

Cover Image, News paper article from 1969 when Mornington Peninsula Astronomical Society first started.



SCORPIUS

THE JOURNAL OF THE
MORNINGTON PENINSULA ASTRONOMICAL SOCIETY INC.

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The Mornington Peninsula Astronomical Society (formerly the Astronomical Society of Frankston) was founded in 1969 with the aim of fostering the study and understanding of Astronomy by amateurs and promoting the hobby of amateur Astronomy to the general community at all levels.

The Society holds a focused general meeting each month for the exchange of ideas and information. Regular public and private observing nights are arranged to observe currently available celestial objects and phenomena. In addition, the society encourages the services of its members for educational presentations and observing nights for schools and community groups. Reg No: A268 ABN: 34569548751 ISSN: 1445-7032

MOON AH-OY!

HERE is the crew for the Apollo 11 mission to land a man on the Moon. From the left: mission commander Neil A. Armstrong, command-module pilot Michael Collins and lunar-module pilot Edwin E. Aldrin, Jrn.

Somewhere for our children to live ...

EXCLUSIVE TO THE SUN

THE remarkable pictures on these pages were taken by Apollo 10 astronauts John Young, Eugene Cernan and Tom Stafford during their recent close orbit of the Moon.

Today, on Page 2, The Sun begins exclusive publication of the astronauts' own stories of their fantastic journey and what they saw where they got there.

John Young is first to give his impressions. To him the Moon is fascinating. He was surprised, he says, at the colors there — grey, white, tan and the blackest of blacks — and the enormous size of the boulder fields. Some boulders, he estimates, were 300 ft. high.

And what does he think about the Moon's future?

"One can only wonder about the Moon — how it got started and whether its four-billion-year-old face may in some manner be a key to the evolution of our own planet and our solar system," he says.

"The Moon fascinates me personally the way Africa once fascinated people; the way any unexplored territory is still fascinating. In the immediate future it will probably be a geological wonder — a place to study and explore."

"But one of these days the world must colonize the Moon just so our grandchildren (or maybe our children) will have a place to live."

"Sooner than any of us realize, our world will be providing the technology and people for self-supporting colonies on the Moon as well as on other planets in the solar system — and their moons."

Copyright Time Inc. 1969

LUNAR module zooms back over the Moon to rejoin the command capsule Charlie Brown.

LIKE a vast scar, the two-mile-wide Hyginus Rille crosses the Moon's face.

THIS photograph of the command craft Charlie Brown, with astronaut John Young aboard, was taken by the other astronauts from lunar module Snoopy. Charlie Brown was about 175 miles above the rough terrain of the Moon's far side.

THESE dramatic pictures, left, show the Earth rising over the Moon, photographed by the Apollo 10 astronauts.

THE moonscape is pictured here as it was viewed from the command ship in orbit 69 miles up. The large crater is Tsiolkovskiy, which measures 17 miles across — about half the size of the Melbourne metropolitan area. The interesting lines are the Tsiolkovskiy Rilles.

THIS is how the Moon's surface looked when the Apollo 10 was high above the lunar equator near 27 degrees longitude. Apollo landing sites 2 and 3 are marked. Site 2 is near the lower margin of the Sea of Tranquility.

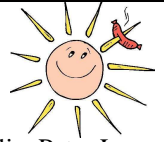
SCORPIUS The journal of the Mornington Peninsula Astronomical Society

Newsletter Disclaimer

The Scorpius Newsletter is published online, once every two months for its membership, by the Mornington Peninsula Astronomical Society, for Educational Purposes Only. As a newsletter, this publication presents news spanning a spectrum of activities, reports, and publications in order to keep society members abreast of a variety of events and views pertaining to astronomy. While prudent, reasonable effort has been utilized to verify factual statements made by authors, inclusion in this newsletter does not constitute or imply official MPAS endorsement. All materials (except previously published material, where credited) are subject to copyright protection © 2013, Mornington Peninsula Astronomical Society

SOCIETY NEWS

By Greg Walton



August 16th science week public night was 100% clouded out with only a small turn out of about 15 members of the public, Peter Lowe (president) did the talk on the solar system Fiona, Simon, Stewart, Alex, James, Peter Skilton, Peter Lowe, John and myself.

August Meeting seen 24 members in attendance Peter Lowe (president) chaired the meeting. Greg Walton did sky for the month and played at short video, from The Sky at night magazine on meteors including the largest of the Cranbourne meteorites 3.5 tons at the British museum, See below. Big Dave demonstrated Sky-X planetary software. Then Member chatted over coffee.



August members BBQ seen about 20 member under a mostly cloudy sky. Sky Drover 18" telescope went out to tested Paul's new eyepiece. Helmuth demonstrated a Jacobs ladder rising spark generator. Thankyou Peter Lowe (President) for buying in all the food. Thanks Guys for help with the cooking and thanks Girls for setting up the food and the cleaning up after wards.

September public night seen a good turn out of about 35 members of the public. Trevor did the talk while the star tried to shine though the cloudy skies. The public saw some deep sky objects and the double star alpha centuries. While I demonstrated my home made microscopes, see article in this news letter. Thanks to those members who braved the elements Peter Skilton, Dave Stock, John Cleverdon, Fiona Murray, Simon Hamm, Greg Walton, Pia, Charlotte and Irena.



September Meeting seen 20 members in attendance Peter Lowe (president) chaired the meeting. Ian Sullivan did a informative talked on history of Sundials and how they work, with many photos of sundials he has visited in Australia and around the world. The largest being in India at 90 feet talk to a beautiful sundial make for the Queen of England with 2 dolphins which cast a shadow with there tails. Greg Walton did sky for the month and play a time lapse video of Monash Uni student at ASV's LMDSS Heathcote.

September members BBQ seen about 20 member under a partly cloudy sky. Big Dave set up Big Blue and got some good views of the planets. I set up the clubs GOTO with the 6" Mac and sent a live video of the Moon from my Pentax Kx to the projector in the big shed. Thankyou Peter Lowe (President) for buying in all the food. Thanks Guys for help with the cooking and thanks Girls for setting up the food and the cleaning up after wards.

October public night seen a good turn out of about 40 members of the public. Trevor Hand did the talk while members demonstrated the telescope under a mostly cloudy skies. Most seen Venus illuminated on one side only and the double star alpha centaurs. Thanks to Peter Skilton, Peter Lowe, John Cleverdon, Fiona Murray, Simon Hamm, Greg Walton, Bob Heale, Rod Brackenridge, Bruce Renowden, Rohan Baumann and family.

Briars Blue Tongue
at the MPAS site.



This year MPAS will again be at VicSouth, so join us.

VicSouth Desert Star Party 2013

Friday 1 November to Monday 4 November 2013

For further information regarding Accommodation and Meals,
Please contact the team at the Lodge on
(03) 53915232 during business hours.

Little Desert Nature Lodge
PO Box 202 Nhill, Victoria, 3418
Fax: 03 53915 217 Email: info@littledesertlodge.com.au



Little Desert
Nature Lodge

Little Desert Nature Lodge Pty Ltd
1457Nhill - Harrow Road
www.littledesertlodge.com.au

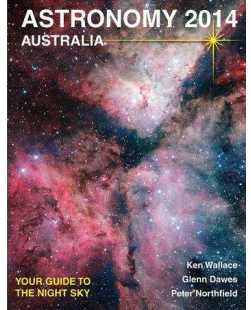
New Members
Welcome

Rohan Baumann
Ross and Elizabeth Adams

PUBLIC NIGHT THANK-YOU

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

SOCIETY NEWS



Astronomy 2014-year books now can be ordered. @ \$25 for members.

Now the weather is warming up, We will need to watch out for snakes at the Briars.

Under the Society regulations the Annual General Meeting elections are to be held in November.

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

The Annual General Meeting will be held on Wednesday, 20 of November 2013. In this edition of Scorpius there is a 'Committee Election Form' that can be used for the submission of nominations for the next committee. This can be posted to MPAS, PO Box 596, Frankston 3199. Alternatively nominations can also be submitted electronically to welcome@mpas.asn.au by stating which position on the committee you would like to nominate for.



Mornington Peninsula Astronomical Society Inc. ANNUAL GENERAL MEETING ELECTIONS



Nominee: _____
Proposer: _____
Secunder: _____

} Must be current financial members

Position: *Office Bearers:* President Vice President Treasurer Secretary
(tick 1 or more*) *Ordinaries:* Ordinary Committee Member (5 of these)

Acceptance Signature of Nominee: _____

Submit 1 day prior to the Annual General Meeting.

Post to M.P.A.S., PO Box 596, Frankston, VIC. 3199.

* Note : (1) That one person cannot nominate for multiple Office Bearer positions. (2) The committee is responsible for the development and operation of the society according to the MPAS Constitution. To support this, all committee members are expected to take responsibility for some aspect of society business

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

A word from the Scorpius editing team.

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

Send them to:
Brett Bajada
Peter Lowe
Greg Walton
gwmpas@gmail.com

2013 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 2013 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 2013-year ahead.

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

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

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.

November / 2013

| Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
|--|--|--|----------------------------------|---|---|-----------------------------|
| Melbourne Observatory 150th Anniversary. As part of the Melbourne Observatory's 150th Anniversary celebrations, the Royal Botanic Gardens, in partnership with the Astronomical Society of Victoria Inc, are presenting a seminar, "Colonial Astronomy in Australia", 9.00 am -5.30 pm, Sunday 24th November, at the Mueller Hall, Royal Botanic Gardens. A draft seminar program can be found here, and a registration form here. Please direct any enquiries to mo150@asv.org.au . | | | | | Public Night 1 8pm VicSouth | 2 VicSouth |
| 3 New Moon VicSouth | 4 VicSouth | 5 Cup Day | 6 | 7 Venus left of the Moon | 8 | 9 |
| 10 Venus in the tea pot till the 25th | 11 First Quarter Remembrance | 12 | 13 ASV Meeting | 14 | 15 | 16 |
| 17 | 18 | 19 Full Moon | 20 Annual General Meeting 8pm | 21 | 22 Jupiter left of the Moon in the evening | 23 Members Night BBQ 6pm |
| 24 Melbourne Observatory 150th Anniversary see above | 25 | 26 Saturn and Mercury 0.5 degree apart in the morning | 27 Committee Meeting 8pm | 28 Last Quarter Mars left of the Moon in the morning | 29 | 30 |

Monthly Events & High Lights. - **VicSouth Star Party 1st to 4th @ Little Desert Lodge near Nhill**
Public nights 1st, 8pm start - **Watch out for Auroras**
Society Meeting at 8pm on 20th @ the Peninsula School - **Members Night BBQ 6pm** at the Briars 23rd
Evening - 7th Venus left of the Moon - 22nd Jupiter left of the Moon - 10th Venus in the tea pot till the 25th
Dawn - 28th Mars left of the Moon - 26th Saturn and Mercury 0.5 degree apart

December / 2013

| Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
|---|---|---|-------------------|---|------------------------------|---|
| 1 | 2 Saturn, Mercury and a thin Moon Io & Callisto go behind Jupiter 1am | 3 New Moon | 4 | 5 | 6 Public Night 8pm | 7 ASV LMDSS Xmas Party check the web |
| 8 | 9 | 10 First Quarter Io shadow on Jupiter 2am | 11 ASV Meeting | 12 | 13 | 14 Xmas Party BBQ 6pm |
| 15 | 16 | 17 Full Moon | 18 | 19 Jupiter left of the Moon in the evening | 20 | 21 |
| 22 | 23 | 24 Last Quarter Ganymede & Io 10pm eclipsed by Jupiter | 25 Xmas Day | 26 Boxing Day Mars below the Moon | 27 | 28 |
| 29 Saturn right of the Moon in the morning | 30 | 31 New Years Eve | | | | |

Monthly Events & High Lights. - **Watch out for Auroras - Red Days** indicates School Holidays
Public nights 6th 8pm start - **NO** Society Meeting in December
Xmas Party Members Night BBQ 6pm at the Briars 14th ****Merry Xmas to all and have a safe Holiday****
Evening - 6th Venus left of the Moon - 19th Jupiter left of the Moon
Dawn - 2nd Saturn, Mercury and a thin Moon - 26th Mars below the Moon - 29th Saturn right of the Moon
Dawn - 2nd Io & Callisto go behind Jupiter 1am - 10th Io shadow on Jupiter 2am - 11th all moon left of Jupiter

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.

