



Cover image - NGC253, the Sculptor Galaxy taken on August 28 using i-Telescope's T30, a 500mm reflector on a wonderful Planewave Mount and FLI CCD camera at their Siding Spring observatory. *By Steve Wilkins*

SCORPIUS

THE JOURNAL OF THE
MORNINGTON PENINSULA ASTRONOMICAL SOCIETY INC.

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

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



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

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

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



Mornington Peninsula Astronomical Society

SOCIETY NEWS

By Nerida Langcake



Society Meeting August 19th - Hi everyone, For those of you who are not yet subscribed (it's free) to the MPAS YouTube channel, the August meeting has already been uploaded for viewing. It featured member Eden White speaking about the Big Bang.

If subscribed, you should be notified of this automatically, all being well with YouTube of course. *Regards, Peter Skilton*

You can also watch it here by clicking on this link: <https://www.youtube.com/watch?v=GRFZMpezD0U>

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

September 8th Hi everyone, On our last Saturday night open meeting, I mentioned that Jupiter did emit some light. Nobody had heard of this but I checked my facts again and it is correct. As we all know Jupiter is a "failed star" and is unable to ignite it's volatile gases such as Hydrogen, but Jupiter does emit light in the infrared spectrum. There is discussion also that there is a very small amount of normal spectrum light that we are able to see naturally however, there is conjecture about this claim. Hope this clarifies what I was saying. *Kind regards Eden.*

Hi All, Always interesting. To explore further... "any object which has a temperature radiates in the infrared. Even objects that we think of as being very cold, such as an ice cube, emit infrared." and Jupiter (or any body reflecting sunlight) 's temperature is... (Sources to search for fun and for True? / False? / Joke? fun.) *Take care everyone. Best Regards Sky*

Hi everyone, Here's some more food for thought for the interesting topic raised by Eden last week. Electromagnetic radiation is self-propagating energy waves that are transmittable through space-time. If the wavelength of the wave (distance from crest to crest) is detectable by our eyes, we call it "visible light". As the wavelength shrinks, our brains perceive the colour changing from red to yellow to green to blue to violet to ultraviolet. When the wavelength is even smaller than the UV, then we're in the realm of X-rays, Gamma rays and beyond. The energies involved are very high at this end of the spectrum. At the opposite end of the spectrum, as the wavelength instead gets longer and longer, the red becomes infrared and eventually into the realm of invisible microwaves and then radio waves. The energies here are very small. Every object in the Universe, whether it makes its own energy internally or not, radiates electromagnetic waves by virtue of its temperature alone. It doesn't matter at all how it got to that temperature. This is referred to as "black body" radiation. The term "black body" just means the object is assumed to absorb all light of any wavelength falling onto it, and reflects none of it outwards at all. This doesn't mean it's invisible though, because it inherently radiates according to its temperature. Fire fighters will attest to the radiant heat from approaching flames, and this is in the infrared region. Even if the hot air near the flames is drawn away from you by the wind, you will still experience the full impact of the radiant heat of the burning material. Thus any object that is about 6000 degrees, whether it's the Sun's outer layer heated up by its internal fusion processes, or an exotic ceramic heated in a furnace, or an industrial diamond squeezed into an incredibly small space to reach the same temperature, will all glow mostly in the yellow. They do in fact glow at all possible wavelengths, but the amount at different colours drops away very quickly. If somehow made even hotter, then all would glow mostly into the blue to ultraviolet and even X-rays, assuming they didn't disintegrate before reaching that temperature. At the other extreme, cooler objects glow in the red to infrared. This means older red giant stars, or failed stars such as Jupiter, or planets or people or icebergs are relatively cool and so emit mostly very low energies. When you get a COVID-19 temperature check, the person aims a device at your head that measures the infrared light that is invisibly emanating from your forehead, and it is calibrated to show this in simple temperature units rather than energy units. All parts of you are radiating this, even if you were standing in pitch darkness inside a sealed room with no light present. The ultimate cooling is for the Universe itself. Originally, once electromagnetic radiation was able to propagate through space-time after the Big Bang passed its initial opaque period, it would have glowed at the Gamma ray and X-ray extreme end then, as it slowly cooled, the Universe glowed in the visible colours, then infrared then microwave regions. One day in the distant future it will predominantly glow in the radio wavelengths. Today we measure it in the microwave region as the so-called "microwave background radiation" of the Universe, and this is due purely to the overall temperature of the matter inside the Universe today, and is only at 2.725 degrees above absolute zero. Absolute zero is -273.15 Celsius and is the coldest possible temperature when all molecular, atomic and subatomic motion ceases - you can't get slower than stopped. Temperature is merely a symptom and measure of atomic motion on the tiniest of scales. Swinburne Uni has a page about this area:

<https://astronomy.swin.edu.au/cosmos/b/blackbody+radiation#:~:text=All%20objects%20with%20a%20temperature,it%2C%20reflecting%20or%20transmitting%20none.>

But what about a Black Hole I hear you say? Surely that doesn't radiate at all, and that is why it's black. Well, it does radiate as a "black body" by virtue of its temperature, however, that electromagnetic radiation is unable to leave the vicinity of the Black Hole due to its gravity curving space-time so severely that light of any wavelength (i.e. energy level) fails to leave the event horizon and may be pulled back into the singularity. The late Stephen Hawking is known for his idea of Hawking radiation, where a real Black Hole can slowly leak energy into space due to pairs of subatomic particles spontaneously coming into existence and occurring just on either side of the Event Horizon. One of the pair falls back in, but the other one is just able to leak out into space and may be detectable one day. But this is something different from black body electromagnetic radiation. *Regards, Peter Skilton*

So Peter, Is there or is there not any nuclearsyntherthys propagation happening on Jupiter ? Hope I spelt it right. *Regards Eden White.*

Hi Eden, There wouldn't be nuclear fusion occurring at the core of Jupiter as the conditions are not extreme enough. As far as is known, a slow-burn "cold fusion" isn't possible, despite a couple of hasty chemists (Pons and Fleishmann I recall) getting the world very excited about it a while back and which wasn't reproducible by others unfortunately. If Jupiter were a lot more massive, then fusion might be able to switch on and we have a fledgling star on our hands. Shades of Stanley Kubrik movies there. You would have nuclear fission reactions occurring and, indeed, that does occur inside the Earth and asteroids. When both bodies formed, there would have been radioactive heavy elements present, left over from the dead star or stars that provided the seed material that formed our Sun. Those radioactive elements decay slowly into other lighter elements (such as Uranium going to Radon etc.). That decay releases a lot of heat and that helps keep the interior of the planet warm and molten over far longer timescales than would be possible otherwise. *Regards, Peter Skilton*

NEW ASTRONOMY CLUB - PHILLIP ISLAND

A new astronomy club is being set up on Phillip Island, Phillip Island Astronomical Association.

For new members wanting to join an exciting new club in astronomy, please register your interest by email to Eden White at: edendwhite74@gmail.com or call Eden on 0448637172.

Society Meeting September Hi everyone, For those of you who are not yet subscribed (it's free) to the MPAS YouTube channel, the September meeting has already been uploaded for viewing. It features a look at the practical aspects of life and love in space with an eye-opening documentary hosted by a German astronaut who spent time on the International Space Station. It ranges from the mundane, such as how long hair is washed and shampooed in space, to learning a few things about dolphins, Jane Fonda, and how interpersonal human relationships of all sorts work in the cramped and isolated conditions, in weightlessness, and with almost no privacy prospects for many months on end. You'll never look at the ISS the same way again as you see it passing overhead from your backyard.

If subscribed, you should be notified of this automatically, all being well with YouTube of course.

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

<https://www.youtube.com/channel/UCm6XOKIcIflt4y0XRBXpXuw>

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

The video is not posted to e-scorpis as it is too large for the medium. *Regards, Peter Skilton*

Society Meeting October For those of you who are not yet subscribed (it's free) to the MPAS YouTube channel, the October meeting has been uploaded for viewing. And, yes, as a special treat it's before our usual meeting date this month. It features a look at the end of time and the future history of the Universe up to its end, if there is one.

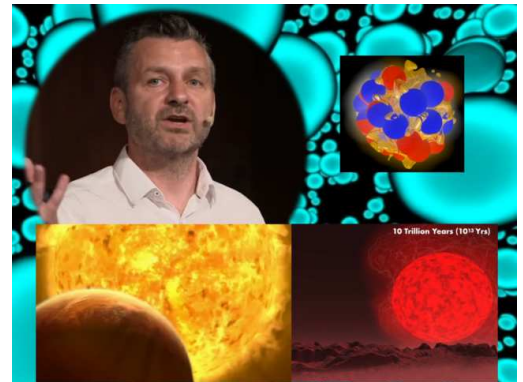
If subscribed, you should be notified of this automatically, all being well with YouTube of course.

You can also watch it here by clicking on this link and going to the most recent video on the channel: <https://www.youtube.com/channel/UCm6XOKIcIflt4y0XRBXpXuw>

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

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

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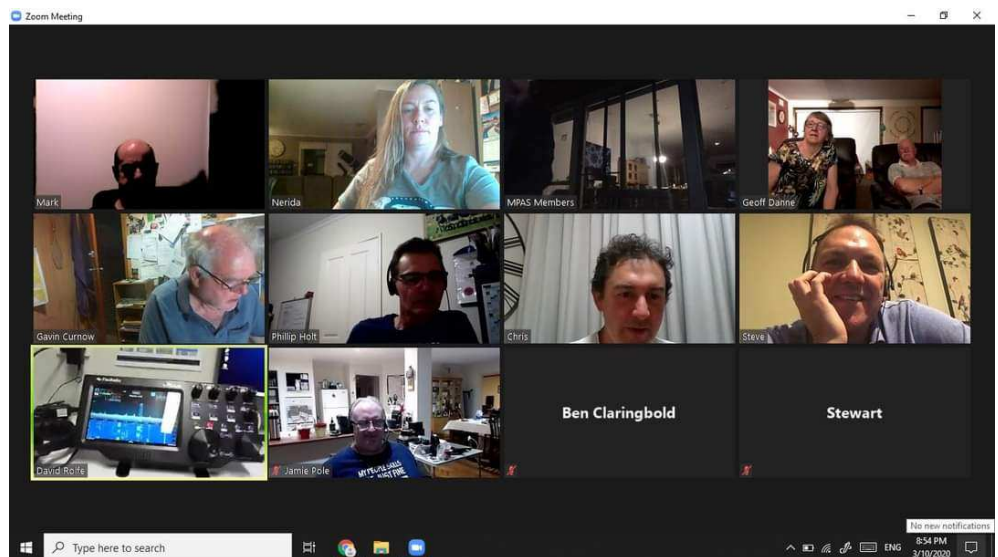
**We also had some zoom meetings.**

On September 30th, for October 3rd

Hi everyone, Our next monthly online Zoom-Get-Together is coming up this Saturday, so please feel free to pop in to say hello, have a chat and see some friendly and familiar faces. It will be just a general free-for-all conversation & Q&A online, much like a society Saturday BBQ type of friendly interaction without the formalities. If you have any interesting photos or items you would like to share please feel free to bring them along!

You basically just have to click this link to join: <https://zoom.us/j/94626725257>
Meeting ID: 946 2672 5257

Hope to see you on Saturday night! Nerida



Hi Members, We have opened up sales of MPAS merchandise (jackets, shirts, vests, name badges, etc..) including the Quasar 2021 astronomy book. Name badges can be ordered as well, however new members who first joined MPAS in 2020 and paid the joining fee, your badges are already sorted (do not re-order!). The aim is to have everything ready for collection from the Briars at the December meeting! Pickups will be ok from Cranbourne, Hallam by prior arrangement. Failing all this we will be able to send (will advise cost on an individual basis). **Bookings now closed October 25.**

Regards, *Dave Rolfe*



Backyard Astronomy 15th September 2020 *By Greg Walton*

I hadn't used my Argo-Navis for a year and remembering how it works was a problem. Adjusting time, location and referring to my notes I eventually got it working aligning on Altair and Acrux. First I moved to Jupiter and watched Europa perform a transit. Europa's surface being ice makes it highly reflective and easily seen as a bright point of light sitting in one of Jupiter's cloud belts. Then I moved to Saturn and now being past opposition, the planet cast a dark shadow across its rings. At high magnification I could just see Saturn's pole peeking out from behind the rings.

