

Cover image - Our Sun taken on the 23rd February 2022

By Russell Smith

See more images from page 16



SCORPIUS

THE JOURNAL OF THE
MORNINGSIDE PENINSULA ASTRONOMICAL SOCIETY INC.

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

Vol. XXVII, No. 3 (May / June) 2022

The Morningside 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/>

Morningside Peninsula Astronomical Society

WHAT'S ON



In line with the recent government relaxation of the pandemic rules for community groups such as ours, the COVIDSafe Plan for the Briars site has been similarly adjusted: www.mpas.asn.au/covidsafe-plan/

Public Stargazing Nights

Stay home if you have any suspected COVID-19 symptom.

Pre-booking remains required for the public. Members need not book. At the moment we are capping public nights at 70 visitors, plus any members there.

QR code check-in and Proof of Vax status are no longer required. Anyone may attend.

Face masks are optional, and social distancing is advised.

Events will be outdoors as much as possible.

Surfaces and equipment are still cleaned.

Member gatherings

Stay home if you have any suspected COVID-19 symptom.

If you've been at the Briars for any length of time, and in the following week test positive, please let us know by email to welcome@mpas.asn.au, or telephone one of the committee members, and we will inform any potential close contacts.

QR code check-in and Proof of Vax status are no longer required. Any member may attend.

Face masks are optional, and social distancing is advised.

Members are encouraged to bring their own telescopes, eyepieces etc.

Any shared equipment (eyepieces, focuser knobs, hand controllers) needs to be cleaned regularly.

Members are now able to use the site fully. This means that if you have completed the observatory training and have received a key and/or fob, you are welcome to use the observatory at any time.

Continue to sanitise your hands regularly.

Surfaces, such as handles, knobs, locks, taps, tables and chairs, hand rails etc. need to be cleaned before leaving the site.

With the transition of COVID-19 restrictions for community groups such as ourselves, we have reopened the Briars observatory site in line with applicable government guidelines.

The 2022 timetable of public events.

MAY

Friday 6th, 8:00pm, Public Viewing Night @ The Briars MPAS site. Speaker Trevor Hand.

Tuesday 10th, 6:30pm Briars. Langwarrin Christian Cadets. Speaker Peter Skilton. 26 anticipated.

JUNE

Friday 3rd, 8:00pm, Public Viewing Night @ The Briars MPAS site. Speaker Trevor Hand.

Friday 10th, 8pm Briars. Scout/Guides/Cubs night. Speaker Manfred Berger. No bookings yet.

Saturday 11th, 7pm, Narre Warren South Scouts at either their new scout hall or Cranbourne. 60 scouts. WWCC required.

JULY

Friday 1st, 8pm Briars. Public stargazing night. Speaker Guido Tack. 70 anticipated.

AUGUST

Friday 5th, 8pm Briars. Public stargazing night. Speaker Katherine McCoy. 70 anticipated.

Friday 12th, 8pm Briars. Scout/Guides/Cubs night. Speaker Peter Skilton. No bookings yet.

Friday 19th, 8pm Briars. Public stargazing night for National Science Week. Speaker Trevor Hand. 70 anticipated.

Tuesday, 30th, 7:00pm, Strathcona Baptist Girls School at Merricks Lodge Camp site in Merricks, 3670 Frankston-Flinders Road, Merricks. 28 Year 10 girls are booked for this stargazing evening. WWCC required.

SEPTEMBER

Friday 2nd, 8pm Briars. Public stargazing night. Speaker Trevor Hand. 70 anticipated.

Wednesday 7th, 6:30pm, Baden Powell Joey/Cubs at Frankston South hall. Speaker TBD. 45 cubs anticipated.

Friday 9th, 7pm Briars, 3rd Ringwood East Scouts. Speaker TBD. 50 cubs anticipated.

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

SOCIETY NEWS



Society meeting February 19th - 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 Prof. Dan Hooper, Theoretical Astrophysicist from University of Chicago and Fermi Lab, speaking about "At the Edge of Time". If subscribed, you should be notified of this automatically by YouTube.

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/>

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



School viewing Night March 3rd - Under clear skies, and balmy conditions, 42 Year 5 girls from Strathcona Baptist Grammar School enjoyed some MPAS stargazing at the end of their first day on camp.

Peter Skilton gave the talk indoors, while outside operating the telescopes

were Guido Tack, Nerida Langcake, Connor Mathieson, Chris Kostokanellis, Fred Crump, Ben Claringbold, Greg Walton and Pia Pedersen. Neither Moon nor planets were visible that evening, however, the telescopes

had no problem pointing out various deep sky objects. Numerous satellites moved silently overhead from twilight, including the Chinese space station, Starlink, and the Hubble Space Telescope, with the evening being capped off

by a bright passage of the International Space Station before it was bedtime. *Regards, Peter Skilton*



Public viewing Night March 4th - With the public nights starting up again after a pandemic lull, we saw 36 visitors at the Briars last Friday evening. Trevor Hand gave the talk inside, complete with his planet scale models, and raffled off some meteorites to some of the lucky people there that night. Alas, the sky didn't co-operate and was 100% high level cloud cover and light drizzle all evening, though the observatory was open (with roof closed) for visitors to see the instruments on show. Numbers attending were down on the actual bookings not only because of the weather, but also due to self-declared sickness on the night. Members on hand to help out included Pia Pedersen, Greg Walton, Fred Crump, Bonnie Cass, Peter Skilton, Ben Claringbold, Guido Tack, Simon Hamm, Jamie Pole and Simon Meyer.

Regards, Peter Skilton

Members viewing March 12th - saw 8 members in attendance under a clear sky. The Moon was just past first quarter which made it a bit of a challenge for viewing or imaging faint objects. Simon Meyer imaged Omega Centauri NGC 5139 and 47 Tuc NGC 104 with the 5-inch refractor, while other members used the 14-inch to hunt down the brighter star clusters. Also 3 members set up their astrophotography telescopes outside. We closed the observatory up at midnight, all very happy with what we had achieved. *Greg Walton*

A very pleasant night at the Briars! It was interesting to have three very similar scopes and mounts set up side by side (Ben Claringbold's, Connor Mathieson's and mine). I managed to get around 2 hours on Centaurus A, the "hamburger galaxy" (NGC 5128). [Editor's note, different from The Hamburger Galaxy NGC 3628.]

Guido Tack



Society meeting March 16th - saw 18 members in attendance. First up Peter Skilton (president) gave a report on past and future events, then presentation by Prof. Sandra Faber, followed by Sky of the Month by Mark Stephens. 10 minute coffee break, then Peter played 3 short YouTube videos. No viewing due to clouds. *Greg Walton*

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 Prof. Sandra Faber, Astrophysicist, Observational Astronomer and Futurist from University of California, Santa Cruz, and Lick Observatory, speaking about "Can Humans Thrive on Planet Earth over Cosmic Time?" This talk is brought to us by special permission of the Sydney Institute for Astronomy. If subscribed, you should be notified of this automatically by YouTube. 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/> The video is not posted to e-Scorpius as it is too large. *Regards, Peter Skilton*



Members BBQ & Working Bee March 19th - Members in attendance at the working bee: Sara Elizabeth, Sylvie Grandit, Alan Brygel, Charlotte Swartz, Ross Berner, Simon Hamm, Roland Knabe, Fred Crump, Bonnie Cass, Jamie Pole, Guido Tack, Nerida Langcake, Greg Walton, Pia Pedersen, Anne and Geoff Danne; sorry if I missed anyone. First job was to finally glue the sundial in place and adjust the angle of the rock; see page 5. Trimmed back trees along the path from the top car park and behind the observatory: replaced the broken key safe: washed the floor in the hall and cleaned the kitchen and BBQ shelter. A big thanks to all who helped out on the day and brought along yummy cakes and salads. Afterwards, members set up their telescopes on the upper slab while a beautiful orange Moon rose in the east. The observatory was open; mainly looked at bright open star clusters. *Greg Walton*

Musical Stargazing Trivia Night March 26th - MPAS and Cranbourne Lions Concert Band combined fundraiser! We couldn't have asked for a better night, low 20's and not a cloud in the sky. We had a series of music sets from the band interspersed with trivia questions. The evening was topped off with a short presentation from me about "Space trivia" and answers to the burning questions like "how do you go to the toilet in space?" "Who was the first person to fart on the Moon?" and "If you found yourself naked in space, what would you do?" The night closed with stargazing through some of MPAS' telescopes! *Regards, Trevor Hand*