Mornington Peninsula Astronomical Society - 2014 Calendar

| Day | January | February | March | April | May | June | July | August | September | October | November | December | Day |
|-----|--------------------------------------|--------------------------|---------------------------|---------------------------------------|---------------------------|----------------------------|---------------------------|---------------------------|---------------------------|---|---------------------------|----------------------------|-----|
| 1 | W New Years Day | S | S | T | Th | Su | T | F Public Night | M | W | S VicSouth | M | 1 |
| 2 | Th | Su | Su | W | F Public Night | M | W | S | T | Th | Su VicSouth | T | 2 |
| 3 | F Public Night | M | M | Th | S | T | Th | Su | W | F Public Night | M VicSouth | W | 3 |
| 4 | S | T | T | F Public Night | Su | W | F Public Night | M | Th | S | T Cup Day VicSouth | Th | 4 |
| 5 | Su | W | W | S | M | Th | S | T | F Public Night | Su Daylight Savings Starts | W | F Public Night | 5 |
| 6 | M | Th | Th | Su Daylight Savings Ends | T | F Public Night | Su | W | S | M | Th | S | 6 |
| 7 | T | F Public Night | F Public Night | M | W | S | M | Th | Su Fathers Day | T | F Public Night | Su | 7 |
| 8 | W | S | S | T | Th | Su | T | F | M | W ASV Meeting | S | M | 8 |
| 9 | Th | Su | Su | W ASV Meeting | F | M Queens Birthday | W ASV Meeting | S | T | Th | Su | T | 9 |
| 10 | F Public Night | M | M Labour Day | Th | S | T | Th | Su | W ASV Meeting | F | M | W ASV Meeting | 10 |
| 11 | S ASV Meeting | T | T | F | Su Mothers Day | W ASV Meeting | F | M | Th | S | T Remembrance | Th | 11 |
| 12 | Su | W ASV Meeting | W ASV Meeting | S | M | Th | S | T | F | Su | W ASV Meeting | F | 12 |
| 13 | M | Th | Th | Su | T | F | Su | W ASV Meeting | S GCSP | M | Th | S Members Xmas Party | 13 |
| 14 | T | F Valentines Day | F | M | W ASV Meeting | S | M | Th | Su | T | F | Su | 14 |
| 15 | W MPAS Meeting 8pm | S | S ASV Messier Party | T | Th | Su | T | F | M | W MPAS Meeting 8pm | S | M | 15 |
| 16 | Th | Su | Su | W MPAS Meeting 8pm | F | M | W MPAS Meeting 8pm | S NSW | T | Th | Su | T | 16 |
| 17 | F Public Night | M | M St Patricks day | Th | S | T | Th | Su NSW | W MPAS Meeting 8pm | F | M | W | 17 |
| 18 | STLD 1pm MembersNight | T | T | F NACAA Good Friday | Su | W MPAS Meeting 8pm | F | M NSW Public Night | Th | S STD 1pm MembersNight | T | Th | 18 |
| 19 | Su | W MPAS Meeting 8pm | W MPAS Meeting 8pm | S Members Night 6pm | M | Th | S Members Night 6pm | T NSW | F | Su | W MPAS Meeting 8pm | F | 19 |
| 20 | M | Th | Th | Su NACAA Easter Sun | T | F | Su | W MPAS Meeting 8pm | S Members Night 6pm | M | Th | S ASV LMDSS Xmas | 20 |
| 21 | T | F | F | M NACAA Easter Monday | W MPAS Meeting 8pm | S Solstice Party 6pm | M | Th NSW | Su | T | F | Su | 21 |
| 22 | W Committee | SAPW 1pm MembersNight | S SD 1pm MembersNight | T | Th SPSP | Su | T | F NSW | M | W Committee | S Members Night 6pm | M | 22 |
| 23 | Th | Su | Su | W Committee | F SPSP | M | W Committee | S Members Night 6pm | T | Th BSG | Su | T | 23 |
| 24 | F | M | M | Th | S Members Night 6pm | T | Th | Su NSW | W Plannin Meeting | F BSG | M | W | 24 |
| 25 | S | T | T | F ANZAC Day | Su SPSP | W Plannin Meeting | F | M | Th | S BSG | T | Th Xmas Day | 25 |
| 26 | Su Australia Day | W Plannin Meeting | W Plannin Meeting | S | M | Th | S | T | F | Su BSG | W Plannin Meeting | F Boxing Day | 26 |
| 27 | M Australia Day Holiday | Th | Th | Su | T | F | Su | W Plannin Meeting | S | M | Th | S | 27 |
| 28 | T | F | F | M | W Plannin Meeting | S | M | Th | Su | T | F | Su | 28 |
| 29 | W | S | S | T | Th | Su | T | F | M | W | S | M | 29 |
| 30 | Th | Su | W | F | M | W | S | T | Th | Su | T | | 30 |
| 31 | F | M | S | S | | | Th | Su | F Halloween | | | W New Years Eve | 31 |

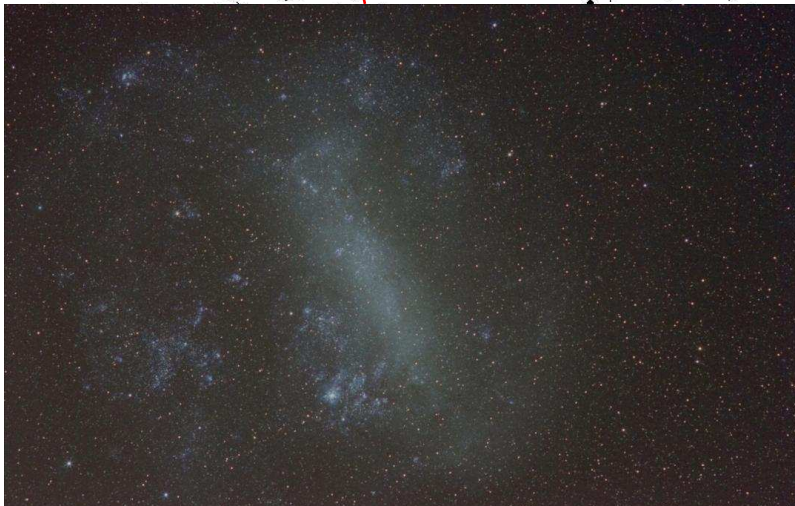
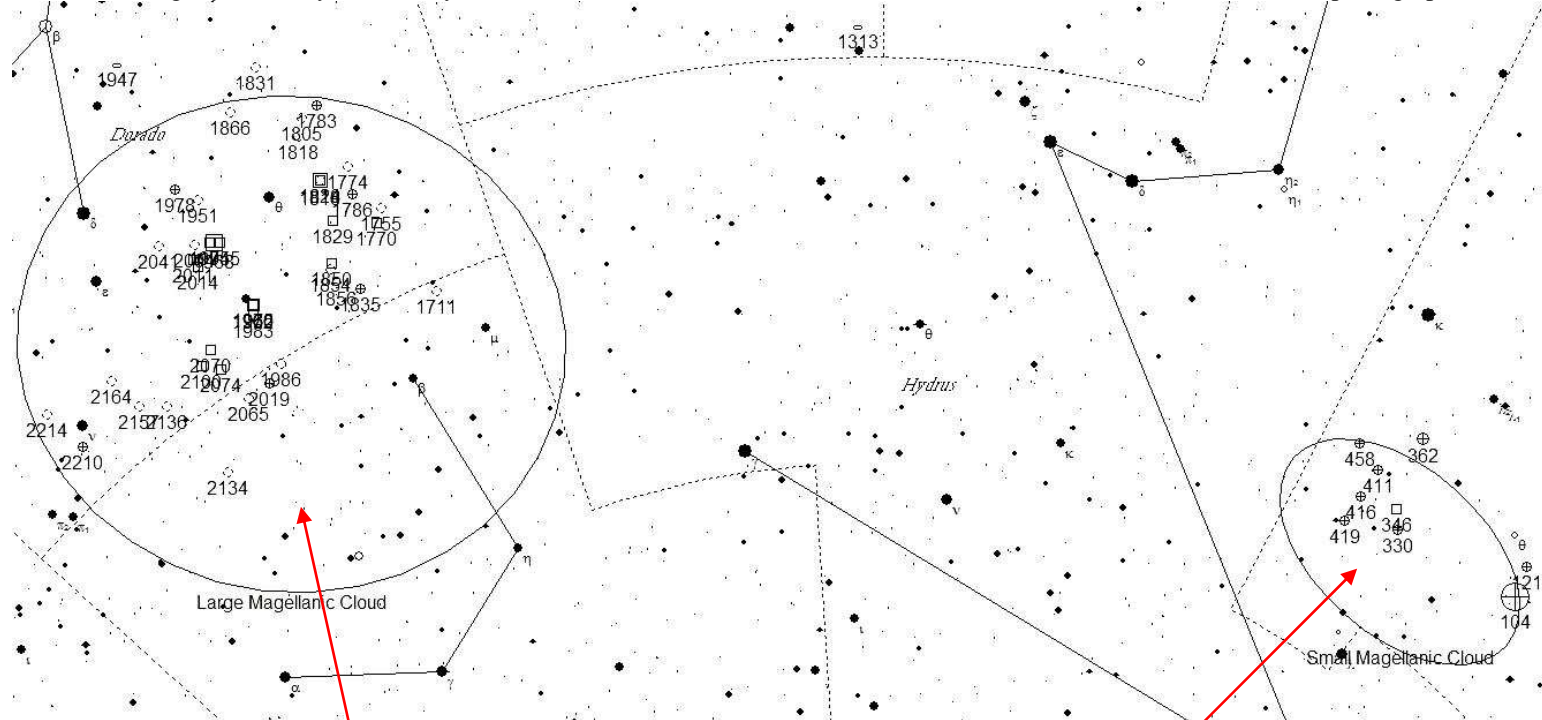
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|--|---|--|
| <p>Zig-Zag Boxes - MPAS Meeting all @ the Peninsula School 8pm Triple Line Boxes - Public nights all @ the Briars 8pm Striped Boxes - Members Only nights all @ the Briars 6pm Dotted Boxes - Committee meetings @ the Briars 8pm Gray Boxes - Weekends & Public Holidays Bold Boxes - ASV General Meeting all @ the Herbarium Melbourne 8pm TLD - Telescope Learning Day on 18 January @ the Briars 1:00 pm APWS - Astrophotography Workshop 22nd February @ the Briars 1:00 pm SD - Solar Day on 22 March @ the Briars 1:00 pm Solstice Party - 21 June @ the Briars 6 pm STD - Show & Tell Day - 18th October @ the Briars 1:00 pm</p> | <p>Autumn Equinox - March 20 Winter Solstice - June 21 Spring Equinox - September 23 Summer Solstice - December 22</p> <p>○ Full Moon ● New Moon</p> <p>LEGEND Bold Under lined Days School Holidays</p> <p>MPAS Calendar 2014 - by Greg Walton</p> | <p>Working Bees will be noted in the calendar in Scorpius News Letter Messier Star Party 15th March @ ASV LMDSS Heathcote NACAA - 18th to 21st April Astronomical Society of Victoria. see nacaaweb site South Pacific Star Party 22nd to 25th May @ Ilford NSW www.asnsw.com/spsp NSW - Nation Science Week on 16th to 24th August ASV Galactic Centre Star Party 13th September @ ASV LMDSS Heathcote BSG - Border Stargaze Star Party 23rd - 25th October @ Albury VicSouth Star Party 1st - 4th November @ Little Desert Lodge near Nhill Snake Valley Star Party Check the iceinspace.web site</p> |
|--|---|--|

