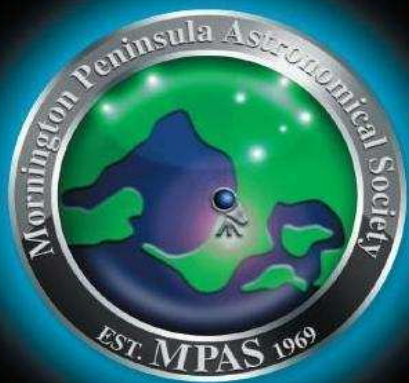


Cover image - Saturn by *Dominic Lucarelli*

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.



The planet Saturn is now nice and high at a reasonable time after sunset, after it's opposition last month. This picture was taken at 10pm, under good seeing. ZWO ASI 485mc with C14 telescope.

By Dominic Lucarelli

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

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

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Mornington Peninsula Astronomical Society

SOCIETY NEWS



School Viewing Night August 29th - Strathmore Girls Baptist Grammar had 32 Year-10 students at Merricks Camp on Tuesday evening. The talk indoors was given by Katherine McCoy and Peter Skilton, with lots and lots of questions, which was impressive given the girls spent the day kayaking at Pt. Leo and would probably have been very tired. Following the talk, telescopes were shown to the attendees indoors by Chris Kostokanellis, Phil Peters, Nerida Langcake and Steve Lomax. Steve made his MPAS debut at this outreach night as a recent new member, and brought along his nicely polished 8-inch white Dobsonian ready to use.

Unfortunately, outdoors it was drizzling with only very small patches of thinner cloud such that the Moon shone through the cloud layer only intermittently. Nevertheless, one teacher and a couple of hardy students persisted until they were able to see the Moon briefly and even tried their hand at capturing a picture of it on their phone held up to the eyepiece, under Phil's expert guidance. Apparently the night before had been beautifully clear skies at the campgrounds. Oh the difference 24 hours can make.

Despite the weather, they all seemed very happy with the experience. *Regards, Peter Skilton*

Public Viewing Night September 1st - The first of September stargazing evening for the public saw 89 in attendance on a 99% cloudy evening. Cloud predictions for the evening were looking very favourable all afternoon, with Cloud Free Night predicting less than 10% cloud at worst. However, a few hours later we had almost 100% cloud at the Briars, and it persisted. Something a bit chaotic was happening with the weather prediction that day. But, as we've encountered many times before, the clouds didn't stop the crowd one bit!

Indoors, Manfred Berger presented the talk and answered questions. Then afterwards, he and Peter Skilton were interviewed by a visiting Year-9 student, Willow Scott, on anything and everything to do with Saturn. This was for a 4-week school "passion project", and her passion was about Saturn. Alas, the skies prevented us capping off the evening with being able to show her Saturn for real over in the east using one of the observatory instruments.

Helping on-site with the setting up and ready to roll if the clouds cleared were Phil Peters, Nerida Langcake, Greg Walton, Simon Hamm, Mark Stephens, Peter Skilton, John Goodall, Rohan Baumann, Jamie Pole, Fred Crump, Ben Claringbold, Dave Rolfe, Michelle, Jared and Sebastian Moore, Chris Kostokanellis, Jason Heath and Alan Predjak. *Regards, Peter Skilton*

School viewing September 5th - Forty five Year-7 girls from Toorak College were treated to some stargazing last night at the Briars. They arrived on time and in style by coach, with an impressive effort always by the driver getting in and out across the narrow bridge at the Visitor Centre, without making it a little wider in the process. The night started outdoors with a bright pass-over of the International Space Station in the south west, followed by the telescopes, then a pass-over of the Chinese Tiangong Space Station rising almost vertically in the west. Everyone then moved indoors to hear the talk given by Katherine McCoy and Peter Skilton before concluding at 9 pm.

Helping run the show outdoors were Phil Peters, Nerida Langcake, Steve Lomax, Greg Walton, Ben Claringbold, Jamie and David Rolfe and Chris Kostokanellis. The weather was cool, but kind, with the clouds staying away all evening. The next two classes of Year 7s from the same school will visit the Briars next week. *Regards, Peter Skilton*

School viewing September 13th - Wednesday, 6:30 pm Briars. The visit to Berwick tonight saw 35 Guides plus their leaders treated to some mild weather conditions, with thin high level cloud raising the light level by the surrounding street and commercial lighting being scattered. There was no Moon for this evening, but the sky was bright enough as if it were a Full Moon, with the 5th star of the Southern Cross not being visible by eye.

The talk in the Guide Hall was given by Peter Skilton, with an enthusiastic audience who offered no respite from questions. One Guide when asked what her question was, said she had seven of them, and proceeded to rattle them all off sequentially before pausing for an answer! I think only 3 of them were actually remembered and answered.

Another Guide asked the thought-provoking question of how the gas giant Uranus was able to be knocked over on its axis if it's basically a ball of gas and not much solid in it.

The group then departed outdoors in time to spot the Tiangong Chinese Space Station clearly appear towards the WSW, before disappearing midflight high in the WNW sky. Even though the lighting was particularly strong in that direction, the Guides had no trouble spotting it and following its path, with it peaking at magnitude -1.5. Helping outside with operating the telescopes on a grassy knoll were Nerida Langcake, Steve Lomax, Chris Kostokanellis, Phil Peters and Greg Walton. Views of Saturn and 47 Tuc were readily achieved, even with occasional incursion of oncoming car headlights. *Regards, Peter Skilton*

School viewing September 14th - Thursday, 7 pm Briars saw another group of 32 Year-7 girls and teachers coached in from Toorak College to the Briars for some stargazing at the observatory. The talk indoors by Katherine McCoy and Peter Skilton started the evening, with soupy high level cloud blocking the entire sky initially and enough to make anyone sceptical about the viewing conditions likely that evening. Temperature was mild, with no wind at ground level.

However, within 10 minutes the cloud had largely cleared and thinned sufficiently for everyone to move outdoors to look through the diverse arrangement of telescopes present. Saturn was the obvious first target, but other deep sky objects were visible, helped by it being a Moonless sky. Then everyone moved back indoors for the rest of the talk. And there were lots of questions...lots. Topics ranged far and wide, but favourite areas of interest were to do with all aspects of living on and colonising Mars, and what to do with potentially Earth-impacting asteroids. It was a group of well-engaged students.

Helping on the night outside with the setting up and operating the instruments were Phil Peters, Greg Walton, Ben Claringbold, Fred Crump, Chris Kostokanellis, Mark Stephens, Guido Tack and David, Jamie & Landon Rolfe. *Regards, Peter Skilton*

APW Astrophotography Workshop September 16th

All the hard work that went into organizing the 2023 MPAS Astrophotography Workshop finally paid off on Saturday 16th September. The day started with clear blue skies, and ended under the glow of the Milky Way, with every camera on-site pointed in its direction at some point during the evening.

The new MPAS Marquee made its official debut in all its full colour glory, and was expertly assembled by David Rolfe, Nerida Langcake, Mark Stephens, Phil Peters, Guido Tack and Greg Walton. Sidereal Trading, who generously sponsored the door prize, a Skywatcher Star Adventurer Mini Pro, made the marquee their home for the day.

Presenters David Rolfe, Guido Tack, Jamie Pole, Alex Cherney, Greg Walton, Nerida Langcake, Chris Kostokanellis, Ben Claringbold and Nik Axaris all shared their knowledge of various topics, and kept the audience busy taking notes, photographing the various slides, and asking plenty of questions. Many attendees were seen to be suffering the effects of information overload. Phil Peters, Mark Stephens, Simon Hamm and John Cleverdon all helped keep everything moving along seamlessly, and Peter Skilton ensured the pizzas were delivered on time, and at an acceptable temperature.

After the winner of the prize was announced, the pizzas dealt with, and the skies darkened, tripods filled the concrete slabs at the MPAS site and all lenses were pointed at the sky for the practical imaging session. Blue vested members were kept busy answering questions and offering assistance to budding astro photographers. The Milky Way and Southern cross did a fantastic job, dutifully posing for photographs. The MPAS telescopes weren't forgotten either, with every scope in the observatory and dome having a camera attached, and several attendees gleefully capturing their first deep sky images.

Well done to all the volunteers for a very professionally executed and successful event. *Chris Kostokanellis*



Society meeting September 20th - For those of you who are not yet subscribed (it's free) to the MPAS YouTube channel, this month's meeting has been uploaded for viewing. The meeting features Dr. Dan Goebel, Senior Research Scientist at the Jet Propulsion Laboratory, on the topic of "Advanced Propulsion for Space Missions". Also covered was a recent field trip by 2 MPAS members to Mount Buller for some icy observing at a collaborative public stargazing evening with the ASV. And Eden White starts a Cosmic Corner segment, this time about Muon Colliders. We close with the gravity map of Earth as measured by the ESA GOCE satellite, set to the music of Dark Ages by the composer MaxKoMusic. 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/UCm6XOkIcIft4y0XRbXpXuw> or watch it on the MPAS site once it's refreshed for this month: <https://www.mpas.asn.au/meeting-recordings/> Regards, Peter Skilton

Working Bee & Members BBQ September 23rd - Saturday was a beautiful sunny day, with over 30 members attending the working bee and BBQ. Everyone chipped in to mow the lawns and clean up the place as always. Usually, I try to mention each and every one of you that come together to make it all work, but there were so many that I'd be bound to forget someone! So I'd just like to say a huge thankyou to everyone for doing such a magnificent job, and to welcome new members Wendy Keys, Bhishag Mohan, and Liam and Arlo Laube.

As well as the usual mowing and cleaning, we also sorted out the container as it can get quite cluttered. Plus there was a large collection of books from the late Ian Sullivan's estate to add to our library.

Because the footy finals are on, as well as the usual BBQ, we also had party pies, sausage rolls and chips added to the menu, with many fans wearing their favourite team colours. During dinner we had the pleasure of Eden White giving a presentation on The First One Billion Years Of Time. This was quite interesting, with questions and discussion afterwards. Thanks Eden!

As it was a clear night, there were many telescopes set up by various members, as well as the observatory and dome being open to view and image the Moon, Saturn and even Jupiter, which was up and bright later in the evening. Warm regards, Phil Peters



By Phil Peters



By Phil Peters



By Phil Peters

Seniors viewing September 26th - We had our first visit last night to Martha Cove Village in Safety Beach where 46 retirees and staff heard Katherine McCoy and Peter Skilton give a talk indoors in the main lounge. The facility had a surprisingly good audiovisual set up. There were lots of existential questions about the Universe, the Sun, Theia, asteroid impacts and dinosaurs, tending to be quite a bit more profound in nature than usual. This is a large gated community, locked after 7 pm, so most of us only arrived just in time before the drawbridge was pulled up.

Following the talk and many questions, the audience drifted outside next to the bowling green, where telescopes were perched just above an unfenced, and somewhat precipitous, drop down to the green. Despite the nearby building external lights not being able to be extinguished, good views were had of Saturn and the gibbous Moon, and no one fell over the edge. Running the telescopes were Fred Crump, Greg Walton, Chris Kostokanellis, Ben Claringbold and Nerida Langcake. Regards, Peter Skilton

Public viewing Night October 6th - The October public stargazing event last night at the Briars saw 69 visitors attend. The approach road had been freshly graded, so the public had a particularly smooth ride to the car park. It was a chilly evening, but mercifully wind-free, odour-free and ranged from a lot of cloud cover sometimes, to nearly cloud-free most of the time. The laughing of Kookaburras was also very evident early in the proceedings.

Guido Tack gave the talk indoors all about telescopes and impressed the audience. Outdoors, Saturn and Titan put on a good showing, being high in the sky at the time. M17 was also very visible from the dome, and provided a steady image. About a third of attendees waited until after 10 pm for Jupiter to rise above the eastern horizon in a direction near the pumping station. At such a low altitude, the image visible in the eyepiece was noticeably coloured, though it was a definite circle with the Galilean moon in-line with it and was surprisingly steady in appearance for being so near to the horizon.

Helping in the preparation and running of the evening were many members. Present were Phil Peters, Fred Crump, Chris Kostokanellis, Anders Hamilton, Katherine McCoy, Peter Skilton, John Goodall, Jamie Pole, Simon Hamm, Ben Claringbold (who was showing everyone the helix nebula in real time), Greg Walton, Liam & Arlo Laube, Julie McErlain and Stewart Gangell. Regards, Peter Skilton

School Viewing Night October 17th - MPAS had its annual visit to Parkdale Secondary College last night, as part of their STEM programme. This time the weather was gloriously clear and steady and, for the benefit of those members unable to attend, it was arguably the best viewing conditions we've ever had for them. The talk indoors was given by Peter Skilton to about 67 Year-7 students and parents who wished to attend as an extracurricular activity. Numbers attending were down this year, and the school believed this was due to cost of living pressures impacting many of their families. These activities are an optional extra cost. The school is also sending a group to Space Camp in the USA soon as well. The school theatre has a high-tech Wi-Fi roof projector. Unfortunately it stubbornly refused to connect to the laptop, despite the best of efforts by their main IT person. So a 20-metre long HDMI cable was pulled out as Plan B and saved the day at 2 minutes before the talk was due to start. Following the talk, everyone moved just outside the southern boundary fence of the school, to a small reserve where the telescopes were set up.

