Cover images - NGC5128 *By Paul Albers*
Taken from snake valley, see page 18.

SCORPIUS

THE JOURNAL OF THE
MORNINGTON PENINSULA ASTRONOMICAL SOCIETY INC.

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Volume XXV, No 3 (May / June)

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 services of its members for educational presentations and observing nights for schools and community groups. Reg No: A268 ABN: 34569548751 ISSN: 1445-7032

SCORPIUS The journal of the Mornington Peninsula Astronomical Society

Newsletter Disclaimer

Society News

By Greg Walton

March public night - Hi everyone, There was a good turnout of the public last Friday evening at The Briars with 67 in attendance on a balmy, still evening with more mosquitos in attendance than usual. If we'd had Aerogard spray cans for sale, we'd have readily sold them at $1 for each spray from the can. Insects can be very persuasive. Although there were some clouds to begin with, they didn't interfere with the observing and, in fact had disappeared by the time the talk finished. Jupiter was prominently on display with a couple of satellite transits and shadow transits across the Jovian disc during the evening. Before the Mars opposition talk, given by Trevor Hand, the International Space Station passed silently overhead and was visible to everyone. However, simultaneously there was a magnitude -5 Iridium satellite flare in the opposite side of the sky, almost right next to Sirius. It was indeed bright, but alas not many were looking in that direction, with their eyes firmly planted on the moving ISS instead. Thanks also to the usual assistants present outside (Chris & Peter Skilton on the door, Bob Heale, Greg Walton, Peter Lowe, John & Marj Cleverdon, Kathryn Hand, Fiona Murray, David Rolfe, Jamie Pole, David Stock, Jason Heath and others I've no doubt overlooked if they didn't sign the observatory log book. Regards, *Peter Skilton*

A small group stayed on till 1am observing the double shadow transit on Jupiter. As Jupiter climbed higher we could see more & more detail in the two cloud belts & luckily the red spot had became easily visible. The red spot was a bright orange in the 18 inch telescope, for many years the red spot has just looked gray & difficult to see. We were happy to see that the colour has come back. Around 11:30 pm Io's inky black shadow was in the centre of Jupiter & was razor sharp at 150 times magnification. Also by this time Europa was on the edge & had almost moved in front of its own shadow making to difficult. As Europa emerged from in front of Jupiter we saw a small bright bump on the edge of Jupiter & the bump kept getting larger. Then we could see a small gap between Jupiter & Europa - a beautiful sight. I attempted to photograph the shadows but did not have much success. (See photo at right) All in all we were happy with the experience. *By Greg Walton*

Viewing night at Parkdale secondary college - Well, in complete contrast to the viewing night we gave the same school last year, this time it was a drizzly evening at Parkdale Secondary school last night, with about 90 in attendance from Year 7 and their parents/teachers. Trevor Hand ably gave them a meteorite talk in a commons area, with various extraterrestrial pieces and dinosaur poo to examine afterwards. One fact that really was appreciated with lots of noise, oohs and ahhs was that an incoming meteoroid is much faster than Superman. I wonder if that'll make it into a science test or exam paper's answer this year. Ready with telescopes were Heinz Rummel and Inge Marcinkowski, Greg Walton, Peter Skilton, Jamie Pole and Fiona Murray but, alas, the conditions didn't improve and so they remained safely in the dry and weren't unloaded from the vehicles. Regards, *Peter Skilton*

Viewing night at Camp Mungang on 15th - The viewing night for 55 year 7 boys and teachers from Camberwell Grammar proceeded as planned last Tuesday at Camp Manyung. The skies were clear of cloud, though the seeing conditions were pretty ordinary not helped by the wind. Fortunately the trees around the oval acted as an efficient windbreak for the telescopes and observers. Jupiter itself showed no surface detail as it was rising through the tree canopy, and was a rippling image like the familiar mirage above heated road bitumen in the outback. Nevertheless, three of its moons were visible, as was the first quarter Moon, Orion nebula and the Jewel Box. The ISS passed over fairly low in the south, though before everyone came outside to the camp oval. Peter Lowe gave the talk, and outside with telescopes were Heinz Rummel, Phil Holt, Peter Skilton and Greg Walton, together with a visit by Pia Pedersen and a visiting Danish relative. Regards, *Peter Skilton*

March Society Meeting - 30 members were in attendance. Dave Rolfe (President) chaired the meeting. Our guest speaker, Ms Luz Angela Garcia from Swinburne University, gave a comprehensive talk on "A BRIEF HISTORY OF THE UNIVERSE", which started with asking the question, were did all this come from? Luz, then explained what we know about the beginning of the universe & how it evolved in to the present day. Greg Walton did “sky for the month”, showed time lapse from the ASV's Messier Star Party, images from Snake Valley Star Party & recent Aurora images taken from Australia, after which Members chatted over coffee. *Greg Walton*

Photo at right - Ms Luz Angela Garcia with Ian Sullivan centre & Dave Rolfe at right.

March members BBQ & working Bee - The day started around 10 am with a small number of members showing up for the working Bee. The first job was to repair the rotted-out west wall on the lower shed. Mark Hillen & Roland Knabe removed the old weather boards, then decided it would be best to just build a new wall in front of the old wall. This new wall would line up with the concrete slab, so when the Colorbond was attached, it would cover the concrete stopping any water from getting in to the shed. John Cleverdon removed the weather boards from the south wall so we could re-clad it with Colorbond steel, while Troy made a steel door for the south side of the observatory. Paul Albers & I made a new internal wall & fitted a solid timber door. Andus Hamilton fitted a new window. Dave Rolfe & Jamie Pole roughed out the wiring. At 6:30 pm we downed tools & had a BBQ & celebrated Paul Albers 50th journey around the sun; so Paul has travelled almost one trillion kms in his life (Earth / Sun Distance 150,000,000km x 2 x 3.141 = 950,000,000,000km) Also, you can listen to Paul Albers on radio at http://beyondinfinity.com.au/astronomy-on-the-peninsula/ Afterwards, we were hoping to see comet Linear 252P but the cloud put an end to this. Thanks to all those who helped at the working bee. *Greg Walton* - See page 11. for Observatory up date.

April public night - The public night went well last night although the numbers were down a bit (Must have been the clear skies that kept them away!) Thanks to Simon Hamm for supplying the door prizes (Chocolate egg shaped asteroids) Trevor gave an old favourite talk on "Astronomical Bunkum", always a crowd pleaser and I got lots of positive feedback from the public visitors. We had our first slithery visitor last night, a brown snake (although it looked black to me) that traversed the viewing area and was walked (slithered) off the site unfortunately under MY car! I'm sure there are some snake in the grass jokes in there somewhere. Last night was also first light in our new observatory. All I can say is I was truly proud to stand in the observatory and see the stars from that new vantage point. Congratulations are in order for everyone who participated in its construction especially Greg Walton and Mark Hillen who has together have down the heavy lifting on this project. All I can say is "WOW" this is a major new asset on the site and members should be justly proud. I can look back over nearly 50 years of society history and a well-constructed observatory has always been on the must-have list. We have had other observatories but this one takes the cake. It shows that the strategy of saving our pennies and staying focused on the endgame eventually does pay off. Now we need to work at incorporating this new asset into the society and members activities. Thanks to all, *Peter Lowe*

Photo *by Peter Skilton*

School viewing night 15th April - It was a very successful viewing night at Cornish College in Bangholme, near Patterson Lakes, last night. The skies were mostly clear and conditions comfortably not too cold and not too hot, and about 55 Year 8 pupils attended as expected. Peter Lowe gave the talk inside, while outside on the telescopes were Melani & Noah Hutchins, Heinz Rummel, Inge Marcinkowski, Simon Birch, Jamie Pole, Greg Walton, Fiona Murray and me. The first quarter Moon gave good views of the craters and mountains on the lunar surface, while Jupiter gave a good show with two dark bands easily visible and 5 apparent satellites; 4 were its Galilean moons and one was a background star that by coincidence was close to them and near to the plane of their orbit. Saturn and Mars were also on show, as was Orion earlier in the evening before Scorpius rose, and the Jewel Box. I received several enquiries about coming to our public nights at the Briars from parents who hadn't realised we existed and were positively delighted. Thanks to all those who attended. Regards, *Peter Skilton*

Hallam Scouts viewing night 16th April - Hi All, I'd like to thank all those who braved the cloudy (yet patchy) skies for the viewing night with the Hallam scouts. I didn't catch everyone that was there but we had a fair number of members and scopes even though only the Moon and Jupiter were seen through hazy clouds. I thought I'd be talking to scouts roughly 12-14 years old but instead I was talking to cubs closer to 10 years old or younger. I'd have to say the talk was one of the most exciting, disturbing, frightening and enjoyable talks I've ever given. The whole night bordered on total chaos held together by the skills of the cub leaders. I decided to switch talks from the usual solar system to just talking about the Moon. The cubs took a keen interest in the topic and asked what I thought were really probing questions. Such as "Do bigger planets have more gravity?" and "Why are the Earth and Moon round?" One boy was proud of the fact that he knew the names of all the planets and insisted on reciting them. Another girl was proud of the fact that her uncle was a cousin of Neil Armstrong. (figger it out?) I pointed to Neil's image in the faceplate of Buzz Aldrin's picture and there followed a general discussion about why Buzz hadn't taken a picture of Neil. I explained that Neil was the only one with a camera and the upshot was a general conclusion that Neil wouldn't give the camera to Buzz (the bastard !!). When we got to the formation of the Moon they all seemed to be fascinated by the idea of colliding planets. Then came the humdinger question from a very young girl "Does that mean God didn't create the Moon?" I tried to sideslip the question with the standard answer that that God might have created the Big Bang but everything else happened later. The Scout Master gave me the thumbs up for that answer but no joy with the kids. There followed the most complex religious exchange amongst the kids I have ever witnessed and I quickly realised the level of religious and cultural diversity in the group. My mind went to the first page of the Hitch Hiker Guide to the Galaxy, "Don't Panic!" I thought I might be about to see a re-enactment of the religious crusades as different cubs argued about how the Moon was created. Fortunately the Scout Master stepped in and changed the subject by pointing out that the astronauts on the Moon were all scouts. Beating a quick retreat I finished the talk just as David Rolfe came in to tell me the Moon was out so we packed up allowing all the cubs to handle the meteorite and go out to see the Moon. I survived (just) to talk another day. We will be talking to the same group in a few months time and I just can't be greedy so I think I'll give Trevor the opportunity to talk, next time. Cheers *Peter Lowe*

April Society Meeting - 29 members were in attendance. Dave Rolfe (President) chaired the meeting, updated members about the new observatory & space news. Our speaker was MPAS/ASV member Ian Sullivan, gave a talk on 'Skjellerup and the Comets' & his trip to NACAA (see below) Greg Walton did sky for the month, then members chatted over coffee. Many member have completed the survey. If you did not get a form www.mpas.asn.au/news_survey_2016.pdf

Figure 1. Frank Skjellerup (1875–1952) as young man (Orchiston Collection).

