the Observatory may be opened for members only viewing.

CALENDAR		February / 2022					Red Days indicate School Holidays
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	
		1 New Moon	2	3 Jupiter below a thin crescent Moon	4 Public night 8pm	5	
6	7	8 First Quarter Alpha-Centaurids meteor shower	9	10	11 Moon at 404,897km	12	
13	14 Valentines Day	15	16 Society Meeting 8pm	17 Full Moon	18	19 TLD 4pm BBQ 6pm	
20	21	22	23 Scorpius Deadline	24 Last Quarter	25	26	
27 Mercury & Venus below dawn Moon at 367,789km	28						

Monthly Events

Southern Comets website - <http://members.westnet.com.au/mmatti/sc.htm>

Public night - 8pm to 10pm on the 4th @ the Briars

Society Meeting - 8pm to 10pm on the 16th @ the Briars

Telescope Learning Day - 4pm on the 19th @ the Briars this is a public event. Members are welcome.

Members Night BBQ - 6pm on the 19th @ the Briars



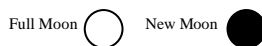
Mornington Peninsula Astronomical Society - 2022 Calendar

Day	January	February	March	April	May	June	July	August	September	October	November	December	Day
1	<u>S</u>	T ●	T	F 8pm Public Night	Su ●	W	F 8pm Public Night	M	Th	<u>S</u>	T Cup Day	Th	1
2	<u>Su</u>	W	W	S	M	Th	<u>S</u>	T	F 8pm Public Night	<u>Su</u> Daylight Savings Starts	W	F 8pm Public Night	2
3	<u>M</u> NYD Holiday	Th	Th ●	<u>Su</u> Daylight Savings Ends	T	F 8pm Public Night	<u>Su</u>	W	S	M	Th	S	3
4	<u>T</u>	F 8pm Public Night	F 8pm Public Night	M	W	S	<u>M</u>	Th	Su Fathers Day	T	F 8pm Public Night	Su	4
5	<u>W</u>	S	S	T	Th	Su	<u>T</u>	F 8pm Public Night	M	W	S	M	5
6	<u>Th</u>	Su	Su	W	F 8pm Public Night	M	<u>W</u>	S	T	Th	Su	T	6
7	F 8pm Public Night	M	M	Th	S	T	<u>Th</u>	Su	W	F 8pm Public Night	M	W	7
8	<u>S</u>	T	T	F SCAG	Su Mothers Day	W	<u>F</u>	M	Th	S	T L/E ●	Th ○	8
9	<u>Su</u>	W	W	<u>S</u>	M	Th	<u>S</u>	T	F	Su	W	F	9
10	<u>M</u>	Th	Th	<u>Su</u>	T	F SCAG	<u>Su</u>	W	S ○	M ○	Th	S	10
11	<u>T</u>	F	F	<u>M</u>	W	S	M	Th	Su	T	F Remembrance Day	Su	11
12	<u>W</u>	S	S	<u>T</u>	Th	Su	T	F SCAG ○	M	W	S	M	12
13	<u>Th</u>	Su	Su	<u>W</u>	F	M Queen's Birthday	W	S NSW	T	Th	Su	T	13
14	F 8pm Public Night	M Valentines Day	M Labour Day	<u>Th</u>	S	T ○	Th ○	Su NSW	W	F	M	W	14
15	<u>S</u>	T	T	<u>F</u> Easter	Su	W MPAS Meeting 8pm	F	M NSW	Th	S	T	Th	15
16	<u>Su</u>	W MPAS Meeting 8pm	W MPAS Meeting 8pm	<u>S</u> Easter	M ○	Th	S	T NSW	F	Su	W MPAS Meeting 8pm	F	16
17	<u>M</u>	Th ○	Th St Patricks day	<u>Su</u> ○	T	F	Su	W MPAS Meeting 8pm	<u>S</u> APWS 1pm	M	Th	S Members Xmas Dinner	17
18	<u>T</u> ○	F	F ○	<u>M</u> Easter	W MPAS Meeting 8pm	S Solstice BBQ 4pm	M	Th NSW	<u>Su</u>	T	F	Su	18
19	W MPAS Meeting 8pm	S TLD 4pm Members	S 6pm Trivia Night	<u>T</u>	Th	Su	T	F NSW 8pm Public Night	<u>M</u>	W MPAS Meeting 8pm	S 4pm Members	M Scorpius Deadline	19
20	<u>Th</u>	Su	Su	W MPAS Meeting 8pm	F	M	W MPAS AGM 8pm	S NSW	<u>T</u>	Th	Su	T	20
21	F 8pm Public Night	M	M	<u>Th</u>	S 4pm Members	T	Th	Su NSW	W MPAS Meeting 8pm	F Vic South	M	<u>W</u>	21
22	<u>S</u> OT 4pm Members	T	T	<u>F</u>	Su	W Scorpius Deadline	F	M	<u>Th</u>	S TLD 4pm Members	T	<u>Th</u>	22
23	<u>Su</u>	W Scorpius Deadline	W	<u>S</u> 4pm Members	M	Th	S 4pm Members	T	<u>F</u>	Su	W	<u>F</u> ●	23
24	<u>M</u>	Th	Th	<u>Su</u>	T	F	Su	W Scorpius Deadline	<u>S</u> 4pm Members	M	Th ●	<u>S</u>	24
25	<u>T</u>	F	F	<u>M</u> ANZAC Day	W	S	M	Th	<u>Su</u>	T ●	F	<u>Su</u> Xmas Day	25
26	<u>W</u> Australia Day	S	<u>S</u>	T	Th SPSP	<u>Su</u>	T	F	<u>M</u> ●	W Scorpius Deadline	S	<u>M</u> Boxing Day	26
27	<u>Th</u>	Su	<u>Su</u>	W Scorpius Deadline	F SPSP	<u>M</u>	W	S ●	<u>T</u>	Th	Su	<u>T</u> Xmas Holiday	27
28	F 8pm Public Night	M	<u>M</u>	Th	S SPSP	<u>T</u>	Th	Su	<u>W</u>	F SCAG	M	<u>W</u>	28
29	<u>S</u>		<u>T</u>	F	Su	W ●	F ● SCAG	M	<u>Th</u>	S	T	<u>Th</u>	29
30	<u>Su</u>		<u>W</u>	S	M ●	<u>Th</u>	S	T	<u>F</u> Grand Final	Su	W	<u>F</u>	30
31	M		<u>Th</u>		T		Su	W		M Halloween		<u>S</u> New Years Eve	31

Colour code

- Green Boxes** - Public nights @ the Briars 8pm
- Yellow Boxes** - MPAS Meeting @ the Briars 8pm to 10pm
- Blue Boxes** - Members BBQ nights @ the Briars 6pm, working bee starts 4pm
- SCAG** - Combined Scout, Cubs & Guides @ the Briars 8pm to 10pm
- Grey Boxes** - Weekends & Public Holidays
- Bold Underlined Days** - School Holidays
- L/E** - Lunar eclipse

- Autumn Equinox - March 21
- Winter Solstice - June 21
- Spring Equinox - September 23
- Summer Solstice - December 22



