

The

Volume 123 No. 11
November 2014

Bulletin

*Monthly newsletter of the
Astronomical Society of South Australia Inc*



*See you at the Solar
BBQ/Picnic on
Sunday, November 9!
See page 5 for details*

Desert Fireball Network p.6
Flinders Ranges geological trail p.8
November's Comets p.11
Observing the Grus Chain of galaxies p.14

Don't Miss! The November General Meeting:
**Islamic Astronomy & the Copernican
Revolution**



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

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Important Notice Additional Online resources for The Bulletin

Members are reminded that additional files, links, and resources will be available on the ASSA website to complement material published in The Bulletin.

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: Rho Ophiuchi cloud complex imaged by Chas Franks from Tungkillo, August 2014. QSI540 camera, Astrodon RGB filters and a Takumar 6x7 lens of 300mm focal length. R, G and B exposures of 3 hours each and a synthetic Luminance generated from them. Acquisition, focusing and guiding with Paramount's TheSkyX and post processing with PixInsight.



Activities

November 2014—the month at a glance

General Meeting

Wednesday 5 November, 2014
@ 8:00pm

Kerr Grant Lecture Theatre,
2nd Floor, Physics Bldg
University of Adelaide, North
Terrace, Adelaide

Guest Speaker:

**Associate Professor
Mohamad Abdalla
School of Humanities
Griffith University, Brisbane**

See speaker biography on page 4

Islamic Astronomy & the Copernican Revolution

The story of Islamic astronomy is a fascinating one, not only because of its significance to the grand narrative of the history of science, but also for the wealth of knowledge it provides regarding the cultural and intellectual interconnectedness of two seemingly antithetical worlds, 'Islam' and the 'West.'

Until very recently, it was conventional belief that no original and innovative research was produced in the field of astronomy after Ptolemy (d. 150 B.C.), until the time of the renowned 16th century Polish scientist Nicolaus Copernicus (d.1543 C.E.).

It was also believed that medieval Islamic astronomers were mere translators and

transmitters of Greek knowledge, and that after Imam al-Ghazali (d.1111) no serious work of astronomy was produced in the Islamic civilisation.

However, more recent research demonstrates that as early as the eight century Muslims appropriated, translated, edited and added their own original contributions to the ancient sciences of the Greeks, Persians and Indians. They did much important ground work for later changes in the Latin West in the development of trigonometry, astronomical instruments and the Latin catalogues of stars.

This lecture will explore the Islamic influence on the Copernicus revolution.

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)

Paul Rogers 8263 7666

Black Forest

Greg Weaver 8293 2341

Whyalla

Ernie Ernesti 8645 3613

Tooperang

Jeff Lowrey 0429 690 610

Northern Yorke Peninsula

Ian Finch 0428 211 018

Riverland

Tim Vivian 0407 800 225

November 2014 Calendar

Day	Time	Activity
Wed 5	8.00pm	General Meeting - Adelaide University
Sat 15	8:30pm	Members' Viewing Night – Stockport
Sat 15	8.30pm	Member's Viewing Night - Riverland
Wed 19	7:30pm	Whyalla Group Meeting
Fri 21	8:30pm	Public & Members' Viewing – NYP
Sat 22	8:30pm	Members' Viewing Night – Tooperang
Sat 22	8:00pm	Members' Viewing Night – Stockport
Wed 26	7:30pm	ASSA Council Meeting
Fri 28	7:30pm	Deep Sky Imaging Group
Fri 28	8:30pm	Public Viewing Night – The Heights
Fri 28	8:30pm	Public Viewing Night – Black Forest
Sat 29	8:00pm	Spring Star Party – Stockport

Note: Times shown above and throughout this document are:

6 Oct 2013 to 6 Apr 2014 : South Australia Summer Time (UTC+10:30)

7 Apr 2014 to 4 Oct 2014 : South Australia Standard Time (UTC+ 9:30)

5 Oct 2014 to 5 Apr 2015 : South Australia Summer Time (UTC+10:30)

Astronomy Education with Colin Hill

7.00pm, November 5, 2014

Kerr Grant Lecture Theatre



Topic - "Galaxies"

After exploring our own galaxy, The Milky Way, we will look at the Local Group of Galaxies and beyond. The various types of galaxies will be discussed and how they are classified using Hubble's Tuning Fork diagram.





Reports and Notices

Reports on recent ASSA activities, and notices of upcoming events

Vacancy - Bulletin flapper required

Alister Smith, our Bulletin Flapper, will not be continuing with the bagging of The Bulletin after the end of this year.

He writes: *"I have done this for the past four years and would be happy for someone else to take it over now. I will certainly help show the next person exactly what needs to be done."*

All up, it requires about 2-3 hours once a month including a visit to the local post office. Also required is an A4 printer - I use a monochrome laser printer - plus Microsoft Word or an equivalent program (such as OpenOffice) with a Mail Merge facility for creating the address sheets. There is a heat-seal machine that belongs to the Society, that I use for sealing the plastic bags. I purchase the plastic bags from a supplier on South Road, Regency Park. I will pass on those that I have left to the next bagger".

Can you help?? Contact Joe Grida, Editor of The Bulletin and he'll put you in touch with Alister.

Guest Speaker Biography:



Dr Mohamad Abdalla is an associate professor at the School of Humanities at Griffith University in Brisbane. He is the Founding Director of the Griffith Islamic Research Unit (GIRU) and the Director of the Queensland node of the National Centre of Excellence for Islamic Studies (GU Node). His research focuses on Islam in Australia, Islamic thought and Islamic civilisation and its interaction with the West. He has published widely in Islamic studies with the Griffith Law Review, Routledge; Palgrave Macmillan; Journal of Muslim Mental Health; Edward Elgar; Journal of Sociology; and the Australian Journalism Review.

His books include Islamic Science: The myth of the Decline theory (2008), Co-edited book Islam in the Australian news media (2010), and a forthcoming book Interconnectedness between civilisations: Islam and the West (2016). Dr Abdalla served in the following capacities: Chairperson of the Queensland Government Muslim Community Reference Group (MCRG), Vice-president and spokesperson for the Australian National Imams Council (ANIC), Australia's leading Islamic religious organisation; and Imam of the Kuraby mosque in Brisbane, Australia. He currently sits on a number of boards including the Queensland Cultural Diversity Roundtable for the Office of the Hon. Glen Elmes MP, Minister for Aboriginal and Torres Strait Islander and Multicultural Affairs and Minister Assisting the Premier.

Have you done your Police check yet?