Operating the instruments were Phil Peters, Ben Claringbold, Chris Kostokanellis, Steve Lomax, Katherine McCoy, Pia Pedersen and Greg Walton, with the very favourable conditions being conducive to some great viewing at the eyepiece. Saturn, two of its moons, and the waxing crescent Moon featured prominently; and alpha Centauri was easily split into its components. For those who stayed until just before 9 pm, the International Space Station made a bright pass, travelling about a handspan above the horizon from low in the west and disappearing towards the south south-east. It didn't travel silently though, because Moorabbin Airport is very close to the park, so the sound of revving aircraft engines was present most of the evening. *Regards, Peter Skilton*

Society meeting October 18th - The meeting features Prof. Sara Russell, Planetary Scientist at the Natural History Museum, London, on the topic of "Our Solar System: How Geology Began". She is a member of the OSIRIS-REx mission's science team, the one that returned a substantial sample of asteroid Bennu to Earth in the last few weeks, and the mission is covered in this talk, hosted by the Geological Society, London. Also covered was AstroMoPho and Sky for the Month, while Cosmic Corner is about the sound of the Big Bang. The Winchcombe meteorite, Spectroscopy basics and the Hubble expansion constant are presented. We close with the OSIRIS-REx mission from launch to now, with the mother craft on its way to another asteroid, Psyche. This video compilation from several sources is set to the music of The Journey by the Slovenian composer Infracore. *Regards, Peter Skilton*



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

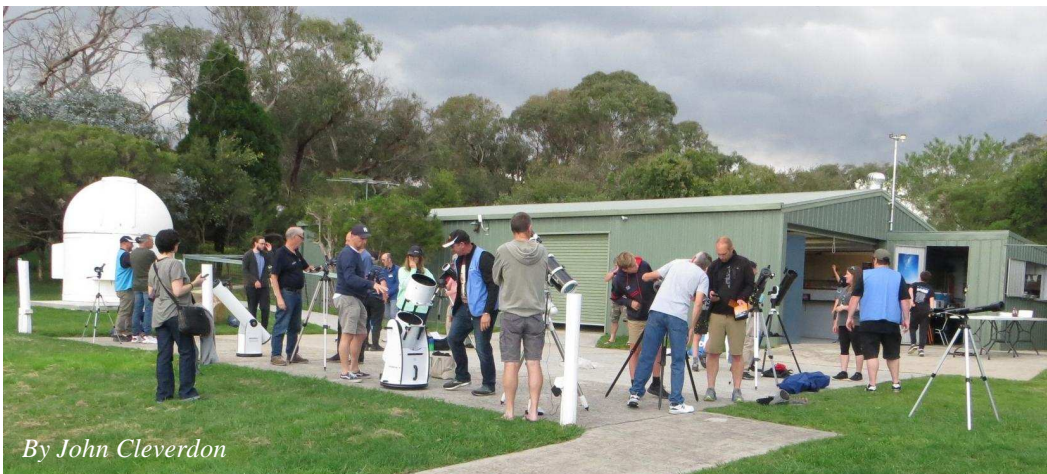
<https://www.youtube.com/channel/UCm6XOkIcIfl14y0XRBXpXuw> or <https://www.mpas.asn.au/meeting-recordings/>

TLD telescope learning day & Members BBQ October 21st - Our second Telescope Learning Day for 2023 was another successfully run event by the MPAS team of Volunteers. The day started off under ominously overcast conditions, and at one point there was a dash to bring some scopes under cover as the skies darkened, and a few drops of rain hit the concrete. But Phil Peters was prepared for this with several sheets of plastic that were used to cover the scopes. There were mixed feelings of despair and optimism for the evening ahead, as the cloud cover appeared to thicken, but the GFS prediction on the Cloud Free Night web site was for a break in the cloud cover come sunset.

Proceedings commenced at 3:30pm, slightly behind schedule as we waited for some late arrivals. All up, 40 of the 60 bookings ended up attending, consisting of both MPAS members and public. Chris Kostokanellis kicked off proceedings, introducing our guests to MPAS and preparing them for the day ahead. Mark Stephens took over, dusting off his well rehearsed and comprehensive TLD presentation. There was then a break in proceedings for a practical session, and a tour of the Observatory where the operation of the different types of telescopes and mounts was demonstrated. Volunteer members were kept busy assisting in demonstrating polar alignment, 2 and 3 star alignment, finder scope alignment and general telescope assembly. All this was happening while Jamie Pole, Peter Halsall and Pia Pedersen prepared the BBQ sausage sizzle.

The post dinner talk was given by Guido Tack, who gave a presentation on advanced scientific telescopes and the objects we observe through them. Several extremely curious and enthusiastic budding young astronomers and cosmologists tested Guido's knowledge, but these very knowledgeable junior scientists simply went on to answer each others questions! Perhaps next year these youngsters could take on the TLD presentations themselves.

Whatever cloud clearing dances and sacrifices were made to the sky gods paid off when the sun set, because the clouds began to part as the sky darkened. The knowledge gained from the talks was then put into practice with a very successful evening of star gazing, leaving all in attendance satisfied.



By John Cleverdon

MPAS Members assisting with the days proceeding were Guido Tack, Greg Walton, John Cleverdon, Jamie Pole, Nerida Langcake, Mark Stephens, Phil Peters, Simon Hamm, Ben Claringbold, Roland Knabe, Leigh Hornsby, Sylvie Grandit, John Goodall, Chris Kostokanellis, Peter Skilton, Pia Pedersen, and Pam and Peter Halsall.

Clear Skies.
Chris Kostokanellis

Photos taken by John Cleverdon



By John Cleverdon



By John Cleverdon

French connection 22nd October - MPAS had a visit yesterday afternoon/evening by Claude & Aline Altayrac, who I picked up from the CBD and drove to the Briars via the scenic route along the Bay. Alas it was quite a grey outlook, with limited visibility offshore.

For the dozen members who attended the Briars, it started with a sausage sizzle, ably cooked by Chris, and salads and cake for dessert. This included a fruit flan as I wasn't able to find a proper dinky-di Aussie pavlova on a Sunday. There were 4 bottles of wine in attendance briefly, with 3 different ones having been nursed through Customs all the way from Burgundy in France. It was interesting to see how fast the Chardonnay disappeared in preference to the red wines. The Chardonnay was unusually rich in colour by design, and Claude explained the special enriching process they use locally to achieve that. They come from a small town of population a couple hundred people, which boasts former resident microbiologist Louis Pasteur (of milk processing fame). Their home town is located centrally in France latitude-wise and is only about 100km West of the border with Switzerland. They have a very small astronomy club there of only a handful of (mostly older) people, so amateur astronomy is mainly an individual hobby there. And we pleasantly discovered that Sylvie Grandit is most fluent in French, with heritage back there, and that helped with some translations.

After the meal, Claude gave a PowerPoint talk and some timelapse videos about the key differences between observing from the northern hemisphere and the southern hemisphere. It was enlightening to know that Polaris is half a degree away from their celestial pole, meaning they have a similar procedure for polar alignment as we do with sigma Octans here in the southern hemisphere. Unfortunately there was no break in the clouds all evening, so no observations of the sky were possible, but they were able to get a close up photo of a very co-operative resident kookaburra who graced the site while

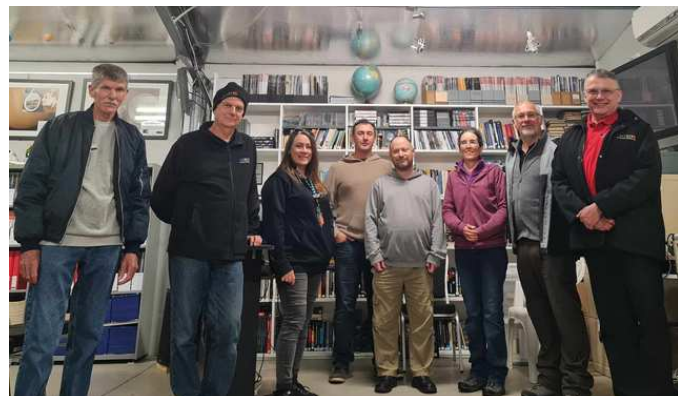
looking for its own meal.

This visit to Australia was a huge adventure for them, as they'd only ever been outside of France to one other country, being a short stay in Singapore on the way. The visitors had endured a 23 hour flight to Sydney, via Heathrow, where they toured the Blue Mountains but, alas, saw no clear skies there. Then they arrived this week in Melbourne only to be greeted with horizon to horizon cloud, with the worst weather we'd had in a month. It was, naturally, clear the night before the Briars visit, and clear the night afterwards as well. They are, however, now off to better sky prospects in Uluru, where they are staying at Yulara, before hiring a 4WD to drive to King's Canyon and Gosses Bluff, which is a massive remnant bolide impact crater's central splash near Uluru. It's an interesting adventure for their first time driving a car with steering wheel on the right side. I believe their Canon DSLR camera just might get plenty of use in the Northern Territory, with properly dark and clear skies.

Before they departed, a group souvenir photo was taken by Nerida but, alas, Sylvie, Louise, Pam & Peter had already left, so missed appearing in the shot. We gave Claude and Aline a society badge showing how to find the south celestial pole, and small Henbury meteorite from the Outback, given their interest in minerals as well.

L to R - Phil Peters, Greg Walton, Nerida Langcake, Chris Kostokanellis, Simon Hamm, Aline & Claude Altayrac, Peter Skilton. Missing: Sylvie Grandit, Louise Edgoose, Pam & Peter Halsall.

And it was instructive to see the visitors' reaction when the left-over wine was ingeniously re-corked by Nerida by using a supermarket vegies bag and black electrical tape. I just know that'll be a talking point when they're back home for many years to come about the strange ways of the people from Down Under! *Regards, Peter Skilton*



School viewing Night October 24th - MPAS visited an eager Stella Maris Primary in Beaumaris again last night for a talk and some stargazing. The talk indoors in the hall was given by Peter Skilton to about 140 students, parents and teachers and this time attracted a lot of questions about the Moon and gravity. Perhaps they had recently covered this in class. To give a flavour of the questioning, one particularly profound question asked by a very young pupil was "how does gravity pull things together and what makes it work?"

Although the week had seen plenty of cloud and rain already, fortunately on the night there was only about 10% cloud coverage, and this enabled some great views outside on the basketball court, which also acted as a convenient wind break, given there was a very cool breeze blowing. Wonderful views were had of the just-past First Quarter Moon and Saturn immediately adjacent to it was displaying 4 of its moons in a line as well. There was an easily visible passage of 3 Starlink satellites overhead, following each other quite closely in an arc across the sky. Unfortunately an ISS passover wasn't until just before 10pm, when Jupiter would have also risen above the treeline.



Expertly operating the telescopes and answering questions in the field were Steve Lomax, Alex Cherney, Robin Broberg, Guido Tack, Pia Pedersen, Greg Walton and Phil Peters. *Regards, Peter Skilton*

School viewing Night October 26th - Fifty Year 2 pupils plus their teachers enjoyed a night at Mentone Primary School last night as part of a sleepover. The teachers ran the kids back and forth across the track to help burn off some energy first. Then, as the sky started to darken, telescopes were placed around the running track, enabling a quick view of the gibbous Moon in gaps in the clouds.

After the clouds became almost totally covering the sky, they were ushered indoors to hear Peter Skilton talk a bit about space, and hand around some interesting objects for them to look, feel and smell so as to identify them. I'm not sure if anyone tried tasting them, but it wouldn't surprise me. They were a noisy bunch, and were evidently very excited about being at school after dark. They became even noisier when they discovered they'd just been smelling and handling a dinosaur coprolite, and the look on the faces of the teachers was priceless! It got them all engaged quickly. After a while, the sky had darkened and the clouds mostly moved on. Some pupils went to bed, while others came out to the telescopes again to see a much better view of the Moon, of Saturn about 30 degrees ahead of it, and Jupiter rising in the East next to an adjacent church belltower across the road.

Running the telescopes were Simon Birch, Steve Lomax, Phil Peters, Greg Walton, Jamie Pole and Chris Kostokanellis.

As the evening end approached, the Chinese Tiangong space station made an appearance as it arched high across the sky to the South, easily visible by eye to those remaining. *Regards, Peter Skilton*

Scouts, Cubs & Guides Night October 27th - The final Scouts, Cubs and Guides night for this year at the Briars went to plan yesterday, with only slight high level cloud interfering later in the evening. The breeze was a tad chilly for those who forget a jacket to wear.

We had 30 attend from the 1st Seaford and 2nd Morningside Cub/Scout groups, who started with a quick look at the Moon and Saturn through the instruments while stragglers arrived, before moving indoors to hear a shortened talk by Peter Skilton, and see a launch and recovery of a reusable Falcon 9 rocket from earlier in the year. The audience then hastily moved outside to witness the International Space Station (ISS) pass silently from SSW to an ESE direction. Several minutes later on the opposite side of the sky, one of SpaceX's Falcon 9 rocket boosters passed from WNW to due North, also being easily visible by eye. Then several minutes after that, for the trifecta, the Tiangong Chinese Space station passed along almost the same path that the ISS had earlier in the evening.

Saturn, Jupiter and the Moon were prime targets even through the wispy cloud layer, and there was a lunar halo later in the night as well. It is unusual to get so many bright satellites in one evening. I saw a few people trying to take a photo on their smartphone held up to the telescopes' eyepieces. The evening was a big success with the weather playing kindly.

Of additional interest to members, the Morningside Scouts have been working on a very impressive project to design, build and launch a helium balloon to an altitude of tens of kilometres, perform modelling of its flightpath through the upper atmosphere on launch day, and go and recover it. The idea would be not to wave it goodbye as it disappeared over the Tasman Sea, never to be seen again with its expensive payload.

Onboard is an Arduina computer the Scouts programmed, a CO2 sensor, GPS, camera and a transmitter to beam telemetry back to Earth, and probably something else I might have forgotten. And if you believe they'd encounter some red tape (and cost) with the Civil Aviation Safety Authority, you'd be completely right. Nevertheless, they're pushing forward valiantly in the face of Aussie bureaucracy. Really looking forward to hearing the story of how it goes, one way or the other. One of their inspiring group leaders, Steve Pemberton, has been an MPAS member for quite a while now and this will be a wonderful achievement if they pull it off.

