



Cover image - Hi everyone - my first deep sky image in about 4 years. Prawn Nebula
 - IC 4628 Have a small sliver of sky to polar align to, so poor alignment but with
 some heavy processing (Ha was good, s2 and O3 very bad) but I managed a result.
 Only 1hr40mins (s2 10m ha 48m o3 34m). *By Russell Smith*

SCORPIUS

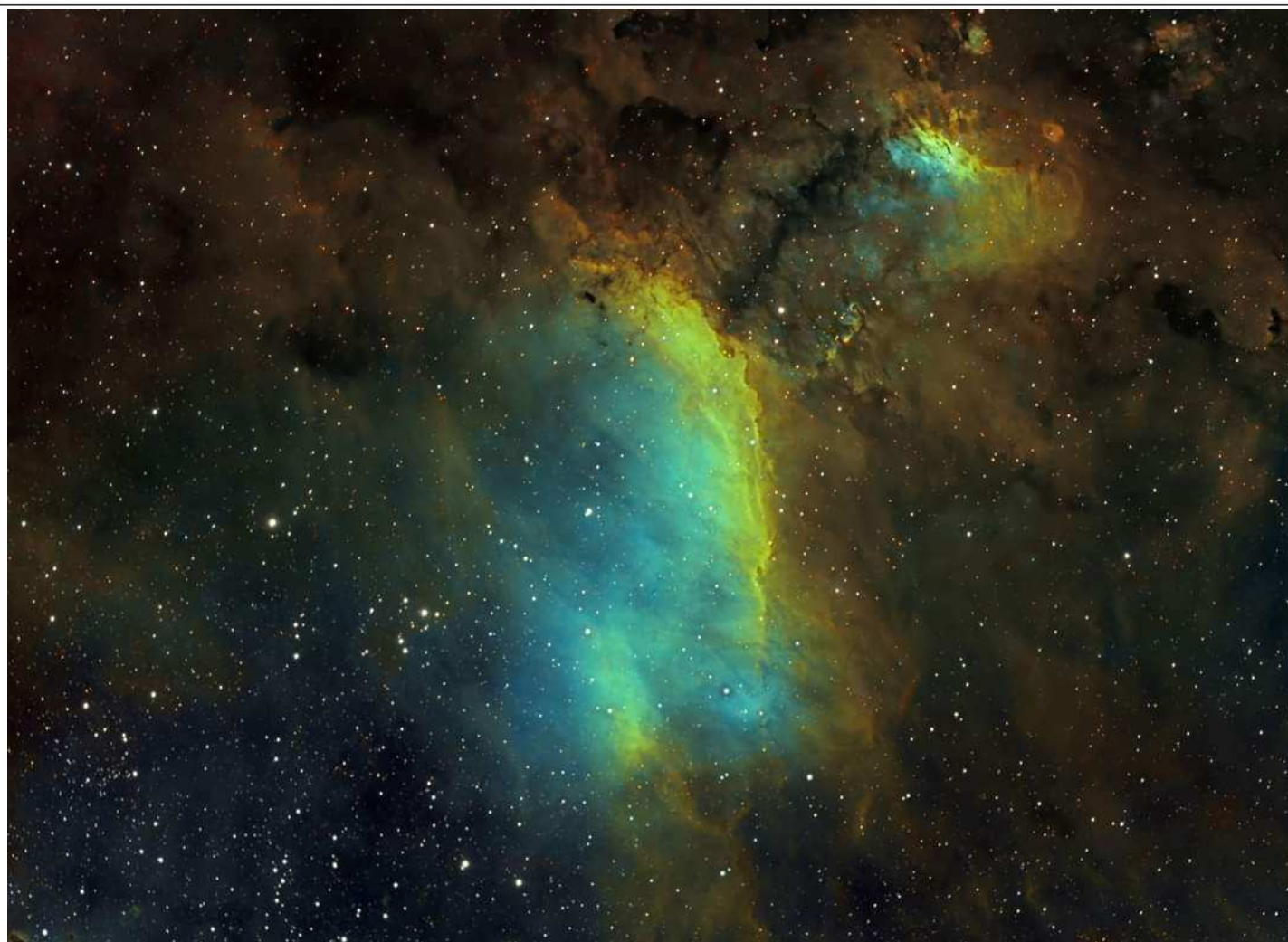
THE JOURNAL OF THE
 MORNINGTON PENINSULA ASTRONOMICAL SOCIETY INC.

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

Vol. XXV, No. 5 (September / October) 2020

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

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



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

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

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

Mornington Peninsula Astronomical Society

facebook

SOCIETY NEWS



Society Meeting June 17th - Due to current COVID-19 restrictions, and therefore limited numbers of members permitted inside the building, if you wish to attend in person you must book by sending an email with your details (include name, arrival and departure times and contact number) to welcome@mpas.asn.au and have it confirmed back to you before you arrive. Alternatively, the meeting will be also streamed live at the link provided below, so please feel free to login and join us.

Basic meeting agenda is as follows: *Kind regards, Nerida Langcake*

Welcome and new MPAS information from Peter Skilton with a couple of slides.

Science of fireworks lecture video.

Tea/coffee break.

Sky for the Month by Mark Stephens.

Pre-recorded segment topic "O R B I T S" by Sky Murphy.

Some short science videos about aphelion/perihelion, floaters and averted vision.

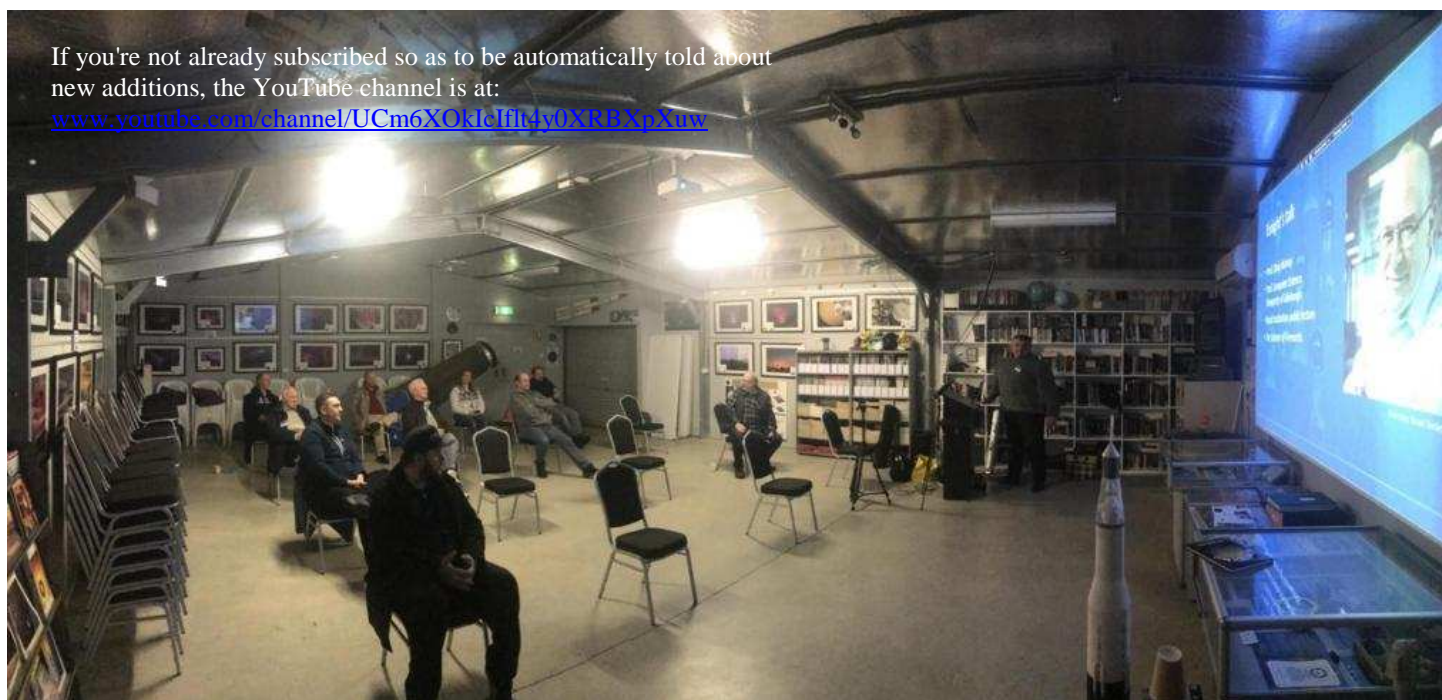
Closure, with a ukulele ditty on video from a young scientist who we're probably going to get for a talk early next year.

Hope you can make it, one way or another...

It will also be on YouTube as usual afterwards.

If you're not already subscribed so as to be automatically told about new additions, the YouTube channel is at:

www.youtube.com/channel/UCm6XOKicIft4y0XR3XpXuw



The Briars evening on 20th June was attended by 12 members under the then limit of 20 for coronavirus restrictions. There was some rain mid-afternoon on the site, but it had cleared up by the time the BBQ was fired up, though jackets were the order of the evening with the temperature being in the low teens. The glass cabinet in reception was restocked, the mushroom cabinets were repopulated with the items from storage, the toilet lock was oiled and the fridge reactivated. The skies mostly cleared as the evening progressed, and some viewing and imaging was done in the main observatory. It was good to see members up and enjoying the site in person after quite a long break, even if it was in fairly wintery conditions. *Regards, Peter Skilton*

Society Meeting AGM July 15th - Due to current COVID-19 restrictions the meeting was held via Zoom video chat.

This year the AGM broke its own speed record of 22 minutes. The meeting saw 18 members in attendance for its first online gathering. First Peter Skilton gave an overview of society progress made during the 2019/2020 cycle. Notable features included:

- Music of the Heavens concert collaboration with Southern Peninsula Concert Band.
- VASTROC and AstroPhotoWorkshop combined.
- SPARC Rosebud Radiofest visit with solar telescope.
- Site improvements e.g. shipping container, mount.
- Defibrillator next door.
- Meetings available on YouTube, with music appearing.
- Range of merchandise expanded.
- Library is coming together well with cataloguing.
- Inaugural Year 10 work experience student at the observatory.
- Cameras and weather station introduced.

