The

Bulletin

Volume 125 No. 2
February 2016

Monthly newsletter of the
Astronomical Society of South Australia Inc

You're invited!
Stockport Turret
Official Opening
March 5, 2016
Bookings essential
See p.4 for details

In this issue:

Don't miss the Awards Presentations at the February General Meeting

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Visit us on the web:
www.assa.org.au

ASTRONOMICAL SOCIETY of SOUTH AUSTRALIA Inc

GPO Box 199, Adelaide SA 5001

The Society (ASSA) can be contacted by post to the address above, or by e-mail to *info@assa.org.au.* Membership of the Society is open to all, with the only prerequisite being an interest in Astronomy.

Membership fees are:

Full Member	$75
Concessional Member	$60
Subscribe e-Bulletin only; discount	$20

Concession information and membership brochures can be obtained from the ASSA web site at:
http://www.assa.org.au
or by contacting The Secretary (see contacts page).

Member Submissions

Submissions for inclusion in The Bulletin are welcome from all members; submissions may be held over for later editions.

Wherever possible, text submissions should be sent via e-mail or posted on CD-ROM in almost any word processing format and may still be submitted handwritten or typed. Your name may be withheld only if requested at the time of submitting. Images should be high resolution and uncompressed, e.g. TIFF file formats, although high resolution JPEGs are acceptable. Your full name and object designation must be provided with each image and will be published. Equipment/exposure etc details are welcome but optional.

Advertising & Classifieds

Small adverts and classifieds are free for members (space permitting). Commercial advertising is available at a cost of $50.00 per quarter page per issue.

All enquiries and submissions should be addressed to The Editor and preferably sent by e-mail to:
editor@assa.org.au

For large files (e.g. on CD) or hardcopy items, post to:
Joe Grida
Editor, The Bulletin
PO Box 682,
Mylor SA 5153

Contributions should reach the Editor no later than the 7th of each month, for publication in the following month's issue of The Bulletin

In this issue:

Sister Society relationships with:

Orange County Astronomers
www.ocastronomers.org

Colorado Springs Astronomical Society
www.csastro.org

Central Arkansas Astronomical Society
www.caasastro.org

Cover photo: Barred spiral galaxy NGC1097, in Fornax, imaged by **Paul Haese** at Clayton Bay, SA. Equipment - GSO RC12 telescope & SBIG STXL11002 CCD camera. Guiding – AOX, Software - MaximDL, Focusmax, Pinpoint, CCDautopilot 5. LRGB 24 hours. Darks, flats and biases applied. Processed in CCD stack and Photoshop CS6.

Activities

February 2016 - the month at a glance

General Meeting

Wednesday, 3 February 2016
@ 8:00pm
Kerr Grant Lecture Theatre
2nd Floor, Physics Blg
University of Adelaide
North Terrace, Adelaide

Special Event:

ASSA Annual Awards Presentations

ASSA Awards Presentation Night

This will be a glittering event featuring the ASSA Awards presentations. Please be there to show your support to those members who will be recognised for their achievements.

The 2015 Awards to be presented at the Awards Ceremony at the February 2016 General Meeting include:

Bill Bradfield Astronomy Award
Craig Richardson Memorial Image Award
Astrophotography Award
Annual Service Awards
Special Service Awards
Editor's Award

Show your support & appreciation. Be there!

Planning on going observing?

Save yourself unnecessary travel and time. If the weather looks doubtful where you are, check with the following people to see if the event is still on (or see www.assa.org.au after 5pm).

Stockport Observatory (DO 3-13)

Observatory 8528 2284

Lyn Grida 8391 5377

Tony Beresford 8338 1231

Heights Observatory (DO 3-34)

Robert Bronca 8266 7504

Whyalla

Peter Mayfield 0408 410 895

Tooperang

Jeff Lowrey 0429 690 610

Northern Yorke Peninsula

Tony "Hendy" Henderson 0429 352 382

Riverland

Tim Vivian 0407 800 225

February 2016 Calendar

Day		Time	Activity
Wed	3	7:00pm	Beginners' Meeting, Adelaide
Wed	3	8:00pm	General Meeting, Adelaide
Thurs	4	7:30pm	Whyalla Members' Meetng
Fri	5	8:00pm	Public & Members' Viewing – NYP
Sat	6	8:00pm	Members' Viewing Night – Stockport
Sat	6	8.00pm	Member's Viewing Night - Riverland
Sat	6	8:00pm	Members' Viewing Night – Tooperang
Fri	12	8:00pm	Public Viewing Night – The Heights
Sat	13	8:00pm	Summer Star Party – Stockport
Tue	23	7:30pm	ASSA Council Meeting
Fri	26	7:30pm	Astro-Imaging Group meeting

Note: Times shown above and throughout this document are:
4 Oct 2015 to 3 Apr 2016 : South Australia Summer Time (UTC+10:30)
4 Apr 2016 to 2 Oct 2016 : South Australia Standard Time (UTC+ 9:30)
3 Oct 2016 to 1 Apr 2017 : South Australia Summer Time (UTC+10:30)

Astronomy Education - Beginners' Talks

Wednesday, 3 February 2016 @ 7:00pm
Kerr Grant Lecture Theatre

Earth's Natural Satellite – The Moon

After travelling to the far reaches of the cosmos last year, we return to our own eighbourhood and take a close look at our own natural satellite – The Moon. Where did it come from? What are it's physical properties? These questions and many more will be explored about our companion in space.