Regards, Peter Skilton

Vale Ian Sullivan

It is with great sadness that I relay the passing of long-term active member, Ian Sullivan, on Friday 1st September at Sandringham Hospital.

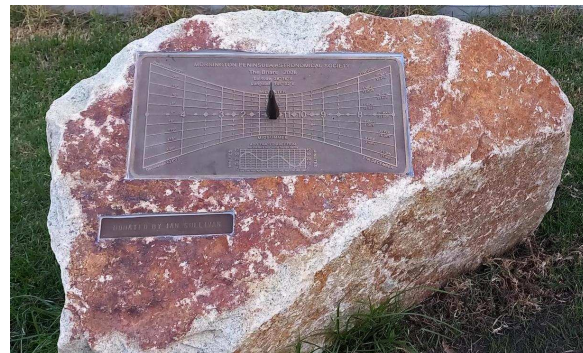
Ian had been a member since 2000, was on Committee for 13 years, including 5 years as Vice-President, and was made a Life Member of MPAS in 2015. He was an avid chaser of solar eclipses anywhere in the world they occurred, and very much into giving in-depth talks about historical aspects of astronomy at VASTROC and NACAA conventions, plus attending many of our past outreach events with his compact Questar portable telescope, just perfect for travelling distances. Prior to retirement, he taught astronomy at the Council of Adult Education, now called the Centre for Adult Education.

His health had been deteriorating for 18 months and it's been a while since we saw him attend any MPAS event. He passed away quietly. The funeral was at 3:30 pm Friday 8th September in the Cirrus Chapel at Bunurong Memorial Park, 790 Frankston-Dandenong Rd, Dandenong South.

Next time you are at the Briars during daylight, do have a glance at the custom-made, high accuracy, brass sundial that Ian had specially commissioned for the Briars' co-ordinates and kindly donated it to MPAS for future generations to enjoy. Greg and Pia later had it mounted in stone on-site, where you see it today.

Ian is survived by his wife, Elvine, and daughter, Kim.

From the stars we come, to the stars we go. *Peter Skilton*



Ian's trusty 3 1/2" Questar telescope.



Ian attended most MPAS events and ran Solar Day at MPAS for many years, where he would teach members about calculating sundial noon and how to count sun spots. Ian was always front and centre presenting endless talks at MPAS, ASV, VASTROC and NACAA. He spent a lot of time scoping out speakers at ASV and MPAS meetings and organizing restaurant dinner for the speakers. Ian was also a demonstrator at the Melbourne Observatory for the ASV where he talked about the history of the Melbourne Observatory and helped run the telescopes. *He will be missed. Greg Walton*

Ian wrote a story about his life in MPAS newsletter - **Scorpius 1 Jan-Feb-2020**

Ian donated to MPAS his library of books, charts and demonstrator items, including a model of stone henge; these took 2 trips to move to the Briars.



Ian at Vastroc 2005 Heathcote



WHAT'S ON



The 2023 timetable of events.

NOVEMBER

Thursday 2nd to Monday 6th, Little Desert Star Party (VicSouth) @ Nhill (Booking required)

Friday 3rd, 8 pm Briars. Public stargazing night. Speaker TBD. 95 booked.

Saturday 25th, all Day Briars. Victorian Astronomy Convention (VASTROC). All VIC astronomical societies & public (booking required)

DECEMBER

Friday 1st, 8 pm Briars. Public stargazing night. Speaker TBD. 95 booked.

Friday 8th, 8 pm Briars. Christmas Star Concert Night with Southern Peninsula Concert Band. 90 anticipated.

The 2024 timetable of public events.

JANUARY

Friday 5th, 8 pm Briars. Public stargazing night. Speaker TBD. 95 anticipated.

Saturday 6th, 8 pm Briars. Public stargazing night. Speaker TBD. 95 anticipated.

Friday 12th, 8 pm Briars. Public stargazing night. Speaker TBD. 95 anticipated.

Friday 19th, 8 pm Briars. Public stargazing night. Speaker TBD. 95 anticipated.

FEBRUARY

Fri 2nd, 8 pm Briars. Public stargazing night. Speaker TBD. 95 anticipated.

Saturday 17th, 8 pm Briars. Trivia Concert Night with Cranbourne Lions Band. 90 anticipated.

Sunday 25th, all Day marquee. Benteleigh Street Festival, Main St, Benteleigh. 6,000 Public anticipated. To be confirmed.

MARCH

Friday 1st, 8 pm Briars. Public stargazing night. Speaker TBD. 95 anticipated.

Monday 11th, all Day marquee. Somerville Family Day, Fruit Growers Reserve, Somerville. 10,000 Public anticipated.

Friday 15th-Sun 17th, Buchan for Gippsland Star Party. Collaboration with LVAS & ASV (booking required)

To attend the school events and scout/girl guide events, these days you need to have a Working with Children Check done first. It takes about a fortnight from the time you apply online to when you get the card in the mail. For volunteers it is free. It's essentially a check of police and justice records over the decades that sees if there might be anything in the past that would preclude participating in these sorts of outreach events involving kids. Once you receive your card, let the Secretary know your card number and expiry details as we are required as an organisation to record them.

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

Regards, Peter Skilton

★ New Members Welcome ★

Liam Laube & family
Jo & Chris Owens
Patricia Macleod & family
Mark Rayment & Alison Smith
Pam Bell
Rebecca Spoor
Alec & Marilyn Clews

Ahmed Elsayed & family
Robert Gray
Silvia Koslow
Russell Thompson
Wendy Keys
Jifin Kurian
Tony & Nelly Nightingale

MPAS SUBSCRIPTIONS 2023

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 2023 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 2023 fees is:

Subscriptions can be paid in a number of ways:

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

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

SOCIETY FEES

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

See more options on-line



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

CALENDAR		November / 2023					Red Days indicate School Holidays
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	
Comet C/2021 S3 near NGC3706 on the 3rd NGC4375 on the 21st NGC4767 on the 29th	Comet 62P near M44 on the 15th	18th Io shadow 12:15am S Io shadow 2:27am F Eu transit 6:56pm F Eu shadow 7:43pm F	1	2 Little desert star party	3 Public night 8pm Jupiter at opposition	4 Little desert star party Jupiter rises at 8pm	
5 Little desert star party Last Quarter	6 Little desert star party	7 Cup Day Moon at 404,569km	8 Eu transit 1:20am S Eu shadow 1:30am S Eu shadow 3:50am F	9 Io transit 3:45am S Io shadow 3:53am S	10 Venus left of a thin crescent Moon dawn Io transit 10:13pm S Io shadow 10:22pm S	11 Remembrance Day	
12	13 New Moon	14 Uranus at opposition	15 Society Meeting 8pm	16	17 Io transit 11:57pm S	18 Working bee 4pm BBQ 6pm Leonids meteor shower	
19 Io transit 6:30pm F Io shadow 8:56pm F	20 First Quarter Saturn right of the Moon	21 Moon at 369,818km	22	23	24	25 VASTROC Jupiter above the Moon	
26 Io transit 8:08pm S Io shadow 8:41pm S Io transit 10:15pm F Io shadow 10:52pm F	27 Full Moon	28	29	30	25th dawn Io transit 1:40am S Io shadow 2:13am S	25th evening Eu transit 6:56pm S Eu shadow 8:00pm S Eu transit 9:10pm F Eu shadow 10:15pm F	

Monthly Events

Little desert star party - 2nd to 6th, Little desert star party @ Nhill (Booking required)

Public night - 8 pm to 10 pm on the 3rd @ The Briars MPAS

Society Meeting - 8 pm to 10 pm on the 15th @ The Briars (Public & members)

Working Bee - 4 pm - **Members night & BBQ** - 6 pm on the 18th @ The Briars

VASTROC - Victorian Astronomy Convention - All Day on the 25th @ The Briars

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

<p>Jupiter Moon code Io = Io Eu = Europa Ga = Ganymede Ca = Callisto S = start F = finish</p>
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CALENDAR		December / 2023					Red Days indicate School Holidays
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	
31 New years eve	Comet 62P near NGC3489 on the 22nd NGC3628 on the 29th	10th dawn Eu shadow 1:13am S Eu transit 1:47am F Eu shadow 3:38am F			1 Public night 8pm	2 Ga shadow 6:42pm F Eu transit 9:13pm S Eu shadow 10:35pm S Eu transit 11:27pm F	
3 Eu shadow 12:45am F Io transit 9:53pm S Io shadow 10:37pm S	4 Io transit 12:03am F Io shadow 12:47am F	5 Last Quarter Moon at 404,346km	6	7	8 Christmas Star Concert 8pm	9 Ga shadow 9:10pm S Ga shadow 10:45pm F Eu transit 11:30pm S	
10 Venus left of a thin crescent Moon dawn Io transit 11:42pm S	11 Io shadow 12:33am S Io transit 1:49am F Io shadow 2:40am F	12 Io shadow 9:10pm F	13 New Moon	14	15	16 Xmas dinner 6pm	
17 Ga shadow 1:13am S Ga shadow 2:54am F	18 Saturn left of the Moon	19 Io transit 10:04pm F Io shadow 11:05pm F	20 First Quarter	21 Moon at 367,901km Scorpius Deadline	22 Solstice Jupiter above the Moon	23	
24	25 Xmas Day	26 Boxing Day Io transit 9:47pm S Io shadow 10:54pm S	27 Full Moon	28	29	30	

Monthly Events

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

Public night - 8 pm to 10 pm on the 1st @ The Briars MPAS

Christmas Star Concert Night with Southern Peninsula Concert Band - 8pm to 10pm on the 8th @ Briars (90 anticipated)

NO Society Meeting in December

Members night Xmas BBQ - 6 pm on the 16th @ The Briars

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

THE BRIARS SKY

By Greg Walton



Visually Jupiter is the most interesting planet, with its cloud belts which change over time. Also Jupiter spins on its axis once every 10 hours, so most of Jupiter's surface can be seen in a single night. Storms cross Jupiter surface continuously, the biggest being the Great Red Spot, which is 3 times the size of the Earth. It also changes over time, notably its colour, sometimes being deep red and other times almost no colour at all.

Jupiter has 4 bright moons which can be seen in any size telescope and with binoculars by those with keen eyes. The position of the moons change from night to night. Jupiter's moons were first viewed and drawn by Galileo on 7th January 1610.

These moons all get their names from the God Zeus in Greek mythology.

Io is named after a maiden who was loved by Zeus.

Europa named after the woman abducted by Zeus.

