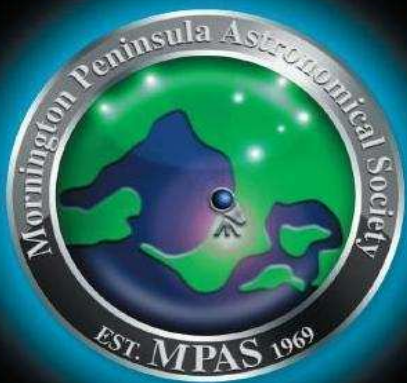


Cover image - Taken from Cranbourne with Ha a filter, *by Dave Rolfe*



# SCORPIUS

THE JOURNAL OF THE  
MORNINGTON PENINSULA ASTRONOMICAL SOCIETY INC.

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Volume XXVI, No 3 (May / June ) 2017

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.

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



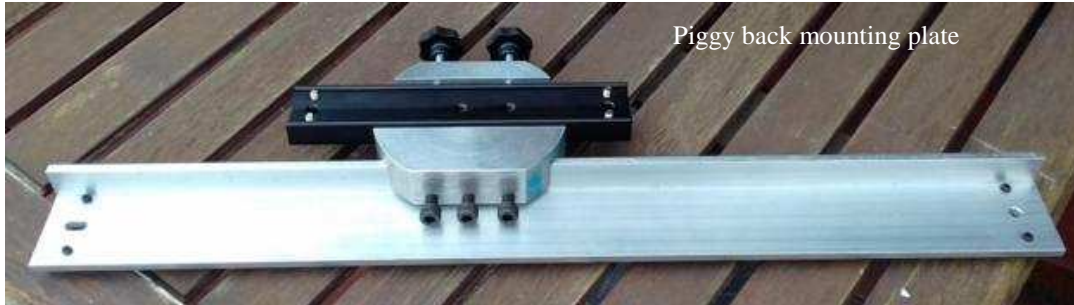
(c) David Rolfe 2017  
Eta Carinae Nebula - 12nm H-Alpha Filter



# SOCIETY NEWS

By Greg Walton

**March public night** - Approximately 60 in attendance - 15 members and 45 members of the public. Trevor Hand did the talk while other members opened the observatory & set up telescopes. We did some cleaning & jobs on the 14 inch Meade telescope adjusting the culmination, also adding a red dot finder & piggy back mounting plate for a 80mm refractor, which we hope to use as a guide scope for astrophotography. We also bought a focal reducer to make it easier for those members with DSLR camera to get images of galaxies. The sky was clear & the public got to see Venus, Mars, Uranus, M42, NGC104, NGC3372 & the almost first quarter Moon. Many stayed till late watching Jupiter with all its moons in a straight line, most likely due to the warmer then average weather.



Piggy back mounting plate

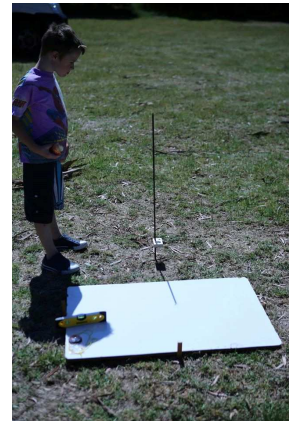
**At right Jupiter** - Here's a shot I took through the eye piece in the 20" on the (6/4/17) with the Canon "holiday" camera set on automatic ... two days before Jupiter's Opposition. You can see the GRS and a Europa transit shadow in the top fifth (small black speck right on the upper edge of the top light brown band), just right of centre. Cheers, *Bruce Renowden*



By Bruce Renowden

**March Society Meeting** - We have Bart Pindor from Melbourne Uni tomorrow night with a talk on 'Why do we think there was a Big Bang?' It is good to have a strong member turnout when we do get external guest speakers, so please drop in (the theatre is air conditioned)! If that is not enough to get you there - Peter Lowe is doing Sky for the Month! Regards, *Dave Rolfe* (President)

**Solar Day & March members BBQ** - Some Photo's from yesterday's solar day - a smaller than expected group, went through the Solar Noon calculations with Ian Sullivan and Jim Blanksby. Some solar observation was also done, on a largely inactive sun. The weather was excellent with a nice clear and warm day (sunscreen required). Visitors and members were treated to a BBQ lunch, then later an al fresco dinner under clear skies for the following member's night. Thanks to all involved for your assistance in helping to facilitate the running of this event.



**Viewing Night for Parkdale Secondary College** - Tuesday 28<sup>th</sup> March. It was a great evening in Mordialloc for Parkdale Secondary year 7 students last Tuesday. The skies were clear throughout, with mild temperatures and no wind, albeit peppered all evening by the noise of planes taking off and landing from Moorabbin airport every minute or so without stopping. We ended up with 125 attending and also had a great turnout of members. Peter Lowe gave an updated solar system talk inside, and outside on the telescopes were Sky Murphy, Jamie and Josh Pole, Tony Nightingale, Ian Sullivan, Heinz Rummel, Inge Marcinkowski and Peter Skilton. Ian had trouble with his mounting, so pointed out the visible constellations instead, which gave a nice variety. Jupiter gave a good, steady view of 4 moons and dark bands, even though it was no more than about 30 degrees above the eastern horizon. I received a lot of very enthusiastic feedback from the students and parents on the night, and from the coordinating teacher the next day after she heard back from the students in class. We made quite an impression for the third year in a row.

Regards, *Peter Skilton*





**April public night** - Thanks to all the members who came out in force tonight - nothing but positive feedback received. Door Prizes given away and a bunch of our red lights sold. I think a few new memberships signed as well. When I left at 10.30 was still going well with the outside talk with a keen few! All society scopes were manned which was good to see as well. Regards, *Dave Rolfe* (President)

Approximately 197 in attendance - 20 plus members and 176 members of the public, which I'm told is an MPAS record. Due, most likely, to all the media activity with **Dr Brain Cox** in Melbourne doing 3 live shows. Trevor Hand did the talk to a full house in the big shed, while Peter Lowe had a second projector running outside on the lawn doing a talk on the solar system to about 60 members of the public. Other members opened the observatory & set up telescopes on the field. Due to the warm night, many members of the public stayed till midnight. Many told me they wish to return. I stayed by the old Springfield telescope most of the night, which showed an excellent view of Jupiter & tracked it very well. I told the public Jupiter was at its closest on this night & it's 10 times the diameter of earth & rotates once every 10 hours. There were very few moments when there was not somebody looking through the telescope. We were fortunate the Mornington council said we could use the toilet at the ECO house, which was a great help. *Greg Walton*



The crowds were remarkably aware about not touching the Equipment or bump the 'scope or use lights. If the presenters emphasised these it did work, thank you! Please keep it up. One family drove from Hoppers Crossing! They said ours was the only one they could find. I told them about others nearer them. Thank you Dominic who helped the public to use 2 "scopes for themselves. So many Woww... and so many enthusiastic questions and several wanted to join. Most pleased when one first-time-telescope user manned the 8" for me to free me up. Most pleased when a member-to-be (Imran?) stayed back and operated the Geoff Dudley 8". Please relate all this to Geoff's family. His has helped the public reach the sky. Fantastic Team MPAS. *Sky Murphy*

A big thank you to those members who manned the scopes in the observatory. I was "crowd controller" and people were queuing up to get in. They were very well behaved and so impressed with the conversations with the members they were reluctant to leave. Thank you... Your contribution did not go unnoticed.

Regards *Tony Nightingale*

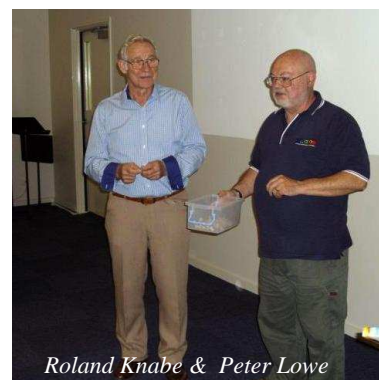


Photo - Peter Lowe

**April Society Meeting** - saw about 30 members in attendance. Dave Rolfe (President) chaired the meeting and talked about what has been happening & upcoming events at MPAS. A representative from Mt Burnet astronomical society talked on Vastroc (Victoria astronomy conference) & also collected payments from MPAS members. Then our speaker, MPAS member Roland Knabe, did an excellent talk on Stellar Size Black Holes & as usual the speaker draws the raffle. Then Greg Walton did sky for the month & showed time lapse videos, after which members chatted over coffee.

