

SCORPIUS

THE JOURNAL OF THE
MORNINGTON PENINSULA ASTRONOMICAL SOCIETY INC.

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Volume XXVI, No 2 (March / April) 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

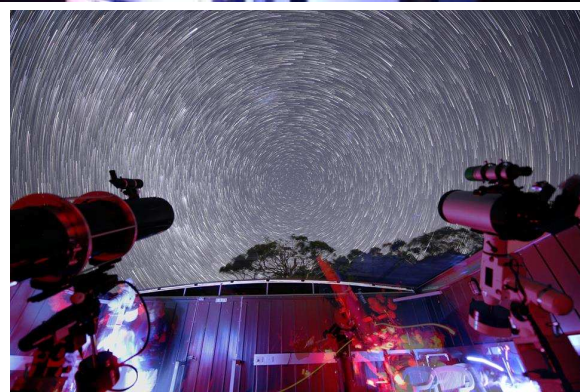


Cover images - by Jamie Pole

A clear night and a free calendar are a rarity these days.

Paul Albers and I managed to find both at once. We spent a few hours observing from inside the Society's new observatory.

Time Lapse by Jamie Pole
<https://vimeo.com/196782711>



SOCIETY NEWS

By Greg Walton

January public night - Last night 6th Jan was busy at the Briars. Thanks to everyone who helped out. There was a trial with 2 talks simultaneously (thanks Trevor Hand & Peter Lowe) with the 140+ attendees; it seemed to work well. We also experimented processing the entry fees at the top gate to stream-line the process, as once a large group enters it is hard to keep track of who has registered or not (thanks Jamie Pole & Paul Albers). We also signed a handful of memberships and received some renewals at the gate. We can implement this next Friday if we get the big booking numbers again. *Regards, Dave Rolfe.*



John Cleverdon



Rohan Baumann

Yes the Briars was buzzing with activity last night 6th Jan, with 141 from the general public in attendance, with even one person turning up at 10:30pm! Now that was keen. Looking back at the Society logs over the last 30 years, we've only had 3 other public nights that were bigger, with 145 at a Mars opposition and 155 and 165 at two previous National Science Week public nights. Those had good coverage in local newspapers in the weeks preceding them, boosting general interest. Such crowds clearly present logistical challenges not only for seating, but to being able to hear the talk over the ambient noise level, and of course having enough tea, coffee, biscuits, cordial and cold cans of drinks present to keep everyone going.

And, of course, with that number of members of the public present, the Society members who come along to help out with telescopes and other activities are vital to the success of the evening and are much appreciated. With another Briars public night on the next two Fridays and with more warm weather on the way, who knows, we may yet reach our #1 attendance number of all time. *Regards, Peter Skilton*



John Cleverdon



John Cleverdon

Yes, it was an impressive night last night, one of the biggest crowds at a public night I have seen. *Regards, John Cleverdon*

Point Leo Public viewing night - Approximately 42 in attendance - 7 members and 35 members of the public. Peter Lowe did the talk in the Point Leo camping ground information centre. While outside under a cloudy sky, Peter Skilton, Tony Nightingale, Jamie Pole, Fiona Murray, Dave Rolfe & I, manned the telescopes. Unfortunately we were only able to show Venus & the Moon.

On the same night the Briars Observatory was opened by Sky Murphy, but due to the clouds & the very busy Friday night, we had only a few members in attendance. The night finished early at about 11:30. Thank you Sky for helping out.

13th January public night - Approximately 30 in attendance - 15 members and 15 members of the public. A stark difference from the week before when we had 141 members of the public. Trevor Hand did the talk while other members opened the observatory & set up telescopes. We also did some cleaning & little repair jobs on some of the telescopes. This time with the smaller number more time could be spent at the telescopes. Amazingly the sky became clear after a day when it rained for most of the day. The public got to see Venus, Mars, Uranus, M42, NGC104, NGC3372, star spectra & the almost full Moon which climbed out of clouds on the horizon at about 10pm.

20th January public night - Approximately 32 in attendance - 12 members and 20 members of the public. Another small turnout of the public, which meant more time at the telescopes. But the sky was cloudy most of the early evening & only becoming clear at 10pm, long enough for the public to see M42, NGC104, NGC3372 & star spectra. Trevor Hand did the talk while other members opened the observatory & got some training on the use of the new telescopes.

January members' BBQ & observatory training, 21st - Approximately 15 members attended the BBQ & another 12 members arrived later for viewing, astrophotography & training on the telescopes in the observatory. The sky was clear, not a cloud in sight, though the sky had a glow to it because of high humidity. Members took it in turn practising start-up & shut-down procedures with the telescopes. After these we demonstrated putting cameras on the telescope & taking images of some bright nebulae: M42, NGC3372 & M46. Outside Alois & Andes set up telescopes for astro-imaging, while David Booth showed many objects through his 12 inch Dobsonian with Argo-Navis. Special thanks to Mark Stephens for not burning the sausages & helping the young lady with setting up her new telescope. Also thanks to Tony Nightingale for the great salad & Pia for scones with jam & cream. It was one of the best viewing nights we have had in a while.

February public night - Approximately 80 in attendance - 20 members and 60 members of the public. The sky was clear with the Moon at first quarter. Trevor Hand did the talk in the big shed, while other members opened the observatory & got some practice on the new telescopes. Also members set up a large array of telescope on the concrete slabs. The public got to see the Moon, Venus, Mars, M42, NGC104, NGC3372, M46, NGC5128, NGC4945, the Jewel Box, Ghost of Jupiter & star spectra! Many stayed till mid night.

February Society Meeting - First meeting for the year saw about 30 members in attendance. Dave Rolfe (President) chaired the meeting and talked about what has been happening & upcoming events at MPAS. Then our speaker, MPAS member Helmuth Schultes, did an excellent talk on spectroscopy, theory and practice. Then Sky Murphy did sky for the month, after which members chatted over coffee.

Telescope learning day & February members BBQ - The day started at 2pm with only a few members of the public, but as the day progressed more & more people arrived. MPAS members did 3 talks on the day: first up was Mark Stephens then Kevin Rossiter & Peter Lowe. The public brought along their telescopes & MPAS members showed them how they worked. We also showed how to check the alignment of the telescopes with a laser. We also had 3 solar telescopes set up on the lower pad, only getting glimpses of the sun between the clouds. No sunspots or prominences could be seen. At 6pm Jamie Pole & Dave Rolfe fired up the BBQ, while other members set up tables & plastic chairs outside, as the big shed was set up with chairs for the talks. I counted about 40 people queuing for food, half of them MPAS members. But there was a steady stream of people coming & going all afternoon, so I'm not sure how many attended. After a sprinkle of rain, we opened the observatory roof & showed how to start up the GOTO telescopes. As the sky darkened the cloud did thin out & more telescopes were set up. A crescent Venus was on display in many of the telescopes. Most members were run off their feet helping the public get the most out of their telescopes & it was 12:30 before the last of them went home. Another successful MPAS event. Thank you to all the members who helped out on the day. Photos by *Jamie Pole*

*Jamie Pole**Jamie Pole**Jamie Pole**Jamie Pole**Jamie Pole*

Trent McDougall has generously donated a brand new Celestron CG-5 equatorial Go-To mount to the Society. On behalf of the Committee and Society members I would like to thank Trent McDougall for his donation. Thank-you so much. Donations like these mean a lot to small Societies like ours. Sincere thanks!

"My pleasure, I hope that the Society gets many years from it" Trent McDougall

Photo of the mount assemblies by Sky Murphy



Paul Albers has decided he can no longer do the role as Vice President. So

we need to say special thanks to Paul Albers for all the great work he has done for the society while he was Vice President.

Peter Lowe will stand in as Vice president till the next annual meeting in the middle of this year.