In 2014 the astronomy classes will be included in this Scorpius news letter.

Sky for November / December we look South to Dorado & Tucana

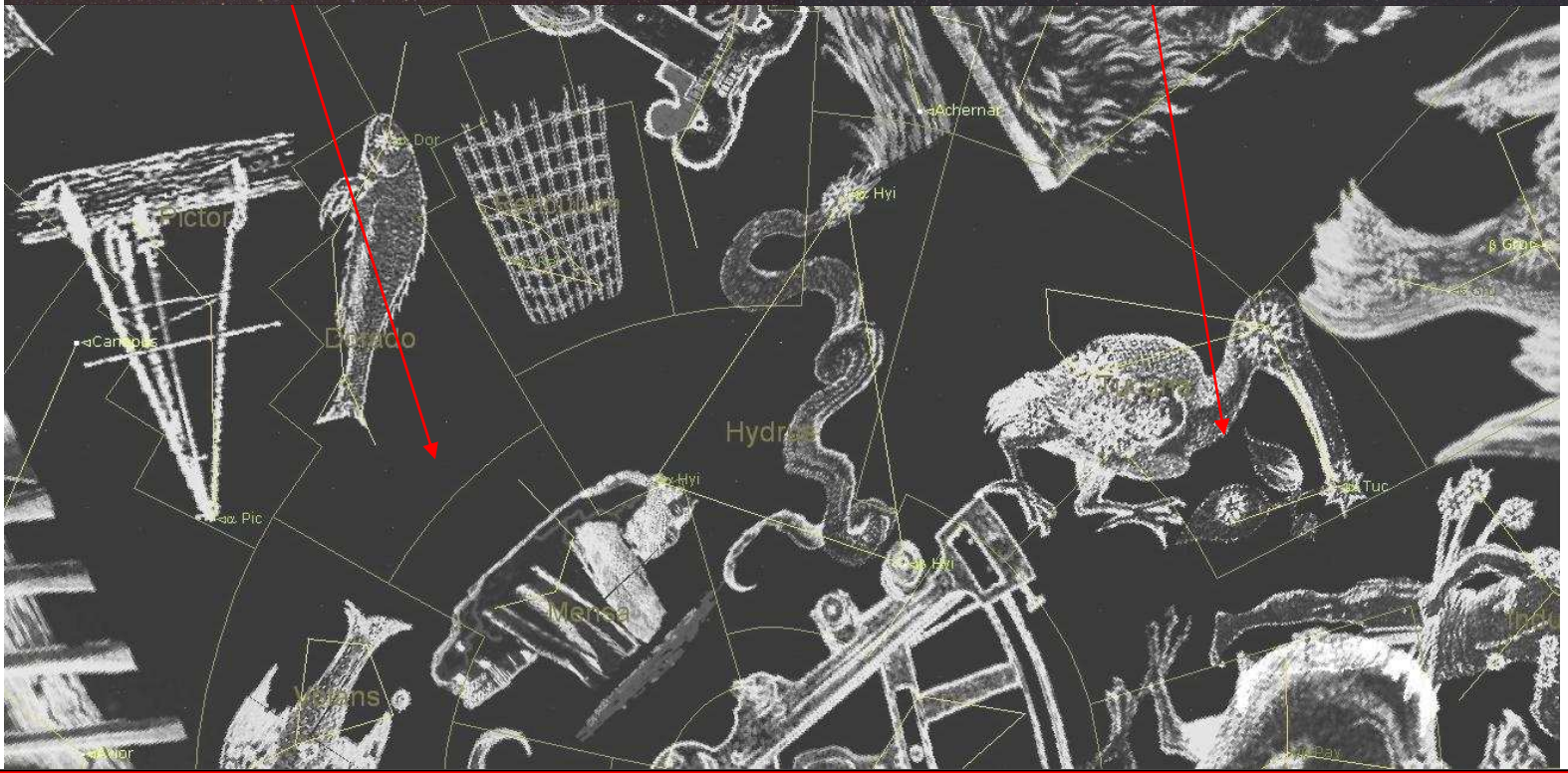
Produced on Sky Map & Starry Night by Greg Walton

Dorado the Swordfish/Goldfish contains the Large Magellanic Cloud which is a galaxy about 165,000 Light years away, with many Open star cluster and Nebula like NGC2070 the tarantula. Tucana the Toucan contains the Small Magellanic Cloud which is a galaxy about 185,000 Light years away, with many Nebula and Globule star clusters like NGC104. Now is the best time to view and photograph.



LMC LMDSS 135mm f5.6 Lens Polarie Pentax Kr 53x30sec iso12800 By Greg Walton MPAS/ASV 10Aug13

SMC LMDSS 135mm f5.6 Lens Polarie Pentax Kr 85x30sec iso12800 By Greg Walton MPAS/ASV 10Aug13



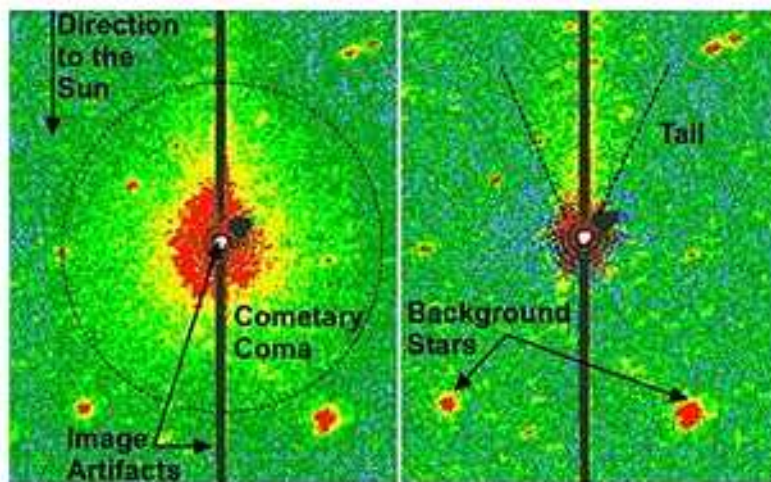
ASTRO NEWS

By Peter Lowe

Comets and Asteroids

Humans like to classify things. Classifications provide structure and understanding in the apparent chaos around us. Classifications can sometimes cause their own chaos until a new discovery or observation leads to a revision in our view of the world around us. Take the global squabble over the definition of a planet when a few years ago astronomers reassigned the planet Pluto as a "planetoid". Today we recognise a whole spectrum of planets in gradation of mass from the tiniest rocks to gas giants progressing to brown dwarfs and then on to stars. The differences between the planets relate more to the physical processes at play than their classifications. A similar reclassification is currently working through the astronomical system between asteroids and comets.

For 30 years the object 3552 Don Quixote was classified as a large near-Earth asteroid orbiting between Earth and Jupiter, however it now appears to be a comet. Researchers at Northern Arizona University using the Spitzer Space Telescope have found evidence of cometary activity. Its orbit is more comet-like than an asteroid that has a more circular orbit thus it was thought Don Quixote was a long dead comet. The new observations show the comet still retains carbon dioxide and water in large amounts. This new observation blurs the classification between comets and asteroids. Most asteroids are left over's from the solar system formation but some are obviously from further afield.



India prepares to launch country's maiden mission to Mars

Indian officials have confirmed a November launch date for the country's first mission to Mars, set to launch from a spaceport in the south of the country. It was reported the Mangalyaan Mars probe would lift off from the Indian Space Research Organization's launch site at Sriharikota. A successful launch would make India the sixth country to initiate a mission to Mars after the United States, Russia, Europe, China and Japan.

"The probes mission is to explore the existence of life and the possibility of sustaining life on Mars and will travel 299 days in space before reaching the Red Planet in September 2014

China Prepares to launch Lunar Lander.

China's Chang'e-3 lunar lander mission has been moved to its launch platform and is expected to be launched by the end of this year for a moon landing mission. The Chang'e-3 moon rover (pictured) will roam the moon's surface. In addition to several cameras, the Chang'e-3 rover also carries a near-ultraviolet astronomical telescope to observe stars, the galaxy and the universe from the moon. Radar attached to the bottom of the rover is expected to explore 100 to 200 meters beneath the moon's surface.

The Chang'e-3 mission is the second phase of China's lunar program, which includes orbiting, landing and returning to Earth. It follows the successes of the Chang'e-2 missions, which include plotting a high-resolution, full-coverage lunar map.

China's deep-space exploration should go beyond the moon, and the country's scientists are actively preparing to implement plans to explore Mars, Venus and asteroids.



One-way Mars trip attracts more than 200,000 volunteers

More than 200,000 people from 140 countries have applied to go to Mars and never return. Bas Lansdorp, a Dutch engineer and entrepreneur, plans to establish a permanent base on Mars in a mission he hopes will take off in 2022 if he can find the necessary \$6 billion. Some 15,000 are Australian. It is planned to put up to 10 four-member teams through intensive training, with the first of those teams reaching to Mars in 2023 on a high-risk journey that would take seven months to complete.

If they survive the trip, the human Martians will have to deal with minus 55 degrees C (minus 67 F) temperatures in a desert-like atmosphere that consists mainly of carbon dioxide.