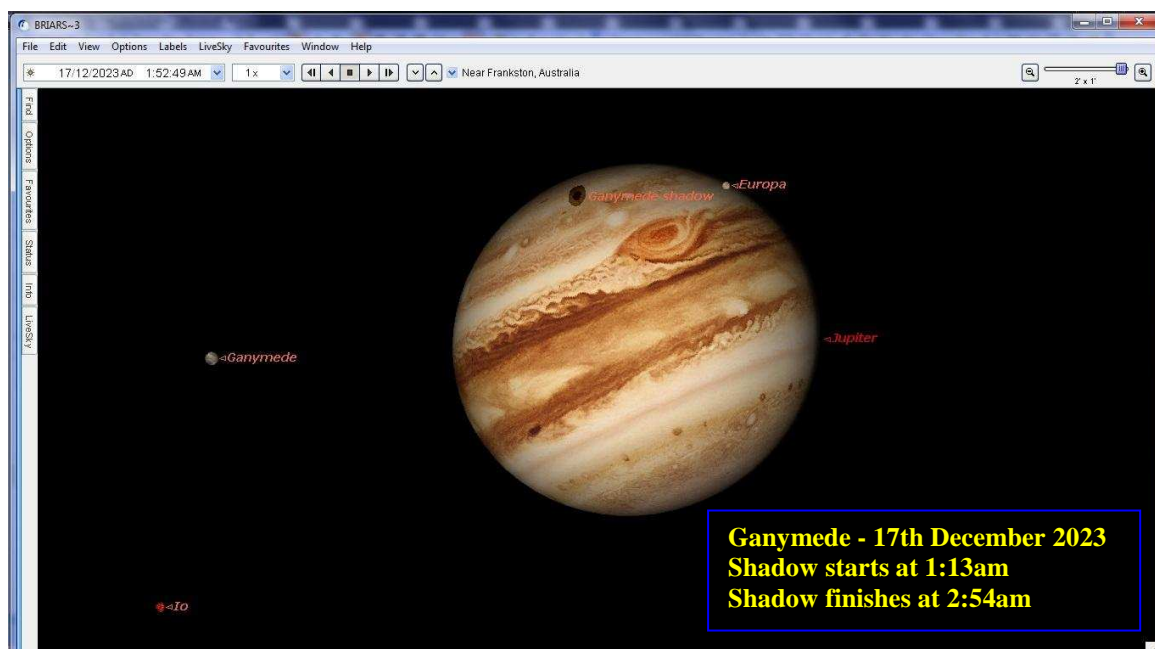
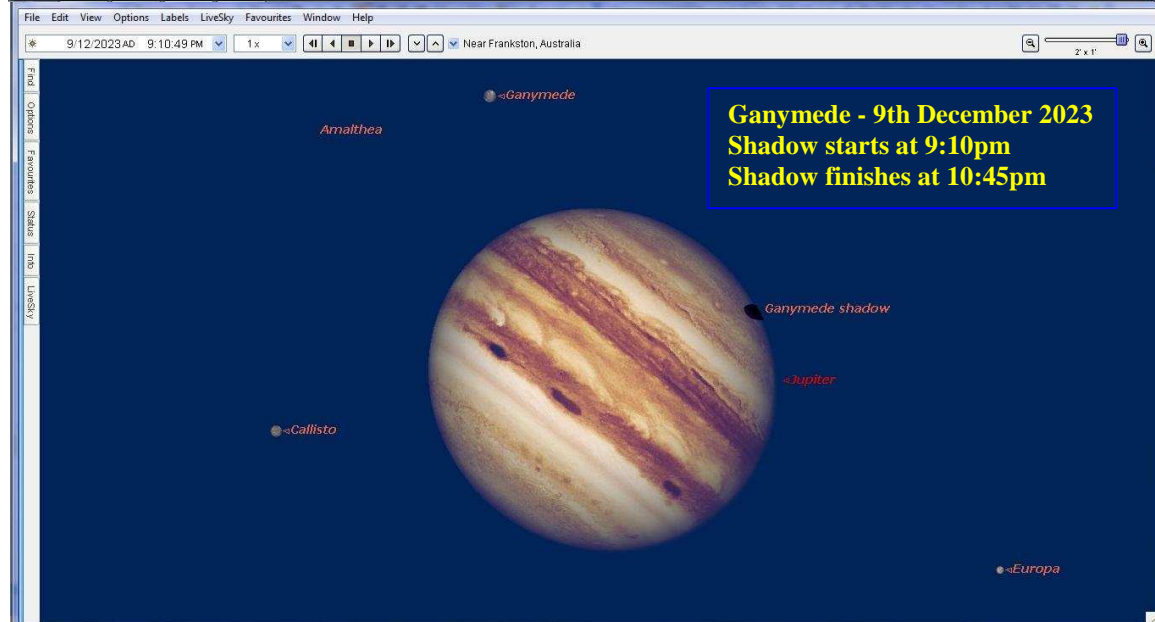
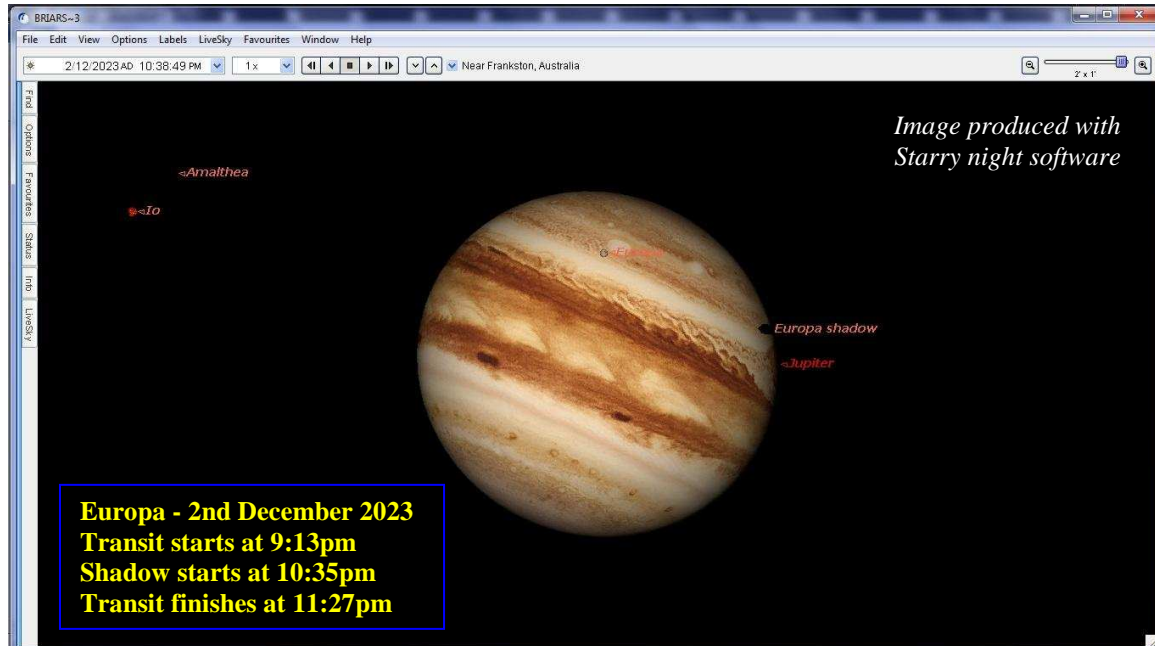
Callisto named for a woman turned into a bear by Zeus.

Ganymede named after a young boy who was made the cup-bearer to the god Zeus.

Jupiter's moons cross the face of Jupiter daily and cast shadows upon Jupiter surface. I have selected the 3 best opportunities to view these events, in December.

I use an 80mm refractor telescope with a focal length of 800mm or F10 with a 10mm eyepiece which gives a magnification of 80 times. Only advice is the seeing conditions need to be good and the focusing perfect.

I find it fascinating to be able to view something happening on another world.



Saturnian adventures, *by Russell Smith*

One celestial object in the night sky never ceases to amaze – that, of course, is the planet Saturn. The impressive icy rings surrounding it are discernible even through small-aperture telescopes, and some of its moons become visible with such instruments as well.

It's always a delight to step outside and observe the planets annually. Jupiter's ever-shifting cloud patterns and colours make each planetary season unique, while Saturn's appearance is often more subtle than Jupiter over time; the main variation one notices is due to the changing angle of its rings. When viewing this year's Saturn, it became evident that its rings are becoming less prominent than they have been in the past few years, rapidly moving toward an edge-on perspective.

This prompted me to go back through my old snaps to compare the angles. I wasn't sure if I had photographed them this edge-on before. All of the images captured (to the right) were from using the same 12" Dobsonian telescope but with four different cameras over the 11 year period (Canon 600D, Sony A7S, a QHY 163M, and a ZWO 224MC). Although I haven't taken images every year, it seems you can see I've never seen this edge-on before (with 2012 appearing next closest). In fact, when Saturn returns in 2024, its rings will be very nearly edge-on. They will cross over in early 2025, but during this time, Saturn will appear close to the Sun, making it unobservable in the dark. By the time Saturn becomes visible again during the night in 2025, we will be looking at the opposite face of the rings.

To learn more about this fascinating phenomenon, refer to the [E-Scorpius Sept/Oct 2022 edition](#) where Greg Walton provides detailed insights into the changing appearance of Saturn's rings.

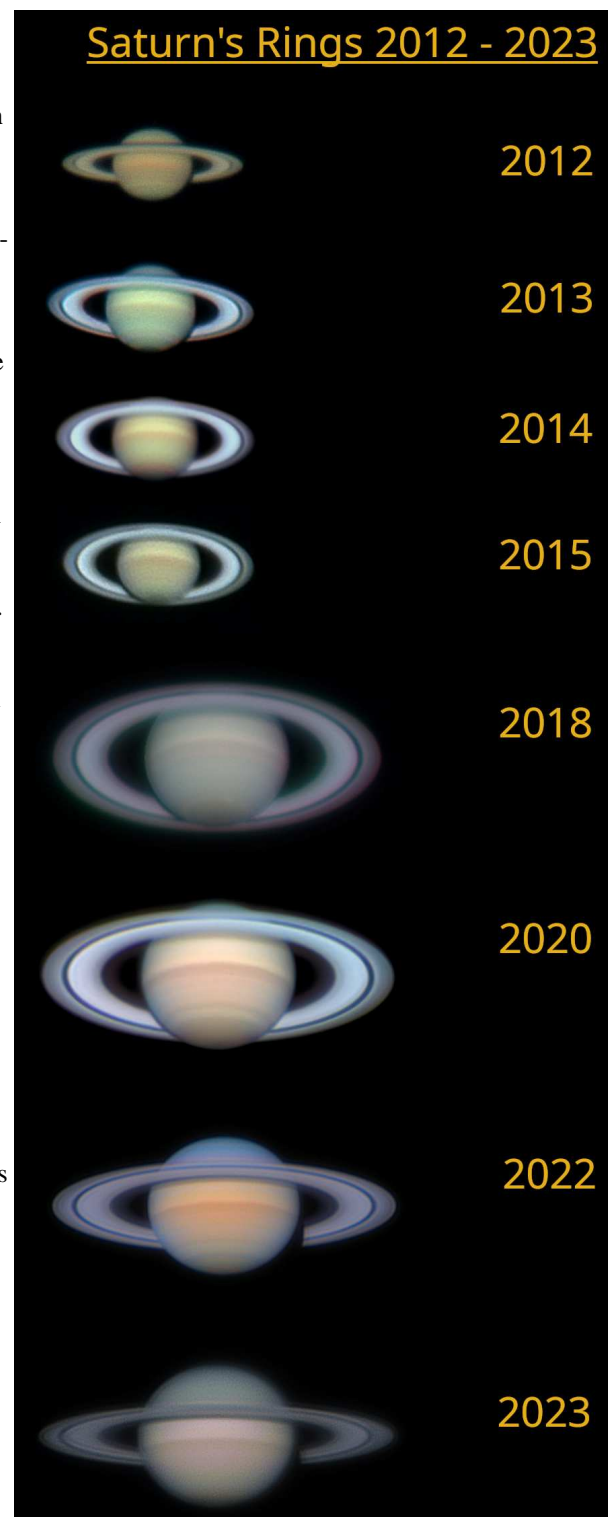
For a captivating animation illustrating the ring plane crossings and Saturn's apparent movement and wobble, click [here](#).

Saturn's Ring Tilt - <https://youtu.be/MTOXRPUKIU?feature=shared>

<https://www.tylermw.com/tutorial-visualizing-saturns-appearance-from-earth-in-r/>

While for some, having the rings edge-on may be a bit less exciting as you are unable to see more of the rings and ring structures (e.g. Encke Gap and Cassini Division). There are other opportunities arising such as being able to view Saturn's moons transit in front of the planet; this is something that is common with Jupiter's 4 largest moons but is only possible for us to view for Saturn when it is near edge on. There is also an occultation of Saturn by the Moon in 2024 – a similar event as shown in the images above and below. I took these in 2014. See Greg's article from Sept/Oct 2022 for further details on timings.

It is still an excellent time to engage in planetary astrophotography or simply observe these planets through the eyepiece. While Saturn has passed its prime for 2023, you can still enjoy splendid views before it vanishes into the western dusk. Jupiter, on the other hand, is putting on a dazzling show for several more months and will reach its largest appearance in early November.



Psyche mission launch success!

The Psyche mission has successfully launched to a priceless asteroid. The spacecraft launched on a Falcon Heavy from KSC in Florida on October 13, 2023. 16 Psyche was one of the first asteroids to be discovered. Italian astronomer Annibale de Gasparis discovered Psyche in 1852, and it was the 16th asteroid discovered. Hence its designation 16 Psyche. De Gasparis named the asteroid after the Greek goddess of the soul.

It isn't made of rock, and it isn't made of ice. Instead, it's a rare metal asteroid, orbiting our sun in the solar system's asteroid belt between the 4th planet Mars and 5th planet Jupiter. Psyche measures approximately 225 km in diameter, with a surface area of about 165,800 square kilometres. Current estimates of its density are 3,400 to 4,100 kg/m³. This density measurement would mean the asteroid is 30 to 60% metal by volume.

We haven't yet explored any world quite like it. And so scientists at Arizona State University – which is leading the mission – are thrilled about the launch of the space mission to 16 Psyche. The craft is due to arrive at the asteroid in 2029.

Although not everyone agrees, some scientists believe this asteroid is the remains of an iron-rich core from a failed planet. If so – and if asteroid mining techniques could be developed – Psyche's metallic resources might be worth some \$10,000 quadrillion (that's 15 more zeroes). But that's not the only reason scientists are interested in 16 Psyche!

Psyche mission goals

The current mission isn't about mining. It's about exploring. After it arrives in 2029, the Psyche spacecraft will orbit the asteroid for three years. During that time, scientists hope to learn more about the origins of the asteroid and whether it truly was the core of a failed planet.

They also want to explore Psyche's topography (the features on its surface) and determine the age of its surface. They say it'll give them insight into the interiors of all the terrestrial planets, including Earth.

But the big question may be ... is Psyche a true metal asteroid, as once believed? Or is it closer to what scientists call a "rubble pile?" There's no way (at present) to put a true price on space objects such as asteroids. But many have tried to estimate the worth of asteroid Psyche, with its metal-rich composition. One estimate suggests a massive, metal-rich object would be worth \$10,000 quadrillion, more than the entire economy of Earth.

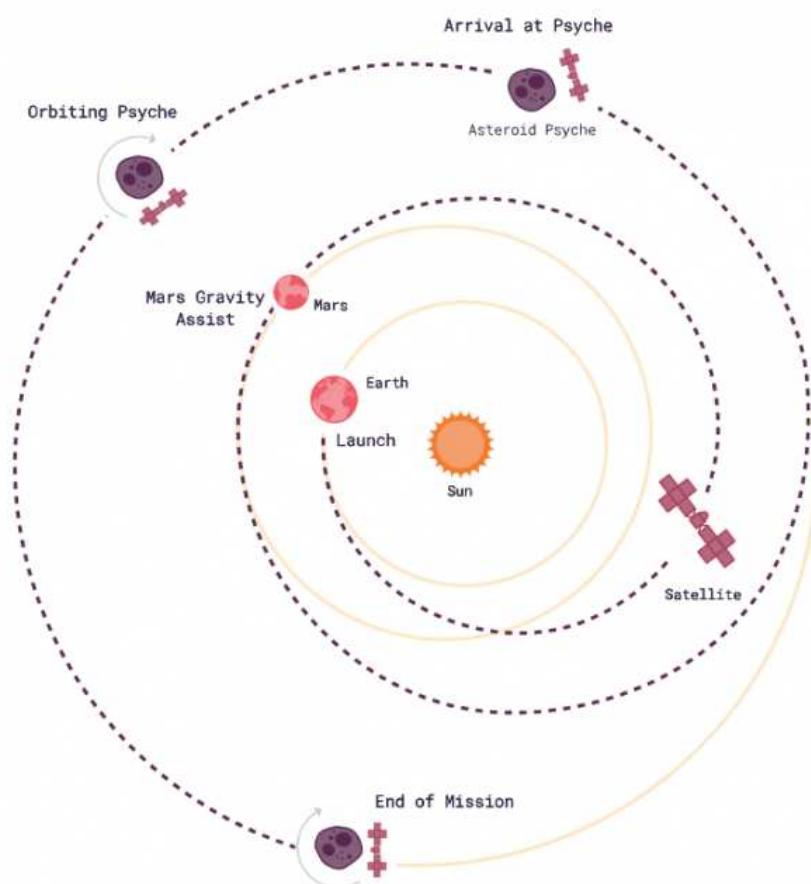
If Psyche isn't as dense as once believed, this estimate will go down. Still, either way, Psyche will be worth a lot! And, to scientists, it'll remain ... priceless.

