Cover image - NGC1360 *By Steve Mohr*

SCORPIUS

THE JOURNAL OF THE
MORNINGTON PENINSULA ASTRONOMICAL SOCIETY INC.

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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/

facebook

Mornington Peninsula Astronomical Society

SOCIETY NEWS

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. No site entry unless you have a confirmed email 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. Max of 100 people outdoors. Max of 50 people or 1 per $2m^2$ (plus speaker/usher) in auditorium, and other areas as sign-posted.

4) CHECK-IN. All attendees must check-in using the MPAS QR code (or log book as last resort) upon arrival to assist with contact tracing.

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. Min 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 the observatory, kitchen, reception & auditorium.

Here's an update of confirmed outreach events for your diary. All are in need of member help with telescopes/speakers as shown. Freshly updated entries are ** asterisked. Please enter them in your diary and post back here for those where you can help. Those who did the presenter training last year are encouraged to help with the speaker role. *Regards, Peter Skilton*

MARCH

Tuesday 2nd, 7:30pm, Essex Heights Primary at lluka Retreat, 20 Shoreham Rd, Shoreham. Speaker Peter Skilton.
Friday 5th, 8pm Briars. Public stargazing night. Speaker Trevor Hand. 50 people booked.

APRIL

Friday 2nd, 8pm Briars. Public stargazing night. Speaker Trevor Hand. 50 people anticipated.

MAY

Friday 7th, 8pm Briars. Public stargazing night. Speaker Manfred Berger. 50 people anticipated.
Tuesday 18th, 7:30pm at Parkdale Secondary College, Warren Rd, Parkdale. 170 Year 7 pupils booked. Speaker Peter Skilton. Telescopes are to be set up again in the adjacent Waratah Ave public park to the south of the school grounds. Help from members is needed as we need 10 telescopes, especially from members living in the vicinity. Melways map 87/G8.
Wednesday 26th, Frankston foreshore. Public lunar eclipse in the evening.
Friday 28th, 8pm Briars. Scout/Guides/Cubs night. Speaker Peter Skilton & Katherine McCoy. No bookings as yet.

JUNE

Friday 4th, 8pm Briars. Public stargazing night. Speaker Trevor Hand. 50 people anticipated.

JULY

Friday 2nd, 8pm Briars. Public stargazing night. Speaker TBD.
Friday 30th, 8pm Briars. Scout/Guides/Cubs night. Speaker Peter Skilton & duet with another member. No bookings as yet.

AUGUST

Friday 6th, 8pm Briars. Public stargazing night. Speaker Trevor Hand. 50 people anticipated.
Friday 20th, 8pm Briars. Public stargazing night for National Science Week. Speaker TBD.

SEPTEMBER

Friday 3rd, 8pm Briars. Public stargazing night. Speaker TBD.

OCTOBER

Friday 1st, 8pm Briars. Public stargazing night. Speaker Trevor Hand. 50 people anticipated.
Friday 29th, 8pm Briars. Scout/Guides/Cubs night. Speaker Peter Skilton. No bookings as yet.

NOVEMBER

Friday 5th, 8pm Briars. Public stargazing night. Speaker TBD.

DECEMBER

Friday 3rd, 8pm Briars. Public stargazing night. Speaker Trevor Hand. 50 people anticipated.

By Trevor Hand

Public Night January 2nd - The first night was held on Saturday, January 2nd, and saw 49 in attendance in total for the public to hear Trevor Hand speak to his new slides about the scale of things in the Universe -from sizes we are familiar with, up to the very largest known. Numbers attending were impacted at the last minute probably either due to weather or due to residual coronavirus concerns with a Black Rock cluster of cases still underway. Thanks go to the following members for coming along to help keep proceedings safe, running smoothly, and potentially looking after the telescopes, though the night was under 100% cloud cover unfortunately, so no instruments saw the night sky. Present outdoors were Kathryn Hand, Peter Skilton, Jamie Pole, Nerida Langcake, Mark Stephens, Guido Tack, Fred Crump, Bonnie Cass, Simon Hamm, Anders Hamilton, Ben Claringbold, Jason Heath and Alan Predjak. *Regards, Peter Skilton*

Public Night January 8th - The second public night was held on Friday, January 8th, and had far superior sky conditions. The auditorium had 46 members of the public indoors, to hear Trevor Hand speak to updated slides about Pluto, before the group was marshalled outside in an orderly manner for each visitor to pick up their personal "Eyepiece Cling Wrap" as dispensed by Peter Skilton. Each member of the public then held their own ECW over the eyepiece of each telescope, had a look, then took the ECW with them to the next telescope. This worked very smoothly, with surprisingly no-one losing their plastic wrap during the evening. It also kept the eyepieces sparkling clean at the end of the evening, with no fingerprints on them or on the telescopes. The skies were clear, steady and Moon-less throughout the evening, with the temperature being pleasantly mild. It could be said with all the Gladwrap in use, that the seeing was surprisingly crisp. The telescopes inside the observatory were operating, together with many more outside on the concrete platforms, with many satellites passing overhead, plus a very bright meteor near the zenith. Mars was a good sight, together with all the other familiar objects present in the Summer night sky. The site had a lovely family buzz for the evening for the appropriately distanced and sanitised crowd there; something we hadn't experienced since the coronavirus rudely interrupted our highly popular outreach activities last year. Other members present outdoors and helping with site control and with telescopes were: Jamie Pole, Nerida Langcake, Mark Stephens, Guido Tack, Fred Crump, Bonnie Cass, Simon Hamm, Ben Claringbold, Jason Heath, Alan Predjak, Greg Walton, Chris Kostokanellis, Rod Stone and Phil Holt. Nerida set up her new 10 inch white Dobsonian on the upper slab, and had fun with handheld-imaging on her new Samsung phone. *Regards, Peter Skilton*

Most waited till the sky darkened around 10pm. There wereabout 10 telescopes operating, all focused on different objects. In the observatory we viewed Mars, Uranus, M42, M45, NGC104, NGC2070, NGC3372. *Greg Walton*

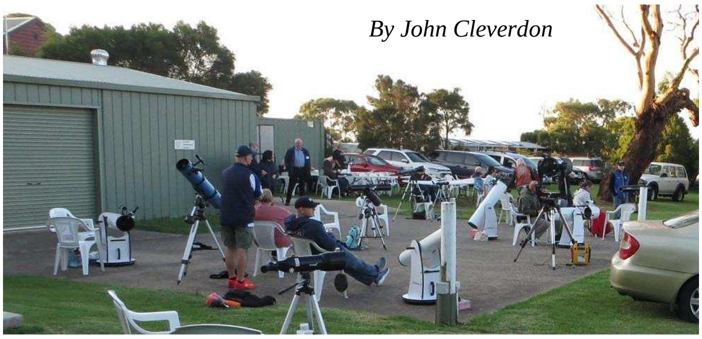
Public Night January 15th - The third public night for January was held last Friday, and saw 40 public and 16 members in attendance under clouded skies and even light rain at one stage. Trevor Hand spoke on the subject of 12 moons, which at times proved a bit challenging over the noise of gentle rain on the roof. Judging by the flashes of lightning to the north, those further up towards Melbourne were probably getting quite a storm. As can sometimes happen, 10 minutes after the last visitor left about 10:15pm, the clouds miraculously cleared across the entire sky, but by that stage the observatory had been closed. Thanks to those members who attended to help out with the running of the evening, including Nerida Langcake, Piper Grierson, Phil Holt, Guido Tack, Peter Skilton, Ben Claringbold, Rohann Baumann, Fred Crump, Bonnie Cass, Jason Heath, Alan Predjak, Mark Stephens, Simon Hamm, Greg Walton and Anders Hamilton. *Regards, Peter Skilton*

Society meeting January 20th - We played a video on Indigenous Astronomy by Prof. Michael Brown & science student Krystal De Napoli. After which Mark Stephens did Sky for the Month, then members chatted over coffee. Then a 7 y.o. young engineer/astronomer-to-be presented in Spanish and English followed by science videos. As well, with the clear sky we opened the observatory and looked at Mars and some of the brighter deep sky objects as the Moon was at First Quarter. *Greg Walton*

For those of you who are not yet subscribed (it's free) to the MPAS YouTube channel, the January meeting has been uploaded for viewing. It features a talk about Indigenous Astronomy, Light Pollution and the Shared Wilderness of the Night Sky, by Assoc. Prof. Michael Brown & science student Krystal De Napoli, both from Monash University.
Regards, Peter Skilton

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/UCm6XOkIcIflt4y0XRBXpXuw
or watch it on the MPAS site once it's refreshed for this month: https://www.mpas.asn.au/meeting-recordings/

Public Night January 22nd - The fourth public stargazing night proceeded smoothly on Friday under COVID-Safe conditions, with 69 attending in total, including 19 members. David Rolfe gave the solar system talk indoors; then everyone went outside for some cling wrap astronomy. While there was high level cloud, this mostly cleared during the evening, giving views of the nearly First Quarter Moon, Mars, Uranus, Orion nebula, 47 Tuc and many other Summertime favourites. Helping outside were Nerida Langcake, Bob Heale, Jamie Pole, Peter Skilton, Landon & Jamie Rolfe, Piper Grierson, Fred Crump & Bonnie Cass, Alan Predjak, Greg Walton, Jason Heath, Anders Hamilton, Ben Claringbold, Mark Stephens, Guido Tack, Trevor Hand and Simon Hamm. *Regards, Peter Skilton*


By John Cleverdon


By John Cleverdon

Members BBQ & working bee January 23rd - Starting at 4pm the working bee was a great success with most jobs completed. Small Sirius dome was scrubbed and washed and looks very clean and white. Lawns were cut and edges trimmed. Trees behind the observatory were shortened which turned out to be a big job made easier with many members helping out. Large dead tree behind the garden shed was cut up and removed. Kitchen was cleaned and reorganized. Sales area got a tidy up. Observatory was swept out and telescopes dusted off. A big thanks to all who helped out on the day and special thanks to Jamie, Pia and Anna for running a Covid-safe kitchen and all their hard work. Once the sky had darkened the telescopes were put to good use by members. We had some very interesting cloud formation crossing the sky which was lit up by the Moon. Members in attendance: Ros & Peter Skilton, Jamie Pole, Anders Hamilton, Nerida Langcake, Piper Grierson, Fred Crump, Bonnie Cass, Simon Hamm, John Cleverdon & Marj Cleverdon, Sarah & Simon Cottrill & their 3 children, Guido Tack, Ben Claringbold, Chris Kostakanellis, Alan Predjak, Jason Heath, Greg Walton, Pia Pedersen, Mark Stephens, Helmuth Schultes, Charlotte Swart, Michael Smith, Anne & Geoff Danne, Andrew Parsons, Katherine McCoy, Kevin Rossiter, Roland Knabe & Craig Turner. *Regards Greg Walton*


