



Cover images - By Alex Cherney

Right - Aurora from Flinders on 4th August 2016. The foreground reflection from the roof of a car.

Right bottom - 3 evening planets, taken on the 8th August 2016

Left - 5 evening planets & the Moon, taken on the 8th August 2016

SCORPIUS

THE JOURNAL OF THE
MORNINGTON PENINSULA ASTRONOMICAL SOCIETY INC.

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Volume XXV, No 5 (September / October) 2016

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 amateurs 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 education presentations and observing nights for schools and community groups.

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Alex Cherney
2016



Presidents Report for 2015/2016

Inline with the AGM I thought it would be good to present the report in the Societies magazine. First of all I would like to thank the committee for their support over the busy year. Although my term was reduced in time, I think we achieved a lot this year and the key points are summarized below.

Peter Lowe Observatory

This was an extension (and completion) of the building formally known as 'the lower shed'. This was built by the members and will provide a world-class platform for the society into the future. Special thanks goes to Greg & Mark for driving the project and for putting in so much of their time.

There are a few items left to complete like Piers and an assisted roof opening system.



Membership Structure

We have now implemented a change the membership structure to suit the calendar year. We hope will enable us to send renewal reminders (member retention) and reduce the admin of the secretary keeping tabs of everyone renewal anniversary date. We have also revised the new member packs and are preparing Astronomy education classes and training on the new observatory.

Website & On-line Bookings

Our updated website now accepts payments and bookings for the Public Viewing Nights, Memberships and Events. This system reduces admin time and gives us a looking glass as to where inquires come from and expected attendance.

Acquisition of new Astronomical instruments

The society has purchased two telescope systems for the Observatory. These are large assets for the society, which will service the society for many years both visually and for imaging.



System 1: Meade LX200, 14" F/10 Tube on an EQ8 Mount.

System 2: Explore Scientific ED 127mm Triplet Carbon Fibre on a NEQ6 Mount.

There are also two new computers in the lower shed to automate this equipment. Access to the new equipment will need to be controlled and systems are still being defined and documented. We aim to have this complete by the official opening in September.

Astrophotography Workshop

We conducted an Astrophotography last year aimed at members of local camera clubs. This proved successful via good feedback from the attendees and income back into to the society. We are doing it again this year although we opened it to the public. The event at time of writing is over 85% booked with 4 months to go.

MPAS merchandise

Inside this edition of Scorpius is an order form and list of the items available for sale. See Page 18. Either return the form or purchase from our website (in the members area).

Public Viewing Nights

This year we are seeing good numbers at the public viewing nights, an increase in particular in the last two months with the Mars opposition. These nights provide good revenue to the society as well as give the members a chance to socialize. We have also taken several memberships from these nights. A special thanks goes to Trevor who has his own fan base at these nights!

We have also reviewed the PVN prices and in-line with inflation, increased the fees from October 1st to Child \$5, Adult \$10 and Family \$25. We are also removing the 2 adults & 2-child rule for families.



Schools - Schools have been steady this year with an average over the year of about 1 per month (although they come in clusters!). Thanks to the members who travel out to these events.

Treasures Report- MPAS is in a strong position with very good revenues from our public nights. We need to maintain this momentum to continue providing benefits back to the society.

As of End of June	2016	2015
Total Assets	\$58,408	\$50,390
Total Liabilities	(\$2,995)	(\$920)
Society Equity	\$61,404	\$51,311
Cash Reserves		
Opening Balance (30/6/15)	\$33,617	\$33,813
Closing Balance (30/6/16)	\$17,798	\$33,617
Gross Profit	\$16,181	\$ 9,656
Total Expenses	\$ 5,413	\$ 5,974
Net Profit	\$10,093	\$ 3,683

A full report is available from the society treasurer.

To the future.... There are still some items on the wish list that we need to build into our forward planning and budgets. Ideas and suggestions are always welcome.

Regards, Dave.

Photos, By Peter Lowe

Good luck to the new committee of 2016/2017

President : David Rolfe
Vice President : Paul Albers
Secretary : Peter Skilton
Treasurer : Jamie Pole

General Committee Members

Greg Walton
Fiona Murray
Peter Lowe
Trevor Hand
Fred Crump

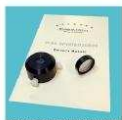


SOCIETY NEWS

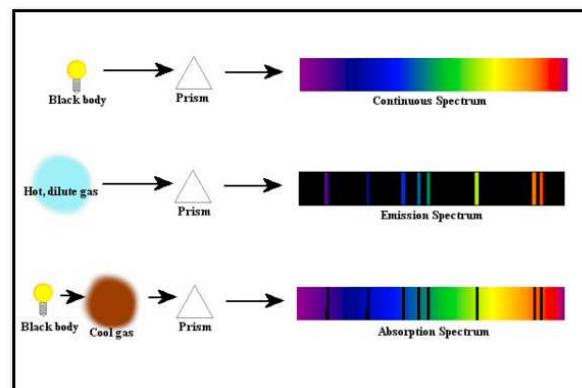
By Greg Walton

July public night - Approximately 50 in attendance - 15 members and 35 members of the public. Many of the regulars were away for this public night, so it was good to hear we had a few extra member along to help. Most got to see Jupiter, Mars & Saturn. Also the societies new telescopes were on display & I was told the view through the 125mm refractor was excellent, unfortunately the 14 inch Meade could not be used as it was shipped with the wrong mounting plate.

July Society Meeting AGM - 25 members were in attendance. Dave Rolfe (President) chaired the meeting. First up was to get the formalities of the AGM out of the way, then our speaker, Sky Murphy MPAS/ASV member, gave a introductory talk on spectroscopy. Also see page 16. Paul Albers (Vice President) did "sky for the month", after which members chatted over coffee. Right & below Slides from Sky



Some transmission gratings. There are other med-res and hi-res equipment.



July members BBQ - only a small turn out of member in attendance due to the cold & cloudy weather, still everyone had enjoyable time chatting & getting warm around the BBQ.

August public night - Approximately 100 in attendance - 15 members and 85 members of the public. Peter Lowe opened the night, then Trevor Hand gave one of his amazing talks. Dave Rolfe took on the job as usher, shoe horning the late comers in were every he could. The clouds hung around for most of the night, but most got to see Jupiter, Mars, Saturn & some deep sky objects. Also the societies new telescopes were up & running, I did not get to see through the new scopes myself, but I could hear many good comments coming from the observatory. I had my hands full manning the telescopes outside, many said Saturn looked its best in Sky Drover as it was running at 200 times magnification, but it was a bit of a struggle for some to reach the eyepiece, as Saturn was directly over head. The last of the public succumb to the cold leaving around 11pm.

Scouts viewing night on the 13th @ Hallam - Approximately 70 scouts & parents in attendance. Peter Lowe started with a brief talk on the solar system, then Trevor Hand gave a talk on the dinosaur extinction. After which everyone got to see the Moon through the clouds. Also helping out was Peter Skilton, Heinz Rummel, Inge Marcinkowski, Jamie Pole, Pia & myself, *Greg Walton*

School viewing night on the 16th @ Mt. Eliza Primary School - Approximately 100 students & parents in attendance. Peter Lowe started the talk, but as there was a brake in the clouds, we decided to get everybody out to look through the telescopes. Most seen Jupiter, Saturn, Mars & the Moon, with Saturn in Alex Cherney's telescope getting most of the wows. Also helping out was Peter Skilton, Dave Rolfe, Tony Nightingale, Pia & myself, *Greg Walton*

August Society Meeting - 25 members were in attendance. Dave Rolfe (President) chaired the meeting & did Astro news talking about Juno space craft arriving at Jupiter, Greg Walton, did "sky for the month" Peter Lowe, gave a talk on the history of MPAS, it was interesting to see old photo & hear how the society started, after which members chatted over coffee.

August 19th Nation Science Week public night - Approximately 40 in attendance - 8 members and 32 members of the public. Peter Lowe opened the night & gave one of his talks. Bands of clouds past passed over head, while in the clear patches Dave Rolfe took small group to the observatory, to view Mars, Saturn & the jewel box cluster.



Scouts viewing @ Hallam



Mt. Eliza Primary School

PUBLIC NIGHT THANK-YOU

Recent public viewing nights and school viewing nights have continue to be very well received by the attendees. It is no coincidence that this is due to the efforts put in by the members that help out at these events. To everyone that has helped out over the past months, a very big thank-you goes to you all. Your efforts are very much appreciated, and are being very well received.