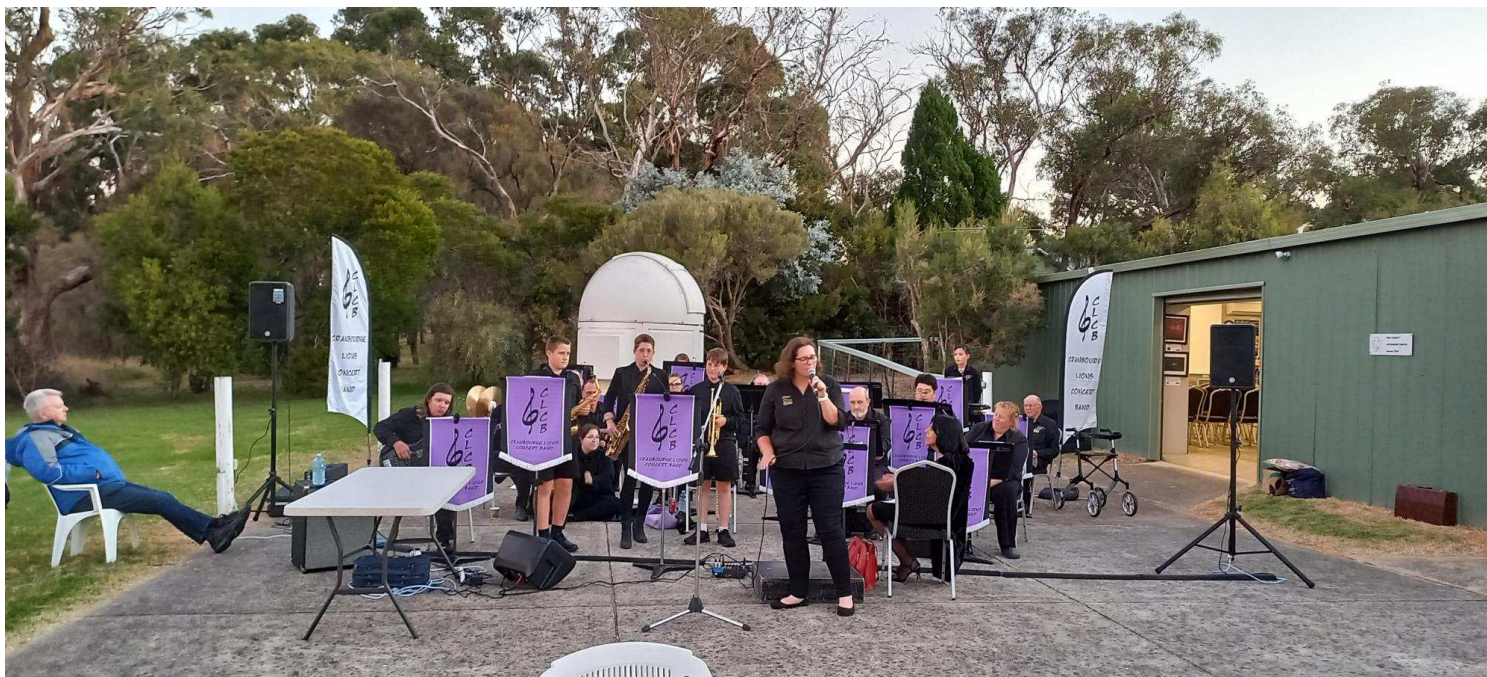




Photo Pia Pedersen

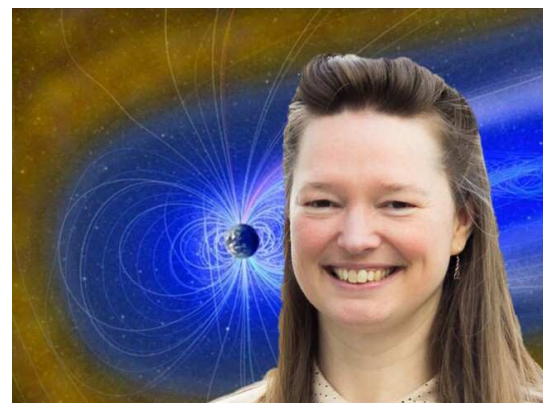
Public viewing Night April 1st - Clouds encroached as the April public stargazing night at The Briars began. After some last minute COVID-cancellation of public bookings, we ended up with 44 visitors present to hear Trevor Hand give a special April Fool's talk indoors. And, yes, he did actually give it. This went for about 1.5 hours, including question time, which was just as well, as the clouds did not clear until most of the visitors had left for the evening. So most had to be content with a tour of the observatory and instruments until next month, unless they waited until about 10pm. Members helping out on the evening were Jamie Pole, Guido Tack, Nerida Langcake, Pia Pedersen, Greg Walton, Mark Stephens, Kathryn Hand, Peter Skilton, Chris Kostokanellis, Simon Hamm, Ben Claringbold, Fred Crump, Bonnie Cass, Simon Meyer and David Connet. The society's new solar telescope was also there (not that it would help with night time viewing), and the society's Ian Sullivan sundial was operational next to the small dome (and not that that was used during the night either).
Regards, Peter Skilton

School viewing Night April 6th - The evening at Iluka Retreat Camp in Shoreham started unpromisingly with total cloud cover, horizon to horizon, but at a pleasant temperature with no wind. Nevertheless, Peter Skilton gave the talk indoors to 75 Grade 5 pupils and their teachers from Essex Heights Primary, Mount Waverley. There were lots of questions; lots! Even though the kids had had a big day combing the local beaches and were probably tired from that on their first day of camp. Meanwhile outside, the stalwart MPAS volunteers must have been doing their incantations and patented cloud dispersion dance in the field. This worked a treat. By the time the talk finished, the skies had therefore cleared perfectly with the only clouds being visible being the Magellanic dwarf galaxies in the southern sky. Outside on the telescopes were Guido Tack, Chris Kostokanellis and Ben Claringbold, with no shortage of targets under a Moonless, dark sky. The only hint of light was to the south east, possibly from Flinders. Just a pity there was neither Moon nor planets in the sky that evening. Orion was visible in the West, while Scorpius had fully risen and was lying horizontally just above the eastern horizon. There were a number of meteors spotted by the kids, but no satellites that I heard about in the field. At the end of the day, the teachers and kids were positively delighted by the experience.
Regards, Peter Skilton

Scout viewing Night at the Briars April 8th - cancelled due to no bookings.

Society meeting April 20th - saw 9 members in attendance. First up Peter Skilton (president) gave a report on past and future events, then presentation by Dr. Gail Iles, followed by a pre recorded Sky of the Month by Mark Stephens. 10 minute coffee break, then Peter played 3 short YouTube videos. No viewing due to clouds.
Greg Walton

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. Gail Iles, Senior Lecturer and Experimental Physicist, RMIT University, Melbourne, speaking about "Surviving the Journey: Protecting Astronauts from Space Radiation". She is a former astronaut instructor at the European Astronaut Centre in Germany, and holds the WISE Champion Award from HRH Princess Anne for inspiring children to study STEM subjects. This talk is courtesy of the Royal Society of Victoria and Inspiring Australia.
Regards, Peter Skilton



You can also watch it here by clicking on this link and going to the most recent video on the channel:

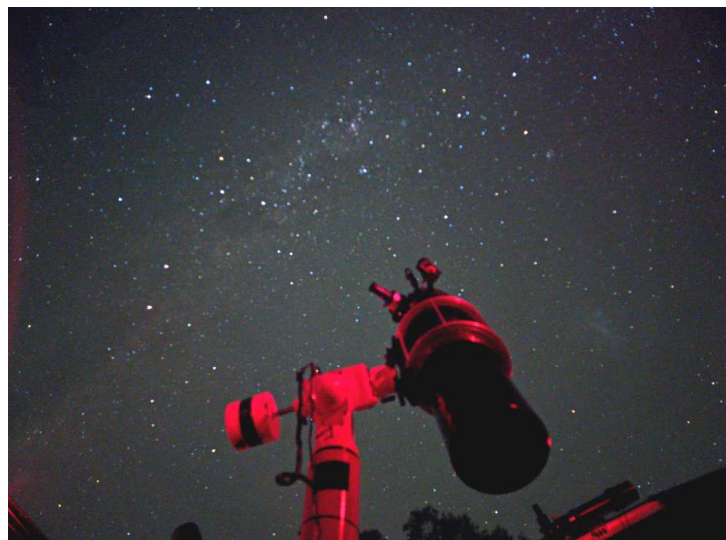
<https://www.youtube.com/channel/UCm6XOkIcIfl4y0XRBXpXuW>

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

Scout viewing night Friday 22nd - We had approximately 10 visitors from the A. B. Balcombe Rovers (18-26 year old senior scouts) who attended on the night. The sky was spectacularly clear, so they began the evening in the observatory, then made their way inside for a presentation from Mark Stephens. Following the talk, the Rovers then spent a couple more hours in the observatory and using the many telescopes that were also setup on the concrete slabs. Members helping onsite were Simon Birch, Nerida Langcake, Greg Walton, Chris Kostokanellis, Ben Claringbold, Guido Tack, Fred Crump, Bonnie Cass, Phil Holt, plus Rod & David Brackenridge who were also part of the Venturers group. *Regards, Nerida Langcake*



Photos: Nerida Langcake



Members BBQ & Working Bee April 23rd - saw 12 members at the 4pm working bee. We mowed grass around the trees, removed 2 dead shrubs in front of the toilet, removed tree branches behind the mower shed, continued to shorten the trees behind the observatory, repaired the letters on Sky Drover, cleaned the security cameras, sorted old magazines, and did general cleaning of the clubrooms, kitchen and sales area. Members BBQ saw about 30 members in attendance, Dave and Mark on the BBQ and we had plenty of chicken, sausages and salad. Sky was clear so we opened the observatory and visited many favourites: Omega Centauri, Eta Carinae, Jewel Box, to mention a few. A big thanks to all who helped out on the day, with special thanks to those working in the kitchen.