You may recall that ASSA published a notification in the January 2014 Bulletin regarding Police Checks. The notice advised all members that they will require a current Police Check (clearance) Certificate if they participate as a volunteer at any ASSA sanctioned public event. Although this is yet to be made mandatory by parliamentary legislation, it was, and is now even more so in the light of recent events, only a matter of time before this will be compulsory.

Regardless, ASSA is still bound by a duty of care under the guidelines set by the Commissioner for Children, and also by our Insurance provider who state this clearly in our insurance policy. Consequently, **ASSA Council passed a motion that has made this a Policy that "all ASSA members who volunteer at any ASSA sanctioned public event hold a current Police Check Clearance Certificate"**. We gave ourselves until the end of June 2014 for the majority of member volunteers to have completed this Police Check, but it would appear that quite a few members who kindly volunteer their time at these events have yet to meet this policy requirement.

Please refer to the member's section on our web site for the Instructions and Guidelines on how to apply for the Police Check Certificate.

<https://www.assa.org.au/media/58017/Police-Checks-Process-for-Applicants-ASSA-version.pdf>

Alternatively, please contact Paul Rogers directly by email and he can email you the guidelines as well as the application form.

ozymandias@senet.com.au

Please note that there is **NO FEE** to do this, as ASSA has been granted a V.O.A.N. number that means we don't pay for members who volunteer, to have this check done.



It's almost ASSA Awards time again. Calling for nominations..

As many of you are aware, the Society delivers a number of awards each year, and now is the time for you to start thinking about who to nominate. Awards include:

- ◆ Bill Bradfield Astronomy Award
- ◆ Craig Richardson Memorial Image Award
- ◆ Astrophotography Award
- ◆ Annual Service Award

Full details: <https://www.assa.org.au/membership/awards/>



Reports and Notices

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The Heights Public Viewing Night

by Paul Rogers

Friday 3rd October 2014 was the date of the public viewing night at The Heights - just prior to the commencement of daylight saving for this season.

The number of public attending was less than expected, and the only explanation was the fact that it was a long weekend in the middle of the school holidays, and people were away for the weekend.

The seeing was ordinary, with some high cloud disrupting proceedings from about 8:45 to 9:30pm - despite being clear all day. With both observatories operating, and with 5 members' scopes in use, there was no waiting required for the public to view. Saturn was an early target, with Mars and Luna complimenting the solar system objects. Some doubles were also on display, as well as some open and globular clusters. The weather was very mild, and the public who turned up were well catered for.

Commencement time for the next months (until daylight saving ends) will be at 8:30. So, plenty of time to get

The Adelaide Planetarium at the University of South Australia, Mawson Lakes, presents:

The Night Sky

Tuesdays 20th January - 24th March 2014

7:30pm - 10:00pm

Course Cost: \$200 per person

Join astronomer Paul Curnow for a 10-week introductory astronomy course at the Adelaide Planetarium.

BOOKINGS ARE ESSENTIAL. Enrolments are subject to the seating capacity of the planetarium, so book early to avoid disappointment - to make a booking or for further information phone (08) 8302 3138 or visit <http://www.unisa.edu.au/Business-community/Arts-and-culture/Planetarium/Events-and-courses1/> to book online.

yourself organised to come along and assist. Thanks to the ASSA members with their scopes, and the STAR group who operated the observatory scopes.

Solar BBQ/Picnic

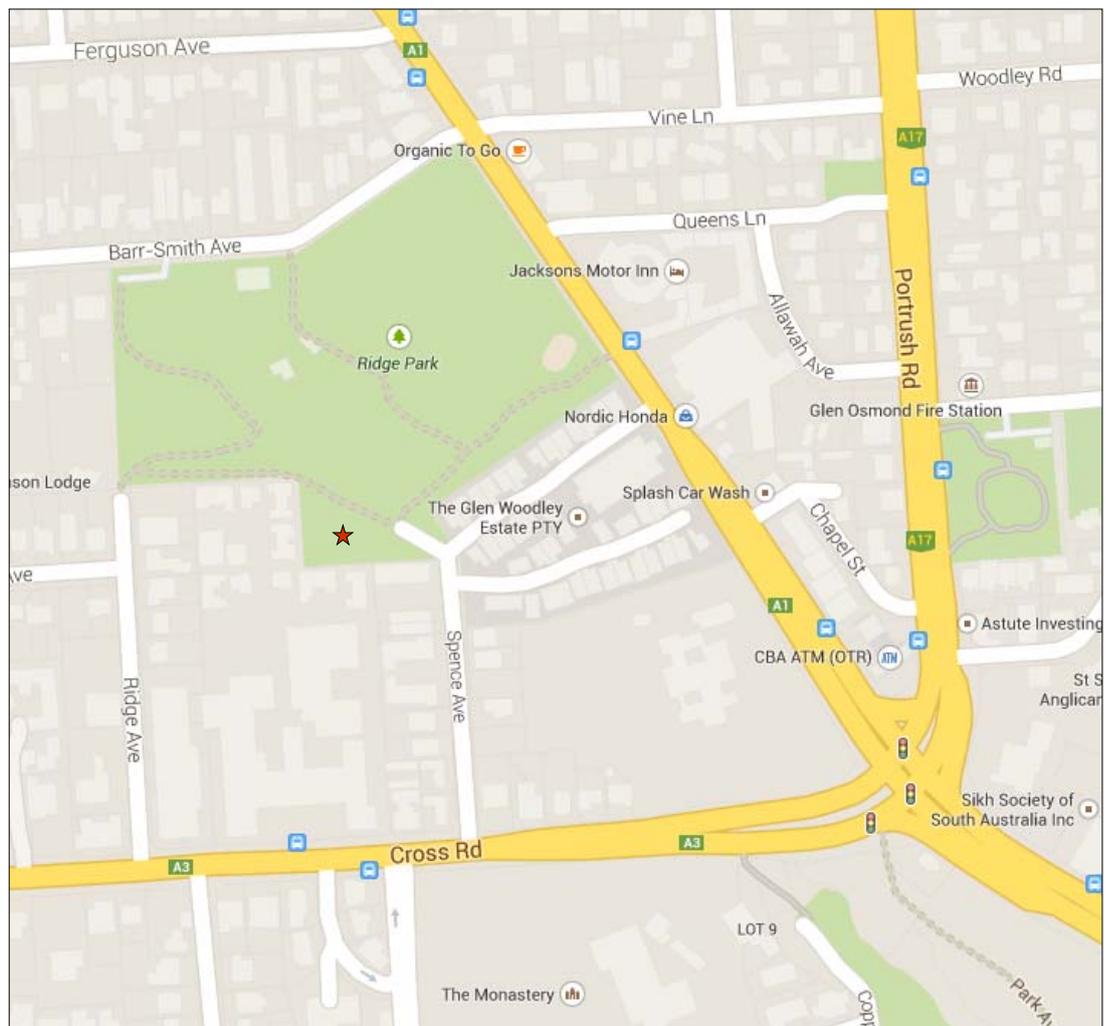
Sunday,
November 9
@ 12:00 noon

At the southern end of Ridge Park, Myrtle Bank. Enter via Spence Ave, off of Cross Road (see map on the right). BYO Food and drinks.