August Members BBQ & working Bee - about 30 members in attendance. In preparation for the astrophotography workshop, many members showed up early to help with the many jobs around the site, Paul Albers did the mowing, while Mark Hillen, Pia & I relocated the kitchen to the entrance area, while Dave Rolfe installed new power points, the old sink from the entrance area & tap was also relocated to the outside BBQ shelter. The floor was washed where the kitchen was, so then the library could be move to the back wall in the meeting hall, this will help sound proof the kitchen from the main meeting hall. John Cleverdon & Valda Walton emptied the books from the cupboards & shelf so they could move them & restack all the books back from where they came. While this was happening, Heath, Mark, Dave, Paul & Jamie Pole started installing insulation foam boards in the ceiling. This should help heat the meeting hall in the colder month & keep it cooler in the summer time, also we are hoping it will help reduce the noise when it rains. The foam installation went on in to the night finally finishing around 11pm. Many other jobs were done on the day, including a safety inspection & tagging of all the electrical cables & appliances, this was done by one of the members with a electricians licence. Leanne Rolfe single handily run the BBQ while Pia & Marj Cleverdon prepared the food. The observatory was open & member got a look at the planets before the clouds set in. It was a massive effort put in by member, I know my back & legs were sore, I guess other member felt the same. On behalf of the committee, I would like to say a big thanks to all who helped out on the day. We also had a visit from Dr. Malcolm Jenkins, the President of ANZAAS (Australia and New Zealand Association for the Advancement of Science) & Amy Shira Tietel a space historian and science media communicator (www.amyshirateitel.com) they mingled with members & looked at the MPAS observatory.

Photo below - From left Peter Skilton, Amy Shira Tietel & Greg Walton.
Photos centre - Member at work.

Photo below - Member using the Springfield.
Photos at bottom right - Kitchen & Library relocated.

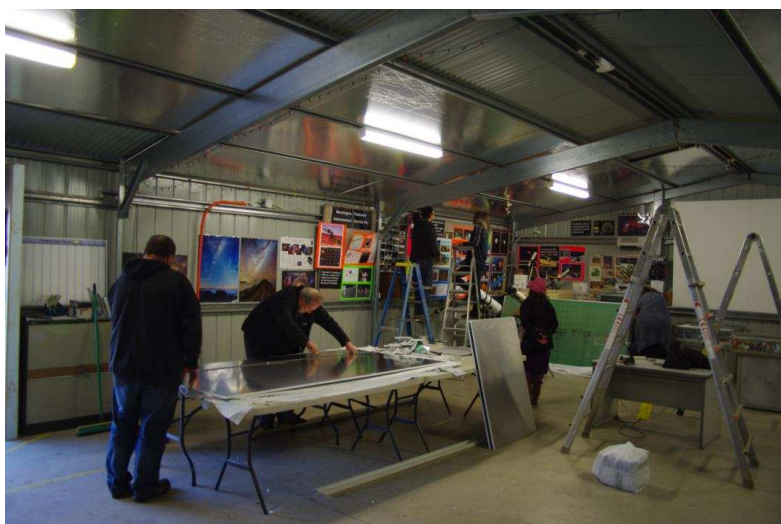


Photo Below centre - From left Dr. Malcolm Jenkins, Amy Shira Tietel & Peter Skilton



Library is now where the kitchen was.

Photos - By John Cleverdon

***** Please Note *****

APWS - Astrophotography workshop 1pm @ the Briars on 10th September
This is a major MPAS event with about 85 paying guesses.

We have many speakers talking on all aspects of astrophotography.
Paul Albers, Dave Rolf, Jamie Pole, Greg Walton, Alex Cherney & Steve Mohr
We are also provided Tea, coffee & BBQ Dinner to guesses & volunteer.

We need at least 12 MPAS volunteers on the day starting from 12 Noon
The meeting hall will need to be set up with chairs & tables.
Also need members with camera & telescope skills on the field.
We need member serving food. Name tags will be provided.

To register as a volunteers Please contact:
Paul Albers : apaulo 1966@bigpond.com or Greg Walton : gwmpas@gmail.com

***** Grand Opening of the Peter Lowe Observatory *****

The Society dinner this year coincides with our solar day and the official opening of the new members observatory. You are invited to attend the festivities on Saturday the 24th of September. The site will be open for Solar day viewing from 1PM followed by the Peter Lowe observatory opening ceremony at 4PM. Members are invited to stay for a 'Pizza & Plate' dinner from 5.30. Please bring a plate to share (either pre-dinner or desert) and confirm your dinner attendance by booking into the event at <https://www.trybooking.com/MWDU> - BYO Drinks. <https://www.trybooking.com/MWDU>

New Members Welcome

Michelle Monnier
Ross Berner
Christopher Sheen

PLEASE NOTE

New Public night pricing
starting from October 2016

	ADMISSION PRICES
Child	\$5
Adult	\$10
Family	\$25

A word from the Scorpius editing team.

Members please write a story
about your astronomy
experiences and add some
pictures.

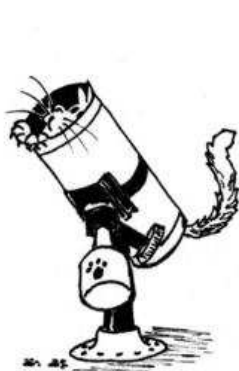
Send them to:
Greg Walton
gwmpas@gmail.com

Brett Bajada
Peter Lowe
Bruce Renowden

THE SCORPIUS FILES

File # 2045-1
Telescope designs that
did not make it into the
Peter Lowe Observatory.

By Phil Holt



The Newton-Schrödinger



the Takahashi-Yamaha



and the Maksutov-Nureyev

MPAS SUBSCRIPTIONS 2016

The ticking over of the New Year also means that society fees are now due to be paid. The society has worked hard to ensure that 2016 fees are still the same as last year's prices. So to assist the society in maintaining the facilities and service we provide, we appreciate your prompt payment for the 2016-year ahead.

As a reminder, the following structure of the fees are:

SOCIETY FEES

Subscriptions can be paid in a number of ways:

- Direct Cash payments to a committee member
- Send a cheque or mail order to the society mail box MPAS. P O Box 596, Frankston 3199
- Make a direct electronic payment into the society working bank account.

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 farther information - https://drive.google.com/file/d/0BYvkxzZG19g_NXZ4cWxHbERTdEE/view?usp=sharing

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

SCORPIUS The journal of the Mornington Peninsula Astronomical Society

Newsletter Disclaimer

The Scorpius Newsletter is published online, once every two months for its membership, by the Mornington Peninsula Astronomical Society, for Educational Purposes Only. As a newsletter, this publication presents news spanning a spectrum of activities, reports, and publications in order to keep society members abreast of a variety of events and views pertaining to astronomy. While prudent, reasonable effort has been utilized to verify factual statements made by authors, inclusion in this newsletter does not constitute or imply official MPAS endorsement. All materials (except previously published material, where credited) are subject to copyright protection © 2016, Mornington Peninsula Astronomical Society

CALENDAR		September / 2016				
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1 New Moon Venus, Jupiter & Mercury are close	2 Public Night 8pm	Neptune at opposition 3 Venus above the Moon while is Jupiter below
4 Fathers Day	5 Venus, Jupiter & Mercury are close	6 Mars near M19	7	8	9 First Quarter Mars & Saturn left of the Moon	10 APWS
11	12	13	14 ASV Meeting	15 Astro Class Mars near ngc6355	16	17 Full Moon
18	19	20	21 Society Meeting 8pm	22 Equinox Moon in Hyades	23 Last Quarter	24 Solar day 1pm Members Pizza Night 5:30pm
25	26	27	28 Committee Meeting 8pm Venus & Jupiter close	29 Dawn-East Mercury below the Moon	30 Mars near ngc6553	Also @ 4pm Grand Opening of the Peter Lowe Observatory 24th

Monthly Events & High Lights. - **Red Days** indicates School Holidays

Public nights 2nd, 8pm start - **Society Meeting** at 8pm on 21st @ the Peninsula School

APWS - Astrophotography workshop 1pm @ the Briars 10th (Please note - We need volunteers on this day)

Astro Class at 8pm @ the Briars 15th *by Peter Lowe*

Solar Day 1pm @ the Briars 24th also **Members Society Dinner** 5:30pm @ the Briars 24th &

*******Grand Opening of the Peter Lowe Observatory** 4pm @ the Briars 24th*****

Evening - In the west at the beginning of the month Venus, Jupiter & Mercury are close - **Venus & Jupiter close** 28th

CALENDAR		October / 2016				
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
30 Venus & Saturn 3deg apart Vic-south	Halloween 31 New Moon Vic-south	2016 Vic-south star party 28th to the 1st November @ Nhill				1 New Moon
2 Day Light Savings Starts	3 Venus above the Moon	4 Venus left the Moon	5	6 Saturn left the Moon Mars near M28	7 Public Night 8pm	8 Mars left the Moon
9 First Quarter Mars near M22	10	11	12 ASV Meeting	13	14	15 Uranus at opposition
16 Full Moon	17	18	19 Society Meeting 8pm Moon in Hyades	20	21	22 Members Night BBQ 6pm
23 Last Quarter	24 Venus near M80	25	26 Committee Meeting 8pm	27	28 Antares, Venus & Saturn in a straight line Vic-south	29 Vic-south

Monthly Events & High Lights. - **Red Days** indicates School Holidays

Public nights 7th 8pm start - **Society Meeting** at 8pm on 19th @ the Peninsula School