NACAA 2016, *By Ian Sullivan*

To MPAS Absentees from NCAA 2016, I arrived home Thursday night March 31st after a drive with Jim Blanksby through much rain around the border in East Gippsland. I was impressed with NACAA organization of hosts Sutherland Society. However there was no visit to any South. Society premises! I think in the circumstances, a 5-min PPT presentation to all registrants about Sutherland would have been appropriate. About 150 society members and several non-members attended. The sessions were staffed and proceeded smoothly. My talk - 'Skjellerup and the Comets' went well, and I got a commendation from the committee who judged the contributions, as did Chris Wyatt a young comet chaser from Northern NSW, who spoke on 'Guide to Visual Comet Observing' Best presentation (Astral Award) went to Donna Burton from Qld on 'Dating Active Young Stars' The Keynote Presentation by Prof. Joss Bland - Hawthorn on 'Fireworks at the Heart of the Galaxy' was a particularly impressive start of proceedings. The After Dinner Speaker was Prof Fred Watson on 'Trollops, Tyrants and Telescopes - taken from Astronomy's Underbelly' - no comment! The food throughout all dinners and teas was a particularly good - but there were no complimentary drinks - we paid our way. The new NACAA Committee will be Gen Sec. Brett McMillan, Deputy Gen. Sec. Donna Burton, Archive Sec. Peter Skilton, Com. Sec. Judith Bailey with Treasurer Peter Northcote - one of the 3 caballeros who write the Quasar almanac. Next NACAA will be in Ballarat at Easter 2018 who have ceded & possibly 2017 Vastroc to Mt Burnett Society.

April members BBQ - Mark Hillen & I arrived at 4pm and wiper sniped the Briars site, we also remove 2 dead trees & cut back the tree next to the big shed. About 5pm member start turning up for the BBQ, it was a larger then normal turnout, mainly because everyone wanted to see the new observatory. Clouds stopped members from viewing till 11pm when most had gone home, about 6 member stayed on & seen Jupiter, Mars & Saturn using the old 10 inch Springfield, we could see a sharp image of the red spot on Jupiter, which has been much redder than normal. Mars also showed some dark patches & a polar cap. Fog rolled in at midnight so we shut the roof on the observatory & headed for home. Thankyou to all who helped with the cooking, setting up the food & cleaning up afterwards. *Greg Walton*

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 BINTEL shop in Camberwell closed on Saturday 16 January 2016 - All enquiries are now referred to Sydney.
Stuck on the window of the Camberwell shop is an A4 notice, advising that Anthony McCullough (past manager) will continue to provide some services under the new company name 'Battes': www.battes.com.au anthony@battes.com.au

New Members Welcome

Charlie Czerny

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

2016 SUBSCRIPTIONS DUE

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 years 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

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

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.

Under the new government regulations, a list of financial members is required for insurance purposes, so please make certain your membership renewals are on time.

New MPAS Membership Fee Structure
We are establishing new membership and renewal guidelines for the MPAS to streamline our process. The main change will be that memberships are for the duration of the calendar year, as apposed to 12 months from the anniversary of signup. We acknowledge during 2016 some members may be disadvantaged for which we regret, but to improve our society this is unavoidable.
The new structure will be as follows;
(1) Payment before End of March, 100% category fee will be for current calendar year.
(2) Payment from 1st of April to End of September 50% fee for the remained of year. (pro-rata period)
(3) Payment after 1st of October, 100% fee will be for following calendar year.
From next year all society fees will be due at the end of the year making the renewal process more streamlined and efficient.
The 5 Year membership option will also be adjusted for the end of year date with June 30 being the cut-off.

CALENDAR May / 2016

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3	4	**SPSP** 5 Uranus 2 deg below the Moon	**SPSP** 6 **Public Night 8pm** Venus below Moon	**SPSP** 7 **New Moon**
SPSP 8 **Mothers Day**	9	10 Jupiter stationary 9am	11 ASV Meeting	12	13	14 **First Quarter** Regulus 2 deg below the Moon
15 Jupiter 2 deg below the Moon	16	17	18 Society Meeting 8pm	19	20	21 Members Night BBQ 6pm Mars right of Moon
22 **Full Moon** Saturn right of Moon Mars at Opposition	23 Saturn above the Moon	24	25 Committee Meeting 8pm	26	27	28
29 **Last Quarter**	30	31				

Monthly Events & High Lights. - **Watch out for Auroras**
Public nights 6th, 8pm start - **Society Meeting** at 8pm on 18th @ the Peninsula School
Members Night BBQ 6pm at the Briars 21st
SPSP - South Pacific Star Party 5th to 8th @ Ilford NSW - www.asnsw.com/spsp
Evening - Jupiter 2 degrees below the Moon on the 15th - Mars at Opposition on the 22nd 9pm

CALENDAR June / 2016

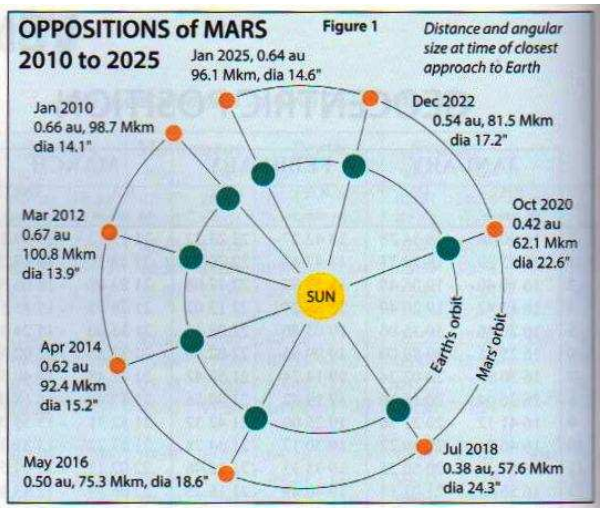
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1	2	3 **Public Night 8pm** Saturn at opposition	4 Mercury above the Moon
5 **New Moon** Comet C/2013 0.4 deg south of ngc7293	6	7	8 ASV Meeting	9	10	11 Jupiter above the Moon
12 **First Quarter** Jupiter below the Moon	13	14 Neptune stationary	15 Society Meeting 8pm	16 **Scorpius Deadline**	17 Mars right of Moon	18 Members Night BBQ 6pm Saturn right of Moon
19 Saturn above the Moon	20 **Full Moon**	21 **Solstice**	22 Committee Meeting 8pm	23 Saturn next to 6mag star 11pm	24	25
26 Neptune 1.2 deg south of the Moon	**27**	**28** **Last Quarter**	**29** Uranus 3 deg below the Moon	**30** Mars stationary & 0.3 deg E ngc5897		

Monthly Events & High Lights. - **Red Days** indicates School Holidays
Public nights 3rd 8pm start - **Society Meeting** at 8pm on 15th @ the Peninsula School
Members Night BBQ 6pm at the Briars 18th
Evening - Saturn at opposition on the 3rd 5pm - Comet C/2013 0.4 deg south of ngc7293 (Helix Nebula) on the 5th
Evening - Saturn next to 6mag star 11pm on the 23rd - Neptune 1.2 deg south of the Moon on the 26th
Evening - Mars stationary & 0.3 deg E ngc5897 on the 30th

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 May/June - Yes Mars is back & now is the best time to view its surface. It will reach Opposition on the 22nd of May; meaning it is at its closest to us & the biggest it will be seen in your telescope eyepiece. As Mars moves more slowly around the Sun than Earth, the two planets line up about every 2 1/2 years, with Sun, Earth & Mars in a straight line. This opposition is favourable at 0.50 au, with a diameter of 18.6"

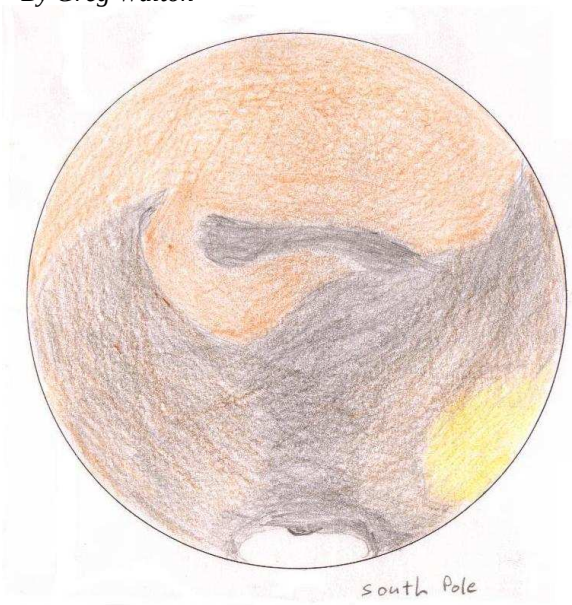
(See Figure 1 below from Astronomy 2016)