So we are one committee member short at the moment. If any member wishes to help out a committee, contact Dave Rolfe (president)

d.rolfe@mpas.asn.au



New Members Welcome

Silvia Koslow
Anne Algar
Deepinder Singh (family)
Hannah Mendelson
Ian Haywood (family)
Eamonn Gunning
Geoff Guest
Caroline Graley
Geoff Stebbing (family)
Fred Swainston
Michael Ypelaan (family)
Alison Coates
Papiya Hall (family)
Scott Harnath (family)
Loka Sampangiram (family)
Stuart Whiteley (family)
Ian Morrissey

Victorian Astronomical Convention 2017

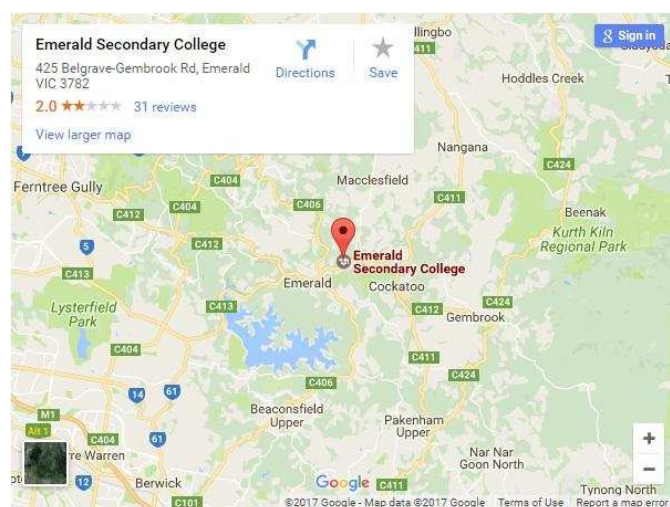
Saturday 6 & Sunday 7 May 2017 at Emerald Secondary College

VASTROC 2017 for the first time will be hosted by the Mt Burnett Astronomical Society.

They are now calling for papers to be presented at Vastroc. MPAS members have always supported & attended this bi-annual event, which is an excellent opportunity to catch up with members from other Victorian astronomical societies.

Vastroc will be held at the Emerald Secondary College (see map)

Check the web site for details - <http://vastroc.net/>



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.

MPAS SUBSCRIPTIONS 2017

The ticking over of the New Year also means that society fees are now overdue to be paid. The society members have worked hard to ensure that 2017 fees are still the same as last few years' prices. So to assist us all in maintaining the shared facilities and service we provide, we appreciate your prompt payment for the 2017-year ahead.

As a reminder, the structure of the fees is as follows:

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 further information - https://drive.google.com/file/d/0ByvkvxZGI9g_NXZ4cWxHbERTdEE/view?usp=sharing

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

A word from the Scorpis editing team.

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

Send them to:

Greg Walton
gwpmpas@gmail.com

Brett Bajada
Peter Lowe
Bruce Renowden

CALENDAR		March / 2017				
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1	2	3 Public Night 8pm Moon 369,062km	4 MPAS Observatory open to members till ~midnight
5 Moon First Quarter	6	7	8 ASV Meeting	9	10	11 MPAS Observatory open to members till ~midnight
12	13 Full Moon Labour Day	14 Jupiter right of the Moon	15 Society Meeting 8pm	16	17 St Patrick's Day	18 Solar Day 11am Members Night BBQ 6pm
19	20 Saturn above of the Moon	21 Last Quarter	22 Committee Meeting 8pm	23	24	25 MPAS Observatory open to members till ~midnight
26	27	28 New Moon	29 Mercury right of the Moon	30 Mars right of the Moon Shadow transit Jupiter	31	

Monthly Events & Highlights. ***Many comets in the sky this month; one may brighten***

Public nights 3rd, 8pm start at the Briars - **Society Meeting** at 8pm on 15th @ the Peninsula School

Members Night BBQ 6pm at the Briars 18th - also **Solar Day** 11am at the Briars 18th (Ian Sullivan will talk on the Sun)

Evening - Europa shadow transit on Jupiter 8pm on the 30th

Morning - Comet Panstarrs could brighten near M8 on the 1st & M22 on the 8th - check the **Southern Comets** web site

CALENDAR		April / 2017				
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
30						Moon in Hyades 1 MPAS Observatory open to members till ~midnight
2 Daylight Saving Ends	3	4 First Quarter	5	6 Europa shadow transit on Jupiter	7 Public Night 8pm	8 Jupiter Opposition MPAS Observatory open to members till ~midnight
9	10 Jupiter right of the Moon	11 Full Moon	12 ASV Meeting	13 Europa shadow transit on Jupiter	14 Easter Friday	15 Easter Saturday MPAS Observatory open to members till ~midnight
16 Easter Sunday Saturn right of the Moon	17 Easter Monday	18	19 Society Meeting 8pm Last Quarter	20	21	22 Sky Atlas Members Night BBQ 6pm Working Bee 12pm
23 Moon occults Neptune at 3am visible from Cape York, Darwin to most of WA	24 Venus left of the Moon	25 ANZAC Day	26 New Moon Planning Committee Meeting 8pm	27	28	29 MPAS Observatory open to members till ~midnight

Monthly Events & Highlights.

Red Days indicate School Holidays

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

Working Bee 12pm at the Briars 22nd - (We will put the job list on e Scorpius the week before)

Members Night BBQ 6pm at the Briars 22nd also **Sky Atlas**, learn how to use a sky atlas 6pm at the Briars 22nd

Evening - Moon in Hyades on the 1st - Europa shadow transit on Jupiter 10pm on the 6th & 11:30pm on the 13th

VASTROC 2017 hosted by the Mt Burnett Astronomical Society check the web site <http://vastroc.net/>

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

But Why?

At one of the recent public nights, a young member of the public asked, **But why do you look at the stars?** At the time I was caught off guard & did not have a thoughtful answer. But the question did get me thinking.

When I was young, maybe I had an inquisitive mind & just wanted to know how things work. At school, I was told that the universe went forever. This did my head in!!! My mind tried to reach the end of the universe. How can something go forever? Forever is really big!!! If the universe went forever, then anything is possible or in other words there would be space for any possible situation, no matter how bizarre.

If I travelled in a straight line, eventually I would meet an exact copy of my self, doing exactly the same thing, at exactly the same time. If I travelled further I would meet an exact copy of the earth, with all the exact same people, doing exactly the same thing, at exactly the same time. Travel further & I should find an exact copy of our galaxy.