Jamie Pole then presented the Treasurer’s Report. Following that was the election of the 2020/2021 Committee, where Nerida Langcake declared all positions vacant and announced the nominations for each committee position. Based on the number of nominations received, no position required a vote from the members present. The 2020/21 Committee was declared elected as shown here. *Regards, Nerida Langcake*

New Committee for 2020 / 2021 (* Life Member)

Peter Skilton *	President
Mark Stephens	Vice President
Nerida Langcake	Secretary
Jamie Pole	Treasurer
Guido Tack	Committee Member / Website
Simon Hamm	Committee Member / Merchandise
Anders Hamilton	Committee Member / Obs. Manager
Trevor Hand	Committee Member / Speaker
Peter Lowe *	Committee Member / Briars Liaison

Members Assisting Committee

Greg Walton *	Newsletter Editor
David Rolfe *	Site Maintenance / Events
Ian Sullivan *	Speaker Organiser

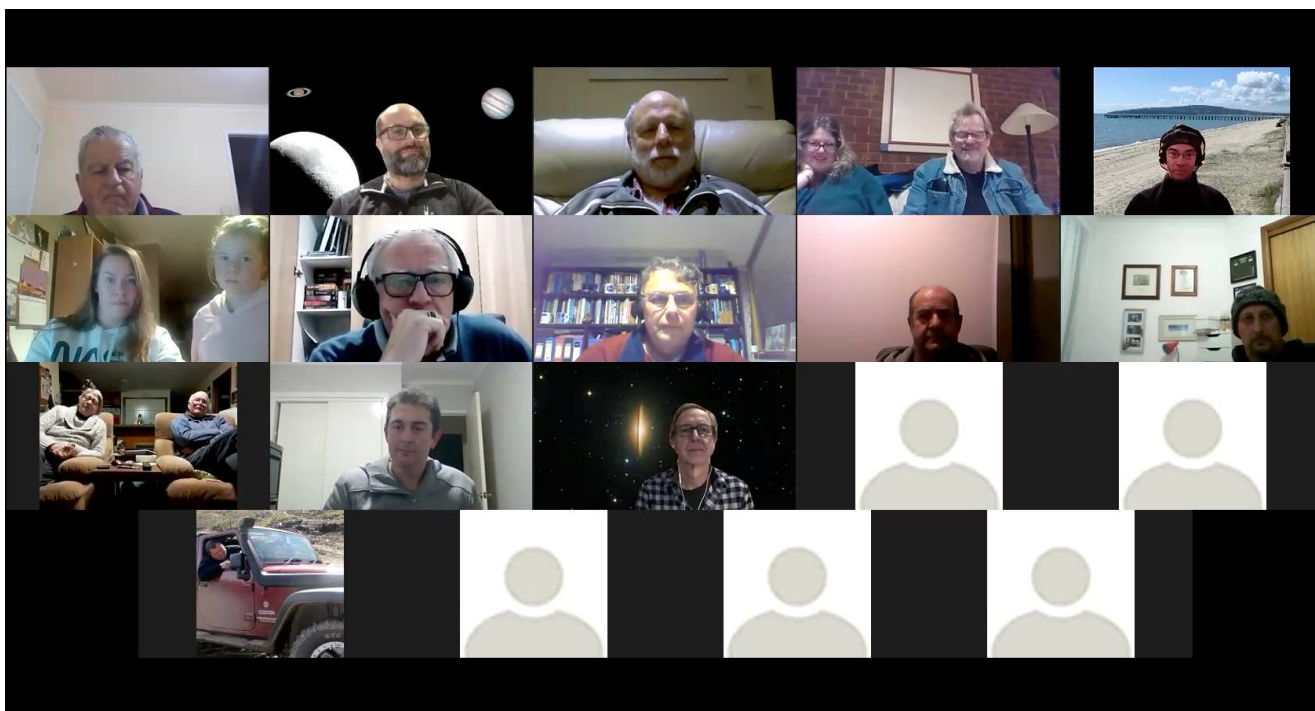
This & the pre-recorded video of the rest of the July meeting are on MPAS www.youtube.com/channel/UCm6XOkIcIfl4y0XRBXpXuw

The Briars Members night on 18th July - Cancelled due to current COVID-19 restrictions

Society Meeting August 19th - Due to current COVID-19 restrictions the meeting was held via Zoom video chat.

The first informal Members Online Zoom chat was hosted by Guido Tack and saw 24 members participating. We enjoyed a presentation by MPAS member Eden White about the Big Bang, which included 70 slides that were shared on the screen as Eden spoke. At the end of the talk many questions were asked and answered. His information was gathered primarily from Dr George Lamenter, Albert Einstein, Wilson & Penzias, E Hubble, S Haking, Dan Hooper, Planck and many others.

After the talk concluded there was general chit-chat amongst the members about telescopes, how we’re all keeping busy, which participant was furthest south (Eden in Phillip Island) and furthest north (Steve Wilkins in Nth Fitzroy). While Anne and Geoff Danne relaxed on their recliners, Mark and Guido quietly displayed some of their LEGO model rockets and ISS. Zoom video filters were discovered and used by Nerida and Piper. Some participants had virtual backgrounds of planets and galaxies, John Cleverdon appeared to be at Dromana Beach, and Guido even had his background set as the bridge of the starship enterprise at one stage. *Regards, Nerida Langcake*



Ganymede Shadow transit report 8:30pm 17th July 2020

Of all the objects in the night sky, it's Jupiter which holds the most eternal fascination for me. The fact that I can watch it over a brief period and see the changes in its cloud patterns and moons as it slowly rotates in front of my eyes always captivates me. But last night it offered up a real treat which I hadn't seen before.

When I turned my scope to it, I immediately noticed two dots just to the north of the North Equatorial Belt which I recognised as a shadow transit and slightly further to the west, the moon responsible for that shadow. This was at about 9:30pm, prior to them crossing Jupiter's central meridian. After referring to Sky Safari, I worked out that I was looking at Ganymede and its shadow cast on the gas giant.

The seeing was mostly quite good, although when the occasional light breeze interrupted the otherwise still night, it would blur details over for a minute or so before things settled down again. Ganymede's shadow was a very conspicuously defined black disk 1.8 arc seconds in width, cast on Jupiter's surface, but my surprise was Ganymede itself. Previously, I've only ever seen a moon of Jupiter as a bright, featureless disk. But last night while in transit, I could see Ganymede as a kind of brownish-grey heterogeneously mottled disk which means that I was definitely glimpsing sub arc second surface detail on the moon. The fact that I could see this detail as opposed to the usual bright featureless disk was, I presume, due to the effects of contrast, being observed against the bright disk of Jupiter as opposed to the usual background of black sky. I could see Ganymede this way until about half an hour before the end of transit where, because of contrast, it disappeared against Jupiter for a while. But as the moon approached Jupiter's western limb and the end of transit, it became visible again as it's usual bright but otherwise featureless disk. This was actually quite striking, because I got the distinct impression of a ball hovering in 3D above its dark shadow on Jupiter. I continued watching while Ganymede and then its shadow popped off Jupiter's disk. Seeing the moon emerge from across Jupiter's disk looked like the planet was slowly giving birth in front of my eyes and as the shadow transit was ending, I could see what looked like a little bite into the planet as the shadow slowly slid off Jupiter's limb. I was using my Celestron C11 at 162x to 233x magnification.

I've included some pictures from Sky Safari which show the event as it was when I started watching it at around 21:30, right up until the shadow transit was ending at around about midnight. **So who else watched this and what did you see?** *Russell Thompson*

Hi Russell, I observed the first half of the transit beginning about 8.30pm, fascinating to see Ganymede leading its shadow. I used a 90mm Takahashi Sky 90 refractor with a Nagler 3.5mm eyepiece giving 143X magnification and manual tracking on the Takahashi SpaceBoy mount. *Mark Hillen*

Hi Russell, you are probably right about the brighter backdrop behind the moon enabling the visibility of features. High contrast with dark background behind a tiny object is not conducive to detailed observation. The seeing must have been very good regardless. I have often observed Jupiter in the past and occasionally there was a moment of spectacular clarity that only lasted a second or two, but granted detailed views of the planet's features. You were indeed lucky to have been granted glimpses of Ganymede's features. There are a few more III and IV satellite transits this year. I must get out and take a look. *Phil Holt*

Hi Russell, yes I watch Ganymede and its shadow transit Jupiter using a 80mm Vixen refractor with 8mm eyepiece. At first I only saw the shadow. I didn't see Ganymede till it reached the centre, both were sitting above the cloud belt making them easy to spot. It's fascinating to see something on another world and that we can predict when it will happen. I noted all the best shadow transits in Scorpius calendar. *Greg Walton*

This is from last night's transit of Ganymede and its shadow across Jupiter. Thanks Greg Walton for the tip! I'm still struggling to get a really clear image. I'm not sure if it's out of focus, or the seeing was bad, or maybe I have to change how I process the images. *Guido Tack*

Watched it with the boys last night as well. *Dave Rolfe*

I just caught the end of it. Gotta check Facebook more frequently! Thanks. Dominic

Hi Russell, Yes, I observed the second – as well as the first, Ganymede transit too Noticeable how different the spacing of moon and shadow had become in just a week. The first transit on the 17th I mistakenly thought was Io, though I couldn't help thinking the shadow looked really big for Io! Upon re-checking, realized it was Ganymede after all. The colour on the moon was terrific first time. Last Friday (24th) seeing conditions weren't as good but a little colour I thought was visible. Great stuff ... Red Spot came into view too, around midnight. Nice! *Cheers, Bruce Renowden*



If you have never seen a shadow transit on Jupiter, there is still time to see other shadow transits over the next 2 months. You will need an 80mm telescope or bigger and an eyepiece which gives a magnification of around 150 times magnification. See calendar in this newsletter for best times to view.

OBSERVATORY UPDATE



With Stage 4 pandemic restrictions now in place for 6 weeks at least, any access (day or night) to the Briars Mt. Martha observatory remains suspended until September 14th earliest, with road vehicle traffic within the Briars now physically blocked.

Note the following:

August, September & October monthly meetings on the 3rd Wednesday evening of the month are pre-recorded videos only. Scheduled visiting speakers in these months are postponed.

August & September members' nights/bbq/working bee at the Briars on the Saturday after the monthly meeting are suspended.

All public nights at the Briars on the 1st Friday evening of the month remain suspended for 2020.

All School, Camp and Scout/Guide nights at the Briars or off-site remain suspended for 2020.

The free MPAS YouTube channel is here: www.youtube.com/channel/UCm6XOKIcIft4y0XRBXpXuW

The videos of the July-October meetings are posted there soon after the scheduled dates.

As always, the safety of our members and those we interact with in the community is our top focus.

Sincerely, Peter Skilton, President

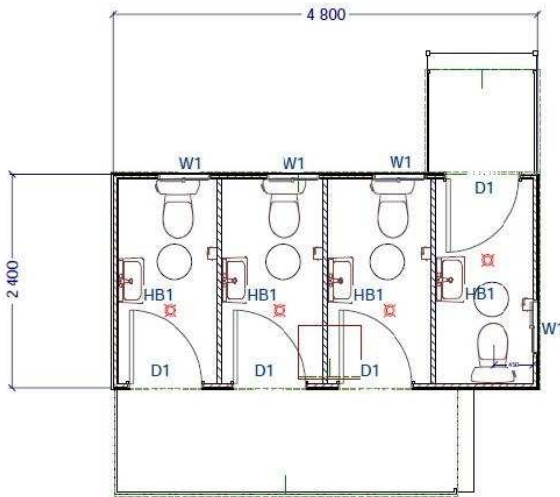
New look for MPAS website, thanks to Guido Tack. <https://www.mpas.asn.au> You may need to refresh your browser. Committee members have been keeping an eye on the MPAS physical site and mowing the grass.

The roll-off roof observatory at the MPAS site has been renamed the **Mt Martha observatory**.

Computers in the warmer room have been upgraded.

MPAS newsletters online - https://drive.google.com/folderview?id=0ByvkvzZGI9g_SUNmZVhkZTFGWTA

Mornington Peninsula Shire Council are planning to install a New Portable Toilet Block at the Briars Eco House. Hopefully MPAS will be allowed to use this facility on our public nights, as we currently use the toilet at the eco house.