Greg Walton



Saturday 30th, 1:30-10pm - MPAS setup daytime solar telescopes and many other types yesterday under a clear sky at the Drift: Into the Wilderness festival at Balnarring. There were 5,000+ people with live music, mild conditions, a clear night sky and a great vibe. Thanks to all the people who visited us at our marquee! *Nerida Langcake*

MPAS members helping out were Guido Tack, Ben Claringbold, Dave Rolfe and family, Chris Kostokanellis, Nerida Langcake, Jamie Pole, Pia Pedersen, Simon Hamm, Greg Walton, Fred Crump, Bonnie Cass, Peter Skilton, Trevor and Kathryn Hand.

We arrived in convoy at 11am and were sent on a wild goose chase by safety officers around and around the Emu plans race track till we final found our way to the MPAS marquee, where we unloaded the mountain of equipment and move the cars to the car park, then began the big job of setting up.



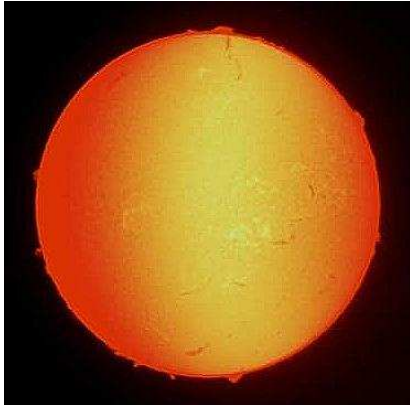
We had a sprinkling of light rain while we waited for the public to start arriving. Unfortunately the clouds hung around for most of the day, with only a few brief appearance of the sun. Still we did had 6 solar telescopes running so quiet a large number the public did get to see



the surface of the sun. MPAS recently purchase a 60mm Lunt solar telescope for viewing the surface of the sun

with a hydrogen alpha filter. We were all very impressed with the way it performed and Dave was able to snap a shot of the sun through the telescope, *see photos below*. An hour after sunset we got very busy, as the clouds started to brake up and more and more people wanted to look through the telescopes. The only difficulty we had was the music, it was so loud it made the telescopes vibrate and we could see the stars shaking to the beat of the music(!). The public was very impressed with the views though the telescopes and the way the society presented its self. At 10pm the public were leaving and we had the big job of getting the cars back to the marquee and start packing up.

Greg Walton



New Members Welcome

Ash Fathers

Bodin Suntu

David & Ewan Connet

David Sango

Nick Hurst

Jonathan Magill

Mary Marshall & Amelie Finicchiaro

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		May / 2022					Red Days indicate School Holidays
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	
1	2 Mercury right of thin crescent Moon	3	4	5 Moon at 405,285km	6 Public night 8pm	7	
8 Mother's Day	9 First Quarter	10 Langwarrin Christian Cadets	11	12	13	14	
15	16 Full Moon Super moon	17	18 Society Meeting 8pm Moon at 360,298km	19	20	21 Working bee 4pm BBQ 6pm	
22	23 Last Quarter Saturn above a dawn Moon	24	25 Mars & Jupiter below a dawn Moon	26	27 Venus below a thin crescent dawn Moon	28	
29	30 New Moon Mars & Jupiter only 0.6 deg separation	31					

Monthly Events

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

- Public night** - 8pm to 10pm on the 6th @ the Briars
- Society Meeting** - 8pm to 10pm on the 18th @ the Briars
- Working Bee** - 4pm on the 21st @ the Briars
- Members night & BBQ** - 6pm on the 21st @ the Briars

- Working Bee job list**
- Mow lawn & trim edges
 - Remove tree branches
 - Clean kitchen
 - Clean observatory

CALENDAR		June / 2022					Red Days indicate School Holidays
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	
			1 Orion & Scorpius both in the evening sky	2 Moon at 406,192km	3 Public night 8pm	4	
5	6 Ga shadow 3:13am S Ga shadow 6:05am F	7 Eu shadow 2:03am S Eu shadow 4:37am F Eu transit 4:41am S	8 First Quarter	9	10 Scout & Guides viewing night	11 Narre Warren South Scouts	
12 Io shadow 1:53am S Io transit 3:09am S Io shadow 4:01am F Io transit 5:17am F	13 Ga shadow 1:53am S Ga shadow 5:01am F	14 Full Moon Super moon	15 Society Meeting 8pm Moon at 357,432km	16	17	18 Working bee 4pm BBQ 6pm Saturn right of Moon	
19 Io shadow 3:48am S Io transit 5:04am S Io shadow 5:56am F	20	21 Last Quarter	22 Jupiter above a dawn Moon	23 Mars below a dawn Moon	24 Scorpius Deadline	25	
26 Venus right of the thin dawn Moon Io shadow 5:40am S	27 Mercury right of the thin dawn Moon	28 Io shadow 2:17am F Io transit 3:36am F	29 New Moon Moon at 406,580km	30		2nd July Eu shadow 1:45am F Eu transit 1:58am S Eu transit 4:24am F	

Monthly Events

Jupiter shadow transits can now start to be seen. Times in brown

- Public night** - 8pm to 10pm on the 3rd @ The Briars
- Scout & Guides viewing night** - 8pm to 10pm on the 10th @ The Briars
- Society Meeting** - 8pm to 10pm on the 15th @ The Briars
- Working Bee** - 4pm on the 18th @ The Briars
- Members Night BBQ** - 6pm on the 18th @ The Briars

- Jupiter moon code**
- Io = Io
 - Eu = Europa
 - Ga = Ganymede
 - Ca = Callisto
 - S = start
 - F = finish

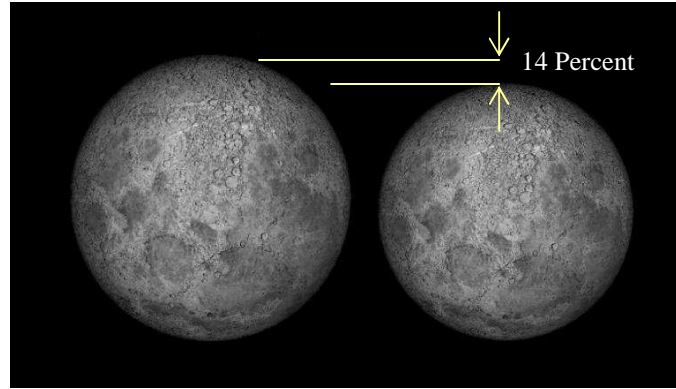
Watch your emails, as on any clear nights the Observatory may be opened for members-only viewing.

THE BRIARS SKY

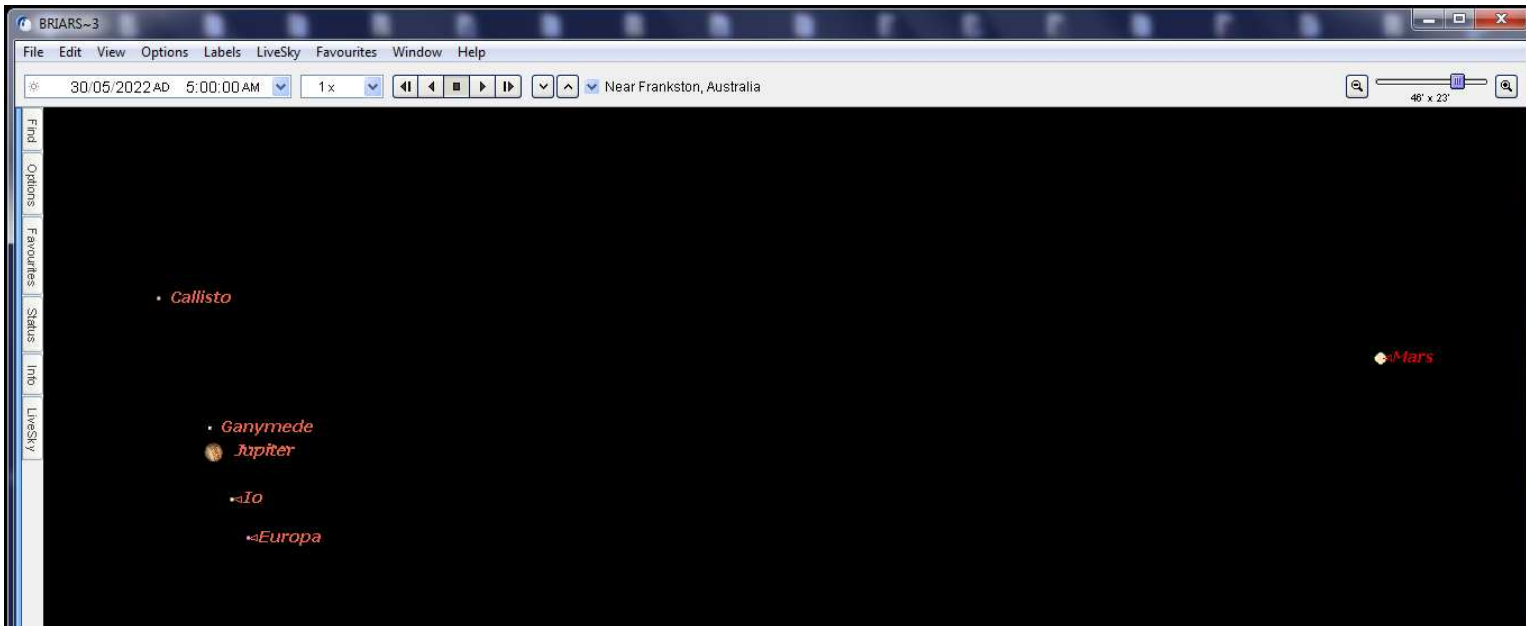
By Greg Walton



Two supermoons 16th May and 14th June which basically means that the full moon happens when the Moon is at its closest to Earth. The Moon has an elliptical orbit and each month its distance varies from about 400,000km to 350,000km with a maximum variation of 14 percent. Viewed from Earth the Moon is only 1/2 a degree in diameter, so seeing any difference in size for most people is a bit of a challenge, as there is little to compare the Moon against (unless near a familiar landmark). See approximate difference in images at right.