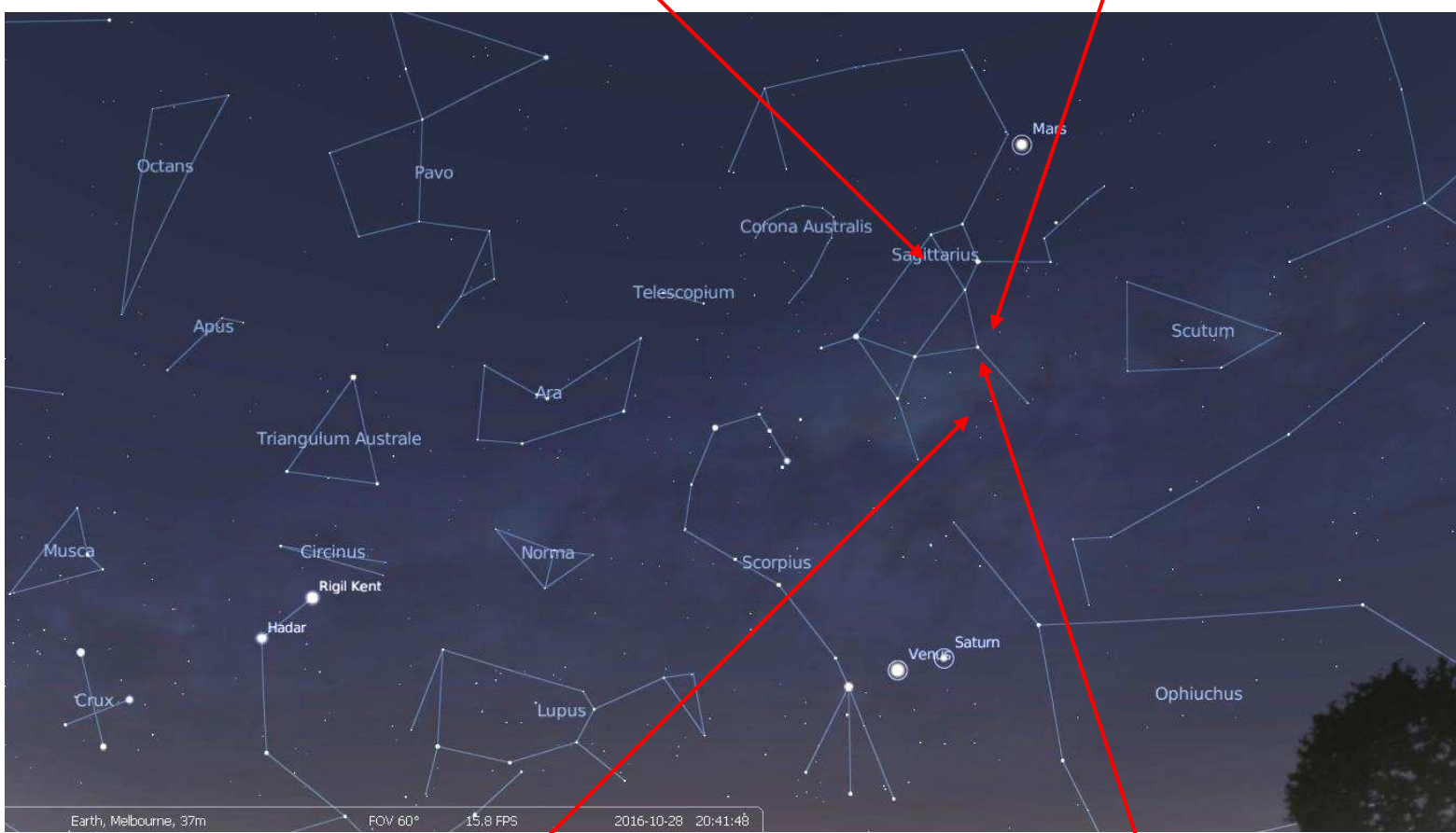
Members Night BBQ 6pm @ the Briars 22nd - **2016 Vic-south star party 28th to the 1st November @ Nhill**

Evening - Antares, Venus & Saturn in a straight line on the 28th

Note this years the Members night BBQ's will be the first Saturday after the Society Meeting.

Also General Meetings will be called Society Meetings under the new regulations.

Sky for September/October we will look at Scorpius, as on the 28th of October - Antares, Venus & Saturn will be in a line. Then we move up to Mars which now lies in Sagittarius, shaped like a up side down tea pot. You can use the chart below to help guide you to the location of these objects, M54, M22, M28 globular cluster & M8 Nebula.

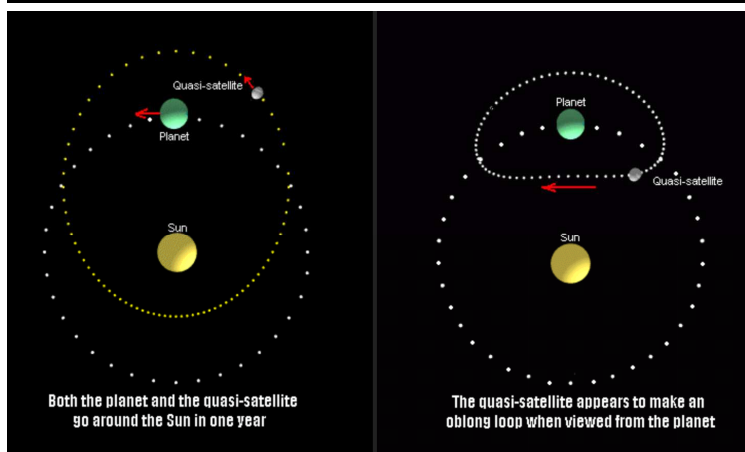
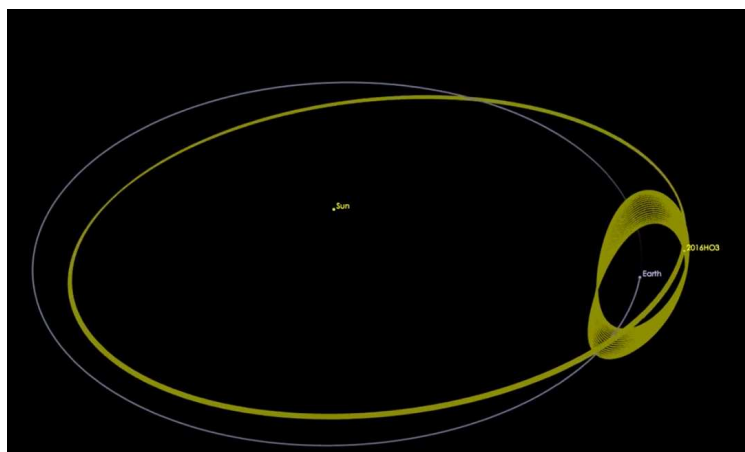


ASTRO NEWS

By Peter Lowe

The Quasi-Satellite Moons of Earth

A standard trick question for those trivial pursuit devotees is "How Many Moons Does the Earth Have?" Earth has only one true natural satellite: the big Moon where we like to send daredevil astronauts. Our Moon has been orbiting the Earth since the early planet-building phase of the solar system formation but the Earth has captured a quite few extra Moons in the meantime. The Earth has roughly a dozen other small moons co-orbiting the Sun-Earth system. It is believed these small moons termed quasi-satellites, are essentially captured asteroids orbiting the Sun at Earth's orbital distance and their orbit brings them under the influence of the Earth-Moon system where they move in several elongated orbits before moving off to circle the Sun again. Astronomers recently discovered another of these temporary moons 2016 HO3's that has been moving in Earth's vicinity for more than the last 100 years. 2016 HO3 was discovered in April using the Pan-STARRS 1 asteroid survey telescope on Haleakala, Hawaii and has been tracked ever since. Its orbit is very wobbly (lower right) and at sometime is expected to eventually leave and continue its journey around the Sun perhaps returning sometime in the distant future. Called a quasi-satellite 2016 HO3 loops around our planet, but never ventures very far away as both it and the Earth go around the sun. Never more than 100 times farther away than the moon, it is also never closer than 38 times that distance; scientists suspect that it has a diameter somewhere between 40 and 100 metres. Another quasi-satellite asteroid — 2003 YN107 — followed a similar orbital pattern for a while over 10 years ago, but it has since departed our vicinity. Calculations indicate 2016 HO3 has been a stable quasi-satellite of Earth for almost a century, and it will continue to follow this pattern as Earth's companion for centuries to come.