Electric BBQ's are available, or you might want to bring your own portable barbie.

The ASSA's Solar Telescope will be available for sun observations.

See you there. For more info, ring Lyn on (08) 8391 5377





The Desert Fireball Network

One of our historians, Terry Wardle, went walkout installing cameras to detect meteors

Terry Wardle has returned from a field trip into the outback, installing a network of cameras at remote sites, to support a Continental Scale Planetary Science Installation project called the Desert Fireball Network. Over an eight day period that covered 2,500kms installing three remote camera stations. Each installation takes about a day to install and setup. Terry became aware of the project from a post on ASSA-Chat advising members that Curtin University were looking for local volunteers to go out and assist the team install the cameras.



Meteorites are the oldest rocks in existence: the only surviving physical record of the formation and evolution of the solar system. Potentially, meteorites offer a direct route to understanding our origins. But to decode that record we need to know where they come from. The **Desert Fireball Network** (or DFN for short) is designed to provide that data.

Meteors generate a fireball as they come through the atmosphere. The DFN is a network of digital cameras in the outback desert which capture photographs of the night sky. By making networked observations of the fireball they can triangulate its trajectory, track the rock forward to where it lands, and back, to where it came from in the solar system.

As this article goes to press there are 27 cameras installed and more cameras are being added to the DFN as the project expands. The final network, will consist of 70 cameras, will image the night sky over roughly one-third of Australia, and track whatever is coming through the

atmosphere. DFN researchers will then go out and recover the meteorite. Knowing where the meteorite came from, and what it is made of, will help them to address some of the biggest questions in planetary science: how our planetary system came into being, and how dust and gas produced a planet capable of supporting life – our Earth.

Fireballs in the Sky is a citizen science initiative that allows everyone to share the discoveries of the Desert Fireball Network. On the website you can see a research project as it happens, use the App to provide your own data and experience the results as they are discovered. For more information, visit: <http://www.fireballsinthesky.com.au/>

The Fireballs in the Sky App allows you to get involved with the Desert Fireball Network research by reporting your own meteor sightings. The App also keeps you up to date with the latest images, news and announcements from the Desert Fireball Network project.



Above: The Badgingarracamera captures a fireball over Perth on 14 August 2014, just before dawn. Photo credit: DFN



The Desert Fireball Network

One of our historians, Terry Wardle, went walkout installing cameras to detect meteors

A two fly trip

Robert, a PhD student and project member flew in from Perth, collected a rental Landcruiser ute and picked Terry up on the way. Staying the first night in Pt. Augusta then heading out to a location near Quorn. This is where there is a shipping container that stores all the equipment, supplies and camping gear needed for the installations in South Australia and the western end of NSW.

After stocking up the esky with supplies we drove to the first site, Woomera. Although everything had been arranged with the authorities in Woomera, there was a glitch in the chain of command which meant the person we liaised with in Woomera had not received the approval notice. So we notified our project coordinator in Perth and moved on to the next site, Stone Well, north of Kingoonya.

Many sites are located on sheep/cattle stations. The station people are a delight to work with. When initial contact was made with the station they were given the parameters needed for a site location, on arrival the station overseer had already picked a location that suited our needs. Carl and Adam, the station hands at Stone Well took pity on us by helping drive in 'star droppers' into the very rocky ground using their jackhammer for the fence around the site. They invited us round to the station that night for a few beers and a yarn or two

Next morning we were told the Woomera issue had been solved so we headed back to Woomera to install a camera. Terry lived in Woomera in the 1970s when in the Air Force. Going back was a bit nostalgic.

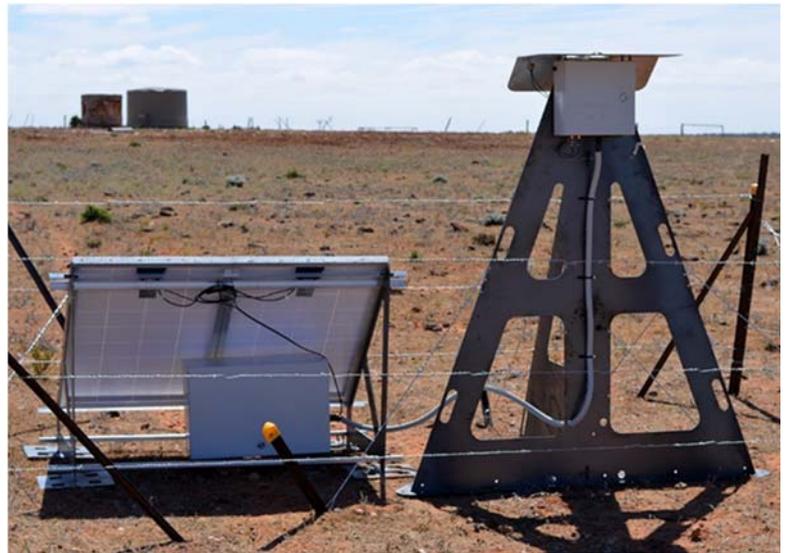
The next site was Mulgathing Station, north west of Tarcoola. We drove up about 100kms north of Glendambo, turned left and drove another 100kms to the station. After discussing site locations with the overseer we headed south for about 50kms where we installed the third camera.

We had intended to install four cameras but on the morning after the third installation we were told that the Woomera camera had problems. We drove back to Woomera. It was more than a simple fix so we replaced the entire camera installation with the fourth unit. Then it was back down the road to unload the gear into the shipping container for the next team.

It was a *two fly* trip. That's the number of flies Terry accidentally swallowed.

How it works

Each installation has a camera and a video camera with fisheye lens' looking up into the sky. A CPU board, an 8TB HDD and a micro-controller card. It has a modem that



connects to the mobile telephone network, a solar panel and battery. In the period before sunset to just after sunrise a 25 sec exposure is taken every 30 secs and stored on the HDD. When an event is detected, a fireball, the camera installation notifies the DFN team who then download the relevant photos via the network. If two or more cameras record the event it is possible to triangulate and estimate where the rock fell to an accuracy to make it possible to go out and locate the meteorite.