On the morning of May 30th during a New Moon, Mars & Jupiter will be only 0.6 degree separation. With a low powered eyepiece you should be able to see both Jupiter and Mars together in the same field of view.



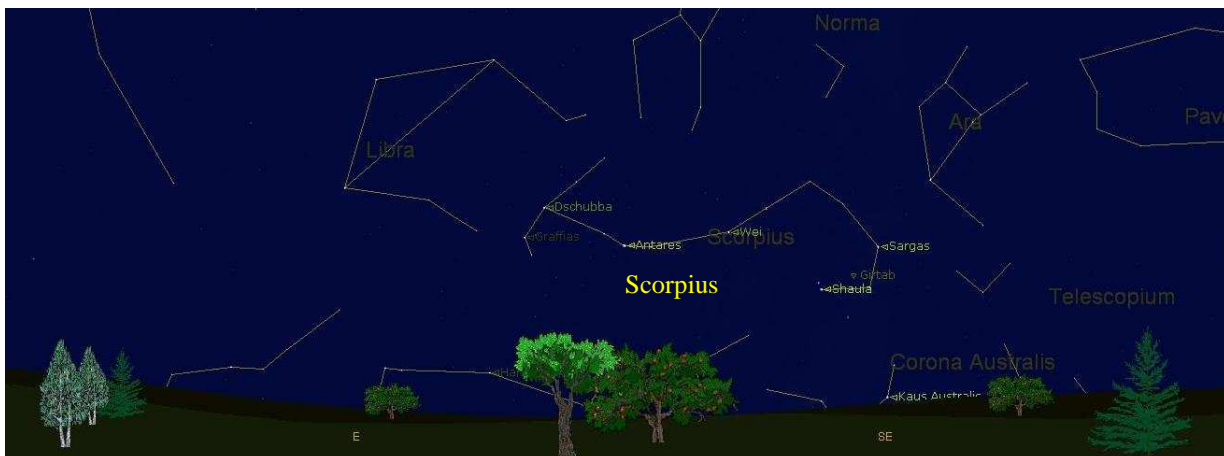
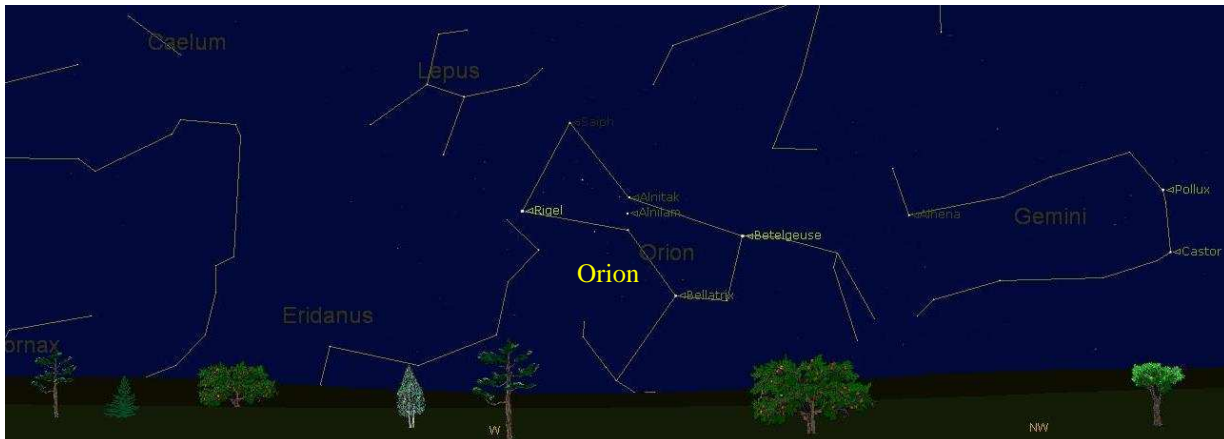
Something interesting to do without a telescope.

Around the 1st of June each year at 6pm.

Looking to the west, you will see Orion just above the horizon. You will see the 3 belt stars vertically. A view that many times in the past has sparked UFO calls.

Now look to the east, you will see Scorpius rising with Antares at its centre, sometimes mistaken for Mars due to its orange colour.

This is the only time of year you can see Orion and the scorpion in the sky at the same time in the evening.



Ax-1 with 1st all private crew reaches ISS

The first paying astronauts reached the International Space Station on the Saturday, April 9. The crew of Ax-1 (or Axiom-1) includes three paying customers – at AU\$76.8 million each – plus a fourth experienced astronaut. Ax-1 successfully launched from Kennedy Space Center. As the Dragon capsule neared the International Space Station, NASA TV aired the event live, and a first-quarter moon appeared in the background. The Houston-based start up Axiom Space organized the private mission.

In the Ax-1 mission, the four astronauts riding into low-Earth orbit are:

– Mission commander Michael López-Alegría. Lopez-

Alegría is an astronaut and test pilot. He went up on the space shuttle three times, and he's been to the International Space Station mission once before. He is also Axiom's vice president of business development.

– Pilot Larry Connor, a real estate and technology entrepreneur and aerobatics aviator from Ohio.

– Mission Specialist Eytan Stibbe, an Israeli a former fighter pilot and businessman.

– Mission Specialist Mark Pathy, a Canadian businessman and philanthropist.

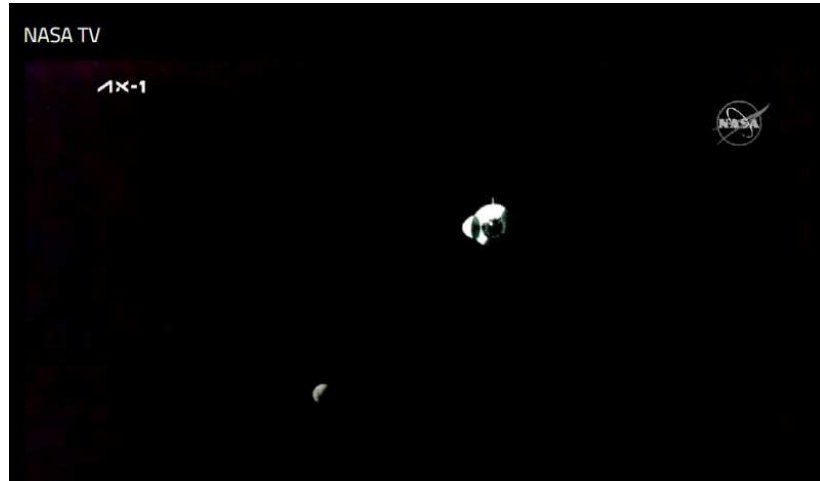
What will the Ax-1 crew do aboard ISS? The Ax-1 mission shares some qualities with recent suborbital flights by Jeff Bezos, Richard Branson and Elon Musk – in what's been called the billionaire space race. But it's not the same, according to the crew of Ax-1. As reported in Reuters, Lopez-Alegría said during a recent news briefing: "We are not space tourists". Lopez-Alegría said the Axiom team has undergone extensive astronaut training with both NASA and SpaceX and will be performing meaningful biomedical research during their eight-day stay at the ISS.

Specifically, while in space, the Ax-1 crew will conduct experimental research for a variety of partners back on Earth, according to a statement by Christian Maender, director of In-space Manufacturing and Research for Axiom: *"As the first step on a path to building a diverse, thriving economy in low-Earth orbit, Axiom has partnered with leaders in academia and industry. The goal is to bring new users and new investigations in research to the space station. The collection of biological and technological tests during the Ax-1 mission represent a breadth of research that will inform everything from human health considerations, to novel infrastructure and design for our future homes away from Earth..."*

Eventually, Axiom wants to build the first private crewed space station in low-Earth orbit. They're calling it the Axiom Station. And the company has said the visit to the existing International Space Station is a step toward that.



The Axiom-1 crew consists of 3 paying customers and an experienced astronaut. From left to right: Larry Connor from Ohio, mission commander Michael López-Alegría, Canadian Mark Pathy and Israeli Eytan Stibbe. Image via Axiom Space.



Mission Ax-1 in the Dragon capsule approaches the International Space Station with a first-quarter moon in the background on April 9, 2022. Image via NASA TV.