News from the Moon and Mars

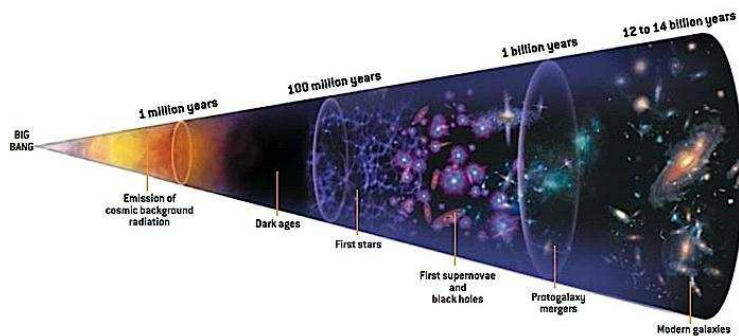
The Chinese lunar mission Chang'e 3 has been working continually on the moon since its soft landing in December 2013 but unfortunately the end has come. Data sent back to the Earth has shown for the first time that there is no water in the lunar geology. The Chang'e 3 lander has gathered data on the moisture content above the lunar surface getting extremely low readings. The mission has achieved several firsts in lunar exploration. It drew the first geological section map of the moon and found a lunar basaltic rock, which can help us understand the evolution of the moon. It also conducted a survey above the north pole of the moon. The Chang'e 3 was composed of a lander and a lunar rover called "Yutu" (Jade Rabbit). It carries eight scientific instruments, including panoramic cameras, a soil probe, a lunar-based optical telescope and an extreme ultraviolet (EUV) camera to observe the moon, the Galaxy and the Earth.

Curiousier and Curiousier

The Mars rover Curiosity has become much more curious about its surrounding. An upgrade of its operating software includes an artificial intelligence module allowing the rover to decide what rocks deserve closer attention. The AI algorithm analyses images taken by the rover's navigation camera (Navcam) and can select a target rock according to criteria pre-programmed by its Earthly controllers. ChemCam determines what kinds of atoms the rock contains and can make the decision to stop and investigate. This new autonomy is especially useful when Curiosity is in the middle of a long drive, or when there are delays in sharing information with scientists on Earth.

The Oldest Oxygen and filling in the gaps

During the Big Bang 13.8 billion years ago only the lightest elements could be formed. The formation of sub-atomic particles meant protons and electrons plus other particles could interact and fuse into the simplest atoms: hydrogen, helium and lithium. The more complex atoms such as nitrogen, carbon and oxygen had to wait until the first stars formed and started to produce these elements in their cores. Observations of a galaxy formed 13.1 billion years ago, some 700 million years after the Big Bang have detected oxygen. This is the oldest sign of oxygen scientists have ever seen and that's a big deal because it helps us pinpoint a moment in time when the first stars were producing heavy elements. The research on galaxy SXDF-NB1006-2 helps get us closer to pinpointing the origin of these life-giving molecules. In particular it helps pinpoint the timing of the cosmic Dark Ages. After the Big Bang, everything was hot and atoms were fully ionised so the universe was a very bright place but after a few hundred thousand years, things cooled and calmed down. The gases cooled becoming neutral and the universe entered a dark age. There were no stars and very, very little light. During this time the universe had nothing to do but slowly bring its neutral hydrogen gas into gravity-gathered clumps. After a few hundred million years the first stars formed producing the first heavy elements. The first stars ionized the gas around them — meaning they made the neutral particles charged again — in a phenomenon known as cosmic re-ionization. Eventually the universe started to look something like the incredible star factory we know and love today. We can't actually see the birth of these first stars, because all that hydrogen was pretty opaque, so scientists are always trying to push further and further back in time. The first oxygen is a historic signpost in our understanding of the early universe during that Dark Age.



Io's Disappearing Atmosphere

Io is the closest Galilean moon to Jupiter. Discovered in 1610 it is the fourth largest moon in the solar system and is also the most volcanically active. Easily visible in telescopes, it is a favourite sight on viewing nights. Orbiting Jupiter every 1.7 Earth days amateurs have long delighted in watching and timing its eclipses as it passes in and out of Jupiter's shadow. Using the Gemini North telescope scientists have documented unique atmospheric changes on Io. They found that Io's thin atmosphere, which is mostly sulphur dioxide gas vented from volcanoes, collapses and freezes onto the surface when shaded by Jupiter. During an eclipse the surface temperature falls producing a sulphur dioxide frost. After the eclipse the moon heats up and the atmosphere redevelops.



First Private Lunar Landing

A US start-up company Moon Express has received approval from the government to send an unmanned lander to the moon next year, in a first for private industry. Commercial spacecraft have flown within the bounds of Earth's orbit but this will be the first mission to the Moon.

It has yet to finish its moon lander, which will be carried in late 2017 by a rocket made by Rocket Lab, another start-up, which has not yet launched any commercial missions. The company's goal is to develop low-cost spacecraft and to explore the resources on the moon.

In the immediate future it is envisioned bringing precious resources, metals and moon rocks back to Earth.



We visited Sydney observatory on our way home from 2016 South Pacific Star Party.

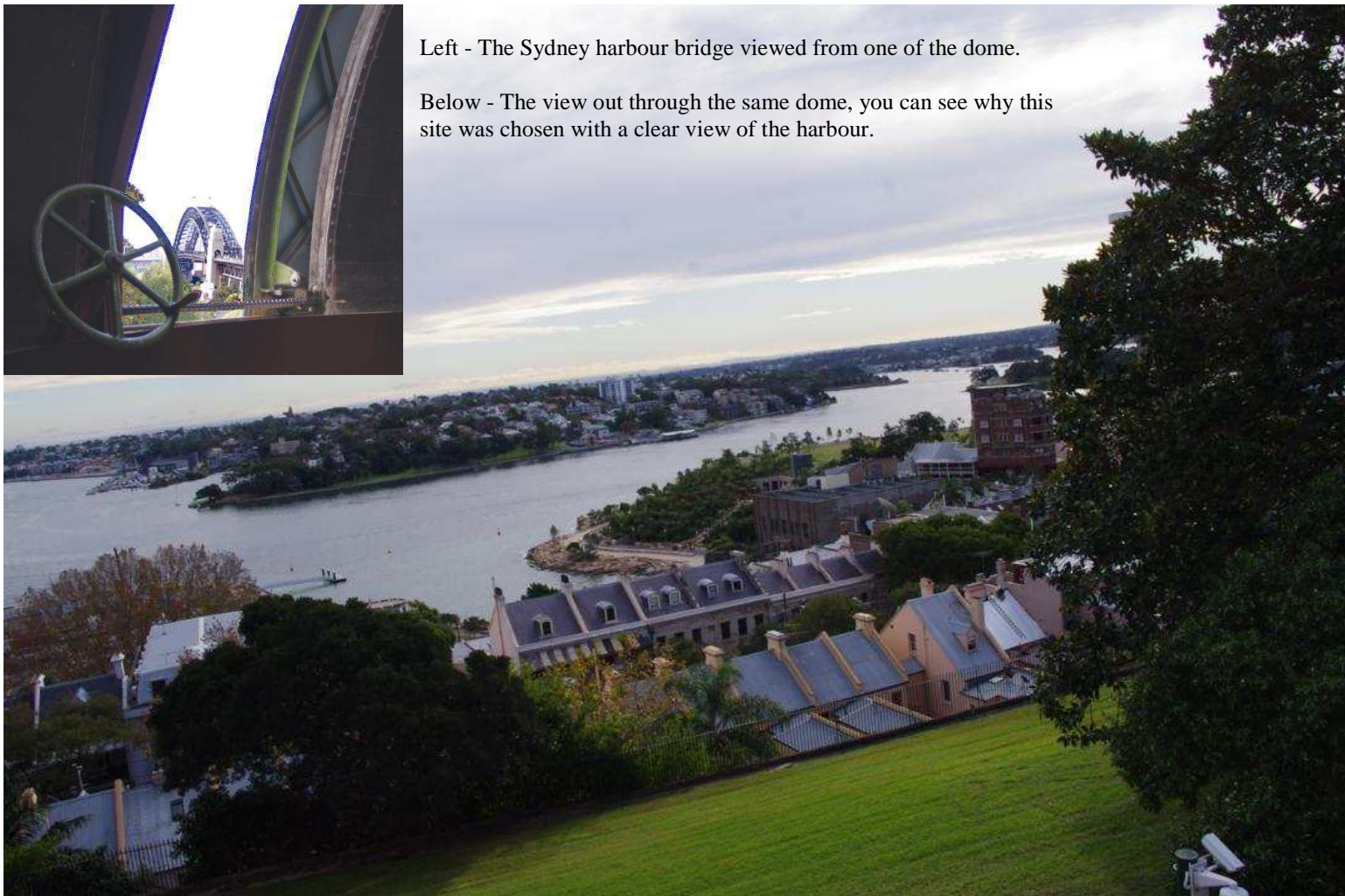
Today the observatory is surrounded by tall building & as we approached we only seen glimpse of the time ball between the buildings.

For a small fee you get to sit in there small planetarium were you get a guided tour of the night sky, which I found very informative. Then we were taken to one of the roof top domed observatory, which housed a 16 inch Meade LX200. This is also used for public viewing nights. But also has 2 solar telescopes fitted, one 60mm refractor with a white light filter to view sun spots & a 60mm Lunt telescope with hydrogen alpha filter to view the suns surface & prominences. The guide cranked open the viewing slot & we seen the harbour bridge in the distance, we all got a quick look at the sun before clouds covered it. I asked which telescope was original in this dome, but the tour guide did not know. I would have rather seen an old telescope in the dome, to keep the old times atmosphere.