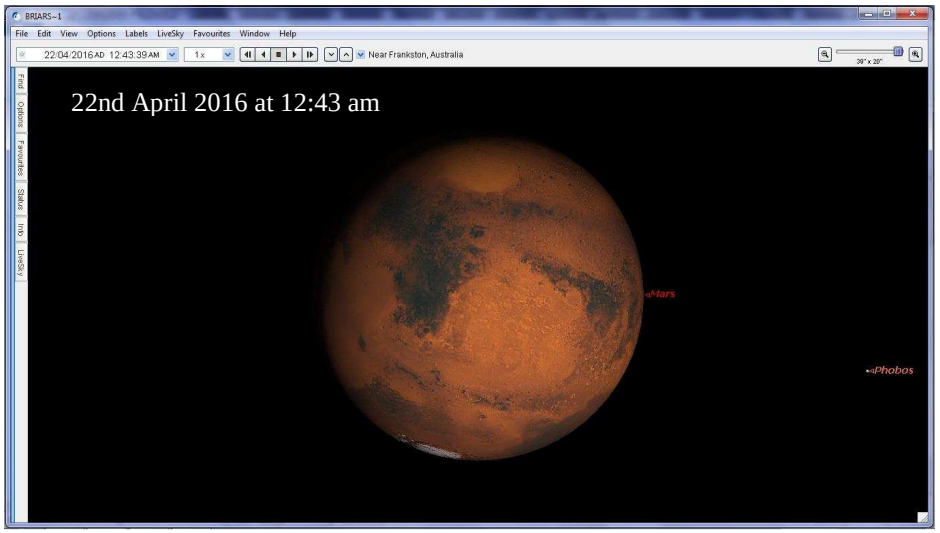


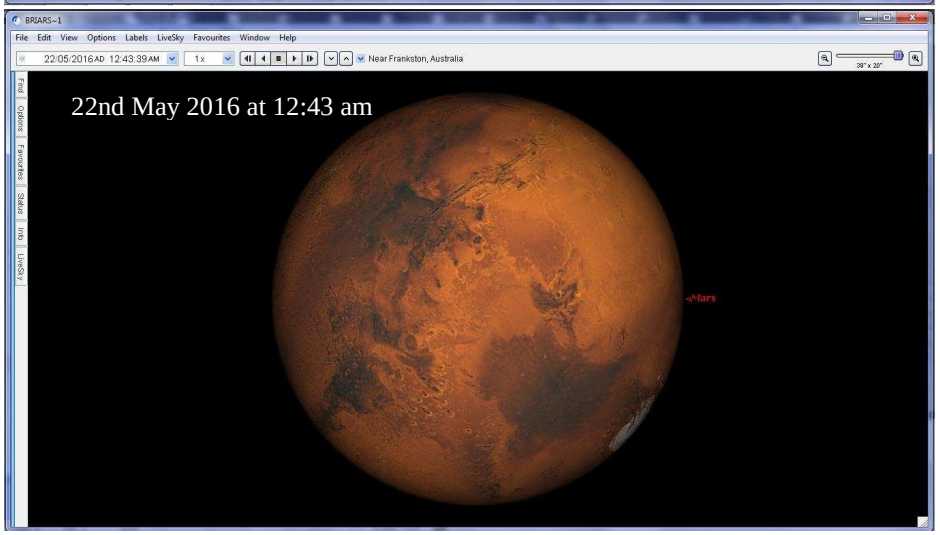
At right are 4 month by month images of Mars, Produced on Starry Night, so you can see how Mars will changes its size, shape & orientation.

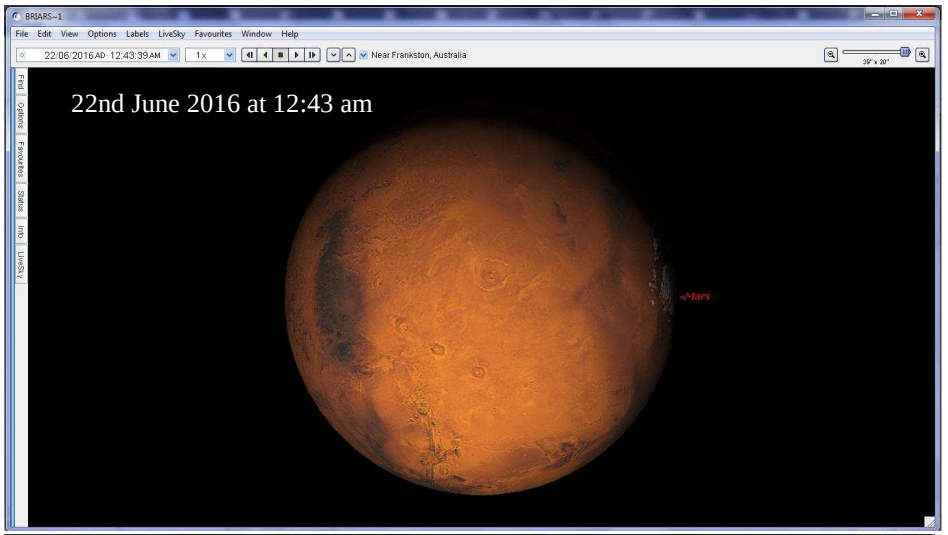
Also May/June is one of the best times to do some viewing of the planets as the atmosphere is cool & stable. Mars will more then double in size between March & May, but then slowly reduce in size between May & July, still giving us plenty of time to image or drawn it surface. See if you can spot the polar caps.

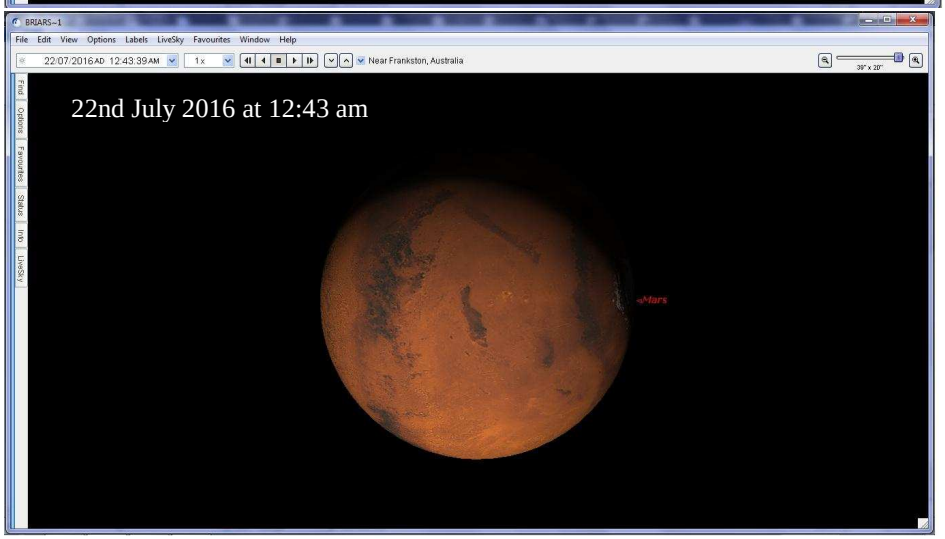
The drawing below I did on 9th August 2003
So give it a go & send me your drawings & we will put then in the Scorpius news letter.
By Greg Walton







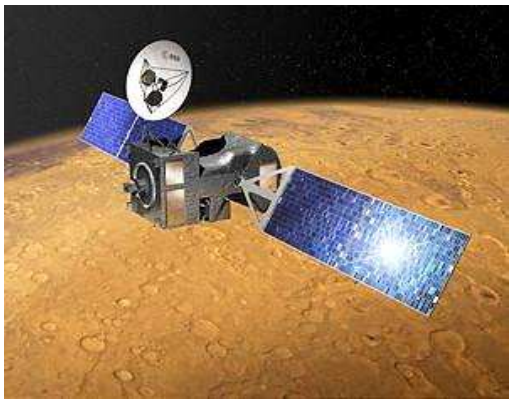




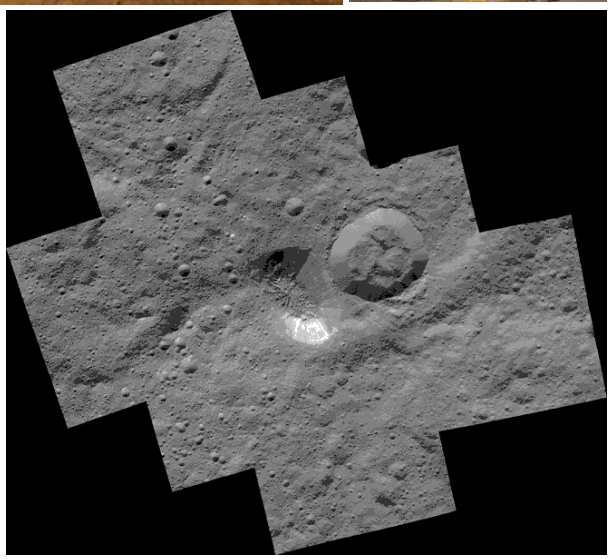
ASTRO NEWS

By Peter Lowe

ExoMars Mission Launches



The European Space Agency's ExoMars Trace Gas Orbiter successfully launched on March 14 from Baikonur in Kazakhstan. This is the first of two joint ESA-Roscosmos missions to Mars aimed to resolve unsolved mysteries of the planet's atmosphere that could indicate present-day geological or even biological activity. One of the mysteries of Mars has been the regular detection of a methane outburst into the Martian atmosphere. The orbiter mission map traces atmospheric gases over an entire Martian year (two Earth years). Of course the methane in the atmosphere prove the existence of microbial life, cosmic dust or other geological processes could also cause it. ExoMars will test for current geological processes that might be releasing the methane and the orbiter's highly specialised spectroscopic and imaging instruments are designed to map the minute constituents of the Martian atmosphere, including methane. If all goes well a more ambitious ExoMars Rover, designed to test for traces of ancient life will be launched after 2018. The first observation of methane plumes on Mars was made over a decade ago. From Earth however the data required a lot of processing, and led to controversy among planetary scientists. ExoMars is intended to "sniff" out the methane source.