You are invited to the Official opening of the new Stockport Turret

Photo: Steven Saffi

The official opening of the new turret for the Charles Todd Observatory over the Jubilee telescope at Stockport will be held on Saturday, 5th March 2016.

The Minister for Science and Information Economy has agreed to perform the opening. State and Federal Members of Parliament, Local Government officials and people involved in the project are all being invited to the opening.

The invitation to attend the event is also extended to ALL ASSA members.

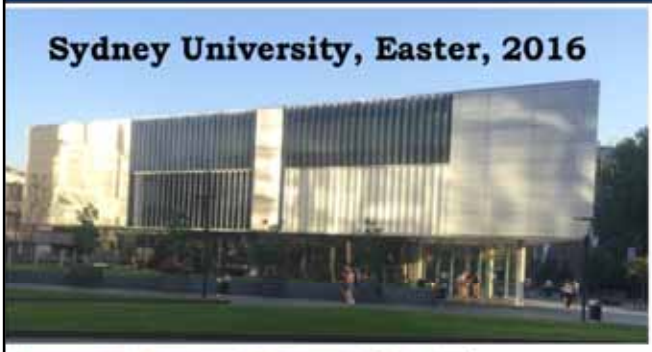
The official opening will be held at 5:00 PM followed by tours of the site for invited guests and a few drinks and nibbles plus the customary ASSA Stockport BBQ. This is also a Members' Observing Night, so the guests will be invited to stay on and enjoy views of our beautiful southern skies.

There will be catering for the invited guests both for the afternoon nibbles and the BBQ, but we ask members attending to bring a plate to share for dessert plus as usual bring your evening BBQ needs.

Come and join us celebrating the reopening of the Charles Todd Observatory. To assist with the arrangements, it is **essential** that you advise the Observatories Director, Lyn Grida, at observatories@assa.org.au, before the 27th February if you will be attending the opening.

NATIONAL AUSTRALIAN CONVENTION OF AMATEUR ASTRONOMERS

Sydney University, Easter, 2016



Thank you to our venue sponsors Sydney Institute for Astronomy (SIfA)

Amateur astronomers from across Australia and New Zealand will be meeting next Easter to share their knowledge on a broad range of topics including variable stars, astroimaging, spectroscopy, occultations, outreach, comet hunting, history, citizen science, pro-am collaboration, and much more. Why not join us?

Programme highlights include:

- Two days packed with presentations
- Variable Stars South Symposium
- Trans-Tasman Symposium on Occultations
- Workshop on image processing with PixInsight
- Conference Dinner with guest speaker Fred Watson
- Behind the scenes tour of historic Sydney Observatory

And don't forget other attractions such as the Royal Easter Show.

Registration packages range from just a half day to all four days.

Visit our website http://nacaa.org.au for more details

Solar BBQ/Picnic

A great day was had by all who attended

Telescope clinic

Did Santa bring you a new telescope for Christmas? Or has your telescope languished in the garage or shed because you didn't know how to set it up?

Is something not quite right with your telescope? Out of collimation? Won't track?

Bring your telescope to see the doctor, and get answers to all these questions, and many more at the first Telescope Clinic of 2016.

The Heights Observatory
Sunday, 21 February 2015
@ 3:00pm

Have you got your National Police Check?

- New legislation applies from 11 April 2015
- Impacts on all ASSA members who volunteer at ASSA sanctioned **public** events
- i.e. public viewing nights, school visits, National Science Week, private booked nights

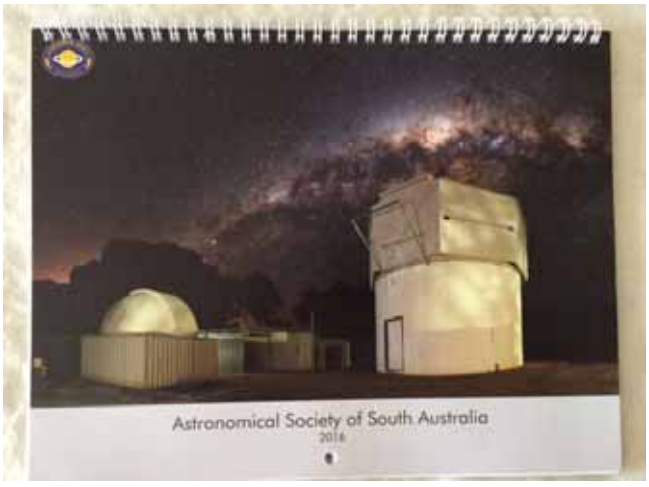
From the 11th April 2015, all members who attend ASSA sanctioned public events MUST have a current NPC clearance certificate, or equivalent clearance letter from their employer, and MUST have provided ASSA with these details.

Non-compliance is a $10,000 fine to ASSA.

Full details available here:
https://www.assa.org.au/media/58017/Police-Checks-Process-for-Applicants-ASSA-version.pdf

Have you got your copy of the ASSA 2016 Calendar yet?

Full of beautiful sky photos taken by ASSA members, as well as details of meetings, observing nights, and other special events in the 2016 calendar.



Special Price

Get your copy at meetings, or email secretary@assa.org.au
$15 + $5 postage/handling

2016 Flinders Ranges AstroCamps

There a 5 astrocamps planned for 2016:

Alpana Station - May 6-9, August 26-29
The Springs - April 8-11, September 23-26

Please be aware that places for these camps fill very quickly, so if you are considering attending, book ASAP!