**April members BBQ & working Bee** - MPAS members put in a big effort at the working bee.

The main jobs were to remove the steel door in the dividing wall, in the big shed & fit new double doors, also move the library so we could add insulation & fit yellow tongue boards to the dividing wall. This will help sound proof the big shed when the talks are running on the public nights. John Cleverdon, Sky Murphy, Tony Nightingale & I arrived early to move the library. Sky Murphy, also repainted the floor in the observatory. Mark Hillen, Zeroed grass along the drive & around the fence line. John Cleverdon, also removed 3 shrubs where the new toilet is to be built. Peter Lowe, repaired the mower shed. Heath, move some power points & fixed the light that did not work, finding a rat had nibbled thought the wires. Dean Mathers, kindly replaced the rotting handle rail on the wire fence near the toilet & also laid pavers outside the rear exit door on the observatory. Kevin Rossiter & I worked on fitting the double doors, which meant grinding & reshaping the concrete floor. While Mark Hillen, Heath, Tony Nightingale, Phil Holt & Mark Stephens fitted insulation & the yellow tongue boards. Countless other members also helped with smaller jobs. Most of the secondary jobs on the list were completed. But we struggled with the sound proofing on the dividing wall in the big shed, with only about half being completed. As usual Jamie Pole, bought & cooked the meat on the BBQ & made the pav. We all downed tools at 6 pm for the BBQ, then after dinner Rohan Baumann did a talk on Naming & Cataloguing Deep Sky Objects. Ian Barry then did a talk on Star charts, both talks were most enjoyable. No viewing on the night as the sky clouded over with most members heading home by 10:30. There was some aurora activity on the night but clouds foiled us as usual. *Greg Walton*



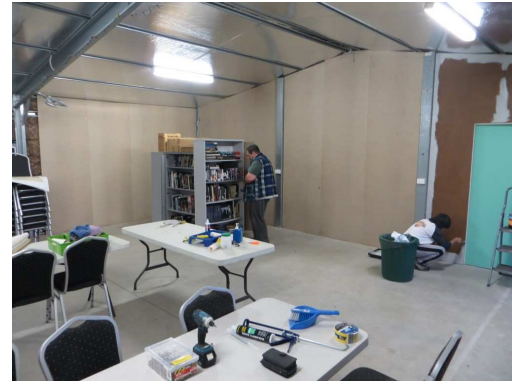
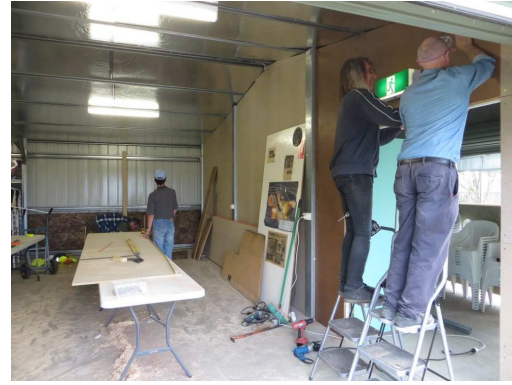
Roland Knabe & Peter Lowe

A great effort by all involved, working in the Gardens, the Observatory, the Main hall and all around - lots of jobs got completed and ticked off Greg's list. Thanks Ian and Rohan for informative talks - they were great after the BBQ meal to provoke some thought and interest - well done to both. I hope everybody enjoyed the day, and if available - are able to come next week and finish off the rear wall and new entrance doors. Many thanks to all involved. *Jamie Pole*

We decided to return the following Saturday at noon to finish the job, before the next public night. Sky & I finished fitting the new double doors. While Dave Rolfe, moved the EXIT sign & power points. Mark Hillen, Tony Nightingale, Phil Holt & Dean Mathers, fitted the last of the insulation & yellow tongue boards. John Cleverdon, remove sharp edges from a aluminium ramp, so Dave & Jamie, could fit to the door way. John also removed another dead tree, then Sky & Josh loaded the branches into my car for dumping. At 6pm, we all quickly sweep the floor & grabbed a paint bush & started painting. While Jamie, cooked hamburgers with the lot, then had trouble getting the workers to down tools, so interested in there work. After the excellent hamburgers we finished painting & set up the shed for the coming public night. Thanks again, for another big effort put in by members. The sky cleared so we did open the observatory for a few hours, so member could complete there observatory & telescope training. We looked at many deep sky objects & Jupiter. *Greg Walton*

**Photos from the working bee on next page, by John Cleverdon**







| CALENDAR                                       |        | May / 2017                    |  |   |                                      |   |
|--|--------|-------------------------------|--|---|--------------------------------------|---|
| Sunday   | Monday | Tuesday                       | Wednesday  | Thursday  | Friday                               | Saturday  |
|  | 1      | 2                             | 3<br>First Quarter   | 4<br>Regulus right of the Moon  | <b>VASTROC 5</b><br>Public Night 8pm | <b>VASTROC 6</b><br>MPAS Observatory open to member till mid Night<br>Ganymede shadow |
| <b>VASTROC 7</b><br>Jupiter right of the Moon  | 8      | 9                             | 10<br>ASV Meeting  | 11<br>Full Moon<br>AC   | 12                                   | 13<br>MPAS Observatory open to member till mid Night                                  |
| <b>Mothers Day 14</b><br>Saturn above the Moon | 15     | 16                            | 17<br>Society Meeting 8pm  | 18  | 19<br>Last Quarter                   | 20<br>Members Night BBQ 6pm   |
| 21   | 22     | 23<br>Venus right of the Moon | 24<br>Jupiter moons 9pm<br>Committee Meeting 8pm<br>Mercury below Moon | 25<br>SPSP  | 26<br>SPSP<br>New Moon               | 27<br>SPSP<br>MPAS Observatory open to member till mid Night                          |
| 28   | 29     | 30                            | 31   | <b>Comet C/2015 V2 (Johnson) could brighten 7 mag this month in Bootes</b><br><b>Eta-Aquarids meteor shower peak on the 6th</b> |                                      |   |

**Monthly Events & High Lights.** **Astronomy class - May** Thursday 11th @ the Briars 8pm to 10pm  
**Public nights** 5th, 8pm start at the Briars - **Society Meeting** at 8pm on 17th @ the Peninsula School  
**Members Night BBQ** 6pm at the Briars 20th - **SPSP 2017 - South Pacific Star Party- Ilford NSW** 25th - 28th May  
**Evening - Jupiter** Ganymede shadow transit on the 6th at 9:30pm - Io shadow transit on the 17th at 8:20pm  
**VASTROC 2017 hosted by the Mt Burnet Astronomical Society** check the web site <http://vastroc.net/>

| CALENDAR  |                       | June / 2017 |  |                                  |  |  |
|---|-----------------------|-------------|--|----------------------------------|--|--|
| Sunday  | Monday                | Tuesday     | Wednesday  | Thursday                         | Friday                                     | Saturday   |
| <b>Comet C/2015 V2 (Johnson) could brighten 7 mag this month in Virgo</b> |                       |             |  | 1<br>First Quarter               | 2<br>Public Night 8pm                      | 3<br>MPAS Observatory open to member till mid Night                  |
| 4<br>Jupiter left of the Moon   | 5                     | 6           | 7  | 8                                | 9<br>Full Moon<br>Saturn right of the Moon | 10<br>MPAS Observatory open to member till mid Night                 |
| 11  | 12<br>Queens Birthday | 13          | 14<br>ASV Meeting  | 15<br>AC<br>Saturn at opposition | 16   | 17<br>Last Quarter<br>MPAS Observatory open to member till mid Night |
| 18  | 19                    | 20          | 21<br>Winter Solstice<br>Society Meeting 8pm<br>Venus below Moon | 22                               | 23   | 24<br>New Moon<br>Members Night BBQ 6pm                              |
| 25  | 26                    | 27          | 28<br>Planning Committee Meeting 8pm                             | 29                               | 30   |  |

**Monthly Events & High Lights.** **Astronomy class - June** Thursday 15th @ the Briars 8pm to 10pm  
**Public nights** 2nd 8pm start - **Society Meeting** at 8pm on 21st @ the Peninsula School  
**Members Night BBQ** 6pm at the Briars 24th  
**Evening- Saturn** at opposition on the 15th  
**Evening - Comet 71P/Clark** in Scorpius all month at 9th magnitude  
**Evening - Johnson** 0.6 degrees north of NGC5566 in Virgo on the 17th

**Please... we need helpers to keep the MPAS Observatory open to members on all Saturday nights.**  
**If you can help contacted Greg Walton on 0415172503 or email - gwmpas@gmail.com**

## Sky for the Month, by Greg Walton

After the excellent talks by Rohan & Ian at the Briars, it got me thinking. Each news letter we try to do something different, so this time we will look at online star charts. At right is, The Evening Sky Map. Which is a down load able PDF of what is happening in the sky. Just click on the link & scroll down the page to the Southern Hemisphere Edition & click on the latest edition.