★ New Members Welcome ★

Michelle Anderson & Ben Falzon
 Christopher Sheen
 Rob & Georgie Idda
 Paul Lohan
 Keith Gledhill

MPAS SUBSCRIPTIONS 2020

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 2020 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 2020 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.

Click on the link for further information - https://drive.google.com/file/d/0ByvkvzZGI9g_NXZ4cWxHbERTdEE/view?usp=sharing

SOCIETY FEES

- \$50 – Full Member
- \$45 – Pensioner Member
- \$65 – Family Membership
- \$60 – Family Pensioner Membership

See more options on-line



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

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		September / 2020					Red Days indicate School Holidays
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	
Please check MPAS groups.io for the latest Covid-19 restriction before coming to the Briars.		1 Eu shadow 8:18pm F	2 Full Moon	3	4 Io transit 12:20am S Io shadow 1:25am S Io transit 2:37am F Io shadow 3:39am F	5 Mars below the Moon Io shadow 7:54pm S Io shadow 10:09pm F	
6 Fathers day Moon at 405,607km Ga shadow 12:32am S Ga shadow 3:52am F	7	8 Eu shadow 8:08pm S Eu transit 8:42am F Eu shadow 10:54pm F	9	10 Last Quarter Mars stationary	11 Mars starts to move in retrograde Io shadow 3:18am S	12 Io transit 8:40pm S Io shadow 9:47pm S Io transit 10:54pm F Ga transit 11:48pm S	
13 Io shadow 12:04am F Ga transit 3:07am F	14 Venus right of the dawn Moon Ca transit 9:09pm F	15 Eu transit 8:23pm S Eu shadow 10:44pm S Eu transit 11:07pm F	16 Society Meeting 8pm Eu shadow 1:30am F	17 New Moon	18 Moon at 359,082km	19 Members night Mercury left of Moon Io transit 10:30pm S Io shadow 12:43pm S	
20 Io transit 12:45am F Io shadow 1:58am F	21	22 Eu transit 10:53pm S	23 Eu shadow 1:20am S Eu transit 1:38pm F Eu shadow 4:09am F	24 First Quarter	25 Jupiter below the Moon	26 Saturn below the Moon	
27 Io transit 12:23am S Io shadow 1:39am S	28 Io shadow 8:08pm S Io transit 9:07pm F Io shadow 10:23pm F	29	30 Eu transit 1:23am S Eu shadow 3:57am S Eu transit 4:11am F Ca transit 10:51pm S				

Monthly Events

Note - NO Public night for 2020

Society Meeting - 8pm to 10pm on the 16th Pre-recorded video

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

Mars starting to rise before 10pm

Jupiter's moons and shadow transits still visible, see times in Brown font and moon code.

<p>Jupiter's moon code Io = Io Eu = Europa Ga = Ganymede Ca = Callisto S = start F = finish</p>

CALENDAR		October / 2020					Red Days indicate School Holidays
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	
Mars starting to rise before 8pm				1	2 Full Moon Mars below the Moon	3 Venus near Regulus Mars above Moon Eu shadow 8:04pm F	
4 Daylight Savings Starts Moon at 406,321km	5 Io transit 9:47pm S Io shadow 11:04pm S Io transit 11:59pm F	6 Io shadow 1:17am F	7 Mars at closest distance to earth 22.45 arc minutes	8	9	10 Last Quarter Eu shadow 8:52pm S Eu transit 9:04pm F Eu shadow 11:41pm F	
11 Ga shadow 9:32pm S	12 Ga shadow 12:59am F Io transit 11:41pm S	13 Io shadow 12:58am S Io transit 1:56am F	14 Mars at Opposition Venus right of dawn crescent Moon Io shadow 9:41pm F	15	16	17 New Moon Moon at 356,912km Eu shadow 11:30pm S Eu transit 11:42pm F	
18 Mercury left of the Moon Eu shadow 2:17am F	19 Ga shadow 1:34am S	20	21 Society Meeting 8pm Io shadow 9:23pm S Io shadow 11:36pm F	22 Scorpius Deadline Saturn & Jupiter above the Moon	23 First Quarter Saturn & Jupiter below the Moon	24 Members night Eu transit 11:36pm S	
25 Eu shadow 2:07am S	26 Ga transit 12:28am S	27	28 Io transit 10:05pm S Io shadow 11:18pm S	29 Mars below the Moon Io transit 12:20am F Io shadow 12:32am F	30	31 Halloween	

Monthly Events

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

NO Public night for 2020

Society Meeting - 8pm to 10pm on the 21st Pre-recorded video

Members Night - 6pm on the 24th @ the Briars Suspended

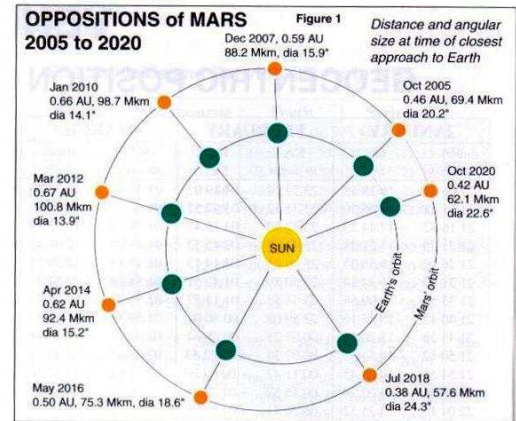
THE BRIARS SKY

By Greg Walton



Now is the best time to view Mars, as on the 7th October it will be at its closest the Earth. Mars moves at 24.12 kilometres per second and takes 686.98 days to complete one orbit of our sun, so it takes 2.3 years for Earth to catch up with Mars. As we overtake Mars on October 14th, it will be a mere 62,100,000 km from us, or about 160 times further away than the Moon.

If you watch Mars over many months you will see it speeding across the starry background. I like to go outside at least once a week to note where Mars is and make a mental note. As we get closer to Opposition, Mars seems to stop and then go backward across the sky; this is called retrograde. Retrograde movement happens as we overtake Mars on the inside lane as we travel around the Sun. At opposition, Mars will be at -2.6 magnitude, that's brighter than any star in the sky ... so will be hard to miss. Though the telescope, Mars will have a diameter of 22.6 minutes of arc, that's about 90 times smaller than the moon. Mars has a diameter of 6,786 km - about half that of Earth. Its length of day is 24.62 hours, similar to Earth, so if you look at Mars the same time every night it will look very similar to the day before! It would therefore take about a month to see the whole surface of Mars. Mars has 2 small moons - Phobos and Deimos, which can be viewed when they are at their greatest distance away, with a specially modified eyepiece.

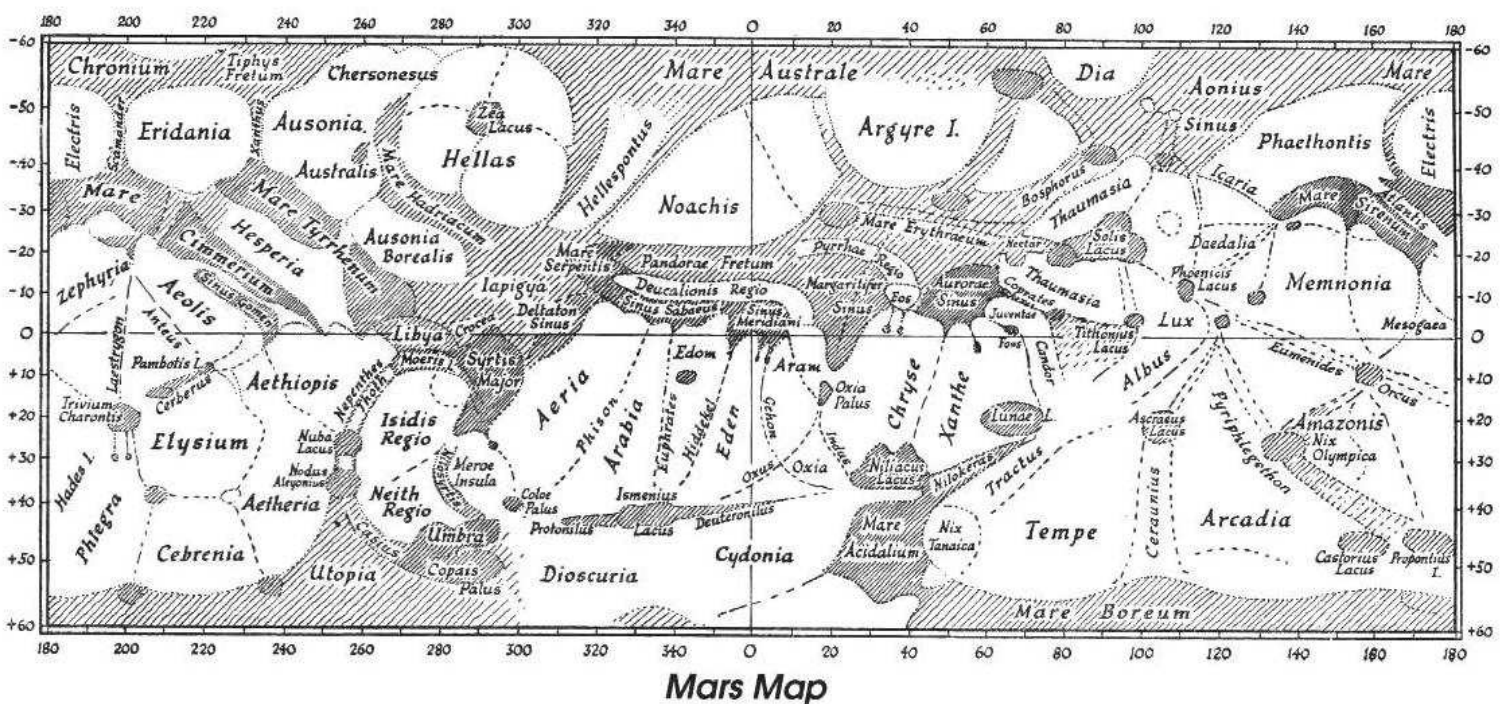
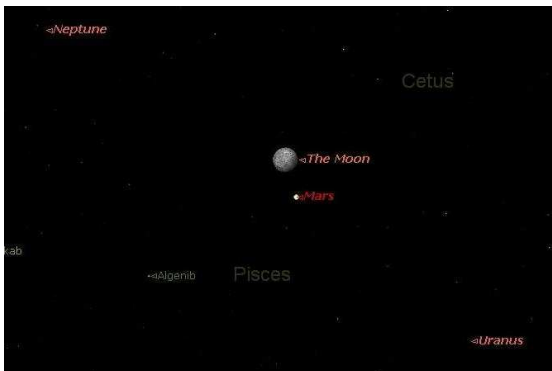


I have not had much luck in photographing Mars, I found it much easier to draw. You will need a telescope with a magnification of 150 times and Mars will need to be more than 30 degrees above the horizon for the best seeing conditions. I often stop my 12 inch Dobsonian telescope down to a 4 inch which helps greatly see detail on its surface. You can just place a piece of cardboard over the front of the telescope, with the 4 inch hole towards the bottom (as heat rises). Also waiting for the telescope to cool helps. I find when viewing the planets its best to sit on a chair and not to touch the telescope. Mars



will show dark patches on its surface and if you viewed over some months before Opposition, you will see a bright white patch on one of the poles. This is frozen carbon dioxide. Use the map on this page to see if you can identify any features.