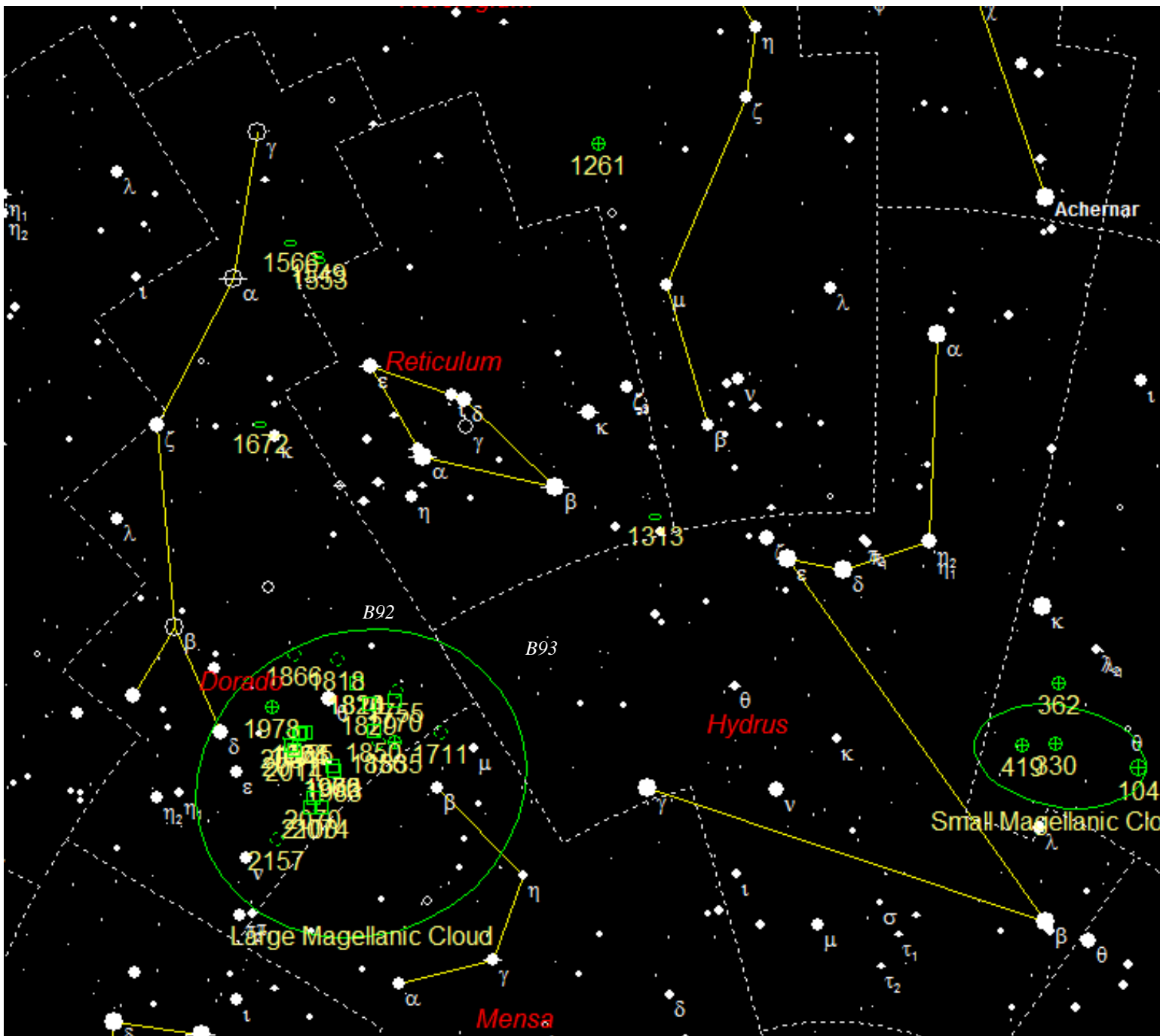
- OT** = Observatory/telescope Training 22nd Jan 8pm after w/bee & BBQ
- TLD** = Telescope Learning Day 19th February @ the Briars 4pm (Public)
- Trivia Night** = 19th March @ the Briars
- Sol** = Solstice BBQ 18th June @ the Briars 4pm
- NSW** = National Science Week 13th to 21st August (Public)
- APWS** = Astrophotography Workshop - 17th September @ the Briars 1pm
- TLD** = Telescope Learning Day 22nd October @ the Briars 4pm (Public)
- NACAA** = Hosted 2022 by ASV over Easter
- SPSP** = South Pacific Star Party - 26th to 29th May @ Ilford NSW
- VicSouth Star Party** - 21st to 24th October @ Nhill Victoria

THE BRIARS SKY

By Greg Walton



Summer is the best time to look at the LMC & SMC. One of the first galaxies I saw through my telescope was NGC1566 and I returned night after night to the same patch of sky, just to check if this little smudge was still there. It was quite easy to find, just head to the Large Magellanic Cloud and follow a string of stars which head straight up, past Beta Dorado, past Zeta Dorado then up to Alpha Dorado the brightest one. Then move the telescope a little to the right and up a bit. Yes, there you are!! A little patch of fuzzy light. It has a bright-ish core with a magnitude of 9.7. When photographed it shows a pair of "S" shaped arms. Moving the telescope a further 1 degree to the right and down a bit, you should find 2 more fuzzy patches. NGC1549 magnitude 9.8 & NGC1553 magnitude 9.4 will both fit in the eyepiece of most telescopes. The image at right is 1 degree high and 1.5 degrees wide. Hope to see you out under the stars.



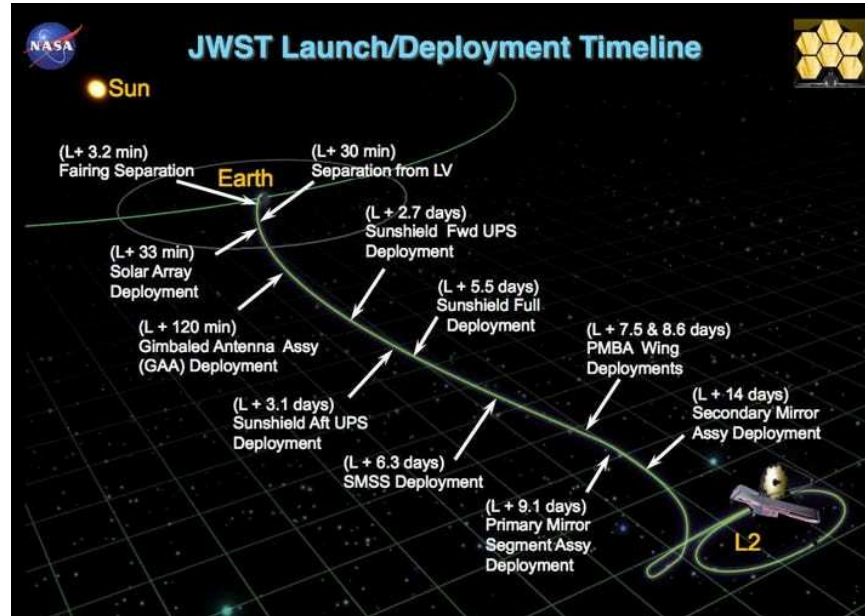
The James Webb Space Telescope's long journey to L2

The James Webb Space Telescope – successor to the Hubble Space Telescope – is on its way to L2, following a successful launch on December 25, 2021. It was a relief to see the \$9.7-billion space telescope go up at last. This telescope has been under development for decades. Unlike the Hubble Space Telescope and thousands of other satellites, Webb won't orbit Earth. Webb is now journeying to Lagrange point 2, aka L2, which is almost 1.5 million km behind Earth as viewed from the sun ... or about four times the moon's distance.

Following its launch by an Ariane 5 rocket, Webb's first task came a short while after. It deployed its solar array to stop draining battery power. Then, it successfully completed its mid-course correction burn. On Sunday, Webb released its antenna, and everything continues to be in good working order.

Between days three and seven, Webb will deploy the parts of its sunshield, raise the tower assembly and deploy the momentum flap. Day 10 might be the most nail-biting, as Webb hoists its secondary mirror into position.

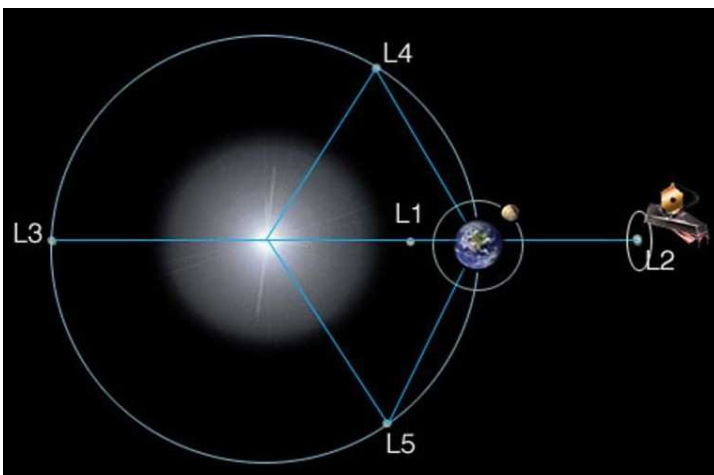
The rest of the mirror will unfurl by the end of the second week. Then, on day 29, Webb will fire its thrusters to enter orbit. After those first 30 days, testing will begin. Because Webb's primary mirror is three times larger than Hubble's, it had to be made of 18 individual segments so it could be folded for launch. Those 18 segments will all need to be recalibrated (aligned), which will take about 10 days. A week of alignment followed by weeks of testing mean that the telescope won't be ready for scientific operations for about six months.



The first images from Webb should be available by winter 2022 (in Australia). Because Webb is an infrared telescope, its focus will be spectroscopy. Hubble provided images in visible light. The advantage of infrared is that Webb will be able to look farther into the universe than ever before.

Why L2, and where is it? Why is Webb going to a point so far away? This point in space – the second Lagrangian point – is where, in the Earth-sun system, gravitational forces and a body's orbital motion balance each other. So a spacecraft can "hover" relatively easily at L2. It can stay near Earth, while both Earth and the spacecraft orbit the sun.