Please note that a dedicated **Astro Imaging workshop** will be held at The Springs over the weekend of March 11-14, 2016. A full program will be available in mid-January.

If you would like to know more about these camps, please contact:

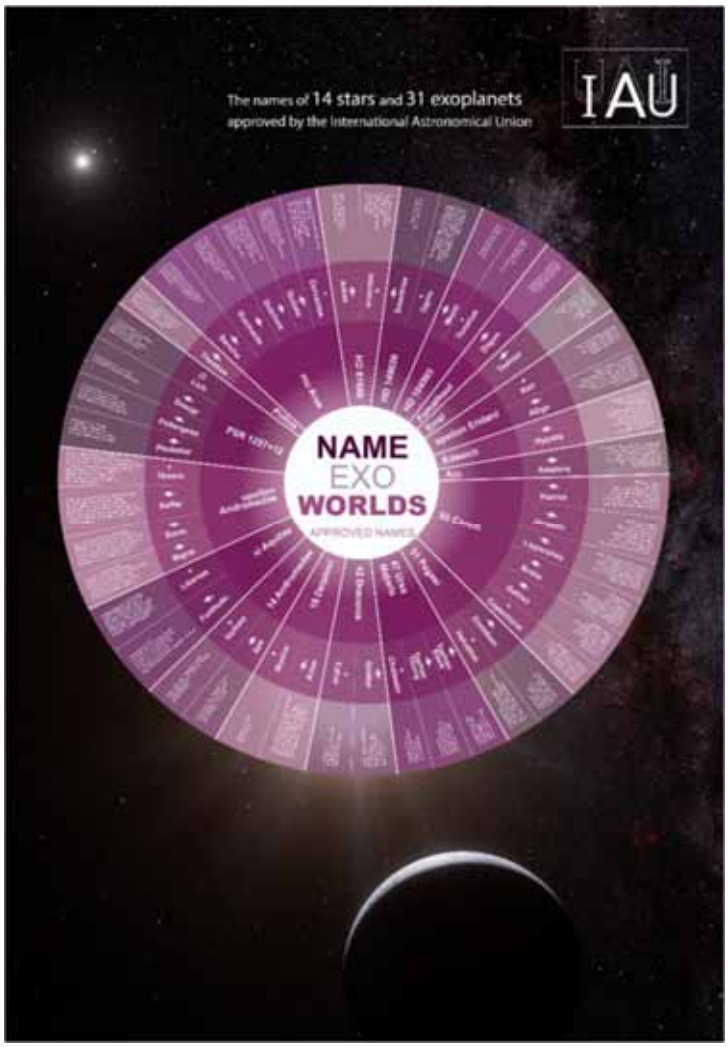
Joe Grida
(joe.grida@internode.on.net)
phone 08 8391 5377
for a detail sheet.

Exo-Worlds Named

Terry Wardle reports that we now have another 31 planet names to remember

The names of 14 stars and 31 exoplanets have been approved by the International Astronomical Union.

A list of 305 well-characterized exoplanets discovered prior to 31 December 2008, was selected for public naming by the International Astronomical Union (**IAU**). These exoplanets belong to 260 exoplanetary systems comprising one to five members, in addition to the host star. These systems and their host star together are referred to as ExoWorlds. Their list is published on the NameExoWorlds website.



Above: *A full-size downloadable image of the naming chart is available at:* http://www.iau.org/public/images/detail/iau1514a/

1. 55 Cancri	2. Epsilon Tauri
3. 51 Pegasi	4. 14 Andromedae
5. Upsilon Andromedae	6. Pollux
7. Xi Aquilae	8. 47 Ursae Majoris
9. Mu Arae	10. Edasich
11. HD 149026	12. Fomalhaut
13. HD 104985	14. 18 Delphinis
15. Epsilon Eridani	16. Errai
17. HD 81688	18. 42 Draconis
19. Tau Boötis	20. PSR 1257+12

An IAU Directory for World Astronomy website allowed astronomy clubs and non-profit organisations interested in naming these ExoWorlds to register. These groups sent in proposals for the names of members of these exoWorlds (including the host star), based on the rules in the IAU Exoplanet Naming Theme, together with a detailed supporting argument for their choice. Each group was allowed to name only one ExoWorld.

The general public then voted to rank the proposed names that were announced at a special public ceremony held during the IAU XXIX General Assembly in Honolulu, USA. The winning public names do not replace the scientific designations, but are recognised by the IAU as the appropriate publicly used name for the object(s).

The ExoWorlds

While there are no astronomical names for exoplanets, the host stars have well known and multiple astronomical designations. The host stars of the exoplanets are: shown on the table at bottom left.

The list includes well-studied exoplanets discovered over twenty years, up to 31 December 2008. A period of at least five years since the discovery was considered as a simple and satisfactory criterion to include exoplanets which can be considered as confirmed.

In the ExoWorlds list, some stars already have common names, i.e. Fomalhaut, Pollux, Cephei (Errai, Arabic for shepherd), epsilon Tauri (Ain, Arabic for the bull's eye) and iota Draconis (Edasich, Arabic also). These stars have common names as well in other cultures. Consequently, these stars could not be considered for public naming.

As announced on 15 December 2015, names for 31 exoplanets and 14 host stars, voted for by the public, were accepted and are to be officially sanctioned by the IAU. The winning names are to be used freely in parallel with the existing scientific nomenclature, with due credit to the clubs or organisations that proposed them.