They'll also have to consent to being observed back on Earth full-time as stars of a reality TV show that would help cover expenses. Let's hope the reality show lasts more than a few seasons. *[Editor: with 200,000+ volunteers I suspect they all failed the psychological tests on the grounds you've got to be mad to go]*



Proposed Russian Spacecraft On Show

The rush to develop quick and easy access to Earth orbit continues. A proposed Russian spaceship intended for voyages to the International Space Station and to the moon has been displayed at the Moscow Air Show as a next development prototype. Extending the former Soviet shuttle design, it is intended as a vertical takeoff space plane capable of servicing the Russian segment of the International Space Station ferrying crew and cargo. The first unmanned test launch of the new spacecraft is scheduled for late 2017 or 2018 and a manned flight is expected by 2020.

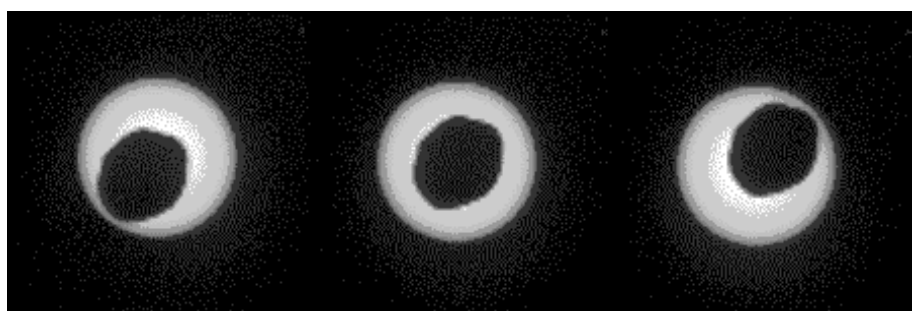


The Orion spacecraft, being developed by NASA and the European Space Agency to take as many as four people on missions to the ISS, Mars or near-Earth asteroids, is set for an unmanned test flight in 2014. It has the advantage over current ISS ferries that this one has an onboard toilet.

Curiosity Views Annular Eclipse of the Sun by Phobos

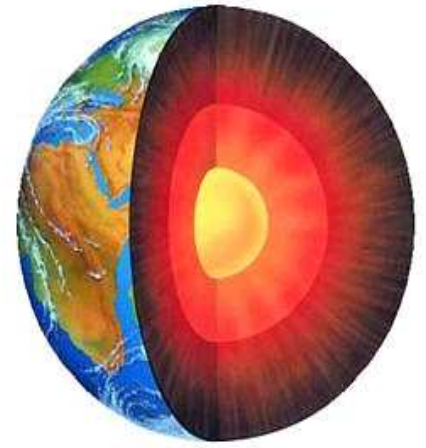
NASA's Mars rover Curiosity photographed an eclipse of the Sun by the Martian moon Phobos (shown at right). The annular eclipse occurred near the rover's location and it stopped its traverse to take a series of high resolution photographs with the telephoto-lens camera of the rover's Mast Camera. The rover took a series of 3 second photographs to record the moon traversing the solar disc producing the sharpest images yet of an solar eclipse from Mars.

Similar eclipse observations of the Martian moons, Phobos and Deimos, by Curiosity and by the older, still-active Mars rover Opportunity are helping researchers get more precise knowledge of the moons' orbits. During the Aug. 17 observation, the position of Phobos crossing the sun was two or three kilometres closer to the center of the sun's position than researchers anticipated.



Earth's Super Rotating Core

The Earth has two iron cores: a solid inner core about the size of the Moon surrounded by a liquid outer iron alloy core, whose convection-driven movements generates the geomagnetic field. The question is do these cores rotate as a single unit or does the solid inner core rotate at a different speed and direction. This has been a 300-year-old question ever since Edmund Halley - who also discovered his famous comet - showed the westward-drifting motion of the Earth's geomagnetic field in 1692. It was the first time that scientists were able to link the way the inner core spins to the behaviour of the outer core. The planet behaves in this way because it is responding to the Earth's geomagnetic field.

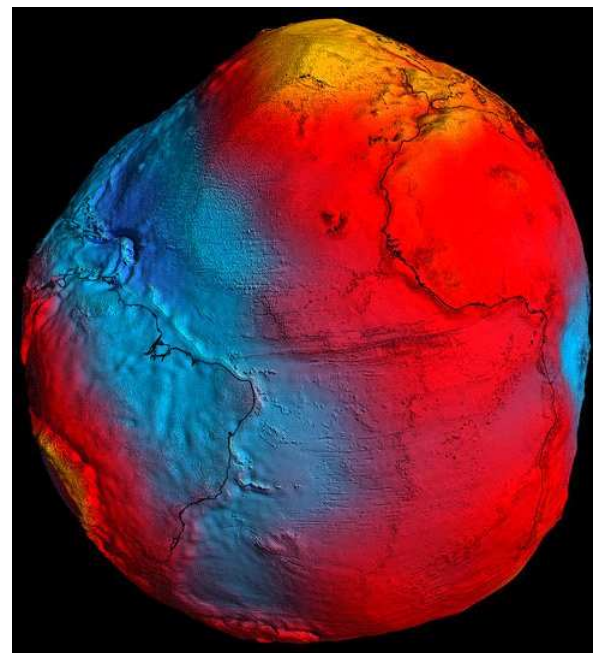


Scientists at the University of Leeds have solved this 300-year-old riddle about which direction the centre of the earth spins. The Earth's inner core, made up of solid iron, 'super rotates' in an eastward direction - meaning it spins faster than the rest of the planet - while the outer core, comprising mainly molten iron, spins westwards at a slower pace. In the last few decades, seismometers measuring earthquakes travelling through the Earth's core have identified an eastwards, or super rotation of the solid inner core, relative to Earth's surface. The link is simply explained in terms of equal and opposite action, the magnetic field pushes eastwards on the inner core, causing it to spin faster than the Earth, but it also pushes in the opposite direction in the liquid outer core, which creates a westward motion. The fact that the Earth's internal magnetic field changes slowly, over a timescale of decades, means that the electromagnetic force responsible for pushing the inner and outer cores will itself change over time. This helps to explain some of the fluctuations observed in the distribution of the surface magnetic field.

ESA's Gravity Probe Mission is Over

Launched on March 17, 2009 by the European Space Agency (ESA), the low altitude satellite GOCE is set to run out of fuel around October of this year. GOCE, which stands The Gravity field and steady-state Ocean Circulation Explorer, was launched with the purpose of mapping the Earth's gravity field at a high level of detail. After collecting data from altitudes ranging between 255 and 235 km, the GOCE satellite carried a gravity gradiometer, which was used to calculate density differences in the crust and oceans of the Earth. The end result was the most accurate model of the geoid ever produced. According to the ESA, the new geoid model is "crucial for deriving accurate measurements of ocean circulation, sea-level change and terrestrial ice dynamics. The geoid is also used as a reference surface from which to map the topographical features on the planet. In addition, a better understanding of variations in the gravity field will lead to a deeper understanding of Earth's interior, such as the physics and dynamics associated with volcanic activity and earthquakes."

The GOCE mission captured data that enabled it to measure other features such as the moho (short for Mohorovičić discontinuity); the boundary between Earth's crust and mantle. The European Space Agency produced the first global high-resolution map of the moho using data from ESA's GOCE gravity satellite via its the GOCE Exploitation for Moho Modelling and Applications project - or GEMMA. The moho was named after Croatian seismologist Andrija Mohorovičić who discovered in 1909 that there is a change in seismic speed 50 km under the earth's surface. The earth's moho ranges from about 70 km in depth in mountainous areas, like the Himalayas, to 10 km beneath the ocean floor. For the first time, it is possible to estimate the Moho depth worldwide with unprecedented resolution, as well as in areas where ground data are not available. This will offers new clues for understanding the dynamics of Earth's interior.



The image above represents the new geoid model produced by GOCE data. With blue for the low values and red/yellows for high values, the image shows deviations in height (-100 m to +100 m) from an ideal geoid.

Comet ISON

Comet ISON will pass just 1.2 million km from the Sun on 29 November 2013 (Australian time). From Earth it will be about one degree from the Sun. At that time it may appear sufficiently bright to be visible in daytime, however, comets are notoriously fickle and this one may not perform as expected. It will probably be worth trying to look in the vicinity of the Sun a day or two before closest approach and for a few days after.

In the week or two before closest approach to the Sun or perihelion the comet will be visible low in the east before sunrise. It should be getting brighter, but also closer to the horizon each morning. If the comet grows a visible tail, it should be pointing upwards, away from the rising Sun.

After perihelion as the comet moves towards the Earth we will not be able to get much of a look from the southern hemisphere. It will be neither an evening nor a morning object for in the evenings the comet will set before the Sun and in the mornings it will rise with the Sun.

Assuming the comet does not fade away like some comets of the past, for those of us in the southern hemisphere the best chance to see Comet ISON will be from mid to late November 2013 in the mornings before sunrise and in the daytime about the date of perihelion on 29 November 2013.