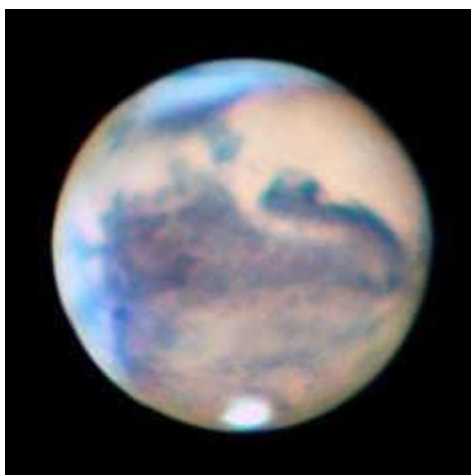
I then went on a tour of globular clusters. M2 was first, easily seen in my 12 inch Dobsonian at 80 times magnification. Then on to M15 which was about as far north as I could see from my back yard at Chelsea. Then it was on to M30, M55, M75, M28, M22, M9, M19, M4, M70, M69, M54 and finishing on NGC6441, a small bright globular next to the star at the tail of Scorpius. I also looked at NGC6397, NGC6752 and NGC6362, near Ara. All these globular clusters should be visible with an 8 inch telescope from light polluted suburbs on the Mornington Peninsula.

I then tried to look at the galaxies in Grus NGC7590 (Grus quartet) but the sky at Chelsea was far too light and none could be seen.

By this time Mars was high enough to be seen. So I selected Mars in the menu on the Argo-Navis and it took me straight to it. I chose my 8mm eyepiece which gave my 180 times magnification. The polar cap was very small but easily seen. Dark patches crossed the rusty coloured surface with one marking looking like a fishtail. In all, a very pleasing view. I remember 2 year's ago when Mars came at its closest to Earth we saw very little details at all due to dust storms enveloping the planet. It's a pity we can't run our public night's as I'm sure everyone would be very impressed with Mars.

At 11pm I went back to Jupiter to watch Europa's shadow start its journey across the face of Jupiter. It's always very interesting seeing something happening on another world. This little black dot moving along casting a shadow on the clouds of Jupiter. Time for me to pack up now, after a very enjoyable night under the stars and planets from my backyard and good to see my Argo-Navis working again. *Regards Greg*

Jupiter Tuesday 15th Sept at 8.38am during Europa's transit. Greg alerted me, so I thought I'd post here. You can see Europa's surface colour but you can see that the moon has moved slightly during the time it takes to make a RGB capture. Taken with a C11 and with an ASI290MM. See right. *Regards Dominic*



Mars left - from Sunday night 11th October 2020

Mars Opposition occurred on Oct. 13th, following the Red Planet's closest approach to Earth last week, on Oct. 6, when the two planets were separated by "only" 62 million kms. Imaged through high cloud in a desperate attempt to get some data I sorted 60 minutes of video to make the best of a bad situation. Taken with a C11 and a ZWO Asi 270MM, you can make out clouds over the north and western sides.

The most I've ever seen! *Dominic Lucarelli*

Mars right - 11th October 2020

Hello - finally some kind planetary photography conditions last night - and managed to nab Mars for the first time this approach - I've got a fair bit of data to work through yet so I think I should be able to process a slightly better version. Also luckily I refocussed half way through my session it made a huge improvement.

Russell Smith



Hi everyone, MPAS has signed up for the Ritchies supermarket community benefits scheme that is open to Incorporated not-for-profit bodies and charities. I know several members who already shop at one of their stores at least some of the time. For those who shop at any of their stores across Australia, they are issuing new loyalty cards to customers at the moment, and these replace the old ones that will cease working soon. The old ones are not being migrated automatically to the new ones. You have to sign up again from scratch.

When any members shop there, if the total spend across everyone in the country for each calendar month exceeds \$2000, then 0.5% of the excess is automatically donated back to MPAS. So if the monthly tally is \$2001, then our Treasurer sees about \$10 in the bank account, but if it's \$1999 then he sees nothing and Ritchies pockets it as profit. Given we have no external income during the pandemic, with no other support from government available, then this is being tried as a bit of an experiment.

A very long time ago, member John Cleverdon temporarily signed us up also, but our membership was only a mere fraction of what it is today and so it had no effect at that time and eventually lapsed as inactive. The public in general anywhere in Australia can also opt to select us from the drop-down list if they so wish. Pity we're not called the AAAardvark Astronomical Society Inc. so as to appear at the top of the list!

So if you're an existing Ritchies shopper, or are contemplating becoming one, all you need to do is get one of their new loyalty cards in-store at a cash register, and sign up at home later with it at www.ritchies.com.au, and nominate which organisation or charity you wish your normal shopping spend to be counted against. You can change your nomination at any time.

So do consider making it "Mornington Peninsula Astronomical Society", which is already appearing in their drop-down list today. For those who'd rather flash their phone at the cash register, and not carry around plastic, they also have that option as well.

I signed up today as Ritchies is by far the closest supermarket to me, and the process is pretty simple. Regards, *Peter Skilton*

Ballarat Astronomical Society

VASTROC 2021
2nd – 3rd October

"Spectra"
Call for presentations



BALLARAT MUNICIPAL
 OBSERVATORY & MUSEUM

The Victorian Astronomical Convention (VASTROC) will be hosted by the Ballarat Astronomical Society in 2021.

As we move towards a new normal post Covid-19 Pandemic, we are now planning for the weekend of 2nd -3rd October 2021.

This VASTROC will be different in that a worst case scenario will be planned for as well as a best case scenario so that it will go ahead no matter what occurs. With bushfires and Covid-19 in 2020, who knows what 2021 will throw at us.

With the above in mind, we ask all who would like to present a talk, poster or workshop to have in place a Zoom presentation as a backup. Selected talks will be on Zoom as well as in person for those who cannot come to Ballarat.

If all the above has not put you off, we are now calling for presentations for VASTROC 2021.

Early notice of intent to present by 31/ 3/2021 to: vastrocprogram@ballaratobservatory.org.au

For all details as they become available go to: vastroc.ballaratobservatory.org.au

Registration of Interest to Present a Paper

Please complete one form per activity

First Name..... Last Name.....

Postal Address.....Postcode.....

Ph/M..... Email.....

Society.....

Full paper 20min + 10 mins questions Poster paper + 5 min talk + 5 min questions Workshop

Title of Presentation.....

Brief Description.....

.....

MEMBER PROFILE



Hi everyone!

We were new members this year (we joined in March) but we never got to meet anyone because of Covid!

This is my 4 year old daughter Acacia, who has been obsessed with rocks since she was conscious, and with space since her eyesight was clear enough to see stars.

She wants to be a “moon rock scientist” when she grows up and is a definitely a STEM girl. She already has a rudimentary understanding of atomic structure and the periodic table because she’s determined to understand the ‘ingredients’ of rocks, can tell you all about every planet in the solar system, whines when it’s daylight savings because she has to go to bed before the stars come out, and vocally heckles play school when they take a GPS on their space explorations (when she goes to space she’ll take a map or some specialised space instruments, not some phone that’s not even going to work).

We wouldn’t have known about this morning’s live stream without this group and this has been a serious year-long highlight for Acacia. Now she wonders if maybe she could study moon AND asteroid rocks when she grows up!

So thank you for your information and heads-up on events like these! In this family they are highly appreciated! We look forward to the day we can actually meet some of you in person.

Best wishes, *Sarah Cottrill*



Hi Sarah, Now that's a wonderful picture, and I recognise what's on your TV from this morning's live NASA stream.

Thanks a bunch for letting us know you all enjoyed it, and a warm welcome to MPAS for your family.

You've certainly come to the right interest group.

I'm chuffed about your daughter and her burning interest in all things rocks, space and science. You just never know where it could lead with the right encouragement and getting accurate answers to lots of questions.

I'd forewarn you that we have meteorites (most originate from asteroid collisions) on show inside the observatory buildings and some smaller ones of different types for sale in the reception area. I'm sure it'll not be long before we're back at the Briars in some form. Say hello to me one Saturday evening and I'll give you a tour of the rocks, metals and meteorites there.

Watch out for our November meeting on YouTube. It'll include something on meteorites and geology of the solar system, as well as a talk by Harrison Schmitt, a geologist and the only scientist to walk on the Moon so far, telling of his experiences on the Moon and what needs to be done to get back there and then on to Mars. He visited Morningson many years ago to give a talk, and many society members went to meet him at the race course there.

While the Osiris-Rex mission is the USA's first landing and sample collection from an asteroid, Japan has had 2 missions to other asteroids already. The first, Hyabusa-1 (meaning falcon in Japanese), came all the way back to Earth in 2010, before parachuting to the ground near Woomera. It returned about 1500 tiny specks of material from that asteroid.

Hyabusa-2 tried again on another asteroid, and its bigger sample is due to land back in Australia just before Christmas this year, so put a reminder in your diary for about a week before Christmas. Its sample comes from the surface and also beneath the surface, because they shot a high speed metal pellet into the asteroid to form a 10 metre wide crater and thereby kicked up buried rocks and dust to be collected. That's probably going to be Woomera as well, but I'm not sure.

I imagine that Acacia has probably started her own rock and mineral collection, or will do so soon.

We were going to have a guided expedition to Point Leo foreshore in about 3-4 weeks from now for members to look for fossils, rocks and learn about the geology of the area, but alas with the pandemic this will now be postponed until next year when larger gatherings are hopefully safely possible.

Kind regards, *Peter Skilton*

Hii Sarah,

Encourage the interest of your daughter, as what ever her future leads to, these memories of rocks and space will remain. *Mark Hillen*

Welcome Sarah and Acacia! Glad to hear of a budding young scientist in the ranks! Hope to catch up with you all at a future event, hopefully not too far in the future face to face! *Jamie Pole*

OBSERVATORY UPDATE



MPAS Briars site on Stellarium



★ New Members Welcome ★

Peter and Debra Bradford
 Sylvie Grandit
 Beverley Knight
 Kerry and Luke Plancke
 Ryan Gray

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/0ByvkxzZGI9g_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		November / 2020					Red Days indicate School Holidays
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	
1 Full Moon Uranus at opposition	2 Melbourne Cup	3	4	5	6	7	
8 Last Quarter	9	10	11 Remembrance Day	12	13 Venus right of thin crescent Moon Dawn	14 Mercury right of thin crescent Moon Dawn Moon at 357,837km	
15 New Moon	16 Mars ends retrograde	17	18 Society Meeting 8pm	19 Jupiter and Saturn right of the Moon	20	21 Pt Leo Excursion TBD Members night	
22	23 First Quarter	24	25 Mars right of the Moon	26	27 Moon at 405,894km	28	
29	30 Full Blue Moon Penumbral Lunar Eclipse 9:16pm				Note - Pluto and Jupiter 1/2 degree apart on the 14th		

Monthly Events**Note - NO Public night for 2020****Society Meeting** - 8pm to 10pm on the 18th @ **By pre-recorded videos (To be confirmed)****Members Night** - 6pm on the 21st @ the Briars **Suspended (To be confirmed). Pt Leo Excursion TBD.**

CALENDAR		December / 2020					Red Days indicate School Holidays
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	
		1	2	3	4	5	
6	7	8 Last Quarter	9	10	11	12	
13 Venus right of thin crescent Moon Dawn Moon at 361,773km	14	15 New Moon	16 Special meeting TBD	17 Jupiter and Saturn below a thin crescent Moon	18	19 Members Xmas Party	
20 Jupiter and Saturn close on western horizon	21 Jupiter and Saturn close on western horizon	22	23 First Quarter Mars right of the Moon	24 Scorpius Deadline	25 Xmas Day Moon at 405,012km	26 Boxing Day	
27	28 Boxing Day Holiday	29	30 Full Moon	31 New Years Eve			