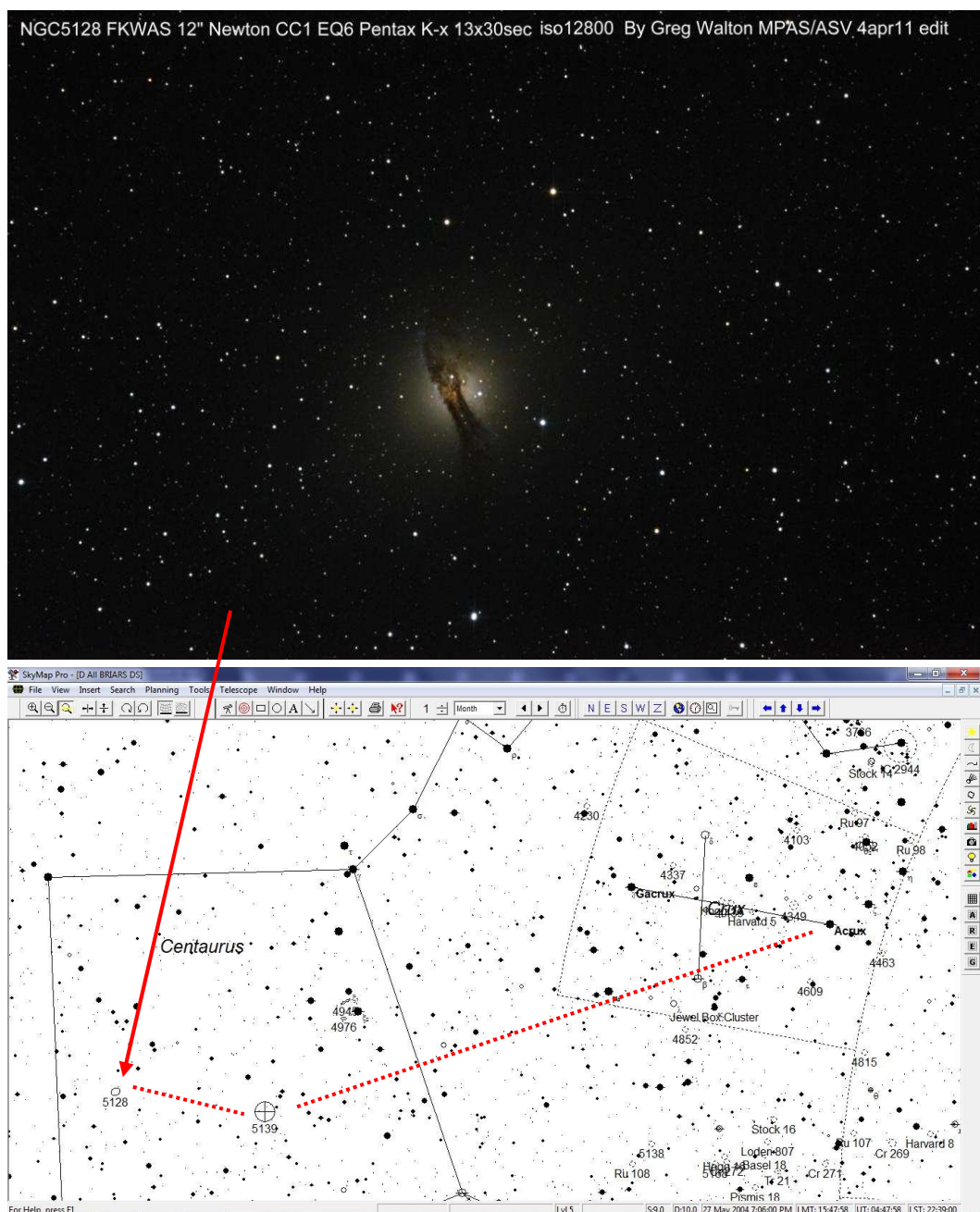
For the first 38 years of my life, I was an armchair astronomer: just reading books & dreaming about buying a telescope. That all changed when I built an 18 inch Dobsonian telescope *Sky Drover*. Then I was able to find the objects in the sky which I had read about, just to see if they were really there!!! I read about the Hamburger galaxy **NGC5128**. An interesting name for a galaxy, because it has a dark line through its centre, as it had collided with another galaxy; also it's a very noisy galaxy. I saw that it was not far from the Southern Cross, so this would be my first galaxy I would find. If I drew a line through the 2 brightest stars in the Southern Cross & moved the telescope 2 times the length of the southern cross, this would put me close to globular cluster NGC5139, which is near the right spot in the sky. With a bit of scouting around I found it. **"YES** there it is, my first galaxy, the books I read were not lying!!!" It was a great feeling to find my first galaxy.

The Hamburger galaxy is 14 million light years (LY) away, fairly close as galaxies go & about 50,000 LY across or half the size of our milky-way. Also a fast moving galaxy, travelling away from us at 545 kilometres per second. It can be seen with a small pair of binoculars, at magnitude 6.7 & almost as big as the moon at 0.4 degrees.

I think there is a certain romance about collecting this long travelled light & using a telescope to convert it into a beautiful image, which we can study & admire. We are lucky, we live in a time of digital photography & anyone can create beautiful images, like the photo of the Hamburger galaxy at right, which I took some years ago.

Today I do astronomy because it's a challenge, it's beautiful, I like showing others the night sky objects in my telescope & I like telling stories about these objects.

Also it makes me look smarter than I really am. *Greg Walton*



MPAS Briars site 1990 to 2016

There is now a website where you can view a 'time-lapse' of Landsat satellite imagery over the past 32 years, one image/year. Go to: <https://earthengine.google.com/timelapse/> and search for or zoom to your area of interest. Regards, *John Cleverdon*

Below - MPAS Briars site in 1990



Below - MPAS Briars site in 2016

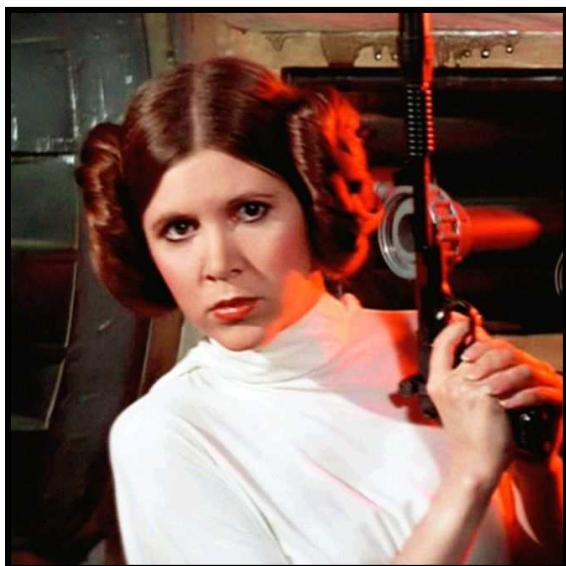
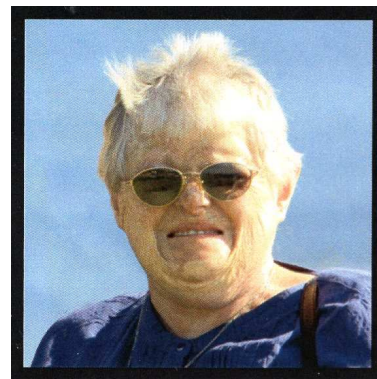


See all the new houses to the north of the Briars. This has increased light pollution at the MPAS site.

Was interesting watching the mouths of Victoria rivers changing their positions, forests being cleared & then regrowing in east Gippsland, and how wild fires changed the landscape in western Victoria & South Australia. I also watched Antarctica to check on global warming, but I did not see any change. Then I went to China to see cities appear from nothing & spread like cancer. *Greg*

While 2016 was a seminal year for the society with the construction and dedication of the Peter Lowe Observatory together with its significant instrument upgrades plus the extensions of the main build, the 2016 year unfortunately ended on a sad note with the loss of three astronomical ladies who have passed into society history.

Joyce Anne Rossiter, a regular attendee at our member's nights and mother of long-time member Kevin passed away suddenly at home on Dec 11th after a short illness. Joyce enjoyed these social get-togethers and regularly helped with the normal BBQ preparations contributing to the success of these events. The other regular ladies recall their afternoon walks together around the Briars with fond memories. Joyce will be sorely missed.



Actress Carrie Fisher, aka Princess Laia Organa from the Star Wars film series died aged 60 on Dec 28th. Princess Laia was one of the general public's most well-known fictional space characters and helped crystallize their view of space and space travel in the 1970's. At the time the public's view of space was quite parochial and very Buck Rogers like as they watched real life Apollo astronauts performing missions to the Moon. Despite the film's many defects in fact, it introduced astronomical ideas that changed that parochial view and was a great boost to the public role of the new Astronomical Society of Frankston. The fictional extra-solar planet Tatooine was the public's first realistic concept of planets and life beyond the solar system. Tatooine is a fictional planet orbiting double star and helped take the public's view toward the stars. Since that time a real version of Tatooine has been discovered. It serves to highlight the close relationship between science fiction and science fact particularly in film.

Finally on Dec 25th the astronomical world experienced the loss of the famous woman astronomer/educator Vera Rubin. Science has always been a male bastion and was even more so in the 1950's. In her 1954 PhD Vera was the first to conclude galaxies were clustered rather than randomly distributed in space, an idea that took a further twenty years to be universally accepted. She served in various professorial roles at Georgetown University before joining the Carnegie Institution in 1965 studying the rotation of the Andromeda galaxy and became the first woman "allowed" to use the instruments at Palomar Observatory. She pioneered work on galaxy rotation curves, which showed the predicted curves were incorrect. The outer regions were orbiting far too fast and concluded there must be addition matter (dark matter) holding the galaxies together. She continued working on the analysis of how stars move in the outskirts of galaxies until her death. Observational evidence for existence of dark matter is comparable to the observational evidence of the Big Bang background microwave radiation for which its two male discoverers received the Nobel Prize. Many argued that Vera Rubin should have received similar recognition however a look to the Nobel Prize roll call still shows the remnants of that male bastion.



Interestingly Vera's astronomical story started when she joined a local amateur astronomical society. All professional astronomers start as amateurs. Vera was a staunch campaigner for more women in science.