<http://www.skymaps.com/downloads.html>

There also many other interesting things on this web site. But most cost money.

You may just need a list of object to view through one of the societies telescope. So I have put together a season by season list you can down load from the MPAS Scorpius Google drive.

Click on links below. Help -

[https://drive.google.com/drive/folders/0BvYkzZG19g\\_VlhZSS1meGpvc2s?usp=sharing](https://drive.google.com/drive/folders/0BvYkzZG19g_VlhZSS1meGpvc2s?usp=sharing)



Also you can find some basic star charts, Moon maps & Briars season by season Planishere for the most of the commonly named stars.

**The Sky Live** - is another online Planishere sky chart which I find ready useful. This easy to use & has the position of most comets in the sky. Just click on the link below to get started.

<https://theskylive.com/guide>

Click on change location to set your location. - **A**  
Then click on PLANETARIUM - **B**  
and you see how the sky look right now.

You can change the date & time by here, so you can see how the sky will look far into the future.

## PUBLIC NIGHT THANK-YOU

Recent public viewing nights and school viewing nights have continued 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.

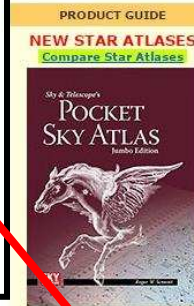


## The Evening Sky Map

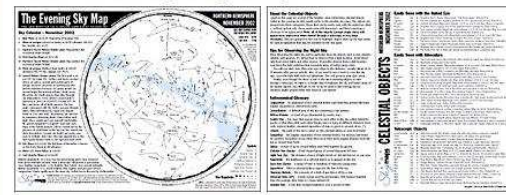
Free each month for you to explore, learn & enjoy the night sky.

### Skymaps.com/store -- Recommended Books & Products for Skywatchers

New Books • Star Atlases • Getting Started • Observing Guides • Planispheres • Telescope Books • Kids Books • Sky Lore  
DVDs • Software • AstroPhotography • Star Map Posters • Telescopes & Binoculars • Astro Calendars 2017 • Digital Prints



## The Evening Sky Map



The Evening Sky Map (PDF) is a 2-page monthly guide to the night sky suitable for all sky watchers including newcomers to Astronomy.

Past issues are not available at present.



### April 2017: Southern Edition (PDF):



[Sky Calendar links](#)

### March 2017: Southern Edition (PDF):



[Sky Calendar links](#)

### February 2017: Southern Edition (PDF):

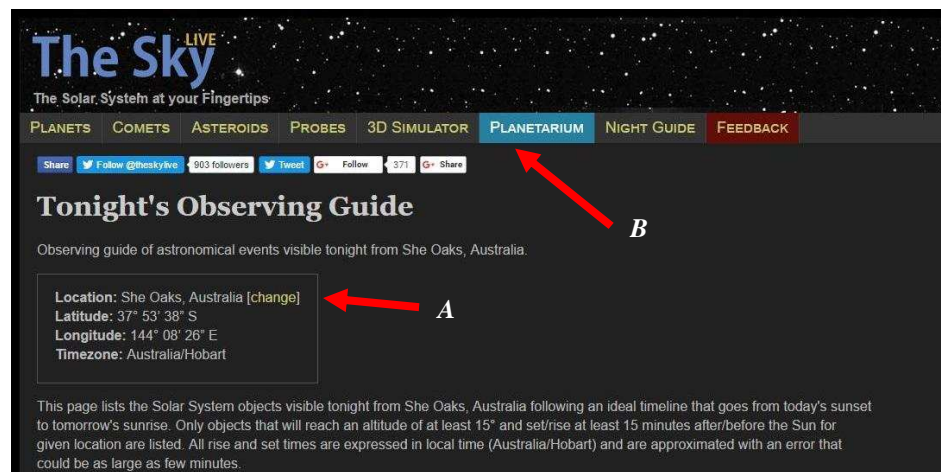


[Sky Calendar links](#)

### January 2017: Southern Edition (PDF):



Map of the Universe  
35° x 35°  
Star Chart Detail  
Large glow-in-the-dark star chart showing stars & classical constellation figures of the northern sky (to 45°). By Tomas Filsinger. Difficult to find.  
[More info](#) | [Buy now](#)  
• LIMITED STOCK •





# ASTRO NEWS

By Peter Lowe

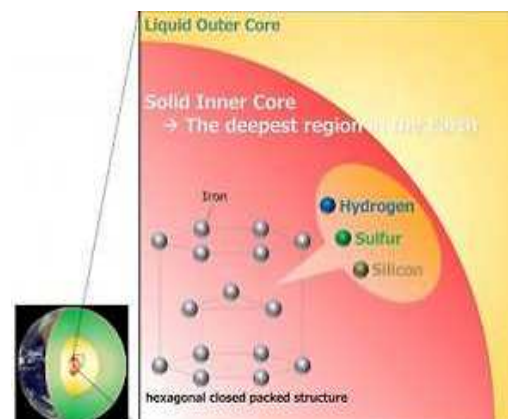
## Longer Days Ahead for Earth

Days on Earth are getting longer and in the distant future there will be 25 hours in a day. Over the past 27 centuries, the average day has lengthened at a rate of almost two milliseconds per century meaning it will take about 6.7 million years to gain just one minute extra per day and we will have to wait about 200 million years for the extra hour. Researchers at Durham University and UK's Nautical Almanac Office gathered evidence from historical accounts of eclipses and celestial events from 720BC to 2015 to suggest that that extra minute may only take 5.2 million years and the slow down is slightly faster because the earth's orbit around the Moon and Sun is not slowing as rapidly as first expected. The team of experts used gravitational theories about the movement of Earth around the Sun, and the Moon around Earth, to compute the timing of lunar and solar eclipses over that time, as viewed from our planet. They then calculated from where on Earth these would have been visible, and compared this to actual observations of eclipses recorded by ancient Babylonians, Chinese, Greeks, Arabs and medieval Europeans. The team found discrepancies between where the eclipses should have been observable, and where on Earth they were actually seen. Using these discrepancies the team deduced a revised slow down estimate of the Earth's rotational slow down. The Earth's rotation can be influenced by factors including its altering shape due to shrinking polar ice caps since the last Ice Age, electro-magnetic interactions between the mantle and core, and changes in the sea level.

## Composition of Earth's Core Better Understood.

Researchers in Japan say they may be one step closer to solving the mystery at the core of the Earth. It has long been established that approximately 85% Earth's core is made of iron, while nickel makes up an additional 10 percent but the details of the final 5 percent have, until now, eluded scientists but is believed to be composed of other lighter elements. New experiments suggest possible candidates for the light elements are hydrogen, silicon and sulphur that alloy with iron and nickel at the high temperatures and pressures at Earth's centre. The experiments consisted of building model cores containing different materials, and subjecting them to temperatures up to 6,000C and pressures 3.6 million times that at the surface of the planet. The researchers measured the alloy's density and sound velocity concluding that the physical properties of the iron-alloy with those three elements were consistent with seismological observations in the real core.