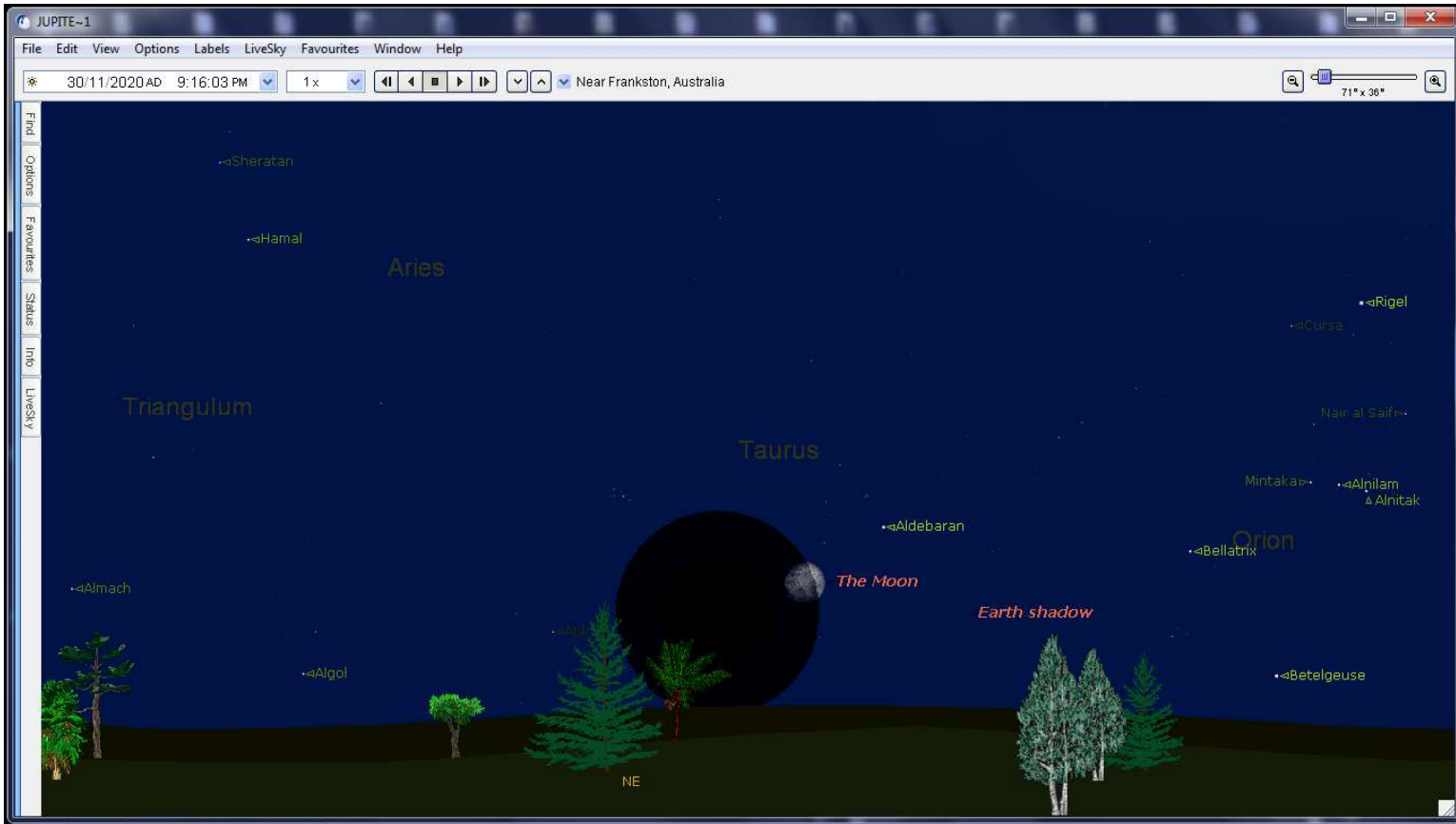
Monthly EventsSouthern Comets website - <http://members.westnet.com.au/mmatti/sc.htm>**NO Public night for 2020****Society Meeting** - None in December. Special Meeting 16th Dec To be determined.**Members Xmas Party** - 6pm on the 19th @ the Briars **(To be determined)**

THE BRIARS SKY

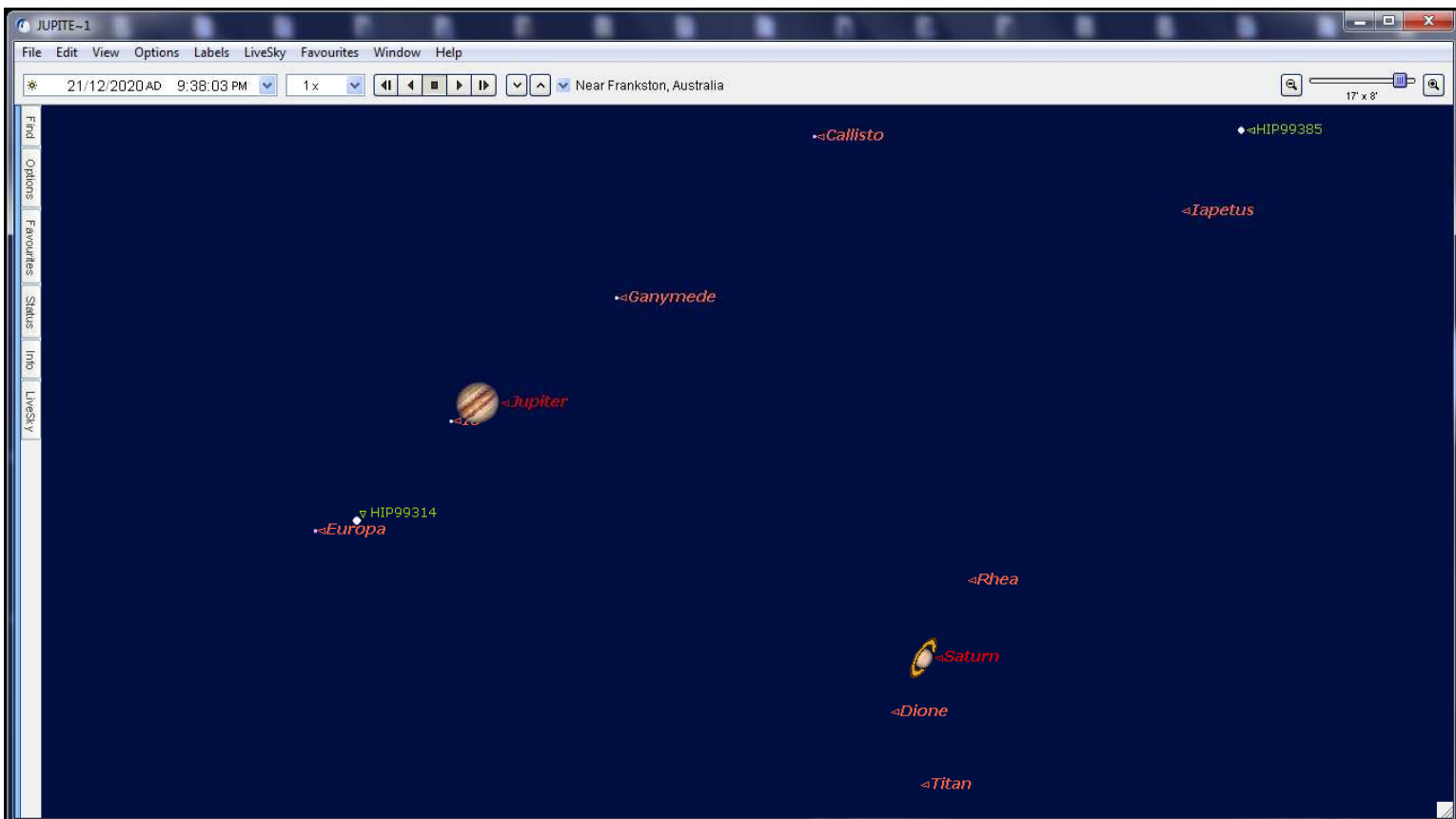
By Greg Walton



Penumbral Lunar eclipse 9:16pm on the 30th November. Rising in the east the Moon will look a bit off colour with a small dark crescent at the bottom left. Also this is a blue moon, meaning the second full moon in a month.



On 21st December Jupiter and Saturn will be 1/8th of a degree apart in the western sky. You can view the days leading up to this date and on the 17th a thin crescent Moon will be just above.



NASA asteroid probe is overflowing with space-rock samples

A probe NASA sent into space to take a sample of asteroid material has retrieved so much that its container can't close properly, allowing rocks to spill out into the void. The robotic arm of the probe, OSIRIS-Rex, kicked up a debris cloud of rocks on Bennu, a skyscraper-sized asteroid some 320 million kilometres from Earth. It then successfully trapped at least 60 grams of the material - a mix of loose, unconsolidated rock, glass and minerals known as regolith - in a collection device for the return to Earth.

But images of the spacecraft's collection head beamed back to ground control revealed it had caught more material than scientists anticipated and was spewing an excess of flaky asteroid rocks into space. The leakage had the OSIRIS-REx mission team scrambling to stow the collection device to prevent additional spillage. NASA will not know how much material it collected until the sample capsule returns in 2023.

101955 Bennu is one of more than 500,000 known asteroids between Earth and Mars. It is a type of asteroid known as a carbonaceous chondrite, which is thought to be rich in the building blocks of life such as carbon and water. It is about 500 metres in diameter, and one of only 26 asteroids that spins slowly enough for a spacecraft to land on. There is also a very slim chance Bennu may hit Earth in about 150 years.

The roughly \$US800 million (\$1.12 billion), minivan-sized OSIRIS-REx spacecraft, built by Lockheed Martin, launched in 2016 to grab and return the first US sample of pristine asteroid materials. Japan is the only other country to have accomplished such a feat.

Asteroids are among the leftover debris from the solar system's formation some 4.5 billion years ago. A sample could hold clues to the origins of life on Earth, scientists say.

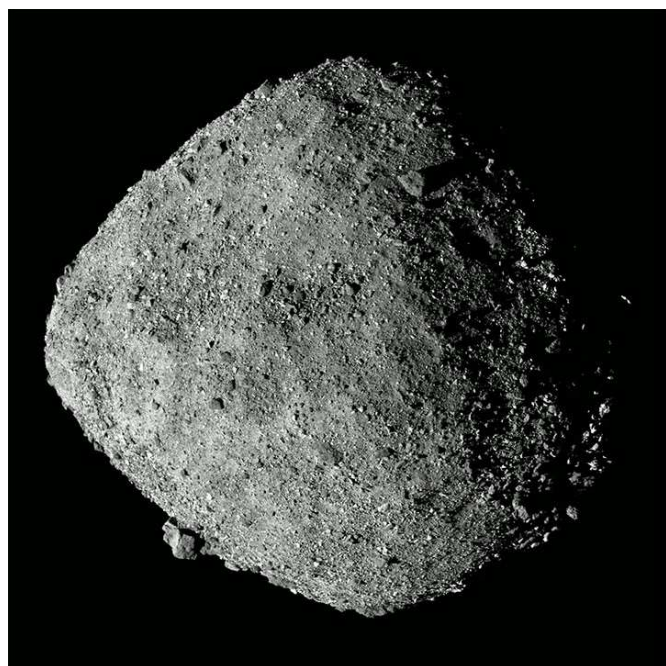


*The spacecraft has spent two years mapping the asteroid Bennu and took about four hours to descend to its surface.
Image: NASA/Goddard/University Of Arizona)*



Captured on Oct. 21 AEST during the OSIRIS-REx mission's Touch-And-Go (TAG) sample collection event, this image shows the SamCam imager's field of view at the moment after the NASA spacecraft touched down on asteroid Bennu's surface. The sampling event brought the spacecraft all the way down to sample site Nightingale, and the team on Earth received confirmation of successful touchdown at 6:08 p.m. EDT. Preliminary data show the sampling head touched Bennu's surface for approximately 6 seconds, after which the spacecraft performed a back-away burn.

Image: NASA



*Asteroid Bennu, seen by NASA's OSIRIS-REx spacecraft.
Image: NASA/GSFC/University of Arizona*

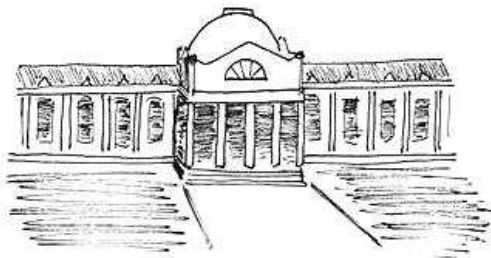
THE SCORPIUS FILES 1920

THE GREAT DEBATE

SCRIBBLED HISTORIES
BY PHIL HOLT.



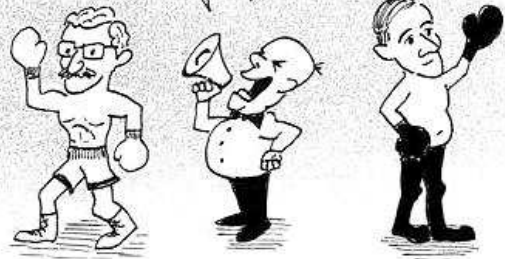
THE FIRST HALE FOUNDATION NATIONAL ACADEMY OF SCIENCES DEBATE WAS HELD AT THE SMITHSONIAN MUSEUM OF NATURAL HISTORY, WASHINGTON.



THE GREAT DEBATE
TOPIC: RELATIVE THE SCALE OF THE UNIVERSE.
CURTIS v SHAPLEY
LICK v WILSON

IN THE BLUE CORNER, FROM THE LICK OBSERVATORY, HERBER "CRUSH-ERRRR" CURTIS.