By Peter Lowe

ASTRO NEWS

By Peter Lowe

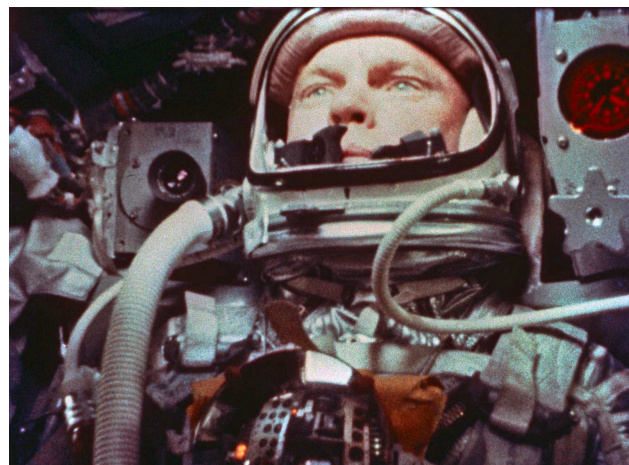
Early Space Pioneer Dies

December 8, 2016 marks the end of an era for the US Mercury manned space program. The last of the American Mercury astronauts John Glenn died at the age of 95 years. He was the first American to fly into orbit in 1962 and the last living astronaut to have flown solo in space. Believe it or not, we still have society members, present company included, who lived through and still remember the “Good Old Days” of the early manned space program. It was an exciting, exhilarating, fast moving period in space history. I don’t actually remember the launch in 1957 of the first satellite Sputnik-1 by the USSR but I do recall a lot of public excitement at the time. I remember my father showing me a newspaper and explaining that it had something to do with space. Later he got me a poster of the solar system, which was probably my first space chart. (I still have it in a bottom draw somewhere) In a very short time I took a pen to the poster and corrected all the mistakes, an unfortunate habit that I still retain to this day. At school all the kids knew the names of the astronauts and we all had models of space ships. The space missions Soviet and American made the headlines every time. I recall it was very much like a Grand Final Footy Show in which every scoring point was reviewed, discussed and picked apart by the instantaneous media space experts. At that time the Soviets were definitely winning.

The American Team



Front row, left to right: Gus Grissom, Scott Carpenter, Deke Slayton and Gordon Cooper. Back row: Alan Shepard, Wally Schirra and John Glenn.



The Soviet Team



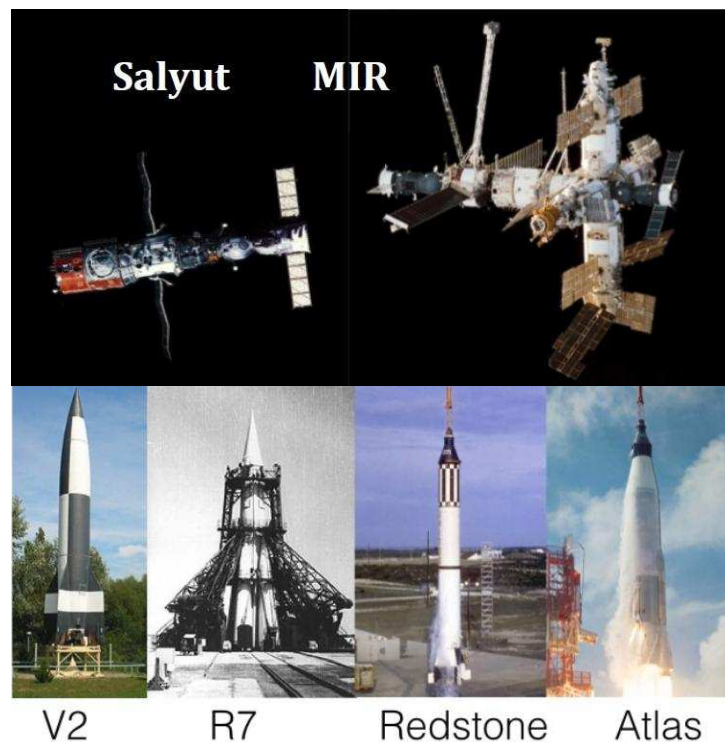
Active Cosmonauts (1) Korolyov Chief Designer (2) Y.Gagarin (3) G.Titov (4) P.Popovich (5) A. Leonov
Others were backup crew or support people

Pre-Match Review - Both sides were reasonably evenly matched post WW2. The US had a number of German V2 rockets plus the entire V2 rocket design team under US Army control. They had aircraft deliverable nuclear weapons and were not much interested in rockets except to keep their German rocketry experts under wraps and away from the Soviets. Furthermore there were war crime accusations to be handled. The Americans initially took a “sweep things under the bed” approach. The Soviets had a few partially built V2 rockets together with the assembly engineers and ground support technicians. Believing a war with the USA was likely forthcoming; they were frantically working to develop nuclear tipped rockets capable of traversing the Pacific Ocean. The nuclear ICBM age was beginning. Their first move was to build V2 rocket duplicates designated R1 followed quickly by an upgraded version designated R2 before moving on to a much more powerful cluster rocket known as the R7 which ultimately became the worlds first nuclear ICBM. The Americans knew nothing of these developments.

The Games Afoot. The Soviet opening shot was the launch in 1957 of the world’s first manmade satellite Sputnik-1 followed quickly with Sputnik-2. The satellite launch was a shock and awe event for the American people who realised they had been totally out manoeuvred. The launch itself was not that much of a surprise for the US military but the orbital mass was a total shock and revealed Soviet technology well beyond US capabilities thereby rendering their aircraft deliverable weapons obsolete. After that first scoring shot the Soviet’s seized the advantage with a series of spectacular space missions; first probe to leave into solar orbit, first probe to hit the Moon, first Dog in space and pictures of the Lunar farside. The American response was to go into a team huddle and argue about the inter-services rules. Who should control US space interests? Who should launch America’s first satellite? The navy, the army or the air force all claimed a controlling interest and they all had plans but none had capability. In the end it was decided to pull the German rocketry engineers out of mothballs with their version of the soviet’s upgraded R1 rocket designated Redstone. With a small third stage rocket on top the Redstone was capable of launching a small satellite. In January 1958 the US played it’s first scoring shot with the launch of a tiny satellite Explorer-1, it was small but it got them into the game. At the same time the Redstone became America’s first nuclear ICBM with a test firing at their nuclear test site. While hailing the Redstone a success, it was basically a German based rocket designed by German engineers and some of those engineers were potential war criminals, temporary pardons notwithstanding. Politically it was problematic and the US was pushing on at full speed to develop their home-grown Atlas rocket system, which was eventually used for John Glenn’s historic flight. Other astronauts, Alan Shepard and Gus Grissom took preliminary ballistic space flight on Redstone rockets becoming the first American’s into space. The Russians countered by noting they had sent a dog into space further than the Americans. It was all very exciting. The Soviets pushed on developing space hardware with the aim of developing manned space stations. At that time it was considered that armed orbiting space stations would be the next logical step in the military space race. Times however were changing. The other military services were catching up and submarines (later cruise missiles) were quickly becoming dominant as first strike weapons essentially making space stations obsolete.

The Soviets and the US were in a military weapons race and this required an enormous financial commitment. The Soviet military could spend basically what they liked but the Americans had to justify their expenditures to the public who did not want a Soviet-American war, who were fighting in the Korean war and who wanted more domestic spending on essential services. It was decided to take space development out of the hands of the military and created a new civilian service called NASA to manage amongst other things “space”. In a bold move the US President laid down a plan to further develop space technology with the aim of sending men safely to the Moon and back. Jules Verne, eat your heart out !! Of course the military spending did not stop but at least it was isolated behind classified budgets and civilian NASA pushed ahead publically with the Mercury space program followed, as we now know, by the Gemini and Apollo programs.