The Ax-1 mission represents the first paying customers taking advantage of NASA's plan to open the ISS to crews of commercial astronauts. NASA announced that plan in June 2019, with the stated goal of building a viable space-based economy: *NASA will continue research and testing in low-Earth orbit to inform its lunar exploration plans, while also working with the private sector to test technologies, train astronauts and strengthen the burgeoning space economy. Providing expanded opportunities at the International Space Station to manufacture, market and promote commercial products and services will help catalyse and expand space exploration markets for many businesses.*

Ultimately, NASA said that allowing private companies to rent time for their crews at the ISS will benefit the entire space industry by reducing the cost of getting into space. NASA stated: *The agency's ultimate goal in low-Earth orbit is to partner with industry to achieve a strong ecosystem in which NASA is one of many customers purchasing services and capabilities at lower cost.*

OBSERVATORY UPDATE

By Greg Walton



Back in 2008, long-time member Ian Sullivan donated a one-off specially made sundial for the MPAS Briars site. This sundial has a very accurate time correction graph enabling you to calculate the time to within 2 minutes. The sundial also shows the date to within a couple of days.

We fitted the sundial to a portable stand so we could move it outside on our yearly Solar Day event, but Ian said he would rather see the sundial permanently set up outside somewhere on the MPAS site. Also it would be good if it could be set in stone with a name plaque.

But then there would be the risk of the sundial being stolen. The best idea would be to cut a recess deep into a large stone, which would make it difficult to remove.

As Ian is getting on in years, we thought it best to get on with the job of mounting the sundial.

The first thing is to find a stone large enough and of the correct shape, preferably with a flat on one side at the correct angle of 38 degrees.

We found a rock yard in Dromana with a large selection of granite stones and chose one that we thought might do.

The stone was delivered and dropped on the right spot, but upper side down and facing the wrong way. It took 5 members and a couple of crowbars to get it facing roughly the right way.



The next part of the job was to make a name plaque. Luckily I found a piece of brass the right size and also found I had a set of large letter punches in the letters. I clamped a bar of steel to the brass plate which I could hold the letter punches against, to make it easier to get the letters straight. Then I cut to length and chamfered the edges.

Then it came time to cut out the recesses for the sundial and name plaque. Easier said than done ... It took 12 hours of grinding and chiselling out. The 8 corners were the worst part of the job and wore out many carbide drills.





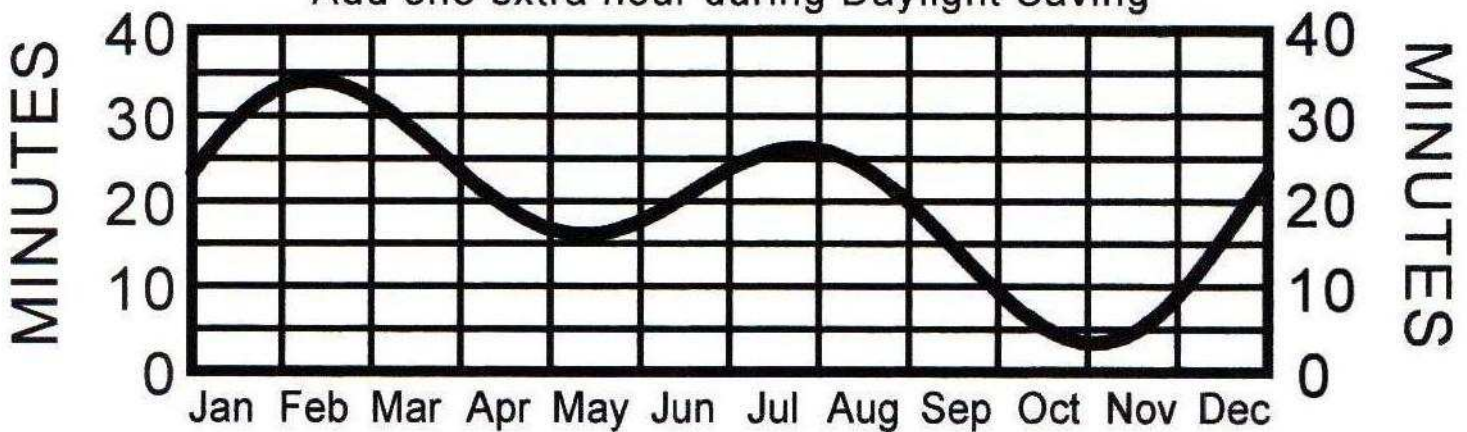
Photo Guido Tack

Finally the sundial and name plaque were glued in place and the angle of the rock adjusted at the March Working bee.

Using the MPAS sundial. Looking at the sundial you should see the shadow of the Nodus. The sun light shining through the hole on the Nodus should marks the time of day. But to adjust the correct time you need to add one hour during Daylight Saving, then look at the months on the bottom of the graph and estimate the position of the date then move up to the curved line and read the minutes at either side and add this for the correct time.

ADD TIME CORRECTION

Add one extra hour during Daylight Saving



This Sundial was made by Australian Sundials see website: <https://www.sundialsaustralia.com.au/>

Building a Rich Field Telescope (Part 3) - Making a Wire Spider, *by Rod Brackenridge*

Conventionally a Newtonian telescope has a 3 or 4 vane spider made of thin sheet metal that supports the secondary mirror and its mount. The spider creates a diffraction pattern around the stars so that bright objects have 4 or 6 spikes radiating from them. Most of us get used to this and don't mind them too much. But there are ways to reduce the effect. Three options are:

- Make a curved spider. This appears to hide the diffraction because the spikes wrap around the star or planet. The diffraction is still there, it's just not as obvious. A more detailed description is here:

<https://www.fpi-protostar.com/cm-faq.htm>

One disadvantage to this method is that the curved spider is not as rigid as straight vanes, leading to potential problems with collimation.

- Mount the secondary mirror on an optical window. This completely removes the spider and seals the tube and is very rigid. In practice few people feel the expense and time involved in making an optical window is worth the trouble. You have to grind and polish two more optical surfaces and keep the thickness of the glass plate within tolerance. Edmund Scientific used to make a clever little 4 inch scope with an optical window:

<https://en.wikipedia.org/wiki/Astroscan>

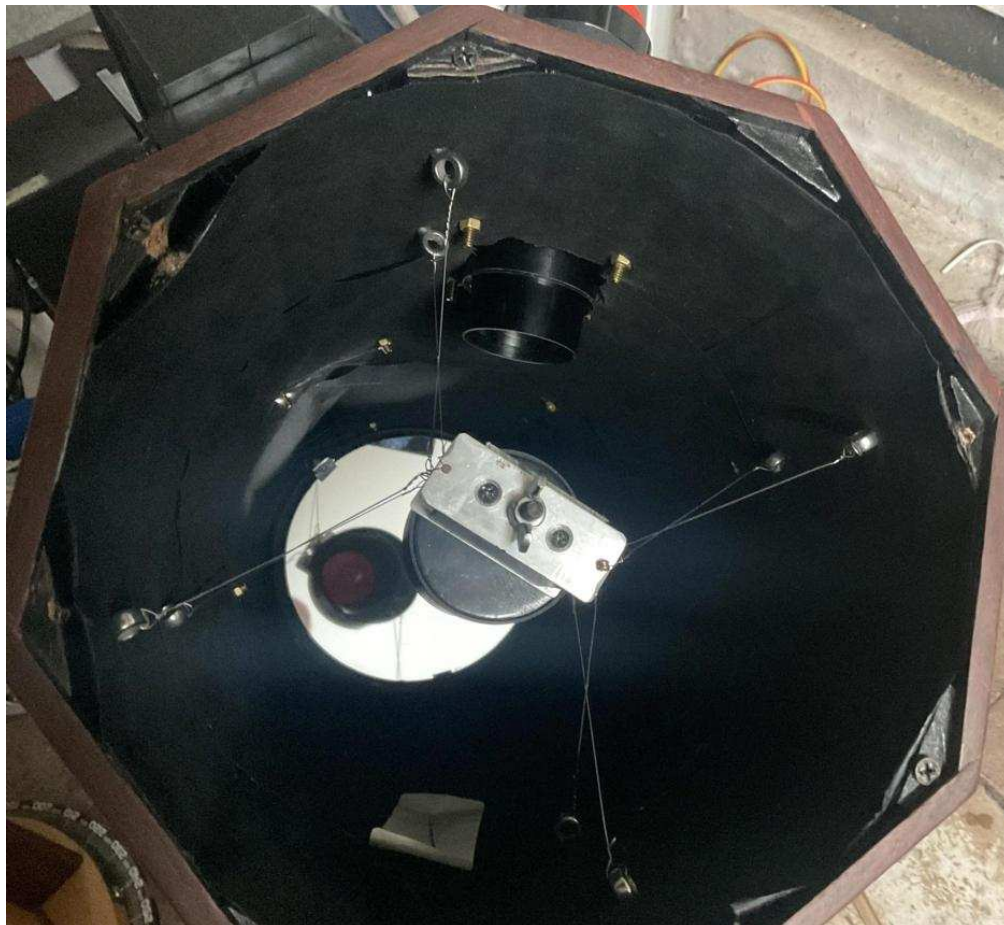
- Make a wire spider. These aren't available commercially but a lot of amateurs build them. I've been using wire spiders on my 12 inch Newtonian for about 20 years. I've tried a few designs and they have all been very strong.