By John Cleverdon


By John Cleverdon

Scout viewing January 23rd - MPAS visited Joseph Harris Camp in Mt. Martha on Saturday evening after the members' BBQ, to speak with 50 cubs and scouts from Hallam and show them some of the night sky. Fortunately, it was a mild evening with occasional wispy clouds ahead of hotter weather. Peter Skilton gave the talk outdoors in an open air tent, projected onto a white sheet pinned to the side of the tent. It worked surprisingly well because of the absence of wind, but could have proven interesting in a gale. Afterwards, everyone in the assembly was given a piece of cling wrap each, and walked across the road to the telescopes out in an adjacent field. A waxing gibbous Moon, Mars and the Orion Nebula were easy targets. There were lots of questions during the talk and in the field. Operating the instruments were Guido Tack, Chris Kostokanellis, Fred Crump and Nerida Langcake (with Piper Grierson in the car away from any mozzies). The thin, slowly moving cloud formations to the south reflected some of the moonlight and actually had a surprisingly close resemblance to the eye of an aurora Australis that was too weak to have colours visible. Indeed, one of the Scouts initially thought that was what they were witnessing. However, none was predicted that evening. *Regards, Peter Skilton*

Public Night February 5th - The public stargazing night on Friday at the Briars was full of surprises. Half an hour before curtain-up, all the power went out! It wasn't confined to our site, and it wasn't due to our circuit board being overloaded with our air conditioners, urns and kettles turned on simultaneously either. Electrical repair trucks were on Craigie Road while driving to the event, and so they probably interrupted the supply to the area, either by design or by accident. Craigie Road was also closed to traffic after the evening concluded, with plenty of amber flashing lights evident. Now, a power outage has to be in the top-5 of worst-case scenarios for a speaker, meaning no PowerPoint slides are possible, and it's a circumstance we've not experienced in the past with a talk night. We don't have an uninterruptible power supply on the site. Fortunately, the outage lasted only 5 minutes, otherwise it might have been a particularly spooky public talk by red torchlight and trying to show slides on a small laptop screen to a socially-distanced audience. Again this month, we were rapidly booked to our COVID Safe capacity, with 48 visitors and members present for the evening.

Giving her debut speech, member Katherine McCoy tag-teamed with Trevor Hand to deliver a refreshed Solar System talk to the audience, and absolutely nailed it with a really happy bunch of people exiting the auditorium at the end so as to collect their cling wrap before taking a COVID Safe look through the telescopes.

Katherine & Trevor just before the talk on Friday.   *Photo at right by Peter Skilton.*

During the talk, there had been lightning on the horizon to the north, east and south-east, and solid low-level cloud cover with occasional holes, and a hint of spitting rain on one occasion. Nevertheless, the rain held off and the skies started to clear about 9:30pm, giving views of Mars, Pleiades, Hyades cluster, Orion nebula and others to the south near Crux. The clouds dissipated almost entirely over the next 2 hours for the diehard public optimists who stayed behind to see what was on offer.

By Nerida Langcake

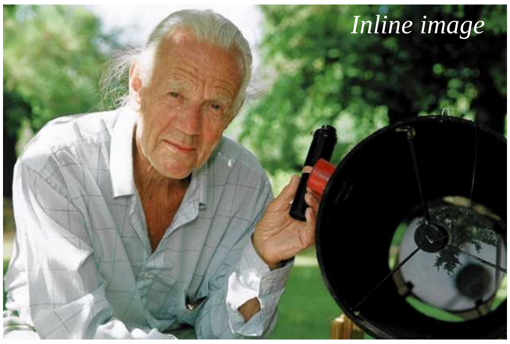
A member of the public emailed back after a clearly inspiring evening with MPAS, saying "Morning! The kids and I attended your public night last night and LOVED it. We would love to join as members. If you could let me know what the next steps are that would be awesome".

It was yet another example of the sky conditions near Mount Martha being far better then elsewhere in the metropolitan region.

Here's a picture taken by Nerida Langcake on the evening with her Samsung Smartphone, and you can see the Southern Cross (Crux) lying on its left side, with the two Pointers, alpha and beta Centauri, just above the dome. The Jewel box is also visible, being the middle object of the 3 faint stars half-circling the left-hand star of the Southern Cross' shorter axis.

Thanks go to those members providing support on the evening, including Nerida Langcake, Guido Tack, Jamie Pole, Peter Skilton, Manfred Berger, Simon Hamm, Dave & Landon Rolfe, Fred Crump, Ben Claringbold and recent arrival Bradley Baldwin and his Dad, Alastair.
Regards, Peter Skilton

Society meeting February 17th - For those of you who are not yet subscribed (it's free) to the MPAS YouTube channel, the February meeting has been uploaded for viewing. It features a talk about Telescope Building by the late John Dobson.



Inline image

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/UCm6XOkIcIflt4y0XRBXpXuw
or watch it on the MPAS site once it's refreshed for this month:
https://www.mpas.asn.au/meeting-recordings/   *Regards, Peter Skilton*

Members BBQ & Telescope learning day February 20th - We had a perfect day for the biannual Telescope Learning Day (although the cloud rolled in much later). It was a very humid 25□C, and down the hill from the MPAS observatory, the Summersalt 2021 music festival tunes drifted up to provide some live background music for the day and night.

Mark Stephens gave a talk in the auditorium that went through and explained different types of telescopes, magnification, FOV in the eyepiece, objects to find in the sky, etc. Then the visitors moved outside where Guido showed and demonstrated a variety of telescopes which were set up. Some visitors brought their own scopes which they wanted assistance with (setting up, polar aligning, how to use them and get the most out of them, etc) so with help from the society members their telescopes were setup and the owners were shown what to do. Other visitors asked lots of questions about the different types of scopes and their uses, to decide what would suit them best before they buy.

Then we fired up the BBQ and had a sausage sizzle for dinner and waited for it to get dark, so we could then look through the telescopes and show our guests where to find objects, etc.

Regards, Nerida Langcake

OBSERVATORY UPDATE

Mornington Peninsula Astronomical Society

Observatory training. 10th & 17th April 2021

This year we have decided to run the observatory training once daylight saving has finished. As this makes it much easier for more members to participate with astronomical twilight ending at 7:30pm, also it's during school holidays. The first opportunity will be on the 10th or 17th April as this is close to the New Moon, with backup date on the 24th members BBQ. We also prefer clear skies as members need to be able to star align the telescopes and find deep sky objects. For those that are new to computerized telescopes we have manuals available online.

Links to telescope manuals - https://drive.google.com/folderview?id=0ByvkxzZGI9g_dnV0SXdKTVdVaUk

MPAS Observatory opening & closing procedure. https://drive.google.com/drive/folders/0ByvkxzZGI9g_NGs4U3dNRWp6UWc?usp=sharing

150mm Maksutov FL 1900mm F12 EQ5H GoTo mount. https://drive.google.com/drive/folders/0ByvkxzZGI9g_MFgyaVI0NHBDams?usp=sharing

125mm Refractor FL 1000mm F8 EQ6 GoTo mount. https://drive.google.com/drive/folders/0ByvkxzZGI9g_M2UxNmljNmd0b1k?usp=sharing

200mm Newtonian FL 1000mm F 5 EQ6 GoTo mount. https://drive.google.com/drive/folders/0ByvkxzZGI9g_aFlHektYRTJOdFE?usp=sharing

350mm Cassegrain FL 3500mm F10 EQ8 GoTo mount. https://drive.google.com/drive/folders/0ByvkxzZGI9g_ajUtZC0wcDI2a3c?usp=sharing

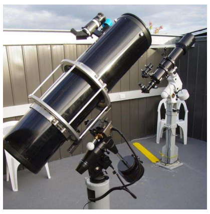
MPAS also has many other telescopes that you can get trained on.

450mm Newtonian FL 2000mm F 4.5 EQ manual mount. https://drive.google.com/drive/folders/0ByvkxzZGI9g_NGdmZ2NES1A2S0k?usp=sharing

200mm Refractor FL 2400mm F 12 EQ manual mount.

FL 1400mm F 5.5 Springfield mount. https://drive.google.com/drive/folders/0ByvkxzZGI9g_OHd3TEoydTI5N00?usp=sharing







Upon completion you will be certified & given an electronic key to open the observatory.
Once your session is over, you will be responsible for shutting down the telescopes & closing the observatory.

Restrictions - Trained members need to be an MPAS member for more than one year, before they can get an observatory key, also must be 18 or more years of age. New members can still get training on the telescopes, but will need to be in the presence of a certified member, when using the observatory.

If you are interested contact Greg Walton gwmpas@gmail.com or phone 0415172503

New Members Welcome

Robert Clarke
Priya & Aakershit Tanu
Winston, Carla, Jasper & Toby Lewinsmith
Christian, Claire, Xavier & Willow Boardman
Craig, Jack & Kristina Turner
Keith & Anne Bartlett
Sarah Elizabeth
Carmen, Tristan & Lila Williams
Carol Hankinson
Bradley Baldwin
Mark & Tersia Godfrey

MPAS SUBSCRIPTIONS 2021

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 2021 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 2021 fees is:

SOCIETY FEES

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

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.