The DFN analyses these data to shortlist locations where the meteorite is likely to be ½ kilogram or higher. This improves the chance of finding it. On a yearly basis they go out on field trips to search for the meteorites.

Results

There are over 50,000 meteorites in collections around the world. Of these, there are eight that we know where in the solar system they came from. Of these eight, two were found by the DFN. Keep in mind that the DFN has only recently started and is growing. It is envisaged that this number will increase over the next few years. The DFN will become THE major contributor.

There are other important uses for these data. Remember the network has a complete log of the night sky for every night from multiple locations across the continent. Whatever happens up there is recorded. This can be any astronomical event. Once a year the cameras are serviced and the HDD swapped. All the data on the HDDs are recovered and stored for future analysis.

Google might know what happens on the surface of our planet but the DFN knows what happens above it.

Terry Wardle (Sep 2014)

This article has been reviewed and approved by the DFN project.



Alpana AstroCamp report—August 22-25, 2014 Pt II

Linden May reports on a geological expedition into the Flinders Ranges



The astrocamps we hold each year in the Flinders Ranges provide us with access to beautiful dark and clear skies (weather permitting!). However, there's more to the Flinders than just dark skies. The area is of enormous international geological significance. A drive through Brachina Gorge is like driving through 130 million years of Earth's history.

Saturday, 2014-08-23, the first official full day of the Alpana Astrocamp, was a pleasant sunny day (much the same as the other days we were lucky enough to have on the camp). It was decided to head into the Flinders Ranges National Park to visit some of the geological sites, and stop for a picnic lunch. We set off at about midday, sixteen members in a convoy of six vehicles.

Once in the national park, heading west through Brachina Gorge, from the main road between Hawker and Blinman, the first stop was at the Golden Spike, a site of global geological significance. A short walk along a dry river bed led to a formation of rock layers, worn through and exposed by the action of water over time. Here, we all gathered to listen to Fraser Farrell's thoroughly interesting explanation of the site.

A small brass plaque marks a layer of dolomite that was deposited during the Ediacaran Period – a time when multi-celled marine life boomed after the end of an ice age, 635 million years ago. A remnant of the ice age is also visible, in the form of a layer of tillite, burgundy in colour, which was laid down by a glacier moving through.

We set off again, driving further west towards Brachina Gorge, through river beds lined with gum trees, and surrounded by rock faces. It was necessary to drive through some pools of water remaining from the recent rain. Next stop was alongside a steep slope covered in fallen rocks, favoured by Yellow-Footed Rock Wallabies – of which we were treated to see a few. It was only a little further to our lunch spot, on the edge of a dry river bed, shaded by gums, where soon a diversity of camping chairs were arranged in a circle.

After lunch, we drove south towards Bunyeroo Gorge. Our last stop was at the *Acraman Debris* site, where Fraser became our geological guide once again. Set in a dry creek bed of crumbly tillite, the *Acraman Debris* is an exposed layer of meteorite ejecta, scattered by an impact 280km away – at Lake Acraman in the Gawler Ranges – 580 million years ago (also in the Ediacaran Period). Interestingly, the layers of tillite that the debris is sandwiched between are a grey-blue colour, rather than the burgundy seen nearby – this is due to a chemical reaction with the debris.



Above: Fraser Farrell explains the Ediacaran Golden Spike in Brachina Gorge. Photo: Linden May

At about 15:00, it was time to turn around and head back to camp, to return in time for sunset drinks on Alpana Station's Sunset Hill.

Linden May, 2014-09-02

References:

Golden Spike interpretive sign:

Marks the start of the Ediacaran Period of geological time, as Earth warmed following glaciation. Multi-celled organisms became widespread in maritime environments. The brass disc indicates its location, where pink Elatina Formation glacial tillite is overlain by buff Nuccaleena Formation dolomite. <http://en.wikipedia.org/wiki/Ediacaran>

Acraman Debris interpretive sign:

A 5km diameter meteorite collided with Earth at the site of present day Lake Acraman 580 million years ago. It threw at least 10 trillion tonnes of 1600 million year old volcanic rock from the Gawler Ranges area into the atmosphere. Some landed here, 280km away, in the sea-floor mud of Bunyeroo Formation siltstones. Look for a 5cm gritty layer in the grey bed. http://en.wikipedia.org/wiki/Acraman_crater

http://www.environment.sa.gov.au/parks/Find_a_Park/Browse_by_region/Flinders_Ranges_and_Outback/Flinders_Ranges_National_Park

http://www.environment.sa.gov.au/files/0d6f9d5d-38db-47e2-8da9-9e4f00b40951/FLRA_PDFS_PARK_GUIDE.pdf



Hubble Maps the Temperature and Water Vapor on an Extreme Exoplanet

A team of scientists using NASA's Hubble Space Telescope have made the most detailed global map yet of the glow from a planet orbiting another star, revealing secrets of air temperatures and water.

The map provides information about temperatures at different layers of the world's atmosphere and traces the amount and distribution of water vapor on the planet. The findings have ramifications for the understanding of atmospheric dynamics and the formation of giant planets like Jupiter.

"These measurements have opened the door for a new kind of comparative planetology," said team leader Jacob Bean of the University of Chicago.

"Our observations are the first of their kind in terms of providing a two-dimensional map of the planet's thermal structure that can be used to constrain atmospheric circulation and dynamical models for hot exoplanets," said team member Kevin Stevenson of the University of Chicago.

The Hubble observations show that the planet, called WASP-43b, is no place to call home. It's a world of extremes, where seething winds howl at the speed of sound from a 3,000-degree-Fahrenheit day side that is hot enough to melt steel to a pitch-black night side that sees temperatures plunge below a relatively cool 1,000 degrees F.

As a hot ball of predominantly hydrogen gas, there are no surface features on

the planet, such as oceans or continents that can be used to track its rotation. Only the severe temperature difference between the day and night sides can be used by a remote observer to mark the passage of a day on this world.

WASP-43b is located 260 light-years away and was first discovered in 2011. WASP-43b is too distant to be photographed, but because its orbit is observed edge-on to Earth, astronomers detected it by observing regular dips in the light of its parent star as the planet passes in front of it. The planet is about the same size as Jupiter, but is nearly twice as massive. The planet is so close to its orange dwarf host star that it completes an orbit in just 19 hours.

The planet is also gravitationally locked so that it keeps one hemisphere facing the star, just as our moon keeps one face toward Earth.

The scientists combined two previous methods of analysing exoplanets and put them together in one for the first time to study the atmosphere of WASP-43b. Spectroscopy allowed them to determine the water abundance and temperature structure of the atmosphere. By observing the planet's rotation, the astronomers were also

able to measure the water abundances and temperatures at different longitudes.