Post Match Review - While the Americans pursued their goal toward the Moon, the Soviets pushed on in their space station programs producing the MIR space station leading ultimately to the ISS. Those early years constituted a technological race of single pilot space missions. Both nations went into the race roughly equal and by its end it would be difficult to score. Personally I would score it one-all. The rest as they say is history. We can only look back in awe at the courage and determination of the men and women who took those first baby steps into space. The Americans and Soviets can be justifiably proud of their achievements during this period although the cost in human lives was high. John Glenn as an American space pioneer cemented his place in history as did all the other Mercury astronauts. On a personal note: The heydays of space travel have been left far behind and the general public is no longer excited by the prospect of man in space. The International Space Station (ISS) orbits silently above us generally ignored except on those rare public-viewing nights when it passes silently overhead. Supply rockets regularly travel and automatically dock with the station. The occasional supply rocket explosion barely makes the news. Relief crews are still sent there on Russian R7 rockets with barely a media note. Interestingly the New Horizon space probe to Pluto caused nothing more than a media blip. Space travel is now an accept part of history and no longer commands awe. What the future holds no one can tell. Given political willpower the next great step may be human footprints on Mars.



Let's hope.

Right - A Summary of the Early Manned and Unmanned Space Race.

Red – Soviet missions
Blue – US Missions

While there were numerous other test flights and probe launches, the Faith-7 and Vostok-6 missions mark the end in the initial phase of manned space exploration and the end of single pilot space vehicles. Both sides moved on to two and three pilot missions.

Date	Mission	Notes
Oct 1957	Sputnik-1	First Russian artificial satellite 84kg
Nov 1957	Sputnik-2	Second Russian artificial satellite 508kg
Jan 1958	Explorer 1	First US satellite
Mar 1958	Explorer 3	Addition studies of near Earth environment
July 1958	Explorer 4	Van Allen Radiation Belts confirmed
Mar 1958	Vanguard-1	Studies solar activity
May 1958	Sputnik-3	Third Russian artificial satellite 1327kg
Dec 1958	Pioneer-3	Launched toward Moon but failed to reach it.
Jan 1959	Luna 1	Lunar fly-by. Missed the Moon and went into solar orbit
Sept 1959	Vanguard-3	Reconnaissance of Earth's magnetic field
Sept 1959	Luna 2	Lunar Impact (with metal Soviet red stars)
Oct 1959	Luna 3	Photographed the Moon's far side.
Mar 1960	Pioneers-5	Probe sent into solar orbit
Mar 1960	Sputnik-9	First dog launch and safe recovery
Mar 1960	Sputnik-10	Dog launch and safe recovery
Aug 1960	KS-2	Two dogs sent into orbit and returned safely
Dec 1960	KS-3	Two dogs sent into orbit and returned safely
Feb 1961	Venera-1	Probe launched to Venus
April 1961	Vostok 1	First man in orbit Y.Gagarin
May 1961	Freedom-7	A.Shepard First American into space on ballistic flight
July 1961	Liberty Bell-7	Gus Grissom launched on ballistic flight
Aug 1961	Vostok 2	G.Titov second man in orbit
Feb 1962	Friendship-7	John Glenn First American into orbit
May 1961	Aurora-7	Scott Carpenter launched into orbit
Oct 1962	Sigma-7	W. Schirra launched into orbit
Aug 1962	Vostok 3	A.Nikolayev launched into orbit
Aug 1962	Vostok 4	P.Popovich - Vostok 3 & 4 first co-orbiting space craft
May 1963	Faith-7	L.G.Cooper launched into orbit
June 1963	Vostok 5	V.Bykovsky – co-orbited with Vostok 6
June 1963	Vostok 6	V.Tereskhova - First woman in space

Eugene Cernan - The Last Man to Stand on the Moon Dies

Living history belongs to those of us who are still alive to recount the experience but it is a fact of life that the people making history today will not be around in the future to recount their story. We are slowly losing our living history regarding the age of manned space travel and recently we lost one of mankind's true space travellers. People like to think of humans as a space faring species but this is in fact, far from the truth. Whilst many people have orbited the Earth and continue to do so in the ISS, this is really not much more than the equivalent of a high-flying aircraft. True space travel involves leaving the Earth for distant planets. To-date the only distant planet we've visited is our own Moon, a mere stone throw's away at about 400,000 kms. Of the thirty-two people selected to fly to the Moon for the Apollo space program only twenty-four actually made the trip and became true space travellers. Twelve of those were privileged to land and walk on its surface. The last person to stand on the lunar surface was Captain Eugene Cernan who recently died on 16 Jan at the age of 82 years. Captain Cernan was one of those rare persons who made the lunar trip twice. Firstly on Apollo 10 during which he test flew the lunar module from lunar orbit. The test flight almost ended in tragedy when the vehicle suddenly went into wild aerobatics (or is that spaceobatics). Control was recovered at an extremely low altitude. He later commanded Apollo 17 landing in the Taurus-Littrow region with fellow astronaut Harrison Schmidt. He later wrote his memoirs in the book "The Last Man on the Moon", a copy of which is in the MPAS library. It was interesting to read the section of his feelings as he prepared to leave the lunar surface. While he was required to make the equivalent "One Small Step for Man" speech as he left, his feelings as he conducted his last task were quite poignant. He was required to drive the rover away from the lunar module and position its remote controlled camera to record the take off. When finished he realised that all he had to do was walk back to the lunar module and take off but with no further tasks to perform he decided to take one final look around. Knowing this was the last Apollo mission and the US space program was scaling down he was likely the last person to experience the lunar surface for many decades, if ever. He found the surface exciting yet bleak. Another piece of living history lost.



Apollo One Crew Remembered

On the subject of Apollo astronaut deaths, Jan 27 marks 50 years since the fatal fire of Apollo One in which three astronauts died during a training exercise. While not an official mission it was named Apollo One honouring Gus Grissom, Ed White and Roger Chaffee. I remember the incident as if were yesterday. I had just driven home on my motorbike when my parents came out and said that three astronauts had been killed. We spent the rest of the evening watching the TV news (black and white TV). It was an unbelievable and sad event.





Why Is It So Hard to Land on Mars? *By Peter Lowe*

The recent destruction of the Schiaparelli Mars probe highlights the problem of soft landing onto the Martian surface. Schiaparelli fell to destruction after a mistimed software “glitch” shutdown its landing rockets too soon. Of all the planetary bodies on which we’ve landed or attempted to land, Mars is the nemesis of probes. While from an exploration probe’s viewpoint Mars is the current tourist centre of the solar system, it is also by far the hardest place to land. Why? So far we have sent probes to all the major planets and some of their satellites and we’ve landed on several comets and asteroids plus of course we’ve landed on one Moon, our own. Compared to landing on Mars the lunar landings were a piece of cake. When you plan a landing on a planetary body you need to take into account a number of factors, specifically the probes orbital path, the body’s mass, the amount and type of atmosphere and finally how to achieve the final soft landing. After all a probe is approaching at interplanetary speeds and must slow down to zero relative speed if it has any hope of a soft landing. Then of course there are the engineering considerations such as fuel load, launch weight and a million other factors to be worked through before you get to that final “here we go” landing phase.

We all know that “escape velocity” is that speed an object must reach to completely escape the gravity of a planet. For Earth the escape velocity is 11.2 kms per second, on Mars it is 5.0 kms per second while from the Moon it’s 2.4 kms per second. The further you are away from the object the lower the escape velocity. For instance the escape velocity from the surface of the Sun (if you were ever foolish enough to try and land there!!) is 612 kms/second. So in theory, if you left the surface of the Sun at 612 kms/second your spacecraft would fly off and eventually leave the solar system. As you move away from the Sun your relative speed would steadily decline reaching relative zero at infinite distance. Interestingly as you pass Neptune you would still be travelling at 7.7 kms/second because that is the Sun’s escape velocity at the orbital distance of Neptune. Reversing this problem and assuming you are in deep space far away from the solar system and your spaceship feels an ever so slight gravitational tug then it would start to fall toward the Sun. (aka comets) Slowly picking up speed until it was speeding past the planets and eventually crashing onto the Sun’s surface at 612 kms/second. This is the same as throwing a ball or apple vertically up. The ball moves up, its speed slowing to zero then it falls back down eventually landing in your hand at the same speed you initially threw it. In other words a space probe approaching a planet will fall and hit the atmosphere at the planet’s escape velocity. In the case of Mars 5.0 kms/sec.