Another advantage of L2 is that it's a step farther away from the heat of the sun and Earth. Satellites in Earth orbit – for example, the International Space Station or the Hubble Space Telescope – undergo temperature changes about every 90 minutes, depending on whether the satellite's surface is in Earth's shadow or on the side of Earth closest to the sun. At L2, Webb won't undergo this same temperature-shifting effect, which has the potential to create distortions in the telescope's ability to view the universe. Webb will observe primarily infrared light coming from faint and very distant objects. In order to be able to detect those faint signals, the telescope itself must be kept extremely cold: -220 C or lower. That's why Webb has a five-layer, tennis-court-sized sunshield, to protect the telescope from the heat of the sun and keep its instruments cold. Being at L2, farther from the sun than the Earth or moon, will help, too.



While we've all been wowed and moved for decades by what the Hubble Space Telescope has shown us of the universe, we expect to be further blown away by the images and revelations of Hubble's successor, the James Webb Space Telescope.

A body's distance from the sun – and the speed it must maintain to keep that distance – are correlated. There are 5 points in the Earth-sun system where a spacecraft can move at such a speed that the craft stays put relative to the Earth and sun. These are the 5 Lagrange points, shown here. Webb is headed to L2.

Image via NASA.

YOUR ASTRO QUESTIONS



Are Zoom eyepieces worth buying?

In the past I would have said no, as most had small lenses and optics that performed badly. Also the adjustable movement wasn't smooth and they often unscrewed in the wrong place, coming apart in your hand. The grease would go hard on cold nights making it hard to adjust. In short, they just didn't last, particularly if they had plastic parts.

But today I have changed my mind, the quality of the more expensive zoom eyepiece is very good. The adjustment is very smooth with definite clicks as each focal length is selected. Surprisingly I found I didn't have to readjust the focuser as I zoomed in on my target.

My zoom eyepiece has a short eye relief, meaning your eye is quite close to the lens, making it not ideal if you need to wear glasses when viewing. But I prefer a short eye relief as I like to lean against the eyepiece to steady my head, especially when viewing the planets. Some of the new models have adjustable eye relief, like the Baader Hyperion Universal Mark IV 8-24mm Zoom-eyepiece.

Of course, the main advantage with the zoom eyepiece is you don't have to keep changing the eyepieces every time you need to up the magnification. Also, if you are a newbie to astronomy you wouldn't have had time to compile an extensive range of eyepieces. So now, instead of agonizing over which eyepieces to buy, you just need to buy one zoom eyepiece.

From my experience, I have found that you usually end up using the same eyepiece most of the time. This eyepiece I bet is the eyepiece that gives you around 80 times magnification. This means, if your telescope is 800mm long, your favourite eyepiece would be a 10mm. When asked which eyepieces should I buy, I say buy one good quality eyepiece that gives you 80 times magnification, all the other eyepieces can be around the \$50 range as you won't be using them very often, or one zoom eyepiece.

If your telescope has a short focal length such as an ED80 refractor, you would find a 2 times Barlow necessary for viewing the planets with a zoom eyepiece, as most have a range of 24mm to 8mm.

Something to watch out for. The one downfall of zoom eyepieces is that to adjust the magnification you need to rotate the body of the eyepiece. This means you need to make sure the screws are tight, if not the eyepiece will turn in the focuser or diagonal. Also most focusers and diagonals are threaded together and can unthread when you rotate the zoom eyepiece. If your new zoom eyepiece falls on to concrete, it will be time to buy another zoom eyepiece. I find it best to hold the body of the zoom eyepiece to avoid turning when adjusting.

How much is this zoom eyepiece going to cost?

Celestron 1 1/4" Zoom eyepiece is around \$200

Orion 1 1/4" Zoom eyepiece is around \$200

Baader Hyperion Universal Mark IV 8-24mm Zoom eyepiece
Comes with 1 1/4" & 2" adaptors is around \$400

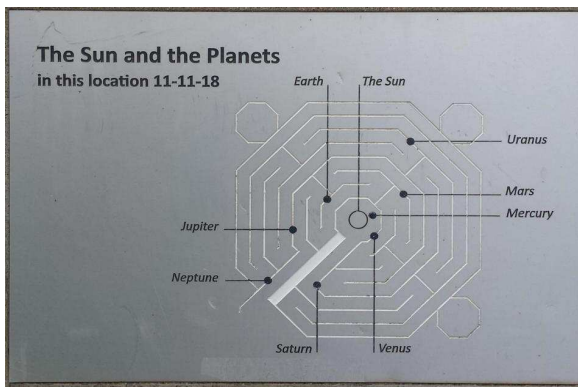
Pentax have many models of Zoom eyepieces - \$400 to \$800

Best to shop around as the prices vary enormously.

By Greg Walton



While staying at Tumut Victoria we wandered around the community gardens and came across a Labyrinth for peace, which marked the position of the planets on the 11 November 1918 the First World War armistice. *Pia and Greg*



Tumut Community Labyrinth for Peace
A labyrinth for all
 The Tumut Labyrinth celebrates the community service of its citizens in times of peace and conflict. By moving along its pathway, visitors quietly contemplate their own life journey and learn of those who have preceded them in forging the Tumut region community.
 As labyrinths are designed to promote respectful contemplation, all those who seek to tread its path are encouraged to do so with courtesy towards others also undertaking its journey.
 Blakeney Millar Foundation Rotary Club of Tumut
 Snowy Valleys Council
 12th August, 2017



THE PLANETS

The planet stones were laid by the labyrinth builders in the presence of a diverse range of community representatives of early pioneer and pastoral families, local industry and commerce, and of health and education facilities, as well as council employees and school students, and members of the Blakeney Millar Foundation and Rotary Club of Tumut.

The stones including the 400 million years old columnar jointing basalt from Batlow and Tumbarumba are positioned around and radiate out from the Sun

The Sun and planet stones are:

- Sun..... Adelong gold granite
- Mercury..... Adelong grey granite
- Venus..... Pale Tumut marble
- Earth..... Tumut marble
- Mars..... Holbrook red granite
- Jupiter..... Gocup - sedimentary stone
- Saturn..... Holbrook pale red granite
- Uranus..... Adelong quartz
- Neptune..... Yarrangobilly limestone

A diagram of the labyrinth with labels for 'The Sun', 'Earth', 'Uranus', 'Mars', 'Mercury', 'Jupiter', 'Neptune', 'Saturn', and 'Venus' pointing to their respective positions in the labyrinth.



Albert Einstein's Relativity.

Albert Einstein was a German-born theoretical physicist who developed the theory of relativity, one of the two pillars of modern physics. His work is also known for its influence on the philosophy of science. Born: 14 March 1879, Ulm, Germany. Died: 18 April 1955, Penn Medicine Princeton Medical Centre, New Jersey, United States. Spouse: Elsa Einstein (m. 1919–1936), Mileva Marić (m. 1903–1919). Children: Eduard Einstein, Hans Albert Einstein, Lieserl Einstein. Education: University of Zurich (1905), ETH Zürich (1896–1900). The theory of relativity usually encompasses two interrelated theories by Albert Einstein: special relativity and general relativity. Special relativity applies to all physical phenomena in the absence of gravity. General relativity explains the law of gravitation and its relation to other forces of nature. It applies to the cosmological and astrophysical realm, including astronomy. *Wikipedia.*



Don't wait for miracles,
your whole life is a miracle.

Einstein achieved fame because he was one of the lucky ones able to go to university. At university

Einstein's teacher said he was a lazy

student. Einstein's teacher was himself working on theories about the universe and Einstein helped him mull over the theories. But Einstein saw more questions than answers. Einstein spent much of his time looking for curiosity in the universe. Why things look different depending on where you are standing and how you are moving. Like when sitting in a train at the station and the train next to you on a different line starts to move and you suddenly think that it's you who is moving. When Einstein was a student he wondered what light would look like if you were travelling at the speed of light. It should stop, being frozen in time and you should see the individual waves. But many experiments showed that this was not the case.



Einstein read many papers on the properties of light and gravity. He used these curiosities to impress other students and later the world. One was his girlfriend Mileva Marić who helped Einstein with his calculations and many think she should have got more credit.

When Einstein first published his theory of relativity, few people understood or accepted it for the first 10 years. And still today most people have trouble understanding the Theory of Relativity, including me. Einstein himself was confused by his own discoveries.

Einstein could not separate light, time and gravity, leading him to write the Theory of General relativity.

Einstein said, Energy cannot be created or destroyed it can only be changed from one form to another.

Einstein's most famous formula $E = m c^2$ which states Energy \propto Mass

$E = m c^2$ (c = the speed of light. c squared was added to demonstrate that there is an enormous amount of energy in mass.) Einstein used c because nothing can travel faster than the Speed of light. So this would set the limit for the amount of energy which can be extracted from mass. Gravity too is thought to be limited by the speed of light.