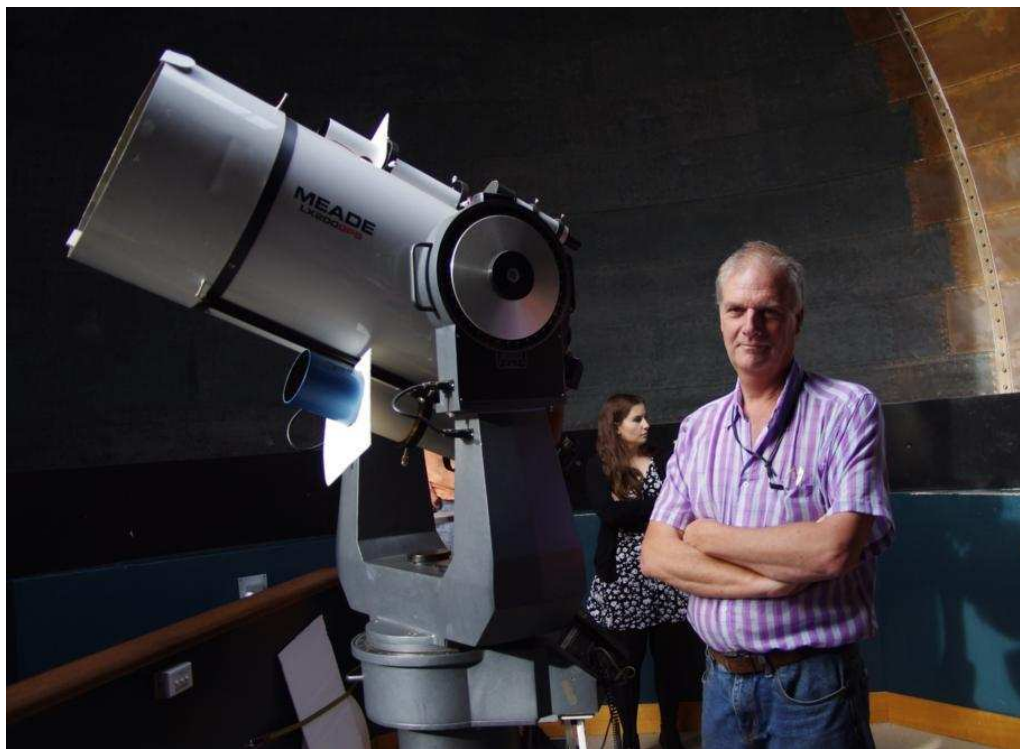


Left - The Sydney harbour bridge viewed from one of the dome.

Below - The view out through the same dome, you can see why this site was chosen with a clear view of the harbour.



We spent many hours walking around looking at all the artefacts, from old telescopes, meteorites, old star charts, Orrery's & old time keepers. This Venus transit Orrery below caught my eye, I have not figured out how it works yet. There is a souvenir shop were we picked up a book on the history of the observatory. Well worth the visit.

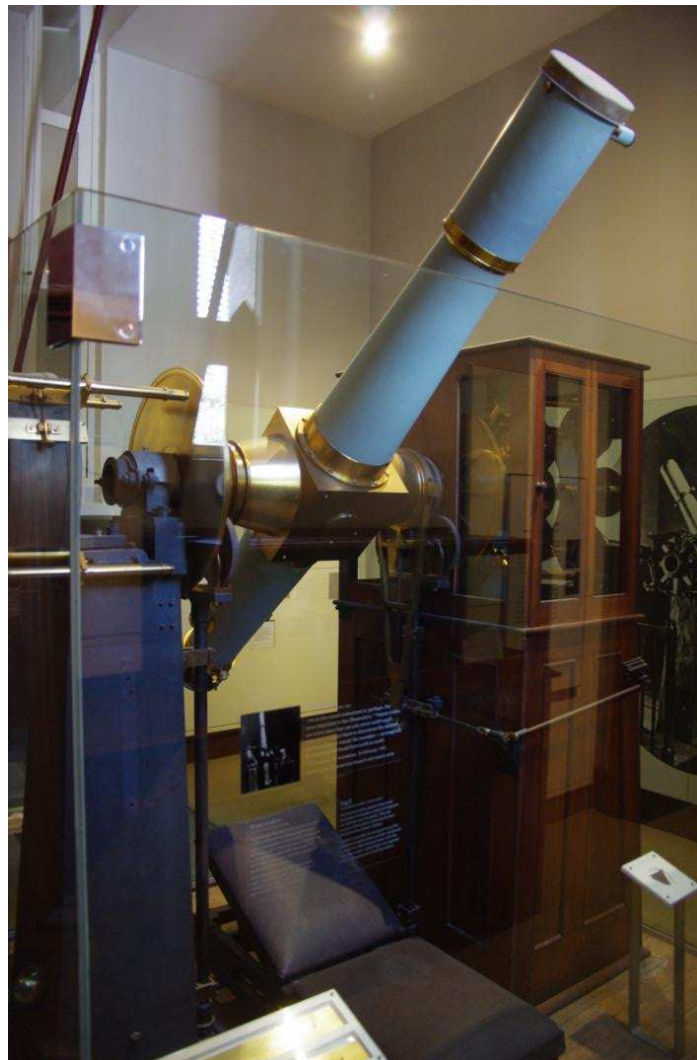


Time Ball in the lower position

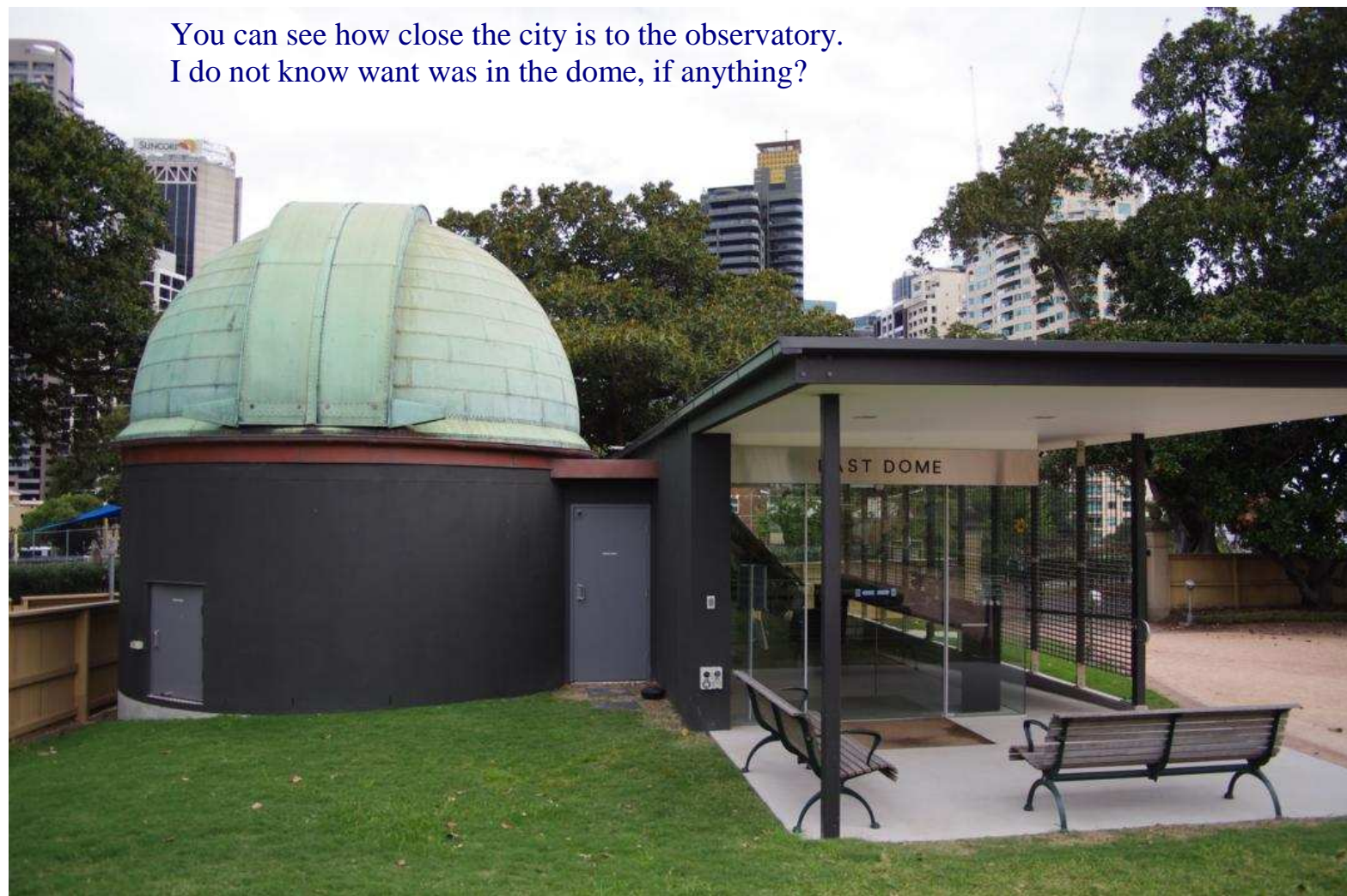
Narrow slots which the meridian telescopes view through.