Now we need to slow the probe’s speed. Depending upon the circumstances we can take several strategies. In the case of the Moon with no atmosphere we can take a Flash Gordon approach using a rocket to slow us down all the way to the surface. This is how the soft landings on the Moon were achieved. In the case of the manned lunar landings the initial speed was reduced by first going into lunar orbit and descending from there, however unmanned probes such as the Surveyor landers come directly in at about 2.4 kms/sec with the final landing done using the good old fashion Flash Gordon method.

On planets with atmospheres landings are a lot more complicated. The probe must be slowed down in stages before the final, hopefully soft touchdown, can be achieved. Aero-braking is used initially to dissipate the probes speed when it first contacts the upper atmosphere. In the case of Venus, Earth and Jupiter the path of the craft is adjusted so the deceleration forces are kept within acceptable ranges otherwise the probe will burn up. For manned landings the spacecraft is literally flown balancing lift and aerodynamic drag to



Venera 9 Venus Lander

hold the deceleration forces within human limits, about 3G for orbital descents but up to 12G on the Apollo lunar returns. After this the probe's speed is such that it literally falls vertically unless it's a space shuttle and can fly hypersonically to a conventional airport landing. Unfortunately this is not an option on Mars yet but we're working on it.

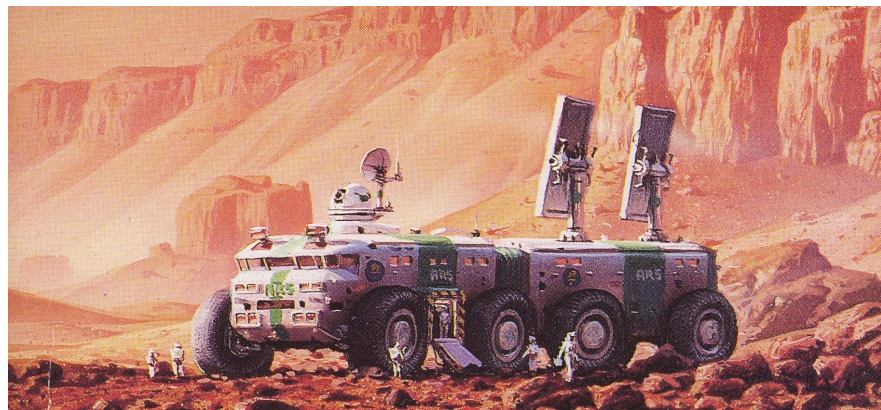
On Venus the lower atmosphere is dense enough that we just needed a parachute and big shock absorber to achieve a soft landing. On Earth we just need bigger parachutes. The Apollo ocean landing used water (sea) to provide the final shock absorption for that last bump.

Mars's atmosphere is dense enough that you must use an aero braking entry but so thin you need a really big, impractically big parachute. While a parachute can slow the descent speed to a few hundred kilometres per hour the final landing requires additional touchdown technology, which is why landing on Mars is such a problem.

The earliest 1970's Martian landings used a large parachute, which was liberated at the last second allowing a rocket to slow the final descent to the surface. This is OK for low mass probes but as the mass increases, more sophisticated methods are required. The bouncing ball method worked for some landings in which toughened airbags were inflated around the probes, which was then dropped onto the surface from the parachute. It bounced around on the surface until it stopped just leaving the problem of unfolding the bags and getting the probe out. This worked for several probes with mid-ranged masses. Heavier probes however cannot be dropped onto the surface. They need to be lowered and placed onto the surface. If we are ever to land people on Mars we need some form of skyhook. The high mass Curiosity vehicle probe used a "sky crane" which is basically a flying rocket base that takes the weight of the probe while hovering above the surface and then lowers to probe to the surface by cable after which it flies away to crash at a safe distance.

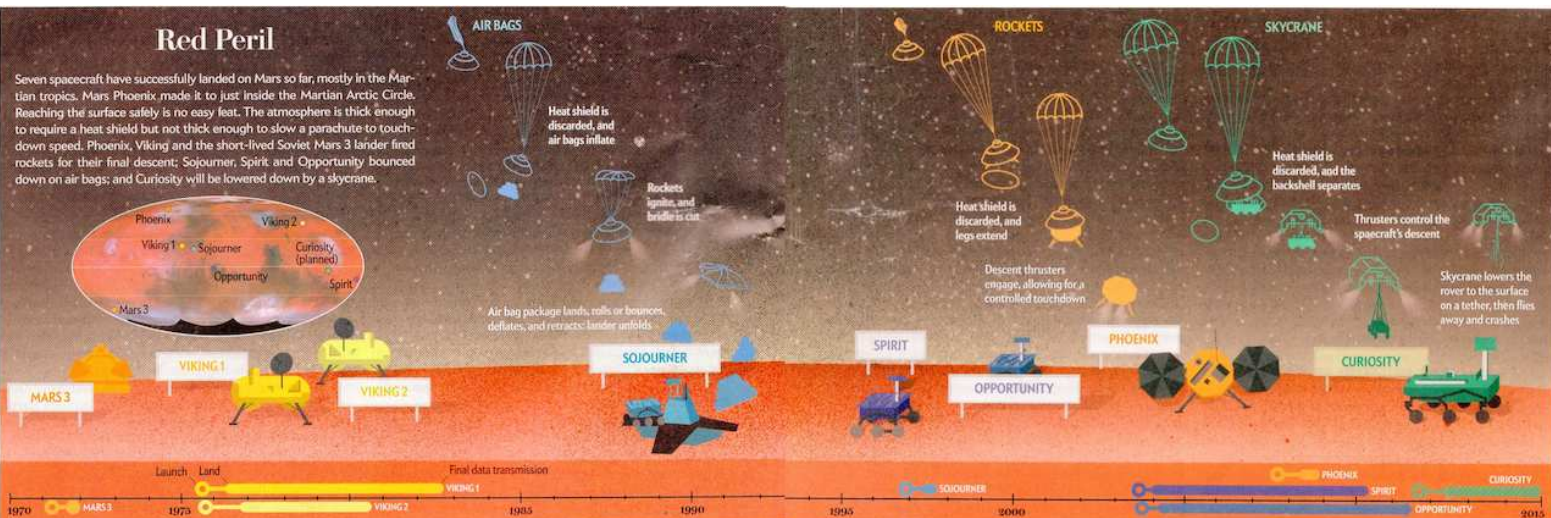
Sky crane technology needs to be advanced further to handle really massive payloads such as manned vehicles delivered whole or assembled from separate sections landed independently. The first manned flights to Mars may be just orbital flights as proof of concept missions with sample return probes using tele-presencing technology from orbit with follow up missions landing hardware in stages to assemble a Mars base of operations. While this is all well into the future, the lure of Mars and the possibility of Martian life, past or present will be constantly tugging at our imaginations to explore.

Apollo 11 Ocean Landing



Red Peril

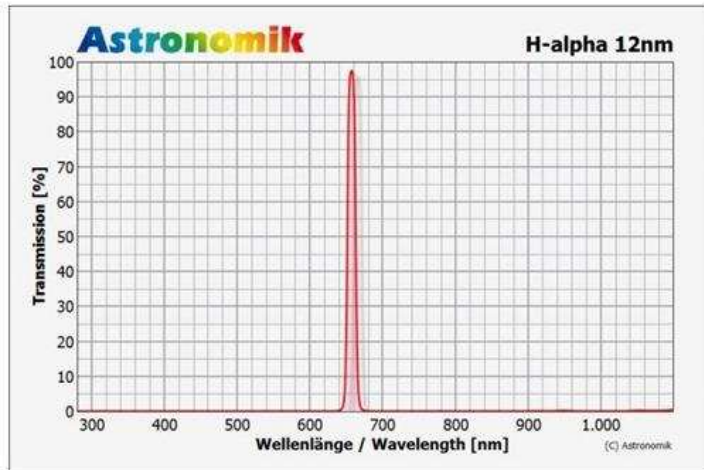
Seven spacecraft have successfully landed on Mars so far, mostly in the Martian tropics. Mars Phoenix made it to just inside the Martian Arctic Circle. Reaching the surface safely is no easy feat. The atmosphere is thick enough to require a heat shield but not thick enough to slow a parachute to touchdown speed. Phoenix, Viking and the short-lived Soviet Mars 3 lander fired rockets for their final descent; Sojourner, Spirit and Opportunity bounced down on air bags; and Curiosity will be lowered down by a sky crane.