Energy can't be
destroyed or
created.



Mass at rest has an enormous amount of energy, but when the same mass is moving, it has more energy so behaves like it has more mass.

When an atomic bomb explodes, only about 1 percent of the mass is converted into energy. That leftover uranium is scattered over the bomb site. The energy locked up in one human's atoms is equal to 1000 megaton explosion.

The energy needed to create enough atoms to make one human is twice that amount. The energy would also make an anti-matter version of you, which you would not want to meet as you would be both eliminated and all that energy would be released again.

In fact if after your death your children had a machine that converted all your atoms into energy, they would become very rich when they sold the energy, as your atoms would produce enough energy to power a city. Something you can think about when you turn on a light or central heating.

The closer you look at general relativity the more complicated it becomes. Einstein spent most of his life thinking about his theories and their affects. He always felt his work was not complete.



Einstein spent much time thinking up different situations involving spacecrafts long before human went into space.



You never fail until you
stop trying.

Creativity is the residue of
time wasted.



Einstein's light.

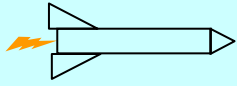
Information can't be transmitted faster than the speed of light.



Einstein predicted light could be a particle or a wave.

It was found that when ultraviolet light was shone on to metal surface, some electrons were released from the atoms and the stronger the light rays the more electrons were released. But strangely all the electrons released had exactly the same energy levels. This led Einstein to think of light as particles of light with equal amount of energy as well as waves. Einstein only received one Nobel Prize in physics in 1921 for his discovery of the law of the photoelectric effect. Einstein never did receive a Nobel Prize for his theory of Special relativity or General relativity, it was thought the theories was too difficult to prove.

Star looks blue when moving towards the star.



Light waves compressed

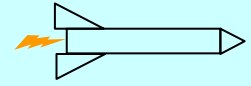
Star



Star looks red when moving away from the star.

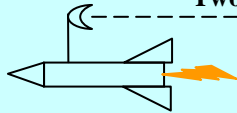


Light waves stretched



Einstein demonstrated that the colour of a star changes depending on where is it viewed from. If the star is moving towards you, then it appears more blue and if is moving away from you, it would appear more red in colour. When the star is blue it has more energy as the light waves are compressed and will also appear to have more mass. When the star is red the light waves are stretched, which meant the star had less energy and appear to have less mass.

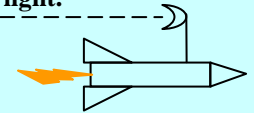
Two spacecraft are travelling away from each other at 1 1/2 times the speed of light.



Spacecraft "A" travelling at 75% of the speed of light away from Earth



Earth



Spacecraft "B" travelling at 75% of the speed of light away from Earth

One of these scenarios which Einstein puzzled over, was if a spacecraft "A" left Earth travelling at 75% of the speed of light, at the same time another spacecraft "B" left Earth travelling at 75% of the speed of light in the opposite direction. The two spacecraft are now travelling away from each other at 1 1/2 times the speed of light, meaning if spacecraft "A" were to send a message to spacecraft "B" the radio message travelling at the speed of light would never catch up with spacecraft "B".

But spacecraft "A" could send a radio message back to Earth. Then the received radio message could be transmitted from Earth on to spacecraft "B". Now what would happen if we remove the Earth? The radio signal would travel to where the Earth was at the half way point and then just keep travelling on to space craft "B". Meaning a radio message could still be sent from spacecraft "A" to space craft "B" which are travelling away from each other faster than the speed of light.

Light or a radio messages travelling from rocket "A" to the Earth in theory, we should see it moving at only 25% of the speed of light by the time it reaches the Earth. But according to Einstein, light is always seen at the constant same speed. Does this mean if you look at the light from rocket "A" it would appear to instantly speed up from 25% to 100%?

No. What actually happens, is the light leaves the position where the spacecraft is located, cancelling out the speed of the spacecraft. According to Einstein, a radio message can be sent from spacecraft "A" to space craft "B".



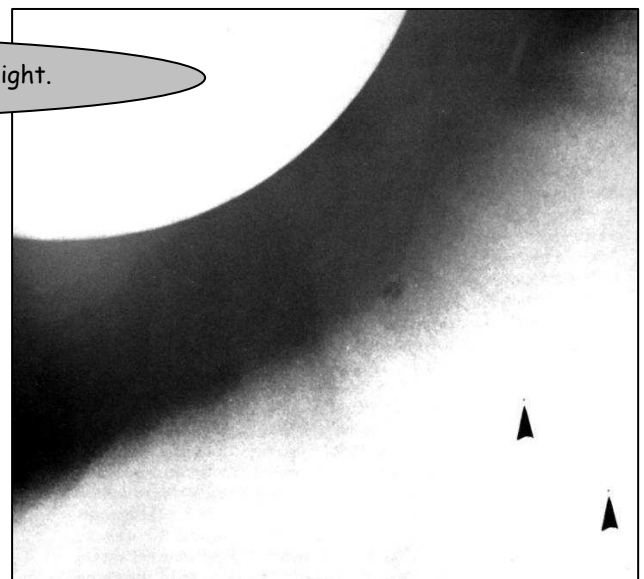
Nothing can travel faster than the speed of light.

Einstein said, light has mass. This was tested during a total eclipse.

On May 29, 1919, Eddington observed a lengthy solar eclipse from Príncipe, an island off of the coast of West Africa. Simultaneously, astronomers took observations from the Brazilian town of Sobral. The team used transportable instruments to record where the stars of the Hyades cluster — which form the bull's face in the constellation Taurus — appeared to be in the sky and compared these observations with Eddington's earlier notes about where the stars normally are when seen in the night time sky.

At their most pronounced, the findings would show a maximum shift in starlight "equivalent to the angle subtended by a quarter viewed from two miles away," author Ron Cowen writes in his new book, "Gravity's Century" (Harvard University Press, 2019).

What does light weigh? Not much. Light from the Sun weights 400 gram per square kilometre at the Earth's surface.



Einstein's time.

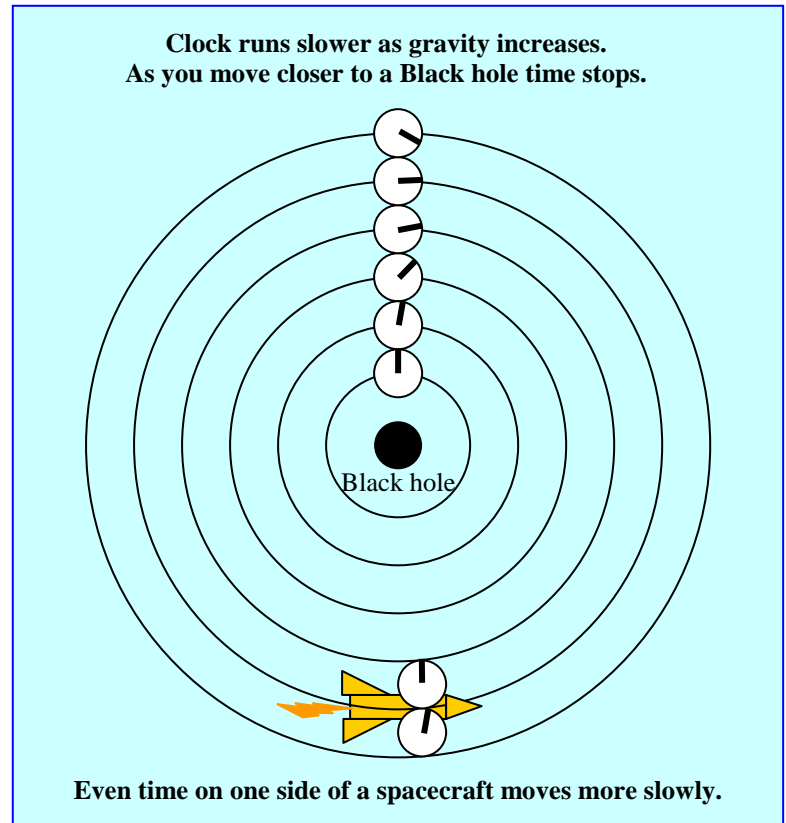
During the 3 centuries before Einstein, there were many discoveries about the nature of things. From Galileo's acceleration rates of falling objects, Newton's gravity, Ole Roemer calculating the speed of light. Thomas Young proved light is made of waves. Jean Foucault accurately measured the speed of light. Albert Michelson and Edward Morley measured the speed of light at different directions showing it was equally the same speed no matter the direction. Maxwell equations found that time was not constant, fifty years before Einstein wrote his theory of relativity. Einstein was born at the right time to be able to put all the pieces all together. What Einstein brought to these discoveries is time. Everyone thought time was fixed and could never change.