The core, which is the deepest region of the Earth, is composed of a liquid outer core (2900~5100 km in depth) and solid inner core (5100~6400 km in depth). The core is one of the most important "final frontiers" for scientists looking to understand the history of Earth, and the conditions during its formation 4.5 billion years ago.



## Middleweight Black Hole found in 47 Tucanae

Black holes come in various sizes and masses. Some contain billions of solar masses at the centre of galaxies while other contain only a few solar masses. Astronomers expected to find black holes of intermediate masses but have struggled to find any. Astronomers have announced new evidence that an intermediate-mass black hole (IMBH) weighing 2,200 solar masses is hiding at the center of the globular star cluster 47 Tucanae. Intermediate mass black holes are expected to range from 100 – 10,000 solar masses. Intermediate-mass black holes are considered primordial seeds that grew into the monsters we see at the centers of galaxies today. Suggesting that globular clusters such as 47 Tucanae, may be "failed" galaxy cores or possible building blocks for larger galactic structures. 47 Tucanae is a 12-billion-year-old globular star cluster located 13,000 light-years from Earth in the southern constellation of Tucana. It contains thousands of stars in a ball only about 120 light-years in diameter and known to contain dozens pulsars. 47 Tucanae had previously been examined for a central black hole before without success. In most cases, black holes are found by looking for X-rays coming from a hot disk of material swirling around it. This method only works if the black hole is actively feeding on nearby gas. The center of 47 Tucanae is gas-free, effectively starving any black hole that might lurk there. Evidence for an IMBH comes from two sources. Star densities are so high in globular clusters that IMBH's tend to "sink" toward the cluster centre stirring stars to high speeds and highly elliptic orbits. The second line of evidence comes from pulsars, compact remnants of dead stars whose radio signals are easily detectable. These objects get flung about by the gravity of the central IMBH, causing them to be found at greater distances from the cluster's center than would otherwise be expected. The combined evidence suggests the presence of an IMBH of about 2,200 solar masses within 47 Tucanae.

Carbon-14 contents in tree rings tell us information of the past cosmic ray intensities because cosmic rays produce  $^{14}\text{C}$  in the atmosphere. We found a signature of a quite large increase of incoming cosmic ray intensity in the mid-Holocene (the 5480 BC event) from the measurement of  $^{14}\text{C}$  content in North American tree rings. The cause of this event is supposed to be an extremely weak sun, or a combination of successive strong solar bursts and variation of a solar magnetic activity. In any case,  $^{14}\text{C}$  variation of the 5480 BC event is extraordinary in the Holocene, and this event indicates the abnormal solar activity compared with other periods.

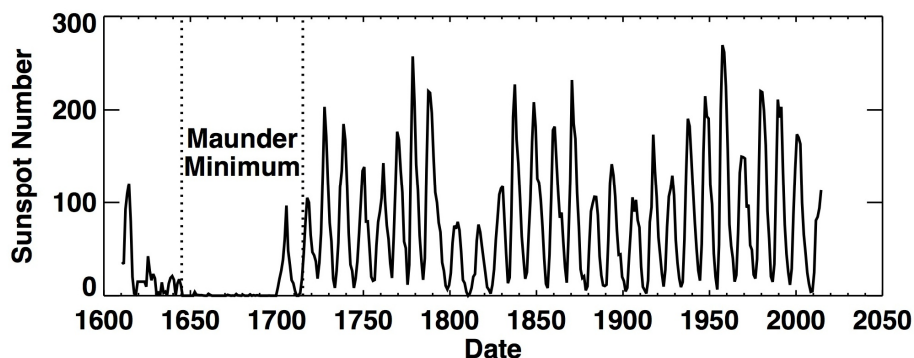
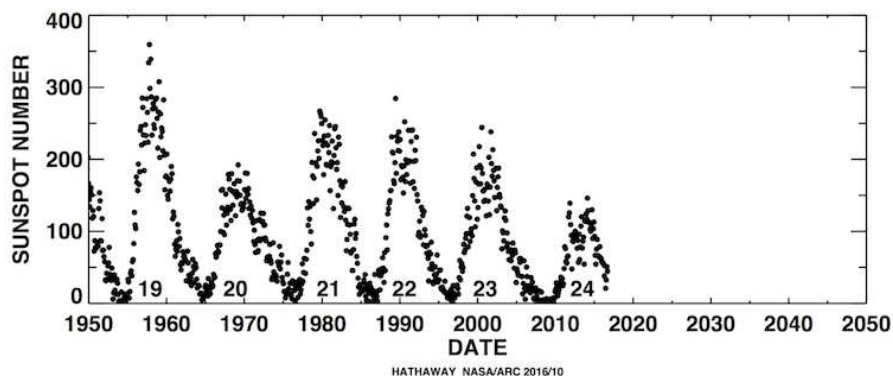


## What Happened to the Sun around 5,500 BC?

We are currently in the minimum of the solar sunspot cycle. Sunspots have been known for several hundred years and are known to vary in intensity over a roughly 11-year cycle. There are other known longer cycles of 90-years and tentatively 274 years. It has been suggested that these cycles can interact leading to periods of essentially super-cycles with either suppressed or enhanced activity. The last major suppression was during the period 1650 – 1680 known as The Little Ice Age because of the global cold weather at the time. During enhance activity cosmic ray particles entering the Earth's upper atmosphere can generate carbon-14 isotopes.

Radiocarbon content in tree rings can be an excellent proxy of the past incoming cosmic ray intensities to Earth. Although such past cosmic ray variations have been studied by measurements of  $^{14}\text{C}$  contents in tree rings with  $\geq 10$ -y time resolution for the Holocene, there are unfortunately few annual  $^{14}\text{C}$  data. There is a little understanding about annual  $^{14}\text{C}$  variations in the past, with the exception of a few periods including the AD 774–775  $^{14}\text{C}$  excursion where annual measurements have been performed.  $^{14}\text{C}$  measurements using the bristlecone pine tree rings for the period from 5490 BC to 5411 BC with 1- to 2-y resolution have found an extraordinarily large  $^{14}\text{C}$  increase (20‰) from 5481 BC to 5471 BC (the 5480 BC event). The  $^{14}\text{C}$  increase rate of this event is much larger than that of the normal grand solar minima and may be an unknown phase of grand solar minimum, or possibly a combination of successive solar proton events and a normal grand solar minimum.

Solar cycle intensities have been declining since the 1950's and it has been suggested the Earth could be heading for another period of extreme cooling during the 2030 – 2040's



## MPAS - Society AGM

The AGM is in July each year.

### Current Committee

President: David Rolfe (0466232783)

Vice President: Peter Lowe (Acting)

Secretary: Peter Skilton

Treasurer: Jamie Pole

General Committee: Trevor Hand, Fiona Murray, Fred Crump,  
Tony Nightingale, Greg Walton

(Note : all Life Members are automatically committee members)

**AGM Invitation**  
19<sup>th</sup> July 2017 at 8PM  
Peninsula School, Senior School Theatre,  
Building T, Wooralla Drive, Mt. Eliza  
**Agenda**  
1. Apologies  
2. Confirm Minutes of previous AGM  
3. President's Report  
4. Treasurer's Report  
5. Election of Incoming Committee  
6. Special Business (none notified)  
7. Other Thanks  
8. Close of AGM.

### We hope to get more members on committee.

If you feel you would like to get involved in the society business or have a particular skill you think would be useful to the society as a whole please give some thought to becoming a Office Bearer or committee member.

The Annual General Meeting will be held on Wednesday, 19th of July 2017. In this edition of Scorpius there is a 'Committee Election Form' that can be used for the submission of nominations for the next committee. This can be posted to MPAS. PO Box 596, Frankston 3199. Alternatively nominations can also be submitted electronically to [welcome@mpas.asn.au](mailto:welcome@mpas.asn.au) by stating which position on the committee you would like to nominate for.

### 2017 AGM Committee Position Nomination - (Leave blank if not applicable)

I ..... would like to nominate for the position of (circle)

PRESIDENT      VICE PRESIDENT      SECRETARY      TREASURER      GENERAL COMMITTEE

for the Mornington Peninsula Astronomical Society committee of 2017/2018.