Click on the link for further information - https://drive.google.com/file/d/0ByvkxzZGI9g_NXZ4cWxHbERTdEE/view?usp=sharing

JOIN NOW

Full Member	$50
Pensioner	$45
Family	$65
Family Pensioner	$60

Joining fee $30

You can now renew your membership online. See link below. Click on Members then JOIN NOW at the bottom of the page. Then just fill in your detail on Try-booking.
http://www.mpas.asn.au/members.html

CALENDAR

March / 2021

Red Days indicate School Holidays

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2 **Moon at 365,423km**	3	4	5 **Public night 8pm** Mercury 0.5deg Jupiter	6 **Last Quarter**
7	8 **Labour Day**	9	10 **Saturn below a thin crescent Moon dawn**	11 **Jupiter left of thin crescent Moon dawn with Mercury below**	12	13 **New Moon**
14 **St Patricks Day**	15	16	17 **Society Meeting 8pm**	18 **Moon at 405,253km**	19 **Mars right of Moon**	20 **Members Night & W/Bee 4pm**
21	22 **First Quarter**	23	24	25	26	27
28	29 **Full Moon**	30 **Moon at 360,309km**	31			

Monthly Events

Public night - 8pm to 10pm on the 5th @ the Briars
Society Meeting - 8pm to 10pm on the 17th @ the Briars
Working bee & Members Night BBQ - 4pm on the 20th @ the Briars

CALENDAR

April / 2021

Red Days indicate School Holidays

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2 **Public night 8pm**	3 Easter
4 Easter **Last Quarter** **Daylight Savings ends**	5 Easter	6	7 **Saturn left of Moon dawn**	8 **Jupiter left of Moon dawn**	9	10 **Observatory training**
11	12 **New Moon**	13	14	15 **Moon at 406,119km**	16	17 **Mars right of Moon** **Observatory training**
18	19	20 **First Quarter**	21 **Society Meeting 8pm**	22	23	24 **Members Night & W/Bee 4pm**
25 **Scorpius Deadline**	26 **ANZAC DAY**	27 **Full Moon**	28 **Moon at 357,378km**	29	30	

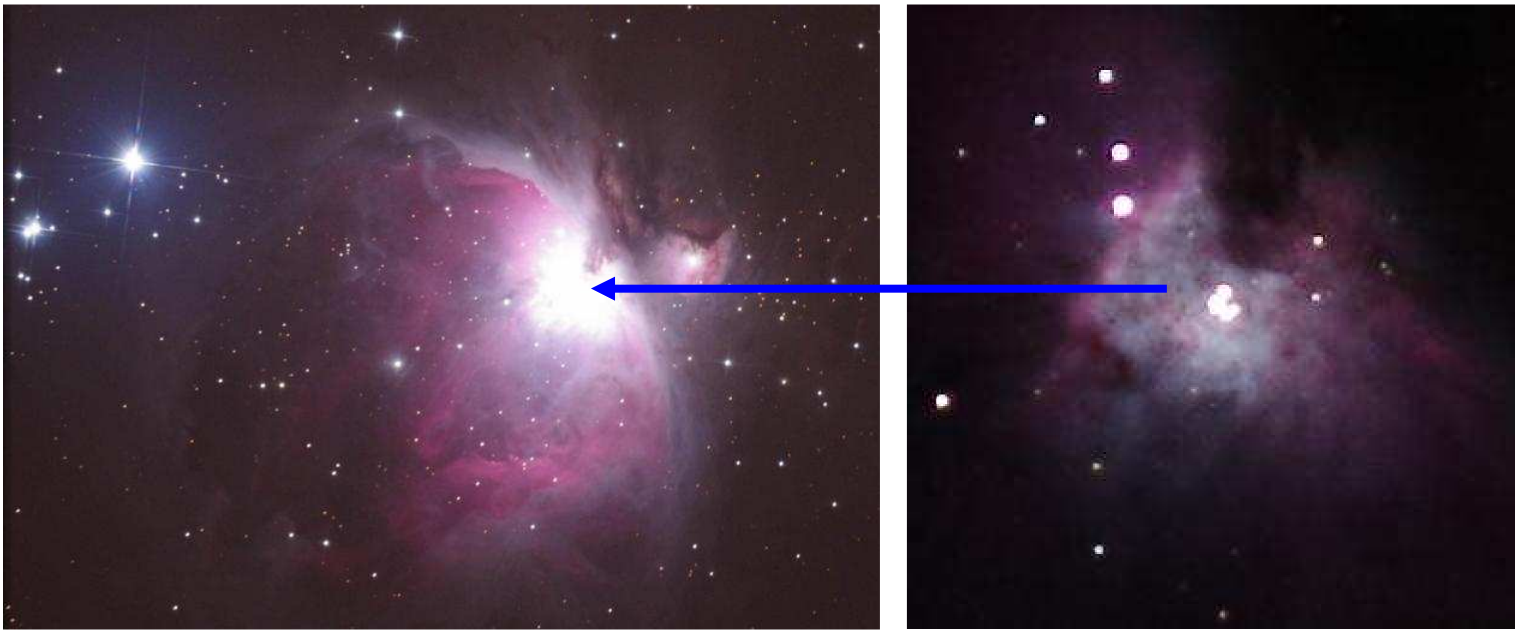
Monthly Events

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

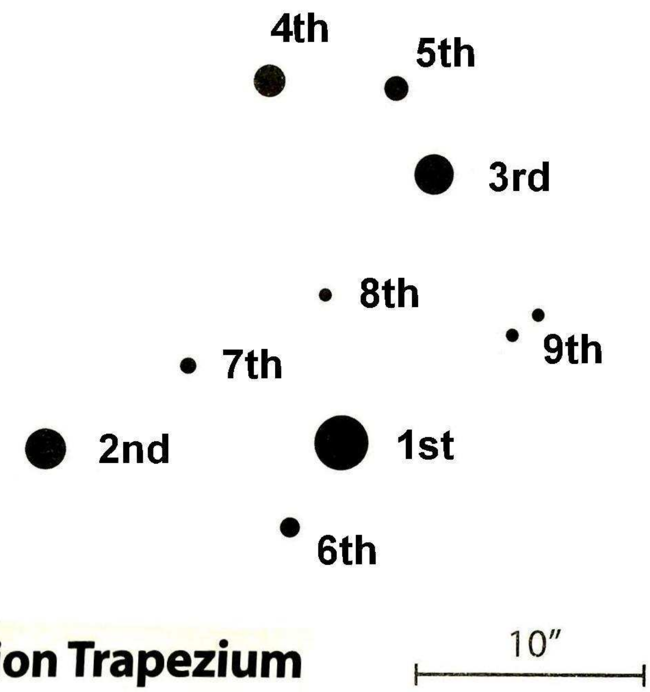
Public night - 8pm to 10pm on the 2nd @ the Briars
Society Meeting - 8pm to 10pm on the 21st @ the Briars
Working bee & Members Night BBQ - 4pm on the 24th @ the Briars
Observatory training - 8pm to 10pm on the 10th or 17th @ the Briars

THE BRIARS SKY

By Greg Walton

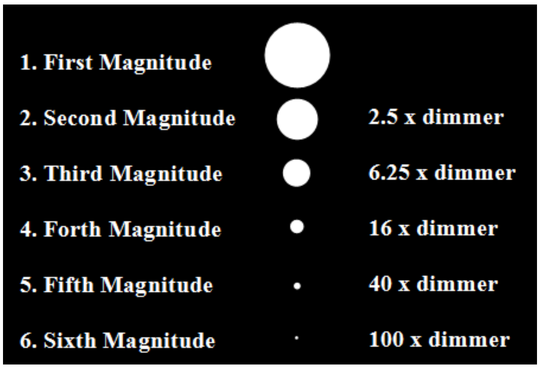


Looking at the Great Orion Nebula (M42) you most likely have seen a small group of 4 stars at its heart. Named the Trapezium because of their shape. These stars are an interesting challenge, to see how many stars you can see other than the 4 brightest stars. The image at right shows the orientation of the stars as seen through a Dobsonian telescope in March at 10pm. The best views are to be had with a smaller telescope such as a 4 to 6 inch, because with larger telescopes the stars tend to be larger and brighter making it hard to see the smaller members of the group. You will need to crank up the magnification to 200 times; this will also give you better contrast or darker background. The other thing you need is a night with good seeing conditions, which usually occurs when the wind is blowing from the south. If all is in your favour first look between the 3rd & 4th stars and with a bit of adjusting on the focuser knob you should see the 5th star. Then we turn our attention to the 1st star -the brightest star of the group at 5.1 magnitude which almost hides the 6th star, particularly if you are using a large telescope then the star becomes too bright and larger. Also the 6th star can look more like a grey blob rather then a pin sharp star. It's considered a good achievement if you see the 6th star. Then you can say I've seen the 6th star in the Trapezium. I must admit I have never seen the 7th and 8th stars or the 9th pair of stars which are only 16th magnitude.



Orion Trapezium

The magnitude scale works in steps of 2.5 times of brightness. The brighter the star the smaller the number. Meaning a second magnitude star would be 2.5 times dimmer than a first magnitude star and a third magnitude star is 2.5 times dimmer than a second magnitude star. For stars brighter than first magnitudes the system uses the same 2.5 times steps into negative numbers. The brightest star in the sky is Sirius at -1.4 magnitude and our Sun is -26.7 magnitude. Also a 5th magnitude star is the dimmest star we can see with the naked eye.



ASTRO NEWS
By Nerida Langcake
Mornington Peninsula Astronomical Society

PERSEVERANCE ROVER LANDING ON MARS

Every 26 months a launch window opens between Earth & Mars, enabling a probe to arrive using minimal fuel. This permits heavier payloads. The specific trajectory is called a Hohmann Transfer. So anybody going to Mars will leave & arrive at about the same time. This explains the current window, in which the UAE, China, & USA all sent probes to Mars within days of each other, and which all arrived within the same week.

NASA's Mars 2020 Perseverance rover launched to the Red Planet on a United Launch Alliance Atlas V rocket on 30 July 2020, and successfully touched down in Jezero Crater on 18 Feb 2021. The rover will explore Mars to search for signs of life, study the planet's geology and much more.