The mission's instruments

The Psyche mission carries three primary instruments: a multispectral imager, a gamma ray and neutron spectrometer and a magnetometer. These instruments will be investigating the first metal space object that humankind has ever visited.

The imagers will take pictures while the spectrometer will measure the elemental composition of Psyche. The magnetometer will check for any remaining magnetic field, which will be an indication of whether or not Psyche was once a planetary core.

Psyche also has an X-band radio telecommunications system that will help map the asteroid's gravity and structure. The system is also used in sending commands to the spacecraft and receiving data back on Earth.



After its launch, the Psyche spacecraft will have a flyby of planet Mars in May 2026, for a gravity assist. The spacecraft will orbit the asteroid for 3 years while it collects data. Image via NASA/ ASU.

MT BULLER ADVENTURE

In collaboration with the ASV to promote a public stargazing event happening in January 2024, Dave Rolfe & his son Landon, and my daughter Piper and I headed up to Mt Buller with our telescopes. We were super lucky with the weather as it snowed for most of the time we were there!

I had to put chains on my 2WD to get to the parking area halfway up the mountain, then we caught the shuttle bus, along with my 10-inch dob, up to the lodge where we were staying. Dave has snow tyres on his car, so he was permitted to drive all the way up, then made the most of a rare opportunity to boast about having a Jeep during the weekend...

Our lodge was two-levels with 3 bedrooms that each had their own bathroom. Eddie from the ASV took the other room, while the other attendees who were also there as part of the promotion had accommodation nearby. We all had dinner together at a fancy restaurant with expensive wine that evening, then ended up at a sports bar where I realised that due to all the loud noise "pot" and "pint" begin and end with the same letter and my beer was much larger than I thought I had ordered...



The following day the snow was thick and it was time to play! Landon & Piper hired skis and I thought I'd give snowboarding a try for the first time. Nope, it was way harder than it looks and I failed miserably! So I ended up exchanging my snowboard for some skis, and we made the most of the amazing snow that kept falling.

That evening, we headed to the village square where I took my 10-inch dob, Dave took his 126mm Vixen binoculars and Eddie attempted to take his telescope but unfortunately left part of it at home. There was a Silent Disco also happening (the blue headphones) which added to the vibe. The ski lifts were still running so there were brights lights on the runs, which obviously won't be going at the actual event that we were there to promote which is in January. We had lots of people come over to have a look through our telescopes/binos, which were pointing to Saturn when the cloud wasn't being a nuisance.

Overall it was a really fun weekend, and hopefully the event in January will be a success!

By Nerida Langcake

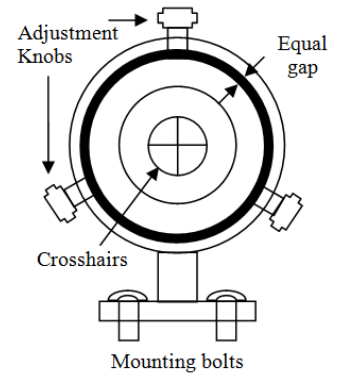


YOUR ASTRO QUESTIONS



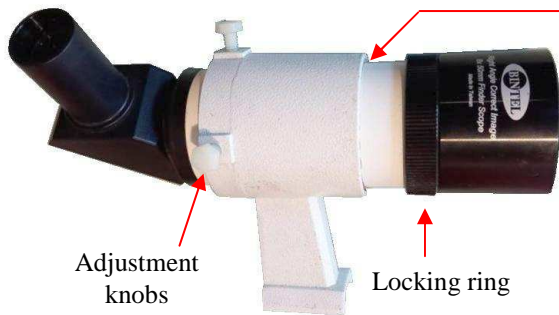
Probably the most asked question is: how do I adjust my finder scope? *By Greg Walton*

Stage 1. Place the lowest power eyepiece in your telescope focuser. Point the telescope at the horizon and find something you can easily recognize with the unaided eye, such as a mobile phone tower, then centre it in the eyepiece. If you have an equatorial mount, lock both axis and double check that your chosen object is still in the centre of your eyepiece. If you own a Dobsonian you will have to make sure you don't move the telescope when making adjustments. Now look through your finder scope. Most are fitted with crosshairs; adjust the 2 to 6 knobs till your chosen object is behind the centre of the crosshairs.



Quiet often you will run out of adjustment before your chosen object is centred. Then it's best to re centre the finder by adjusting all the knobs until the gap is equal around the finder. Then you will need to loosen the mounting bolts on the base of the finder and twist the finder left and right till your chosen object is in the centre. Often I have found I needed to make the mounting holes in the telescope tube a bit larger. Also sometimes you will need to add cardboard packing under the back or front of the mounting foot to get your chosen object in the centre. Now retighten the bolts and start again at Stage 1.

Once adjusted you should be able to see the same object in the finder scope and eyepiece. (Note - may not have the same orientation)

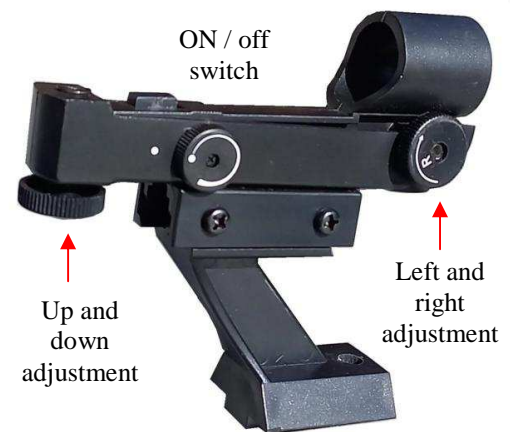


Another problem I have found is that some finder tubes are loose in the housing or the rubber ring is missing or broken. The best way to fix this is to wrap electrical tape around the tube to take up any gap.

Other adjustment you need to do is the focusing of your finder scope. The front lens housing is threaded onto the tube, with a threaded locking ring. Loosen the locking ring 3 or 4 turns. Then turn the front lens housing while looking through the finder scope, till the view is sharp and then turn the locking ring till it touches the front lens housing.

If you are going to use your finder scope for more than an hour you will need some sort of dew shield or dew heater. An inexpensive option is to find a cardboard tube that fits neatly over the lens housing and cut to about 250mm long. The Post Office sells these tubes; they usually come with 2 end caps. If you are going to use your telescope a lot, then I would buy a right angle finder scope. They are much easier on your neck and knees.

The next most popular finder is the red dot finder, which has no magnification. Using this type of finder for the first time can be a bit of a challenge. Looking through the small window, you need to have your eye about 250 mm behind the finder and then move your head around until you can see the small red dot. Adjust this finder the same as before, (stage 1): Switch on the red dot and adjust the 2 thumbscrews. The knob on the side adjusts the finder sideways, while the knob under the back adjusts the up and down movement. This is best done at dusk as you may struggle to see the red dot during daylight hours. Red dot finders are more susceptible to dew, best to keep it covered over with a piece of cloth. At the end of your viewing night, double check it's off and always carry spare batteries. They come at varying pricing, I found the cheapest version are easily damaged, particularly the on/off switch.

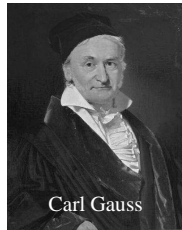


Telrad finders are similar to red dot finders with no magnification. But they are much larger and have 3 illuminated circles, the small centre circle is 1/2 degree and the larger circles are 2 degrees & 4 degrees across -which is the width of the Southern Cross. These circles are a great aid for those who still go star hopping. If you know a galaxy is 2 degrees to the left of a star. You just need to place one side of the circle on the star and the galaxy should be in the eyepiece. Sky Atlas 2000 paper star-charts provide you with a clear sheet of plastic, with the 3 circles printed on it. By overlaying the clear sheet with circles over the map, you can get an idea which direction to move your telescope. Some star chart software include the Telrad circles as a moveable over lay. Telrad has a bigger battery which is much easier to change than the red dot finders. Again dew is a problem and best to cover with a cloth while not in use. There is some after market dew shields and dew heaters on sale to suit the Telrad. A Telrad is an excellent investment for a large Dobsonian telescope.



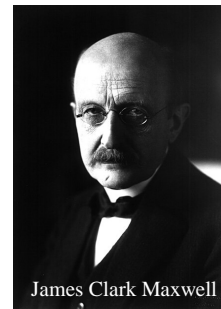
Discovering the ionosphere, by Greg Walton

German mathematician, geodesist and physicist **Carl Friedrich Gauss** (1777- 1855) in 1839 postulated that an electrically conducting region of the atmosphere could account for observed variations of Earth's magnetic field. He was also instrumental in the discovery of the dwarf planet Ceres and invented the magnetometer in 1833.

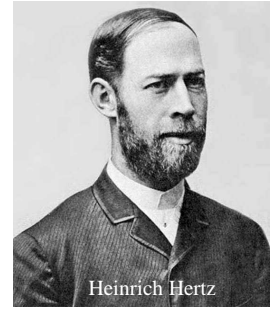


Carl Gauss

English mathematician **James Clark Maxwell** (1831-1879) in 1865 predicted the nature of wireless waves, that electricity can move through air or vacuum the same way that light waves behave and at the speed of light.

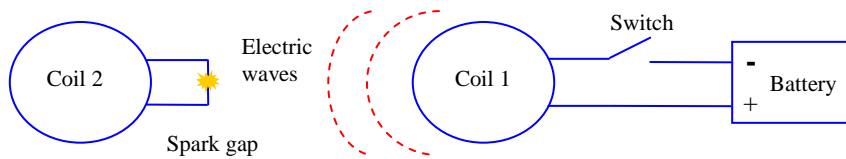


James Clark Maxwell



Heinrich Hertz

From that, the German scientist **Heinrich Hertz** (1857-1894) in 1888 carried out experiments to see if he could jump electricity from one coils of wire to another coil of wire. The 2 coils sat on his test bench and weren't touching each other in any way. When he attached one of the coils to a battery, the other coil produced a little spark at the ends of its electric contacts. Hertz continued his experiments by bouncing the electrical waves off metal plates and redirecting them to the second coil of wire, which also produced a spark. Hertz then proved that, like light waves, electrical waves move in a straight line at the speed of light. Hertz did this by bouncing electrical waves back and forth between metal plates. This proved Maxwell's theory that electricity can move through air or vacuum as waves.

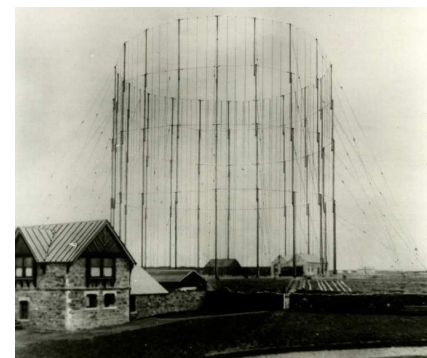


Hertz electric wave experiment

Guglielmo Marconi (1874-1937), his mother almost died giving berth to him; this created a strong bond between him and his mother. So much so Guglieimo led a sheltered life and didn't get on with many people. Guglieimo's mother was a well-known young singer and his father was a wealthy landowner with a large library in their home. Guglieimo spent his young life skipping school to go fishing and investigating the countryside. But eventually he started to read all the books in his father's library: Greek mythology, history, steam engines, chemistry, and Michael Faraday's books on electricity. Eventually Guglieimo attended university and became more interested in electrical experiments inspired by Benjamin Frankin's life achievement and Heinrich Hertz's experiments. At home Guglieimo spent most of his time locked in the attic, the only place his father would allow him to experiment. His mother would buy Guglieimo whatever he wanted for his experiments, even if his father didn't approve. One night Guglieimo woke his mother and took her to the attic. In one corner he had set up a battery attached to a coil of wire with a telegraph switch. At the other side of the room was another coil of wire with a tiny metal bell hanging from the coil. When he pressed the telegraph switch the bell rang on the other side of the room. There were no wires connecting the 2 coils. Over the next few years Guglieimo continued his experiments, moving the coil and bell farther away from the second coil and battery. At first it was only metres, then tens of metres, then hundreds of metres and then many kilometres and yes the bell still rang. Guglieimo thought, why has nobody done this before, then he started to worry that his ideas could be stolen, with no reward for his effects. Guglieimo's mind had thoughts of removing all the wires between telegraph stations. When word got out about what he was doing, the experts said, it could not be done. But single-minded Guglieimo proved them wrong, when on the 12th of December 1901 he sent the first telegraph signal over the Atlantic ocean, from Cornwell, England to Newfoundland, Canada, a distance of 3,000 kilometres' being three dots for the Morse code letter S. The experts still said, 'this is impossible', as there was no line of sight between the 2 countries. The signal must have bounced off something to get around the curvature of Earth. Guglieimo Marconi did make a large amount of money and awarded a Nobel Prize in 1909.



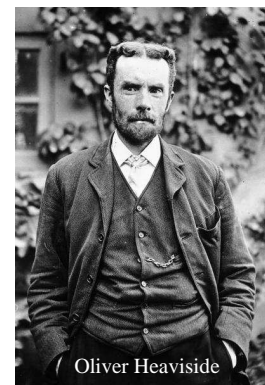
Guglielmo Marconi



Marconi antenna at Cornwell England

Finding what the telegraph signal bounced off?