Because there's no planet with these tortured conditions in our solar system, characterizing the atmosphere of such a bizarre world provides a unique laboratory for better understanding planet formation and planetary physics.

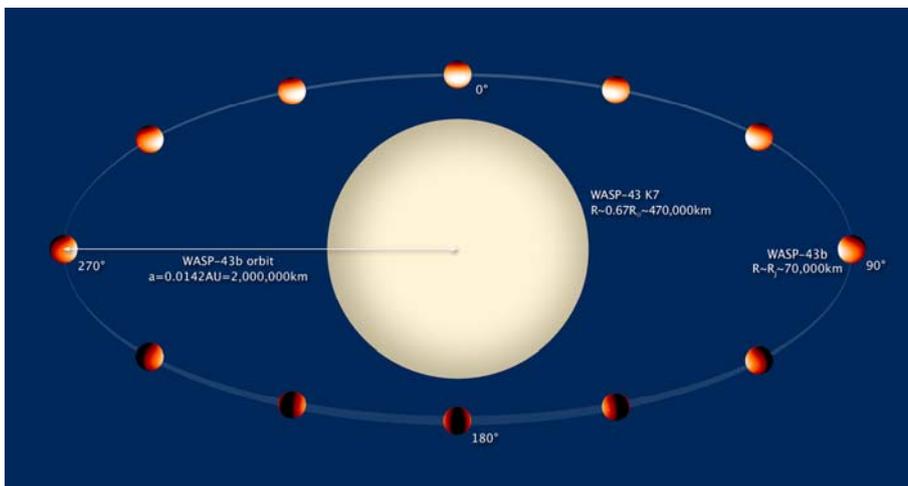
The water abundances in the giant planets of our solar system are poorly known because water is locked away as ice that has precipitated out of their upper atmospheres. But on "hot Jupiters" -- that is, large planets like Jupiter that have high surface temperatures because they orbit very close to their stars -- water is in a vapor that can be readily traced.

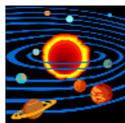
The team didn't simply detect water in the atmosphere of WASP-43b, but also precisely measured how much of it there is and how it is distributed with longitude.

In order to understand how giant planets form, astronomers want to know how enriched they are in different elements. The team found that WASP-43b has about the same amount of water as we would expect for an object with the same chemical composition as the Sun.

For the first time astronomers were able to observe three complete rotations of a planet, which occurred during a span of four days. This was essential to making such a precise measurement according to Jean-Michel Désert of the University of Colorado, Boulder. More research is to follow.

Source: ScienceDaily, 9 October 2014. www.sciencedaily.com/releases/2014/10/141009141450.htm





Solar System Highlights

The major planets during November 2014

by Joe Grida

There's little to excite planetary observers in the early evening sky this month. **Saturn** reaches conjunction with the Sun about mid-month, and will reappear in the morning sky in late December.

Mars is easy to spot in Sagittarius in the early evening, because of its bright red/orange colour. It will make a great contrast with the stars of the globular cluster M28 on the 3rd of November, and then makes a close approach to the larger globular cluster M22 on the 6th. Mars leaves the Sagittarius Milky Way on the 21st November. With an apparent diameter of around 5 arc-seconds, it makes a very tiny target in the telescope.

Uranus is ideally placed for observation all month in Pisces, in a fairly barren part of the sky. At magnitude 5.7 it should be possible to spot it naked eye from a dark site, or fairly easily in binoculars from the city. Its small diameter, 3.7 arc-seconds, means there's not much detail discernible visually through a telescope. However, Anthony Wesley from Canberra, recently produced some amazing photos of the blue-green giant (see photo at right).

The other giant of the outer solar system, **Neptune**, can be

found in Aquarius. Its even smaller diameter of 2.3 arc-seconds means telescopic observation will offer little reward, however the keen observer may want to try finding its large moon Triton. At magnitude 13.5, it should be possible with telescopes of 300mm or larger aperture.

Venus has been in conjunction with the Sun, and returns to the evening sky in late November.

The colossus of the solar system, **Jupiter**, can be found in the constellation of Leo, rising around midnight. At a magnitude of -2.1, this celestial lighthouse will not be easy to miss. And its diameter of 37.9 arc-seconds ensures that telescopic observations will reveal a wealth of features on its cloudtops.

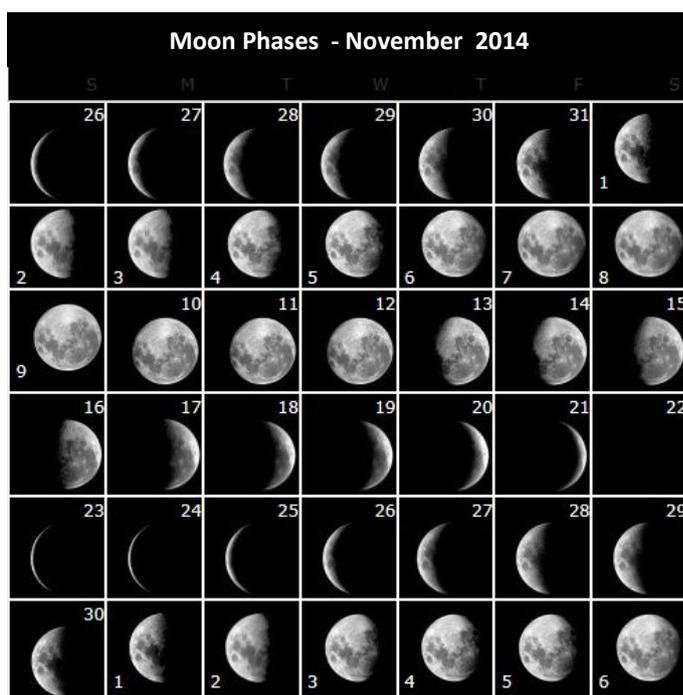


Dairy of phenomena

November 2014

d h(UT)

- 1 19 Mercury greatest elong W(19°)
- 2 0 Neptune 4.4°S of Moon
- 2 23 Moon at perigee
- 4 14 Mercury 4.2°N of Spica
- 4 17 Uranus 1.2°S of Moon
- 6 22 **FULL MOON**
- 9 23 Moon furthest North (18.6°)
- 10 23 Mars 3.7°S of Pluto
- 13 1 Venus 1.5°S of Saturn
- 14 14 Jupiter 5.0°N of Moon
- 14 15 **LAST QUARTER**
- 15 1 Moon at apogee
- 16 10 Neptune stationary
- 18 8 Saturn at conjunction
- 19 18 Spica 2.6°S of Moon
- 21 18 Mercury 1.9°S of Moon
- 22 5 Saturn 1.2°S of Moon
- 22 12 **NEW MOON**
- 23 2 Venus 3.9°S of Moon
- 24 8 Moon furthest South (-18.6°)
- 24 17 Venus 4.5°N of Antares
- 26 2 Mercury 1.6°S of Saturn
- 27 23 Moon at perigee
- 29 6 Neptune 4.2°S of Moon
- 29 10 **FIRST QUARTER**





November offers one bright binocular object, Comet K1 PANSTARRS. However, there are still other comets to keep you busy.