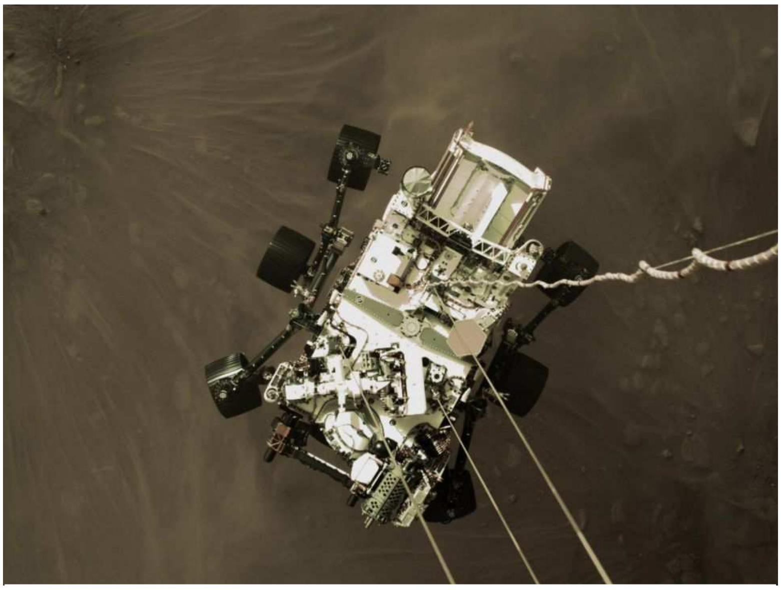
This is the first photo NASA's Perseverance rover beamed back to Earth after it landed on Mars on February 18, 2021. (Image credit: NASA)

The car-sized Perseverance, the most advanced robot ever sent to Mars, touched down, landing gently on an ancient lakebed inside the 45 kilometres wide Jezero Crater. After a series of instrument and hardware checkouts, Perseverance will start doing what it crossed interplanetary space to do: hunt for signs of ancient Mars life, collect and cache rock samples for future return to Earth and demonstrate some shiny new exploration technologies, among other things. The rover is loaded with seven instruments and accompanied by a helicopter named Ingenuity,

The six-wheeled Perseverance is modelled heavily after its predecessor, NASA's Curiosity rover, which touched down inside Mars' huge Gale Crater in August 2012 and is still going strong today. Perseverance is a few inches longer than Curiosity and, with a weight of 1,025 kilograms, nearly 136 kg heavier. Some of their scientific instruments are also quite different. But the two rovers share the same basic body plan and the same type of nuclear power source, and they used the same strategy to land safely on the Red Planet.

Perseverance hit the Martian atmosphere at about 19,500 kph and deployed a 20.5 metre wide parachute a few minutes later, while still traveling faster than the speed of sound. But Mars' air is just 1% as thick as that of Earth, so a chute couldn't slow the rover down enough for a safe landing. Mars 2020 therefore employed a rocket-powered sky crane, which lowered the Mars car to the red dirt on cables, then flew off to crash-land intentionally a safe distance away.

The first helicopter ever sent to another world is doing just fine on Mars after surviving a "seven minutes of terror" landing aboard NASA's Perseverance. Ingenuity is getting its power from Perseverance from the time being, but once the rover lets go of the helicopter, the drone will be charging fully on its own, using solar panels.



This high-resolution still image is part of a video taken by several cameras as NASA's Perseverance rover touched down on Mars. A camera aboard the descent stage captured this shot. (Image credit: NASA/JPL-Caltech)

After Perseverance deploys Ingenuity to the surface, the helicopter will then have a 30-Martian-day [31-Earth-day] experimental flight test window. A Martian day or "sol" is 24 hours and 37 minutes, compared to Earth's 24 hours, and controllers are operating on Mars time for the first 90 sols of the mission.

If Ingenuity survives its first bone-chilling Martian nights - where temperatures dip as low as minus 90 degrees Celsius – the JPL team will proceed with the first flight of an aircraft on another world. If Ingenuity succeeds in taking off and hovering during its first flight, over 90 percent of the project's goals will have been achieved. If the rotorcraft lands successfully and remains operable, up to four more flights could be attempted, each one building on the success of the last.
Ingenuity's flights could pioneer a new generation of soaring Mars explorers working either independently, or alongside far-future human landing missions. Flying drones on Mars could scout ahead of rovers to plan the best routes, or hover above dangerous terrain to perform scientific studies, among other applications.

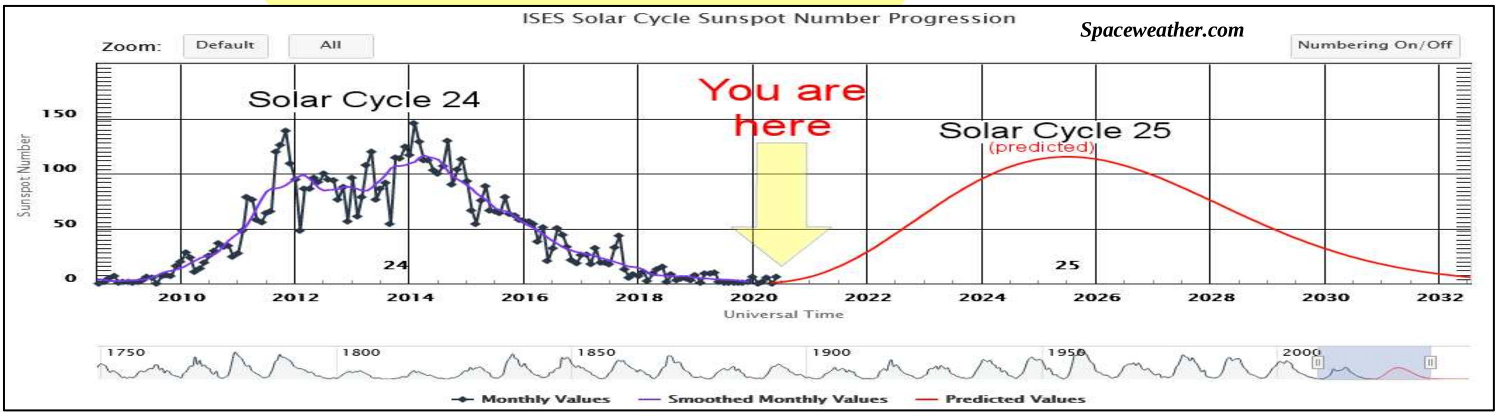
Our Sun. *By Greg Walton*

Sun *Earth*

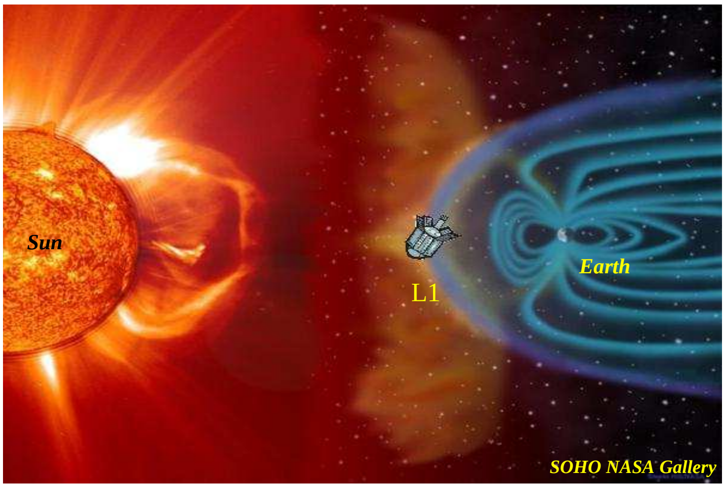
Our sun is an ordinary star and the most important thing we wish to know is it will make our lives comfortable for the next billion years and will continue to shine for the next 5 billion years. By then it will be a red giant and have a diameter the same size of the Earth's orbit.

The Sun is 149,597,871 kilometres from Earth (1 astronomical unit, AU). It is 1.4 million kilometres in diameter, 109 times the diameter of the Earth and 1.3 million Earths would fit inside the Sun, see scale in background. The Sun spins at the rate of once every 29 days. Right - Images of the sun taken over a 6 days period. You can see how the Sun turns by looking at the position of the sunspots. The sun is moving around our Milky Way galaxy at 170 kilometres per second, taking 240 million years to travel once around our galaxy.

The Sun's energy output is very constant and its visible surface is 5,800 degrees but the sunspots are one thousand degrees cooler. The Sun has a solar cycle of 11 years, however it's not always regular and can change without warning or disappear altogether. During solar minimum the Sun's magnetic poles reverse their polarity, meaning the south pole becomes positive rather than negative. To add to the mystery the Sun's poles can both become positive for a few weeks. During solar maximum the number of sunspots increase because the polar regions spin at a slightly slower speed. This twists and stretches the magnetic field lines, therefore tearing holes in the Sun's surface which we see as sunspots and sometimes cause a coronal mass ejection CME sending a flood of charged particles across the Solar System.



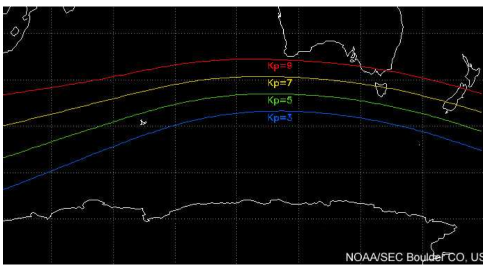
These charged particles are sometimes in the direction towards Earth and take about 3 days to reach the Earth. The magnetic fields around the Earth protect us from the worst of it, but a small amount gets drawn into the Earth's polar regions causing an aurora. See image I took during the last solar maximum in 2012 below right. There is a point between the Sun and the Earth where their gravity equalise and cancel each other out, called Lagrange point L1, where the Solar and Heliosphereic Observatory (SOHO) is parked. SOHO was launched in 1995 and is still operating today. This satellite is able to give us a warning of solar activity, as radio signals travelling at the speed of light arrive at Earth hours before the solar wind. You can see the solar wind during a solar eclipse, see image I took on page 12.



SOHO NASA Gallery


Aurora at Elephant Rock Flinders 10mm Sigma Pentax Kx 30sec iso3200 By Greg Walton 21jan12

To see an aurora from the Mornington Peninsula, the KP level needs to be 6 or more. Best places to view are on the ocean beach looking south away from lights. With the naked eye you won't see much colour, but a camera can capture the colours. *See image above right.*



There are some good websites for predicting when an aurora can happen.
Aurora forecast - http://www.aurora-service.net/aurora-forecast/
Space weather - https://www.spaceweather.com/
Space weather live - https://play.google.com/store/apps/details?id=com.spaceweatherlive.app

The Sun and the Earth.