If the IAU invite organisations to propose names for the next batch of discovered ExoWorlds maybe the ASSA will have an entry accepted.

Report on VicSouth Desert Spring Star Party

Michael Mattiazzo reports on another successful star party

The 13th VicSouth Star Party was held over 3 nights, between Friday 6th to Monday 9th of November 2015, at the Little Desert Nature Lodge near Nhill, Victoria.

It was well attended, with over 80 registrants. The weather cooperated brilliantly and we were treated to 3 mostly clear nights, with an Aurora Australis and bright Taurid fireball activity on offer.

This year, the committee made the decision to separate astrophotographers from the visual observers, to ensure that stray light was kept to a minimum.

Interestingly, astronomers appeared to prefer imaging over visual, estimating it at about 2/3rds. This goes to show how astronomy has changed over the years, with a preference for capturing photons on a CCD chip instead of an eyeball!

There were impressive pieces of equipment on both sides of the field. Several large dobs of 18" as well as a 24" for the visuals, followed up by impressive Takahashi refractors and the likes for the photographers.

On Friday evening, the usual public session for local Nhill residents was a non event, as Lodge management underwent a change in the weeks prior, so unfortunately word didn't make it out. Despite this, Perry Vlahos presented a well received sky for the night for star party attendees.

On Saturday afternoon, we organised a special guest speaker from Brisbane, Terry Lovejoy, who presented a workshop on *"Techniques for Searching and discovering new Comets".*

Terry has been an avid amateur astronomer for nearly 40 years and is best known for the discovery of 5 comets that bear his name.

He is also credited for 11 SOHO comets, using data from the LASCO C3 camera and his most notable discovery was the great Kreutz Sungrazing Comet C/2011 W3 which spectacularly appeared in late December of 2011.

Terry's latest discovery C/2014 Q2, which peaked at magnitude 4 in January 2015, was one of the most photographed comets on record, when it was well situated for observers in both hemispheres during the more convenient evening hours.

During this workshop, Terry looked at the key points for conducting an effective Comet Hunting Survey. Major topics included instrument selection, camera and scope automation, automated moving object detection as well as survey strategies. Terry also described his successes. (I aim to have this presentation uploaded to the VicSouth website)

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Afterwards Will Godward, representing Skywatcher Australia, presented their latest products on offer. Then Joe Grida discussed the benefits of having, and how to generate a deep sky observing plan. Matthew Lovell of "Telescopes and Astronomy" was the main vendor on display.

Saturday evening dinner was followed by the door prize. Our sincere appreciation goes to Skywatcher Australia, who donated an 8" Dobsonian telescope, Simulation Curriculum Corporation, who donated a copy of Starry Night Pro 7 and Bintel who donated observing books.

After the prize draw, Fraser and Lorraine Farrell conducted the quiz session that was well contested. Later that evening, observers were treated to an aurora display. It was not overly impressive visually, but captured quite well with a host of digital cameras about.

The Taurid meteor complex also appeared quite active with many very bright fireballs on offer, leaving persistent "trains". These high altitude trains were seen to move in a north-westerly direction as opposed to the notheasterly direction of passing clouds. Interestingly Greg Walton (MPAS) seemed to have captured a meteor train that originated from below the horizon!

Sunday was a day for relaxation, where many astrophotographers were seen processing their previous nights' images. Another fine night was on offer, but most people had packed it in by midnight, ready for the drive home Monday.

VicSouth 2016 should be a big one. It is scheduled to occur from Friday October 28 to Tuesday November 1 (including the Melbourne Cup public holiday). A four night star fest. Get your bookings in early to avoid disappointment (bookings start from June 1st each year)

IMAGE DETAILS

1. Previous page: the Taurid Fireball was taken on the 8th of November at 10.45pm local time, by Mark Samson

2. Below: Aurora imaged by Mark Samson on the 7th of November at 9:38pm local time, Canon 6D 14mm f2.8 45sec ISO6400.

3. Bottom: Group Photo courtesy Paul Rogers

Comet fragments best explanation of mysterious dimming star

Was it a catastrophic collision in the star's asteroid belt? A giant impact that disrupted a nearby planet? A dusty cloud of rock and debris? A family of comets breaking apart? Or was it alien megastructures built to harvest the star's energy?

Just what caused the mysterious dimming of star KIC 8462852?

Massimo Marengo, an Iowa State University associate professor of physics and astronomy, wondered when he saw all the buzz about the mysterious star found by citizen scientists on the Planet Hunters website.

Those citizen scientists were highlighting measurements of star brightness recorded by NASA's Kepler spacecraft. Tiny dips in a star's brightness can indicate a planet is passing in front of the star. That's how Kepler astronomers -- and citizen scientists using the internet to help analyze the light curves of stars -- are looking for planets.

But this star had deep dips in brightness -- up to 22 percent. The star's brightness also changed irregularly, sometimes for days and even months at a time. A search of the 150,000-plus stars in Kepler's database found nothing like this.

So Marengo and two other astronomers decided to take a close look at the star using data taken with the Infrared Array Camera of NASA's Spitzer Space Telescope. They report their findings in a paper recently published online by *The Astrophysical Journal Letters.*

Their conclusion?