C/2012 K1 PANSTARRS

This large, dynamically new comet arrived at perihelion on 2014 August 27 when 1.05AU from the Sun. Unfortunately, it was on the far side of the Sun at this time.

However, since the orbit is retrograde, it will make an Earth pass on November 1 at 0.95AU which could see the comet reach magnitude 6.5, deep in southern evening skies.

At the start of November, Comet PANSTARRS is at its brightest, with a strongly condensed coma and short dust tail visible in telescopes, towards the north-east. The much fainter ion tail could also be visible to the west of the coma. On Nov 1, the comet will be situated in Pictor, some 5 degrees north of Canopus, in the southeastern evening sky.

Moonlight interferes until November 9. On this evening, the now magnitude 7 comet will be situated in Dorado, adjacent to the galaxy group of NGC 1566, 1549 and 1553 (*photographers take note*).

On November 14, it is 1 degree south of globular star cluster NGC 1261 in Horologium. On November 23, the comet is 5 degrees North of Achernar in Eridanus, located high in southern evening skies.

By December 1, the now magnitude 8 comet will be situated in Phoenix, 1.5 degrees south of Beta Phe. ***Please post images and reports to the editor.***

C/2013 A1 Siding Spring

As you read this, the encounter with Mars has already passed. I will write up a post encounter report in our next issue of the Bulletin. In the meantime, you can catch up with all the action at:

<http://mars.nasa.gov/comets/sidingspring/>

C/2013 V5 Oukaimeden

Was closest to the Sun on September 28 at a distance of 0.62 AU. This comet had a 50% risk of disintegrating, being similar to comet ISON in size and activity.

Problems eventuated during August, when the comets rate of brightening started to decrease. It was fading intrinsically as it approached the Sun -Fizzling. It failed to reach its predicted peak of magnitude 5.0 in mid September and only just managed to reach mag 6.5.

I obtained several images remotely using an I-Telescope in Siding Spring during late Sep to mid Oct. As of Oct 7th, the comets nucleus was still intact. The comet was observable in the evening sky from September 20.

Despite the fading performance, the comet was quite a nice telescopic comet, displaying a tail >1/2 degree long visually. Photographically I measured a 3 degree ion tail, a faint broad dust tail, followed by a very unusual green dust trail, possibly due to HCN. The comet faded from mag 6.5 on Sep 13 to 7.8 by Oct 1.



Above: Comet C/2012 K1 PANSTARRS and its twin tails. Note the many streamers of the ion tail pointing to the right as well as the broad, curvature of the dust tail at upper left. Details: 2014 Oct 2 at 18:15UT. I-TEL T31 0.50-m f/6.8 astrograph + CCD + focal reducer, taken remotely from Siding Spring NSW. 4x1 minute stack. Credit: Michael Mattiazzo.



Above: Comet C/2013 V5 Oukaimeden imaged on Sep 25 with Canon 60Da and Sigma 70-200mm f2.8 lens 6x30sec exposure. Cropped. Image size is 3 degrees wide. Galaxies M83 and NGC5253 near the tail are visible. Credit: Michael Mattiazzo.



C/2014 Q2 Lovejoy

Brisbane amateur comet hunter Terry Lovejoy has done it again with his 5th discovery! Quite a remarkable achievement in todays age. The recent closure of the Siding Spring survey operated by Rob McNaught has opened up opportunities for amateurs in the southern hemisphere.

Terry's new find will arrive at perihelion on January 30 at 1.29AU and may reach magnitude 8. The orbit has been determined to be periodic, so the comet may perform better than this. Periodic comets are more reliable than first timers and are much less likely to fizzle.

For those wanting an early peek at the comet, during November it can be found on the Puppis-Vela border, low in the southeast during late evening. It brightens from magnitude 12 to 10 by the start of December. More about this comet next month.

C/2014 Q1 PANSTARRS

The latest orbit update for comet C/2014 Q1 PANSTARRS indicates that it NOT dynamically new. This comet is much less likely to fizzle! From the MPC website: reciprocal semimajor axis original (AU) = 0.001271. Aphelion distance = 2121 AU. Period=34,500 years

With a perihelion distance of 0.31AU next July 6th, it is likely that this comet has been baked by previous solar encounters. We can expect this dormant comet to become much more active as it reaches the ice line (about 2-3AU) from the Sun next February.

Viewing circumstances are poor however, with the comet situated in twilight, but there is a strong chance of it

reaching bright naked eye visibility at perihelion.

Observers in the southern hemisphere will be well favoured post perihelion, in late July 2015, when the comet will be conveniently situated in evening skies, fading from 3rd magnitude.

Latest updates, images and finder charts can be found at my website:

<http://members.westnet.com.au/mmatti/sc.htm>



Above: Comet C/2013 V5 Oukaimeden imaged on Sep 26, 6x30sec exposure(3V, 3R filters). I-telescope T17 0.43-m f/6.8 astrograph + CCD. Image size is 15 arc minutes high. Note sunward jet. Credit: Michael Mattiazzo.

Comet Siding Spring Planned Science Observations		Mars Reconnaissance Orbiter					Mars Odyssey		MAVEN*			Curiosity Opportunity		
TARGET	OBSERVATION OBJECTIVE	HiRISE	CTX	CRISM	MCS	MARCI	SHARAD	THEMS	HENDNS	IUVS	LPW, MAG, SEP	NGIMS, STATIC SWIA, SWIA	MarsCAM, CHEMCAM	PAN/CAM
COMET	Comet General Features							◇						
	Comet Nucleus (size, shape, variation)	◆												
	Comet Activity (jets, variable brightness)	◆	◆	◇					◇					
	Comet Coma (variability, particle size, gas composition)	◆	◇	◆	◆	◆			◆					
Comet Tail (particle size)		◆	◇	◇	◇			◇						
MARS ATMOSPHERE RESPONSE	Upper Atmosphere Composition (neutrals, ions & electrons, meteor trails)						◇		◇				◆	◆
	Lower Atmosphere (temperature, clouds)			◇		◇		◇					◇	◇

◆ Major contribution ◇ Contribution * MAVEN observations conducted in the event of nominal transition to science orbit.