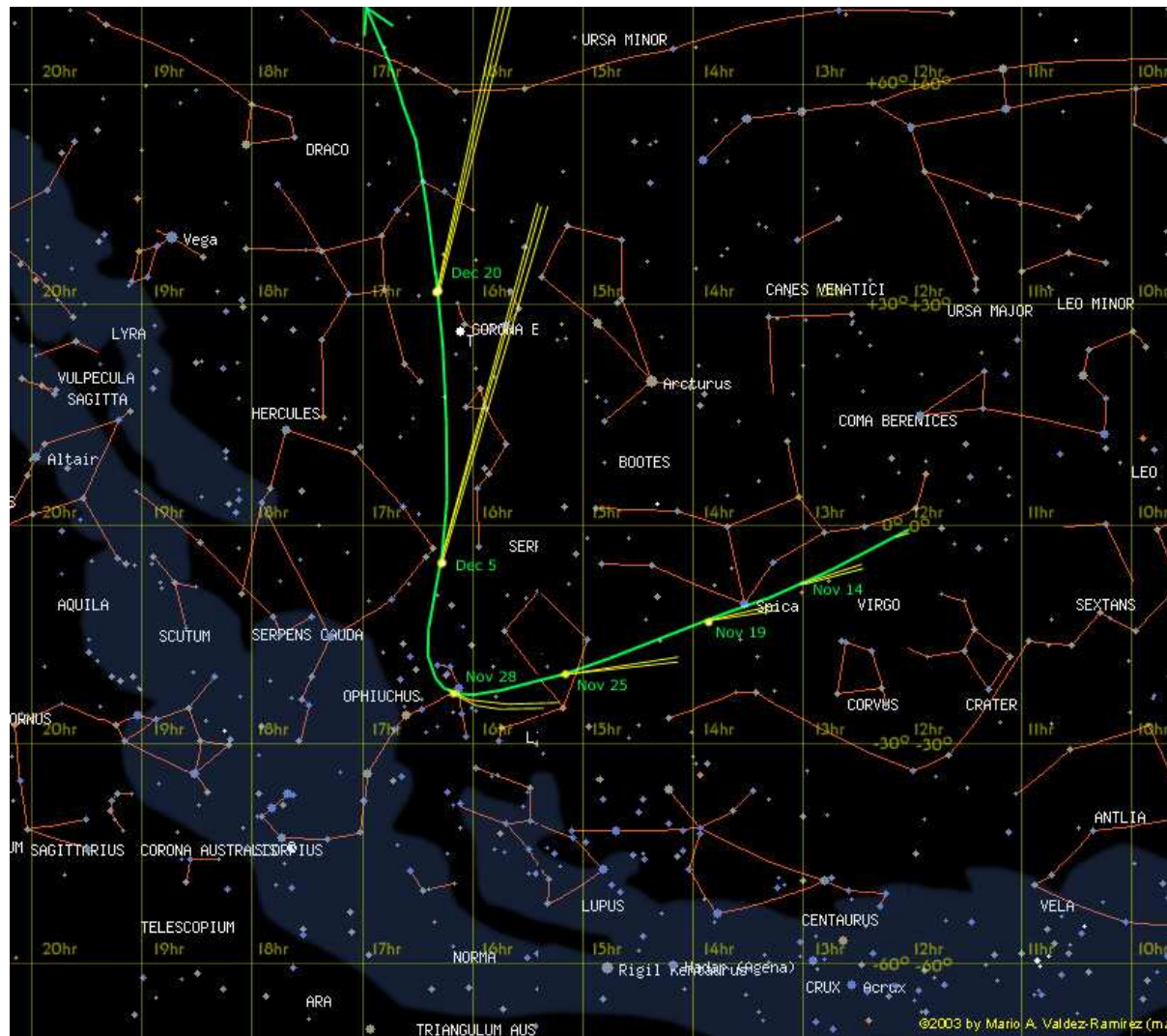
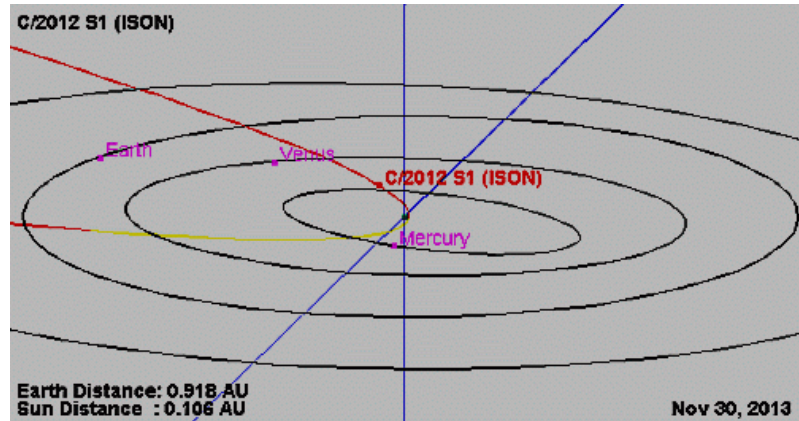
- Extract from the Sydney Observatory Thanks Dave Rolf For sending this in.

Blue Tongue Lizard in the big shed



How NASA Space Assets Will Observe Comet ISON
For more information, visit: <http://solarsystem.nasa.gov/ison>

- Deep Impact** imaged ISON for the first time on January 17 and 18 from 493 million miles away
- MESSENGER** will be observing ISON as it passes by Mercury on November 19th on its way to the sun
- SDO** will be observing ISON as it passes by the sun in late November
- Hubble observed ISON in April/May and will see it again in October and December (if ISON survives)
- Astronauts aboard the International Space Station will be able to observe Comet ISON as it passes by the sun in late November
- Curiosity** will be observing ISON as it passes by Mars. Close approach is October 1st
- In November, **Chandra** will observe ISON with its X-ray instruments
- Lunar Reconnaissance Orbiter** will be observing ISON with its X-ray instruments
- Mars Reconnaissance Orbiter** will be observing ISON as it passes by Mars. Close approach is October 1st
- STEREO** will be observing ISON as it passes by on its way to sun in late November
- In January and March, **Swift** observed ISON when it was 460 million miles away from the sun
- Opportunity** will be observing ISON on its way to the sun on October 1st
- BRISQ**, a sub-orbital balloon, will be launched mid September to study ISON from above nearly all of the Earth's atmosphere
- Spitzer** observed ISON on June 15. The comet was 310 miles away from the sun
- FORTIS**, a sounding rocket, will be launched in mid-to-late November to obtain ultra-violet spectra from ISON
- SDO** will have the ability to observe ISON under extreme-ultraviolet light when the comet is closest to the sun



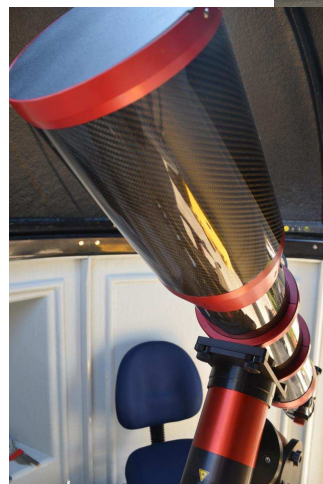
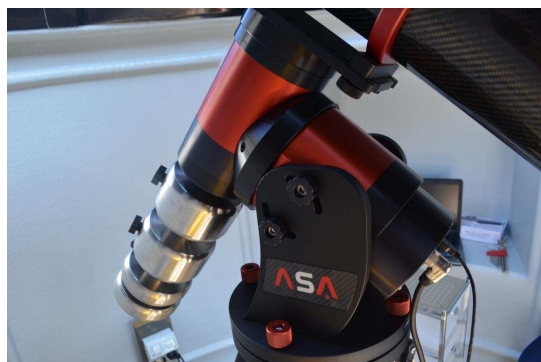
Clemens Unger builds a new observatory

I have been interested in astronomy ever since a summer holiday school camp in the 1970's run by the local astronomy club back in Germany. Like many amateurs in our hobby I went through a range of telescopes which then finally culminated in a fork mounted Celestron 14 which at the time was an incredible scope for an amateur. Following my decision to migrate to Australia in the mid 1990's I decided to donate the C14 to my astronomy club. I was without a telescope for more than a decade as other things took priority. Astronomy was still one of my interests but more in a theoretical sense by reading publications like Sky & Telescope and following developments on the internet.

Last year finally I decided to treat myself and buy a new telescope after my long abstinence from practical astronomy. With memories of spending hours setting up and taking down the C14 in my mind I felt it was best to build an observatory in the backyard in order to get the most out of the telescope. Next I had to decide on a telescope and mount that was suitable for visual observing as well as imaging. After trawling for months through reviews and exchanging emails with users I ordered an Officina Stellare 152mm apochromatic carbon fibre refractor from Italy and a DDM60 direct drive mount Astrosysteme Austria (ASA). The complete system was going to be housed in a Queensland built Sirius dome. I went for a dome as the available space did not allow for a roll off roof observatory design.

Following months of anticipation the components of the system finally arrived. The dome was delivered in segments and it took only a few days to put it together on the previously poured concrete slab. I opted against a pier in the dome as we are planning to move to another (less light polluted) property within the next years. Hence the system sits on a tripod. First light was a few months ago and I was rewarded with truly spectacular views of Saturn through the Officina Stellare refractor. The ASA mount with its cutting edge direct drive technology requires some time to get familiar with. The mount comes with Autoslew, a software that teaches the mount via a pointing model the specific behaviour of the telescope and equipment on the mount. After successfully going through this routine it is possible to take 20min unguided exposures with the system. Autoslew interfaces with several planetarium software packages such as Starry Night or The Sky X via the ASCOM platform. The Sky X allows to plan a night of imaging or observing ahead and is a very useful tool.

The decision to house the telescope permanently in the Sirius dome has proved to be the right decision. It is an incredible luxury to just walk out in the garden open the shutter and be ready for some observing without spending a long time setting up.



MPAS at the Melbourne Camera Show, by Greg Walton

Big Dave & I went to the Melbourne Camera Show to check out the latest cameras and lens on offer. All the big names were there. Pentax had a wall of multi coloured camera and were keeping tight lipped about the release date of the new full frame K3, they also had the new K50 on display which replaced the K30 it had the all features the only changer are new soft ware and a different style body. Canon & Nikon were having a competition on who can make the biggest lens. Lots of uses for GOPRO movie camera, one even attached to a helicopter. Many under water camera housing to suit most cameras. Loads of work shops on all sorts of topics with many girls posing for the cameras. We also scene a large number of tripods, programmable rails and panning heads. You could easily spend a large amount of money a Hasselblad would set you back \$35,000 & then you would need some lens for it at \$3,000 to \$7,000 each. Leica & Olympus had a Range of camera that looked old on the outside but had the latest digital technology on the inside. Tasco had a large range of gadgets on display. Well worth the trip and we resisted spending any money.

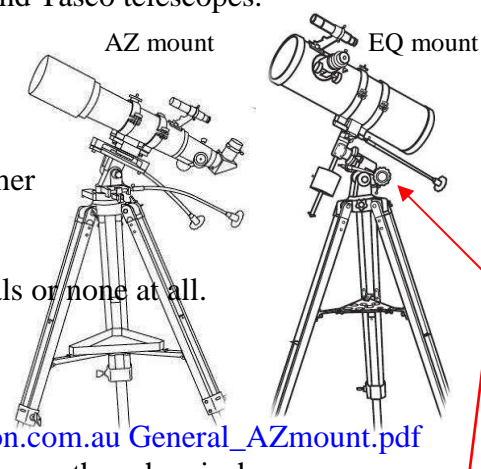


Setting up a budget telescope, *by Greg Walton*

There are many different types of telescopes. Most new astronomers I see have already brought a department store telescope, either a refractor (with a Lens) or a reflector (with a mirror). Supported on a flimsy mount, either a azimuth, like a gun turret which turns parallel to the horizon, which are much easier to use, or an equatorial which is set to an angle equal to the latitude of where you live. I found the cheaper the telescope the more difficult it is to use. Its best to buy a book on telescopes before you buy your telescope, or join an astronomical society. On the telescope learning days run by MPAS at the briars, we see a lot of the cheaper Saxon and Tasco telescopes.