What is a wire spider?

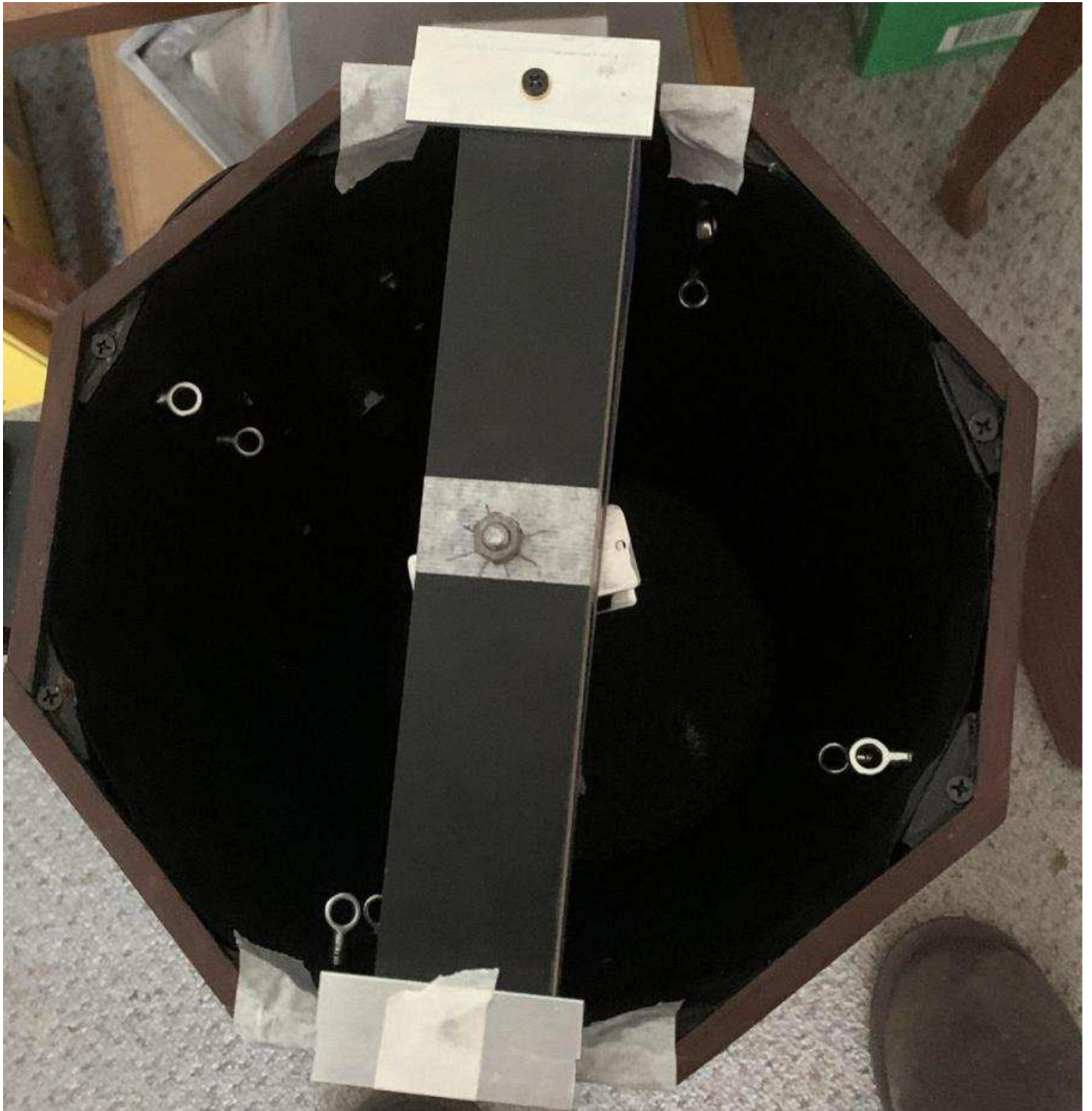
The secondary mirror and its support are held in place by wires held in tension. I use guitar strings for mine. The tension is not that great - just enough that all the wires are taut. Here is the one I made for the 8 inch F3

Notice that there is no adjustment for the secondary mirror inside the tube. Collimating is done by loosening or tightening the eye-bolt nuts on the tube exterior.

This arrangement is fairly cheap to build. Admittedly it's a little fiddly to set up the first time. You need to use a jig that holds the secondary mirror support in place while you attach the wires. Here is the one I used. The spider hub is in place. The wires just thread through the holes in the aluminium strips.



Here it is ready to thread the wires:



Incidentally the secondary mirror holder was designed and 3D printed by a friend from the ASV. Here is how it goes together.

My son David and I have our own 3D printer now and we have made the same part for a friend. I don't have great metal working skills or a lathe so my secondary holders have always been functional but ugly. 3D printing is offering some better options for DIYers. Now all the skill is in drawing the part accurately. David is very good at that. We can also download drawings of parts other telescope makers have designed from Thingiverse. The printer does all the physical work.

So other than reduced diffraction what are the other benefits of a wire spider?

I can think of two:

- They are cheap to make
- They are surprisingly strong and hold collimation well. I recently drove my recently completed 8 inch F3 to Heathcote for the Messier Star Party. It's nearly a 3 hour drive and there is a long gravel road at the end complete with potholes. When I checked the scope's collimation, the laser moved perhaps 2 mm off centre during the trip. It took a few seconds to make the adjustment. No change to the primary collimation was required. I checked the collimation when I returned home and it had the same result.

There are potential downsides:

- A wire spider will bend a tube that is not rigid. A soft metal tube or a cardboard tube will need reinforcing rings to stop the tube being bent out of shape.
- The rigidity of the spider relies on the large triangular supports created by the wires. This means you need more room to accommodate the long spider hub.

When I look through a scope with a wire spider, I see short, faint diffraction spikes, much less prominent than in a conventional Newtonian. The image looks cleaner. That's a good enough reason for me to build one.

References:

<https://www.bbastrodesigns.com/NewtDesigner.html#spiderDiffraction>

http://www.reinervogel.net/index_e.html?/Planung/2_Hut_e.html

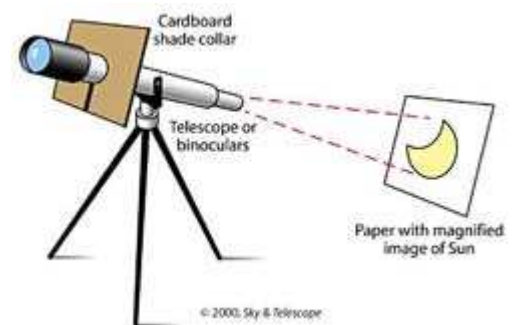


Solar Imaging with the Daystar Quark, *by Russell Smith*

I recall when I first was getting into astronomy visiting an Astro store about 20 years ago, some fantastic Hydrogen Alpha filters images on posters and Coronado solar telescope products and thought wow look at all the hairy details on the sun, it looks awesome. Then I looked at the price tag and said wow once again. These specialised telescopes with inbuilt solar filters are expensive – so much so I have held off a couple of decades till I got one – well kind of.