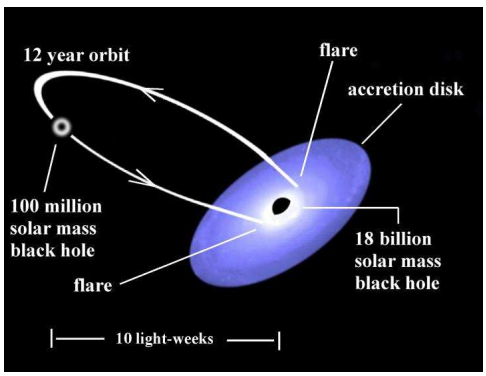


NASA's Dawn continues to give one year on

NASA's Dawn spacecraft has been orbiting the dwarf planet Ceres since March last year and has delivered a wealth of images and other data. Ceres' mysterious mountain Ahuna Mons is seen in the mosaic at right. Dawn took these images from its low-altitude mapping orbit at 385 kilometres above the surface. On its steepest side, this mountain is about 5 kilometres high.One year ago, on March 6, 2015, NASA's Dawn spacecraft slid gently into orbit around Ceres, the largest body in the asteroid belt between Mars and Jupiter. Since then, the spacecraft has delivered a wealth of images and other data that open an exciting new window to the previously unexplored dwarf planet. Its most enigmatic feature is a small, bright-sided bump on the surface. From afar, Ahuna Mons looks somewhat pyramid-shaped, but upon closer inspection, it is best described as a dome with smooth, steep walls. Dawn's latest images of Ahuna Mons, taken 120 times closer reveal that this mountain has a lot of bright material on some of its slopes. Mountains were completely unexpected on this body and there is till no satisfactory model explaining its formation.

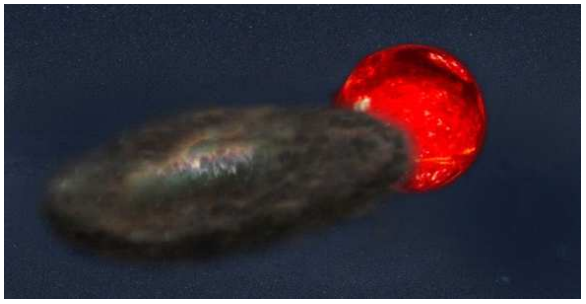
How Black Holes Rotate

OJ287 is a 3.5 billion light year distant quasar with an 18 billion solar mass black hole at its heart. Quasars are distant galaxies with very bright centres emitting huge amounts of electro-magnetic radiation due to the infall of matter into their central massive black holes. A recent observational campaign involving NASA's space based SWIFT X-ray telescope and a myriad of optical telescopes has allowed a team of astronomers to measure very accurately the rotational rate of this massive black hole, one of the most massive known. The measured rotational rate is roughly one third of the maximum spin rate allowed in General Relativity.



Because this quasar lies very close to the ecliptic, where most searches for asteroids and comets are conducted, it has been possible to investigate optical photometric measurements covering more than 100 years. Careful analysis of OJ287 observations reveals quasi-periodic optical outbursts at intervals of approximately 12 years dating back to around 1891. Additionally, a close inspection of newer data sets reveals the presence of double-peaks in these outbursts suggesting OJ287 harbours two orbiting unequal mass black holes consisting of one 18 billon solar masses and the other 100 million solar masses. The current hypothetical model involves a massive black hole with an accretion disc with the comparatively smaller black hole orbiting about it. The more massive black hole is visible due to the slow accretion of matter, present in its accretion disc while the small black hole passes directly through the accretion disc during its orbit causing the disc material to heat up to very high temperatures. This heated material flows out from both sides of the accretion disc and radiates strongly for weeks. This causes the peaks in the brightness, and the double peaks arise due to the ellipticity of the orbit. The binary black hole model for OJ287 implies that the smaller black hole's orbit should rotate, and this changes where and when the smaller hole impacts the accretion disc. This effect arises because of relativistic frame dragging and its precessional rate depends mainly on the two black hole masses and the rotation rate of the more massive black hole. Measurements of eight well-timed bright outbursts of OJ287 enabled the precession rate of the smaller hole's orbit to be accurately measured. This analysis revealed for the first time the rotation rate of the massive black hole along with accurate estimates for the masses of the two black holes. The smaller black hole's orbit precesses at an incredible 39 degrees per individual orbit. The General Relativistic model for OJ287 also predicted that the next outburst could occur around the time of GR Centenary, 25 November 2015, which marks the 100th anniversary of Einstein's General Theory of Relativity. This quasar has a visual magnitude of 14.6 that is well within the range of amateur observation and an easy target for astrophotography thereby giving amateurs an opportunity to directly contribute to the study of black holes.

Longest-lasting stellar eclipse discovered



In the Vin Diesel movie “Pitch Black” a spacecraft crashes onto a planet orbiting a binary star so there is permanent daylight however every few years the stars align with another planet and suddenly there is a month long period eclipse of pitch black night. On a similar theme, a newly discovered binary system sets a record for both the longest duration stellar eclipse and the longest period between eclipses in which a near total eclipse lasting three and a half years occurs every 69 years. That is just what happens in the newly discovered binary system TYC 2505-672-1 about 10,000 light years distant. The previous record holder is Epsilon Aurigae, a giant star that is eclipsed by its companion every 27 years for periods ranging from 640 to 730 days. An observation of this type of system is scale limited to the human lifetime. A bit like observing Halley’s Comet every 76 years. Fortunately there are resources that make these discoveries possible: observations by variable star observers held in online databases such as the American Association of Variable Star Observers (AAVSO) network and the Digital Access to a Sky Century @ Harvard (DASCH) program. The DASCH survey is based on thousands of photographic plates taken by Harvard astronomers between 1890 and 1989 as part of a regular survey of the northern sky. In addition there is the low-cost Kilodegree Extremely Little Telescope (KELT) system that uses 4.5cm lens coupled with CCD cameras to collect continuous photographs of the sky that are databased for public access. Searches of the KELT database, found about 9,000 images of the obscure system taken in the last eight years that combine with the 1,432 images taken over the last century to help fill in the picture. The analysis revealed a system similar to the one at Epsilon Aurigae, with some important differences. It appears to consist of a pair of red giant stars, one of which has been stripped down to a relatively small core and surrounded by an extremely large disc of material that produces the extended eclipse. In order to produce the 69-year interval between eclipses, the astronomers calculate that the stars must be orbiting at an extremely large distance, about 20 astronomical units, which is approximately the distance between the Sun and Uranus. The system is too far away to resolve optically but hopefully, technological advances will make that possible by 2080 when the next eclipse occurs.

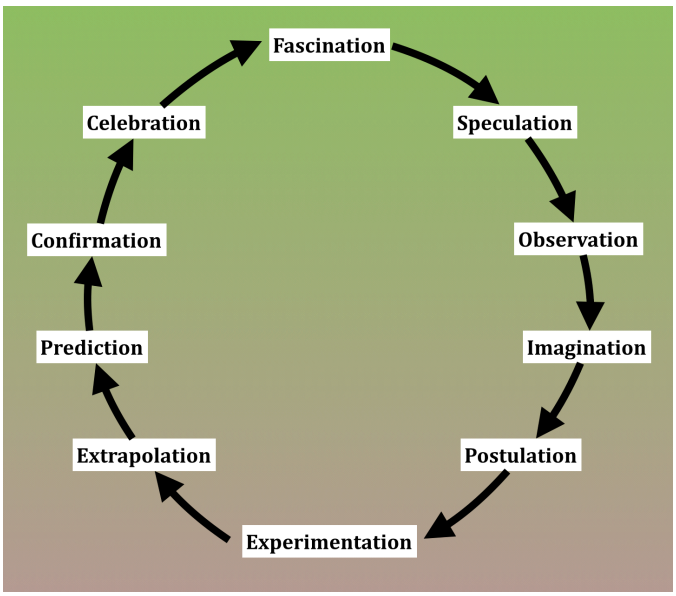
The Scientific Method and Amateur Astronomy

A Personal Perspective *by Peter Lowe*

Amateur science is a journey of exploration from the unknown to the known and you need to map your journey otherwise like ancient mariners you could end up lost at sea. Ever since the early 19th century professional and amateur scientists alike have used a standard map called "The Scientific Method" to learn about nature. It is not a complicated map and personally I have found it greatly enriches the fun of astronomy by adding the elements of exploring and understanding to the hobby. The scientific method is about facts and how we connected them. It is interesting today how we live our lives by facts, however what we regard as facts today are completely different from the facts we knew yesterday. For centuries, people's facts were those things they knew from personal experience because their lives depended upon intimate knowledge of the world around them. All other knowledge was treated as mystical tales that came from shaman, priests or social elders much like today's news, Internet and social media. The scientific method also depends upon facts and follows an established pattern that has been several hundreds of year in the making. A scientific fact is considered different to a fact based on common belief because it is based upon reproducibility. Scientific facts aren't necessarily right or wrong merely reproducible which means we can rely upon them to further develop our knowledge base. We all know of so called scientific facts that have later proved incorrect because they can't be reproduced. Well before the age of science, philosophers mostly argued about whether the goal of science or natural philosophy is either "truth" or "knowledge" and whether the accumulation of knowledge ultimately will lead to the truth. I am not about to engage in this metaphysical argument because it is an argument that has no resolution but I will merely state that I do not believe science will ultimately tell us the truth but it might get us closer to a believable truth.