On the 29th October Mars is just below the Moon and between Neptune and Uranus. Many people don't realize you can see Uranus with a pair of binoculars. A telescope will show its greenish disc. For Neptune, being harder to find at only 7.8 magnitude, you will need a telescope ... It will look like a blurry star with a touch of blue.



Perseverance: NASA's Mars 2020 rover

NASA's boldest-ever Mars rover is on its way to the Red Planet. The car-size Perseverance rover launched atop a United Launch Alliance Atlas V rocket from Florida's Cape Canaveral Air Force Station on July 31, kicking off a nearly seven-month cruise to the Red Planet. After touching down inside the 45 kilometre wide Jezero Crater in February 2021, Perseverance will do things no Mars rover has ever done - hunt for signs of life, collect samples for future return to Earth and deploy a miniature helicopter, to name a few.

The launch did not go perfectly smoothly. Perseverance, the centrepiece of NASA's \$2.7 billion Mars 2020 mission, entered a protective "safe mode" shortly after lift-off, apparently because part of the spacecraft got unexpectedly cold when it passed through Earth's shadow. All temperatures are now back to normal, NASA officials said.

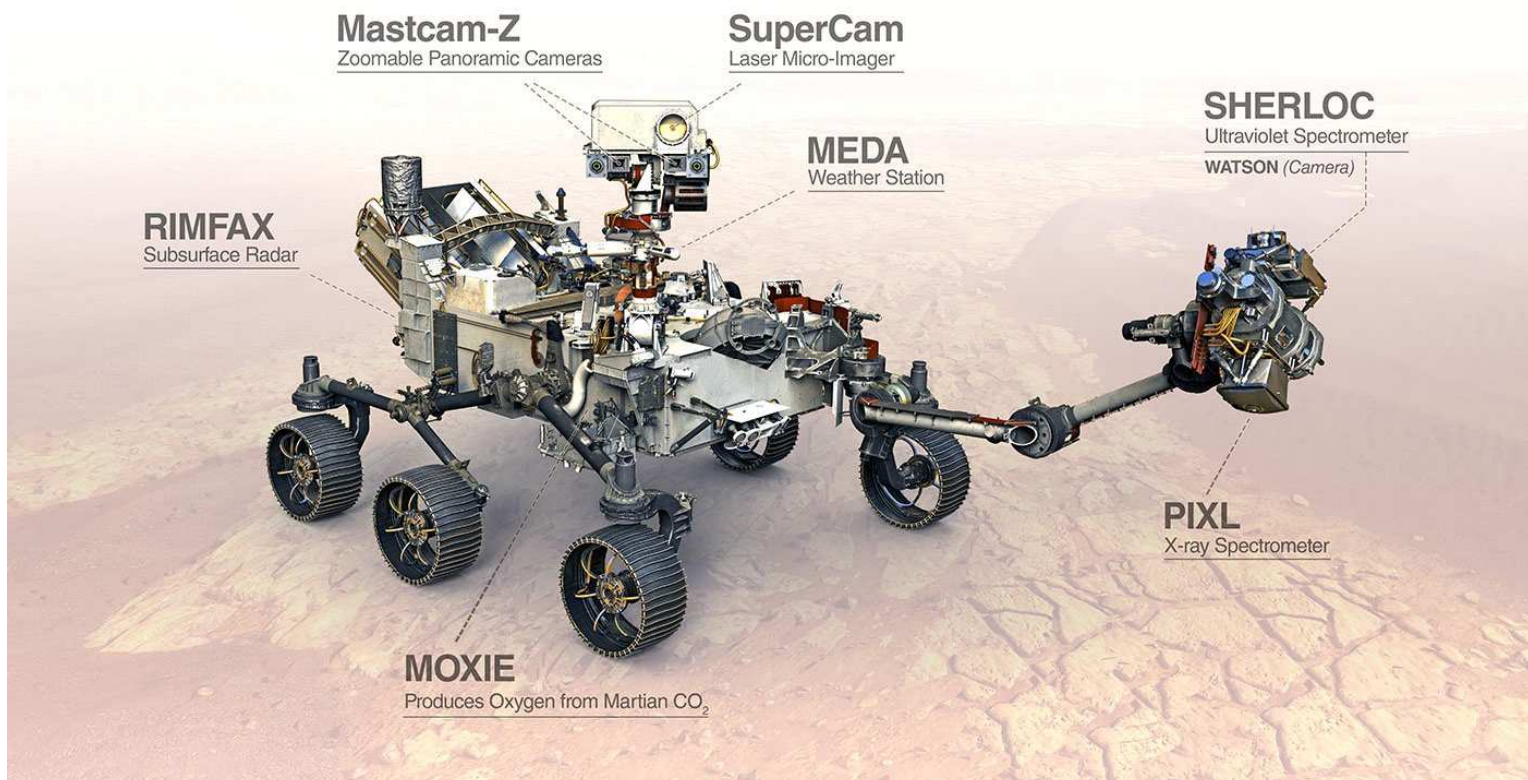
One of the rover's key tasks is to collect and cache at least 20 rock and soil samples, which will be selected on the basis of their astrobiological promise and potential to paint a picture of Jezero through time.

This material will be recovered and brought to Earth as early as 2031 by a joint NASA-European Space Agency campaign, giving scientists their first-ever looks at pristine pieces of another planet.

Though Mars 2020 is primarily a science mission, it will also test out a variety of technologies that may pave the way for ambitious exploration efforts in the future. For example, one of Perseverance's seven instruments, the Mars Oxygen In-Situ Resource Utilization Experiment (MOXIE), will generate oxygen from the Red Planet's thin, carbon dioxide-dominated atmosphere. Such gear, if scaled up, could help astronauts explore the Martian surface, a goal that NASA wants to achieve in the 2030s. The rover also carries a ground-penetrating radar instrument that will be able to detect subsurface water ice, another resource that human pioneers could exploit on the Red Planet.

And Perseverance has a traveling companion, a 1.8 kilograms helicopter called Ingenuity that will make the journey to Mars on the rover's belly. After Perseverance rolls upon a suitable Martian airfield, Ingenuity will deploy and attempt a few short flights - the first ever by a rotorcraft on a world beyond Earth. Helicopters could someday serve as scouts on Mars and other distant worlds, helping mission controllers direct rovers to areas of scientific interest, he added

Mars 2020 will feature other firsts as well, some of which will bring the Red Planet closer to home for people around the globe. For example, the mission sports two microphones, one of which will capture the sounds of the rover's wheels crunching through the Martian dirt, its drill boring through Red Planet rock and generally going about its scientific business. The other microphone will record Perseverance's landing on February 18 2021, which will end when a rocket-powered sky crane lowers the big rover onto Jezero's floor with cables. (Curiosity, whose chassis strongly resembles that of Perseverance, proved out this sci-fi touchdown strategy in August 2012). Some of Perseverance's 23 cameras will memorialize the touchdown as well, capturing high-resolution photos and videos.



SETI@Home - If You Don't Look, You Won't Find. Unless They Find You First.

I waded today through thousands of messages on the Berkeley University's blogs on the subject, after John Cleverdon tipped me off that he'd read that SETI@Home was closing down after finding no evidence of ET.

An ongoing criticism of searching for ET radio signals has always been that it's based on the assumption that an alien civilisation would broadcast at radio wavelengths and not use laser light or other frequencies, or indeed might use some other physical mechanism we on Earth haven't yet discovered (perhaps like a Star Trek dimensional concept of communicating via subspace). But you have to start somewhere, even if you might fail in the search.

I remember installing SETI@Home way back last millennium, when Windows 98 was the state of the art and USB drives were still a laboratory test novelty, and no doubt many members did the same.

The project itself collects raw radio signals from both the giant Arecibo telescope in Puerto Rico and the US Green Bank telescope in West Virginia, often piggy-backing on listening time being done by other researchers anyway, so as to keep costs down. Professional telescope time is mega-expensive and hotly contested.

Unfortunately, that restricted it only to searching the skies visible to these telescopes in the northern hemisphere. Data from the Parkes radio telescope in Australia, which would cover southern skies, was originally going to be included as well, but never eventuated into SETI@Home in practice. Of the sky area that could be observed, every "pixel" has been re-listened to many times with the assumption being that an intelligent signal would be present across time and not just a once-off.



On March 31st this year, the SETI@Home project was mothballed and stopped sending new packets of telescope data to volunteers in homes around the world.

A few million people had contributed up to that point by using their home computers to sift through data packets of the raw telescope signals, looking for anything that was above the noise and hence was a possible candidate radio station originating extraterrestrially.

The global project started in 1999, using donated computer idle time when the home user wasn't using their computer to its capacity (such as when the screen saver comes up), and millions of people signed up for this citizen science patrol activity and dutifully had their electricity bill and data download/upload costs increased a bit as a result.

Despite what some have said on the internet recently, SETI@Home isn't closed and dead, but rather has been mothballed for the public so it could easily restart again at a later date.

Most people who have heard of the project think that their computer was going to detect the signal itself, but that is incorrect and was a misleading perception. All their efforts in fact were at identifying candidates with a first rough pass, for follow up. Initially this was hoped to be done in parallel soon after, but the central computing power, storage, and staff levels available to do the follow up all proved not up to the magnitude of the task. But the telescopes kept relentlessly producing new data, and users around the world kept eagerly sifting them and sending back their findings, which then grew and grew and grew centrally.

Unfortunately, funding levels for SETI@Home were insufficient to allow it to be upgraded and staffed to do a quick turnaround analysis, so an unannounced Plan B decision was made many years ago to break the global project into smaller projects and run the search in sequence instead, rather than in parallel. This, of course, is disappointing for the many contributors at home, but entirely practical in that funding circumstance. So it kept collecting and sifting initial data and storing data for 21 years as Step 1.

Step 2 in the sequence was to take all that backlog of data and search for genuine radio signal beacons at each location and importantly across time, looking for patterns. For this it was decided to halt further data collection so the entire dataset could be locked and processed together instead. This is what is now called project Nebula, and the way its software was written (to save money at the time) does not allow for distributed parallel computing by volunteers around the world. Nebula therefore takes over where SETI@Home (Step 1) has hibernated.

So no-one should be surprised that ET hasn't been found in the last 21 years, because SETI@Home hasn't really been looking yet for intelligent signals!

Despite what the media has led everyone to think over the years and the researchers no doubt also kept quiet about - so as not to dissuade the public from participating with everyone in the public still left thinking that they'll perhaps have their own Jodie Foster moment - like in the movie Contact, that was never going to be under Plan B.

SETI@Home has therefore only been collecting de-noised data and finding possible radio sources in each packet, and there have been billions and billions of candidates detected to date in Step 1 for follow-up data analysis in Step 2 and 3.

So Step 2 Nebula is about trying to understand if a signal is a random fluke, a known or unknown natural phenomenon, man-made, or is something with some remote ET intelligence behind it.

Step 3 is then Deciphering any ET signal that still appears of interest after Step 2.