Einstein predicted that time could speed up or slow down depending on how fast you are moving. A group of scientists took 4 atomic clocks around the world on jet planes in 4 different direction and return back to Washington where a 5th atomic clock stayed so the other 4 clocks could be compared. It was found that the clock that travelled east lost 59 nanoseconds while the clock that travelled west gained 273 nanoseconds. The other 2 clocks travelled north and south both run slightly faster because gravity is slightly weaker at higher altitude.

How can gravity slow time? Atomic clocks run slower as gravity increases, because the atoms in the clock vibrate slower.

The closer you get to a black hole the slower time runs.
The faster you travel the slower time runs.

Even time on one side of a spacecraft would move slightly more slowly on the side closest to the black hole.



Einstein's gravity.

If you fire a laser at the horizon, it will bend towards the earth about 1mm after travelling 1000 kilometres.

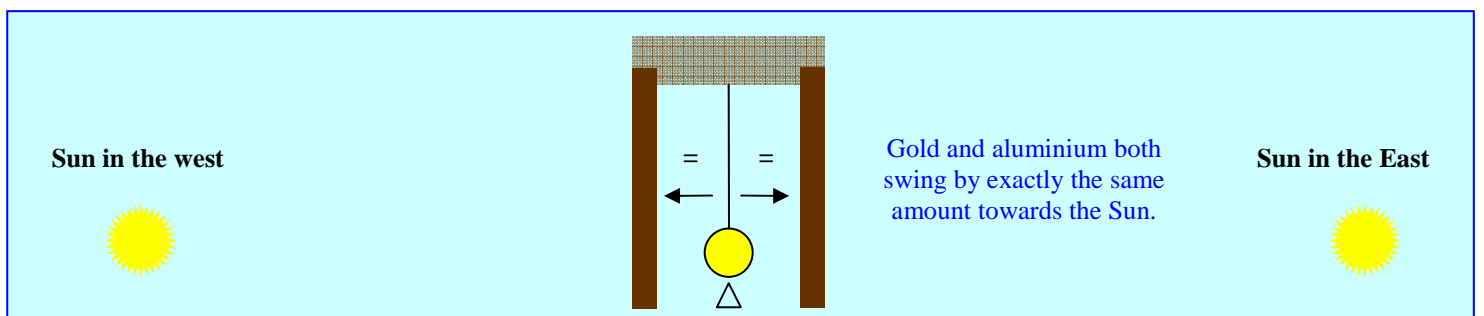
If you fall into a well that went all the way to the centre of the Earth. You may think you would get faster and faster as you approach the centre, but you would slow down a considerable amount because of the gravity from all the rock above you. In fact you would not weigh anything at all in the centre of the earth.

As the moon passes overhead each day, its gravity pulls against the seas lifting them higher creating the tides. But the moon also pulls against the land raising it **300mm** along the equator and at Melbourne's latitude raises the land **140mm**.

Gravity is slightly less along the equator; as the Earth turns its centrifugal forces is throwing you up against gravity. Meaning there is less gravity around the equator than at the poles. So you would weigh slightly less at the equator. According to Einstein, because there is less gravity on the equator time runs slightly fast than the poles. Also a person standing on a mountain top would experience less gravity and time would move slightly faster, then someone at sea level.

The gravity felt on the surface of the Earth is 1,660 times stronger then the gravitational effect of the Sun felt on Earth.

Experiments with metal ball hanging on a thin cable showed there was no difference between gold and aluminium both moving by exactly the same amount towards the Sun every morning and evening.





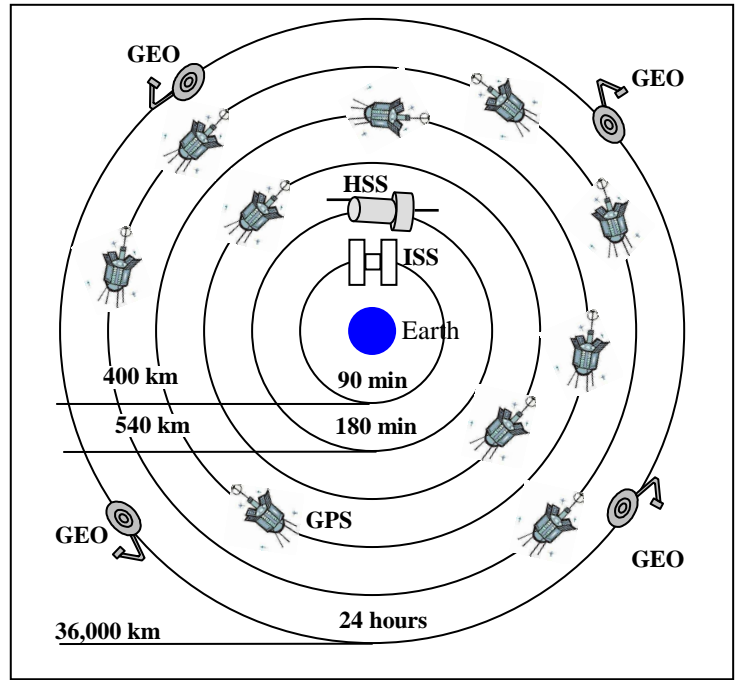
Earth is the insane asylum of the universe.

Spacecrafts or satellites of different sizes and mass all need to move at exactly the same speed when they're at the same distance from the Earth. The closer the satellites are to the Earth the faster they must move to stay in orbit. Every satellite must orbit at the same speed at a certain distances from Earth to stay in orbit.

Hubble Space Telescope at 540 kilometres need to orbit the Earth every 180 minutes to maintain its Earth distance.

At a distance of 36,000 kilometres satellites take 24 hours to circle the Earth. These satellites are said to be in a GEO geostationary orbit and are mostly communication satellites.

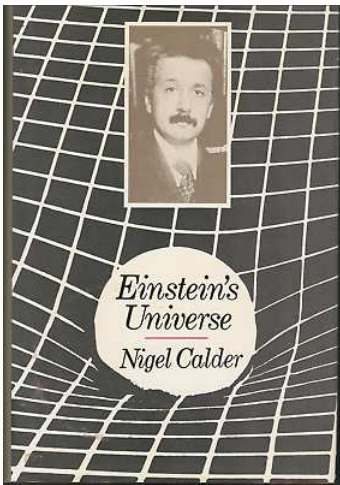
According to Einstein GPS Global position satellites need to have their time continually corrected as their internal clocks run slower the faster they orbit.



Space is not empty.

Experiments carried out in laboratories have shown that when all the air was removed from a glass or steel vessel very close to a pure vacuum as possible, it was found there was a soup of energy and particles jumping in and out of existence in a pure vacuum.

Einstein contemplated being able to use this soup to navigate the universe. If you were moving at close to the speed of light, you would be constantly crashing into these particles. Therefore it should be possible to measure this force and create a map of the universe.



The important thing is not to stop questioning. Curiosity has its own reason for existing.

Don't wait for miracles, your whole life is a miracle.

A happy man is too satisfied with the present to dwell too much on the future.

Anyone who has never made a mistake has never tried anything new.

Everything has changed, except our way of thinking.

"God does not play dice with the universe."

I love to travel, but I hate to arrive.

Two things are infinite: the universe and human stupidity; and I'm not sure about the universe.

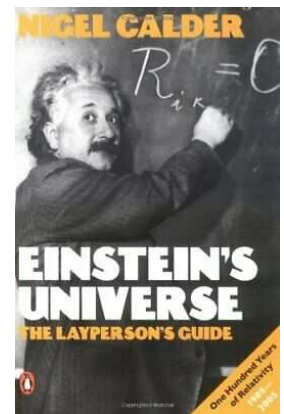
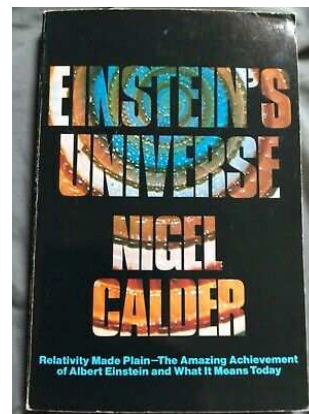
Insanity: doing the same thing over and over again and expecting different results.

See more Einstein quotes @ Einstein app - <https://play.google.com/store/apps/details?id=com.nilkanthsoft.alberteinstein>

I tried to read many books on Einstein's theory of relativity, but none have made any sense until I came across a book and video by Nigel Calder called Einstein's Universe, published in 1979 (ISBN 0563175923). This book explained the effects of Special relativity (gravity) and General relativity (mass & energy) in layman's terms. Nigel Calder also wrote other books on Einstein and boats. He also made a documentary for the BBC which has been digitally remastered in 2017 and can be seen on YouTube which I enjoyed. The book has been reprinted many times, so getting your hands on a copy is not too difficult. See different cover styles above and at right. I'm still no expert but now have a better understanding of Einstein's theories.