Descarte 1596-1650 Sir Francis Bacon 1561-1626

The early stirring of scientific revolution in the 17th & 18th century was a period of collecting facts without interpretation, mere collection and documenting facts to extend knowledge. The Royal Society itself established in 1661 was founded on the principle of experimentation and publication of facts for the betterment of mankind. Theorizing was frowned upon as unproductive speculation. Interpretation or theorizing did come generations later. Theorizing was regarded as something akin to "Flights of Fantasy" of little value to mankind whilst demonstrated facts derived from experimentation were considered of practical use. Of course theorizing no doubt did occur at the after party's. In an attempt to "proceduralize" the creation of new facts, Sir Francis Bacon in the seventeenth century documented a procedure that he thought would extend knowledge. He believed that if you followed his procedure new facts could be found without the need for imagination. His method involved mechanically listing facts and properties then comparing lists to find linkages thereby revealing avenues for further experiments that would uncover yet more facts. Today, we would call these linkages hypothesises. His method did not work but it did lead the way to modern investigative methods that was the basis of the Royal Society workings. By contrast, the French philosopher René Descarte believed nature held hidden truths beyond the reach human senses, which he did not trust. He believed that pure thought was the ultimate source of knowledge and existence. ("I think therefore I am"). He would apply thought and imagination to create explanations of observed facts whereas Bacon believed that imagination was not necessary. ("The facts would speak for themselves") Both methods are equally wrong but they do differentiate the two opposing philosophical views of the way to understand the world. Mere thought without checking your facts leads to "flights of fantasy" whilst collecting facts without interpretation stifles understanding.



The collection of facts and the application of imagination to interpret those facts are at the heart of science but they are only the start of the scientific procedure. These two approaches to gaining knowledge ultimately led to the schism between pure and applied science in the 19th century, later prosecuted with devastating effects in the 20th century wars. Pure scientists saw themselves as merely observing nature and collecting facts without social responsibility. Applied scientists exercise their skills in developing machines and technologies for the betterment of mankind deferring social responsibility to governments that used expediency rather that rationalism to make their decisions.

Today's moralistic arguments surrounding such issues as nuclear energy, genetic modification, biological weapons, etcetera are off shoots from this 19th century schism and with the rise of government sponsored research in the 20th century shows no sign of resolution yet in the 21st century. As the old song goes, "When the rockets go up. Who cares where they come down? That's not my department says Vernher Von Braun".

Putting moral issues aside, the scientific method we know and understand today follows a sequence of actions in a never-ending loop. As shown in the diagram, the starting point is always fascination, curiosity, and inquisitiveness. It is the starting point for all amateur science including amateur astronomy. Humans by their very nature are inquisitive but not all humans go on to the next step of speculating, "Why is it so?" If you stop at that, you end up at the Bacon/Descartes barrier where no further progress occurs. (You can only look at the Moon so many times before it becomes boring but if you observe the Moon it never becomes boring)

The next stage is a bit harder requiring a degree of planning and is usually the stage at which amateur astronomers struggle because it needs a systematic approach rather than mere random viewing. This system is taught at schools for student projects. Following the Baconian method the amateur needs to collect the currently known facts but must then apply some imagination to ask, "Why is it so?" and then speculate at the possibilities. Many possible explanations might come to mind. At this time the theorists are in their ascendancy coming up with new explanations or postulations. Eventually a hypothesis is produced that suggests an explanation. A hypothesis is merely an idea that possibly explains the known facts but cannot make the transition to theory until it produces some new facts by experimentation. The known facts are collated and extrapolated looking for a prediction of new facts. If subsequent observations confirm these new facts then open the champagne for a party and the hypothesis becomes a theory. The best and current theory is just that explanation that best explains the known facts. Theories are of course just "flights of fantasy" but they are the best "flights of fantasy" we have until proven wrong. Science never finds the truth; it just allows humans to imagine the best "flights of fantasy". If it is a good "flight of fantasy" then the applied scientists can make good use of it. Science of course never accepts status quo and is always searching to test the current best theory. You can never prove a theory right but you can prove it wrong at which time the next best "flight of fantasy" takes over as the best current theory. Einstein is famous for saying that million facts can prove him right but it only take one fact to prove him wrong.

I hope you can see that science is based upon scepticism constantly testing the current best theory in an attempt to prove it wrong. Each time the sceptics are proven wrong the current theory is reinforced but when the sceptics are proven right the current theory must be modified or possible completely replaced by another.

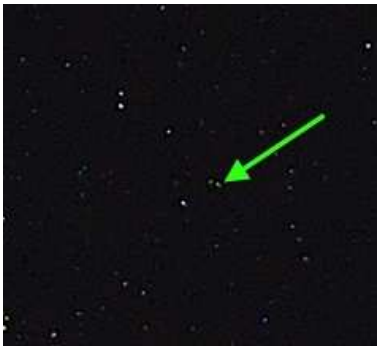
This is the fun and joy of the scientific method. It's very much like a game of Russian roulette. Each time we orbit the scientific method circle we win or we lose. The losers' die and the winners live to fight another day or in this case another experimental verification. To truly appreciate amateur astronomy you need to jump onto this scientific method circle and add some excitement into your personal astronomy making the transition from look-see viewer to observer.

FOOTNOTE:

For those members who would like to learn more about Project Observing using these methods please come and have a chat to me about how to get started. I'm hoping to get an astronomy school started mid-year to coincide with the completion of the observatory and we hopefully might be able to get a few projects started.

Over the years we have had a few members who have used these methods as part of their observing activities trying to help answer a few open questions.

For instance what is the frequency of supernova in galaxies and does it vary from galaxy to galaxy? Amateurs across Australia have been observing and photographing target galaxies to collect facts about supernovae aimed at establishing their rate of occurrence by galaxy type, nominally accepted at about one per galaxy every 50 years yet you have to look at a lot of galaxies to establish this rate and there are galaxies with very high rates of supernovae, why?



A project close to my heart was a study I did decades ago concerning the outburst mechanisms of recurrent novae. These stars can undergo explosive novae outbursts a number of times. Why? There were several competing theories to explain the explosion mechanism. It was finally resolved by amateurs taking repetitive observations over several decades to show that the mechanisms was associated with a sudden and catastrophic collapse of the accretion disc around a white dwarf star leading to a surface nuclear explosion. The picture at right is an image of the 2011 outburst taken by the author showing T-Pyxidis in outburst at magnitude 7and has now returned to its more "normal" magnitude 15.

There are many more questions still to be answer all they need is someone to ask why. Cheers Peter

MPAS Observatory update!!!

Work has progressed on the long awaited observatory. The roof frame is on & rolling quiet freely. Now the observatory is starting to look the part & everyone can get an idea of what it will look like. In the next few weeks, we hope to clad the frame in green Colorbond steel. The existing wooden building will be also clad in the same green Colorbond steel, to make the whole structure look as one. Once the steel arrives, an email will be sent out asking for members to come along & help with this work. *By Greg Walton*

Above - Roof trusses made and bolted in place... then roof battens & bracing is tek-screwed in place.

Left & Below - wooden frames hold the "C" beams in place while the concrete sets.

Below - all welds painted on truss roof.

Below - close up view of wheels in "C" beam, small rubber wheel at top helps to keep the roof central & stops any metal rubbing.

Above - The temporary wooden supports removed & the roof is on the move. We have fitted end stops in the "C" beam, so the roof can't be pushed out on to the ground.

Left - Colorbond sheet metal on site.