1 AU (distance to the Sun 149,597,871km) x 2 x Pi (3.141) = **940,000,000** km, the distance the Earth travels around the Sun in one year. To complete this journey around the sun in one year, the Earth travels on average at 29.78 kilometres every second. It’s also amazing to think that each year the Earth speeds up and slows down as we travel around the sun. This happens because the Earth’s orbit is not circular, from January to July the Earth slows down by as much as 3% or 60kph, then from July to January the Earth speeds up again by 3% or 60kph. The Earth is moving 60 kilometres per hour faster in January than in July.

Earth’s average orbital speed is 29.78 km/s that’s 107,208 km per hour.

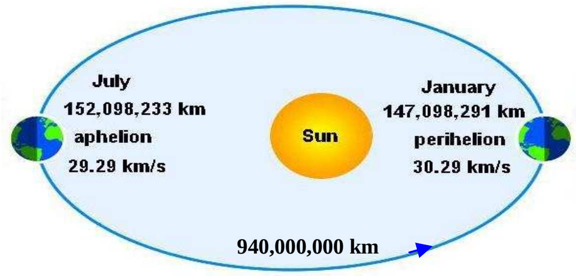
Earth’s speed at aphelion is 29.29 km/second

Earth’s speed at perihelion is 30.29 km/second

Earth’s average distance from Sun - 149,598,262 km (1.0 AU)

Earth’s distance from Sun at Perihelion in January - 147,098,291 km

Earth’s distance from Sun at Aphelion in July - 152,098,233 km



As Earth moves around the Sun, towards January we move faster and faster. Then towards July we slow down. A bit like throwing a ball up in the air, it slows down, stops, then returns to earth. The average temperature of the whole Earth during perihelion, when we are closer to the sun, is actually 2.3 degrees cooler than at aphelion. This is because we are moving faster and spend less time close to the Sun. Also the southern hemisphere is mostly ocean, which heats up less compared with the NH’s land mass during aphelion.
This is not the seasonal effect of the Earth tilt, comparing the temperature of one hemisphere with the other’s at the same time.

How much energy does the Sun produce?

In 1833 William Herschel placed a metal tin with one litre of water in the Sun and timed how long it took to raise its temperature by one degree. He calculated the area of the Earth’s orbital sphere and worked out how many metal tins were in this area, then multiplied it to find the energy needed to raise all the tins of water one degree. He was able to calculate the total energy output of the Sun with surprising accuracy. This experiment is often reproduced by students at secondary school.

Formula for the surface area of a sphere.   4 x pi x Radius ^{2}

4 x 3.141 x 1AU ^{2} = 12.564 x 2.2379e+16 = 2.8117e+17 square kilometres x 1,000,000 = 2.8117e+23 square metres

2.8117e+23 square metres x 1,360 watts per square metre = 3.8240e+26 watts or **382,400,000,000,000,000,000,000,000 watts**

Scientists calculated that if the Sun was made of coal, it would have burned all the coal in about one thousand years.
But the scientists knew the Sun was much older, so something else must be powering the Sun.

We now know the Sun produces its energy by converting hydrogen into helium in its core under the pressure of gravity. In this fusion process a small amount of mass releases a large amount of electromagnetic energy -photons of. light incl. ultra-violet, infra-red, x-rays and gamma-rays. This energy takes some 150,000 years to reach the surface of the Sun because it bounces back and forth between the atoms in the core. Once it reaches the surface it takes only 8 minutes to reach the Earth. If we could take a piece the size of a grain of sand from the core of the sun, which is at 27 million degrees and then instantly bring it to earth, it would set everything alight for a 25 kilometre radius.

The sun loses mass at the rate of 4 million tons every second. Even losing mass at this rate for 5 billion years would see the Sun lose only 10 percent of its mass. Light from the Sun radiates out in all directions. One square metre on Earth receives 1,360 watts above the Earths atmosphere, but on the Earth’s surface it’s about 1,000 watts of light energy from the Sun on a cloud-free day if the Sun was directly overhead. That’s about 1,000,000,000 watts per square kilometre. Enough to power 20 million light globes. We can collect this energy with solar panels, but the problem is that the best solar panels are only 20 percent efficient, equal to 4 million light globes.

Our Sun is a second generation star.

Looking at the spectra of the sun it was found that there are heavy elements such as iron and gold within the Sun, but our Sun isn't large enough to be able to produce iron. This iron was produced in a much larger star, up to 100 times bigger. This larger star would have burnt through its hydrogen in just a few million years producing all the elements that we find on Earth. So our Sun must be a second generation star, born out of the dust left over from a larger first generation star, once it had blown itself apart in a supernova explosion.

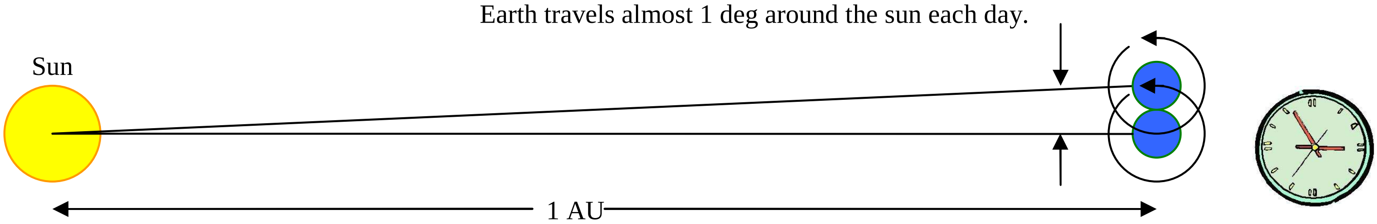
Our Sun would not have been born on its own, it would have been one in a cluster of stars. Our Sun must have been kicked out of its home cluster by a larger sister star. By looking at the spectra of the nearest star clusters, it’s been determined that no clusters match the Sun’s spectrum, though 2 stars with a simular spectrum have been found at about 250 light years. It’s now thought the Sun’s home cluster must have totally broken apart. The Gaia spacecraft launched in 2013 is mapping 1.7 billions stars in the Milky Way and it’s our best hope at finding our Sun’s sister stars. The data from the Gaia spacecraft will take decades to process and is only now starting to be released.
See links.

Gaia mission profile https://youtu.be/oGri4YNggoc
Gaia 2020 update https://www.esa.int/ESA_Multimedia/Videos/2020/12/Exploring_Gaia_s_2020_data_release

Solar time.

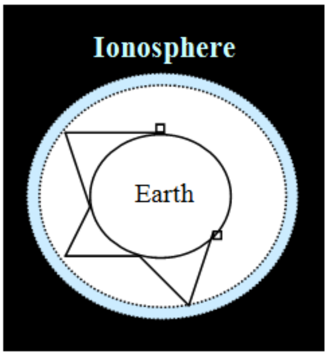
Today our lives are governed by an electronic device call a clock. It tells us we must be at a certain place at a certain time and we are judged if we are late. In the past these clocks were corrected each day as the Sun passes directly overhead at 12 noon. All clocks have been set from Greenwich England since 1884 (GMT) Greenwich Mean Time. Clocks are locked to the movement of the Sun, not the movement of the Earth. Most people think the Earth turns once every 24 hours, but as astronomers we know differently, the Earth turns once every 23 hours, 56 minutes and 4.1 seconds, we call this sidereal time and it's the time we adjust our telescope equatorial mounts to turn at, so the stars can stay put in the eyepiece. Sidereal time is 4 minutes less than 24 hours, because the Earth moves 1 degree around the sun each day. So our 24 hours clock needs to add an extra 4 minutes of time till the Sun is directly overhead at 12 noon every day. Another way of looking at this is the Earth turns 361 degrees in 24 hours.

Earth travels almost 1 deg around the sun each day.



The Earth turns 361 degrees in 24 hours.

The ionosphere is produced by the Sun.



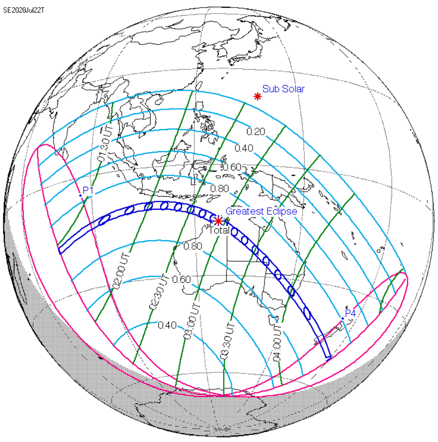
In 1901 Marconi succeeded in sending radio waves 3,000 kilometres from America to England, but how could this have happened, as the radio waves would not have travelled a straight line and some how they bent around the curvature of the earth. In 1902 British mathematician Heaviside and American Kennelly independently worked out that the radio waves must have been reflected off an electrically changed layer in the upper atmosphere. Known as the Heaviside layer and it's 100km above the earth.

We now know when ultra violet light from the Sun hits the Earth's upper atmosphere, it splits electron from helium atoms creating ions. These are atoms that have a positive charge and these atoms create an electrically charged layer, which reflects radio waves back to earth. This is called the ionosphere and is why radio signals can be sent half way around the Earth. The radio waves bounce back and forth between the ionosphere and the earth. This was tested in 1924 by scientist Dr Appleton when he transmitted a radio signal with a reducing wavelength from Bournemouth to a receiver at Oxford university. The signal travelled in a straight line between the cities, but also travelled the longer distance up to the ionosphere and back down to Oxford. What happened, as the wavelength got shorter, they cancelled each other out, which was recorded as a fluctuation on a signal strength meter at Oxford. This proved for the first time that the ionosphere was real and now known as the Appleton Layer which is 200km above the earth at night and jumps to 300km during the day.

Sydney total solar eclipse 22nd July 2028

https://en.m.wikipedia.org/wiki/Solar_eclipse_of_July_22,_2028#/media/File%3ASE2028Jul22T.gif

The central line of the path of the eclipse will cross the Australian continent from the Kimberley region in the north west and continue in a south-easterly direction through Western Australia, the Northern Territory, south-west Queensland and New South Wales, close to the towns of Wyndham, Kununurra, Tennant Creek, Birdsville, Bourke and Dubbo, and continuing on through the centre of Sydney, where the eclipse will have a duration of over three minutes.
Map & text from - Wikipedia



The Moon is 400 times smaller than the Sun, but it's 400 times closer to Earth. So they appear the same size in the sky from Earth. Imaging a total solar eclipse needs planning and having the right equipment. We have 7 years to practice till the next total eclipse crosses Australia. I always try to automate my equipment so I can just sit back and watch this spectacle as no camera can capture the views, the sounds or the great feeling you get at these event.