Einstein's Universe BBC re-mastered was on YouTube for some years, but has now been removed or sold to one of the video channels. With a bit of fishing around you can find it.

By Greg Walton



MEMBERS GALLERY



Below - Still image of the Aurora from Teddywaddy Victoria. *By Jamie Pole*

Time lapse Link <https://vimeo.com/640944001>

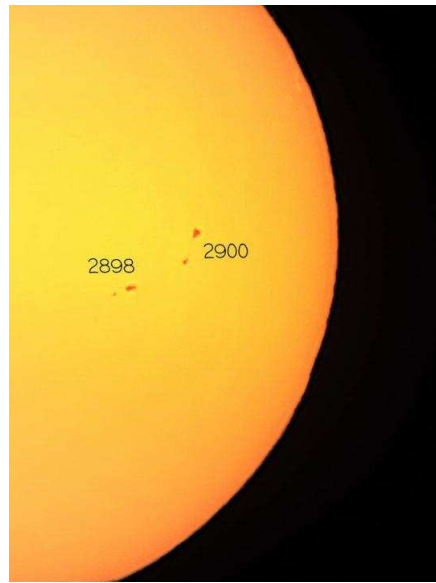
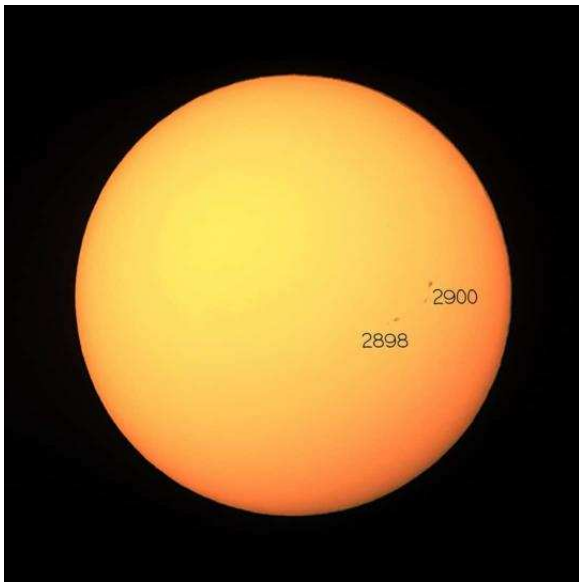


Below - Aurora from 4/11/2021 from the Mornington Peninsula. *By Jamie pole*

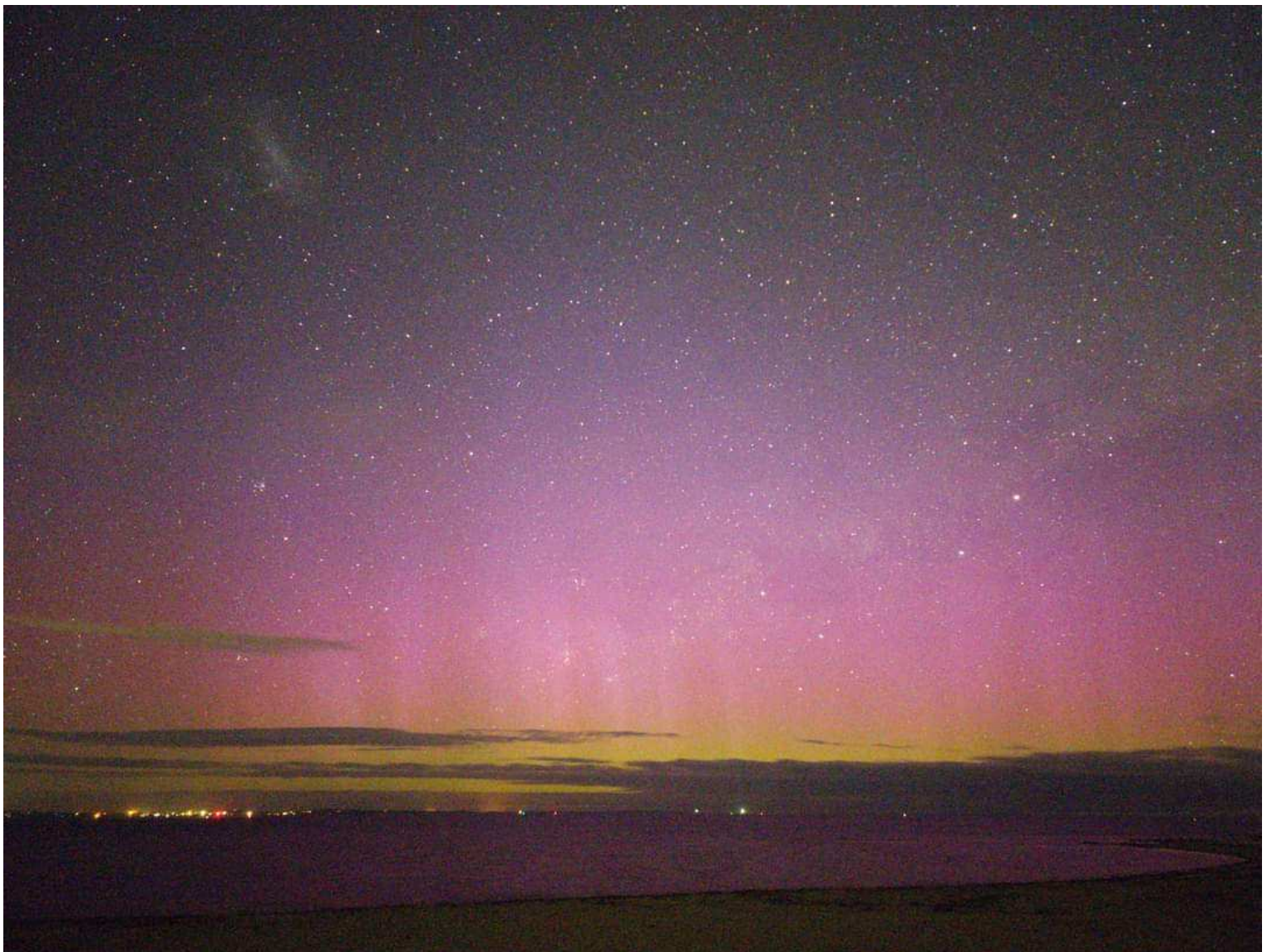
Time lapse Link <https://vimeo.com/642312395>



Finally a stunning Melbourne day for some solar viewing (using a solar filter on one of my telescopes - safety first!)
These images of our star, the Sun, were taken with my Samsung Note20 Ultra smartphone. The number refers to the current sunspot region.
By Nerida Langcake