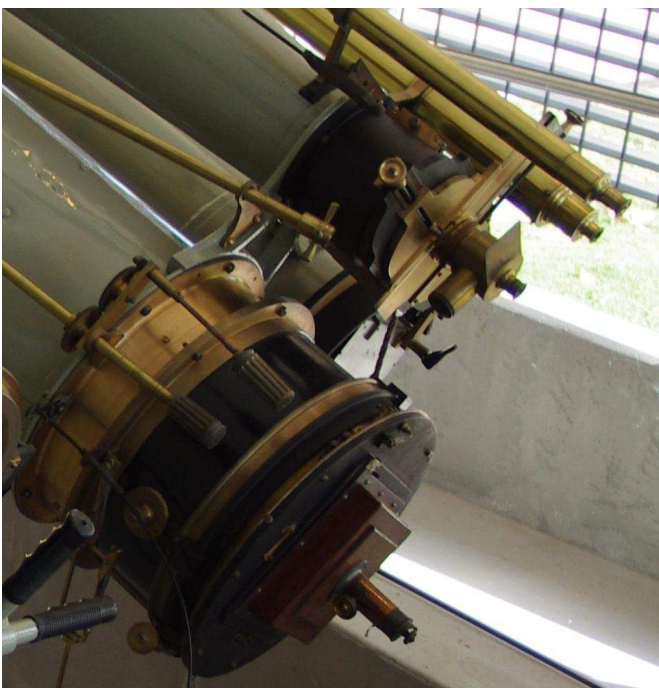
Not far from the Sydney harbour bridge, is the Sydney observatory built in 1858 on a hill over looking Sydney harbour, were all the ships in the harbour could see its time ball, which was raised at noon & dropped at 1pm every day. This was so ships could set there chronometers (clocks) before they set off on there voyage. This was so they could work out there longitude or how far there have travelled around earth. Today we still use time to measurer our position on earths surface, which you may have seen on your GPS. Also astronomers use time to measurer the position of the star in the sky, which you may have seen on your star charts. The time ball was at the observatory, because it was the astronomers job to measure, when a known star crossed the meridian (directly over head) Photo at right is one of the telescopes used for this job, the telescope has only one axis so can only point north or south, so usually only needs a narrow slot to view through. *See photo below centre.* These instrument are very precise & also measure the high of a star as it cross the meridian, this is used to calculate the distances the observatory is from the equator, but not very portable. Sailors use a potable sextant for this job, *See below a copy of Captain Cook quardrant.*



You can see how close the city is to the observatory.
I do not know what was in the dome, if anything?



Just inside the entrance gate sits a no longer used old telescope with the name Grubb Dublin on it. I could see this is of very high quality with brass finder scopes, slow motion control knobs & setting circles. The massive mount fitted with 2 refractor telescopes, one for photographing the heavens with glass photographic plates & the other for viewing, its eyepiece holder can be moved in 2 axis, this was used to position a guide star in the illuminated cross hairs. Another interesting feature was the end covers which looked like something from the Hubble telescope. I thought it would have been better if it was still operational. *See right & below*



Below - One of the domes houses a 29mm (11.5inch) refractor purchased prior to the transit of Venus in 1874, mounted on a very solid cast iron mount, below the mount, on the floor below hung a large weights to power the mounts clock work drive. The dome has had many of its copper ceiling plates replaced.



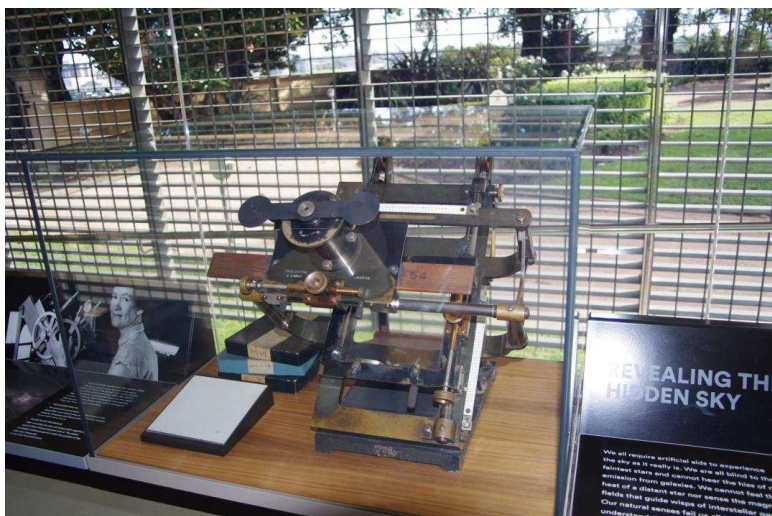
Below - Old brass telescope once used to photograph a transit of Venus across the Sun. Has been recently restored but many of its parts have been lost over time. Its very similar to the transit telescope at Melbourne observatory restored by Barry Clark.



The observatory has many interesting items.

Right - 2 large brass Orrery's under plastic domes, one shows Sun, earth, moon & the other shows the Sun out to Saturn.

Below - In a glass case sits a microscope for measuring the distance between stars on glass photographic plates.



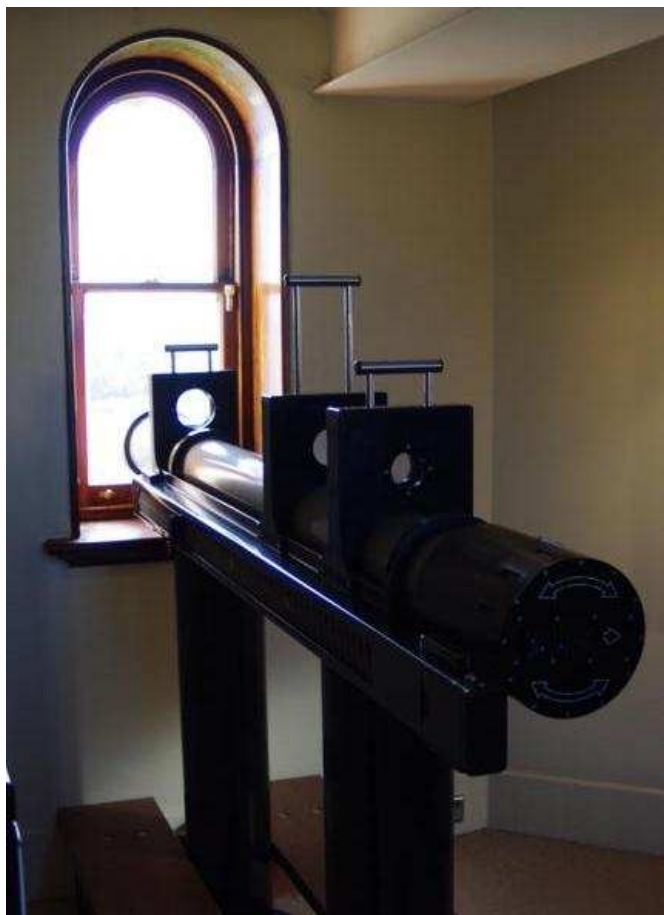
Below - Copy of sun dial, owned by King Sejong from 1418 to 1450



Below - Rear count yard with painted path of the planets & comet.



Below - By lifting the slides up & down this changes the lens configuration. This demonstrates how a telescopes magnification changes.



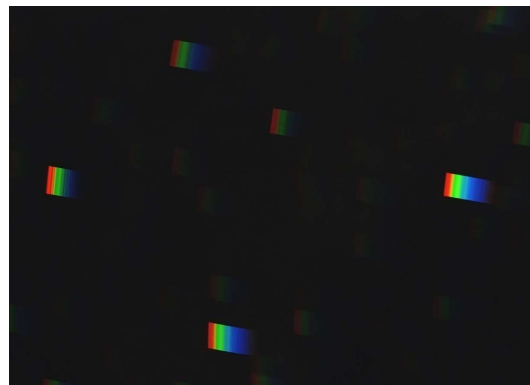
Colour Codes from the Stars Part 1

There are ample opportunities for Field Astronomers to enjoy the colours from the stars and supply data as contributions to science, especially from the rich southern skies.

Simply looking is fascinating; astronomical spectroscopy is also a major area where more contributors are needed.