The Heaviside theory. In 1902, Oliver Heaviside (1850 - 1925) proposed the existence of the Heaviside layer of ions. If the atmosphere got thinner the higher it got above the earth, then eventually it would get thin enough, for radiation from the Sun to be able to strip one of the electron off atoms, making these atoms positively charged (these are called ions) and would act like a reflector to radio waves. Thus explained how radio waves could travel around the Earth's curvature. He also wrote the famous telegrapher's equations.



Oliver Heaviside

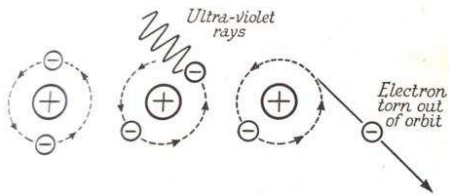
For twenty years most scientists, businessmen, and amateur ham radio enthusiasts were working on improving radio equipment and aerials for military, sea-going ships, aircraft, profit, or just for fun. Some of the benefits of radio at the time were: before the Titanic sank it was able the radio for help thus saving many lives; also a man who had murdered his wife and then jumped on a ship to escape was captured because the ship had radio. The triode valve and cathode ray tube were also invented at this time, which helped make radio equipment smaller and more reliable. **But nobody seemed to be working on how radio waves could circle the globe.**

Edward Appleton (1892 - 1965) finally found a solution by timing the radio waves. He transmitted a signal between two aerials placed at a maximum distance, but still in the line of sight. Knowing the distance and that the radio waves travelled at the speed of light, he knew exactly when the signal should arrive at the second aerial. But the radio waves also travelled up into space, so a second weaker signal was received, only it was very slightly delayed. However Appleton found two weak signals on his receiver. By timing this delay Appleton was able to calculate the height of the reflective layers in 1924. The lower reflective layer turned out to be about 100 kilometres high and is now known as the Heaviside layer. The higher reflective layer turned out to be about 200 kilometres high and is now known as the Appleton layer. In 1926, Scottish physicist Robert Watson-Watt introduced the term ionosphere and Edward V. Appleton was awarded a Nobel Prize in 1947 for his confirmation in 1927 of the existence of the ionosphere.



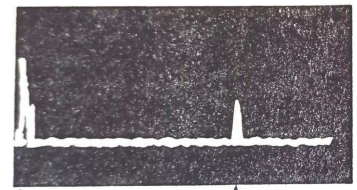
Edward Victor Appleton

Complicating thing more, it was also found that the delay was different between day and night. The Appleton layer was found at 300 kilometres high during the day and only 200 kilometres at night. The night time radio signals were found to be weaker, but more reliable.



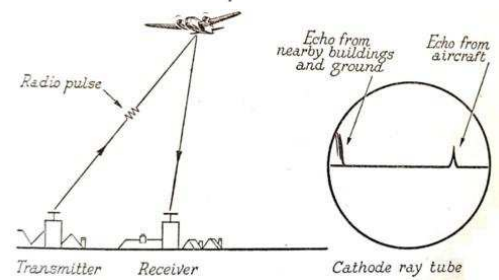
The steady output of ultra-violet radiation from the Sun causes ionisation of atoms, but the Sun has violent outbursts from time to time, particularly around solar maximum which takes place about every 11 years. A strong burst of UV radiation can wash away the ionosphere altogether. These outbursts disrupt radio signals, known as radio blackout, and are very hard to predict as light only takes eight minutes to arrive at Earth, whereas the solar wind takes about 2 days.

Appleton continued his research with more refined radio wave detectors. He found more layers in the Earth's atmosphere, some of which appeared sporadically for only a few minutes and coincide with times of meteor showers. As meteors burn up when entering the atmosphere, they produce a large amount of high temperature heat, which knocks electrons out of their atoms, making them positively charged, these ionized atoms reflect radio waves back to earth. It proved to be an excellent means of detecting and counting meteor rates during the day when there was little chance of seeing them.



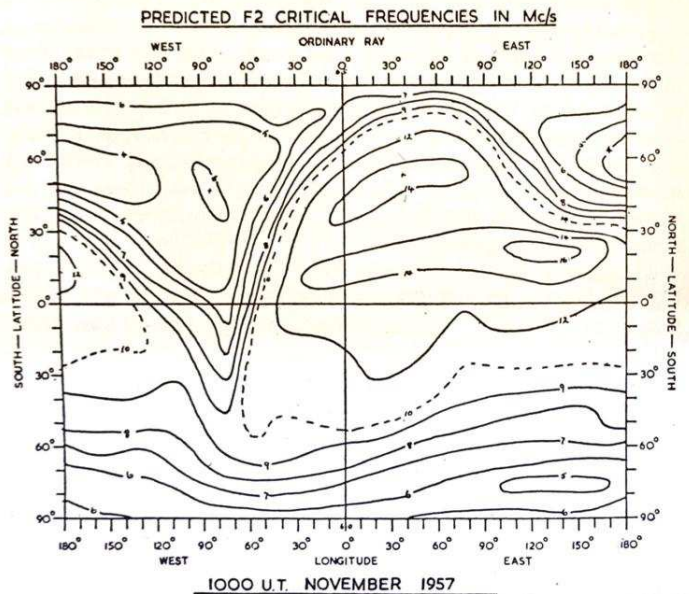
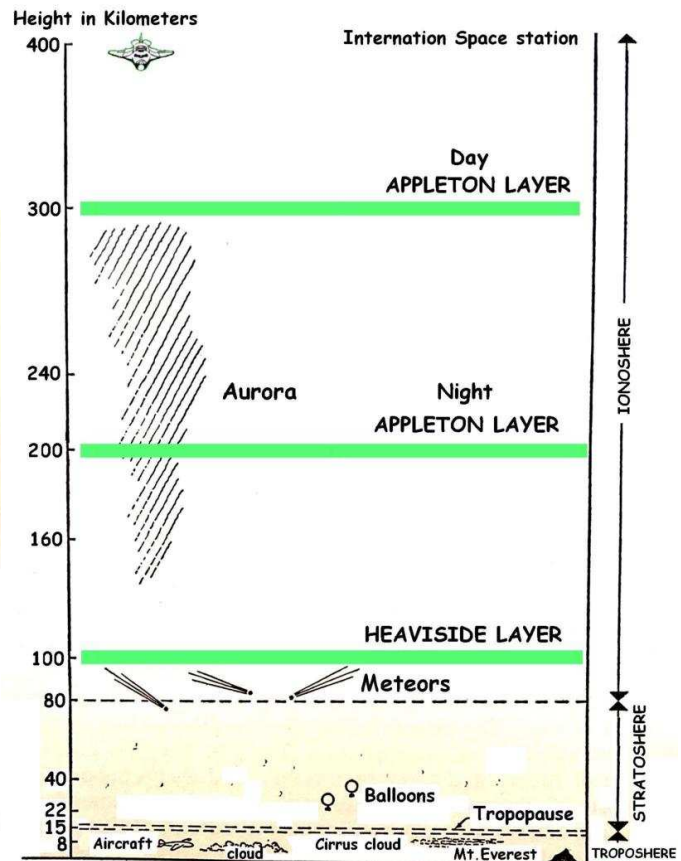
Transmitter pulse Meteor echo

Appleton also found that radio waves were reflected off airplanes, which interested the military greatly. With military funding the radio wave transmitters grew very powerful and detectors more sophisticated. Now known as Radar (*acronym for radio detection and ranging*).

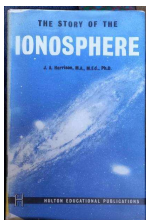


This also sparked the new field of radio astronomy. After the Second World War, there was a large amount of surplus radio and radar equipment going cheap, often sold for scrap metal value. Soon astronomers were listening to radio waves coming from space, the sun and the planets.

But the ionosphere still had mysteries that needed to be solved. The main problem is: it's unreliable for reflecting radio waves. In the 1950's a network of 50 radio stations and receivers were set up around the world. It was found that the Earth's magnetic fields affected the strength of the ionosphere. By 1957 detail world maps of the ionosphere were being produced. Also tests were done to find the best radio wave frequencies for each layer of the ionosphere. The higher frequencies were found to go straight through the ionosphere out into space.



Images from Wikipedia and the book titled *Story of the Ionosphere*, by J. A. Harrison, published in 1958. It is one of my favourite books.



MEMBERS GALLERY

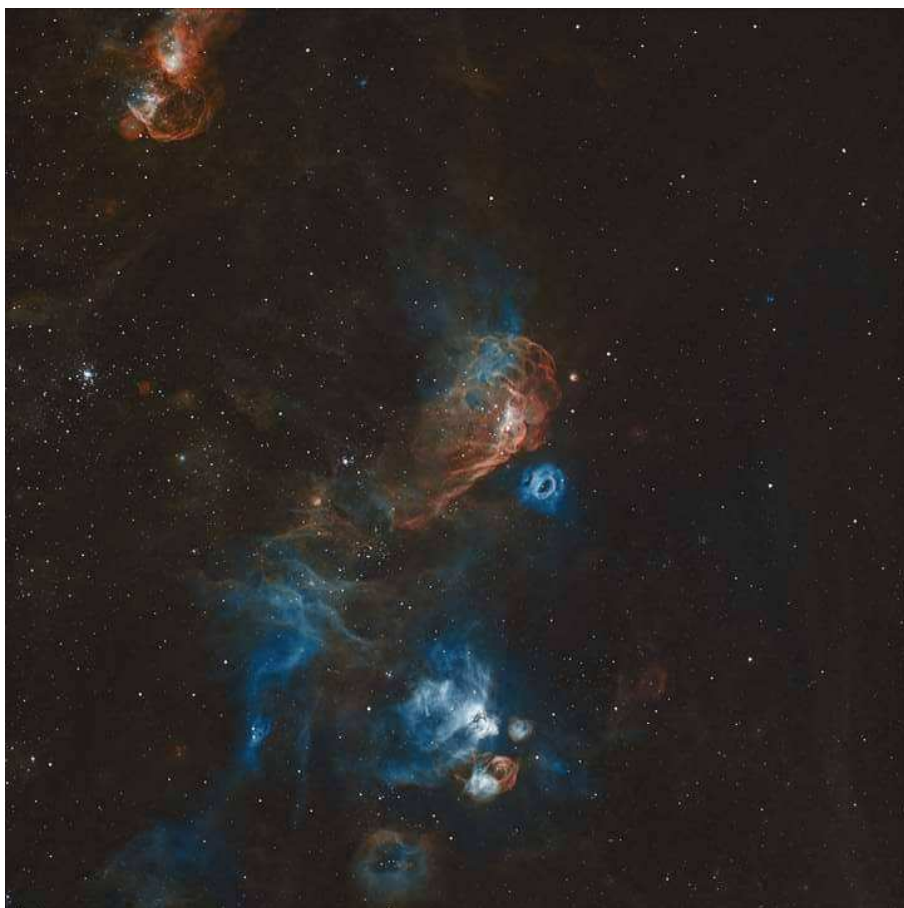


Starless - By Nik Axaris

I don't normally do starless images but I really like the detail in these. Large Magellanic cloud globules, including NGC2020, NGC2014 and others, and M16 the Eagle Nebula, incorporating the Pillars of Creation -made famous by the Hubble Telescope. These areas are star forming regions; so who knows maybe one day a few billion years from now they will be looking at our neck of the woods and see what is left of our planet. (Our Sun in a few billion years will make life uninhabitable as it slowly transitions to a red giant.)

Below - NGC2020 and NGC 2014 found in the Large Magellanic Cloud. The circular object, blue nebula (NGC 2020) has been shaped by a solitary mammoth star. This young, massive star, called a Wolf-Rayet, has ejected its outer layers of gas, exposing its searing-hot core, making it roughly 200,000 times brighter than our Sun. It's not even in our galaxy!

4.5 hours of 10 minute subs. ASI533mc Optolong L-Ultimate. ASIAIR - TS-optics 130 APO reduced to 680mm with Riccardi 0.75 reducer
Processed in PixInsight and Photoshop Data stacked and HA channel separated in Astropixel Processor.



Starless

Below - Eagle Nebula M16 - Old data - Optolong L-enhance, 294mc pro processed in PixInsight using the newer methods.



Starless

Right -

M8

A big thank you to all the MPAS speakers and members for your efforts and energy at the APWS. Here is an image I took of the Lagoon Nebula (M8) with my Canon 6D DSLR through the 350mm Meade in the Observatory (thanks Greg). First ever attempt at post-processing, 28 x30 sec images at ISO 3200, stacked (no darks, etc) and with some playing around in Siril. Try not to laugh!

By Leigh Hornsby

**Right -**

My go at the Helix from the last month or so. This is a combo Narrowband and LRGB image processed in Pixinsight plus some work in APP, finished in Photoshop. Stellarvue sv130t scope, ASI1600mm pro, AP1600gto, taken with Voyager from the Mornington Peninsula.