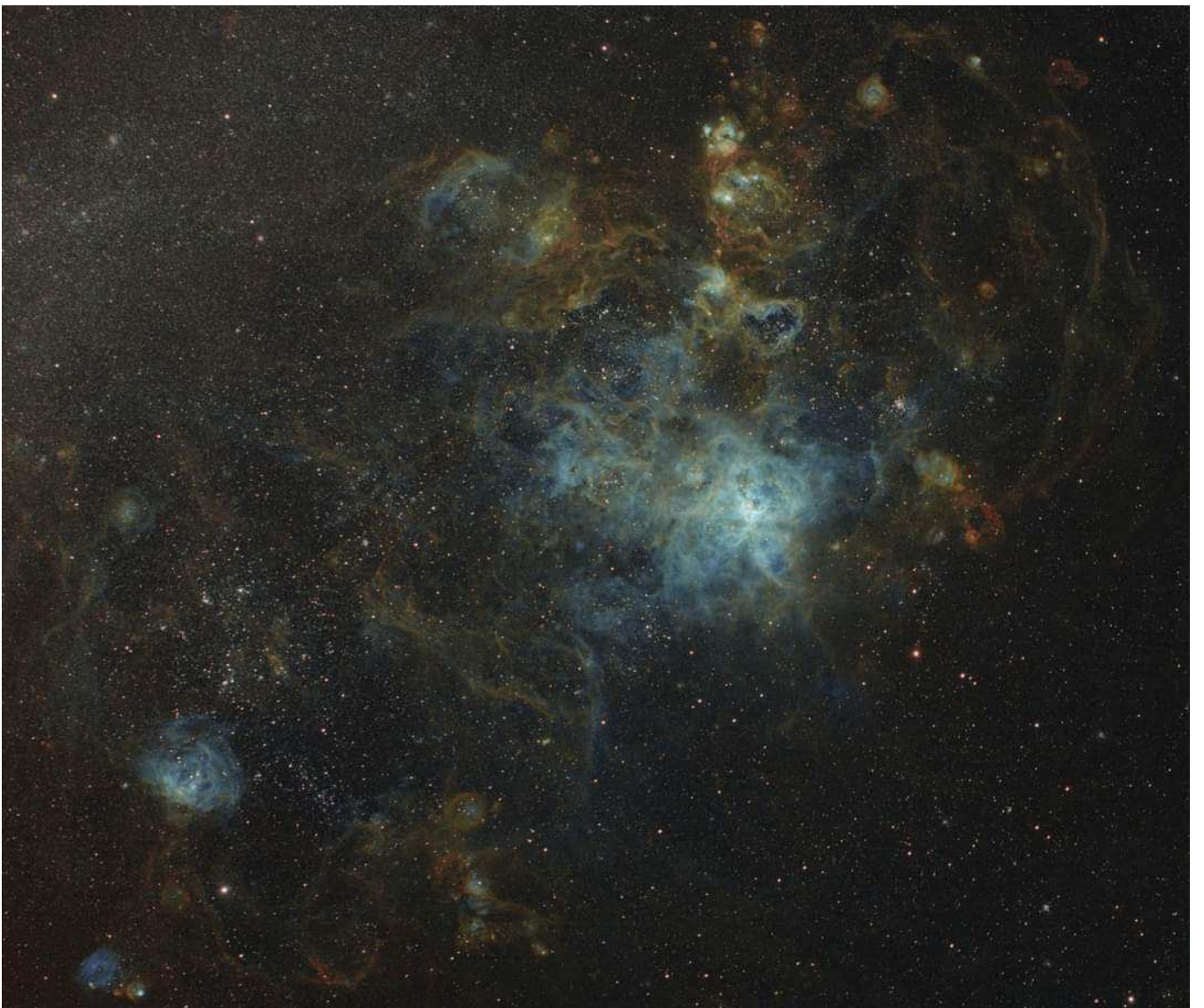
Below - Last night I caught my first aurora. I have so many images to go through to create a time-lapse... this is straight from my phone with no processing. *By Nerida Langcake*





Above - Aurora from Blow Hole Track Flinders also known as Elephant Rock. *By Russell Smith*

Below - Tarantula Nebula NGC2070. *By Russell Smith*



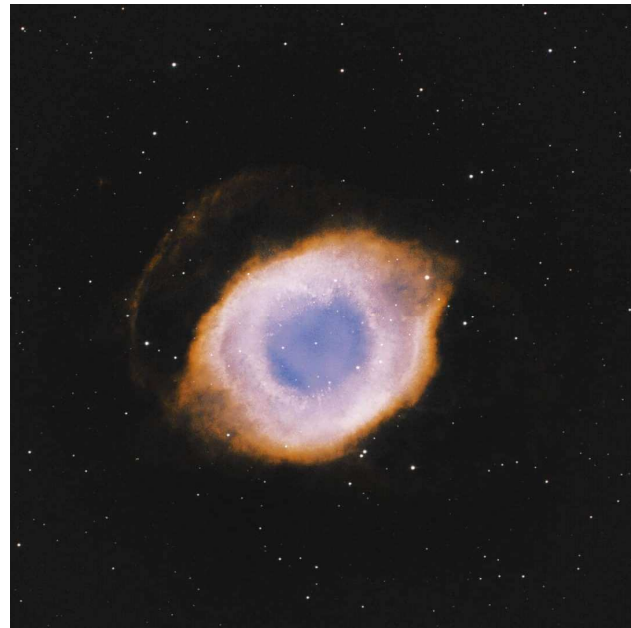
Below 2 Aurora images from Balnarring - Last night's effort! Freezing my butt off between 12~130am. Result of an X-Class CME 1.06 flare. Must've only grazed the Earth. Was expecting an awesome burst of energy but was disappointed. Still happy with the results.
Canon 6D Iso 3200, 20 sec subs Processed in PS CS3, *By Paul Albers*



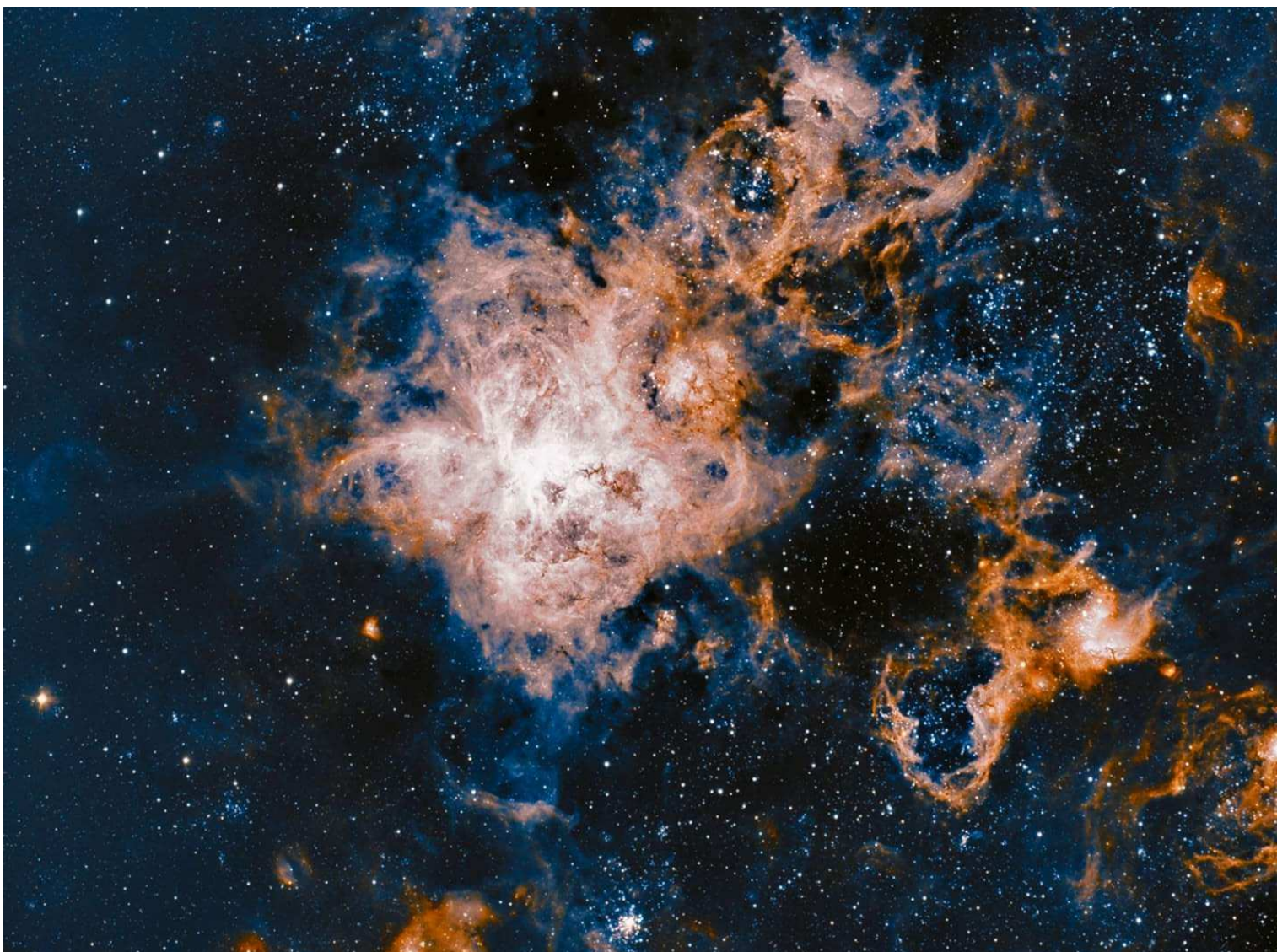


Left - Have a look at Venus and the Moon! They're within 2° of each other right now. If you look closely you can see that both Venus and the Moon appear as a crescent. *By Guido Tack*

Right - Helix nebula (NGC 7293) from last weekend. 44x120s subs, OSC camera with dual band filter, and I think a bit too much post processing... *By Guido Tack*



Below - I also collected 150x120s of data on the Tarantula (NGC 2070) last Sunday/Monday. Pretty happy with the result, although I have no idea how to get even close to Nik's version from a few weeks ago... *By Guido Tack*





Below - NGC2070, M42 and Horsehead Nebula. I tried out the new post and managed to get these three shots in breezy conditions. Setting up and packing up was much quicker and easier than usual.