Viewing the Sun is not for the beginner.

You need to know exactly what you are doing and if you get it wrong you can lose your eyesight. **Never leave a solar telescope unattended.**

Projection method. This is one of the safest ways to view the sun, as you don't look directly at the sun. Light passes through the telescope and eyepiece, then is focused on a white surface or a piece of paper, which makes it easy to draw sunspots and faculae which are bright white patches seen during solar maximum. However this method does have its problems. The concentrated Sun's rays can melt or burn internal baffles, plastic focusers, plastic diagonals and plastic eyepiece. Don't use expensive eyepieces as it will get hot and destroy optical coatings, also expensive eyepieces have upwards of 8 internal lens which could heat up,

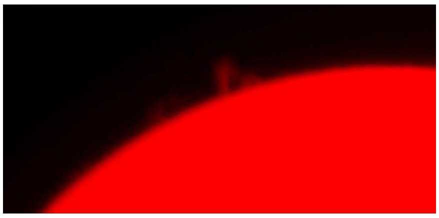
expand and shatter. Best to use the cheapest glass eyepiece you can find, also you need to keep the Sun's rays concentrated on the eyepiece, because if you were to leave the telescope unattended the Sun's rays will drift and start to burn plastic, paint or cardboard baffling. I have seen smoke coming out of unattended telescopes. Also you need to keep the dust cover on the front of the finder scope or remove it altogether, not just for safety's sake, but because any cross hairs in the finder scope will be destroyed. You can easily align the telescope on the Sun by looking at the shadow cast by the front diameter of the telescope on the mounting rings. There are some budget sun finders on the market. I find 50 times magnification works best as it shows the whole Sun and a telescope with a 50 to 80mm aperture works fine. Some older telescopes came with a solar projection screen, see above.

Glass solar filter. This type of filters covers the front primary lens or mirror of the telescope. These filters have a thin aluminium coating on one side of a flat glass plate which is mounted in an aluminium housing. These filters only allow 1/100,000 of one percentage of the Sun's rays to pass through the telescope to the eyepiece. These filter have a moderate risk as the thin aluminium coating can corrode over time allowing too much of the suns ray to the eyepiece and can damage your eyes. When not in use, these filters must be stored in an airtight container. Every time you use this filter you must hold it up to a bright light and check for any pin holes. If you see any holes, you must dispose of the filter. Make sure the filter is properly secured to the front of the telescope. If it were to fall off, your eyes will be damaged. Remember to keep the dust cover on the front of the finder scope.

Plastic solar filter. Made of Mylar film they are very similar to the glass filter but show a more yellow in colour view of the Sun, also this type of filter is about half the price. Again this type of filter covers the front primary lens or mirror. The main concern with this filter is its very light in weight and can be blown off the front of the telescope, so make sure it's a good tight fit. This type of filter is less susceptible to corrosion, but can be easily damaged, also try not to touch it with your fingers as it's not easy to clean. Again, before use hold the filter up to the light and check for any holes. I have seen these filters patched with black sticky tape, but best replaced with a new filter. Remember to keep the dust cover on the front of the finder scope - or remove it. The more experienced buy just the Mylar film and make their own filter.

Herschel wedge. This filter looks a bit like a diagonal which attaches to the draw tube of a refractor telescope. With this system there is no filter over the primary front lens of the telescope. Like the projection method it sends all the Sun's rays through the telescope, which then strikes the glass wedge. Most of the Sun's rays goes straight through the Herschel wedge while reflecting only a small amount of light in the eyepiece mounted at 90 degrees. Again remember the concentrated Sun's rays can melt or burn internal baffles and plastic focusers, so you need to keep the Sun's rays concentrated on the Herschel wedge. Remember to keep the dust cover on the front of the finder scope.

Colorado PST. A very expensive telescope predominantly built for viewing the Sun and nothing else. This type of telescopes is used to view prominences on the surface and around the edge of the Sun's disc. It has a metal coating over the front primary lens which only allows a very small percentage of the suns rays to pass through the filter. The Sun's rays then pass through 2 adjustable etalon plates which only allow the hydrogen alpha wavelength of light to the eyepiece. You adjust the etalon plates by turning the tuning ring and adjust the focus with a small knob at the back of the telescope. It has a built-in sun finder which you view in a window on the top. These telescopes have a starting price of $1,000 for a 40mm model up to $20,000 for the largest models. Designed to be the safest instrument for viewing the Sun, but you will still need to inspect this telescope every time you use it, as the coating on the front primary lens can degrade over time. Best to buy this telescope just before solar maximum as it will give the most interesting views. It's not easy to image the sun with the PST. I had to modify a Barlow lens so the light could reach my DSLR camera. It's very hard to see the screen on the camera in the bright sunshine. I found I had to hide under a large beach towel or connect a cable from the camera to a computer inside away from bright lights.



Sun gun. This very safe to use homemade device has been popular for those who are on a tight budget. It's made by using a budget 50 to 60mm refractor, a large plastic garden pot and a sheet of tracing paper. Mounted on a tall tripod, many people can safely view the sun at once and is very good for public events such as solar eclipse. Remember to keep the dust cover on the front of the finder scope. Sun-gun - https://www.sunguntelescope.com/EXP.html

Solar eclipse glasses need to be purchased from a reputable supplier. Made from cardboard and Mylar plastic film they usually have a limited life and usually cost around 5 dollars. Again you need to hold then up to a bright light to check for pin holes or any other damage before use.

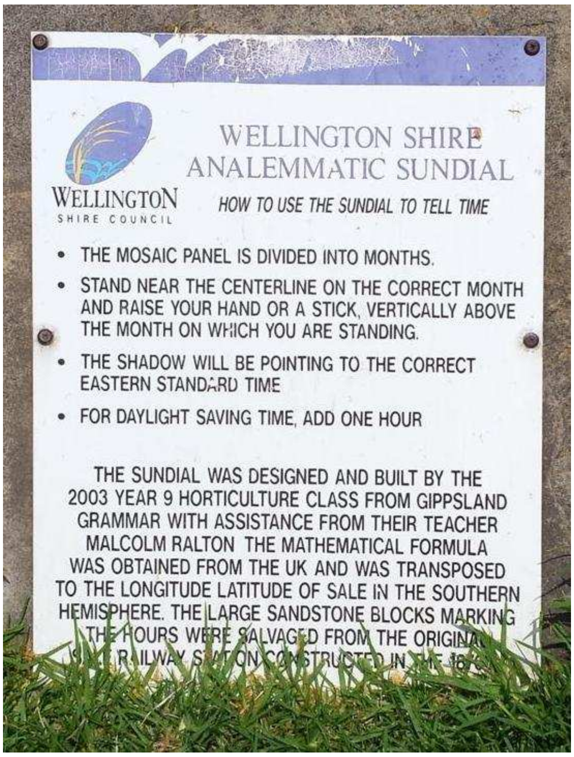
A solar filter for your finder scope or a sun finder are relatively inexpensive and make the job of keeping the sun in the eyepiece a lot easier.

Darkened glass eyepiece filters should not be used. Darkened glass filters which thread into the back of an eyepiece need to be able to withstand the concentrated heat of the sun for prolonged periods. If the filter was to shatter while you were looking through the telescope, the sun's rays could instantly damage your eye. Very few of these filters have survived and are no longer manufactured, as they are dangerous to use. Many articles on these filters advise that you should smash and bin them, before it does any damage to someone's eyes.

Warning using a welding shield to view the Sun is dangerous, as the glass in most shields is not dark enough for this purpose.

Interesting sundial near the lake in Sale Victoria.

This sundial doesn't have a gnomon.
You become the gnomon by standing on the correct month.



MEMBERS GALLERY

Cover image - NGC1360 | Planetary Nebula | Robin's Egg |LRGB-Ha-OIII *By Steve Mohr*

From an APOD text summary: This pretty cosmic cloud lies some 1,500 light-years away, nested securely within the boundaries of the southern constellation Fornax. Recognized as a planetary nebula, it spans about 3 light-years with its shape and colour being reminiscent of a blue robin's egg. NGC 1360 doesn't represent a beginning though. Instead it corresponds to a brief and final phase in the evolution of an aging star. In fact, visible in this image is the central star of NGC 1360,known to be a binary star system likely consisting of two evolved white dwarf stars, less massive but much hotter than the Sun. Their intense and otherwise invisible ultraviolet radiation has stripped away electrons from the atoms in the surrounding gaseous shroud. The predominant blue-green hue of NGC 1360 seen here is the strong emission produced as electrons recombine with doubly ionized oxygen atoms.

Information about the image: Center (RA, Dec): (53.306, -25.872) Center (RA, hms): 03h 33m 13.458s Center (Dec, dms): -25° 52' 19.140" Size: 43.4 x 28.5 arcmin Radius: 0.433 deg Pixel scale: 0.732 arcsec/pixel Orientation: Up is 307 degrees E of N

Instrument: Planewave CDK 12.5 | Focal Ratio: F8 Camera: STXL-11000 + AOX | Mount: AP900GTO
Camera Sensitivity: Lum, Red, Green, Blue, Ha, OIII: BIN 1x1
Exposure Details: Total: 62.33 hours | Lum: 36 x 900 sec [hr], Ha: 59 x 1200 sec [hr], OIII: 65 x1200 [hr], RGB 16 x 900sec each [hrs]
Viewing Location: Central Victoria, Australia. Observatory: ScopeDome 3m Date: July-December 2020
Software Enhancements: CCDStack2, CCDBand-Aid, PS, Pixinsight

NGC 246 - Hello MPAS Members, Just like to share with you an image of the Skull Nebula that I've just finished processing. I really enjoyed doing this one; having a ton of average data with a smaller volume of great data made processing this tricky and rewarding.