IN THE RED CORNER THE MOUNT WILSON HARRIERRR.... HARLOWWWW... SHAPLEY.



SHAPLEY OPENS WITH A PROBING JAB AT THE LACK OF A RELIABLE MEANS OF MEASURING STELLAR DISTANCES.

HIS LEFT NOW EXPOUNDS THE VERY LARGE, ALMOST 30,000 LIGHT YEAR DISTANCE TO SOME GLOBULAR CLUSTERS

CURTIS FLAPS ABOUT HINTING THAT THE MILKY WAY IS SMALLER AND MAY HAVE A SPIRAL STRUCTURE.

THEY LOOK WORNS OVER TINY STARS EVIDENT IN SPIRAL NEBULAE, AND CURTIS LABELS THEM AS ISLAND UNIVERSES.



AT THE FINAL BELL WE ARE STILL NO CLEARER ON THE SIZE OF THE UNIVERSE. CURTIS IS THE CROWD FAVOURITE, BUT THERE IS NO CLEAR WINNER!

IT WASN'T UNTIL HUBBLE'S 1922-23 STUDY OF THE ANDROMEDA NEBULA WITH THE HOOKER 100 INCH, THAT RELIABLE CEPHEID VARIABLE STARS WERE FOUND. THEY PLACED IT AT A WHOPPING 2 MILLION LY. DISTANCE. (BEYOND THE MILKY WAY) SUDDENLY THE UNIVERSE BECAME VERY BIG INDEED.



THE HALE DEBATES - 100 YEARS

Historic telescope that travelled half way around the world. *By Greg Walton*

Some years ago a friend gave me an old brass telescope. He said, "I know you're interested in telescopes, my father bought a shop in Wangaratta more than 40 years ago and while doing renovations he found an old telescope behind a cool room and it has your family's name engraved on it." *Manufactured for Thomas Walton outfitter to the Royal family Gosport.*



The telescope doesn't have a maker's mark and many similar telescopes can be found in museums on the web. It has a small sliding brass cover built in to the eyepiece and also has sliding sun shield at the 35mm objective end. Centre part is leather bound.

I Googled Thomas Walton outfitter and got an instant result. Thomas Walton had a shop at 62 High Street Gosport making uniforms for naval officers and the royal family, most famous for making child's Sailor suits. A painting of the Prince of Wales was made by Franz Winterhalter (A) and this promoted a fashion trend which went international and still exists today. First ever children's sailor suit was made for the then Prince of Wales (Edward VII) by Walton & Co Gosport, which is in the National Maritime Museum Greenwich (B). It was requested by Queen Victoria for a cruise in September 1846 off the Channel Islands. Royals continued to dress the children in sailor suits. Albert Edwards is the older man standing (C). Albert Edwards at right in this photo (D).



This still doesn't tell us how the telescope ended up in country Victoria. Searching the history of Gosport I found an Australian immigration office in Gosport at that time. Gold had been discovered in Australia and many were trying to get to Victoria and maybe get rich. Looking through immigration records in South Australia I found many Thomas Waltons had immigrated to Australia, but one date jumped out at me 1855, 9 years after the sailor suit was made, see link <https://passengers.history.sa.gov.au/node/564028> I also found in the public notices in an old newspaper that Thomas Walton had got into some financial trouble over a failed Gosport water pumping scheme. I found in ancestors records Thomas Walton was most likely not one of my relatives, as his family name changed as he had mostly daughters, but I found some relatives still live in Australia today. But I still need to do more research.

I will most likely post it to the National Maritime Museum Greenwich London UK, so it can be put with the sailor suit.

Yet another use for a smart phone. *By Greg Walton*

I purchased a SynScan Wi-Fi adaptor for my EQ6 & HEQ5 go-to mounts. This gadget enables me to control my telescope mount with a smart phone. Also this Wi-Fi adaptor can be used to control any of the go-to telescopes in the MPAS observatories. Why would I need this gadget if I have a hand controller that works fine? The main reason is if my hand controller stops working I would have a backup and the SynScan Wi-Fi adaptor is half the cost of a new hand controller.

Before I purchased the Wi-Fi adaptor I downloaded the SynScan app and operating manual. I saw this app had a few more functions than the hand controller, one being the 8 detection slew buttons, so I can slew in 2 axes at once. In the centre of the buttons is the speed indicator (1 to 9) and arrow keys either side to adjust the speed. In the Utility icon there is a Tonight's Best button, which brings up a list of the best objects visible for the night in order of brightest magnitude, handy if you are a beginner. Also has a list of double stars and an identify button which displays the closest object and a list of nearby objects as well, handy if you are galaxy hopping. This app gets its time and GPS location from the smart phone, which the EQ6 hand controller doesn't do. This means you can get set up faster. Another feature is you can set an altitude limit, handy if you are surrounded by trees or buildings.



I usually find new fangled gadgets have their faults, require extra software and lots of patience. But this time it was different. I unplugged the EQ6 hand controller and plugged in the Wi-Fi adaptor into the same cord. Switched on the EQ6 mount and started SynScan app on my smart phone, making sure the phone's Wi-Fi and GPS was on. In the manual it recommended that you switch off the mobile data to save battery life or plug the charger in.

Quickly SynScan appeared on the smart phone's Wi-Fi list, so I selected SynScan and tapped on Connect on the SynScan app. Next I tapped on Alignment, then 2-star... It displayed a list of brightest named stars. I selected Altair in the north and Acrux in the south. I tapped on Altair and the mount didn't move, it said you need to move the

mount with the keypad to align the first star. I slued the telescope to Altair in the north and centred it in the eyepiece. Looking at the app you will see one or two of the direction buttons flashing, the SynScan app is prompting you to tap one of the flashing buttons, just tap one. Then I tapped Acrux and the mount slewed to Acrux and asked me to centre Acrux in the eyepiece. I centred Acrux. Again looking at the app you will see one or two of the direction buttons flashing, the SynScan app is prompting you to tap one the flashing buttons. I tapped the flashing button and SynScan said, **alignment successful**. I see you can also set up the alignment on the planets, so I tested it and it worked fine.

On the home page I selected Deep Sky then I selected Messier 7 then tapped the Go To icon and the mount slewed to Messier 7. I looked in the low powered 30mm eyepiece and there it was M7, a bright open cluster in Scorpius. I then zipped around the sky looking at about a dozen deep sky objects. On the deep sky list there were no planets. I found the planets in the Star icon and in the Tonight's Best icon.

While everything was working I started the Stellarium app and to my surprise it too connected to the mount and displayed the part of the sky at which the telescope was pointing, with a circle flashing around my last selected object. I scrolled across the sky and tapped on NGC5139 and the telescope moved to NGC5139. I was amazed it was just too easy. The Stellarium app I was using is the free version which has only the brightest deep sky objects. I will most likely buy the more advanced app before long.

One problem I saw was if you need to leave the telescope, say go to the pizza shop and take your smart phone with you. This will make the system fail. But in the app you will find a hibernate icon, tap the icon and it will ask if you wish to save your settings, tap on yes once the telescope gets to the park or home position. When you return to the telescope with your smart phone in hand, the app will ask if you wish to start up with the saved data. Just tap on the yes and the telescope mount is ready to go, no star alignment needed. I tested this function and it worked well, taking me straight to my desired object. I then remembered I had an old budget smart phone that was no longer in use, I found I could add the SynScan app to its memory card and install the app. It worked fine. I can just leave this old smartphone with the mount when I go to the pizza shop. I found the SynScan Wi-Fi adaptor and app was easy to use.

Skywatcher SynScan app - <https://www.skywatcher.com/download/software/synscan-app/>

Stellarium mobile app - <https://play.google.com/store/apps/details?id=com.noctuasoftware.stellarium>



Finding deep sky objects with your smart phone and a Dobsonian. *By Greg Walton*

I can see the SynScan app is useful even if you don't have the Wi-Fi adaptor. A free catalogue of deep sky objects at your finger tips is handy. Also, when you key in an object it displays some basic information like its RA Dec coordinates in the sky and also displays a real time distance above the horizon and degrees from north - very useful. If you only have a Dobsonian, protractor and a smartphone, this tool would enable you to find your way around the sky. It's important to make sure the base of the Dobsonian is level for it to work. You can use a smartphone level app for this and can also use the same app to measure the angle of the telescope tube to get your Altitude.

SynScan app - <https://www.skywatcher.com/download/software/synscan-app/>

Smartphone Level - <https://play.google.com/store/apps/details?id=com.digital.and.dreams.android.android.army.knife>

Smart tools - <https://play.google.com/store/apps/details?id=com.pcmehanic.smarttoolbox>

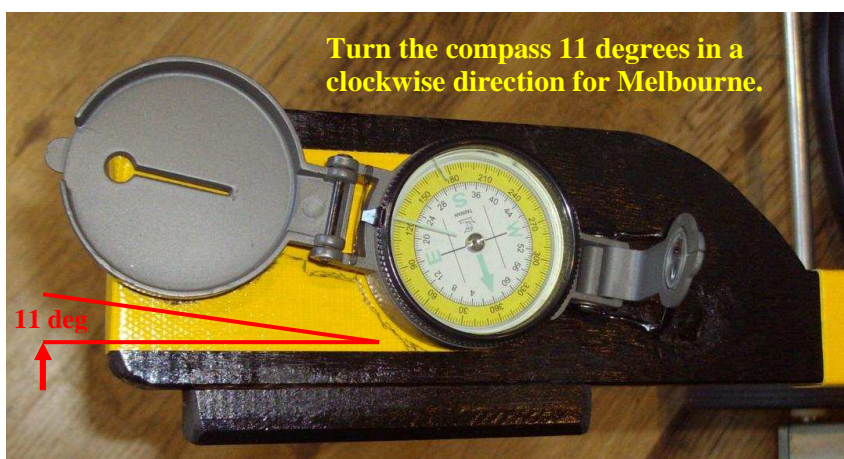
Living in the Sun app - <https://play.google.com/store/apps/details?id=com.zara.app.compassk>

A better away of measuring the Altitude of the telescope tube is to use a magnetic digital angle gauge or the more simple plastic type that uses gravity to move the pointer, see below. I found this method is accurate to within 1 degree.



Then by using a compass app on your smartphone you can point the telescope to the correct amount of degrees from north. I like the **Living in the Sun** Android app as it corrects for the magnetic error using the GPS location in the phone. The red pointer is magnetic north and the orange pointer is true North as it deducts the error of 11 degrees for Melbourne. Unfortunately, I found the accuracy of the compass in the smartphone can be up to 8 degrees out to the left or right.