While Step 1 doesn't produce any scientific publications, Step 2 might, and Step 3 definitely would, so the University researchers are now all working on Step 2. Publish or perish is the mantra in universities these days.

So, why couldn't Step 1 still continue in parallel, especially if most of the southern skies haven't been recorded?
Why call a halt on March 31st?

It comes down to what was able to be funded at early development stage, and the cheaper option was to code everything to be done in sequence. The project team initially tried to design and build it for parallel running on the BOINC platform (project Nitpicker), but didn't have the staff to debug it and support it successfully, so eventually gave up on that option and retreated to a simpler sequential solution.

The estimated need was just \$1 million USD per year (some years ago though), which in context is probably what one McDonald's burger shop turns over in a week or two.

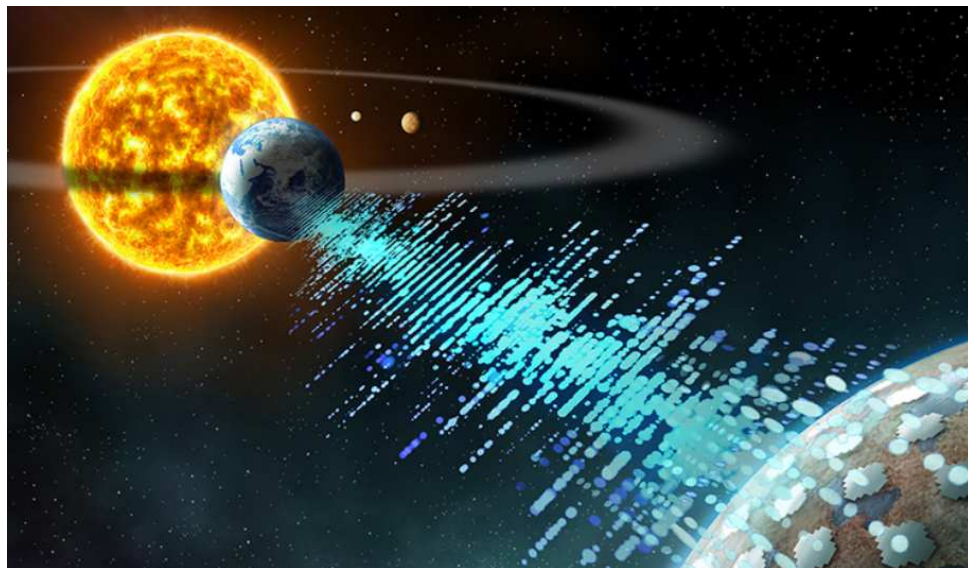
So the search for an ET signal will now continue behind the scenes using the gathered mountain of data up to March 31st and a supercomputer at Berkeley, at least for the northern skies. Perhaps something will be found and announced in coming months.

If enough funding arises in the future, say in conjunction with cosmology and pulsar researchers, then Step 1 (SETI@Home) can be re-started with increased storage capacity, and home volunteers could be re-engaged. For now though, current users of SETI@Home are being directed instead to use their spare computer CPU cycles on other science projects already underway on the Berkeley University's BOINC platform.

So could that be done immediately instead? The central team say, yes, if there's a billionaire's kid running SETI@Home and is able to convince the parents to donate, much like on the movie Contact. But that hasn't happened yet. Seems that's also an unbelievably elusive thing to hunt down.

Of course, I hear you say, another possible reason for suddenly stopping SETI@Home earlier this year might be that they've found ET already; but the government just isn't letting the public know for some reason.

Regards, *Peter Skilton*



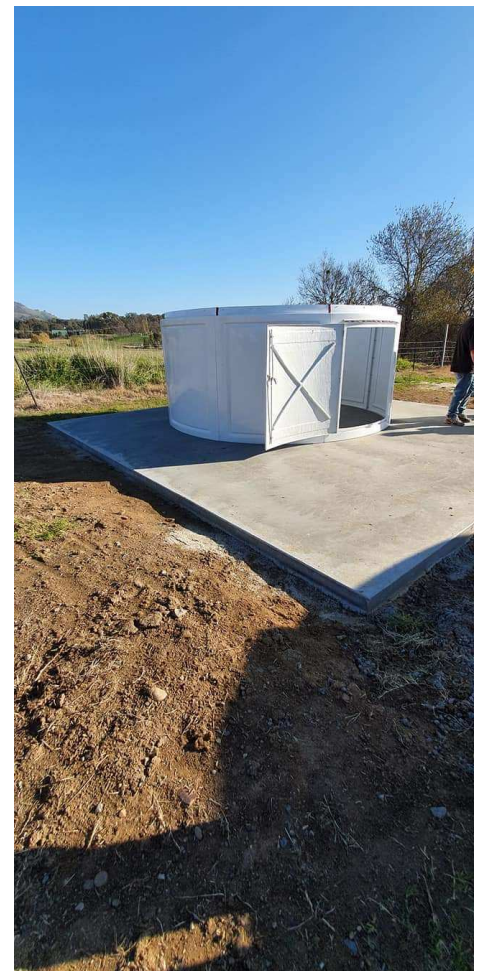
EXCITING COMMUNITY ANNOUNCEMENT! **New Astronomy Club in North East Victoria.**

We would like to announce to the community of Tallangatta and surrounding districts that we now have a world class observatory and telescope right here in town! This has been a monumental project that was initially set back by the fires and then Covid-19. The initial telescope and observatory were to be moved from Towong on the day of the fires, but was unfortunately destroyed by the fire. The club has worked hard to see this come to fruition and is now excited to share this with the community. Tallangatta and District Astronomy Club (TADAC) now have a permanent base for everyone to enjoy the night sky, as well. We would like to make a special mention to Dr Richard Barkas who has been a major driving force to make this possible for our community.

OUR FIRST PUBLIC VIEWING NIGHT WILL BE ON SATURDAY 25TH OF JULY AT 6.30PM!

Memberships to TADAC will be available soon. <https://mathewshields76.wixsite.com/tadac>

Please come down and say hello and more importantly have a look! We really look forward to sharing the observatory with everyone!



Watching the Marvel movies in chronological order

During my time spent at home for the “Stay at Home COVID-19 Restrictions” I decided to have a movie marathon watching all the Marvel Cinematic Universe (MCU) movies again, but this time in chronological order.

Starting with Captain America and currently closing with Spider-Man: Far From Home. The value of watching the Marvel movies in this order is you will see important MCU events play out as they happened. You'll follow the Tesseract from Captain America's time, up until the coming of The Avengers, plus you'll see Carol Danvers meet Nick Fury in the '90s and learn how he came to wear an eye patch.

I know some of you are already MCU fans, and for those who don't know where to start, here is the chronological viewing order of the science fiction, superhero, action, adventure Marvel movies. I highly recommend watching them in this order.

1. Captain America: The First Avenger (takes place during WWII)

During World War II, after being deemed unfit for military service, Steve Rogers volunteers for a top-secret research project in an experiment that transforms his weak body into Captain America, a super hero dedicated to defending America's ideals and leading the fight for freedom as the ultimate weapon against evil. When a terrifying force threatens everyone across the globe, the world's greatest soldier wages war on the evil HYDRA organisation headed by Johann Schmidt aka Red Skull to defend his nation.

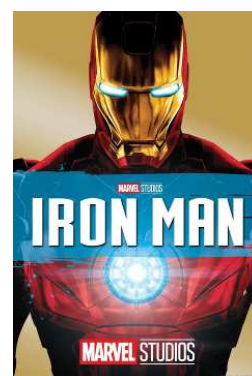


2. Captain Marvel (takes place in 1995)

Captain Marvel takes you on an adventure from the 1990's, tracing the path of Carol Danvers as she becomes one of the most powerful heroes in the universe. When a galactic war reaches Earth, Vers, a Kree warrior, gets separated from her team and is stranded, and there she meets young agent Nick Fury, a S.H.I.E.L.D. agent, at the centre of a maelstrom, leading to her ultimate destiny as an Avenger!

3. Iron Man (takes place in 2010)

Tony Stark, a billionaire industrialist and genius inventor, is kidnapped and forced to build a devastating weapon. Instead, using his intelligence and ingenuity, Tony builds a high-tech suit of armour and escapes captivity. When he uncovers a nefarious plot with global implications, he dons his powerful armour and vows to protect the world as Iron Man.



4. Iron Man 2 (takes place after Iron Man)

With the world now aware that he is Iron Man, billionaire inventor Tony Stark faces pressure from all sides to share his technology with the military. He is reluctant to divulge the secrets of his armoured suit, fearing the information will fall into the wrong hands. With Pepper Potts and “Rhodey” Rhodes by his side, Tony must forge new alliances and confront a powerful new enemy, all the realising that not only is there a madman out to destroy him, but the very technology designed to save his life is slowly killing him.

5. The Incredible Hulk (time unspecified, pre-Avengers)

Bruce Banner becomes the Hulk as an unwitting pawn in a military scheme to reinvigorate the "Super-Soldier" program through gamma radiation. Banner goes on the run from the military while attempting to cure himself of the Hulk.



6. Thor (takes place six months before Avengers)

This epic adventure spans the Marvel universe from present-day Earth to the cosmic realm of Asgard. At the centre of the story is The Mighty Thor, a powerful but arrogant warrior whose reckless actions reignite an ancient war. As a result, Thor's father Odin banishes his son to Earth where he is forced to live among humans. Stripped of his divine power, he joins the other members of S.H.I.E.L.D to save earth from a dark force. Thor must make preparations to stop his evil brother Loki from dethroning Odin, seizing power and imposing his villainous rule on all of Asgard. When the darkest forces are sent to invade Earth, Thor learns what it takes to be a true hero.

7. The Avengers (takes place in 2012)

Nick Fury, Director of the international peacekeeping agency known as S.H.I.E.L.D., finds himself in need of a team to pull the world back from the brink of disaster. The Avengers – Iron Man, The Incredible Hulk, Thor and Captain America – assemble alongside Black Widow and Hawkeye to battle an unexpected enemy: the Asgardian God Loki, who commands a powerful Chitauri army threatening global safety and security.



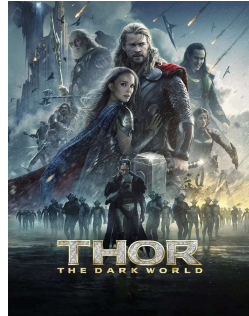


8. Iron Man 3 (takes place six months after The Avengers)

Iron Man 3 pits brash-but brilliant industrialist Tony Stark/Iron Man against an enemy whose reach knows no bounds. When Stark finds his personal world destroyed at his enemy's hands, he embarks on a harrowing quest to find those responsible. This journey, at every turn, will test his mettle. With his back against the wall, Stark is left to survive by his own devices, relying on his ingenuity and instincts to protect those closest to him.

9. Thor: Dark World (post-Avengers, pre-Ultron)

Thor: The Dark World continues the adventures of Thor, the Mighty Avenger, as he battles to save Earth and all the Nine Realms from a shadowy enemy that predates the universe itself. In the aftermath of Thor and also The Avengers, Thor fights to restore order across the cosmos... but an ancient force led by the vengeful Malekith returns to plunge the universe back into darkness. To defeat an enemy that not even Odin and Asgard cannot withstand, Thor sets out on his most dangerous and personal journey yet, forced into an alliance with the treacherous Loki to save not only his people and those he loves... but our universe itself.