Seconded By ..... Dated ...../...../ 2017

Both the nominee and the seconder need to be financial members of MPAS at the time of the AGM. Nominations must reach the Secretary by the 13 July 2017.

### MPAS SUBSCRIPTIONS 2017

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 2017 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 2017-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](https://drive.google.com/file/d/0ByvkxzZG19g_NXZ4cWxHbERTdEE/view?usp=sharing)

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

### 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

[gwmipas@gmail.com](mailto:gwmipas@gmail.com)

Brett Bajada

Peter Lowe

Bruce Renowden



**Snake Valley Astronomy Camp.** Below are some photos from the Bi-Annual – held at Crystal Lake Cabins, near Snake Valley (just outside of Ballarat). The camp was run from the 24th to the 27th of March 2017. The camp has been run in the last couple of years by Malcom Barker – with the assistance of a core group of people, and has become one of the events to attend on the Victorian Astronomy Camp Calendar. More information can be found at <http://snakevalleyastrocamps.org/>

A few MPAS members, including Anders, Dave, Alios and myself, headed down on Friday night hoping for a couple of nights of clear skies. The weather outlook was not so good, so a fair element of luck was required. The first night was clear at sunset, and remained clear for about an hour (about enough time for most of the imagers to get polar aligned), then clouded in. So we headed off to have a refreshing beverage, and chat with friends from prior camps. It ended up being a late evening even though the skies were clouded.

The next day we decided to do some solar imaging, and discovered one of the glass filter elements in my Lunt Solar scope had oxidized and was passing a quite inferior view. We attempted to clean this element using some CLR and soaking and were partially successful in doing so. The views improved and resulted in the first two images – one a full disk of the sun (0.5x Focal reducer), and one a close up (2.4 Vixen Barlow). Note to Lunt owners – the glass element was replaced free of charge by Lunt, even though the scope was manufactured in 2009, and I'm the second owner.

Saturday night was a spit roast dinner which was well received by all (delicious).

The last night for us – was clear for about 4 hours or so – clouding it at midnight or so – so most imagers got some data, but not enough for a complete image, depending on the technique used.

*By Jamie Pole*



Full Disk Sol



'Imaging Lane' – a large group of imagers assembled at SV in a line



Alios setup hoping for some clear sky!

One of the SDM scopes on the field



Close up of some Solar Features



'Imaging Lane' – Another Perspective – including the lake.



A small amount of Luminance data on the Statue of Liberty



## Weapons from the sky, *By Greg Walton*

made of bronze or flint stone, man did not first figure out how to make steel till about 3,000 years ago in central Africa & china, but its thought that the technology did not reach Egypt or Europe till 2,500 years ago, when man found he could crush rusty rocks & heat them to 1,000 degrees by burning charcoal while blasting it with air. This gave a low grade iron, which he could reheat & hammer till most of the carbon & impurities are removed. It would have been much easier to find an iron meteorite & rework it into a knife, as you would only need to heat the iron to 500 degrees to work it into shape. Most Meteorites found are made of iron & nickel, if you cut one in half you will see it has an interesting pattern or grain. This has happened over a very long time, while cooling in space. By melting the meteorite you will destroy this pattern, but you will have a piece of steel more durable & corrosion resistant, due to the nickel content. This is why we can still find these meteorite knives today. King Tut's steel dagger predated the iron-age by only 340 years & when tested it was found that King Tut's dagger was made from a meteorite. Still at that time iron or steel was very rare & seldom used anywhere. The beginning of the iron age is very blurred, with some civilization starting to work with iron many hundreds of years before others.



King Tut's dagger was 'made from a meteorite'

<https://www.theguardian.com/world/2016/jun/01/dagger-king-tut-tomb-iron-meteorite-egypt-mummy>

The ancient Hittites of Turkey were the first to smelt iron, around 1500 B.C. In Egypt, the earliest iron smelting dates to around 700 B.C. That's why it came as a considerable surprise when archaeologists recovered a handful of iron beads from the Gerzeh cemetery near Cairo dating to around 3500 B.C. Where did the iron come from? Could Egyptians have developed iron smelting that much earlier? It surely didn't just fall from the sky. Or did it?

**Photo at right** - Prehistoric Iron bead excavated at the Gerzeh cemetery made from meteorite iron, Manchester Museum 5303 (*image: D. Johnson Open University/Manchester Museum*)



**Above** in other parts of the world, weapons made of meteorite have been found. Worlds biggest meteorite sword made by the Chilkoot Indians & found in the early 1800's - <http://chilkoot-nsn.gov/large-sword-made-meteorite-chilkoot-indians-early-1800s>



### Below - Early modern Indian knife.

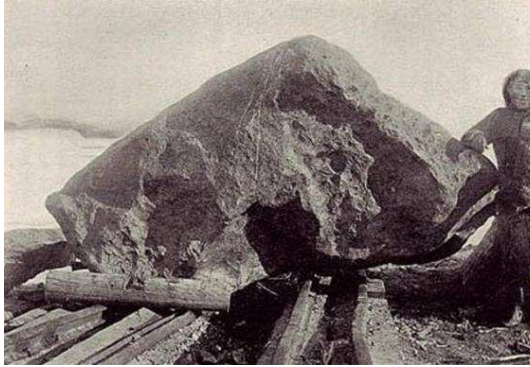
There is at the Smithsonian a [gold/meteorite HYPERLINK "http://www.asia.si.edu/collections/singleObject.cfm?ObjectNumber=F1955.27a-b"](http://www.asia.si.edu/collections/singleObject.cfm?ObjectNumber=F1955.27a-b) knife from among the Mughals. What is particularly interesting about this blade is that the meteorite from which it is made is reported as falling: the Emperor Jahangir ordered the knife to be created from the core of the meteorite. Note that at this date there was still a consensus in the west that 'stones' could not fall from the skies! If Jahangir had boasted about his find, then any 'educated' western visitor would have rolled their eyes.





## Greenland harpoon.

Isolated from the rest of the world. It would have been difficult to find steel to make tools 1,200 years ago. You could not pop down to the local hardware store, instead you walked for 3 days to your local meteorite. I guess they just hit it with a rock & hope a flat piece fell off.

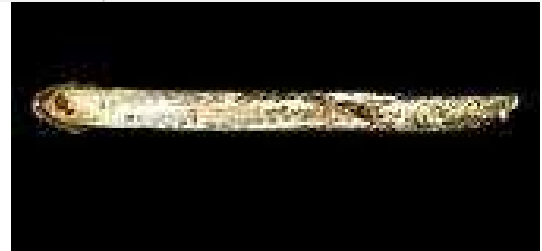


## People of the Arctic worked meteorite iron 1,200 years ago

About 10,000 years ago a big meteorite fell to the Earth on northern Greenland and broke apart. About 1,300 years Dorset Culture people in the Innaanganeq or Cape York Peninsula area of Greenland began extracting iron from it. [Ironfromthesky.org](http://Ironfromthesky.org) says the meteorite was apparently a valuable commodity, and the people walked three days to take iron from it using stone tools.



**Canadian lance** - At some point in the eighteenth century an Inughuit made a lance from the remains of the Cape York meteorite, a blade that has come to rest in the British museum. The iron from the Cape York fall supplied much of Arctic America through much of the previous millennium: chunks and artifacts made from the Cape York falls had passed from hand to hand deep into what is today Canada. In a world without wood and where only bone could be used to cut, a meteorite weapon must have been quite something.



**Right** - This knife was found with the remains of a woman. Most likely it was once attached to the end of a wooden spear, see the 4 holes in the bone handle. This hatchet was forged from a similar meteorite which was found on Fox Island near Seward Alaska. Remnants of the meteorite structures are still visible in the blade.



The Vikings were some of the best craftsmen in the world, making all kinds of steel tools & weapons.

**Right** - Its also believe that the Vikings had swords made from meteorites.

**Below** - Reenactment of Vikings trading there products.



*I believe some Vikings had swords crafted from meteorites*

Some very elite Vikings carried the legendary "Ulfberht Swords". These swords have been found in several Viking graves and the crucible steel used in them is considered to be of very good quality, event by TODAY'S standards. For years archeologists wondered where the hell they got the steel to make them, but now it is known that the Vikings were actually trading as far away as Persia, and the Persians had the best steel on Earth at the time (even better than the Japanese!).