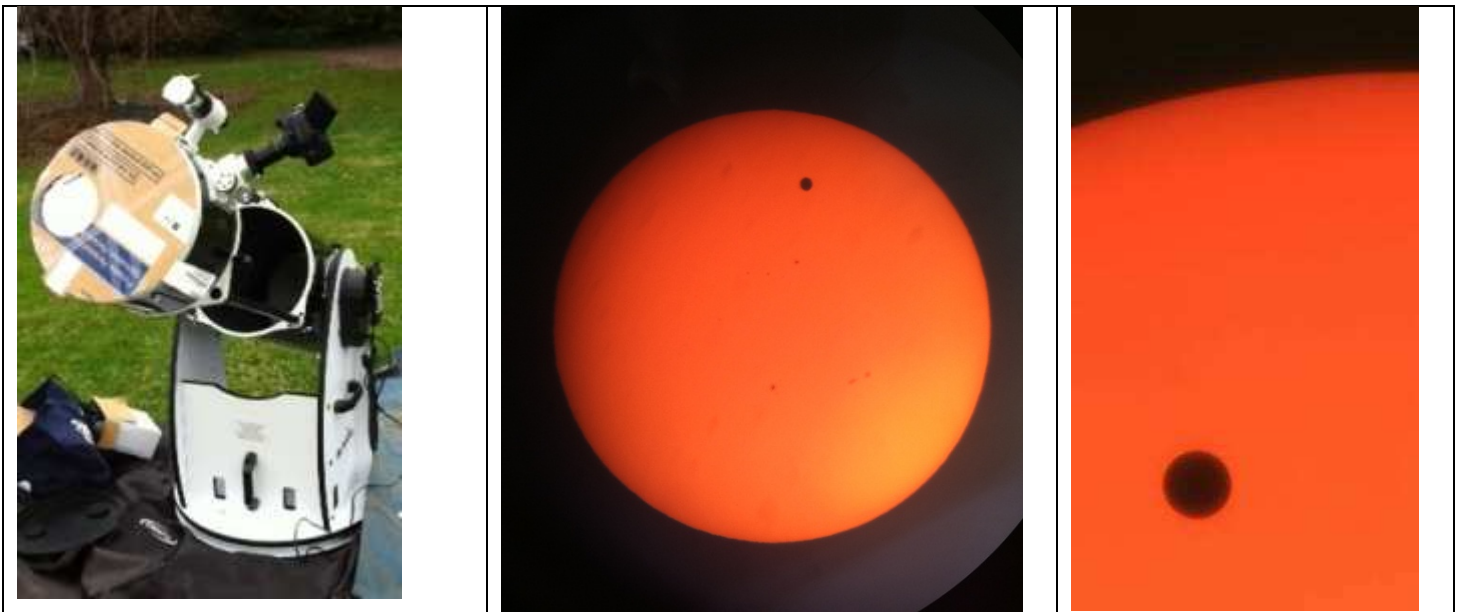
Types of Solar Filters

There are a few ways to look at the sun which I don't intend on going too deeply into. There is the **projection method** in which you can point a small telescope at the sun and project the image onto a board some distance back from the telescope (careful not to light things on fire). I have done this once with a 6" reflector many years ago with a partial solar eclipse, unfortunately I don't have a photo of it handy (I believe I took a photo of the projected image with film) but it worked.



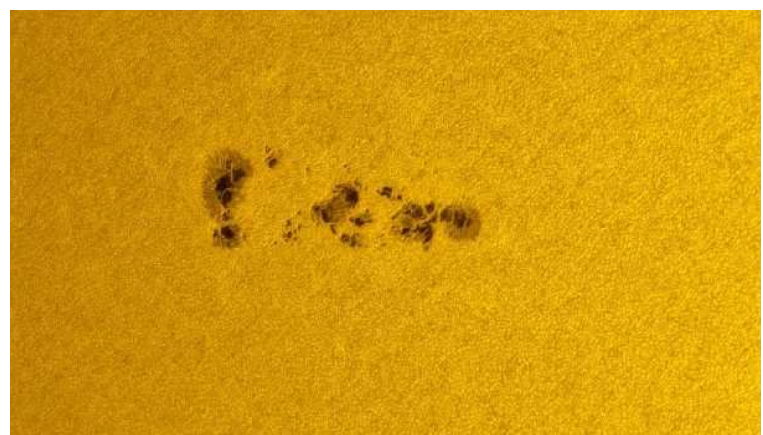
The next easiest way is to use **solar white light film** and place that in front of your telescope. I first had a go at this for the 2012 transit of Venus. I chose not the white light film but something like a *Solar RB filter* – which gives an orange red view. Back then I didn't know they aren't as good as the white light ones (and that you can colorize white light images to orange red in photoshop) – but I know that now!

Below: 1. Home made filter cell; 2. Transit of Venus with an iPhone 3. Transit of Venus with a Canon 600d & 5x Powermate – 12" dobsonian



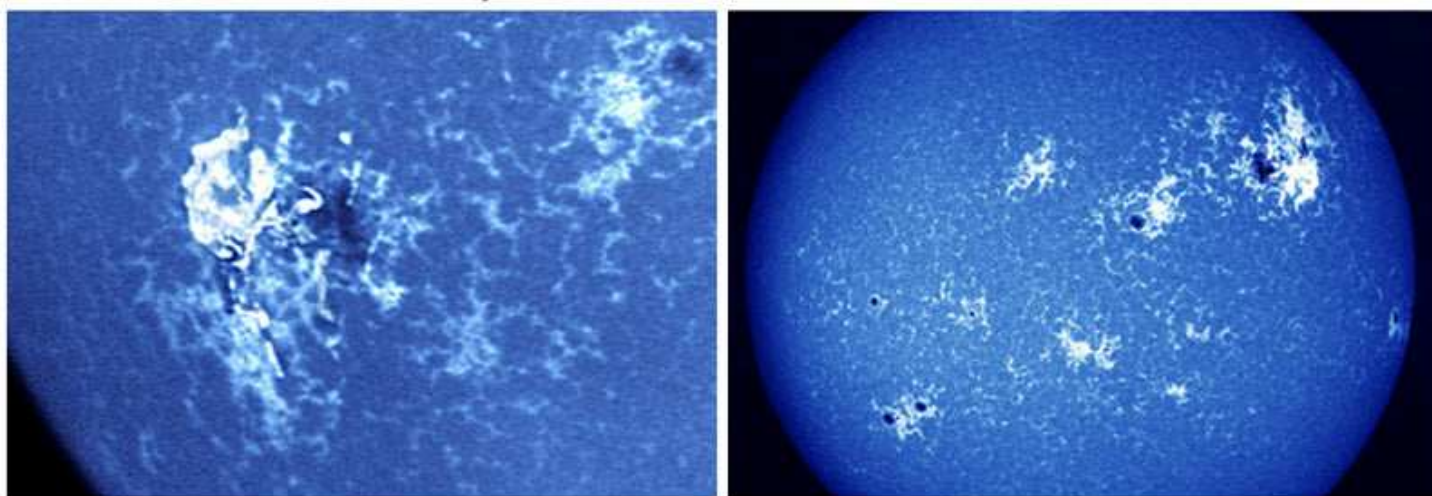
I constructed the make-shift solar filter using an A4 sheet of the film this costs about \$40 these days (Baader Astrosolar Safety Film) although there are professional well constructed versions as well with glass filters. As a fairly large aperture can be used, some fantastic views can be achieved with these sheets, including sun spots and sometimes granulation on the surface (which can be enhanced with an additional filter).

Solar granulation & spots from a Solar White Light Filter
(source <https://thousandsoptical.com/products/solar-filters/#>)
– colour would have been added in Photoshop or similar



Another type of filter - probably the third most popular, is the Calcium K-Line Solar filter. This produces interesting surface details and activity different from the white light filter and a Solar Hydrogen filter. These are often coloured in purple or blue in the processing. These are a more expensive type and usually made in specialised telescopes or specialised filters.

Below: Calcium K line filter photos (source https://www.testar.com.au/products/daystar-quantum-calcium-ii-k-2a-pe?_pos=3&_sid=0853d6139&_ss=r)



There are a few other options but generally used by professionals rather than amateurs (sodium lines and helium etc) due to the cost in production.

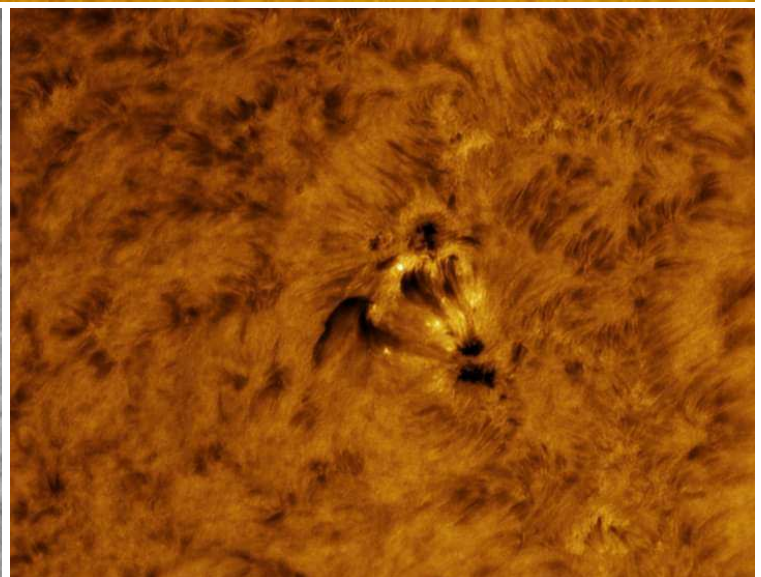
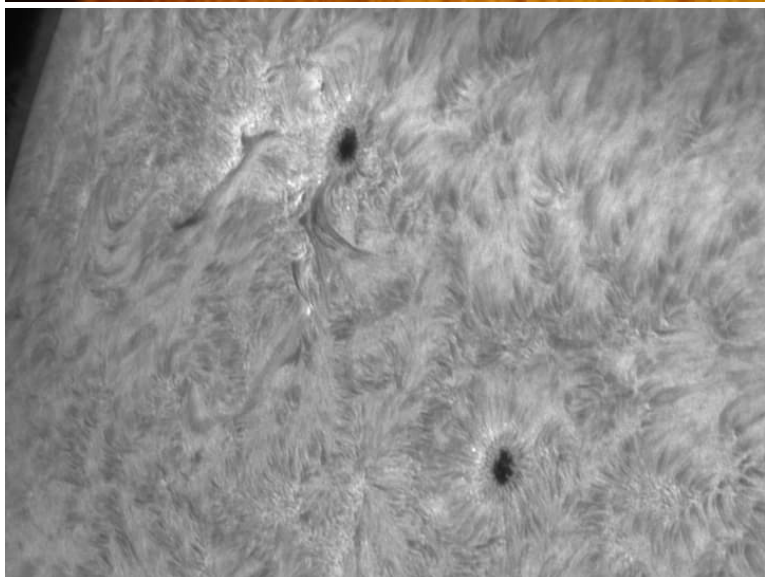
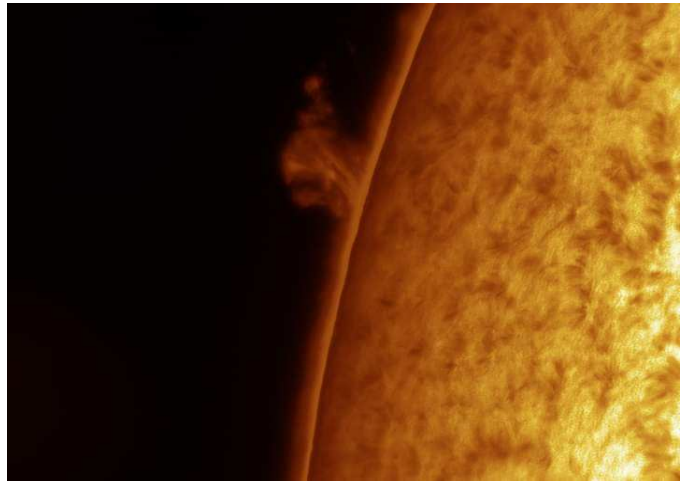
Hydrogen Alpha solar filters are the most popular, mostly I think for the excellent details on the surface and the ability to also see the solar prominences. Most commonly these are found in specialised Solar Telescopes made by companies such as Lunt, Coronado and Daystar. These require specialist pressure spacings and tunings, but the advantage is that they have the filter built into the telescope and are safe for observation. All of these companies in recent years have made efforts to bring in some cheaper entry level telescopes such as the PST 40mm and LS40, which are small aperture refractors. These telescopes still offer nice views and a way to see the entire solar disc in one go. The price steeply increases however when you go up in aperture size. You can also increase the image quality by a method called 'double stacking' which aids in increasing the contrast on the Sun – however this costs money to do so as well.