10. Captain America: Winter Soldier (post-Avengers, pre-Ultron)

After the cataclysmic events in New York with The Avengers, Steve Rogers, aka Captain America, is living quietly in Washington DC and trying to adjust to the modern world. But when a S.H.I.E.L.D. colleague comes under attack, Steve becomes embroiled in a web of intrigue that threatens to put the world at risk. Joining forces with Black Widow, Captain America struggles to expose the ever-widening conspiracy while fighting off professional assassins sent to silence him at every turn. When the full scope of the villainous plot is revealed, Captain America and Black Widow enlist the help of a new ally, the Falcon. However, they soon find themselves up against an unexpected and formidable enemy – the Winter Soldier.

11. Guardians of the Galaxy (sometime in 2014)

An action-packed, epic space adventure, Guardians of the Galaxy expands the MCU into the cosmos, where brash adventurer Peter Quill finds himself the object of an unrelenting bounty hunt after stealing a mysterious orb coveted by Ronan, a powerful villain with ambitions that threaten the entire universe. To evade the ever-persistent Ronan, Quill is forced into an uneasy truce with a quartet of disparate misfits: Rocket, a gun-toting raccoon; Groot, a tree-like humanoid; the deadly and enigmatic Gamora; and revenge-driven Drax the Destroyer. But when Quill discovers the true power of the orb and the menace it poses to the cosmos, he must do his best to rally his ragtag rivals for a last, desperate stand – with the galaxy's fate in the balance.



12. Guardians of the Galaxy Vol. 2 (after Guardians)

Guardians of the Galaxy Vol. 2 continues the team's adventures as they traverse the outer reaches of the cosmos. The Guardians must fight to keep their newfound family together as they unravel the mystery of Peter Quill's true parentage. Old foes become new allies, and characters from the classic comics come to their aid as the MCU continues to expand.

13. Avengers: Age of Ultron (takes place in 2015)

Good intentions wreak havoc when Tony Stark unwittingly creates Ultron, a terrifying A.I. monster who vows to achieve "world peace" via mass extinction. Now Iron Man, Captain America, Thor and The Hulk – alongside Black Widow, Hawkeye and Nick Fury – must reassemble to defeat Ultron and save mankind... if they can.



14. Ant-Man (takes place in 2015)

The next evolution of the MCU brings a founding member of The Avengers to the screen for the first time with Ant-Man. Armed with the astonishing ability to shrink in scale but increase in strength, master thief Scott Lang must embrace his inner hero and help his mentor, Dr. Hank Pym, protect the secret behind his spectacular Ant-Man suit from a new generation of towering threats. Against seemingly insurmountable obstacles, Pym and Lang must plan and pull off a heist that will save the world.

15. Captain America: Civil War (post-Ultron, pre-Infinity War)

Captain America: Civil War finds Steve Rogers leading the newly formed team of Avengers in the continued efforts to safeguard the humanity. But after another incident involving the Avengers results in collateral damage, political pressure mounts to install a system of accountability, headed by a governing body to oversee and direct the team. The new status quo fractures the Avengers, resulting in two camps – one led by Steve Rogers and his desire for the Avengers to remain free to defend humanity without government interference, and the other following Tony Stark's surprising decision to support government oversight and accountability.





16. Spider-Man: Homecoming (post-Civil War, pre-Infinity War)

Spider-Man begins to navigate his new identity as the web-slinging superhero under the watchful eye of his mentor Tony Stark. Peter Parker tries to stop the Vulture from selling weapons made with advanced Chitauri technology while trying to balance his life as an ordinary high school student.

17. Doctor Strange (takes place in 2016)

From Marvel Studios comes the story of the world-famous neurosurgeon Dr. Stephen Strange, whose life changes forever after a horrific car accident robs him of the use of his hands. When traditional medicine fails him, he's forced to look for healing, and hope, in a mysterious enclave known as Kamar-Taj. He quickly learns that this is not just a centre for healing... it's also the front line of a battle against unseen dark forces bent on destroying our reality. Before long, Strange, armed with newly acquired magical powers, is forced to choose whether to return to his old life or leave it behind to defend the world as the most powerful sorcerer in existence.



18. Black Panther (takes place in 2017)

After the death of his father, the king of Wakanda, young T'Challa returns home to the throne and take his rightful place as king. But when a powerful enemy appears, T'Challa's mettle as king – and Black Panther – is tested as he's drawn into a formidable conflict that puts the fate of Wakanda and the entire world at risk. Faced with treachery and danger, he must release the full power of Black Panther to defeat his foes and secure the safety of his people and their way of life.



19. Thor: Ragnarok (post-Ultron, pre-Infinity War)

The Mighty Thor is imprisoned on the other side of the universe... without his mighty hammer. He's in a race against time to get back to Asgard to stop Ragnarok, the cataclysmic destruction of his home world and the end of Asgardian civilisation at the hands of an all-powerful new threat, the ruthless Hela. But first, he must survive a deadly gladiatorial contest that pits him against his former ally and fellow Avenger – the Incredible Hulk.



20. Avengers: Infinity War (takes place in 2017)

An unprecedented cinematic journey ten years in the making and spanning the entire MCU, Avengers: Infinity War brings to the screen the ultimate, deadliest showdown of all time. The Avengers and their Superhero allies must be willing to sacrifice all in an attempt to defeat the powerful Thanos, before his blitz of devastation and ruin puts an end to the universe.



21. Ant-Man and The Wasp (ambiguous, but fits nicely between IW and Endgame)

Scott Lang grapples with his choices as both a Superhero and a father. As he struggles to balance his home life with his responsibilities as Ant-Man, he's confronted by Hope van Dyne and Dr. Hank Pym with an urgent new mission. Scott must once again put on the suit and learn to fight alongside the Wasp as they join forces to uncover secrets from the past.



22. Avengers: Endgame (starts in 2017, finishes in 2022)

This epic conclusion to the Infinity Saga! This dramatic showdown pits the Avengers against the universe's most powerful villain, Thanos. After devastating events wiped out half the world's population and fractured their ranks, the remaining heroes struggle to move forward. But they must come together to restore order and harmony in the universe and bring their loved ones back.



23. Spider-Man: Far From Home (post-Endgame)

Following the events of Avengers: Endgame, Spider-Man must step up to take on new threats in a world that has changed forever. As Spider-Man, a beloved superhero, Peter Parker faces four destructive elemental monsters while on holiday in Europe. Soon, he receives help from Misterio, a fellow hero with mysterious origins.

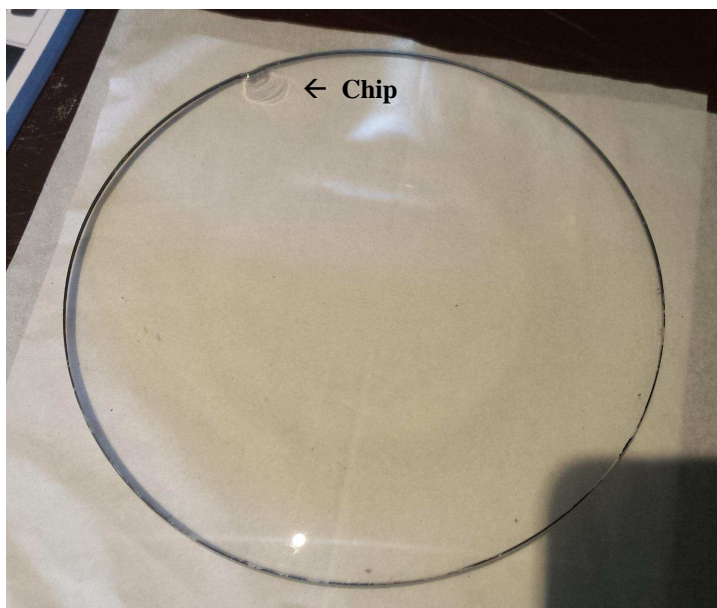


When 2020 and 2021 Marvel movies like Black Widow and The Eternals are finally released, this MCU timeline will be updated. Black Widow, for example, is definitely set after Captain America: Civil War, but with its release date delayed until at least November 2020, it's been left off for now.

By Nerida Langcake

Building a 6-inch refractor on a budget. *By Greg Walton*

A while ago, I picked up a old German made camera lens cell, as shown at right. It has the markings **1000mm Astro Berlin F6.6 Fernbildlinse**. I Googled fernbildlinse which means long distance lens. The objective lens has lots of fine scratches and a thumbnail size chip on the edge, see below. It's a doublet cell, so has a thick flint lens, which looked in much better order, which will go behind the objective; see below right. The aluminium housing looked like it had been dropped many times in its life as its edges are dented in several places. Also the lens retaining rings had been broken - looked like someone had taken to it with a hammer and chisel! The housing had 3 layers of paint which I removed with paint stripper. I had thought ... "One day I will do something with this lens", so due to the Covid-19 lock down, now is that time.



How long will this telescope need to be? I placed the lens on a bench pointing at a distant tree and held a 30mm eyepiece by hand about 1 metre behind the lens and to my surprise the tree came into focus. So now knowing the focal length, I would need a piece of tube about 1000mm long. I planned to use an old focuser I had with a 2 inch diagonal, which had a total length of 200mm. The tube would need to be 800mm long, rather short for a 6-inch refractor. The lens is 170mm in diameter, I thought I could use a 150mm-diameter aluminium tube, but found I could only buy 6.5 metres at \$200. Then while at the hardware store, I found 152mm ID plastic pipe at \$20 per metre and thought that would do the job, as I didn't want to spend a heap of money if the lens turned out to be bad ... I machined a steel ring to fit over the plastic pipe and cut a thread to suit the lens cell. Then I made a plate to fit the other end of the plastic pipe and bored a hole through to hold the focuser. I also made a new retaining ring with a 6 inch internal diameter, which helps cover the chip in the objective lens and it was pointless making the inside diameter bigger as the plastic pipe was only 6 inches / 152mm on the inside.

Next was to find the balance point and bolt on a dovetail and carry handle / finder mounting plate which I made from aluminium. I made a set of internal baffles 5, 4, 3 & 2 inch from very thin aluminium; I made them a neat fit so I could move them back and forth till all the edges lined up when looking along them. Painted matt black along with the plastic tube, then glued the baffles in place. Refractors need baffles to stop light from bouncing around inside the telescope; without baffles, stray light would make its way to the eyepiece degrading the view.



This refractor will need some sort of dew control. I could buy a dew shield, but the plan was not to spend any money; so I looked for something. I found a plastic flower pot the correct size that could be use as a dew shield. I made a steel ring with a thread to fit the front of the lens cell - see right. Even with this dew shield the telescope would most likely be affected by dew after an hour, so I fitted heater straps which I took from my ED80 refractor. Now I should be able to run the telescope all night.



This telescope will need a finder scope. I pinched the 50mm finder scope and red dot finder from my ED80 refractor, as I was still trying not to spend any money. I found an aluminium plate and machined 2 dovetails and threaded clamp screws, then I attached it to the handle / mounting plate. See above.