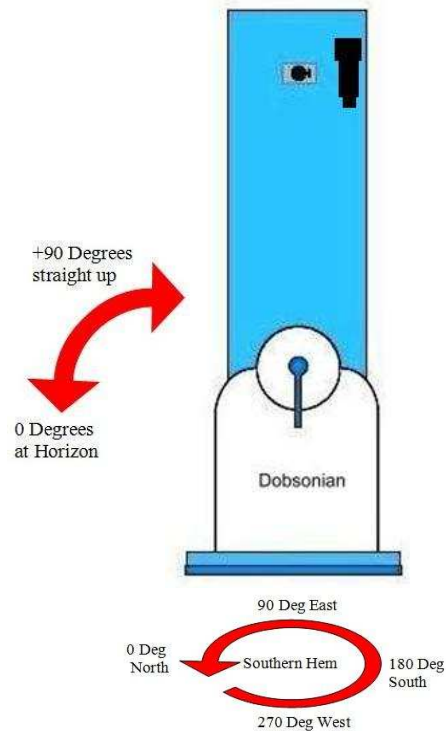
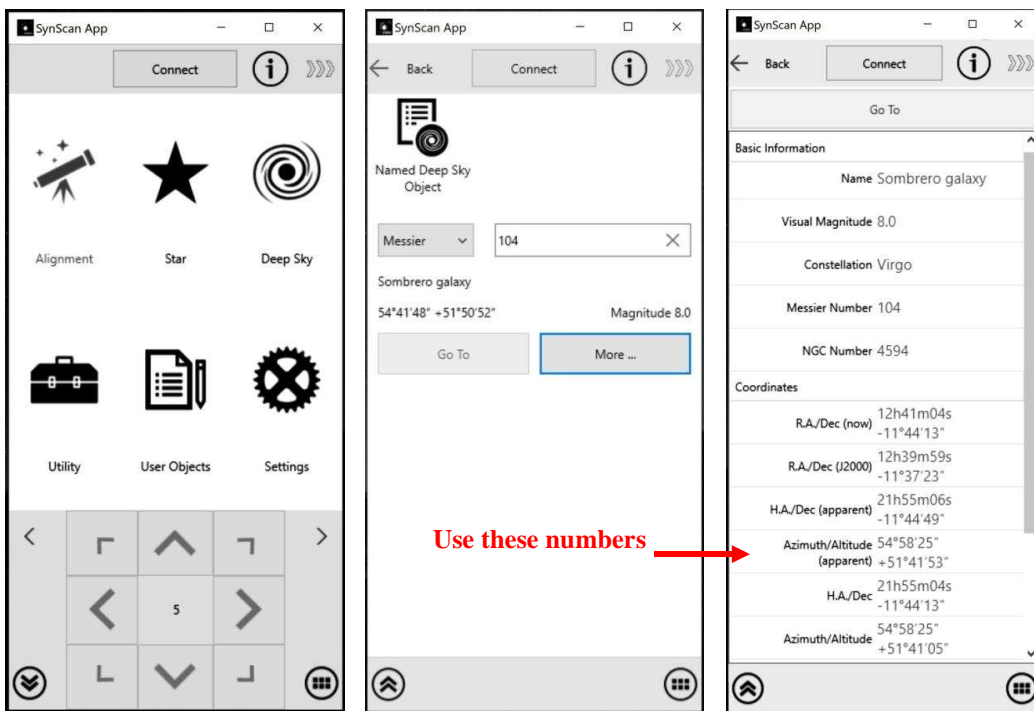
I found the old-fashioned manual compass to be more accurate with the worst reading error of 5 degrees, but most of the time it was within 2 degrees. My compass has the 360 degrees mark around the dial and is easy to read in the night. The only problem with the manual compass is that it doesn't correct any error for the position of magnetic south pole, you need to do that yourself. For Melbourne you need to turn the compass clockwise 11 degrees. I test the compass by pointing the telescope at Mars which was lower on the eastern horizon. Then I got the Azimuth co-ordinate from the SynScan app and adjusted the compass till it matched the same number as the SynScan app.



The major problem with this method is if your telescope is made of steel, it will interfere with the electronic compass in the smart phone. I found by keeping the smartphone at least 600mm away from the telescope the smart phone compass app worked at its best. Making a simple wooden bracket to hold the smartphone, overcame this problem. I mounted it on the rocker box under the telescope tube using just one bolt, as in this location it's less likely to get in the way when walking around the telescope. I made sure not to use any steel screws near the smartphone or compass and that the piece of wood was straight, see above.

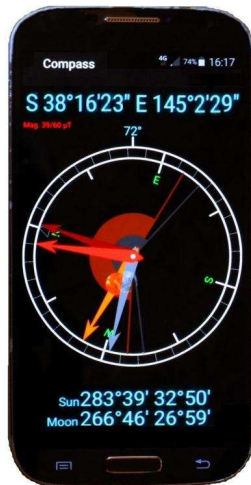
We have dealt with the mechanical part, now we need to deal with the method of getting it to find something in the sky.

We start the SynScan app with GPS location on, click on **Deep Sky**, then key in your object and click on **More** and a list of basic information is displayed. Looking down the list you will see the RA/Dec co-ordination of the selected object.



Under that you will see the Azimuth/Altitude coordinates. You will notice that these numbers keep changing. These are the numbers we use. Rotate the telescope till the first number (Azimuth) is on the **Living in the Sun** smartphone app or manual compass.

- 0 degrees = North**
- 90 degrees = East**
- 180 Degrees = South**
- 270 degrees = West.**



Use the second number (Altitude) to adjust the angle of the telescope tube.

0 degrees = Horizon and 90 degrees is pointing straight up.

Using your lowest power eyepiece and scanning around that area of sky, you should find the object you are looking for.

As long as the base of the telescope is level I found the Altitude to be within 1 degree, so you may find you only need to swing the telescope left or right to find your object. Best to start with the brighter object that can be seen in the finder scope.

If you live in the suburbs under a light polluted sky as I do, then this is a great inexpensive aid to help you find deep sky objects.

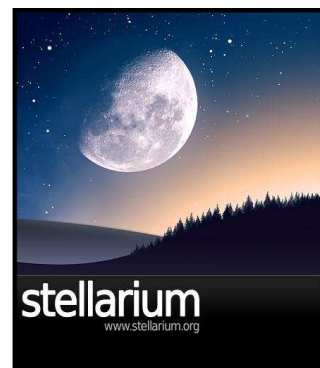
The SynScan app has a tour mode which generates a list of the brightest objects in the sky for that night, this would be a good place to start if you're a beginner. Best to stick to open clusters, globular clusters and only the brightest nebulas.

As with anything, the more you use it the better you become.



Setting up a Stellarium landscape. *By Andrew Parsons*

I enjoy using Stellarium to see where planets and other objects are located at any particular time and date in the night sky. Or even just for fun seeing how things look from another part of the world! The biggest issue for me when using my telescope was knowing how do the stars look from my backyard? Would a planet rise above my fence or a neighbour's tall tree? At what time and from what direction? By importing landscapes from the internet or making one, I can get a pretty good idea what I will see from places like my own yard.



At night after setting up my refractor, I would look up and then realise that over to my south there is a huge tree obstructing 50% of that side and much of my east side is blocked by my house. I also have different obstacles at different heights. Landscapes can take those obstacles into account. Here's my outline to making a Stellarium landscape.

To do this, you'll need a photo of your backyard (or observing site) imported into Stellarium, it will be superimposed over the program's night sky. It can be done accurately or just roughly so it can, at minimum, be a great starting point.

Step 1) You'll need to have a 360 degree panorama photo of your yard. (You can use multiple photos but I find a single photo is the easiest approach). I took a photo using the standard panorama settings on my iPhone and saved it to my computer.

Step 2) The landscape photo needs to be a PNG file with 2048x1028 pixels in dimension. Using a picture editor, create a PNG file and paste your photo to fit neatly inside it. Move the image to the horizon line which is in the middle. Make the top sky area transparent and then fill the bottom area (underneath the ground in your photo) to solid white. Please note, making transparency requires a lot of knowledge of your picture editor and consumes over 1/2 of your time setting up a landscape photo. Save the PNG file.

Step 3) You'll need a setup INI file now. Copy a LANDSCAPE.INI from the Stellarium program folders. Modify the INI file with your own details such as yard title, PNG file name, GPS location and yourself as the author ☐! Save the INI.

Step 4) ZIP up your photo and INI together.

Step 5) Run Stellarium, open Sky and Viewing Option Window menu, click Landscape tab, click Add/Remove landscapes button and select your ZIP file. After it loads, you should see your yard with the stars shining above inside Stellarium!

Step 6) Chances are the North cardinal point is wrong. Stellarium usually picks a midway point in photo so you'll need to go back into the INI file to adjust the Angle of Rotation number. Save the ZIP file again. Remove your landscape and add it again. Recheck the North point until it is accurately shown.

Computers have a devious sense of humour and the devil is in the detail!

I like to set my landscape to default so from that time on Stellarium will open up to my yard. Of course, you make multiple landscapes and select the appropriate view. I have found seeing my yard to be so worthwhile and it has really improved how I can plan a night's observation or just whittle away a moment's spare time!

Stellarium website - <http://stellarium.org/>

Stellarium mobile app - <https://play.google.com/store/apps/details?id=com.noctuasoftware.stellarium>

Briars Stellarium ZIP file https://drive.google.com/folderview?id=1222KdfYps2Vryv13NBj-xn-LWiAhqf_t



MPAS

Latitude = -38.2729

Longitude = 145.0415

Stellarium 0.20.3. *By Greg Walton*

Stellarium website - <http://stellarium.org/>

I have been using a free version of Stellarium Planetary software for more than 10 years. For beginners it definitely has the wow factor. Its best features are the beautiful constellation figures and its realistic day/night sky appearance.

I thought it's time to update to the latest version. On the Stellarium website you can choose the type of computer you are using by just clicking on one of the icons across the top of the home page. You can make donations to the developers with a link at bottom right.

Using a recently purchased Windows touch screen laptop, I clicked on the Windows 64-bit icon and the computer downloaded the 250 MB file. Running Stellarium 0.20.3 looked pretty much the same as the old version. I saw there were a few new icons on the screen.

First I set up the location using the icon on the top left-hand toolbar; I found it easier to scroll down through the list of locations and found Mornington Australia. Or you can enter your own location then click on **Add to List** to save, see right. Also best to tick the box saying 'Use current location as default'.

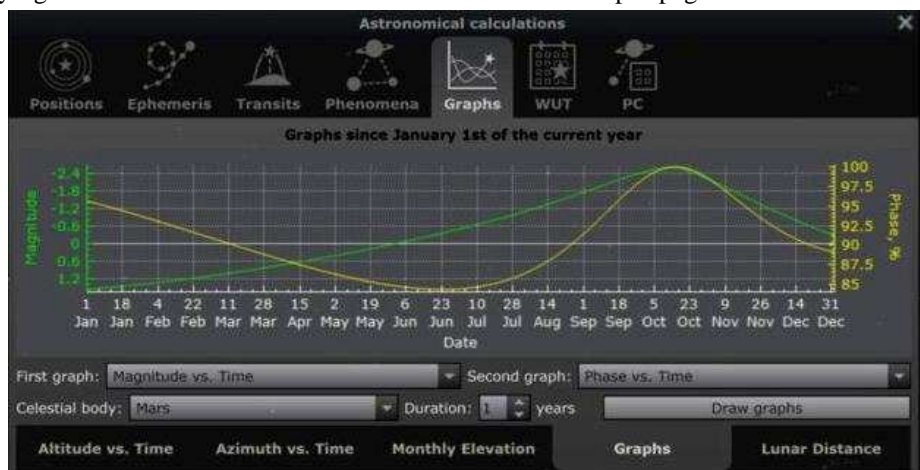


Then I used MPAS-member Andrew Parsons' article on **Setting up a Stellarium Landscape** to add the MPAS Briars landscape 360 degree image. Following Andrew's instruction and using the ZIP file he created made the job very easy. See set up window at right.

The bottom toolbar looks very much the same as the earlier versions and is pretty much self-explanatory. As you move the pointer over the icons it tells you what they do.

The side toolbar also looks the same except for the astronomical calculator.

This calculator does all manner of things like predicting when a certain event will occur. I struggled with this calculator and could only figure out how some of the features worked. On the Graphs page I selected Mars and it produced a nice graph showing when Mars will be at its brightest Magnitude -2.5 on the 14th October, also show how much of Mars surface is illuminated by the Sun, see right.



Helpful Links

How to use Stellarium - <https://www.skyatnightmagazine.com/advice/skills/stellarium-astronomy-planetarium-software-how-to-use/>
Changing Landscape - <https://www.skyatnightmagazine.com/advice/diy/stellarium-how-to-create-a-customised-landscape/>