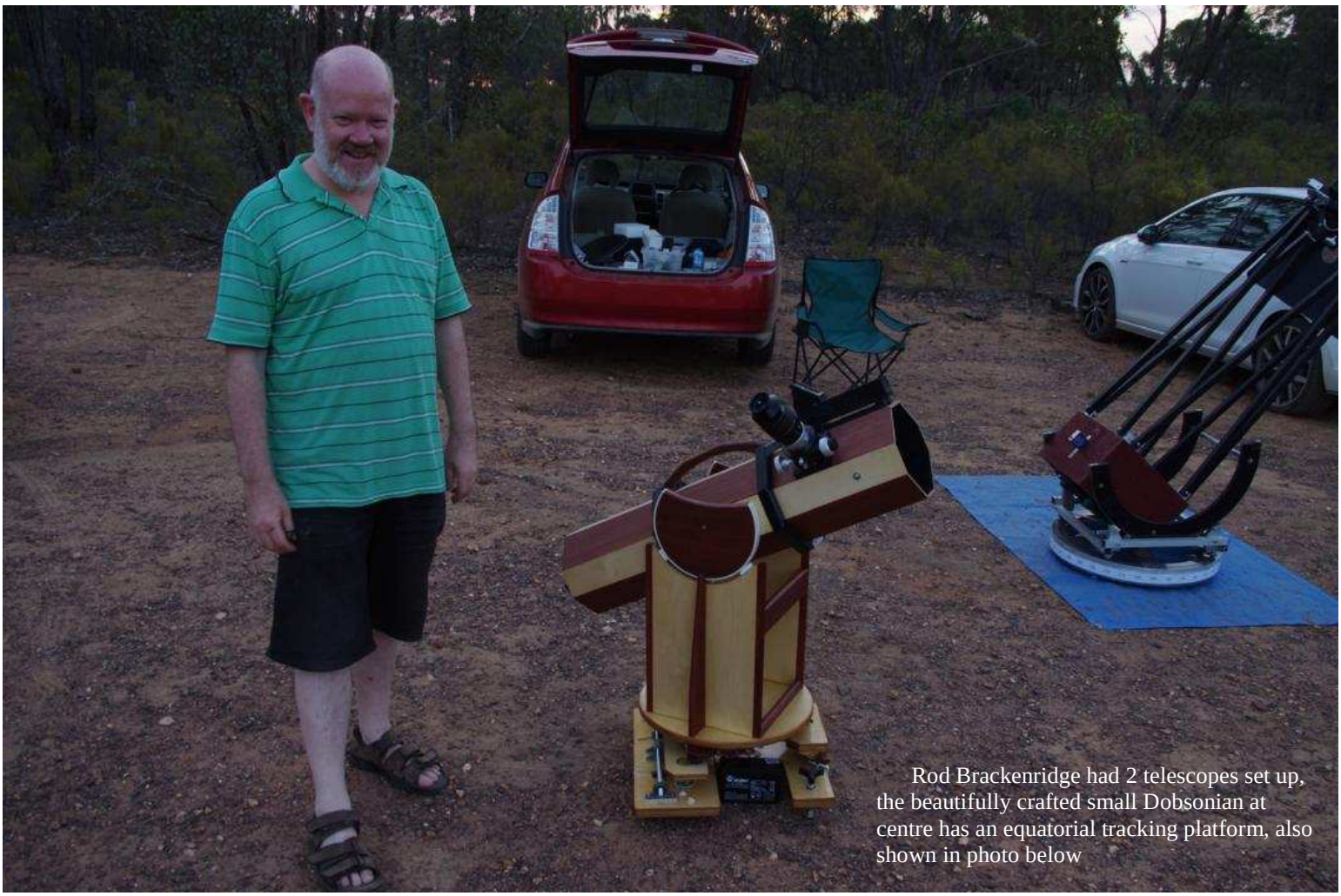
Below - Corrugated roof all screwed down.

Bottom - Repair work has started on removing the old weather boards & replacing rotten timber frame, then fitting the new colour bond sheet metal.

The last big effort to get the observatory finished & the old shed clad in colour bond. New internal wall, 2 doors, window, Gutter & drains were fitted, also floor was painted & shade cloth was put around rails to stop people from walking in to them in the night. We also installed the wiring & computer cabling. We even got a change the install some telescopes & computers. Also a lot of time was spent removing rubbish, cleaning up & dusting.
I must say, the observatory is looking very good, thanks to all these who worked on the project. See photos below

MPAS working Bee 19 March 2016 https://youtu.be/q6GqLVMYMfU

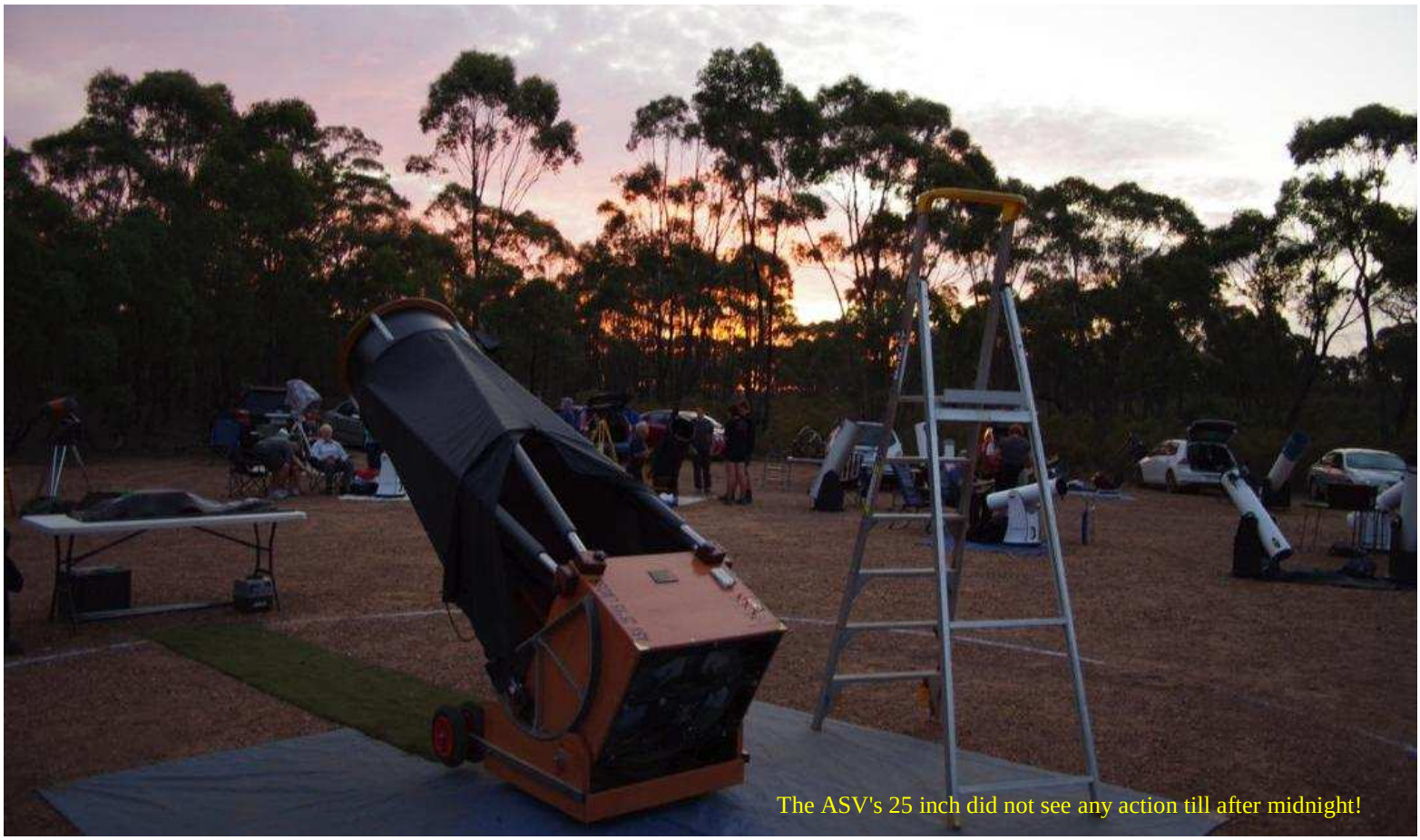
MPAS @ the Messier Star Party, *by Greg Walton*



Rod Brackenridge had 2 telescopes set up, the beautifully crafted small Dobsonian at centre has an equatorial tracking platform, also shown in photo below

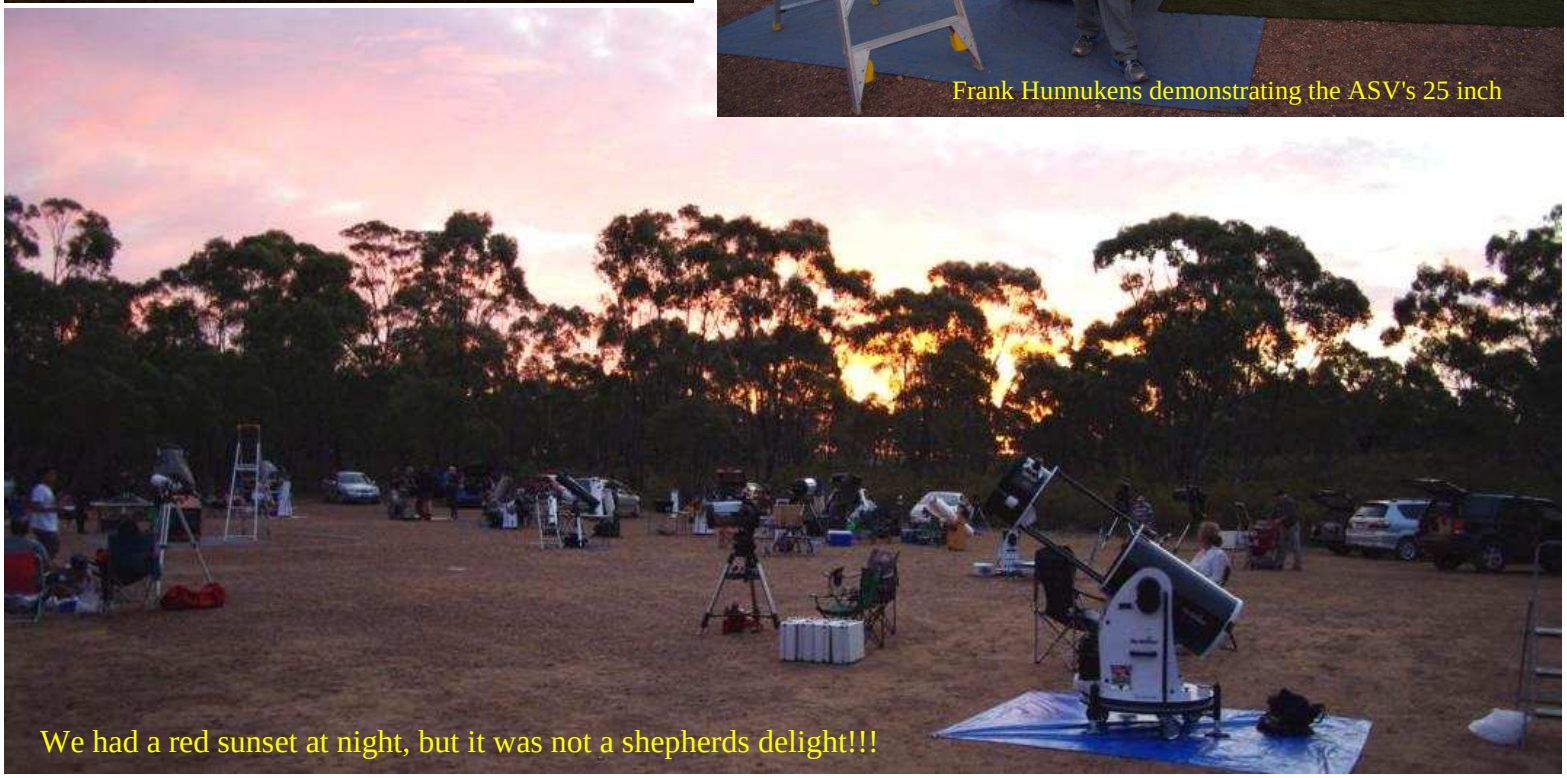
In Melbourne the sky was cloudy, but the forecast for Heathcote was 35 degrees with patchy cloud. We arrived at 3:30 pm to find only a small number at the ASV's LMDSS. Even the Lions club did not show up. But as time passed more people arrived till there was well over 100 people on site & about 40 telescopes. Luckily 2 of the local wineries set up & sold their observing elixir. Pia & I set up camp down the back - well away from the crowd, waiting for the sun to go down before setting up the telescope & cameras; it was just too hot. As time passed the clouds rolled in & covered the sky, with no stars in the sky a small group of MPAS members gathered around the wine till 1am. Then the cloud disappeared and I sat in my bino-chair cruising the heavens till 3am. I then walked around the viewing field but most had packed up there telescope & gone to bed. I did not get my astrophotography telescope working as the sky was hazy, but my time lapse camera run all night. Click on the link to play...
Messier Star Party 2016 https://vimeo.com/158117319