I cut a thread on the focuser drawtube so I could attach the 0.85X field flattener from my ED80 refractor for my DSLR camera. Just in case I decide to use this telescope for astrophotography. See right

The focuser has a nice feature with a locking ring which can be loosened so the focuser can be rotated. I placed my laser collimator in the focuser and found the drawtube was not parallel with the scope. I loosened the mounting screws and shimmed it with a piece of paper. I placed the shim after the locking ring as the fault is where the internal rollers were in the housing. Now the focuser can be rotated to any position and the laser beam stays in the lens' centre.



Sky is clear, so time for a test run. I put the telescope on my EQ6 GoTo mount, switched on the dew heaters and waited till dark.



I fitted a 2-inch diagonal with a 30mm eyepiece and did a quick polar alignment. Switched on the goto mount and did a one star alignment. First object I went to was Omega Centauri NGC5139 and it looked remarkably good - but not the best object for testing this telescope, as Omega Centauri doesn't have many bright stars around the cluster of stars. I next went to the southern Pleiades IC2602 as this object has much brighter stars across the field in the eyepiece. I saw a red glow around these stars and as I turned the focuser knob, the stars changed to blue. This is a common problem with budget refractors; the best way to fix this is by spending more money on a refractor which has a triplet lens. (There is a "minus violet filter" available that removes violet fringe from around the Moon, planets & bright stars, but it's costly at \$150. I did see an MPAS member using a minus violet filter many years ago; I wasn't really impressed with the view)

This telescope has a fast lens or short focal length at F6.6 so some eyepieces work better than others. A common problem is coma i.e. that the stars look like seagulls towards the edge of the field. There is a bit of luck when buying expensive eyepieces; some have a lot more coma than others, with wide field eyepieces suffering the most. My 31mm Nagler works fairly well. A 14mm Meade ultra wide was excellent due to the fact that it has a Barlow built in to its design. Also using a Barlow with any eyepiece helps remove coma. My best eyepiece was the one I made from an old 50mm f2.8 camera lens showing no coma at all.

I moved to Jupiter and cranked up the magnification. The detail was fair but the reddish violet on the edge of Jupiter was a little annoying. Probably could remove most by stopping the telescope down to a 4 inch, but that defeats the purpose of having a 6 inch telescope.

As NGC 5139 had climbed higher in the sky, I thought I should attach the camera and take a few test shots. Very happy, see below.



NGC 5139

6 inch Refractor Pentax k30 By Greg Walton

I had to shorten the tube by 20mm to get all my eyepieces and camera to work. So far I'm happy with the way the telescope has turned out and hoping soon to be able to get the telescope under a dark sky location. I spent a couple hours cutting out black contact adhesive name for the scope, as the lens was made in Germany I decided on **Klarer Himmel** meaning "Clear Heaven/Sky".

That's really interesting. I just looked up Astro-Berlin. Apparently the company existed from 1920 till 1991, and their telephoto lenses were produced for still photography and cinematography. The F1000 was used with 60x90mm film (I didn't even know that existed). Unfortunately the Wikipedia page only exists in German, perhaps you can use Google translate on that page if you're interested. It also links to a great page with pictures of their lenses and newspaper clippings:

<http://www.exaklaus.de/astro.htm> *Comments by Guido Tack*



Trial and error astrophotography, with Klarer Himmel.

Most of my astrophotography has been done with Newtonian type telescopes which don't suffer the fault colour problems that refractor telescopes have.

So there has been a fair bit of trial and error to get this refractor to take a good image.

Most refractor type telescopes suffer from colours around bright objects such as stars, planets and the Moon. That's because when light passes through glass at an angle the white light splits into the colours of the rainbow.

To fix this, it was found that by placing a second lens made from a different type of glass behind the objective lens, called the flint, the rays of light could be brought back in line with one another.

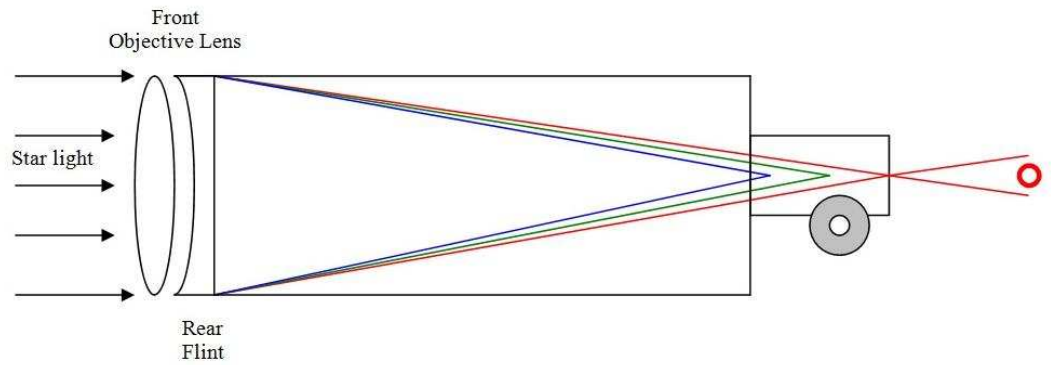
If you place a straw in a glass of water, you will see that the straw looks like it's bending as it passes through the surface of the water. Basically the more it bends the higher the refraction index number. Light appears to slow down as it passes through higher-index materials.

Air	1.000293
Water	1.333
Polycarbonate	1.5
Glass lens	1.52
Flint lens	1.66
Diamond	2.42

Even with the combination of different types of glass, most refractors still suffer some false colours.

Only the most expensive refractors manage to remove all colour faults by using 3 lenses.

I imaged NGC3372 and found I could remove the red around the stars by defocusing the star slightly towards the blue. You can see the difference between the 2 images at right.



Seven Sisters Traditional/Jenkyn Thomas

In the Dreamtime, many ages ago, the cluster of stars, which we now know as the Pleiades, or the Seven Sisters, were seven beautiful ice maidens. Their parents were a great rugged mountain whose dark head was hidden in the clouds, and an ice-cold stream that flowed from the snow-clad hills.

The Seven Sisters wandered across the land, with their long hair flying behind them like storm clouds before the breeze. Their cheeks were flushed with the kiss of the sun, and in their eyes was hidden the soft, grey light of the dawn. So entrancing was their beauty, that all men loved them, but the maidens' affections were as cold as the stream which gave them birth, and they never turned aside in their wanderings to gladden the hearts of men.

One day a man named Wurrannah, by a cunning device, captured two of the maidens, and forced them to live with him, while their five sisters travelled to their home in the sky. When Wurrannah discovered that the sisters whom he had captured were ice maidens, whose beautiful tresses were like the icicles that drooped from the trees in wintertime, he was disappointed. So he took them to a camp fire, and endeavoured to melt the cold crystals from their beautiful limbs. But, as the ice melted, the water quenched the fire, and he succeeded only in dimming their icy brightness.

The two sisters were very lonely and sad in their captivity, and longed for their home in the clear blue sky. When the shadow of night was over the land, they could see their five sisters beckoning to them as they twinkled afar off. One day, Wurrannah told them to gather pine-bark in the forest. After a short journey, they came to a great pine tree, and commenced to strip the bark from it. As they did so, the pine tree (which belonged to the same totem as the maidens) extended itself to the sky. The maidens took advantage of this friendly act, and climbed to the home of their sisters. But they never regained their original brightness, and that is the reason why there are five bright stars and two dim ones in the group of the Pleiades. The Seven Sisters have not forgotten the earth folk. When the snow falls softly, they loose their wonderful tresses to the caress of the breeze, to remind us of their journey across our land.

When the Seven Sisters were on earth, of all the men who loved them, the Berai Berai, or two brothers, were the most faithful. When they hunted in the forest, or waited in the tall reeds for the wild ducks, they always brought the choicest morsels of the chase as an offering to the sisters. When the maidens wandered far across the mountains, the Berai Berai followed them, but their love was not favoured.

When the maidens set out on their long journey to the sky, the Berai Berai were grieved, and said: 'Long have we loved you and followed in your footsteps, O maidens of the dawn, and, when you have left us, we will hunt no more.' And they laid aside their weapons and mourned for the maidens until the dark shadow of death fell upon them. When they died, the spirits pitied them, and placed them in the sky, where they could hear the sisters singing. Thus were they happily rewarded for their constancy. On a starry night, you will see them listening to the song of the Seven Sisters. We call them Orion's Sword and Belt, but it is a happier thought to remember them as the faithful lovers who have listened to the song of the stars from the birth of time.

Source: Aboriginal myth adapted from the collection by Jenkyn Thomas. Featured in the book "The Best Australian Yarns and other true stories" by Jim Haynes, published by Allen & Unwin Australia 2013.

Forwarded by Tony Nightingale



Landon's Space Search

G N C Y O J M R I G H N O I T A T L U C C O K
 C A T L U U M J N K E O K B U N I V E R S E E
 E R L R G T P A T Q E O Q R S P U T N I K E T
 N B E W A H S U E U W Z S T U A N O M S O C I
 U M L P S N Z D R A R L B Y Y R U C R E M B L
 T U O U T D S E S S C A T G N V X S X H K A L
 P E H L E U S N T A H O S P S C O A U G Z V E
 E L K S R R U S E R E Z S T E A H M D A F O T
 N O C A O A N I L P J S T M R R T R T Z E N A
 E H A R I N E T L W T U X C O O I U O F T R S
 C M L A D U V Y A X C U P P N S N G R N V E R
 A R B X S S T M R K W Z N I L N P A E N O P A
 P O Y T I R A L U G N I S I T U I E U E U U M
 S W R A R O E T E M A B M L A E T C Q T T S S
 P R E C E S S I O N N X L C D N R O A M B C A
 X Y M N E E B P D E C L I N A T I O N A J I K

Find the following words in the puzzle.

Words are hidden \uparrow \downarrow \rightarrow \leftarrow and \swarrow .

ASTEROID	INTERSTELLAR	PLUTO	SPUTNIK
ASTRONAUT	JUPITER	PRECESSION	SUPERNOVA
BLACKHOLE	MARS	PULSAR	TRANSNEPTUNIAN
COSMONAUT	MERCURY	QUASAR	UMBRA
COSMOS	METEOR	SATELLITE	UNIVERSE
DECLINATION	NEPTUNE	SATURN	URANUS
DENSITY	OCCULTATION	SINGULARITY	VENUS
GEOSYNCHRONOUS	PERIGEE	SPACE	WORMHOLE

I've been doing some practice on my planetary processing with some of my old 2018 Mars data (best data I probably have) and went back to Damian Peach's (aka the best planetary photographer in the world ...) images and turns out we had a shot near enough to the same time.