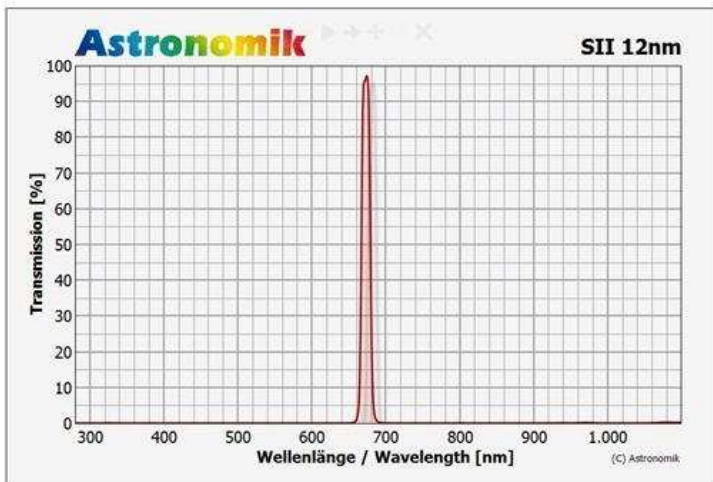
Mornington Peninsula Astronomical Society

Image 1 : H-alpha 12nm Filter

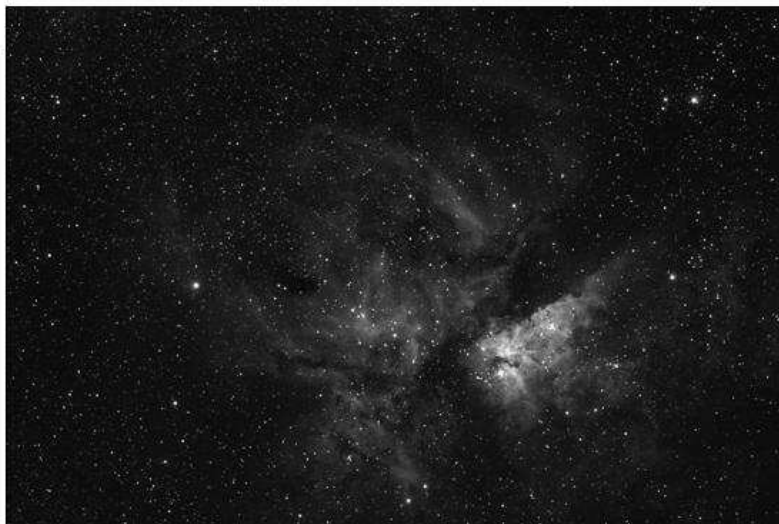
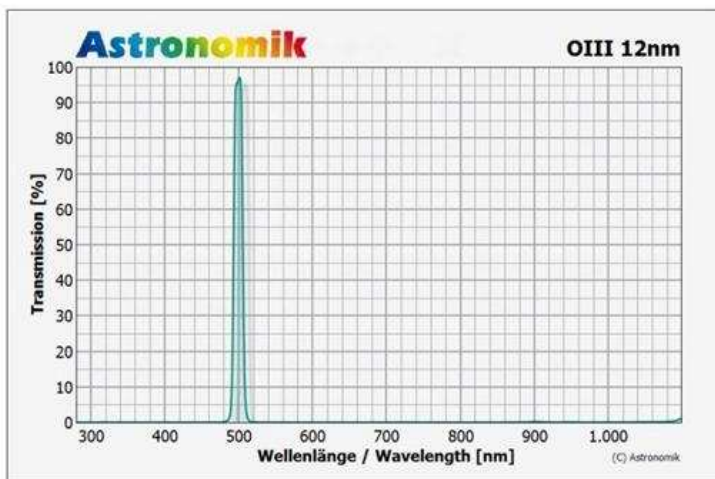
This filter allows only light falling inside the 656 nm \pm 6nm wavelength to reach the camera.

**Image 2 : SII 12nm Filter**

This filter allows only light falling inside the 672 nm \pm 6nm wavelength to reach the camera.

**Image 3 : O3 12nm Filter**

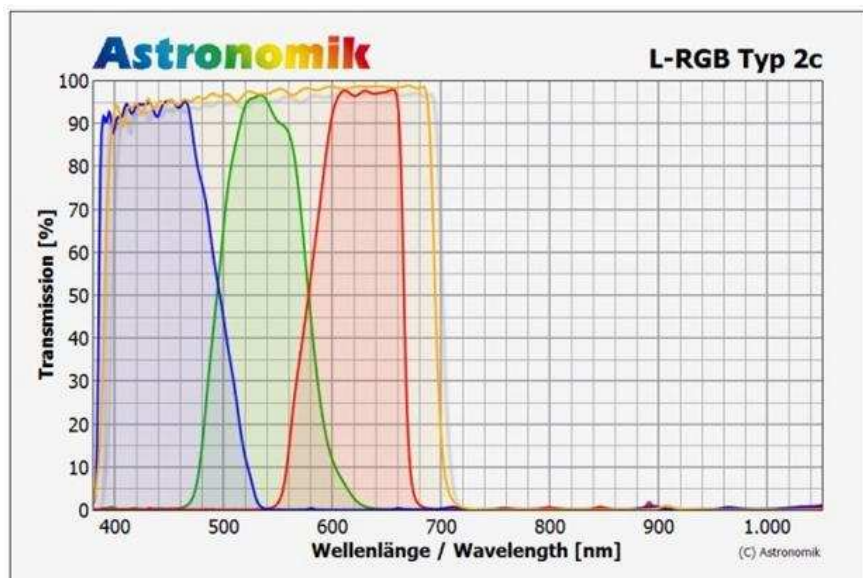
This filter allows only light falling inside the 501 nm \pm 6nm wavelength to reach the camera.



LRGB filters

These filters are a lot wider in their transmission as shown in the graph below.

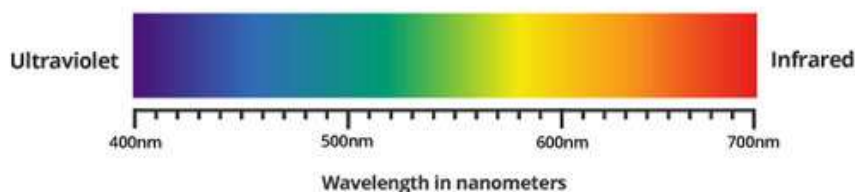
They are Luminance (depicted here as Yellow), Red, Green and Blue), the additive primary colours.



The issue with using these filters at home is that they capture a lot of light pollution. This graph is also fairly typical from what a standard SLR camera has as well.

The colour spectrum is shown below.

Visible Light Spectrum



So in comparison, images using the narrow band filters show very sharp contrasts.

Using the appropriate filters can also determine an object's spectrum, or composition.

The spectrum of this nebula is shown below. This explains why the SII image had less detail for the same image time.