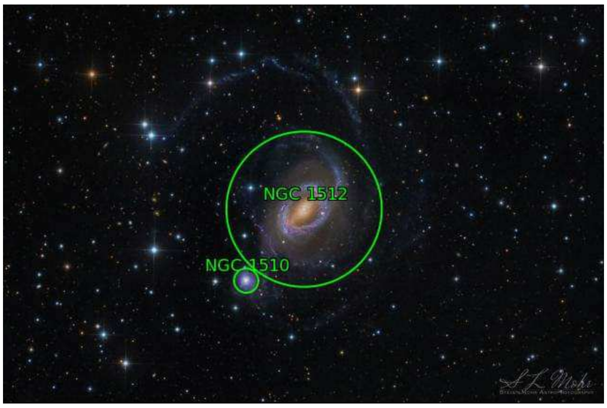
Instrument: Planewave CDK 12.5 | Focal Ratio: F8 Camera: STXL-11000 + AOX | Mount: AP900GTO Camera Sensitivity: Lum, OIII & Ha: BIN 1x1, RGB: BIN 2x2 Exposure Details: Total: 61.0 hours | Lum: 64 x 1200 sec [21.33hr], OIII: 37 x 1200 sec [12.33hr], Ha: 64 x 1200 sec [21.33hr], RGB 16 x 450sec each [6.0hrs] Viewing Location: Central Victoria, Australia. Observatory: ScopeDome 3m Date: June-November 2020 Software Enhancements: CCDStack2, CCDBand-Aid, PS, Pixinsight *By Steve Mohr*

NGC1512 & NGC1510 | Galaxy | LHaRGB *By Steve Mohr*

From the Wiki… NGC 1512 is a barred spiral galaxy approximately 38 million light-years away from Earth in the constellation Horologium. The galaxy displays a double ring structure, with one ring around the galactic nucleus and another further out in the main disk. To the lower left of NGC1512, is NGC1510, a dwarf lenticular galaxy that is gravitational tied to NGC1512.

Very strange was that the colour data suggested the outer halo of NGC1512 is a faint golden colour. This did not seem to be an artefact of processing as it was present immediately following colour calibration – so I left it that way for my take on this image. □

This image represents 44% of the cameras full frame, composed of luminance, red, green, blue, and hydrogen alpha filtered colour channels. Thanks for having a look.



Information about the image:
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Center (RA, hms): 04h 03m 55.913s
Center (Dec, dms): -43° 20' 58.319" Size: 32.6 x 21.6 arcmin
Radius: 0.326 deg Pixel scale: 0.732 arcsec/pixel
Orientation: Up is 269 degrees E of N

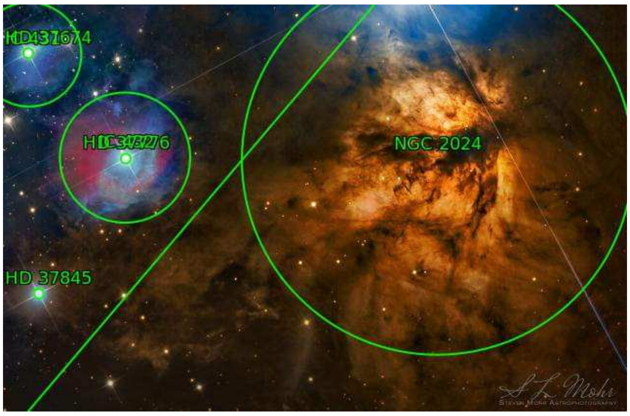
Instrument: Planewave CDK 12.5 | Focal Ratio: F8
Camera: STXL-11000 + AOX | Mount: AP900GTO
Camera Sensitivity: Lum, Ha: BIN 1x1, RGB: BIN 2x2
Exposure Details: Total: 23.75 hours | Lum: 35 x 1200 sec [11.67hr], Ha: 16 x 1200 sec [5.33hr], RGB 18 x 450sec each [6.75hrs]
Viewing Location: Central Victoria, Australia.
Observatory: ScopeDome 3m
Date: November-December 2020
Software Enhancements: CCDStack2, CCDBand-Aid, PS, Pixinsight

NGC2024 | Flame Nebula | LHaRGB - Just out of this field of view, to the top of this image, is the super bright star Alnitak. It lets us know it is there by strafing across the image intense diffraction spikes from where it resides. *By Steve Mohr*

From the Wiki…The Flame Nebula, designated as NGC 2024 and Sh2-277, is an emission nebula in the constellation Orion. It is about 900 to 1,500 light-years away.

The bright star Alnitak (just outside the field of view at the top of this image), the easternmost star in the Belt of Orion, shines energetic ultraviolet light into the Flame and this knocks electrons away from the great clouds of hydrogen gas that reside there. Much of the glow results when the electrons and ionized hydrogen recombine. Additional dark gas and dust lies in front of the bright part of the nebula and this is what causes the dark network that appears in the centre of the glowing gas. The Flame Nebula is part of the Orion Molecular Cloud Complex, a star-forming region that includes the famous Horsehead Nebula.

At the centre of the Flame Nebula is a cluster of newly formed stars, 86% of which have circumstellar disks. X-ray observations by the Chandra X-ray Observatory show several hundred young stars, out of an estimated population of 800 stars. X-ray and infrared images indicate that the youngest stars are concentrated near the centre of the cluster.



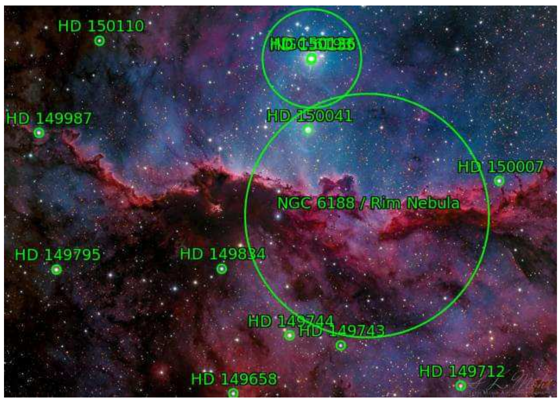
Information about the image:

Center (RA, Dec): (85.407, -1.689)
Center (RA, hms): 05h 41m 37.563s
Center (Dec, dms): -01° 41' 21.605"
Size: 47.9 x 31.3 arcmin
Pixel scale: 0.732 arcsec/pixel
Orientation: Up is 119 degrees E of N

Instrument: Planewave CDK 12.5 | Focal Ratio: F8
Camera: STXL-11000 + AOX | Mount: AP900GTO
Camera Sensitivity: Lum, Ha: BIN 1x1, RGB: BIN 2x2
Exposure Details: Total: 23.0 hours | Lum: 48 x 900 sec [12.0hr], Ha: 16 x 1200 sec [5.0hr], RGB 16 x 450sec each [6.0hrs]
Viewing Location: Central Victoria, Australia. Observatory: ScopeDome 3m. Date: November-December 2020
Software Enhancements: CCDStack2, CCDBand-Aid, PS, Pixinsight

NGC6188 & NGC6193 | Nebula & Open Star Cluster | Fighting Dragons of Ara | LRGB Ha OIII SII *By Steve Mohr*

From the Wiki… NGC 6188 is an emission nebula located about 4,000 light years away in the constellation Ara. The bright open cluster NGC 6193, visible to the naked eye, is responsible for a region of reflection nebulosity within NGC 6188. This region of space is a star forming nebula, and is sculpted by the massive, young stars that have recently formed there – some are only a few million years old. This spark of formation was probably caused when the last batch of stars went supernova. This image has been created upon the base filters of Ha, OIII, and SII [these are narrowband filters that target specific wave lengths of light], with star colour enhanced from the combination of red, green, and blue filters [normal broadband visible colour – that is Steve colour enhanced □]. The Ha and OIII filters provide the base scene colour, with these filters mapped Ha to the Red channel, and OIII mapped to the Green and Blue channels. As this image is based on narrowband palette, we are allowed some creativity in how to represent the displayed colour palette. This colour palette was achieved through the manipulation of the individual strengths of each filter when applied to the colour channel it was assigned to, and then later overall modified via the LAB colour space to achieve these colour tones displayed here.



"Fighting Dragons of Ara"… Many moons ago, Mike Sidonio was processing his image data on this region, when the Supreme Commander of their household, Ange his wife, came to view his progress. Ange asked him to rotate the orientation of the image a few times, and she said "that looks like two dragons fighting, fighting over that magical egg down in the corner", to which Mike agreed! That year he submitted the image to the Astronomy Photographer of the Year 2011, Greenwich, under the title "Fighting Dragons of Ara", where he received a Highly Commended award! What an awesome story.

Information about the image:
Center (RA, Dec): (250.032, -48.782) Center (RA, hms): 16h 40m 07.626s
Center (Dec, dms): -48° 46' 55.438" Size: 45.4 x 32.2 arcmin
Radius: 0.463 deg Pixel scale: 0.733 arcsec/pixel
Orientation: Up is 263 degrees E of N

Instrument: Planewave CDK 12.5 | Focal Ratio: F8
Camera: STXL-11000 + AOX | Mount: AP900GTO Camera Sensitivity: Lum, OIII, SII & Ha: BIN 1x1, RGB: BIN 2x2
Exposure Details: Total: 57 hours | Lum: 53 x 900 sec [13.25hr], OIII: 46 x 1200 sec [15.33hr], SII: 25 x 1200 sec [8.33hr], Ha: 38 x 1200 sec [12.66hr], RGB 20 x 450sec each [7.5hrs] Viewing Location: Central Victoria, Australia. Observatory: ScopeDome 3m
Date: June-July 2020 Software Enhancements: CCDStack2, CCDBand-Aid, PS, Pixinsight

Above - M42 Orion nebula, *By Nik Axaris*

Right - M42

Image taken last night total of 1.5 hours combined 120 second and 15 second shots to protect the core. Skywatcher ed72 with .85 reducer LPro filter asi 294mc pro