Pia & I set up far away from the crowd.



The ASV's 25 inch did not see any action till after midnight!

Frank Hunnukens demonstrating the ASV's 25 inch

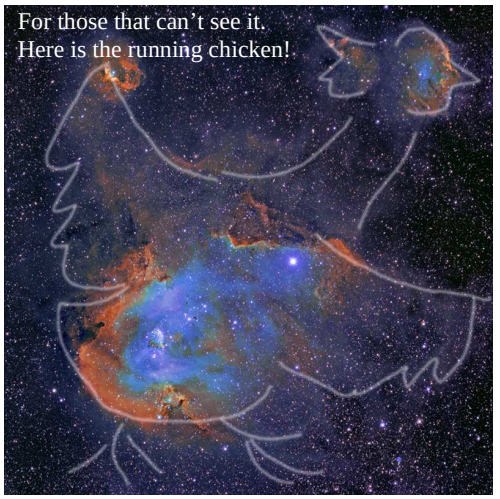


We had a red sunset at night, but it was not a shepherds delight!!!

MPAS @ Snake Valley Astro Camp, *by Jamie Pole*

The running Chicken Nebula IC2944
Narrowband Component of Ha

On the long weekend in March (11th to the 14th of March 2016) an MPAS contingent of three – Paul, Alios and Myself – made the trip to Crystal Lake cabins, just outside of Snake Valley – near Ballarat for three nights of dark skies and catching up with friends from previous camps. Whilst the weather wasn't the most co-operative (we had three nights, where we had crystal clear skies until midnight or 1am when the cloud / fog rolled in to spoil the party). The event was well attended with about 45 attendees, with some visual people with some big dobs, some newcomers who came down to view the dark skies through some new telescopes, and members scopes, and a large imaging contingent. All had a good camp, and thanks to some early morning cloud, weren't all that sleep deprived upon our return. There were some great presentations – one from Paddy – one of the regulars – on the LMC and surrounds, detailing lots of areas of interesting areas to observe – some of the information presented is available here: http://cloudsofmagellan.net.au Another presentation by John Glossop (another Snake Valley regular) who did some basics of astrophotography presentations, and also some basic image processing sessions using both Deep Sky Stacker, and Photoshop, with some ETA Carine data that was passed around. Lots was learned, and fun was had. There were a couple of very 'artistic' renderings of Eta Carine to be seen around the room, highlighting the relative complexity of some of the image processing techniques. There was a return of the traditional Snake Valley Saturday night feast in the form of a spit roast. We made the mistake of letting Paul Albers get a first helping from the smorgasbord of meats available, thankfully, due to some over catering by Malcom – we all managed to get by on what he left behind. There was also some Pavalova made available by one of the attendees (no not me!) – to try and temp David Rolfe to drop by, but alas it was all gone by the time he arrived on the way back from a 4wd adventure. If you've never attended a star party before – I can thoroughly recommend the Snake Valley camps for an overall friendly and helpful group of people, relaxed atmosphere, and general love of astronomy. I've very much enjoyed each camp I've been to, always felt welcomed, and had a great time regardless of the weather. We had several attendees this year that had very little by way of skills or equipment, who were welcomed and showed the night skies, and hopefully learned a great deal. For more information on upcoming camps see http://www.snakevalleyastrocamps.org/ - they normally hold two camps a year – March and November. I think at this point November 2016 camp may be held on the Grand Final long weekend in October, so watch the website for details. I managed to do a little solar imaging (sorry, I'm a little rusty as I haven't done some for a while) – and started collecting some data on the Running Chicken Nebula (some incomplete data included).



For those that can't see it.
Here is the running chicken!

Performing 'surgery' on Alios's binding mount

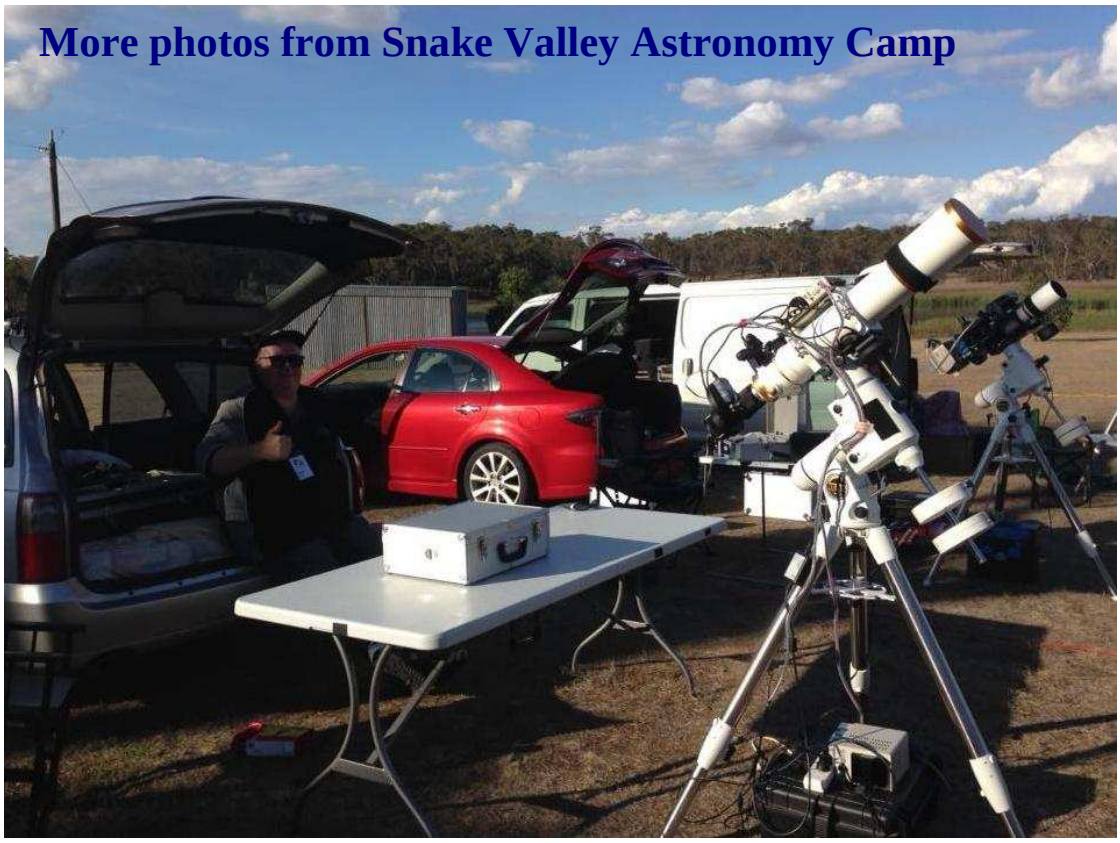
Saturday spit roast

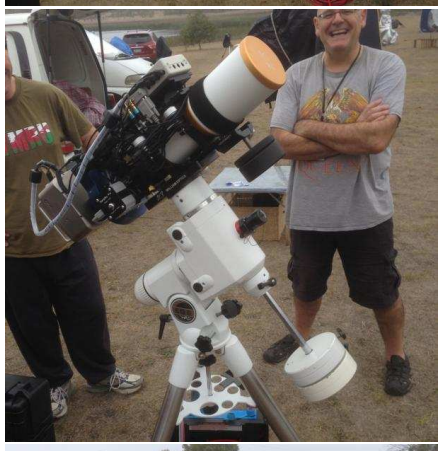
Dave Bait (otherwise known as Pavalova)