[https://en.wikipedia.org/wiki/Ulfberht\\_swords](https://en.wikipedia.org/wiki/Ulfberht_swords)



The movie **Thor**, with his hammer made from a meteorite & **The Hobbit** also found a sword made from a meteorite, these movies have popularized weapons made from meteorites & now everyone seems to want there own meteorite knife, there is plenty on eBay for sale, but there come with a big price tag at around \$1,000



Making one of these knives is not that easy. Some are cut from the meteorite, but these are only good for decorative purposes. If you were to use them, they may just brake due to the many fine cracks or flaws most meteorites have. If you have ever held a meteorite you would notice small pieces braking off them. Knives below were cut from a meteorite.



So what knife makers did, was to make the knife in many layers. First they cut the meteorite in to thin strips & put a thin layer either side of a good quality knife steel. Then heat it to bright red & hammer the layers together. This makes a much stronger blade. But in the process, it changes the pattern on the blade.

It's actually a lot of work that goes into these knives, once forged into the rough shape. They are then ground, polished & fitted with a old looking handle - usually made from very hard wood, bone or leather.

**Right** - The layers being hammered together, see videos on you-tube of people making these knives. Bob Kramer crafts the perfect kitchen knife from melted meteorite. [https://www.youtube.com/watch?v=4x0f2b\\_0kn0](https://www.youtube.com/watch?v=4x0f2b_0kn0)  
Meteorite sword [https://www.youtube.com/watch?v=K\\_PS2l31EhM](https://www.youtube.com/watch?v=K_PS2l31EhM)  
Len Landrum forging a meteorite <https://www.youtube.com/watch?v=VXg0Uz1pu8>



Pictures below are knives made from a layer of meteorite & knife steel.





## Something for the person who has everything???



**Above** - This pair of guns were cut from the meteorite above, the barrel was not made from the meteorite, as it would not have been strong enough because meteorites have many flaws. But you will need very deep pockets at \$ 4,500,000 for the pair. Also if you import them into Australia, they may be confiscated by customs & destroyed. <https://www.youtube.com/watch?v=cBgWfRVtq-U>

**Right** - This is an antique kris-shaped spear point from Java, Indonesia. Said to be from the Pajajaran period (14th-15th centuries), when Java was part of a widespread Hindu radiation originating in India. The blade may be made from meteorite iron, the traditional material for old kris blades.



**Right - Terry Pratchett.** There are several modern companies that make vanity knives (and watches and statues) from meteorite iron. But British fantasy writer, Terry Pratchett, went one further and forged a sword, which included meteorite iron ('thunderbolt iron'), when he was knighted by the Queen in 2010. 'With help from his friend Jake Keen — an expert on ancient metal-making techniques — the author dug up 81kg of ore and smelted it in the grounds of his house, using a makeshift kiln built from clay and hay and fuelled with damp sheep manure.'



See more - <http://www.strangehistory.net/2014/07/20/meteorite-weapons/>



## More things you can do with a meteorite.

**Below** - Replica of the Tucson Ring used as an anvil In 1850 one fragment of the meteorite was taken to the Mexican presidio in Tucson - the blacksmith there used the Ring meteorite as an anvil - the widest part was used as a work surface. Today the real one is in the Smithsonian institute, see right.



## Iron Man Statue Was Molded From a Meteorite, Nabbed by Nazis, and Now Scrutinized by Scientists

By Sophie Bushwick | September 28, 2012 12:23 pm

**Right** - Statue cut from a meteorite

See more - <http://blogs.discovermagazine.com/discoblog/2012/09/28/iron-man-statue-was-molded-from-a-meteorite-nabbed-by-nazis-and-now-scrutinized-by-scientists/#.WFSc3P197IV>



**Above left** - The sculpture he made with that space rock 400-pound meteorite is now on the fourth floor of the museum. The meteorite hangs on one end of a long steel balance. On the other end is a working yellow 1974 Porsche 914. For years, the car was parked with the rest of his cars at his home and studio out in Southern California's rural Topanga Canyon. Now it's sculpture.

**Below** - You could be unlucky enough to be hit by a meteorite, as this women found out.

<http://www.iflscience.com/space/the-story-of-the-only-confirmed-person-to-be-hit-by-a-meteorite/>



**Right** - This tool is made from the Toluca iron meteorite and was used to break up agave plants.

Link - <https://twitter.com/ASUMeteorites>





## Can you spot a fake????

Right - These axe heads clam to be made from a meteorite, but I doubt they are. Most likely there made from many layers of different types of steel, squashed together in a forge & grind into shape.

When I was researching this story I found a enormous amount of produces for sale made from meteorites, which lead me to believe that most of them are fakes. There just could not be that many meteorites available to make all of these things. I know the earth is struck by 65,000 ton of meteorites each year, but 99% of this is dust. I came across a jewelry company which experimented for a long time to see if they could artificially make meteorites. They cut up different types of sheet metal & layered them to approximat the

structure of a meteorite. Then by heating the whole stack & hammering them all together with a forge, they ended up with a block of metal which looked similar to a real meteorite. Than they could just cut or machine out a piece of jewelry from the block. Meteorite jewelry would not be practical as it would rust on your finger. Additionally, many people are allergic to nickel. Find out if you are one of these. Place a 20 or 50 cent coin on the inside of your arm for a few minutes. When you remove it, if you find a red imprint of the coin, you are one of them. Once the rings have been polished they are dipped in acid which eats away some of the steel, highlighting the structure of the meteorite. See some of the finished pieces below....



**Left** - Maybe a watch is more your style, with a meteorite dial. There is many to choose from on eBay.

**Right** - A pair of shoes made from meteorites, might by the ticket. No one will mess with you once you put these on. That is if you can lift your legs!?

.... Most likely fake anyway.



Left - Hatchet, maybe MPAS can buy one of these for cutting back the trees at the Briars.

Link - [https://commons.wikimedia.org/wiki/File:Meteorite\\_and\\_a\\_meteoritic\\_iron\\_hatchet.JPG](https://commons.wikimedia.org/wiki/File:Meteorite_and_a_meteoritic_iron_hatchet.JPG)

Meteorite men TV series - [https://www.youtube.com/results?search\\_query=Meteorite+Men+](https://www.youtube.com/results?search_query=Meteorite+Men+)

Is it a Meteorite? <http://www.wikihow.com/Tell-if-the-Rock-You-Found-Might-Be-a-Meteorite>

How Do you know if it is a meteorite? <http://www.star-bits.com/ID.htm>

Meteorite identification <http://geology.com/meteorites/meteorite-identification.shtml>

How to collect Meteorites <http://www.meteoritecollector.org/howtocollect.html>

**Need to know more?  
Here is some links.**



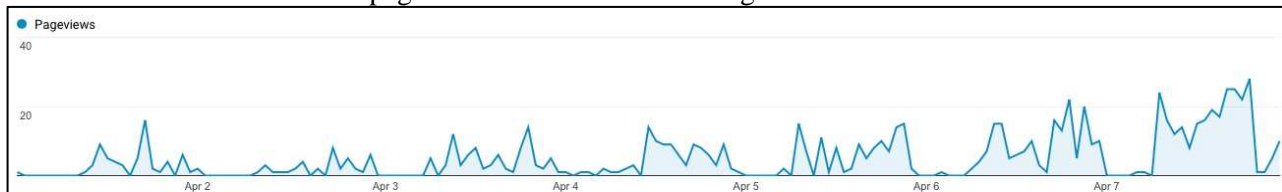
# 176 : The Evolving Information Systems of MPAS

That's right! 176 attendee's at the April Public Viewing Night, beating the old MPAS record of 165. This was most likely due to a culmination of the ABC Stargazing Live program, school holidays and mild clear weather. I thought this would be a good time to share with the society some statistics and information about our evolving on-line systems. Ultimately it's all about a connected society finding us on-line!

## MPAS Website

This is our first point of call for people searching for Astronomy related content. We have our webpage registered with Google (free) and we get detailed analytics from our visitors to help us target our content to suit the demographics who digitally visit us.