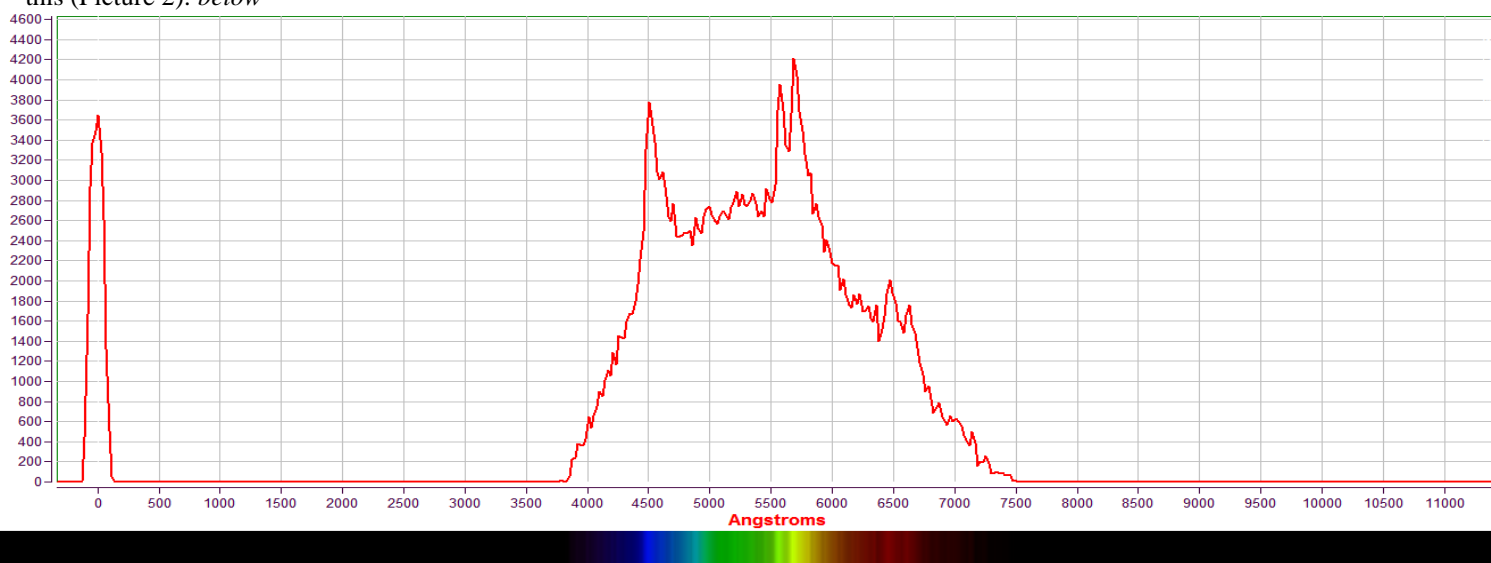
Colour components from the Sun can be seen readily just from any round droplet of water from a blade of grass as vivid, sparkling, bright violet –through other rainbow colours – to deep red. Expanded out we can tell what existed *and* what was going on dynamically on the Sun. Similarly farther out in deep space too!

A prism or a basic transmission-grating spectroscope (such as the SA100/200, Rainbow Optics) that fits to an eyepiece like a filter, or to a camera or with a CCD can show a beautiful rainbow-like spectrum of each star like this (Picture 1): *At right*



Picture 1 *Crux Spectra, through an objective prism, 135mm telephoto lens, QHY8 camera. No tracking therefore spreading out each spectrum. Image taken and supplied by Stefan Buda, ASV, Vic.*

To see more clearly how strong each colour component, or lack of, is, software (some freeware available) can display data graphically like this (Picture 2): *below*



Picture 2 *Gamma Velorum spectrum. SA100 with a 3.8 degree prism, 9 1/4" Celestron SC, Camera SBIG ST8 and CCDSoft, 1 sec exp., RSpec s/w. Image taken and supplied by Ken McEwen, member SASI, NSW.*

For illustrative purpose only, with basic wavelength calibration, vertical axis arbitrary intensity scale, horizontal axis wavelength in Angstrom.

Higher resolution equipment (such as L200, Alpy, Lisa, LhiresIII), incorporating a slit reflection-grating and guiding, with careful setup and calibration, can supply data for NASA and Pro-Am campaigns such as BRITe-Constellation, Funnelweb among others.

Find out more from numerous posts and resources on the internet. Follow works by southern hemisphere shining lights in spectroscopy including Bernard Heathcote (Vic), Ken Harrison (Vic), Paul Luckas (WA), Jonathan Powles (ACT), Terry Bohlsen (NSW), Paulo Cacella (Brazil), and Malcolm Locke (NZ).

Please explore and join the fun. Some possibilities are:

Some groups have plastic gratings for making into a hand-held spectroscope; see spectra from lamps and sunlight-glint. Examples of homemade tubes are via the links below.

Ask at group viewings, to see spectra from bright stars such as Sirius, gamma Velorum, eta Carinae. Some members already have equipment. Some Societies (if you ask!) may consider acquiring gratings and, in the future, more advanced equipment, to facilitate observation by members and the public.

Talks and workshops can be organised especially if enough interest! Please voice your interest.

A number of people interested to explore spectroscopy, working together as volunteers and not-for-profit, would like all Field Astronomers, whether members of Societies or not, to share the riches of the southern skies and help each other read the colour codes from the stars and other sky objects. If your Society has distributed the poll information please reply to the address they have advised. Otherwise, to let volunteer organisers know what your interests might be please either go to (preferable) IIS sub-forum Star Parties.... Events: <http://www.iceinspace.com.au/forum/showthread.php?p=1254277#post1254277> , or alternatively reply by email to this address: southskyscience at gmail com

A few among mountains of resources:

Intro to Stellar Spectra <https://youtu.be/jjmjEDYqbCk>

Colours, Life and Death of Stars: <https://youtu.be/HdBzVW1r9K4>

Foldable Spectrometer: <http://publiclab.org/wiki/foldable-spec>

Smart Phone Spectrometer: <http://publiclab.org/wiki/smartphone-spectrometer>

IIS <http://www.iceinspace.com.au/forum/forumdisplay.php?f=40>

ARAS Spectroscopy Forum (<http://spectro-aras.com/forum/>)

Astronomical Spectroscopy for Amateurs https://groups.yahoo.com/neo/groups/astronomical_spectroscopy/info

Christian Buil website www.astrosurf.com/buil/



By Team at Southskyscience - A version of this article has been submitted for newsletters of Astronomy Societies in Australia and New Zealand with invitation and permission for local content to be added below.

s h a r i n g t h e f u n

Spectroscopy News from ASV, Vic June 2016

Among other exciting developments in the Instrument Making Section led by Mark Justice, several members are exploring spectroscopy during our monthly meetings and on the forum. In the wide world of ASV we have Ken Harrison and a few others with various depths of related experiences. Some are now turning up with equipment and know-how.

Picture 3. 21st May 2016 ASV-IMS exploring spectroscopy.

Photo supplied by Stefan Buda



Passed into our care now are the 900 grooves/mm plastic gratings and mounts previously organised by Barry Clark and Filomina Lo Schiavo. These we bought and divvied up for inventing and experimentation. A homework construction brought results shown in Picture 4. Can you tell what the bands are evidence of? What does the 'more blue' in one tell?

Picture 4 Comparing spectra of 'cool white' (top) and 'warm white' compact fluorescent lamps, through a plastic grating 900 lines/mm; picture taken and supplied by Mark Justice, ASV

How about from the stars, novae, planets and comets? It is hoped that more people will get to enjoy colours from these and progress to contributing to science. We are sitting on (revolving within?) the treasure trove of the southern skies! Perhaps demonstrators and our big-scope operators can be furnished with appropriate equipment to show these wonders to our members and the public.

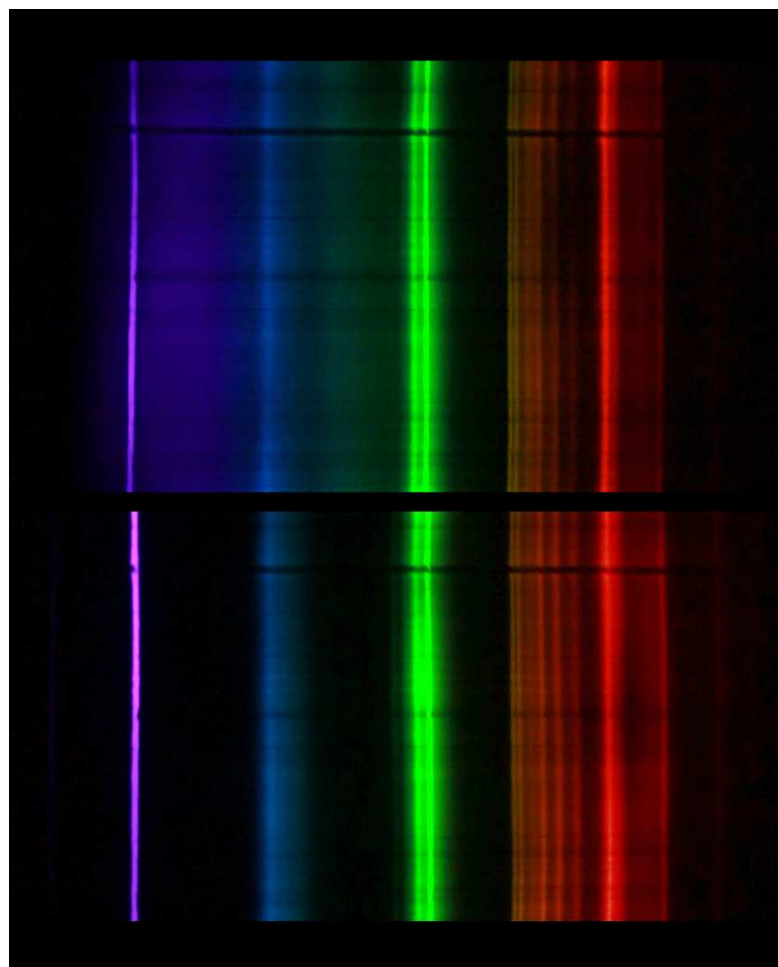
Who else are interested? Please vote in the opinion poll mentioned in the article.