Basic setup for a telescope, step by Step instructions

- 1 Read instructions and assemble the telescope.
Most new astronomers think you can just through the telescope together and it will just work, this is not the case.
I've seen too many telescopes assembled the wrong way.
Many department store telescope are sold with bad instruction manuals or none at all.
Help can be found at the Saxon web site www.saxon.com.au
- 2 Set up the mount.
For azimuth mounted telescopes, just level the mount. See www.saxon.com.au [General_AZmount.pdf](#)
For equatorial mounted telescopes, Point the polar axis to the south for southern hemisphere.
Adjust angle equal to your latitude. See www.saxon.com.au [General_EQ1and2.pdf](#)
- 3 Balance the telescope, move the telescope tube back and forth to find the best balance point.
If its an equatorial mount move the count weight along the shaft till the telescope is in balance.
When you move the telescope it should stay put or not move when you take your hand off.
- 4 Find your lowest power eyepiece or say 25mm and place it in the focuser.
Never look at the sun, especially with a telescope, for it will damage your eyes without you noticing.
If the Moon is in the night sky, see if you can find it in the eyepiece, not so easy.
- 5 Adjust finder scope or red dot finder. Point the telescope at the horizon.
Look through the eyepiece and find a distinctive object in the distances like a phone tower.
Look through the finder scope and adjust till the phone tower is in the centre.
Look through the red dot finder and adjust till the phone tower is in the centre.
Now use the red dot finder then finder scope to finder the Moon, it should now be in the eyepiece.
- 6 The star may look out of shape this means you will need to Culminate the telescope. [Collimation.pdf](#)
- 7 You will often see the mention of 500 times magnification on the box the telescope come in.
Most telescope work at there best at 100 times magnification.
Telescope length divided by the Eyepiece length gives you the magnification.

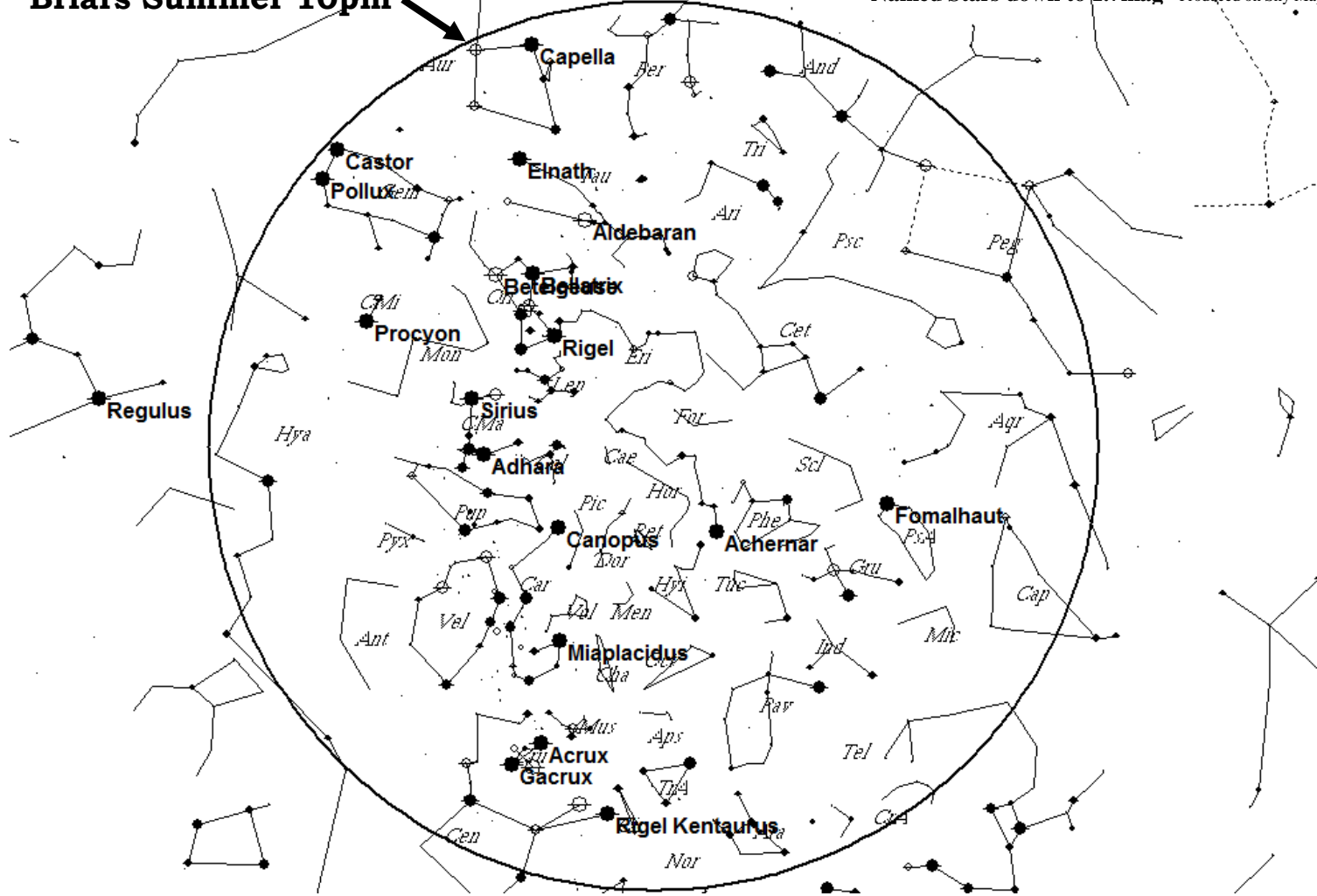


I visited some telescope manufactures web sites, looking for information on setting up and using the most common types of telescopes. Most web sites had nothing useful, just some pretty pictures of there range of telescopes. The Saxon web site was the only really helpful one, I found lots of good information at www.saxon.com.au. See below a list of PDF's available, there is also a excellent trouble shooting section, which answers the most asked questions. **I have also included a seasonal Planisphere on the next 2 pages.**

| | | | |
|-------------------------------------|---|---|---|
| AdjustableLens.pdf | EQ3-2Dual.pdf | HEQ5andEQ6130405V1.pdf | SettingCirclesEQ1and2.pdf |
| Auto-tracking.pdf | EQ3-2Single.pdf | how to choose Microscopes.pdf | SettingCirclesEQ3and5.pdf |
| Collapsible_Dob.pdf | EQ5Dual.pdf | How-to-use-Laser-Collimator.pdf | Synscan Hand Control 271206V3.pdf |
| Collimation.pdf | EQ5Single.pdf | Instruction-digital-camera-binoculars.pdf | SynScan210305V1.pdf |
| Dobsonians.pdf | GENERAL_AZMount.pdf | Pointing.pdf | SynScanV1.pdf |
| EQ1FixedRate.pdf | GENERAL_EQ1and2.pdf | PolarAlignmentEQ1and2.pdf | SynScanV2.pdf |
| EQ1Single.pdf | GENERAL_EQ3and5.pdf | PolarAlignmentEQ3and4.pdf | SynScanV2_V3_11Update.pdf |
| EQ2FixedRate.pdf | GOTOEQ3.pdf | Polarscope.pdf | SynTrek 040805V1.pdf |
| EQ2Single.pdf | GOTOEQ5.pdf | PreAssembledTripod.pdf | SynTrekV1.pdf |
| EQ3 SynScan.pdf | HEQ5 Upgrade Kit 240505V1.pdf | RedDotFinder.pdf | Upgradekit.pdf |

Briars Summer 10pm

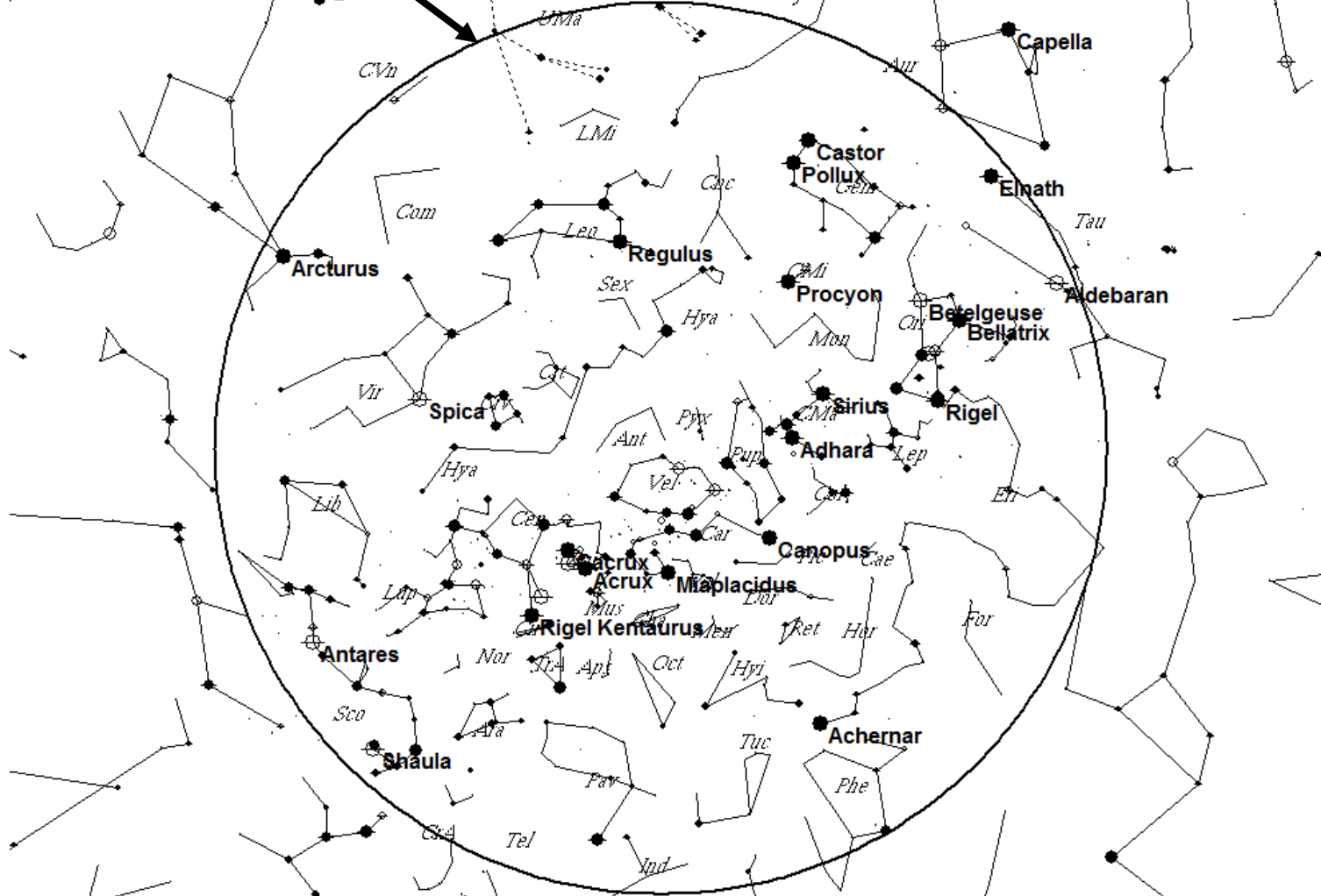
Named Stars down to 1.7mag Produced on Sky Map