"The scenario in which the dimming in the KIC 8462852 light curve were caused by the destruction of a family of comets remains the preferred explanation …," wrote the three -- Marengo; Alan Hulsebus, an Iowa State doctoral student; and Sarah Willis, a former Iowa State graduate student now with the Massachusetts Institute of Technology's Lincoln Laboratory.

Questions about the star were launched last month when a research team led by Tabetha Boyajian of Yale University reported on the star in the Monthly Notices of the Royal Astronomical Society. The astronomers reported how citizen scientists tagged the star's deep and irregular dips in brightness as "bizarre" and "interesting."

Boyajian and the other researchers looked at the data and investigated several possible causes. They wrote the "most promising theory" was a barrage of crumbling comets passing in front of the star.

In a subsequent paper submitted to The Astrophysical Journal, Jason Wright and colleagues at Penn State University speculated about other causes, including alien megastructures built to harvest energy while orbiting the star.

Above: *Observations of the star KIC 8462852 by NASA's Kepler and Spitzer space telescopes suggest that its unusual light signals are likely from dusty comet fragments, which blocked the light of the star as they passed in front of it in 2011 and 2013. The comets are thought to be traveling around the star in a very long, eccentric orbit. Credit: Illustration by NASA/JPL-Caltech*

When the Iowa State astronomers studied the star with Spitzer infrared data from January 2015 -- two years after the Kepler measurements -- Marengo said they didn't see much. If there had been some kind of catastrophe near the star, he said there would be a lot of dust and debris. And that would show up as extra infrared emissions.

Marengo said the study looked at two different infrared wavelengths: the shorter was consistent with a typical star and the longer showed some infrared emissions, but not enough to reach a detection threshold. The astronomers concluded there were no excess infrared emissions and therefore no sign of an asteroid belt collision, a giant impact on a planet or a dusty cloud of rock and debris.

So Marengo and his colleagues say the destruction of a family of comets near the star is the most likely explanation for the mysterious dimming. The comet fragments coming in rapidly at a steep, elliptical orbit could create a big debris cloud that could dim the star. Then the cloud would move off, restoring the star's brightness and leaving no trace of excess infrared light.

And the alien megastructure theory?

"We didn't look for that," Marengo said. "We can't really say it is, or is not. But what the star is doing is very strange. It's interesting when you have phenomena like that -- typically it means there's some new physical explanation or a new concept to be discovered."

Story Source: Iowa State University. "Comet fragments best explanation of mysterious dimming star." 25 November 2015. www.sciencedaily.com/releases/2015/11/151125084108.htm

Solar System Highlights

The major planets during February 2016

by Joe Grida

Psst! Wanna see naked eye planets? Then get up before sunrise, sleepy-heads! For all 5 of the naked eye planets are strung out along the ecliptic in the February pre-dawn sky.

This month provides an excellent opportunity to catch speedy **Mercury**. It reaches greatest elongation (26°) west of the Sun on the 7 February, displaying a diameter of 6.8" and a magnitude of -0.1. Look out for it the previous morning, below brilliant Venus. See the diagram, below right, from *Cartes du Ciel* software.

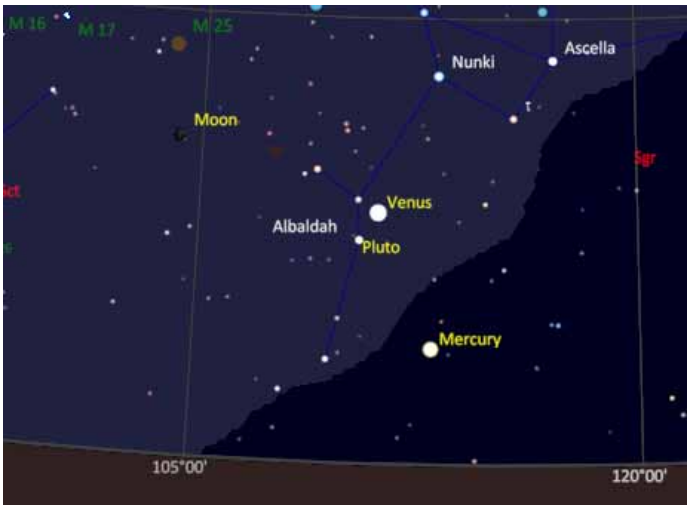
Venus has begun its slide into the dawn sky, bringing an end to its long rule in the morning sky. By the end of the month, it rises just a couple of hours before the sun. Shining at a brilliant -3.9 mag, its diameter shrinks from 12" to 11", whilst its gibbous phase increases from 85% to 90% lit.

Mars loiters in Libra all month. At the start of February, you can find it 1.1° north of 3rd-magnitude Zubenelgenubi (Alpha Librae). It rises at approx. 12:30am at the start of the month, and 1 hour earlier at the end of February. Brightness increases from +0.8 to +0.3 magnitude, as it begins to close the gap with Earth for closest approach on May 30. The angular size grows from 6.8" to 8.6" during February. The diameter grows 18.6" at opposition in May. Due to its small size during February, you'll need a large telescope, good seeing, and Mars high in the sky to glimpse any detail. You'll see the north polar cap if nothing else. You'll also notice that the disk isn't perfectly round; it displays a gibbous phase with only 90% of the disk illuminated. On 7 February Mars reaches western quadrature; i.e. the Sun-Earth-Mars angle is 90°.

The king of the planets, **Jupiter**, begins its campaign to re-capture the evening sky this month, with the giant planet rising by 10:00pm ACDT at the start of February and 1.5 hours earlier by month's end. Grab any size telescope, and you'll be rewarded with amazing views of the planet and its Galilean moons.