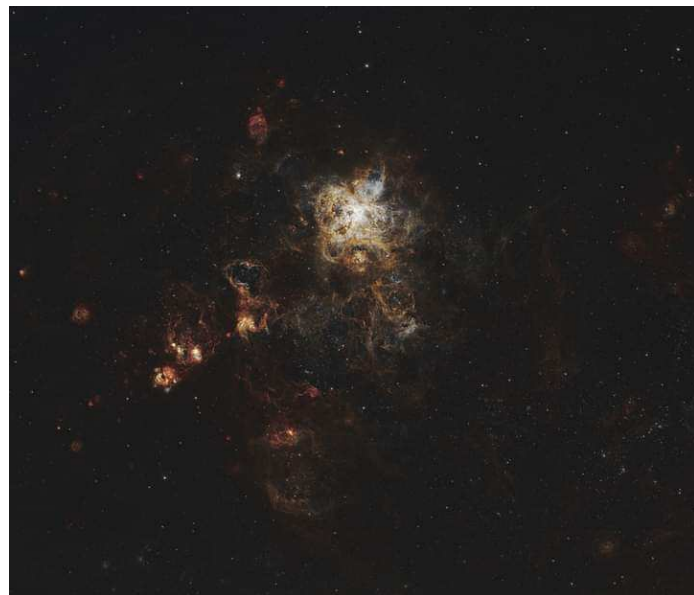
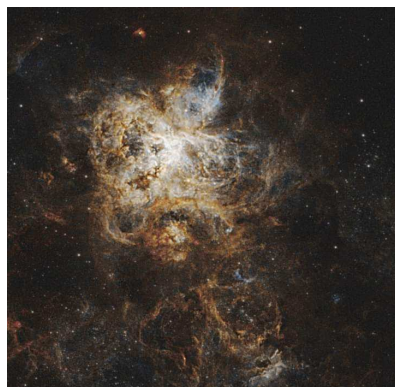
By Steve Wilkins

**Right and below -**

NGC 2070, the Tarantula Nebula.

Imaged from the Briars during the last Members BBQ with my 80mm Refractor, Optolong L-Extreme filter and ASI 294 MC Pro Camera. This is 55 minutes of Exposure, processed in Siril.

By Chris Kostokanellis



MO PHO CHALLENGE

Chris Kostokanellis



Astro Mo Pho challenge for September is the Moon.

Phase of the Moon app, see image at right - I found this app very useful for planning my imaging of the Moon. It shows how the shadows around craters look on a particular day. With a bit of practice you can zoom in and move around the surface with a two-finger movement. Then with one finger swipe sideways to change the day.

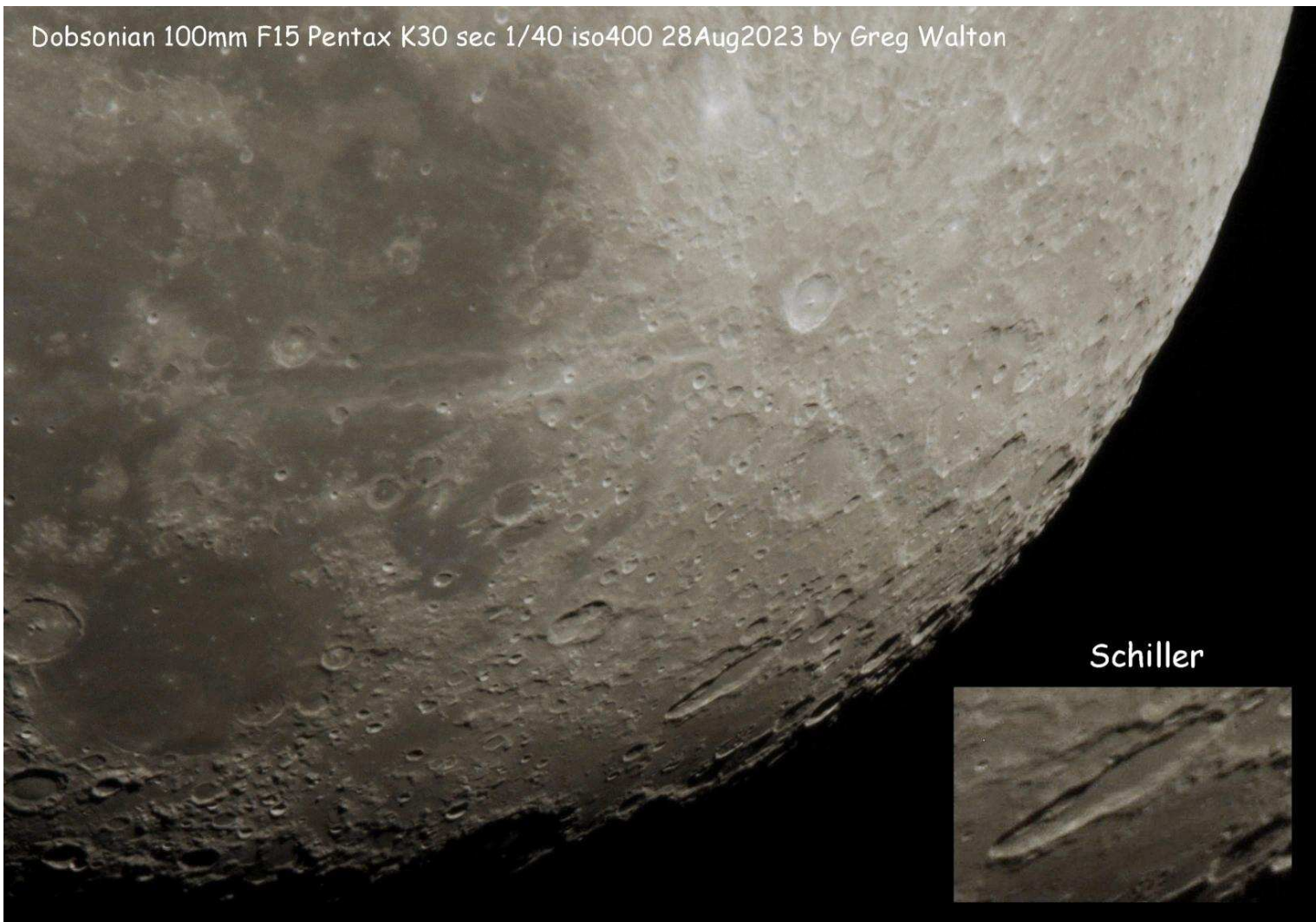
Below - On the 30th August 2023, I imaged the Moon, Saturn and Jupiter with the same telescope. I added Saturn and Jupiter to the top right hand corner of the image, just to compare their size against the Moon. 100mm Newtonian f15 with Pentax k30 1/60 sec iso 100 (no tracking). *By Greg Walton*

Next page - The ray craters Copernicus and Tycho. Odd shaped crater Schiller - 28th August. *By Greg Walton*



Moon imaged with Dobsonian 100mm F15 Pentax K30 sec 1/60 iso400 30Aug2023 by Greg Walton

Dobsonian 100mm F15 Pentax K30 sec 1/40 iso400 28Aug2023 by Greg Walton



Schiller



Copernicus and Tycho imaged with Dobsonian 100mm F15 Pentax K30 sec 1/40 iso400 28Aug2023 by Greg Walton



Left -

A little bit of Moon action tonight - post the excitement of the "Blue Supermoon".

Taken with a Canon 6D, Sigma 150-500mm Zoom Lens, 2x APO Teleconverter. Single Shot F13, 1/50th sec, ISO 100. Post processing in photoshop to bring out some detail. Cropped for detail.

By Jamie Pole

Right -

A small gap in the clouds earlier.
130mm Refractor, 0.02 seconds with a SII filter.
25 shots, aligned and stacked in Autostakkert.

By Dave Rolfe



Below Right - Tonight's Super Blue Moon with my 80mm Refractor and ASI294 MC. Captured and Stacked using the ASI Studio software, and finished off in Photoshop. My first go at capturing the Moon this way, with video, frame extraction, and stacking 20% of the frames. *By Chris Kostokanellis*

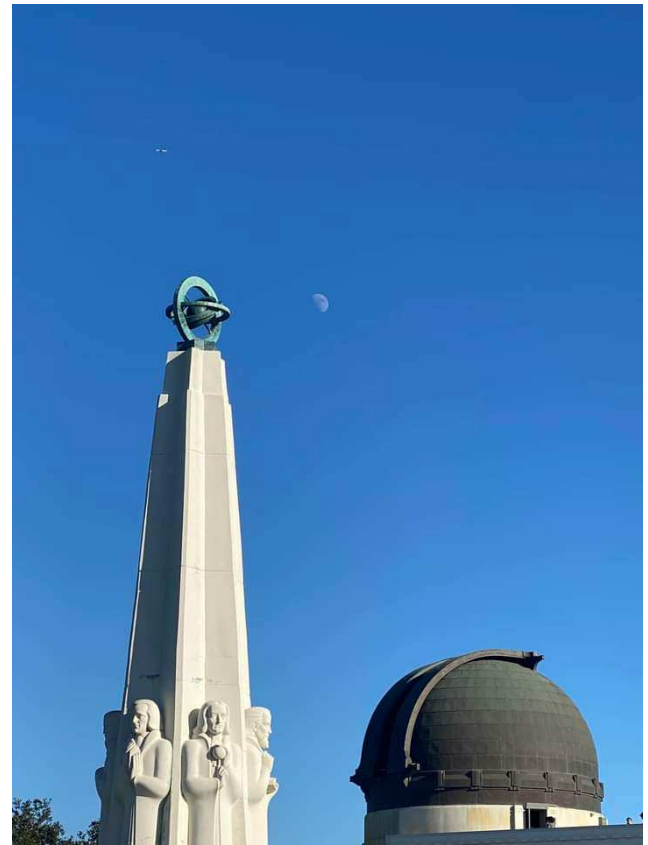
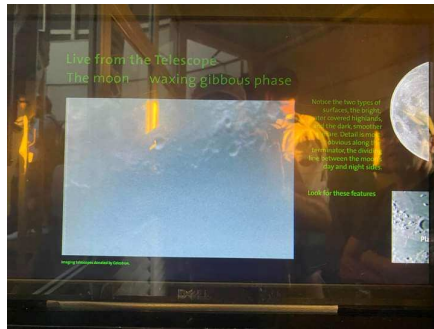
Below Left - Moon amongst the palms. *By Chris Kostokanellis*



Right and below -

Astro Mo Pho. Moon over Griffith Observatory in Los Angeles on 25 August, an actual Moon rock from the Apollo 14 mission, and Griffith's 12 inch Zeiss refractor pointing at the Moon. All taken with my iPhone.

By Guido Tack



Right -

A fine crescent Moon tonight. Imaged with my Olympus camera. 300mm_1.4x tc. ISO400, 1/80th s, f9. Single, handheld image. Processed in LR.

By Kelly Clitheroe



Left -

You really don't need a telescope when you have a dome nearly the size of Marvel stadium. Image taken before things got messy from the high roller a good few blocks away. Certainly easier to spot than the real thing.

By Peter Wylie

Astro Mo Pho challenge for October is the gas giants, Jupiter, Saturn, Uranus and Neptune.

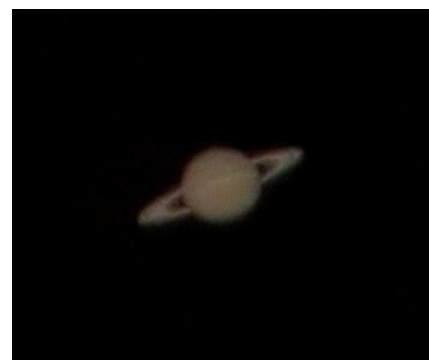
Right -

Played with a telescope last night. Very stable air. Finished with a try at hand held image of Saturn with a 7 year old second-hand Samsung S7.

Enlarged and cropped in the phone. Amazes me what this old dinosaur can do.

Phone held over 3.5mm Nagler, Astro-Physics 130EDF GT on Heq6 at 234X

By Mark Hillen



Below - Saturn imaged with the 350mm Meade telescope in the MPAS observatory. Top image shows 3 different magnifications and the bottom image shows 3 different time settings. *By Greg Walton*

Saturn imaged with Meade 350mm F10 EQ8 Pentax K30 23Sep2023 by Greg Walton

I used the 0.7 focal reducer and stopped the telescope down to 100mm

2500mm focal length divided by 100mm = F25 Images haven't been edited in anyway



1/2 sec 1600 iso
3 times converter
F75

1 sec 3200 iso
6 times converter
F225

1.6 sec 6400 iso
12 times converter
F450

Stopped down to 100mm



2sec iso3200

1.6sec iso3200

1sec iso3200

Saturn imaged with Meade 350mm F10 EQ8 Pentax K30 with 6 times converter 29Sep2023 by Greg Walton

Right -

Here is my photo of Saturn.
I captured this on 28/9/23, through the glare of a 98% full moon from my back yard.

This was taken through my 80mm refractor, with a 5x Powermate, and a 25mm Plössl eyepiece stacked on it via an extendable camera adapter for added magnification. I think this equates to around 100x magnification. I took about 1min of video, extracted and stacked the best 20% of frames in Autostakkert, processed the wavelets in Registax, and adjusted the brightness and colour in Photoshop.
Aiming to capture the rest of the gas giants at the next clear sky opportunity.

Clear skies Chris Kostokanellis



Greetings MPAS Members.
I'm open to suggestions for our next Monthly Photo Challenge.

For our current challenge, I managed a couple of captures of Neptune with my 80mm refractor, a few days apart.

2/10/2023 with a 2x Barlow, 1000mm FL, and 8/10/2023 with no Barlow, 500mm FL.