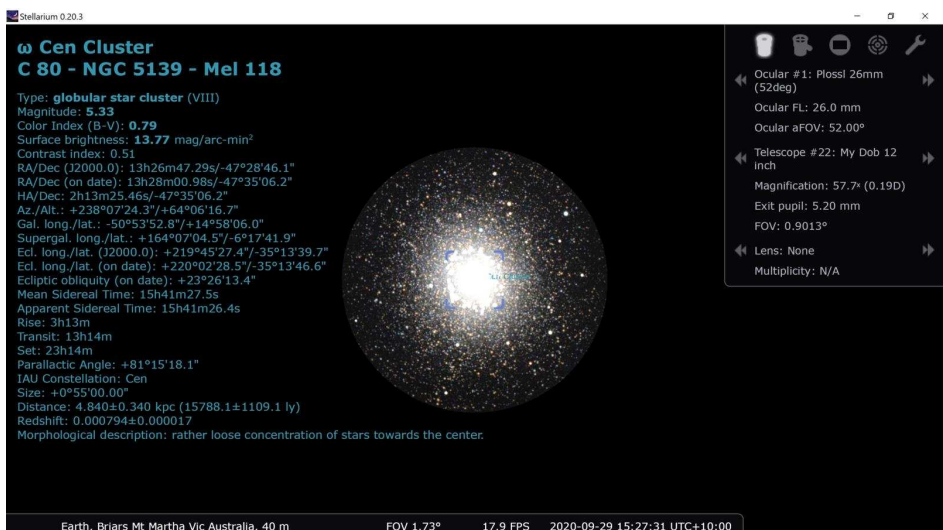
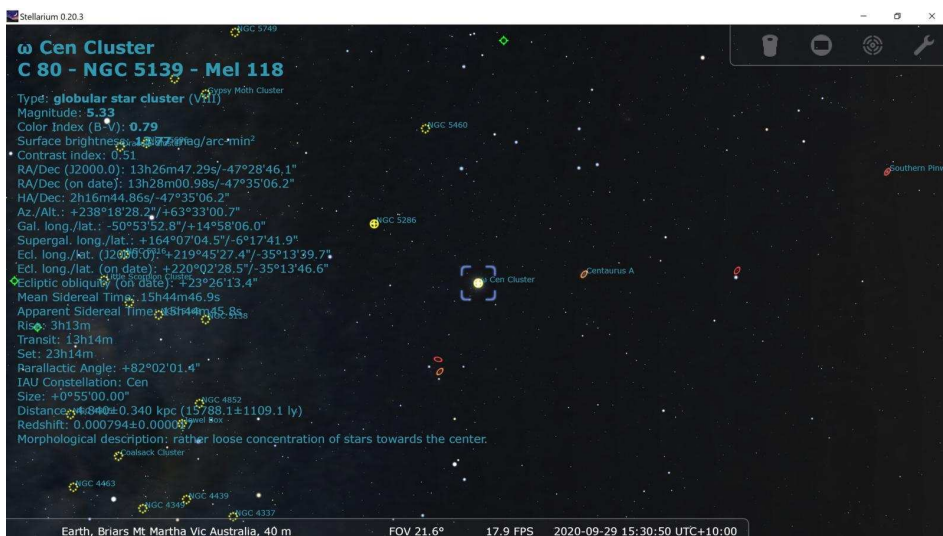
Stellarium's best feature is the constellation options. You can choose a simple line figure or fancy illustrations. Also if you go to Sky and Viewing options on the left side toolbar and select Starlore you can choose from many different cultures' including Australian aboriginal **Boorong**, each comes with a description and options window, see below. A nice feature to play with, but most of the time you will be using the more recognizable constellations **Western**, see right. As we are in the southern hemisphere most northern constellation cultures can't be viewed from the Briars. Though if you switch off landscape on the bottom toolbar and scroll the screen up, you can see these constellation figures.



I saw a new toolbar in the top right corner. First you must select an object and an indicator box will flash around the object, see right. Then you can click on the first icon which looks like an eyepiece. This will bring up a selection of eyepieces and telescopes. By using the arrow keys you change between the eyepieces or telescopes, and with every change the view of the selected object will change, giving you a fair idea of what to expect when you look through the eyepiece, see below right. You can also select a Barlow or a type of corrector lens. If you can't find your telescope or eyepiece, you can easily add them by clicking on the spanner icon. I added all my telescopes as I didn't see them on the list.

The round icon with a rectangle inside lets you choose an astronomical camera or DSLR along with your telescope. This places a rectangular frame around your selected object, giving you a good idea of what to expect your images will look like.

The other icon is a Telrad viewfinder overlay. This always stays in the centre of the screen and has 3 circles; the large circle is 5 degrees which indicates the area the sky viewed with binoculars or a standard finder scope. The middle circle is 2 degrees, the area the sky viewed with a small telescope. The smallest circle is 1/2 degree, the same size as the Moon or NGC5139 and what you can expect to see with a large telescope, see right.



If you click on the spanner on the left-side toolbar and click on Scripts, you will see a collection of scripts you can run. Scripts are programs that display an arrangement of objects or constellations as a moving slide show. First select a script to run then click on the Play or Stop button in the options window, bottom right.

I ran a few scripts and found myself travelling around the solar system viewing the planets and their moons. Then I went on a tour of deep sky objects. I could even watch a solar eclipse. All very entertaining and educational for beginners.



For the more adventurous, you can use Stellarium to drive your telescope mount.

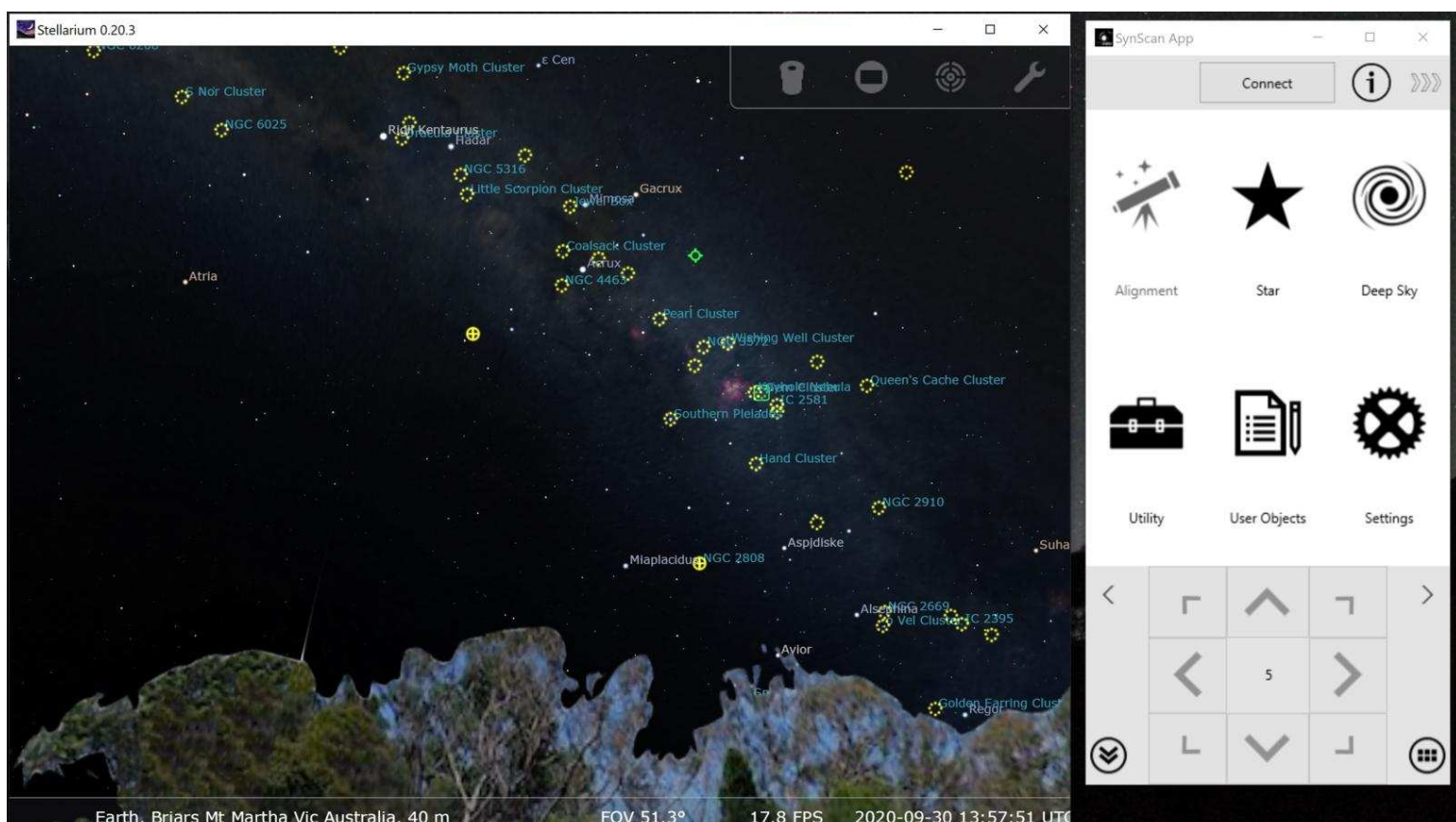
First I downloaded the SynScan app for windows, then I installed and started the app on my laptop. Note - There is an Apple version. SynScan Pro App, Version 1.19.0 <https://www.skywatcher.com/download/software/synscan-app/>

Then I clicked on Settings, then Location and entered the Briars Latitude 38d 3' 10" S, Longitude 145d 7' 15" E, Altitude (m) 40 and switched off Use Location Sensor. I started my EQ6 mount with SynScan Wi-Fi dongle attached. Then I checked the Wi-Fi list on my computer and sure enough the Sky Watcher SynScan was on the list. Then I just clicked on Connect and I heard the EQ6 mount go tick. Then I clicked on the direction arrows and the mount moved, I put the mount in the home position and did a one-star alignment using Saturn. The mount moved the telescope to Saturn and I centred it in the eyepiece. I saw one of the direction keys blinking on the SynScan app, this prompts me to click on the flashing direction key to set the alignment. Using the Deep Sky icon I entered NGC104, click on Go-To and the telescope moved to NGC104, a bright globular cluster. **Yes it worked.** I selected a few more objects and everything was working fine.

While the SynScan app was running, I started Stellarium, clicked on an object and nothing happened. This was not unexpected as I've seen so many others struggling with this before. It's still workable, I just have to enter each object in to SynScan window.

Remembering a few days before I had downloaded the SynScan app and Stellarium app to my smartphone and everything just worked, when I tapped on an object on Stellarium the mount just moved straight to the desired object, which I wrote about on page 13.

So not giving up I looked through some help files and found how to fix the problem.

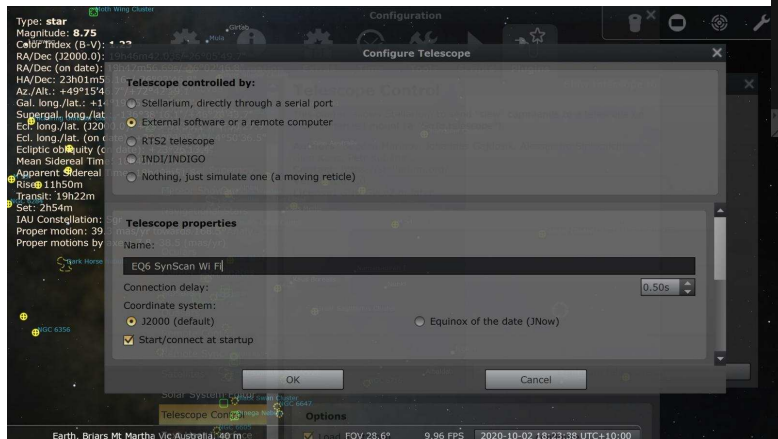
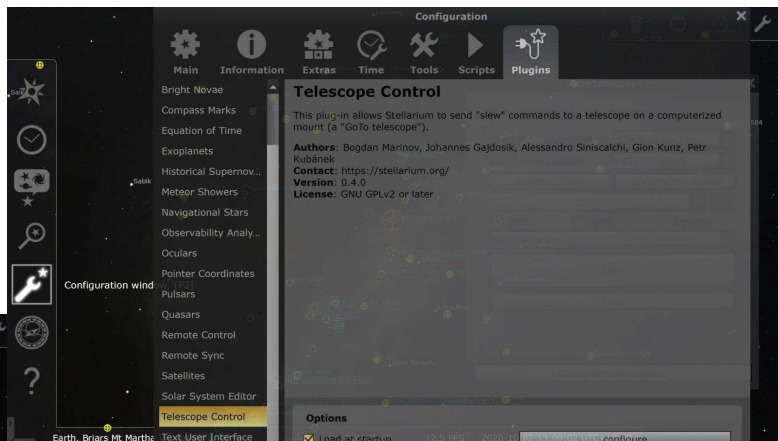


Controlling EQ6 mount with Stellarium.

Click on the Configuration window (spanner)

Then click on **Plugins** and select **Telescope Control**

Then in the **Options** window tick the 'Load at startup' box and then click on the **Configure** box.



You should see 2 new windows. See left

Telescope controlled by:

As we're using wi-fi, select **External software or a remote computer**.

Telescope properties

Give your telescope a name. I used **EQ6 SynScan Wi Fi**

Then tick the **Start/Connect at startup** box.

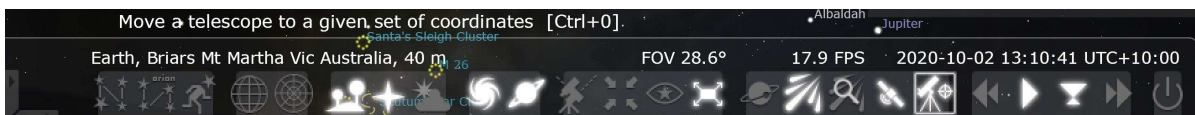
Then click on OK.

You can enter multiple telescope mounts in this window by clicking on the spanner icon, see right. Once your telescope mounts are entered just select your mount and click on the **Connect/Disconnect** box.

Note - At this stage I should remind you, that you need to have the SynScan Wi-Fi adaptor connected to your EQ6 mount and the SynScan app running on your computer for this to work. Also need star alignment to be completed.