Number of Visitors to our webpage over the week where 'Stargaze Live' was broadcast:



Traffic Flow through the website

*Above the date is Midnight*



### Traffic Flow.

*'/' indicates our main webpage*

*'/pvn' Public Viewing Night,*

*'/apw' Astrophotography Workshop*

| Operating System | Sessions                         | Sessions                         | Contribution to total: |
|------------------|----------------------------------|----------------------------------|------------------------|
|                  | 371<br>% of Total: 100.00% (371) | 371<br>% of Total: 100.00% (371) |                        |
| 1. iOS           | 160                              | 43.13%                           |                        |
| 2. Windows       | 109                              | 29.38%                           |                        |
| 3. Android       | 61                               | 16.44%                           |                        |
| 4. Macintosh     | 34                               | 9.16%                            |                        |
| 5. Windows Phone | 5                                | 1.35%                            |                        |
| 6. Linux         | 2                                | 0.54%                            |                        |

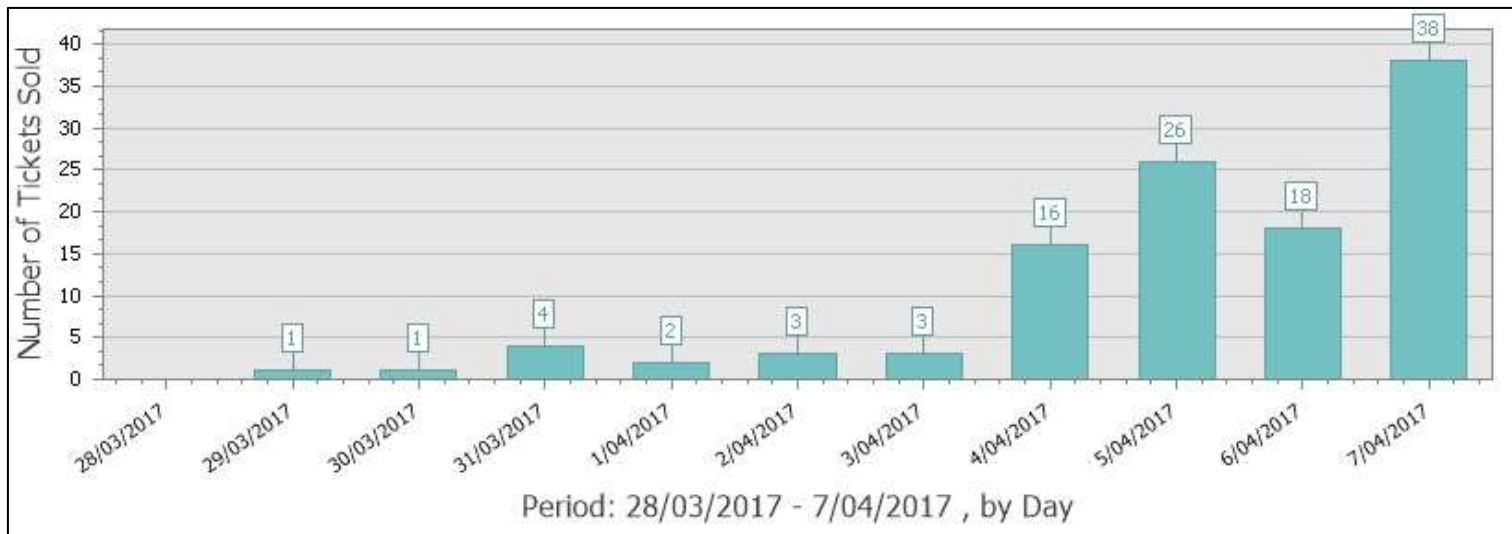
Computer Types: Covers all Apple Products - Macs, Ipads, iPhones...



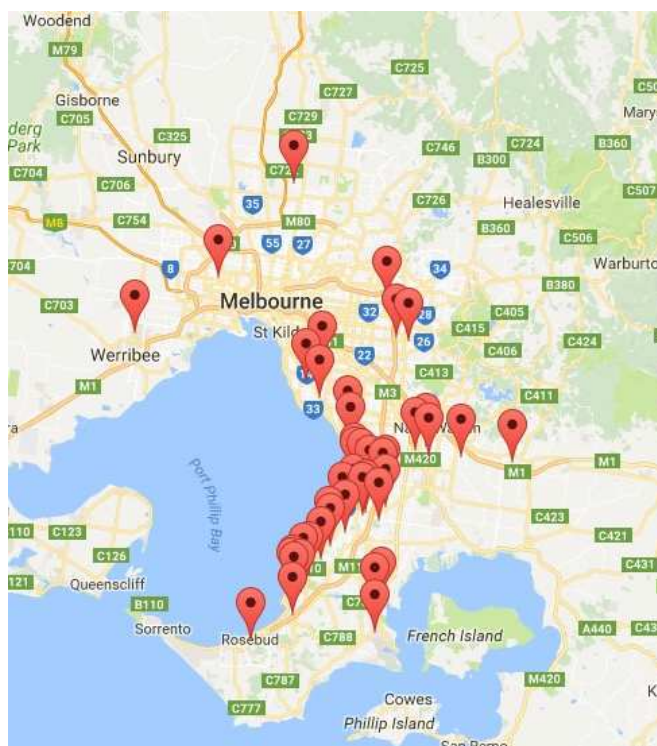
## Try Booking System

Our TryBookings system handles all the ticketing and payments system for our paid events. There is a percentage cost of transactions that also reflects card transaction fees. This system alone has reduced the number of phone calls and RSVP emails that MPAS committee volunteers need to respond to.

### Tickets Sold by Day over the week where Stargaze live was broadcast:



### Booking Location Source Map & booking so far:



| Event Summary                         |        |         |          |      |          |        |          |          |        |           |
|---------------------------------------|--------|---------|----------|------|----------|--------|----------|----------|--------|-----------|
| Event Name: Public Viewing Night      |        |         |          |      |          |        |          |          |        |           |
| Session Date Range: All Session Times |        |         |          |      |          |        |          |          |        |           |
| Event/Session Time                    | Ticket | Payment | Discount | Misc | Card Fee | Total  | Capacity | Reserved | Booked | Available |
| <b>Public Viewing Night</b>           |        |         |          |      |          |        |          |          |        |           |
| January 08, 2016 08:00 PM             | 1      | 4.00    | (0.00)   | 0.00 | (0.58)   | 3.42   | 200      | 0        | 1      | 199       |
| June 03, 2016 08:00 PM                | 35     | 208.00  | (0.00)   | 0.00 | (10.39)  | 197.61 | 200      | 0        | 35     | 165       |
| July 01, 2016 08:00 PM                | 35     | 212.00  | (0.00)   | 0.00 | (10.45)  | 201.55 | 200      | 0        | 35     | 165       |
| August 05, 2016 08:00 PM              | 37     | 236.00  | (0.00)   | 0.00 | (11.47)  | 224.53 | 200      | 0        | 37     | 163       |
| August 19, 2016 08:00 PM              | 18     | 128.00  | (0.00)   | 0.00 | (7.71)   | 120.29 | 200      | 0        | 18     | 182       |
| September 02, 2016 08:00 PM           | 19     | 128.00  | (0.00)   | 0.00 | (5.70)   | 122.30 | 200      | 0        | 19     | 181       |
| October 07, 2016 08:00 PM             | 18     | 146.00  | (0.00)   | 0.00 | (7.09)   | 138.91 | 200      | 0        | 18     | 182       |
| November 04, 2016 08:00 PM            | 14     | 151.00  | (0.00)   | 0.00 | (7.68)   | 143.32 | 200      | 0        | 14     | 186       |
| December 02, 2016 08:00 PM            | 14     | 155.00  | (0.00)   | 0.00 | (6.76)   | 148.24 | 200      | 0        | 14     | 186       |
| January 06, 2017 08:00 PM             | 71     | 730.00  | (0.00)   | 0.00 | (30.93)  | 699.07 | 200      | 0        | 71     | 129       |
| January 13, 2017 08:00 PM             | 11     | 105.00  | (0.00)   | 0.00 | (4.72)   | 100.28 | 200      | 0        | 11     | 189       |
| January 20, 2017 08:00 PM             | 1      | 10.00   | (0.00)   | 0.00 | (0.71)   | 9.29   | 200      | 0        | 1      | 199       |
| February 03, 2017 08:00 PM            | 29     | 275.00  | (0.00)   | 0.00 | (12.79)  | 262.21 | 200      | 0        | 29     | 171       |
| March 03, 2017 08:00 PM               | 31     | 255.00  | (0.00)   | 0.00 | (12.38)  | 242.62 | 200      | 0        | 31     | 169       |
| April 07, 2017 08:00 PM               | 120    | 945.00  | (0.00)   | 0.00 | (41.19)  | 903.81 | 200      | 0        | 120    | 80        |
| May 05, 2017 08:00 PM                 | 9      | 85.00   | (0.00)   | 0.00 | (3.54)   | 81.46  | 200      | 0        | 9      | 191       |
| June 02, 2017 08:00 PM                | 2      | 20.00   | (0.00)   | 0.00 | (0.92)   | 19.08  | 200      | 0        | 2      | 198       |

You may see that a few bookings are also for May and June. Typically this swells a few days before the event.