Briars Autumn 10pm

South at bottom

Anything outside the circle is below the horizon

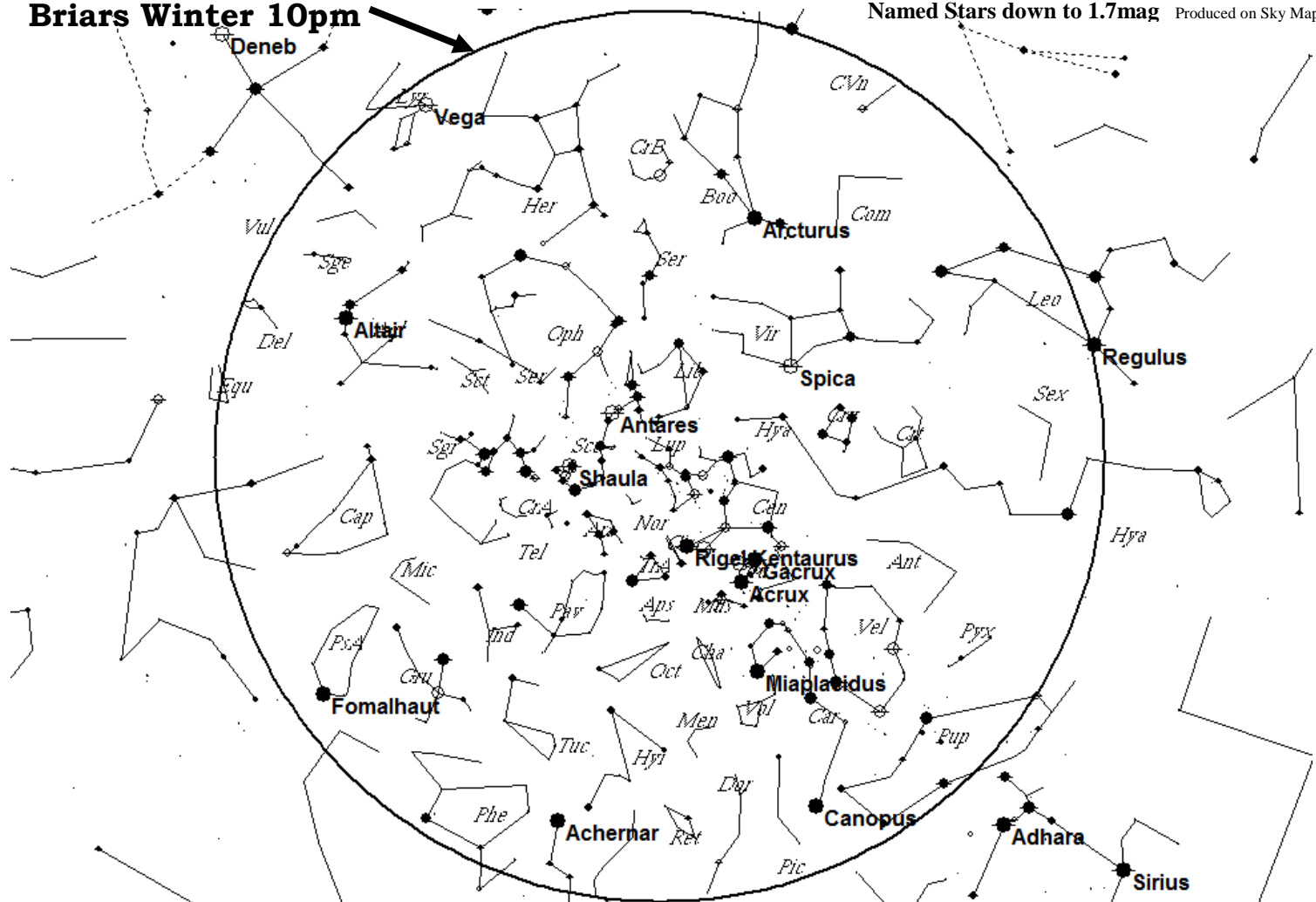


South at bottom

Alignment Stars for Argo Navis or GOTO mounts

Briars Winter 10pm

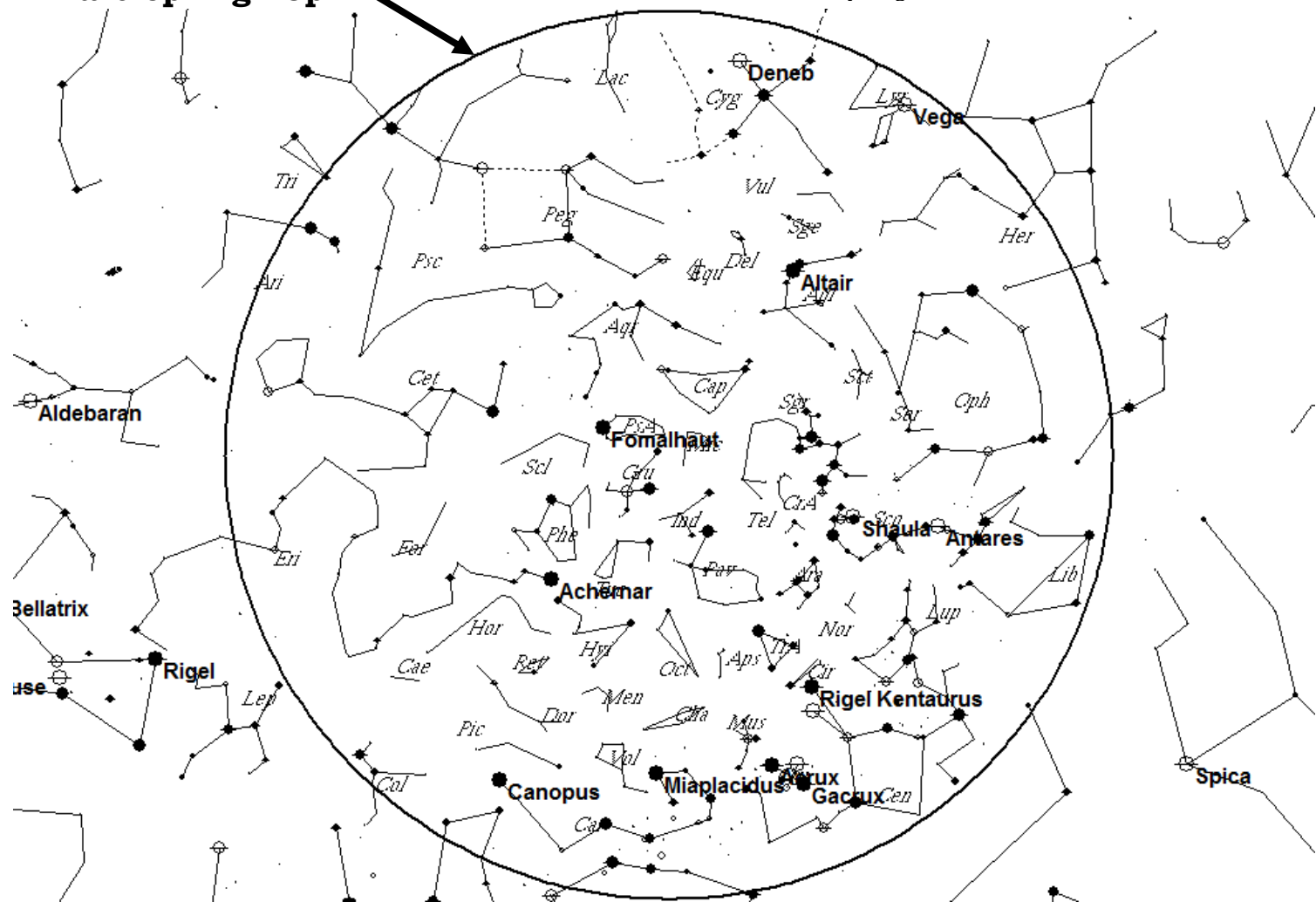
Named Stars down to 1.7mag Produced on Sky Map



Briars Spring 10pm

South at Bottom

Anything outside the circle is below the horizon



South at Bottom

Alignment Stars for Argo Navis or GOTO mounts

Which eyepiece should I buy? *By Greg Walton*

The second most asked question. I usually say, buy a freezer suit first, it's hard to enjoy that new eyepiece if you are cold.

This all depends on the telescope you own and how much you can afford.

Most important thing to consider is the Focal length and F ratio of your telescope, also never buy plastic eyepieces.

I always say spend most of the money on one good eyepiece that will give you 80 to 100 times magnification, because this eyepiece will be used 95% of the time. All other magnifications can be \$50 eyepieces, as these will be used only 5% of the time. A \$500 eyepiece only works twice as good as a \$50 eyepieces, so there not good value. In the last few years the quality of the \$50 eyepieces has improved enormously, I'm amazed how well they work. A lot of telescopes come with \$50 eyepieces these days, often a set of 1 1/4" Plossl 25mm, 15mm, 10mm and 6.5mm. Most eyepieces these day have antireflective coating, meaning light is less likely to bounce off the lens and create internal reflection. The field of view is the angle of view inside the eyepiece, I find you cannot see the edge of the field in these new 100 degree eyepieces, unless my eye is hard against the eyepiece and also need to move my eye around. From my experience I found most eyepieces stay in there case, some people just like collecting eyepieces and are not happy till they have them all. Before you spend any money go to a star party and look through as many telescope eyepiece combination as you can.

Orthoscopic 40 Degree field of view less than \$50 with 4 elements works ok with most telescopes. Rarely seen today, still better than plastic department store telescope eyepieces.

Plossl 50 Degree field of view, for around \$50 with 4 elements, works best with long f ratio telescopes. Finding the sweet spot with this sort of eyepiece can be challenging, especially when tied. Best to be seated. Also with this eyepieces you can see if the culmination of the telescope is off. The stars at the edge of the field will look like comets in telescopes with f ratio less then f7.

Super Plossl 55 Degree field of view, around \$65 with 4 to 5 elements, works best with longer than f7 ratio telescopes. These are a new comer and work surprisingly well, especially with refractors and are slightly more comfortable to use than Plossl. I find these are the best eyepiece for small telescopes, as most of the eyepieces listed below are much to heavy and only come as a 2", also the more lens for the light to past through the less light you will see. The stars at the edge of the field will look like comets in telescopes with f ratio less then f7. Bright stars usually show flares.

Panoptic 68 Degree field of view, around \$300 with 6 elements, works best with longer than f5 ratio telescopes. To see the edge of the field, your eye will sits very close to this eyepiece, as a result the eyepiece gets grubby very quickly. I usually rest my head on this eyepiece to steady myself, this also helps me hold my eye at the correct distance from the eyepiece. My 22mm Panoptic is very comfortable to use so it has become my most used eyepiece. The stars at the edge of the field will look like comets in telescopes with f ratio less then f5, but not as bad as Plossl or Super Plossl. Bright stars show less flares.

Nagler 82 Degree field of view, around \$700 with 7-8 elements, works best with f ratios longer than F4.5 telescopes. One of the most popular eyepieces ever made, especially the 31mm which sits in the focuser of most 18 inch or larger Dobsonian's. Very few people would part with there Naglers they are a life time investment. To see the edge of the field, your eye will sits very close to this eyepiece, as a result the eyepiece gets grubby very quickly. I usually rest my head on this eyepiece to steady myself, this also helps me hold my eye at the correct distance from the eyepiece. The stars at the edge of the field will look like comets in telescopes with f ratio less then f4.5, but not as bad as Panoptic or Super Plossl. The antireflective coating on all these lens makes the view through these eyepieces darker with more contrast than the Panoptic or Super Plossl, giving them a disadvantage in small telescopes.