Variable Vagaries

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

by David Benn



I completed the [VPhot](#) course in early September, learning some fundamental aspects of the art and science of photometry along the way.

I'm about to start a [DSLR photometry CHOICE course](#) on October 13. In preparation for this and to satisfy a desire to start doing variable star photometry with a DSLR anyway, I recently purchased a second-hand Canon 1100D DSLR camera body, a new Canon EF 100mm f/2 USM lens and a T-ring to connect the camera to my LX-90; I already had a T-adapter.

Mostly I've been getting to know the camera and learning to use the EOS Utility software to control it from my Mac. Other than a few happy snaps, the first astronomical images I took with the 1100D (on a tripod), were of one of my favourite Cepheid variables, W Sgr, a star I've been visually estimating again recently. See image at top right.

Other than the RAW W Sgr images, I also took dark, bias, and flat images for calibration. Mark Blackford suggested I take a look at the free [IRIS software](http://www.astrosurf.com/buil/us/iris/iris.htm) (http://www.astrosurf.com/buil/us/iris/iris.htm) for photometry. This is Windows software and since I want to run everything on a Mac if possible, I either had to run it under Windows in a virtual machine or use an emulator such as [WINE](#). I chose the latter

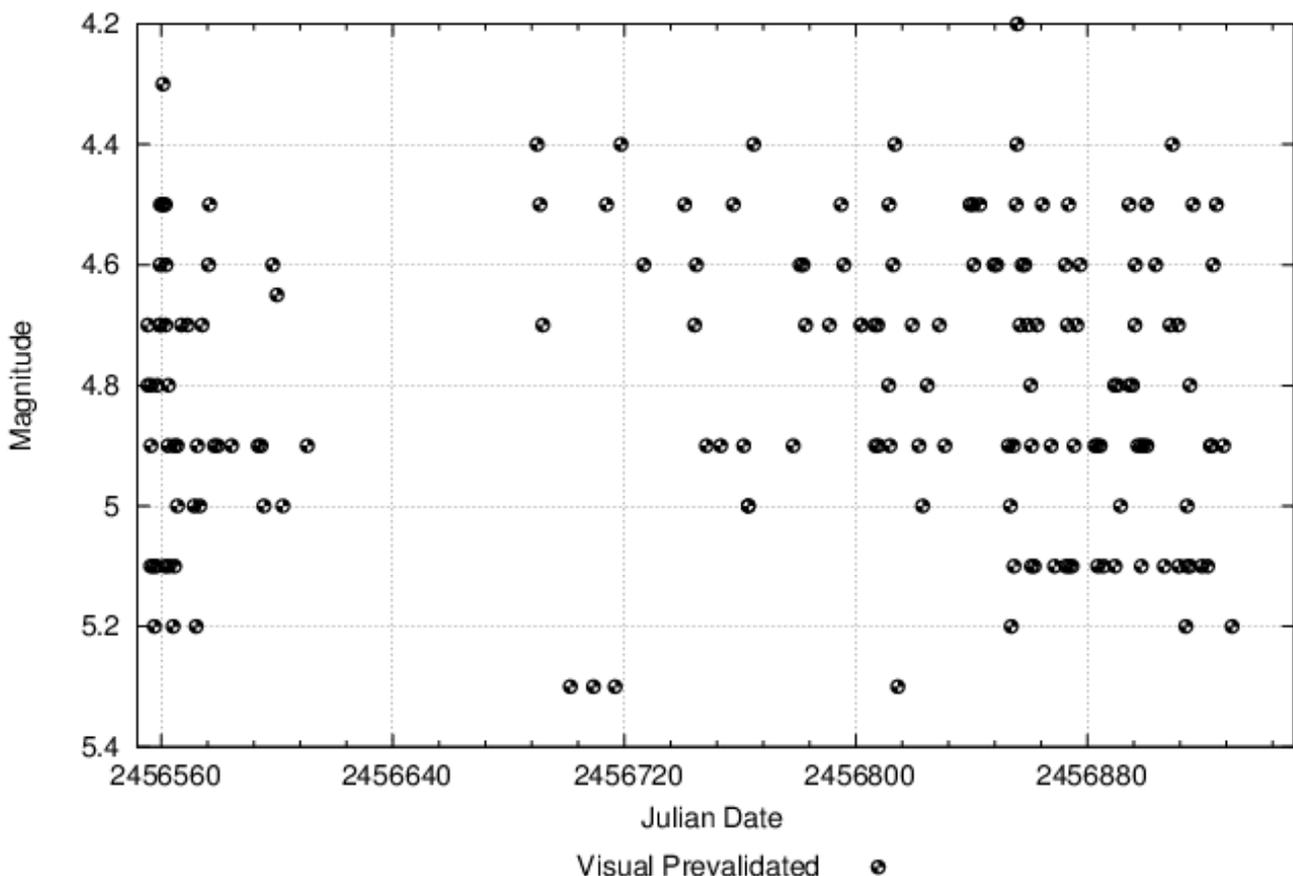


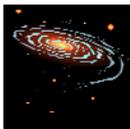
because it allows Windows programs to be run alongside Mac applications, it's free, and runs IRIS just fine under it.

I've gone through the process of photometry a couple of times using these images and IRIS to come up with instrumental magnitudes.

Hopefully next time I'll be able to say that I'm submitting DSLR photometry results to AAVSO.

AAVSO DATA FOR W SGR - WWW.AAVSO.ORG





Alone in the dark

A guide to observing faint fuzzies in our night sky

by Joe Grida



Observing the Grus Chain of Galaxies

Right on the border of Grus and Piscis Austrinus, there's a chain of galaxies, known as the Grus Chain, that stretches 1.5° in a north-south direction, with the giant elliptical IC1459 at its centre.

We'll start our tour of this chain with the easy to locate 6.15mag star SAO214215, 5.9° south of Fomalhaut. The star is located at RA 22:58:35, Dec -35:31:22. The spectral type F8 star is 254 light years away, and is 17 times more luminous than our Sun. Head 21.6 arc-minutes south to our first galaxy, IC 5270.

IC 5270 is a 12.3 mag Sc spiral galaxy, 3.2'x0.6' in size. In the 16" telescope is looks quite small and elongated.

A further 10.2 arc-minutes to the south, you'll find IC 5269. Similar in brightness to IC 5270, but smaller in size, 1.8'x0.8', this S0 galaxy appears elongated 3:1, with a bright centre.