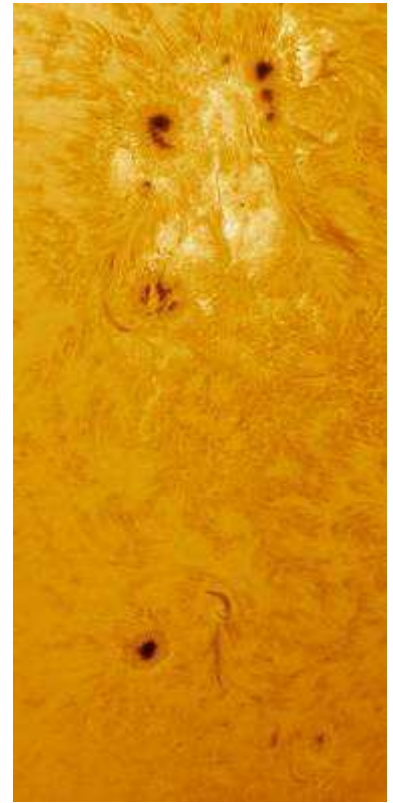
I was lucky to stumble across a product called the Daystar Quark which is an “eyepiece” rather than a specialised telescope. One is able to insert this into a refractor of nearly any size, thereby avoiding the steep increase in price we see with Solar specific telescopes. One of the benefits is that it also includes a 4.2x Barlow in the product, so if you didn't have a Barlow or Powermate you are actually saving money once again. They do recommend once you get in the range of 120mm-150mm and above in telescope aperture to use an energy rejection filter in front of the telescope. I have been using the Daystar Quark on my existing 130mm refractor and the product cost approximately \$2k. If I were to buy from the same company (Daystar), their 127mm Hydrogen Alpha filter SolaREDi telescope costs \$15,800au at Testar. Of course you need a telescope as well as the Daystar Quark, but with Solar imaging you don't require an expensive apochromatic refractor: a cheapie achromatic refractor will do just fine as you are only focusing one fine wavelength of light and not 3 broad wavelengths (.. red blue green) .. And longer/slower F ratios suit solar imaging more than faster imaging ratios. Often people will create an aperture mask to reduce the light going through the front of their telescopes to change F ratio. It is something I have yet to try as I apparently could benefit from a slower refractor.



If you are fairly familiar with Planetary Imaging then the process is nearly the same. However, there are some differences. An optical effect called 'newtons rings' occurs when directly imaging Hydrogen Alpha on the sun, so you actually have to introduce tilt in to the image train which removes the effect. These look like interference patterns and are nearly impossible to remove with flats or post processing. So I use a special tilt adapter to assist with this when imaging. Flats are necessary for disc imaging and can be easily taken by going to the middle of the sun and defocussing keeping the capture settings the same.

I've really enjoyed getting into Solar imaging. Unlike the Moon, the Sun is different every time you look at it. There could be huge prominences lifting off at anytime or new sun spots coming into view, especially as we approach solar maximum. Now is a great time to get into solar astronomy. This dynamic nature isn't the same anywhere else in astronomy, second place perhaps to watching comet outbursts.





Above - Pretty happy with the new solar filter. Quite a few quirks to sort out - harder than regular planetary but kind of nice to be doing astrophotography on a nice day rather than late at night!

So I recommend looking into it if you can perhaps grab one of those white light filters to start off the adventure!

MEMBERS GALLERY



Top 3 images

Some pictures from last weekend: Carina Nebula, Flame Nebula & Horse head and Running Chicken nebula.

Unfortunately I lost the flat calibration frames because I hadn't noticed that I had frost on the camera sensor... so I had to do some ugly post processing (and couldn't get all the vignetting and dust motes removed).

Bottom image

Centaurus-A "Hamburger" NGC 5128
Imaged from the Briars on 12th March.
By Guido Tack



Top 3 images

Playing with the smaller ZWO chip camera I am getting some tighter fields of view than the STL.

Here is the core of Eta Carinae Nebula NGC 3372 at right and Spanish Dancer Spiral Galaxy NGC 1566 below.

Dave Rolfe



David Rolfe



David Rolfe
NGC1566

Right

Finally managed a good shot of the Horsehead and Flame Nebulae NGC 2024 (stack of 55 shots 80mm ULT refractor APO ED glass triplet)

Brad Gilmour



Right

Carina Nebula in HOO, Skywatcher ED72 and the 0.85 reducer, Skywatcher NEQ6 Pro, ASI294MC Pro, optolong L-EeXtreme, ASIAIR PRO.
4 hours of 10-minute acquisitions.

By Nik Axe

**Right**

NGC 3572 open star cluster and the Southern Tadpoles, near the Carina Nebula in our Southern Hemisphere. A much overlooked Nebula.

6 hours of 10-minute exposures.

ASI294MC Pro Optolong L-eXtreme, TSoptics 130 APO 0.75 Riccardi reducer, ASIAIR PRO for guiding and acquisition Melbourne Australia Bortle 6-7

By Nik Axe

**Right**

Gabriela Mistral Nebula (NGC 3324) and Gem Cluster (NGC 3293)

HSO Process using ASI 294mc Pro with Optolong L-eXtreme Filter. Channel separation in Astropixel Processor using Mono HAO3 channel as the Sulphur channel. Processed and recombined in Astropixel Processor and processed in Photoshop

6.7 hours of acquisition guided with ASIAIR Pro using the new Sky Atlas, it's a game changer!

By Nik Axe



Left - NGC 3576, Statue of Liberty Nebula. 29x 240Sec Exposures with my Modified DSLR from last week. *By Chris Kostokanellis*

Right - NGC 6334, Cat's Paw capture from last week. 20 x 240 sec exposures with my DSLR. *By Chris Kostokanellis*



Below - NGC5128 Hamburger galaxy taken with the 350mm Meade in the Briars observatory on 24th April 2022
30 images of 30 second, stacked with Deep sky stacker, *by Greg Walton.*



NGC5128 Briars Meade 350mm 0.7 reductor EQ8 Pentax K30 30x30sec iso6400 By Greg Walton 24 March 2022

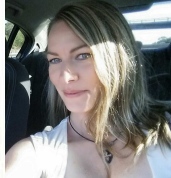
SOCIETY INFORMATION



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

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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)

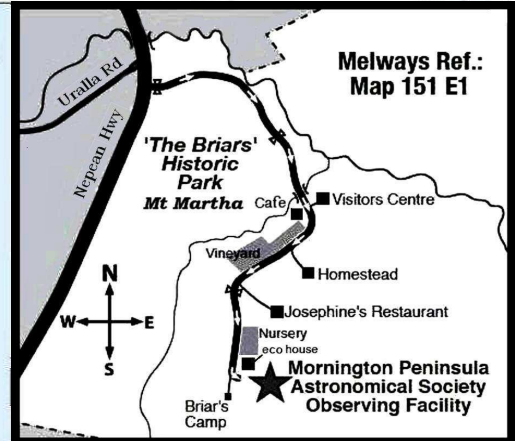
Society meetings: Don Leggett Astronomy Centre
 8pm on the third Wednesday of the month
 (except December)
 (See map at right & Below)



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.



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=0BvykxzZGI9g_SUNmZVhkZTFGWTA

SCORPIUS The journal of the Mornington Peninsula Astronomical Society

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