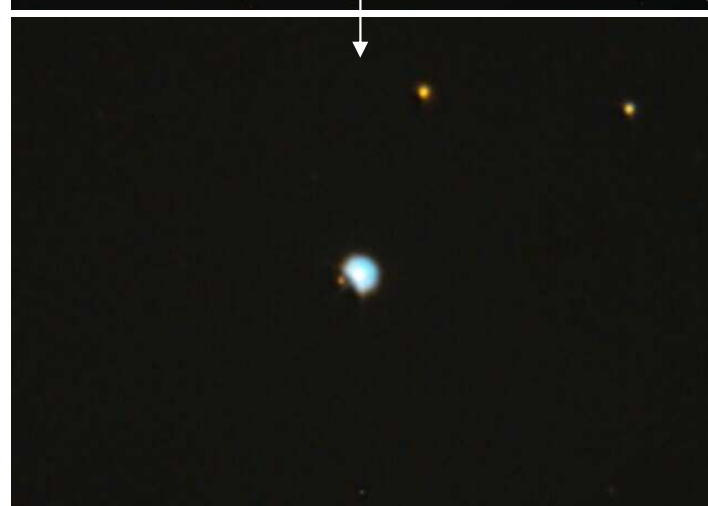
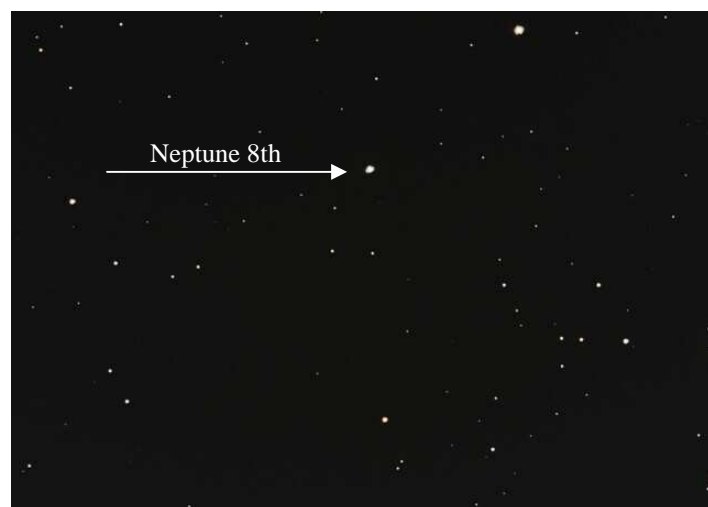
I've rotated the images and cropped them to make them match, and you can see the different position of Neptune over the 6-day period. A crop of the image taken with the 2x Barlow also shows Neptune's moon Triton very close to it.

Clear Skies Chris Kostokanellis

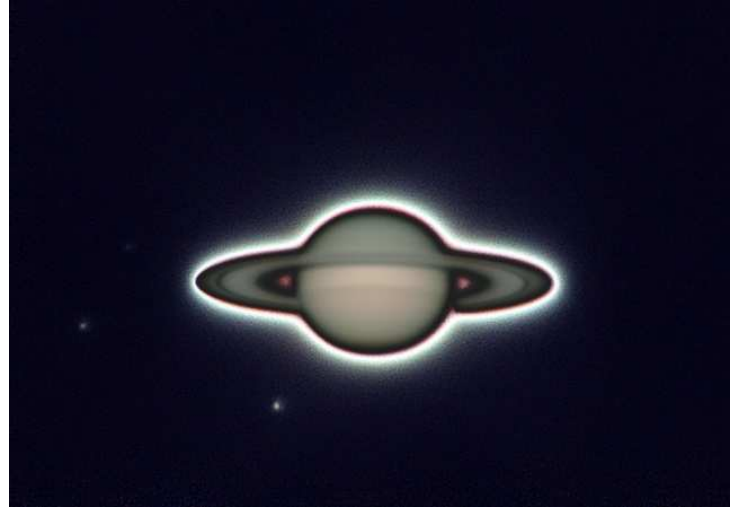
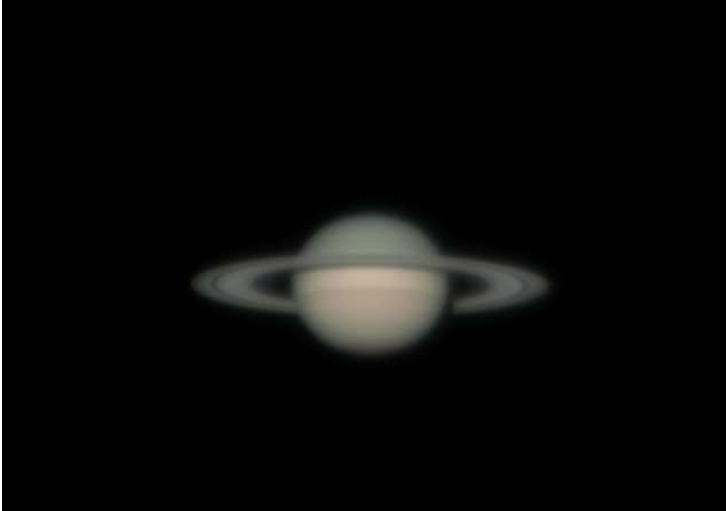
Neptune (just up from centre of frame) 8/10/2023 imaged with 80mm Refractor, 32 x 60 Sec frames

Neptune and Triton just to its bottom left. 2/10/2023

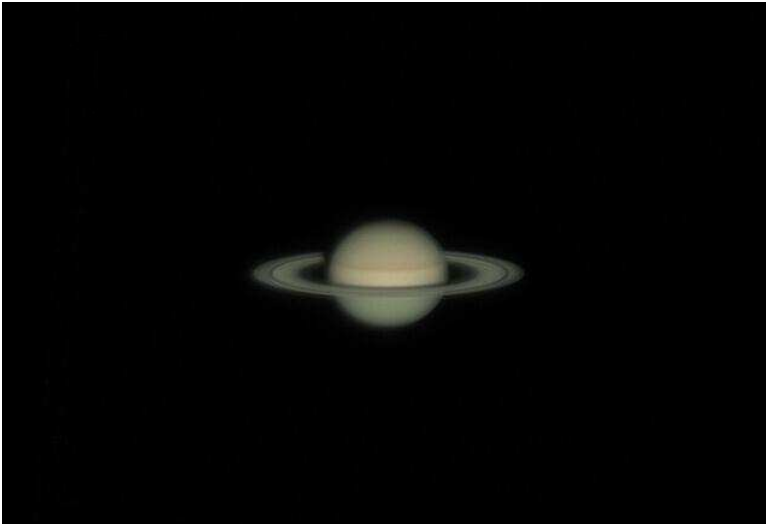
Neptune (centre of frame). 2/10/2023 Imaged with 80mm refractor, 2x Barlow. 20 x 60 Sec frames



Below - Saturn imaged on 8th October. Second one shows the moons top to bottom Enceladus, Tethys, and Rhea. 12" Dobsonian telescope, ZWO224mc. Tried some eyepiece projection shots without success before hooking up the planetary cam. *Cheers, Russell Smith*



Below - On 17th October, Jupiter was still low and hadn't cleared the tin roof yet so fairly blurry. Saturn came out fairly well. Really need to clean the primary mirror; dodging the dark blotches was near impossible with Jupiter! *Cheers Russell Smith*



Below - Jupiter (top right above the lights) competing with Iron Maiden's stage lighting at Coachella. *By Dave Rolfe*



Right -

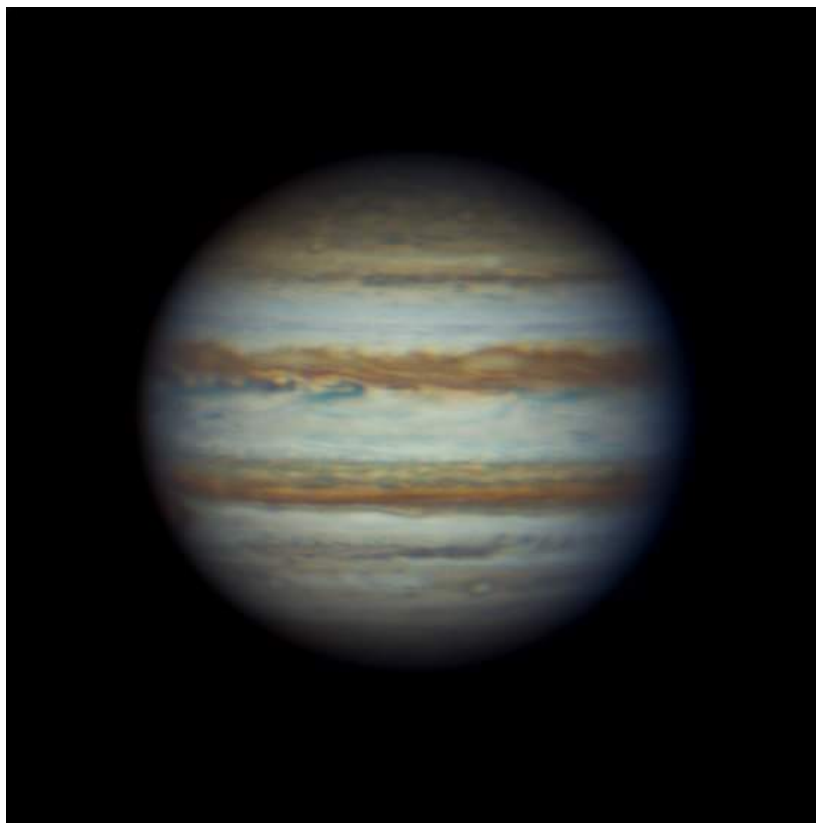
The planet Jupiter is now getting closer to its best for 2023. This photo was taken at 1am on Wednesday morning, using lucky imaging. Best 15 percent of 20 minutes of video. Processed in Registax, Winjupos, and PS. Zwo ASI 485M with a C14. (Jupiter Diameter = 49.00" Magnitude = -2.88)

By Dominic Lucarelli

Cover image -

The planet Saturn is now nice and high at a reasonable time after sunset, after its opposition last month. This picture was taken at 10 pm, under good seeing. ZWO ASI 485mc with C14 telescope.

By Dominic Lucarelli

**Astro Mo Pho #9. The Gas Giants.**

Congratulations to all contributors in this months Photo Challenge.

MPAS Members managed to capture some impressive images of all the gas giants except Uranus, which is still a little low in the sky. The summary of the images submitted is in the video here, as well announcing our next challenge. Thanks to Peter Wylie for suggesting a Halloween themed "SPOOKY ASTRO".

Think ghostly nebulae, Spiders, webs, witches, wizards and mysterious dark nebulae. There is also a full moon to howl at on the 29th October.

Now, Facebook doesn't like me putting music on the video summaries, so if you want a suggestion of something to listen to while watching the summary, you can try this: <https://youtu.be/4m1EFMoRFvY?si=TXI4Y7Qla2V-XQh9>

Clear skies everyone. Chris Kostokanellis

MPAS AP Group.

Greetings MPAS Members.

We are excited to announce the new Astro Photography Group (AP Group) of the Mornington Peninsula Astronomical Society.

The purpose of the AP Group is to allow members interested in all aspects of Astro Photography to discuss with each other, any and all aspects of our hobby. Be it equipment, imaging techniques, image processing or targets of interest.

Members will be able to post their images and request feedback on them, or help troubleshoot a particular problem, drawing on the deep pool of experience and knowledge that exists in our membership base.

We will also endeavour to arrange the occasional face-to-face meeting at Members BBQs, or perhaps over Zoom to discuss and demonstrate that new piece of equipment you just picked up, a new processing trick you discovered, or that project you've been working on. The AP group is open to all members, whether you are a new or experienced photographer, or just interested in learning how these images are taken. A new E-Scorpius group has been set up, and any member interested in joining the MPAS AP Section is invited join the group by selecting it from the "Your Groups – Manage My Subscriptions" menu on groups.io.

Remember, you can customize your notification settings to adjust the frequency of the emails you receive from E-Scorpius, from receiving notifications as messages are posted, or a daily digest.

Look forward to seeing you there.

Clear Skies Chris Kostokanellis

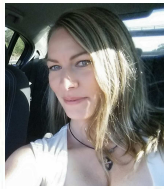
SOCIETY INFORMATION



Peter Skilton



Chris Kostokanellis



Nerida Langcake



Jamie Pole



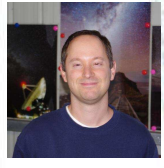
Anders Hamilton



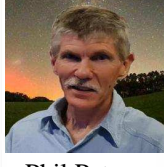
Trevor Hand



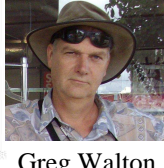
Guido Tack



Simon Hamm



Phil Peters




Greg Walton

OFFICE BEARERS OF THE MORNINGTON PENINSULA ASTRONOMICAL SOCIETY

President: Peter Skilton
Vice President: Chris Kostokanellis
Committee: Anders Hamilton, Trevor Hand, Guido Tack, Simon Hamm and Phil Peters
Secretary: Nerida Langcake
Treasurer: Jamie Pole
Web master: Guido Tack
Scorpius editor: Greg Walton
Librarian: Fred Crump & Lara Conway

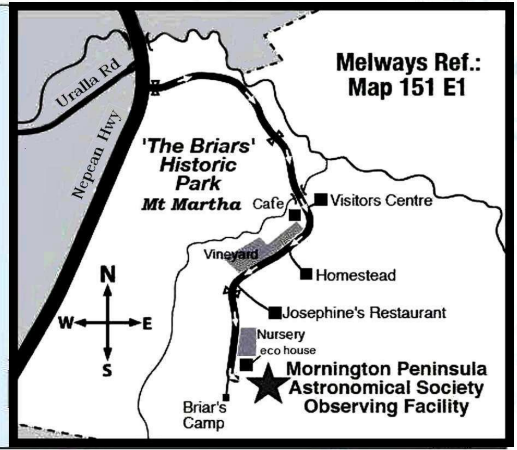
SOCIETY MEETINGS

Meeting Venue: MPAS Astronomy Centre
 The Briars, 450 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: Mornington Peninsula Astronomical Society
 450 Nepean Hwy, Mount Martha, Victoria, 3934



LIBRARY



Fred Crump

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

E-SCORPIUS NEWSGROUP

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

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

VIEWING NIGHTS - MEMBERS ONLY

Members only Viewing Nights - any night at The Briars, 450 Nepean Hwy, Mt Martha. 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: Mornington Peninsula Astronomical Society
 450 Nepean Hwy, Mount Martha, Victoria, 3934



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=0BvykxzZG19g_SUNmZVhkZTFGWTA

SCORPIUS The journal of the Mornington Peninsula Astronomical Society

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