**TryBookings** also handles our Membership, Events and Merchandise order. It reduces the errors due to illegible handwriting (i.e. Email addresses) and removes the amount of cash that members need to handle.

For free events we have no fees with TryBookings as it is percentage based.

Currently on-line payments for Public Viewing Nights constitutes about 60-70% of bookings; but I predict this will only rise with the aging society, cheaper tech and the push for the 'cashless society'.



## Facebook System

We use Facebook to advertise our events each month. We effectively pay per click (a click directs to the TryBookings booking & payment system). Most months we spend about \$20-\$25 however this month went to \$40 due to the number of 'clicks' we were getting.

We have control over the advert delivery, for example I limit it to people located within 100km of the Briars, age groups from 18-99 years old and who have previously 'liked' content of a science, outdoor or photographic nature.

This month we had over 7,000 people see our event advert, 142 'click' on it and 43 actually make a purchase in TryBookings.

Below is graph of when the clicks were made for this April Event:



This is the demographics of the age and gender of those who 'clicked':



Our event Ad on Facebook:

**Astronomy Public Viewing Night**  
Public · Hosted by Mornington Peninsula Astronomical Society - MPAS

★ Interested ✓ Going

Friday, May 5 at 8 PM - 11 PM

The Briars

Tickets Available  
[www.trybooking.com](http://www.trybooking.com)

About Discussion

### Details

Escape your daily concerns and instead ponder the mysteries of the night sky, Universe and existence. Come to an Astronomy evening with the Mornington Peninsula Astronomical Society. Hear the REALLY BIG questions, ask your own, hold a meteorite, and see the night sky through our telescopes.

Want to escape your daily Earthly concerns and instead ponder the mysteries of the night sky and Universe? Bring your 5 senses to an Astronomy evening with the Mornington Peninsula Astronomical Society at their registered observatory on the Mornington Peninsula, south east of Melbourne. See the Universe through powerful telescopes. Hear the REALLY BIG questions out there. Feel and smell real meteorites scarily up close and personal, and get the taste for more.

The evening starts indoors with a multimedia talk and Q&A then, weather permitting, moves outside onto the adjacent observing field with the telescopes underneath the night sky. Please dress appropriately for being outdoors and on a grassy or uneven surface. You may bring a small torch if you wish.

The observatory is shown on the Melways at map reference 151/E1.

More information & Map on our website [www.mpas.asn.au](http://www.mpas.asn.au)

Night Astronomy

I normally start the event advertising about a week out from the event.

This is the public system the Society has in place at the moment, we have not really tapped Twitter, Instagram or others at this point. If any members are a 'tech guru' in these systems and is willing to set it up, please give me an email.

Regards, Dave Rolfe



Below - NGC2070 in the LMC, taken from Cranbourne with Ha a filter, *by Dave Rolfe*



**Right** - NGC2070  
imaged by Peter  
Goodhew, while  
visiting MPAS  
from the UK.

Below email  
we received.

Just to prove that  
I really did capture  
some images at the  
Briars here's my  
attempt at the  
Tarantula.

Once again many  
thanks for the  
support and letting  
me make use of  
the MPAS  
facilities.

*Peter Goodhew*





# OFFICE BEARERS OF THE MORNINGTON PENINSULA ASTRONOMICAL SOCIETY



Dave Rolfe



Peter Lowe



Peter Skilton



Jamie Pole



Trevor Hand



Tony Nightingale



Fred Crump



Greg Walton

**President:** Dave Rolfe  
**Vice President:** Peter Lowe  
**Committee:** Trevor Hand, Fiona Murray, Fred Crump  
 Tony Nightingale & Greg Walton  
**Phone Contact:** Peter Skilton

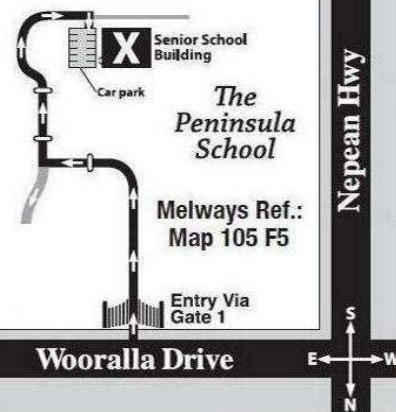
**Secretary:** Peter Skilton  
**Treasurer:** Jamie Pole  
**Web master:** Dave Rolfe  
**Scorpius editor:** Greg Walton  
**Library:** Fiona Murray

## SOCIETY MEETINGS

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

**For addition details:**  
**Internet:** [www.mpas.asn.au](http://www.mpas.asn.au)  
**email:** [welcome@mpas.asn.au](mailto:welcome@mpas.asn.au)

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



Fiona Murray

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

## LIBRARY

## E-SCORPIUS NEWSGROUP

M.P.A.S. main line of communication is the online newsgroup called E-Scorpius.  
 Here you will be kept up to date with the latest M.P.A.S. news & events information as well  
 as being able to join in discussions & ask questions with other members.

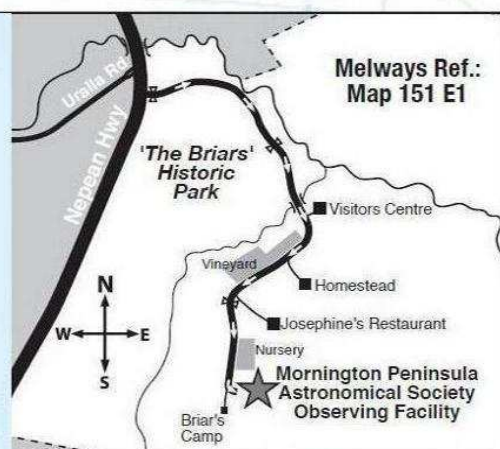
To join, to go: [www.groups.yahoo.com/e-scorpius](http://www.groups.yahoo.com/e-scorpius) and sign up to Yahoo groups - you are required to  
 sign up to Yahoo groups to join E-Scorpius. Once you have signed up at Yahoo groups, email  
[welcome@mpas.asn.au](mailto:welcome@mpas.asn.au) say that you want to join E-Scorpius & you will be added to the E-Scorpius list.  
 Member forum : [http://www.mpas.asn.au/members\\_forum.html](http://www.mpas.asn.au/members_forum.html)

## VIEWING NIGHTS - MEMBERS ONLY

**Viewing Night** - Members only  
 Any night, at The Briars, Nepean Hwy,  
 Mt Martha, starting at dusk.  
 Members visiting The Briars for the first time  
 Must contact Greg Walton on 9776 2074 or  
 0415172503 if they need help getting to The Briars  
 site. Upon arrived at the site, remember to sign  
 the attendance book in the observatory building.

**For addition details:**  
**Internet:** [www.mpas.asn.au](http://www.mpas.asn.au)  
**email:** [welcome@mpas.asn.au](mailto:welcome@mpas.asn.au)

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



Members please write a story about your astronomy experiences and add some pictures.  
 Send them to: Greg Walton [gwpas@gmail.com](mailto:gwpas@gmail.com)

## 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 © 2017, Mornington Peninsula Astronomical Society