Ultra wide 84 Degree field of view, around \$400 with 8 elements with a built in Barlow, works well with most telescopes. Not a copy of a Nagler, these eyepieces are a bit of a mixed bag, definitely try before you buy. The Meade Ultra wide has a built in Barlow which removes all coma, but leaves the stars a bit fuzzy. This is the number one eyepiece for looking at the moon and planets, as they come in a 14mm, 8.8mm and a 7mm. The antireflective coating on these lens, is not so strong making the stars brighter than the Nagler. Can be bought for about half the cost of a Nagler, making them a good deal, 2 eyepieces for the cost of one Nagler. One problem with the Meade Ultra wide is your focuser needs an extra 35mm of out travel or you can us a spacer.

Radian 65 Degree field of view, around \$250 with 6 elements, works ok with most telescopes. This eyepiece has been designed for those who wear glass while viewing and have a 20mm eye relief, meaning your eye is 20mm from the eyepiece. This eyepiece is the only option if you have astigmatism.

Ethos 100 Degree field of view, around \$900 with 8 elements, work with any telescopes. If you have the money buy this one, it does not matter were you put your eye in front of this eyepiece is just works, no problems finding the sweet spot. This eyepiece is the latest and greatest advance in eyepieces evolution, minimal coma at the edge of the field of view, that is if you can find the edge.

Barlow lens are a cheap way of increasing magnification \$50 for a 1 1/4" and about \$200 for 2" Big Barlow. Also remove all coma.

Coma corrector makes the star more round at the outer edge of the field also increases magnification by 15%.



See page 59 of Astro image plus https://drive.google.com/folderview?id=0ByvkvxzZGI9g_Zml0UVY4ejdLVEk&usp=sharing

A home built Microscope, *by Greg Walton*

Most amateur astronomers have spent a substantial amount of money on high quality eyepieces, but want to do with them when the clouds hung around of months. Build a microscope which using your eyepieces and get your family and friends involved. The astronomy eyepieces are many time superior to the eyepieces on a bought microscope. All you need is a 50mm camera lens and a piece of 2" plastic pipe about 150mm long, which a 2" eyepiece can slide into. The longer the tube the more magnification you will get and the less light you will also get. I use an old macro bellow for the tube, it's much more versatile and you can attach a DSLR camera. Also you will need a height adjustable stand and a light. You can fine adjust the focus with the 50mm camera lens and adjust the light level with the F stop ring. Most microscopes have their light sores from underneath the specimen, but we will have the light shining down on our specimen, as this is best for looking at every day items like money, rocks, shells, seeds, leafs, flowers, etc. Some of the most uninteresting looking things are the most interesting under the microscope. Attach a DSLR camera and fire away.

I found an old wooden slide storage box, which is perfect for storing my specimens; I used a hot melt glue gun to attach them to card board square cut to suit the box.



The Gallery

Alex gets another image in Sky & Telescope right

3 popular NGC objects in one image
Taken with a 135mm lens
Centre right

Caldwell 44 from Heathcote
Bottom right

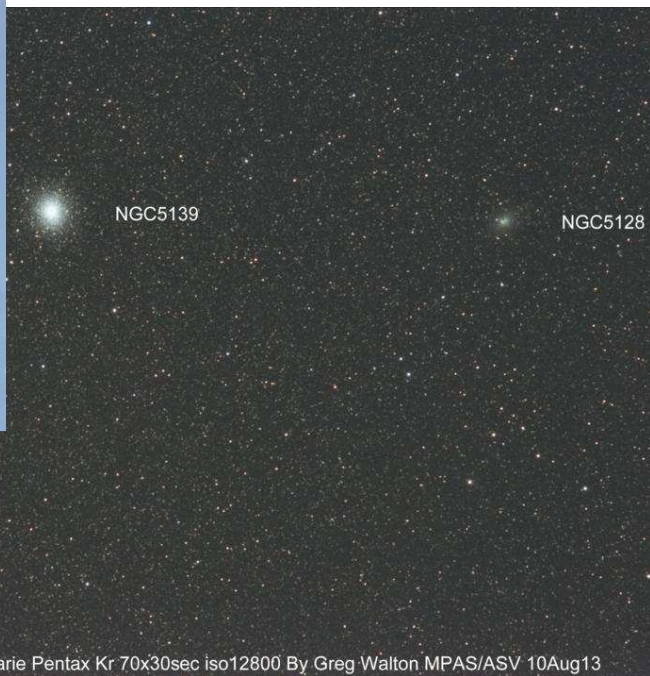
Star Wars Star-fighter at Dromana Drive in I photo shopped away the support stand, to make this image below, it looks like it is really flying.

THE OTHER BRIGHT COMET

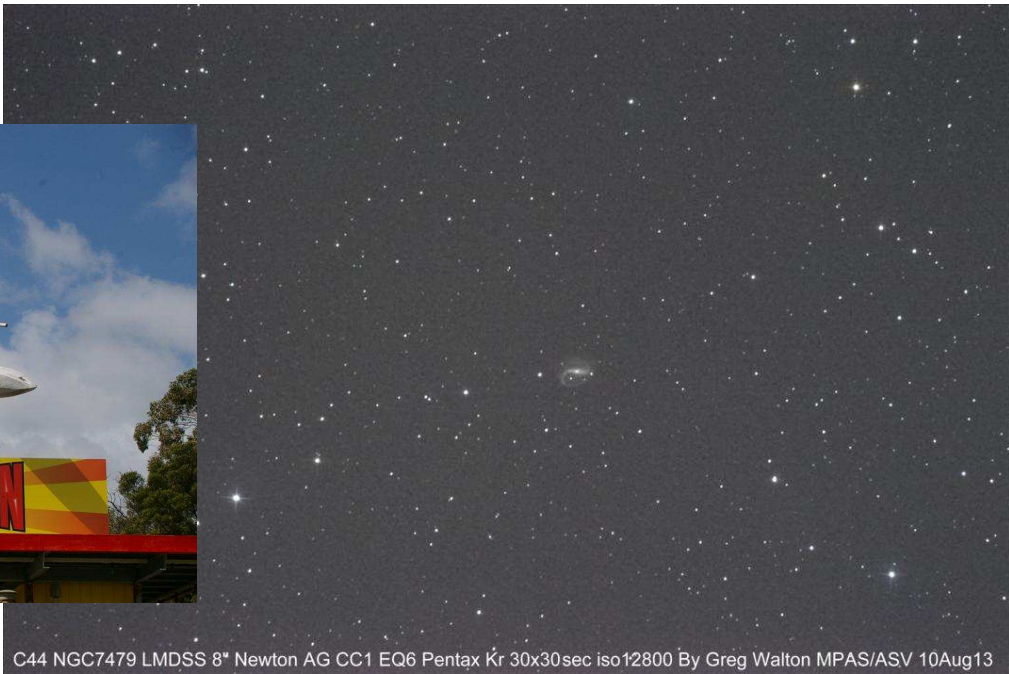
Alex Cherney

While Comet C/2011 L4 (PANSTARRS) took the spotlight in March in the Northern Hemisphere (see below), fainter Comet C/2012 F6 (Lemmon) displayed a complex dust tail and greenish coma for astroimagers here in the Southern Hemisphere. At lower right is the galaxy NGC 55.

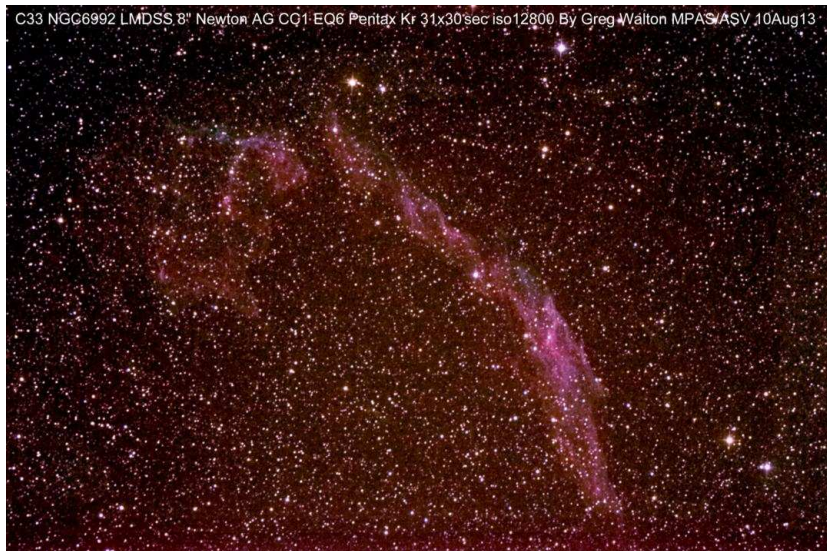
DETAILS: Stellarvue SV80 refractor with a Sony NEX-5N digital camera. Total exposure time was 150 seconds at ISO 3200, recorded on March 11th.



NGC5139 LMDSS 135mm f5.6 Lens Polarie Pentax Kr 70x30sec iso12800 By Greg Walton MPAS/ASV 10Aug13



C44 NGC7479 LMDSS 8" Newton AG CC1 EQ6 Pentax Kr 30x30sec iso12800 By Greg Walton MPAS/ASV 10Aug13



C33&C34 are part of the Veil Nebula low in the northern sky.

Greg Walton's Gallery

Sky Dancer & Sky Drover @ LMDSS in the day & night



SOCIETY INFORMATION



Peter Lowe



Dave Rolfe



Peter Skilton



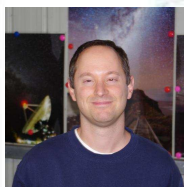
Jamie Pole



Trevor Hand



Ian Sullivan



Simon Hamm



Greg Walton - Please send your articles & photos to gwpas@gmail.com

OFFICE BEARERS OF THE MORNINGTON PENINSULA ASTRONOMICAL SOCIETY

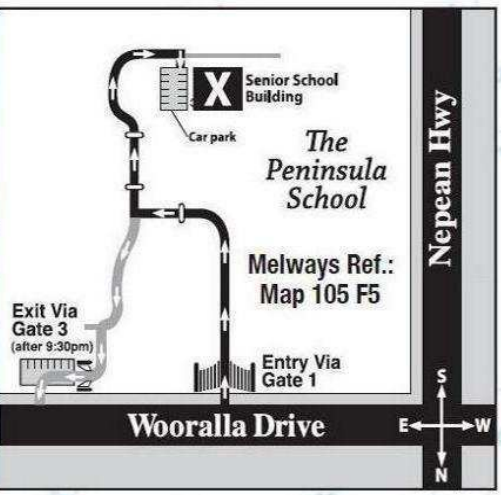
President: Peter Lowe
Vice President: David Rolfe,
Committee: Ian Sullivan, Trevor Hand, Simon Hamm
 Fiona Murray, Greg Walton.
Phone Contact: Peter Skilton - 0419 253 252

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 gates or Gate 3, off Wooralla Drive. Exit is via Gate 3 Only after 9:30pm (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.



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 9773 0098 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.