Saturn can be located just below Antares, in Scorpius. It rises at 02:00am at the start of February.

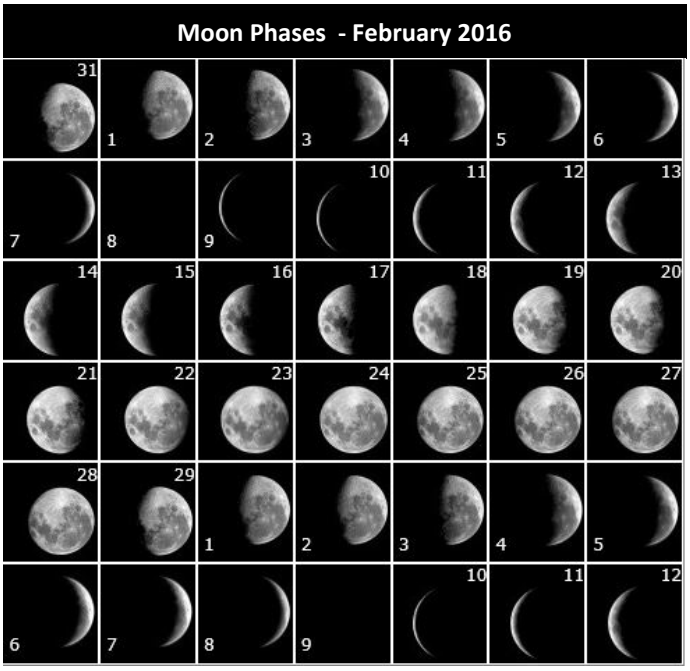
Uranus and **Neptune** are the only major planets in the early evening sky, but are unobservable low in the western sky.



Dairy of phenomena

Febuary 2016

d	h(UT)	
1	3	LAST QUARTER
1	10	Mars 2.6°S of Moon
3	19	Saturn 3.4°S of Moon
5	4	Moon furthest South (-18.3°)
6	1	Venus 1.1°S of Pluto
6	5	Pluto 3.2°S of Moon
6	6	Venus 4.3°S of Moon
6	15	Mercury 3.7°S of Moon
7	5	Mercury greatest elong W(26°)
8	14	NEW MOON
9	23	Neptune 2.0°S of Moon
11	3	Moon at perigee
12	14	Uranus 1.6°N of Moon
15	7	FIRST QUARTER
16	8	Aldebaran 0.4°S of Moon
17	23	Moon furthest North (18.3°)
22	11	Regulus 2.4°N of Moon
22	18	FULL MOON
24	2	Jupiter 1.6°N of Moon
26	23	Spica 4.9°S of Moon
27	3	Moon at apogee
28	15	Neptune at conjunction
29	19	Mars 3.5°S of Moon



A potentially naked-eye comet mid-year

C/2013 X1 PANSTARRS.

Will be closest to the Sun on 2016 April 20 at a distance of 1.31AU and later, aproaches the Earth to within 0.64AU on 2016 June 21.

When it was discovered in 2013, it was predicted to reach magnitude 6 around the time of closest approach to the Earth, assuming an "average" brightening rate.

Around early January 2016, brigtness estimates had the comet around 9.5 until late on January 3 UT, when it was seen to rise by >1 magnitude in a 24hr period.

On January 5.46UT, I was estimating a magnitude of 8.0 and a 8' coma, through 25x100mm binoculars.

The morphology was indicative of a gaseous eruption, with a sharp increase in coma size and development of a photographic ion tail.

Was this an outburst? or simply an awakening of a dormant comet? The brightening behaviour of C/2013 X1 PANSTARRS doesn't seem to be typical of a dynamically new comet, which often disappoint.

But is this really the comet's first trip into the inner solar system?

We need to look at the reciprocal semimajor axis (a) of the original orbit

(AU)=0.0002451 not the current eccentricity of 1.0010515, after planetary perturbations.

The MPC orbit is very well determined with over 2 years of data. Therefore the original "a" was 4,080 AU and period 260,000 years.

This may indicate that the comet has had a previous solar encounter, and is only just awakening as it crosses the "ice line" for water sublimation.

The cutoff for dynamically new comets is at 20,000AU. Coma estimates of 10'-12' put the actual size around the 800,000 to 1,000,000 km diameter range, nearly as large as the Sun!

Potentially we could be looking at a magnitude 5.0 peak this June when it rapidly moves into evening skies, crossing the

Images of Comet C/2013 X1 PANSTARRS taken by Justin Tilbrook of Penwortham, near Clare SA.
Above left: *Pre image taken 2015 Dec 28 at 21:51UT.* ***Above right:*** *Post image taken 2016 Jan 4 at 21:54 UT*

Southern Hemisphere Comets

by Michael Mattiazzo

A roundup of bright and telescopic comets visible for southern hemisphere observers

constellations of Pisces Austrinus, Microscopium, Telescopium and Ara.

During February, the comet will only be seen from the northern hemisphere as it heads towards solar conjunction.
Around the middle of March, it will enter the SOHO field of view. It returns to southern hemisphere skies during April as a morning object.

C/2013 US10 Catalina.

No longer observable from the southern hemisphere, comet Catalina seems to have maintained a steady peak of mag 6 throughout December to January.
See the image above by Michael Jager from Austria, showing amazing detail in the ion tail, as well as a bright sunward pointing tail (trail).