Camp at night with fog/cloud approaching - Snake Valley Astronomy Camp

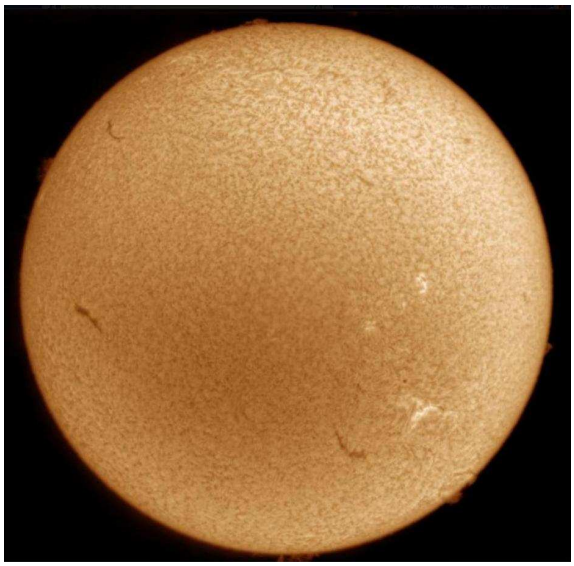
Early Morning Fog at camp - Snake Valley Astronomy Camp

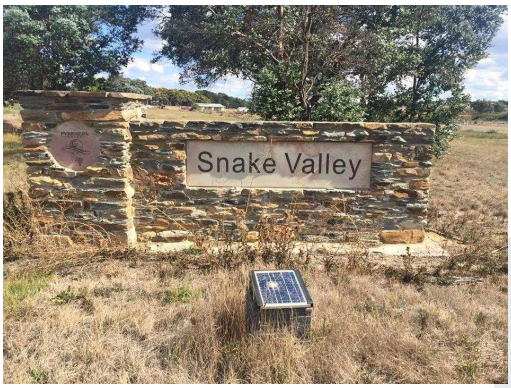
More photos from Snake Valley Astronomy Camp





Top Left – The MPAS contingent of scopes lined up at SV (Paul, Myself, then Alios at the end).
Top Right – Checking out Paul's focal reducer issues….
Top Right – Second down – My Setup
Centre – Solar Image taken from Saturday the 12th of March.
Right of Sun – Still playing with Paul's focal reducer issues…
Lower Right of Sun – Still discussing Paul's focal reducer issues…
Left Lower of Sun – the Sign on the way into Snake Valley
Lower Left – Paul about to tuck into the Saturday Night Feast.
Centre Bottom – Paul's image of Centaurus A from his Newly acquired FLT110 Triplet.
Bottom Right – a QHY CCD Pole Master camera – (polar alignment camera, driven from a PC) fitted to my EQ6.





Below - Information for image on front cover.

Paul Albers
March 14 at 3:32pm ·

First CCD image through the William Optics FLT110 triplet.
"Centaurus A" Taken with the QHY9 Mono with a total of 2 hours worth of Data. RGB 300 sec x 5 2x2 bin each and Lum 300 sec x 5 1x1 Bin. Master Darks, Bias and Flats applied processed with CCD stacker and PS3.
Had a great time meeting new people, making new friends at the Snake Valley Astro Camp. Looking forward to November!

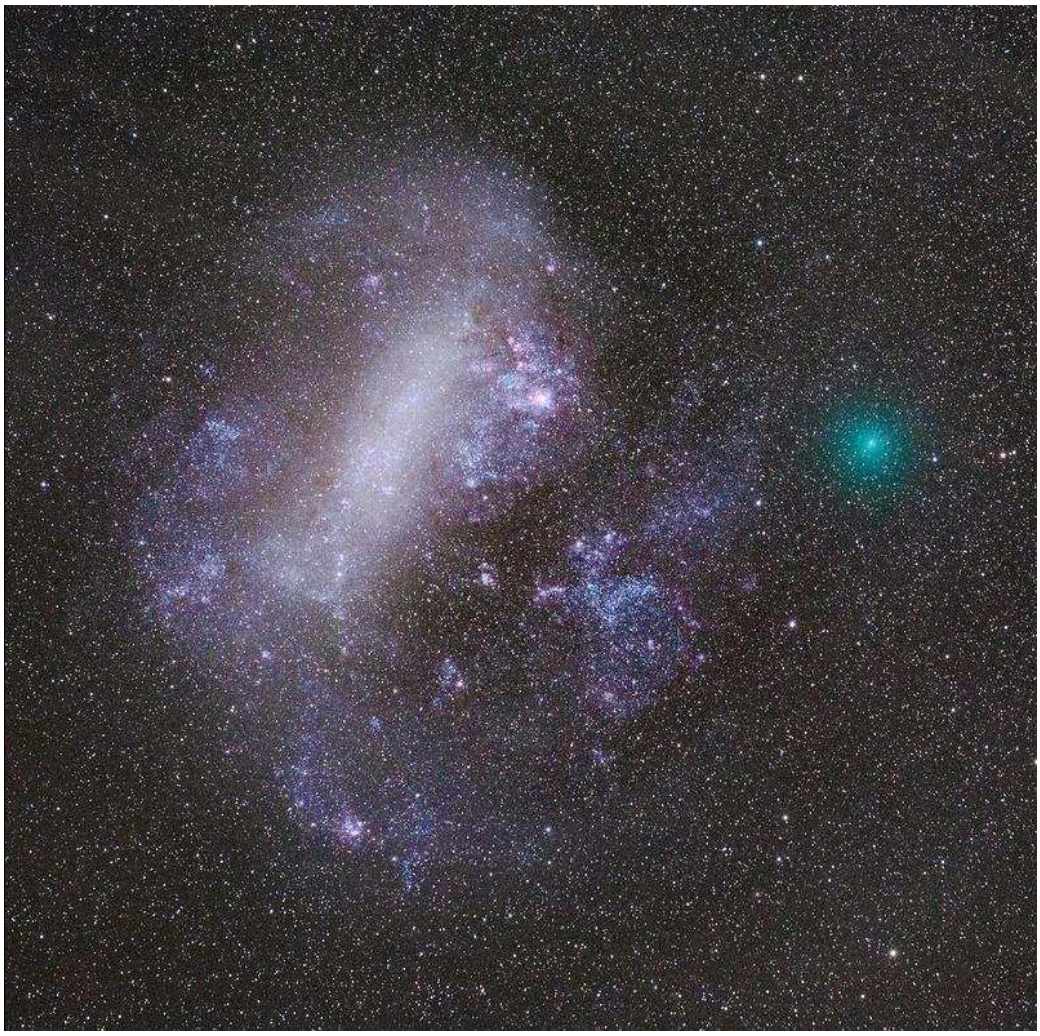
MPAS Gallery

After the MPAS monthly meeting some members imaged Comet Linear 252P on the 17th March 2016

Above - From the MPAS Briars site, *by Andrew Nilsson*

Right - From the blow hole track Flinders, Comet Linear 252P & LMC, *by Alex Cherney*

Below - From the blow hole track Flinders, Comet Linear 252P & LMC, *by Greg Walton*



SOCIETY INFORMATION

Dave Rolfe

Paul Albers

Peter Skilton

Jamie Pole

Trevor Hand

Stewart Gangell

Peter Lowe

Greg Walton

OFFICE BEARERS OF THE MORNINGTON PENINSULA ASTRONOMICAL SOCIETY

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

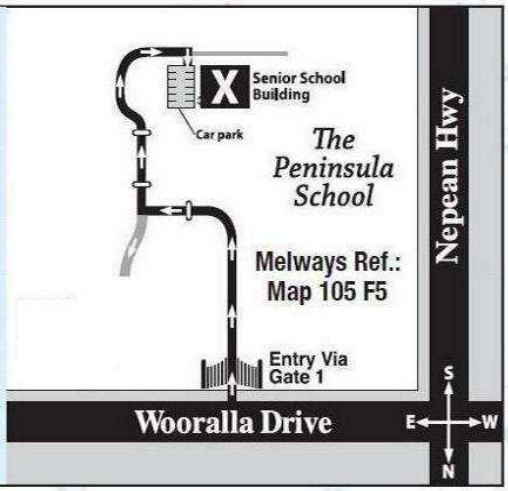
Secretary: Peter Skilton
Treasurer: Jamie Pole
Web Master: Steven Mohr
Scorpius Editor: Greg Walton
Library: Fiona Murray

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.

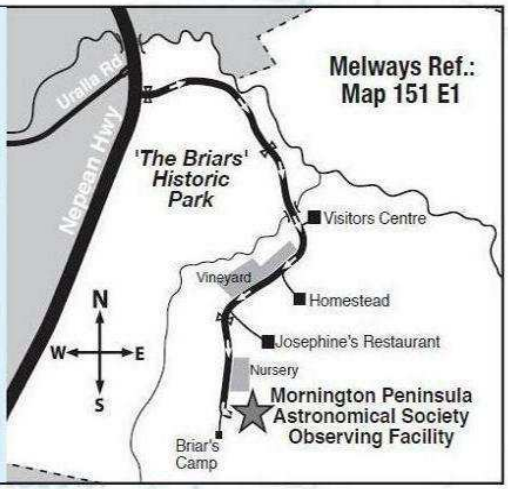
To join, go to: http://groups.com/group/e-scorpius and sign up to Yahoo groups - *You require to sign up to Yahoo groups to join E-Scorpius*. Once you have signed up at Yahoo groups, email welcome@mpas.asn.au saying that you want to join E-Scorpius and you will be added to the E-Scorpius list.

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 gwmpas@gmail.com