Pretty happy with the comparison!
Mine's on the left ;) Russell Smith



MPAS GALLERY

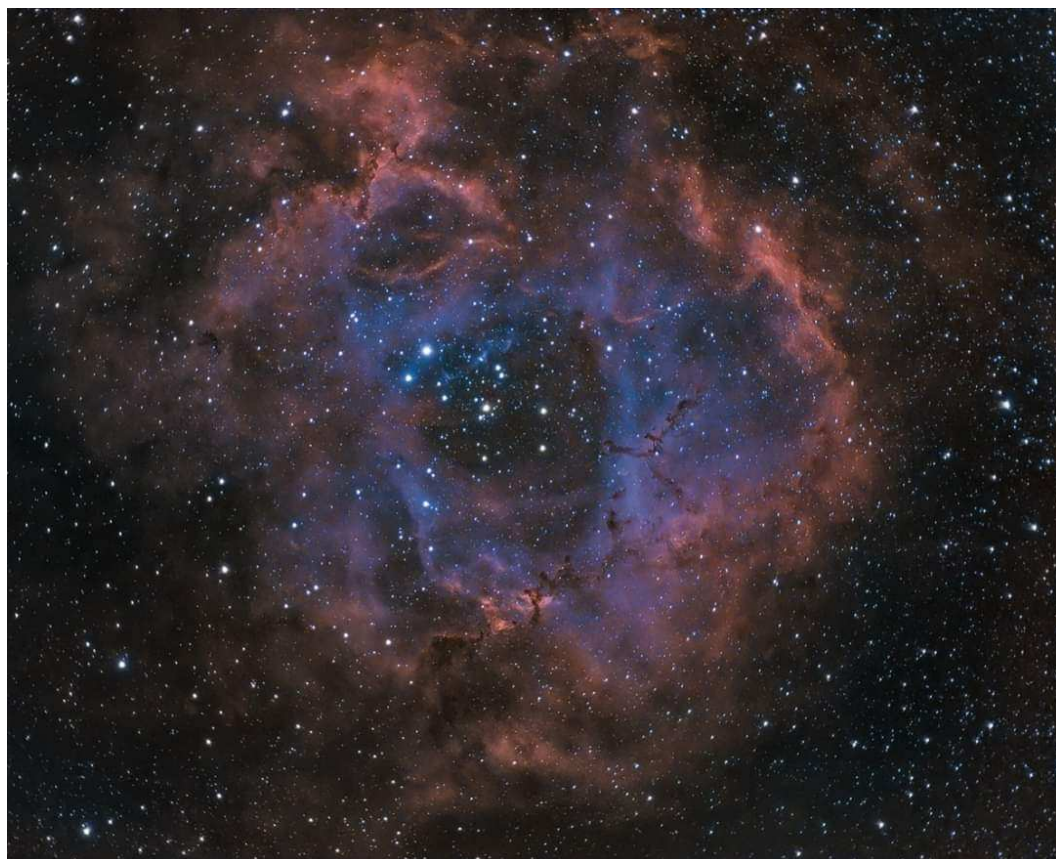


Right

Rosette Nebula

60 minutes (30 sec subs) acquisition
HA O3 combined in Astropixel
processor, ZWO 294mc with the 224
guide, TS Optics 130mm with Altair
astro 0.6 reducer/flattener.

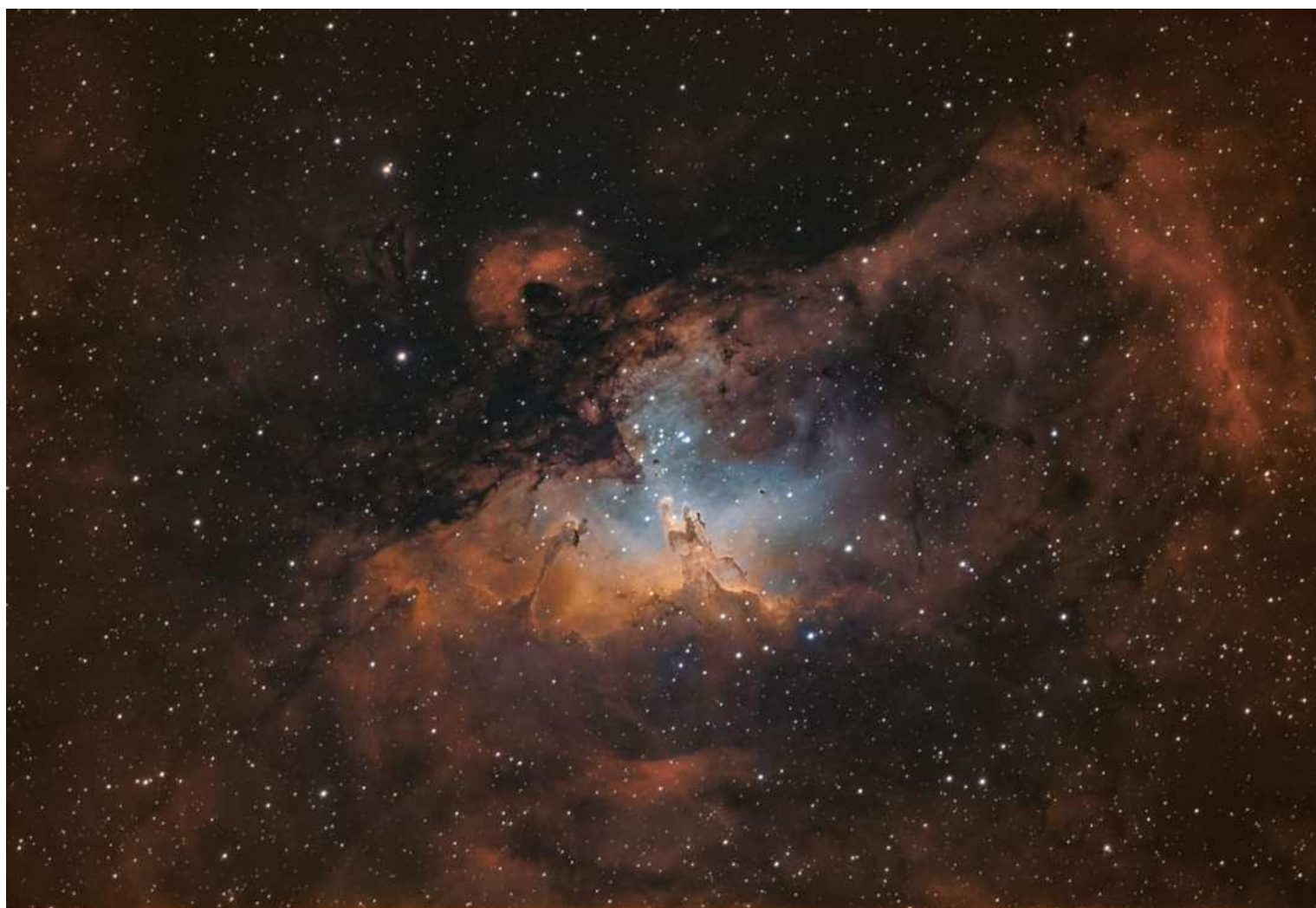
By Nik Axaris



Below

M16 The Eagle Nebula aka The
pillars of creation aka the Star Queen,
if you rotate the image anti-
clockwise you'll see the profile of
what looks like an Egyptian queen in
profile (use your imagination). HOO
bicolour, image ZWO 294mcPro
120mm mini guide cam, 2 hours
integration 120 second subs.
Processed in Astropixel processor
and Photoshop Optolong L-Enhance
filter. TSoptics photoline 130mm
refractor.

By Nik Axaris



Right

M20 The Triffid Nebula

I used the L-enhance and extracted the Ha channel in APP then in Photoshop used it as a luminance layer with the RGB image, also stacked in APP. Never really imaged this up close. TSoptics 130mm 89 x 120 second images. High level moisture in the air in Melbourne last night. ZWO 294mc Pro ZWO Asiair Skywatcher Neq6Pro

By Nik Axaris



Right

I know these have been done to death but this is a new one for me

M8 and M20 enjoying a celestial dance,

Skywatcher ED72 zwo 294mc Pro guided with 120mm mini

NEq6 Pro and ZWO asiair

6 x 10 minutes and 47 x 120 seconds combined, in Astropixel processor

Optolong L-Enhance Filter.

By Nik Axaris



Finally managed to get my DSLR connected to my telescope. These are from last night. Two stacked 2x Barlows, Canon EOS700D, 8" f/6 Dob on EQ platform, something like 2000 frames processed with PIPP, Autostakkart, Registax. *By Guido Tack*

Jupiter



Saturn



Helix Nebula fireball

OK I'd been looking for these files for some time. These images were taken when my wife and I were trying to capture the Helix Nebula. A massive fireball managed to skite across my CMOS. What I find interesting is the smoke trail left behind.

By *Paul Albers*



Left

Mighty Jupiter, time to go out and have a look at it ! Jupiter reaches opposition on July 14. Opposition marks the best time of year to see a planet. That's because it's when the planet is up all night and generally closest for the year. This image was taken last Saturday night 27th June, with a C11 and ZW0 290MM.

Thanks for looking, *Dominic Lucarelli*

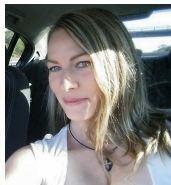
SOCIETY INFORMATION



Peter Skilton



Mark Stephens



Nerida Langcake



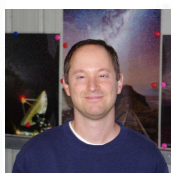
Jamie Pole



Anders Hamilton



Trevor Hand



Simon Hamm



Peter Lowe



Dave Rolfe



Greg Walton

OFFICE BEARERS OF THE MORNINGTON PENINSULA ASTRONOMICAL SOCIETY

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

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

SOCIETY MEETINGS

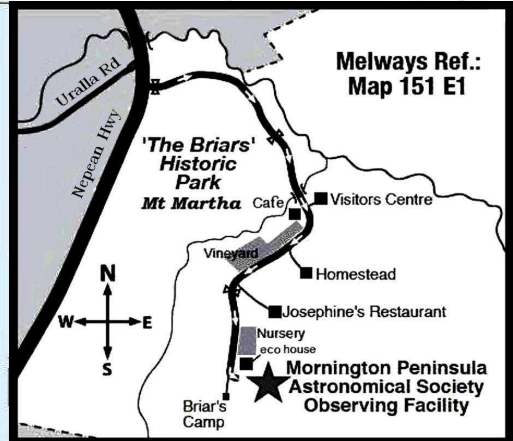
Meeting Venue: MPAS Astronomy Centre
 The Briars, Nepean Hwy, Mt Martha
 (Melways ref. 151/E1)

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



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

Phone: 0419 253 252
Mail: PO Box 596, Frankston 3199, Victoria, Australia



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



Guido Tack



Fred Crump

E-SCORPIUS NEWSGROUP

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

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

VIEWING NIGHTS - MEMBERS ONLY

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

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

Phone: 0419 253 252
Mail: PO Box 596, Frankston 3199, Victoria, Australia



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

MPAS newsletters online - https://drive.google.com/folderview?id=0BvykxzZGI9g_SUNmZVhkZTFGWTA

SCORPIUS The journal of the Mornington Peninsula Astronomical Society

Newsletter Disclaimer - The Scorpius Newsletter is published online, once every two months for its membership, by the Mornington Peninsula Astronomical Society, for Educational Purposes Only. As a newsletter, this publication presents news spanning a spectrum of activities, reports, and publications in order to keep society members abreast of a variety of events and views pertaining to astronomy. While prudent, reasonable effort has been utilized to verify factual statements made by authors, inclusion in this newsletter does not constitute or imply official MPAS endorsement. All materials (except previously published material, where credited) are subject to copyright protection © 2020, Mornington Peninsula Astronomical Society