A talk by Bernard Heathcote for members and the public is in the pipeline.

And please do get in touch, through the email address above or the people in the photo!

by Sky C Murphy

Editors notes - this article also appeared in the ASV's CRUX news letter Vol 34 No.4, Greg Walton



Embroidered MPAS merchandise

All Items will have the MPAS Moon phase logo on the left hand side.

Colours have been selected to minimize clash with logo.

(by The Uniform guys)



(A) Men's Micro Waffle Polo

- BIZ COOL™ 100% Breathable Polyester
- Micro waffle knit textured fabric
- Self fabric collar with concealed 2 button placket
- Matching self fabric cuff on sleeve
- Side splits
- Loose pocket included
- 170 GSM
- Modern Fit

Sizes : S,M,L,XL,2XL,3XL,5XL

Colours : Black, Navy, White

Price : \$35

(B) Ladies Micro Waffle Polo

- BIZ COOL™ 100% Breathable Polyester
- Micro waffle knit textured fabric
- Self fabric collar with Zip
- Matching self fabric cuff on sleeve
- Side splits
- 170 GSM
- Modern Fit

Sizes : 8,10,12,14,16,18,20,22,24

Colours : Black, Navy, White, Green

Price : \$35



(C) Kids Botany Polo

- 160gm 100% Driwear polyester moisture removal
- DriWear Mini-waffle knit easy care fabric
- Self fabric collar
- 3 button placket
- 2 button placket on sizes 4, 6 & 8

Sizes : 4,6,8,10,12,14,16

Colours : Black, Navy, White

Price : \$25

(D) Adults Auto Winter Jacket

- Polyester/Polyamide (Nylon) shell
- Quilted satin lining
- Zip-through collar with snap closure wind panel
- Internal pockets
- Up to Size 3XL
- Black Only

Sizes : S,M,L,XL,2XL,3XL

Price : \$70



(E) Hotham Hoodie

- 310gm blended 80% cotton/20% polyester
- Jersey knit fleece knit, low pill
- Grey marle hood liner and flat tie cord
- Sizes Small to 3XL

Sizes - Men : S,M,L,XL,2XL,3XL

Ladies : 8,10,12,14,16

Colours : Black, Navy, Charcoal

Price : \$45



**(F) Kids Full Zip Fleece Jacket**

- 100% Polyester
 - Black Only
- Sizes : 4,6,8,10,12,14
Price : \$30

(G) Woolmix Corporate Pull Over Knit

- 50% Wool 50% Acrylic
 - 'V' neck long sleeve plover
 - Easy Fit
- Sizes : XS,S,M,L,XL,2XL,3XL,5XL
Colours : Black, Navy, Charcoal
Price : \$75

**(H) Tee Shirt (Note : Printed)**

- Printed Logo (by Speedy Tees)
- Sizes (Men): S,M,L,XL,2XL,3XL,4XL,5XL
Sizes (Lady): 8,10,12,14,16,18,20
Kids: 2,4,6,8,10,12,14
Colours : Black, White, Yellow, Navy, Pink, Red, Purple, Grey
Price : \$25

**(J) Adults Micro Fleece Beanie**

- One Size Fits All
 - Stretch Beanie
- Colours : Black, Charcoal, Navy, Pink, Royal, Purple
Price : \$15

**(K) Microfibre Structured Brim Hat**

- Adjustable Band and Toggle
- Sizes : Small / Large
Colours : Bottle Green, Royal Blue, Navy Blue
Price : \$20

**(L) Adults Scarf**

- 300g Anti-Pill Polar Fleece Scarf
- Colours : Navy, Black, Bottle Green, Royal, Maroon
Price : \$18

**ORDER FORM**

ITEM (letter)	NAME	SIZE	COLOUR	AMOUNT \$

TOTAL \$:

As this is a batch order, all orders need to be received and paid by end of August.
Orders can also be emailed to d.rolfe@mpas.asn.au and payment to MPAS BSB:033272 A/C:162207
Orders are also taken on-line at <https://www.trybooking.com/MFEJ>

Down load this form https://drive.google.com/file/d/0ByvkxzZGI9g_RkJObVE0SWxQeUE/view?usp=sharing

OFFICE BEARERS OF THE MORNINGTON PENINSULA ASTRONOMICAL SOCIETY



Dave Rolfe



Paul Albers



Peter Skilton



Jamie Pole



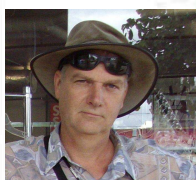
Trevor Hand



Peter Lowe



Fred Crump



Greg Walton

President: David Rolfe
Vice President: Paul Albers
Committee: Trevor Hand, Fiona Murray, Peter Lowe,
 Fred Grump, Greg Walton
Phone Contact: Peter Skilton - 0419 253 252

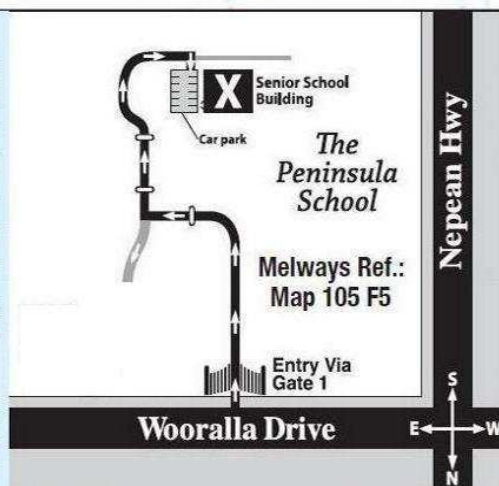
Secretary: Peter Skilton
Treasurer: Jamie Pole
Web Master: David Rolfe
Scorpius Editor: Greg Walton
Library: Fiona Murray

SOCIETY MEETINGS

Meeting Venue: The Peninsula School,
 Wooralla Drive, Mt. Eliza, (Melways ref. 105/F5)
 in the Senior School at 8pm,
 on the 3rd Wednesday of each month
 (except December).
 Entry is via the main gate, off Wooralla Drive.
 (see map).

For additional details:
Internet: <http://www.mpas.asn.au>
email: welcome@mpas.asn.au

Phone: 0419 253 252
Mail: P.O. Box 596, Frankston 3199, Victoria, Australia.



Fiona Murray

LIBRARY

The Society also has books and videos for loan from it's library, made available on most members nights at The Briars site, contact Fiona Murray.

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 and event information as well as being able to join in discussions and ask questions with other members.

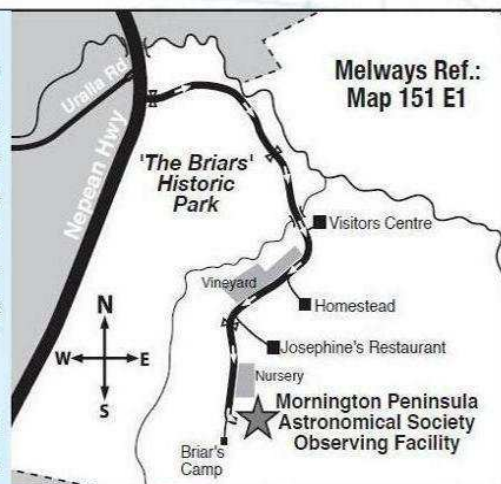
To join, go to: <https://groups.yahoo.com/neo/groups/E-Scorpius/info> and sign up to Yahoo groups - You require to sign up to Yahoo groups to join E-Scorpius. Once you have signed up at Yahoo groups, email welcome@mpas.asn.au saying that you want to join E-Scorpius and you will be added to the E-Scorpius list.

VIEWING NIGHTS - 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 either 9776 2074 or 0415 172 503 if they need help in getting to the site. Upon arrival at the site, remember to sign the attendance book in the observatory building.

For additional details:
Internet: <http://www.mpas.asn.au>
email: welcome@mpas.asn.au

Phone: 0419 253 252
Mail: P.O. Box 596, Frankston 3199, Victoria, Australia.



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