By Nik Axaris

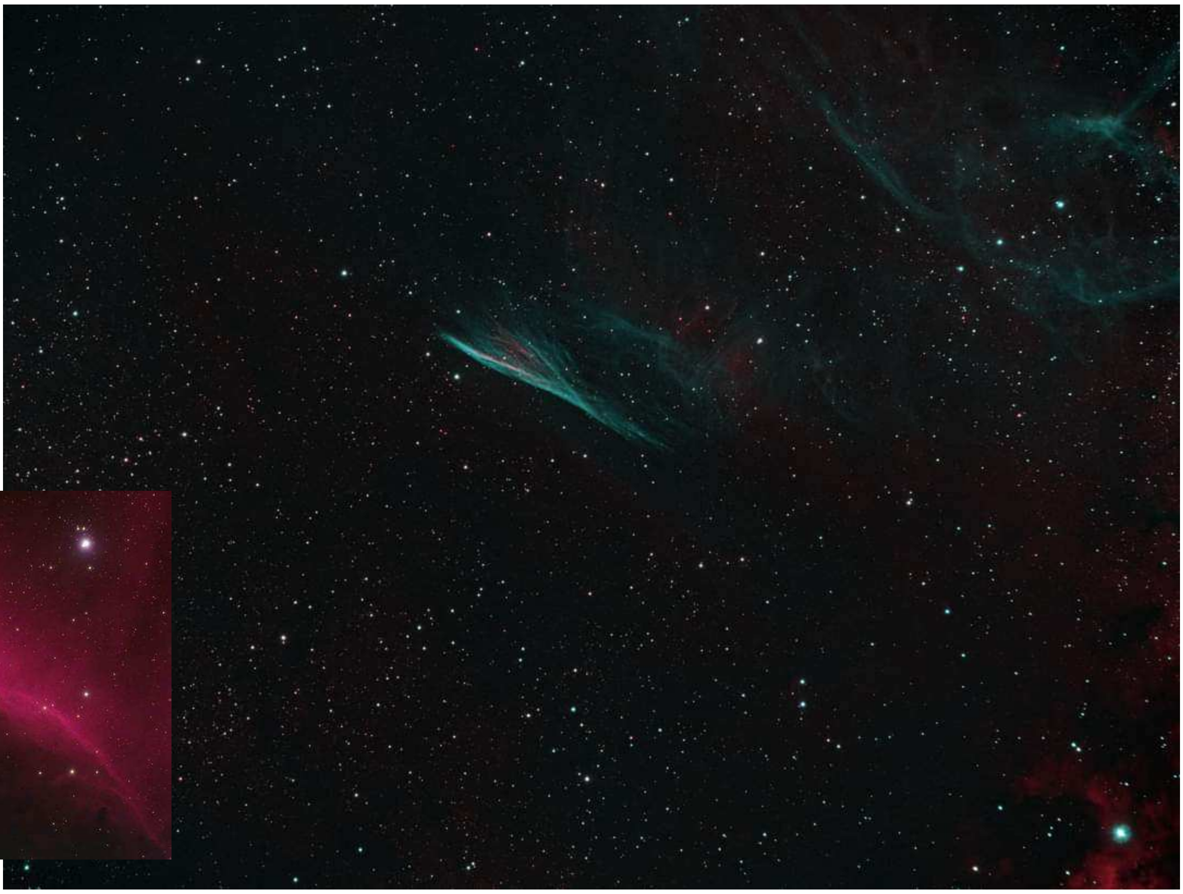
Above - A rose by any name Rosette Nebula. I love the angle of this image. It actually resembles a rose. Taken 8th January about 2am when it cleared our trees. Optolong L-Extreme Asi 294mcPro Skywatcher Ed 72 with the .85 reducer Bi Colour process Ha and O3.
By Nik Axaris

Right - Pencil Nebula/NGC 2736, bicolour mapped to HOO - only 40 mins each in Ha and O3.

By Russell Smith

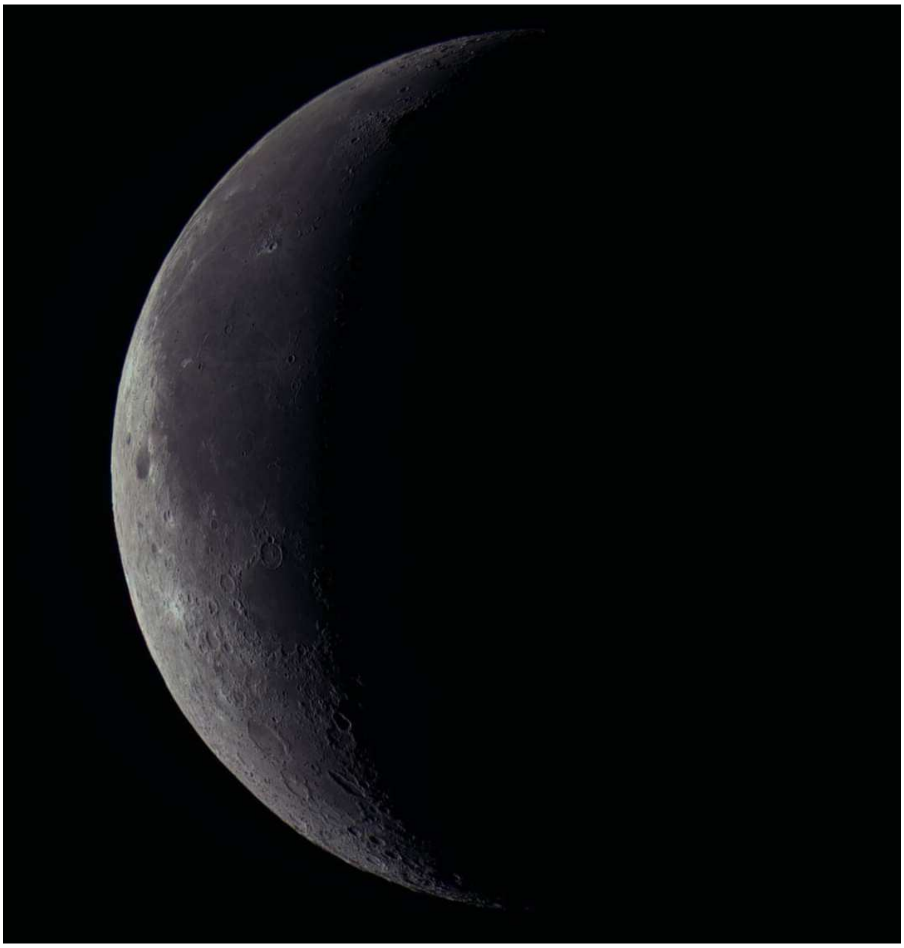
Below - Horsehead and Flame nebulae in Orion.

By Russell Smith



Right - Southern Cross *by Nerida Langcake*

Below - Moon *By Russell Smith*

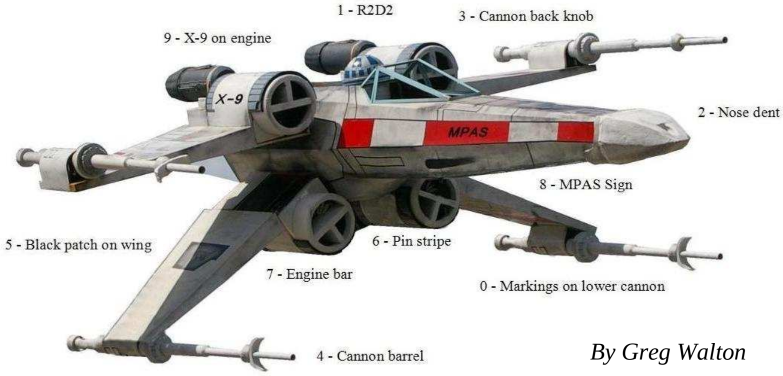


Right - The Horsehead Nebula (also known as Barnard 33) is a small dark nebula in the constellation Orion. Taken with a William Optics 110FT, a ASI071MC and a G11 mount. From Heathcote during the last new moon, I had a lot of trouble getting an acceptable result; but I persisted, and just ended up cropping out the bad bits to leave the chess piece! Total 37 x 3m subs with processing in Startools and PS.

By Dominic Lucarelli

Spot 10 differences.

M1 - Crab Nebula - This Nebula is a supernova remnant that corresponds to a star that exploded at the end of its life in year 1054. The nebula is about 6,500 light-years from Earth. Taken From Heathcote during the last new moon (William Optics 110FT, a ASI071MC and a G11 mount - 40 x 3m subs - cropped). *By Dominic Lucarelli*



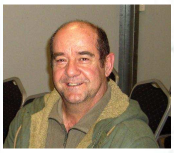
By Greg Walton

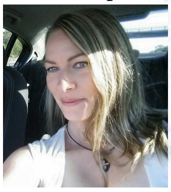
Spot the difference

1 - R2D2
2 - Nose dent
3 - Cannon back knob
4 - Cannon barrel
5 - Black patch on wing
6 - Pin stripe
7 - Engine bar
8 - MPAS Sign
9 - X-9 on engine
0 - Markings on lower cannon

SOCIETY INFORMATION


Peter Skilton


Mark Stephens

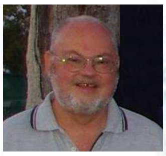

Nerida Langcake


Jamie Pole

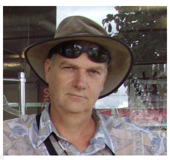

Anders Hamilton


Trevor Hand


Simon Hamm


Peter Lowe


Dave Rolfe


Greg Walton

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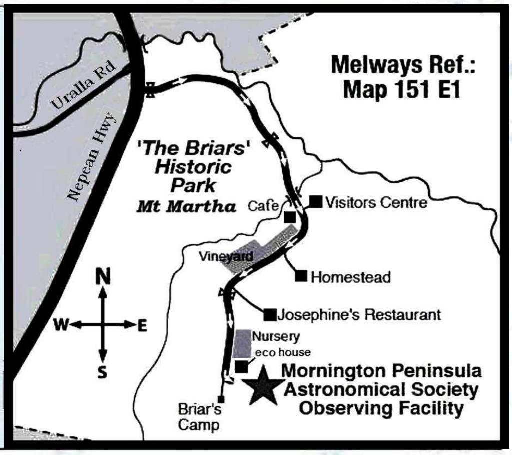
SOCIETY MEETINGS

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



LIBRARY


Guido Tack


Fred Crump

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

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.

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:
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Members please write a story about your astronomy experiences and add some pictures.
Send them to the editor: Greg Walton gwmpas@gmail.com
MPAS newsletters online - https://drive.google.com/folderview?id=0ByvkxzZGI9g_SUNmZVhkZTFGWTA

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