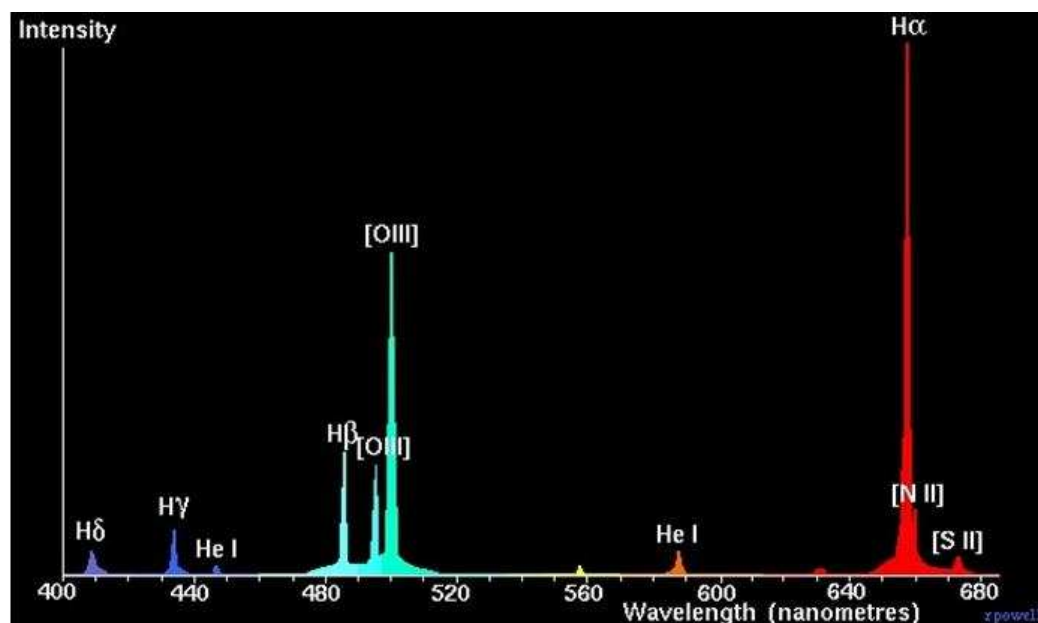


Chart Credit: Hua C & Llebaria A

Combining the Images

After I have taken all the images (usually about 10-15 or so), I calibrate and combine the images using a mean (averaging) method to reduce noise;

i.e. any noise in one shot and not the others will be removed by averaging. (An alternative is the median method.) This is the image when all three of the mono-frames shown above are combined.



This is a similar field of view from this time last year using Red, Blue & Green filters from a dark sky site.

You will notice that the faint nebulosity is not as prominent, but the picture looks more natural overall and has nicer gradients.

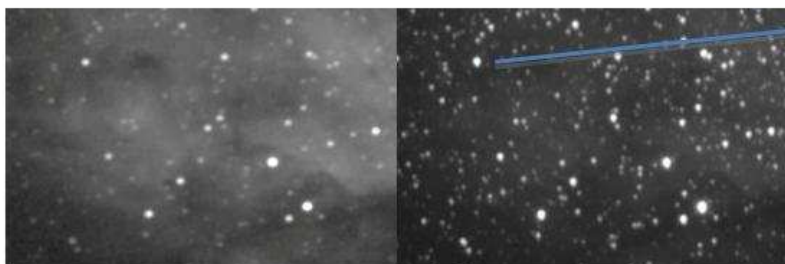
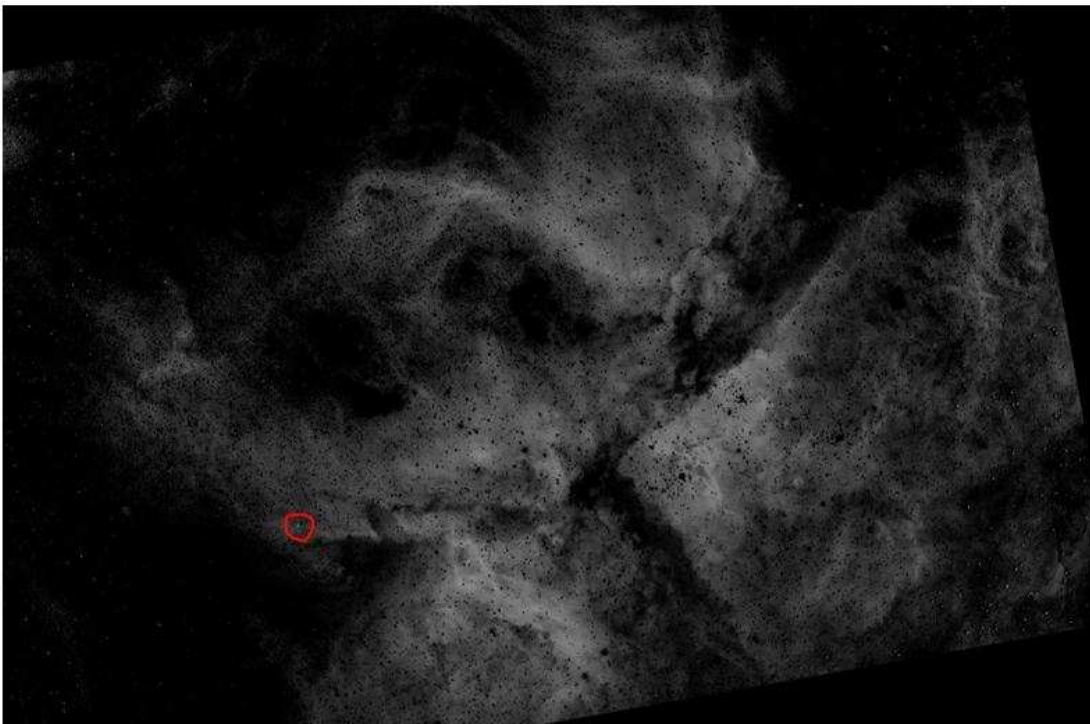


Now the search begins....

Using the Luminance frame from last year's image (shown below), I compare the two images for any changes.



Subtracting 1 image from the other reveals this negative. The stars around the outside are due to framing of the two exposures. The only 'significant difference' is highlighted in red. Other differences are caused by bloating or image artefacts. To verify this, I will need to compare to more of my stock images.



USNO-A2 0225-09332646

Spot the difference in the High Res Crops

Why was this unnamed Star near USNO-A2 0225-09332646 (RA 10h 45m 20.53 S Dec -60 deg 26' 12.2'') missing?

Until next time, *Dave Rolfe*

MPAS Gallery, *by Norm Taylor*

Is it worth standing around for a few hours in -16 deg C, Norm Taylor from Tromsø, Norway. January 5th 2017



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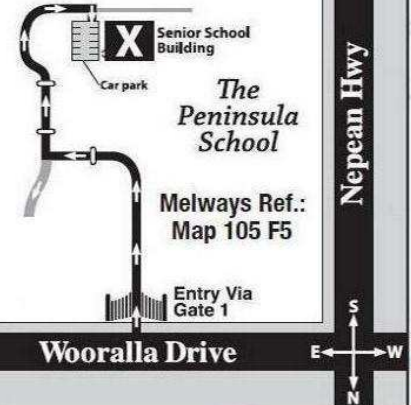
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SOCIETY MEETINGS

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:
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Mail: PO Box 596, Frankston 3199, Victoria, Australia



Dave Rolfe



Peter Lowe



Peter Skilton



Jamie Pole



Trevor Hand

Please we need
 one more
 committee
 member.



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.

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.

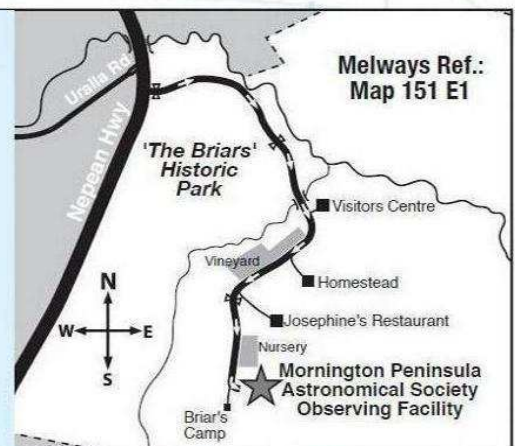
To join, to go: www.groups.yahoo.com/e-scorpius and sign up to Yahoo groups - you are required to
 sign up to Yahoo groups to join E-Scorpius. Once you have signed up at Yahoo groups, email
welcome@mpas.asn.au say that you want to join E-Scorpius & you will be added to the E-Scorpius list.
 Member forum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

VIEWING NIGHTS - MEMBERS ONLY

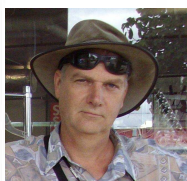
Viewing Night - Members only
 Any night, at The Briars, Nepean Hwy,
 Mt Martha, starting at dusk.
 Members visiting The Briars for the first time
 must contact Greg Walton on 9776 2074 or
 0415172503 if they need help getting to The Briars
 site. Upon arrival at the site, remember to sign
 the attendance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

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



Fred Crump



Greg Walton

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

SCORPIUS The journal of the Mornington Peninsula Astronomical Society

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