SynScan - <https://www.skywatcher.com/download/software/synscan-app/>

Close Configuration window (spanner) on the left-hand toolbar and you will see a new icon on the bottom toolbar. Move a telescope to a given set of coordinates [Ctrl+0]. Looks like a telescope with a target, see below.



Click on the icon and the **Slew telescope to** window should appear.

There are two methods to select an object.

First method is to centre your object in the centre of the screen and click on **Center of the screen** box, then click on **Slew** box. You should see a circle with **EQ6 SynScan Wi Fi** moving towards the centre of the screen and hopefully the telescope moves as well.

Second method is to select an object on the screen, click on it and you should see a flashing box around the object then click on the **Current object** box then click on **Slew** Box and again the telescope moves as well.

When I was finished I shut everything down and restarted SynScan and Stellarium. To my surprise it all worked. I just clicked on the telescope icon and we were up and running again. Then I tried pushing it to breaking point and it all worked fine for many hours, then some bugs started creeping in and I found I had to restart Stellarium. While the SynScan app just kept working no matter what I threw at it. I found that disconnecting and reconnecting the telescope also got it working again. One other thing I found, was I couldn't select objects that were directly overhead. This is a safety feature to stop the telescope from crashing into the tripod legs of the mount.



Overall I'm very happy with the performance of the SynScan Wi-Fi dongle and the Stellarium program. *Greg Walton*

Planets app

<https://play.google.com/store/apps/details?id=org.qcontinuum.planets>

Stellarium mobile app

<https://play.google.com/store/apps/details?id=com.noctuasoftware.stellarium>

Sky safari app

<https://play.google.com/store/apps/details?id=com.simulationcurriculum.skysafari5>

Star chart app

<https://play.google.com/store/apps/details?id=com.escapistgames.starchart>

Aurora forecast

<http://www.aurora-service.net/aurora-forecast/>

Space weather live app

<https://play.google.com/store/apps/details?id=com.spaceweatherlive.app>

Space weather

<https://www.spaceweather.com/>

Heavens above app

https://play.google.com/store/apps/details?id=com.heavens_above.viewer

Phase of the Moon calendar app

<https://play.google.com/store/apps/details?id=com.probadosoft.moonphasecalendar>

Moon rise and set calendar

<https://www.timeanddate.com/moon/australia/melbourne>

Tide times app

<https://play.google.com/store/apps/details?id=au.com.vervetech.tidetimesau>

Cloud free nights weather

<https://www.cloudfreenight.com/>

Yr weather app

<https://play.google.com/store/apps/details?id=no.nrk.yr>

Space news app

<https://play.google.com/store/apps/details?id=com.briox.riversip.tech.space>

SynScan Pro App, Version 1.19.0

<https://www.skywatcher.com/download/software/synscan-app/>

SynScan polar scope viewer app

<https://play.google.com/store/apps/details?id=com.RapidoDroid.synscaninit2>

Living in the Sun app

<https://play.google.com/store/apps/details?id=com.zara.app.compassk>

Army knife android app

https://play.google.com/store/apps/details?id=com.digital_and_dreams.android.android_army_knife

Smart tools app

<https://play.google.com/store/apps/details?id=com.pcmehank.smarttoolbox>

Real Time Lightning

<https://www.lightningmaps.org/?lang=en>

Earthquakes@GA

<https://earthquakes.ga.gov.au/>

Campermate app

<https://play.google.com/store/apps/details?id=nz.co.campermate>

List of Free Apps and software on my Android smartphone.

My smartphone is the old S4

These are the apps and software that haven't been deleted from my Android smartphone.

Which says something; if an app gives me any trouble I delete it.

By Greg Walton

Rockets and Comets



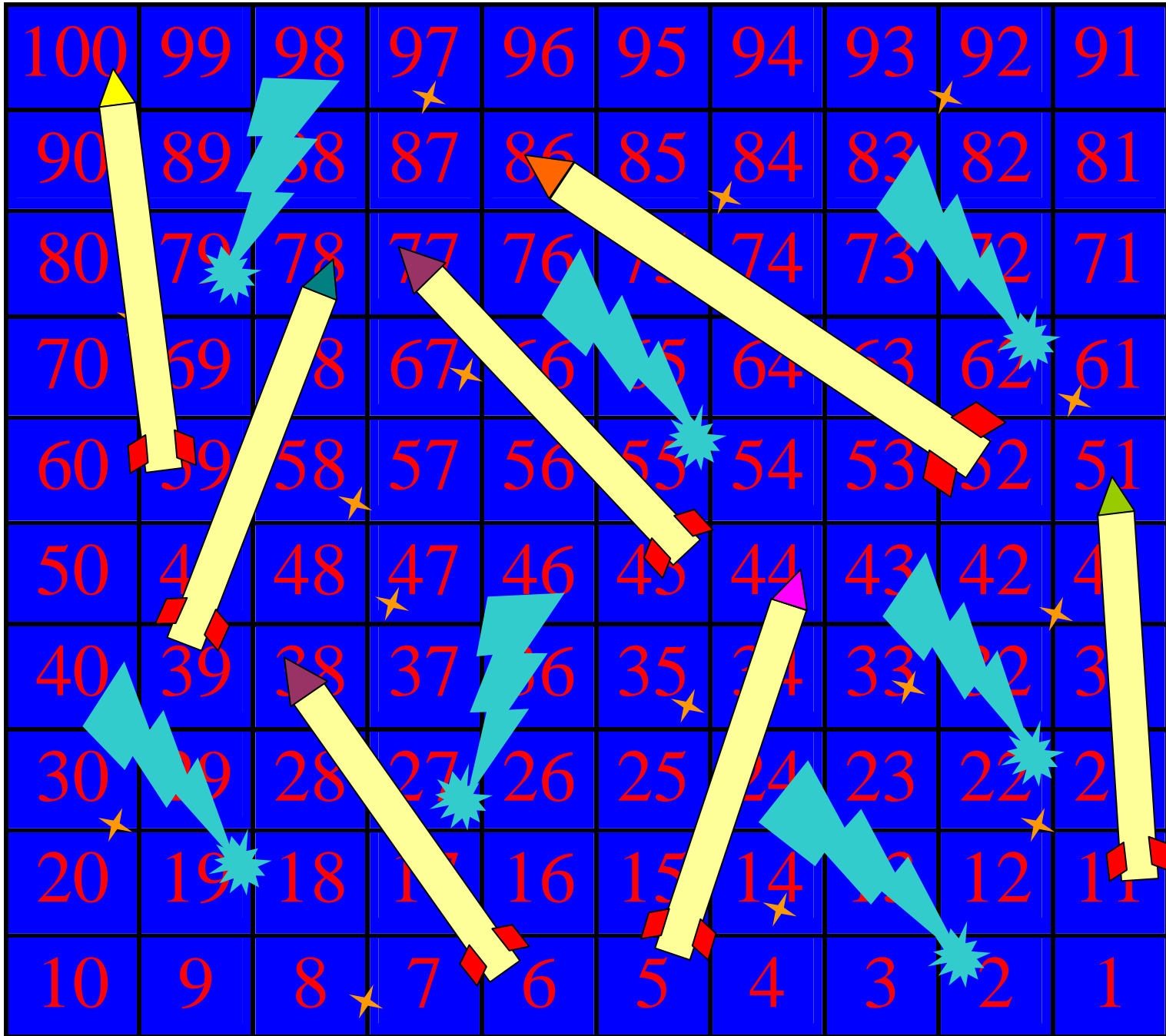
Like Snakes and Ladders, this is a dice game where rockets move up and comets move down.

Land on the tail of a comet and you move to the head of the comet.

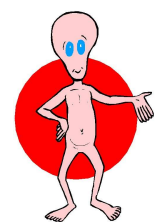
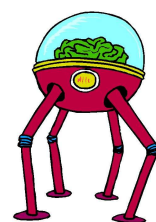
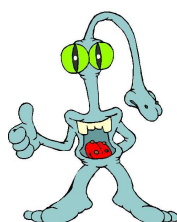
Land on the tail of a rocket and you move to the top of the rocket.

2 dice are recommended for this game, just add them and move the number of steps starting at 1

There are some good dice apps for smartphones if you don't have a dice.



Just cut out your alien players.



Dice app - https://play.google.com/store/apps/details?id=appinventor.ai_ansonsavage.DiceRole [Magic8Ball](#) [Extension](#) [Two Die](#)

MPAS GALLERY



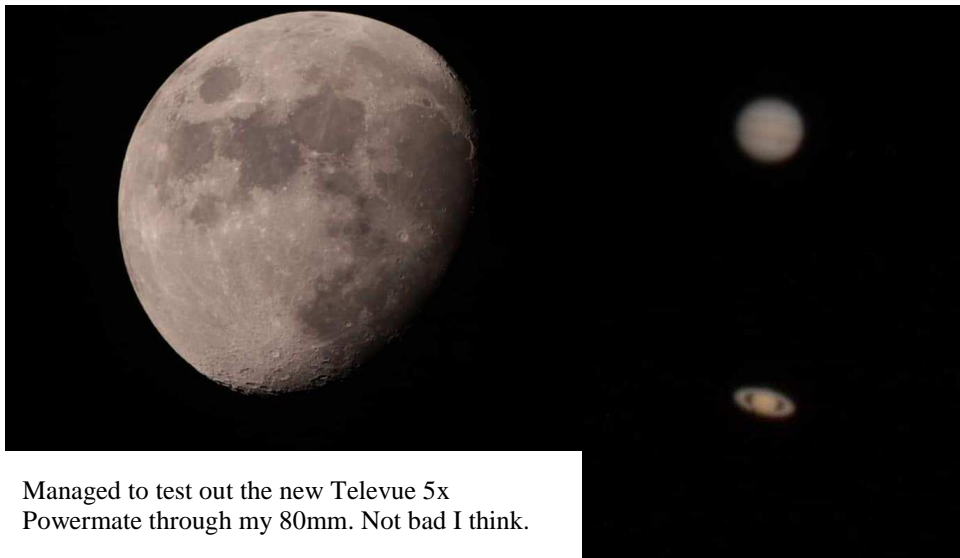
Right - Took my first shot of Mars 28th August when I noticed it peeking over my neighbour's roof for the first time in a while. It was still low (18°) so it's a bit fuzzy but it's exciting to see some shades of colour and a hint of the polar ice cap! *Guido Tack*



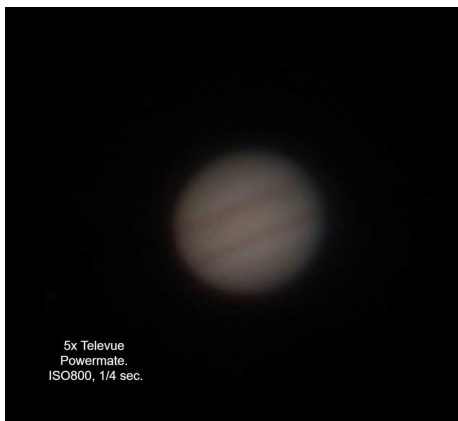
Left - Jupiter on Saturday 29th August night around 10pm under very good seeing for Melbourne. C11 with a ZWO ASI290MM.

Dominic

Below - My setup and viewing on 30th August. *By Chris Kostokanellis*



Managed to test out the new Televue 5x Powermate through my 80mm. Not bad I think.



5x Televue Powermate. ISO800, 1/4 sec.



2x Barlow + 12.5mm Plossl. ISO800, 1/4 sec.