More pics can be found on his website.
http://cometpieces-at.webnode.at/

Check my Southern Comets website for more information:
http://members.westnet.com.au/mmatti/sc.htm

Her diary:
Tonight I thought my husband was acting weird. We had made plans to meet at a nice restaurant for dinner. I was shopping with my friends all day long, so I thought he was upset at the fact that I was a bit late, but he made no comment on it. Conversation wasn't flowing, so I suggested we go somewhere quiet so we could talk. He agreed, but he didn't say much. I asked him what was wrong. He said, "Nothing". I asked him if it was my fault that he was upset. He said that he wasn't upset, that it had nothing to do with me, and not to worry about it. On the way home, I told him that I loved him. He smiled slightly, and kept driving. I can't explain his behaviour; I don't know why he didn't say "I love you too". When we got home, I felt as if I'd lost him completely, as if he wanted nothing to do with me anymore. He just sat there quietly and watched TV. He continued to seem distant and absent. Finally, with silence all around us, I decided to go to bed. About 15 minutes later, he came to bed. But I still felt he was distracted, and his thoughts were somewhere else. He fell asleep – I cried. I don't know what to do. I'm almost sure that his thoughts are with someone else. My life is a disaster.

His diary:
Telescope won't guide. Can't figure out why.

Variable Vagaries

by David Benn

This regular column will cover happenings in the ever-changing world of variable stars.

Other than novae and supernovae observed before 1600, such as Tycho's supernova in 1572, Fabricius was generally thought to have been the first to record observations of a variable star: the long period variable omicron Ceti (Mira) in 1596. Mira's almost 332 day periodicity was determined more than 40 years later by Holwarda. Then, in the late 1660s, Montanari discovered the naked-eye eclipsing binary star Algol (beta Persei), with Goodricke determining its 2.867 period in 1783.

It has been thought for some time that Algol was known much earlier than the 17th century with ancient references to it as the demon star or blinking demon.

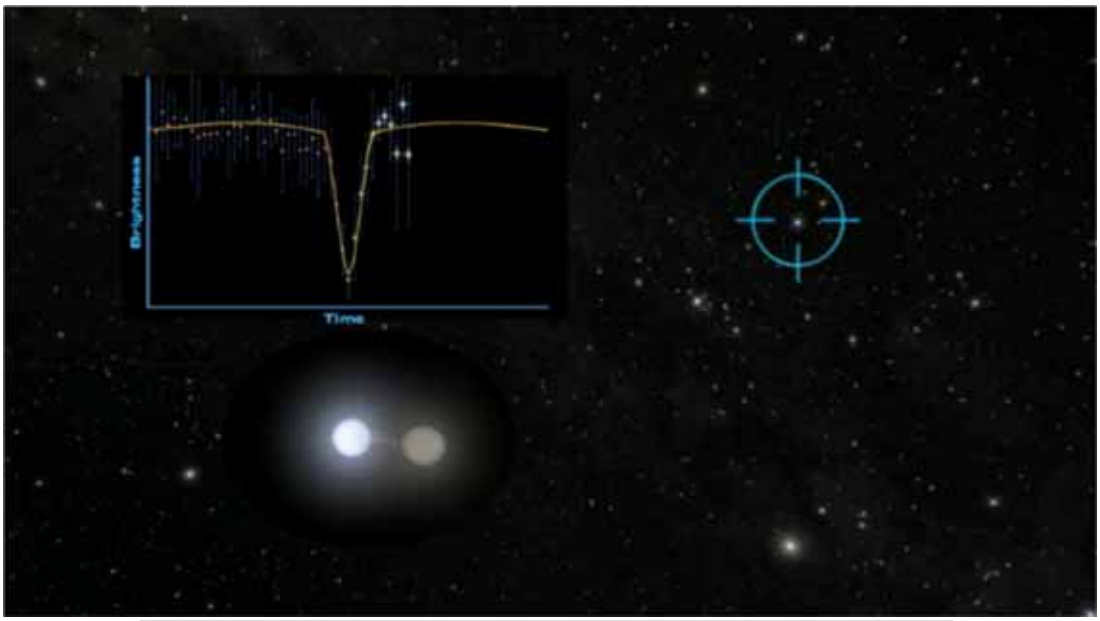
A recent paper in *PLoS One* presents evidence that *observations of Algol* were being recorded by ancient Egyptians in a papyrus, now referred to as the "Cairo Calendar" (CC) circa 1000 BC. The authors' analysis shows that the actions of deities recorded in this calendar are strongly "regulated" by the 29.6 day periods of the Moon and Algol.

The authors claim that the "…texts describing the actions of Horus are consistent with the course of events witnessed by any naked eye observer of Algol". The detailed analysis also considers Algol's period change over time, around 0.017 days more now than its CC value of 2.85 days. In the author's words: "The mass transfer in this binary system should have increased the period in the past three millennia. The period value in CC is the first evidence for such an increase since Goodricke discovered this periodicity over two centuries ago." See the links for more detail.

This research got me wondering about observations of bright variable stars by Australian indigenous people, in particular the outburst in the 1840s of eta Carinae (already brightening by the 1820s), an unstable object of great interest still today, and on my regular visual observing list.