By Chris Kostokanellis



Right - Halloween Jupiter! Taken under very good local seeing, this is a 24-minute-long series of 40-sec videos of red, green and blue all stacked together! Jupiter is now starting to get lower every night and will soon be harder to image this well. Then we'll have to wait until 2022!

By Dominic Lucarelli



Left - Jupiter from Monday evening. The seeing was kind to me that night! ZWO290MM with a C14. Processed with AS3, RS6, Winjupos, and CS5

By Dominic Lucarelli



Moon Craters (3-day-old Moon)

Petavius Crater is 177 km in diameter and so is one of the larger lunar craters. The grand double rampart on the east side is nearly 3,400 m high and its terraces, interior floor with central hill and cleft compose a magnificent landscape.

By Dominic Lucarelli

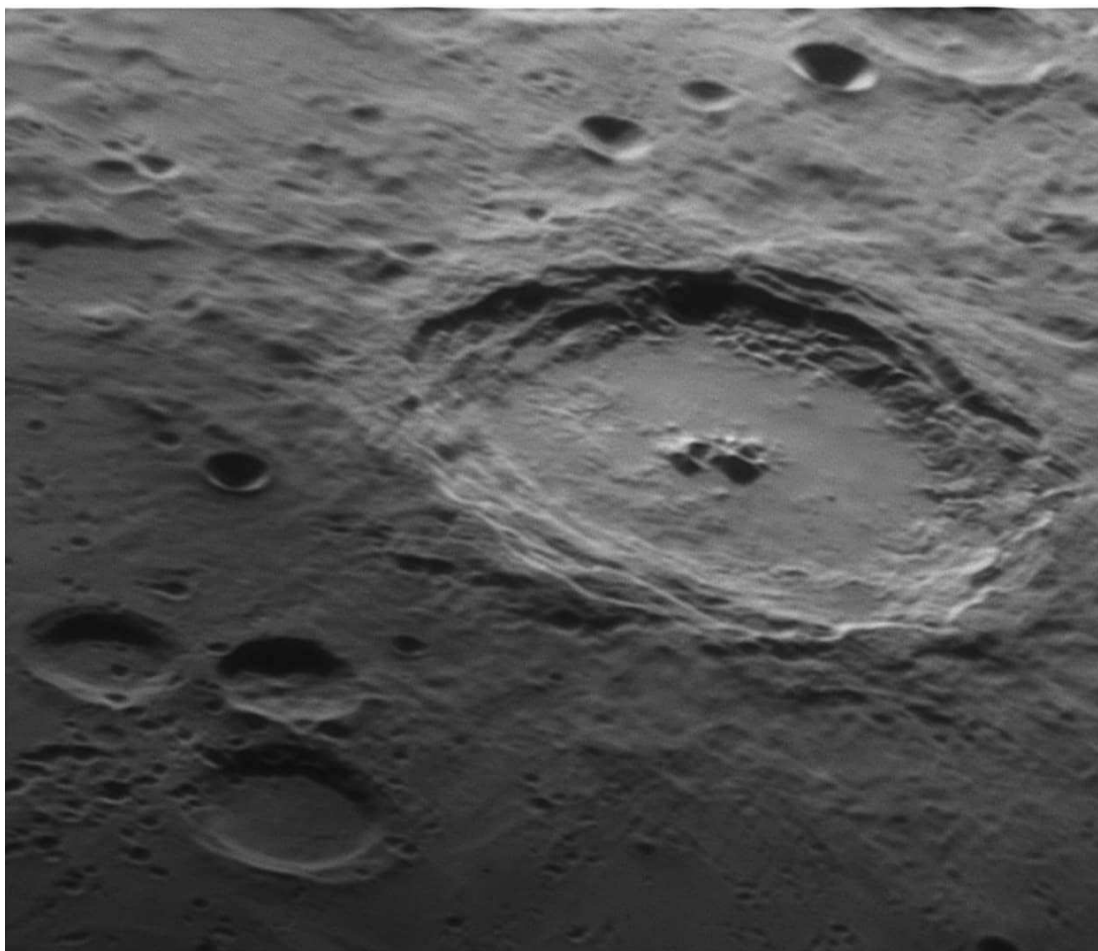


Langrenus Crater is an impact crater about 130km in diameter. The feature is circular in shape, but appears oblong due to foreshortening. The inner wall of Langrenus is wide and irregularly terraced, with an average width of about 20 kilometers. The central peaks rise about a kilometre above the floor, and a peak on the eastern rim ascends to an altitude of 3 km.

(Source Wiki, edited)

Taken with an IR742 filter and ZWO290MM with a C14. Processed in PIPP, AS3, RegiStack, and Cs5

By Dominic Lucarelli



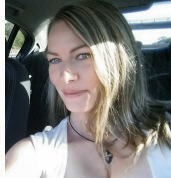
SOCIETY INFORMATION



Peter Skilton



Mark Stephens



Nerida Langcake



Jamie Pole



Anders Hamilton



Trevor Hand



Simon Hamm



Guido Tack



Ben Claringbold



Greg Walton

OFFICE BEARERS OF THE MORNINGTON PENINSULA ASTRONOMICAL SOCIETY

President: Peter Skilton
Vice President: Mark Stephens
Committee: Anders Hamilton, Trevor Hand, Guido Tack, Simon Hamm and Ben Claringbold

Secretary: Nerida Langcake
Treasurer: Jamie Pole
Web master: Guido Tack
Scorpius editor: Greg Walton
Librarian: Fred Crump

SOCIETY MEETINGS

Meeting Venue: MPAS Astronomy Centre
 The Briars, Nepean Hwy, Mt Martha
 (Melways ref. 151/E1)

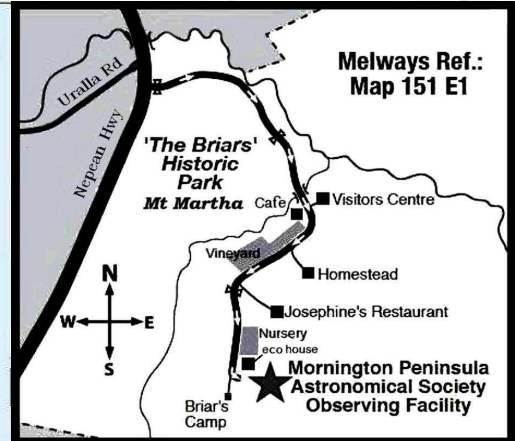
Society meetings: Don Leggett Astronomy Centre
 8pm on the third Wednesday of the month
 (except December)
 (See map at right & Below)



For addition details:
 Internet: www.mpas.asn.au
 email: welcome@mpas.asn.au

Phone: 0419 253 252

Mail: PO Box 596, Frankston 3199, Victoria, Australia



Melways Ref.: Map 151 E1

LIBRARY

The Society also has books & videos for loan from its library, made available on most public & members nights at The Briars site. Contact Fred Crump or Lara Conway



Fred Crump

E-SCORPIUS NEWSGROUP

M.P.A.S. main line of communication is the online newsgroup called E-Scorpius. Here you will be kept up to date with the latest M.P.A.S. news & events information as well as being able to join in discussions & ask questions with other members. To join, email welcome@mpas.asn.au say that you want to join E-Scorpius & you will be added to the E-Scorpius list.

facebook MPAS members - <https://www.facebook.com/groups/MPAS1/>
 MPAS - <https://www.facebook.com/mpas0/>

VIEWING NIGHTS - MEMBERS ONLY

Viewing Night - Members only any night, at The Briars, Nepean Hwy, Mt Martha, starting at dusk. Members visiting The Briars for the first time must contact Greg Walton on 0415172503 if they need help getting to The Briars site. Upon arrival at the site, remember to sign the attendance book in the observatory building.

For additional details:
 Internet: www.mpas.asn.au
 email: welcome@mpas.asn.au

Phone: 0419 253 252

Mail: PO Box 596, Frankston 3199, Victoria, Australia



Members please write a story about your astronomy experiences and add some pictures. Send them to the editor: Greg Walton gwpas@gmail.com

MPAS newsletters online - https://drive.google.com/folderview?id=0ByvxzZGI9g_SUNmZVhkZTFGWTA

SCORPIUS The journal of the Mornington Peninsula Astronomical Society

Newsletter Disclaimer - The Scorpius Newsletter is published online, once every two months for its membership, by the Mornington Peninsula Astronomical Society, for Educational Purposes Only. As a newsletter, this publication presents news spanning a spectrum of activities, reports, and publications in order to keep society members abreast of a variety of events and views pertaining to astronomy. While prudent, reasonable effort has been utilized to verify factual statements made by authors, inclusion in this newsletter does not constitute or imply official MPAS endorsement. All materials (except previously published material, where credited) are subject to copyright protection © 2021, Mornington Peninsula Astronomical Society