****WARNING Crazy Oversaturated Images Below - Exposure May Cause Permanent Retinal Damage****

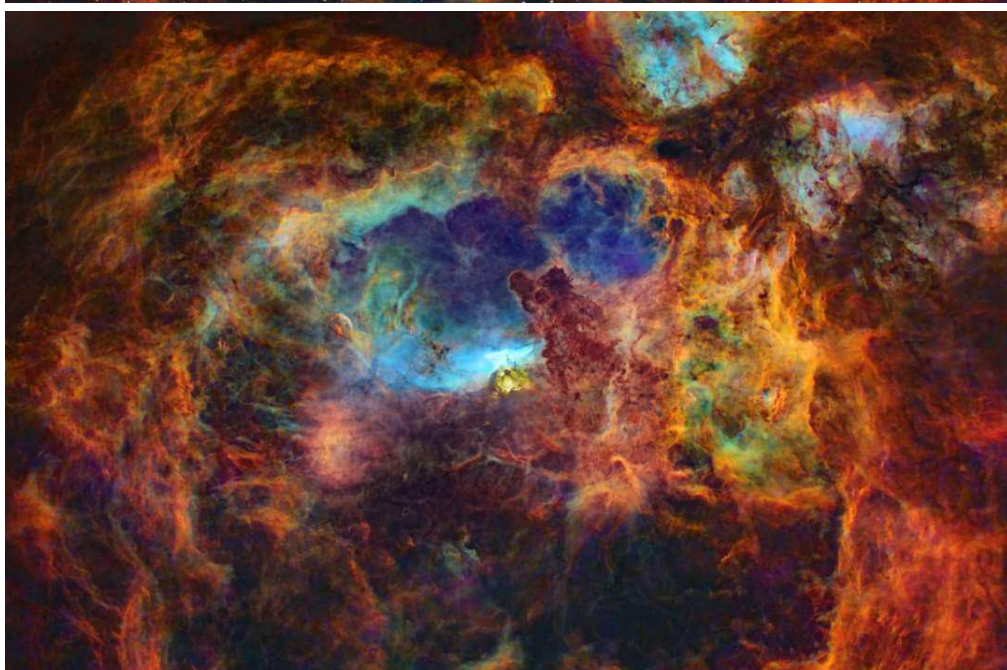
NGC6357 | Lobster Nebula | War & Peace Nebula | LRGB+Ha | SHO + RGB Stars
 Hope all are going well. Been off the wagon for some time and lost sight of hobbies for a while now; trying to get back into good things. In saying that, I had a lot of fun with this L, R, G, B, Ha, OIII, and SII data for this object. Actually took a long time to remember how to do things and made mistakes along the way [some registration errors I now see in the end results – oh well]. The SHO version is my first real attempt at the Hubble palette, and I see now this narrowband processing is an open license to go crazy with the photo editing sliders to get the result you want. However, I did try to create a Hubble like palette result.

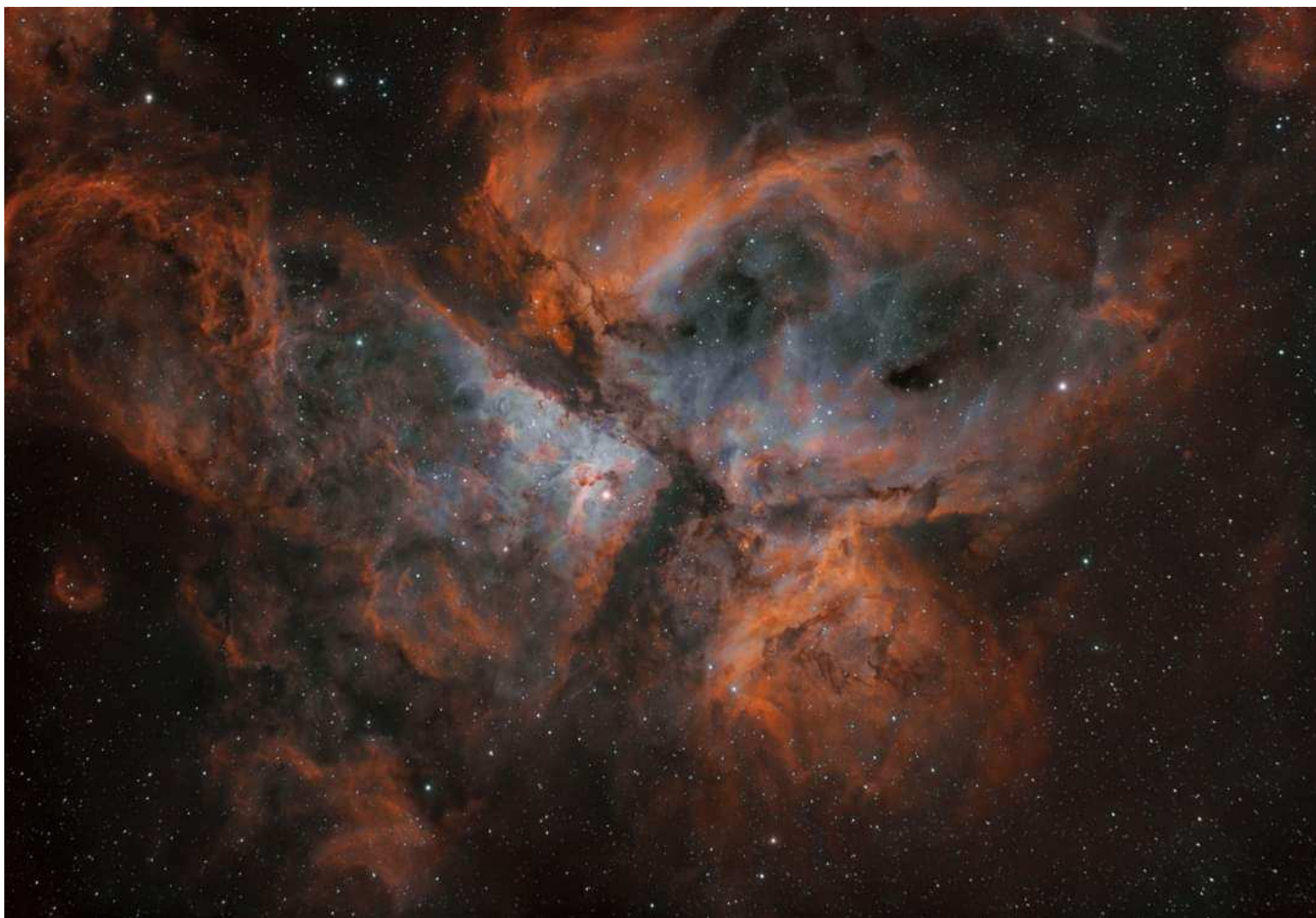
Just a quick note, regarding the SHO colouring and the conversion of the SUPER green tone imposed by the over the top Ha data, I found that the Pixinsight SNR tool was much better than the Photoshop version. It was more delicate and was not damaging to features that were damaged in the PS version.

Starnet was the tool I used to remove the stars, and it did a pretty good job. Using the 64bit tool, it takes about 2mins to do the job, it certainly beats the old way of subtracting them. Some star marks are still visible, but that's okay. In Photoshop, I used the spot healing tool to selectively content fill/ repair the star remnants. I removed the stars to allow me to smash the nebula data with processing steps. Then replaced the stars at the end and added RGB star colour to those I could mask. Masking RGB stars to a Ha star is tricky, but worth the manual touches to make it work.

My original LRGB [with Ha highlights] image was more boring than this shown below, so I added the narrow band colour data selectively into some areas to create a little more interest. I mention that just in case you try to match your RGB results to my colours. So there you go; back on the wagon. All the best, Steve
 L Bin 1x1 22 x 900sec x 22 subs
 RGB Bin 2x2 x 450sec x 12 subs
 Ha Bin 1x1 x 1200sec x 89 subs
 OIII + SII Bin 1x1 x 1200sec x 12 subs.

Steve Mohr





Above

Carina Nebula.

Reprocessed earlier data. Using Astropixel Processor extracted HA and OIII channels then combined Final process in Photoshop Combined stacks of 60 120 and 180 seconds approximately 2 hours acquisition.

ZWO 294MC Pro Skywatcher ED 72 Skywatcher NEQ6
ZWO ASI AIR Guided with ZWO 224mc, Optolong L-Enhance.

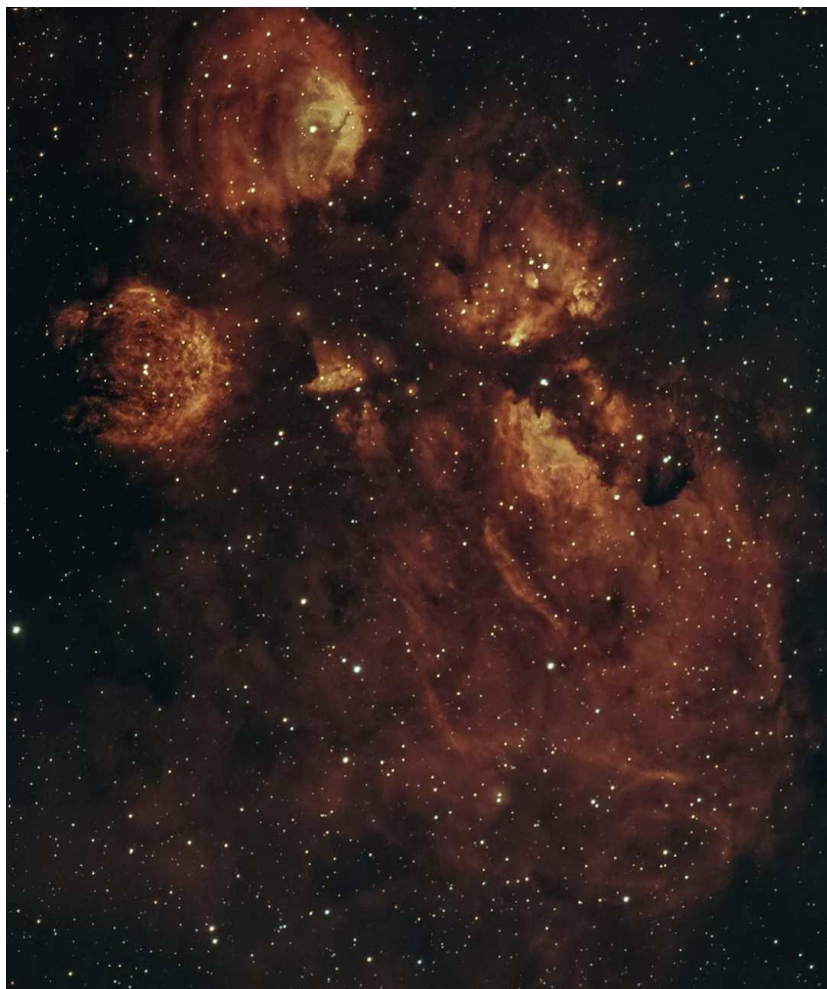
By Nik Axaris

Right

Cats Paw Nebula

1.5 hours integration (300 second subs), RGB only as the HA O3 extraction yielded poor results, ZeeOne more from Earlier in the week's imaging with some rare winter Melbourne clear skies. Lots of moisture in the air so not the clearest, TSOptics 130mm, Optolong L-Enhance, ZWO 294mcPro, ZWO 120mm mini guide cam, ZWO ASI AIR.

By Nik Axaris





Above - Helix Nebula under a very bright moon 3 hours 20 minute integration 10 minute subs Darks flats etc. TS-Optics PHOTOLINE 130 mm f/7 NEq6 Pro and ZWO asi air asi 294mc pro asi 120mm mini guide cam. HA OIII extraction and recombination using Astropixel processor combined with the Optolong L-Enhance Filter which captures the HA and OIII channels for a one shot colour camera. I still need to collect more data but winter in Melbourne has been overcast, or moonlit or unbelievably windy. *By Nik Axaris*

Below - Moon *By Nik Axaris*



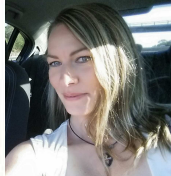
SOCIETY INFORMATION



Peter Skilton



Mark Stephens



Nerida Langcake



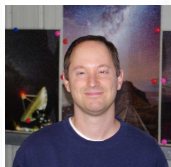
Jamie Pole



Anders Hamilton



Trevor Hand



Simon Hamm



Peter Lowe



Dave Rolfe



Greg Walton

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COVID-SAFE PRACTICES APPLY

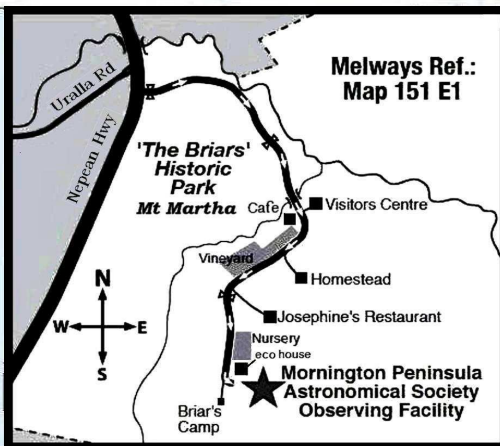
Meeting Venue: MPAS Astronomy Centre
 The Briars, Nepean Hwy, Mt Martha
 (Melways ref. 151/E1)

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



SOCIETY MEETINGS



Guido Tack Fred Crump

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

LIBRARY

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/>

COVID-SAFE PRACTICES APPLY VIEWING NIGHTS - MEMBERS ONLY

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

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

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



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

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

SCORPIUS The journal of the Mornington Peninsula Astronomical Society

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