The Australian Aboriginal Astronomy Wikipedia page says that the Boorong people of north-western Victoria incorporated the outburst in their oral traditions, but that this is the only definitive indigenous record of the eta Carinae outburst in the literature. One has to wonder though, whether there are undocumented observations of eta Carinae or other variable stars throughout the millennia that have been handed down through oral tradition or perhaps even recorded; a question perhaps for experts like Paul Curnow or Ray Norris.

In early January I imaged RY Leporis, a pulsating variable in the constellation Lepus, for almost 6 hours. RY Lep has a visual magnitude range of around 8.05 and 8.46 and a catalog period of 0.2251475 days or around 5.4 hours. It's classified as a so-called high-amplitude delta Scuti (HADS) star. I started processing the images a couple of days ago to yield what *should* be a fairly complete 5.4 hour cycle. I'll say more about this next time.



Above: *Algol frame from 2009 planetarium show narrated by Timothy Ferris*

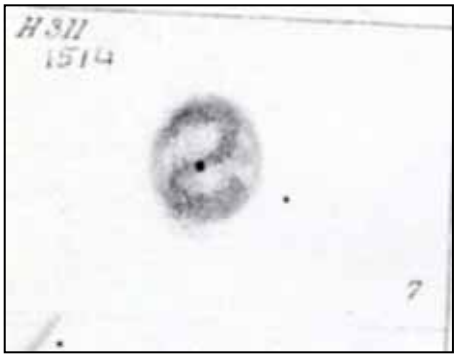
Useful links:
https://www.aavso.org/citizen-sky-planetarium-show-wtimothy-ferris
http://en.wikipedia.org/wiki/Algol
http://www.sci-news.com/astronomy/papyrus-cairo-calendar-astrophysical-information-variable-star-algol-03533.html
http://www.sciencedaily.com/releases/2015/12/151217151651.htm
http://journals.plos.org/plosone/article?id=10.1371%2Fjournal.pone.0144140
https://en.wikipedia.org/wiki/Australian_Aboriginal_astronomy

NGC 1514 - a planetary nebula in Taurus

Object data:
Aliases: PK 165-15.1 = PN G165.5-15.2, Crystal Ball Planetary
RA: 04h 09m 17s Dec: +30° 46' 33"
Type: Planetary Nebula
Size: 136" x 121"
Distance: 600-800 light years

William Herschel discovered NGC 1514 on 13 Nov 1790 (sweep 980) and recorded "A most singular phenomenon. A star of about 8th magnitude with a faint luminous atmosphere of a circular form, and about 3' in diameter. The star is perfectly in the centre and the atmosphere is so diluted, faint and equal throughout that there can be no surmise of its consisting of stars; nor can there be a doubt of the evident connection between the atmosphere and the star. Another star, not much less in brightness and in the same field with the above, was perfectly free from any such appearance."

The symmetry of NGC 1514 forced Herschel to rethink his ideas of the nature of planetary nebulae. He previously assumed all nebulae were unresolved stellar clusters of some kind, appearing nebulous on account of their great distance. After viewing NGC 1514, he was convinced of the existence of pure nebulosity, out of which individual stars or planets were formed and he no longer expected every nebula to be resolved with enough aperture. This realization also halted his interest in seriously observing with his 40-foot telescope (48-inch aperture), along with its unwieldiness.



A total of 20 observations were made using Lord Rosse's 72" with one of the earliest (13 Jan 1852) describing NGC 1514 as a "new spiral of an annular form round the star, which is central; Brightest part is south-following the star, spirality is very faint, but I have no doubt of its existence". Above is a sketch made at Birr Castle.

Noted US observer, Steve Gottlieb writes: *"At 100x, moderately bright, round, ~2' halo surrounding a prominent mag 9.5 star. Excellent filter response to UHC and OIII blinking while the H-beta filter killed the PN (OIII/H-beta = 12). Using the OIII filter, the surface brightness was noticeably uneven, with the NW quadrant of the rim clearly brighter. The SE end was also weakly enhanced while the center and ends of the minor axis were slightly darker. At 220x using a UHC filter, the halo appeared nearly 2.5' in diameter. There was a small, darker "hole" surrounding the central star and halo was clearly irregular with a brighter "knot" on the SE side, while the NW portion of the halo was brighter along the rim".*

Above: This image composite shows two views of a puffy, dying star, or planetary nebula, known as NGC 1514. The view on the left is from a ground-based, visible-light telescope; the view on the right shows the object in infrared light, as seen by NASA's Wide-field Infrared Survey Explorer, or WISE. *Image credit: NASA/JPL-Caltech/UCLA/DSS*

Contact information

Here's how to contact various members of Council, Regional Co-ordinators and SIG's

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Whyalla

The group meets on the first Thursday of the month.

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Northern Yorke Peninsula

The NYP'pers hold combined members' and public viewing nights monthly.

Coordinator: Tony Henderson
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Riverland

The Riverland group hold combined members' and public viewing nights monthly.

Co-ordinator: Tim Vivian
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Members' Gallery

Highlighting members' astrophotos

Above: The Orion Nebula (M42) imaged by **Jarrod Koh**, 12 December 2015 at Aldgate, SA. Nikon D4 DSLR, Nikon 400mm/2.8 lens mounted on Astrotrac mount. 10 x 90 sec exposures. Stacked and stretched in Nebulosity 4. Post-processing in Photoshop CS 2015

Below: Terry Wardle provided his picture of members and public enjoying the night sky during the Heights Observatory Public Viewing Night on 15 January 2016.