Head 19.2' to the south-west, and you'll see IC5269B glide into view. This 12.4 mag edge-on spiral required averted vision when I observed it recently from a dark spot in the back garden. At a size of 4.1'x0.8', and a low surface brightness of 13.6, it was difficult to see.

IC 5269A is a further 10' to the southwest. This 14th mag face-on spiral was not seen in the 16". I'm sure that a dark sky site would remedy the situation. There's a 6.4 mag K2III deep orange star, SAO214182, only 9' to the west-south-west, so make sure you keep it out of the field of view. Travel 15' to the southeast from IC 5269A, and you'll come to the brightest member of this chain of galaxies, IC1459. This 10.0 mag peculiar elliptical E3 galaxy has fast counter-

rotating stellar core, stellar shells and ripples, a blue nuclear point source, and strong radio core emission. Studies at the beginning of the last decade found the galaxy has a 4×10^8 solar-mass black hole.

In the eyepiece of the 16" at 153x it appeared large, with a sharply concentrated bright core. Size is given as 5.2'x3.8'.

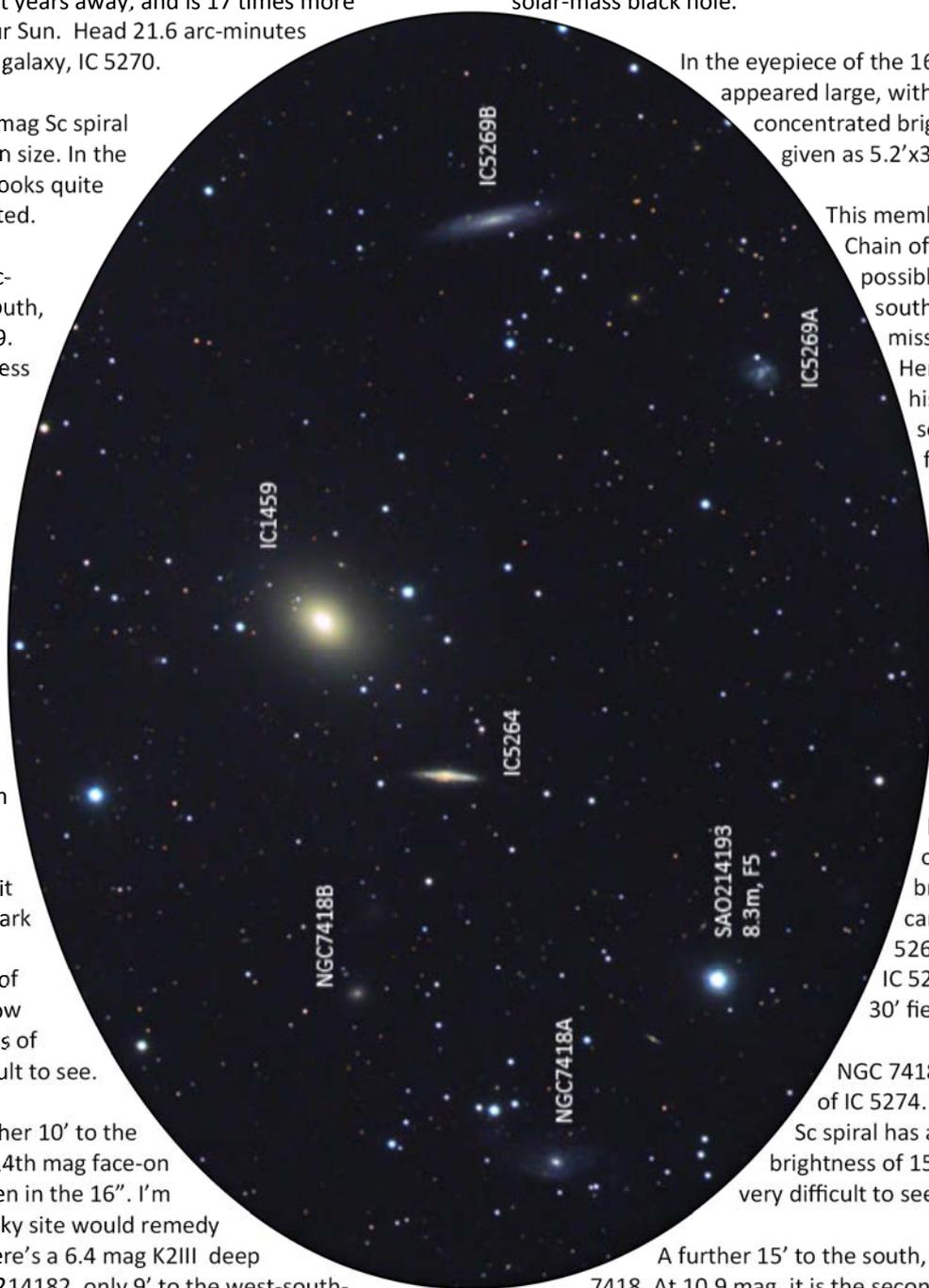
This member of the Grus Chain of galaxies is possibly the brightest southern galaxy missed by John Herschel, during his survey of the southern sky from South Africa in the 1830's.

Heading 6.5' SW of IC 1459, we come to the 12.6 mag edge-on galaxy IC 5264. This 2.5'x0.5' appears as a long thin streak of uniform brightness. You can fit IC 5269B, IC 5269A, IC 1459 and IC 5264 all within a 30' field.

NGC 7418A is 13.2' South of IC 5274. This 13.2 mag Sc spiral has a low surface brightness of 15.1, making it very difficult to see.

A further 15' to the south, we find NGC 7418. At 10.9 mag, it is the second brightest in the group. This almost face-on spiral, 3.5'x2.6' is bright, large and elongated 3:1.

Happy observing.



Above: The central part of the Grus Chain imaged by Mike Sidonio. The field is 40 minutes of arc high. North is up.



Contact information

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

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Note: To address all members of the ASSA Council, send email to: council@assa.org.au

REGIONAL GROUPS

Whyalla

The group meets on the last Wednesday of the month; and public viewings are held monthly.

Coordinator: Ernie Ernesti
Ph: 8645 3613
Email: whyalla@assa.org.au

Northern Yorke Peninsula

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

Coordinator: Ian Finch
Ph: 0428 211 018
Email: nyp@assa.org.au

Riverland

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

Co-ordinator: Tim Vivian
Ph: 0417 800 225
Email: riverland@assa.org.au

SPECIAL INTEREST GROUPS

Deep Sky Imaging	Neil Walter	0418 805 182
South Australia Telescope (36")	sat@assa.org.au	
Variable Stars	David Benn	0407 261163
Radio Astronomy	Peter Gray	0418 829 632
Light Pollution	Martin Lewicki	0413 494 366

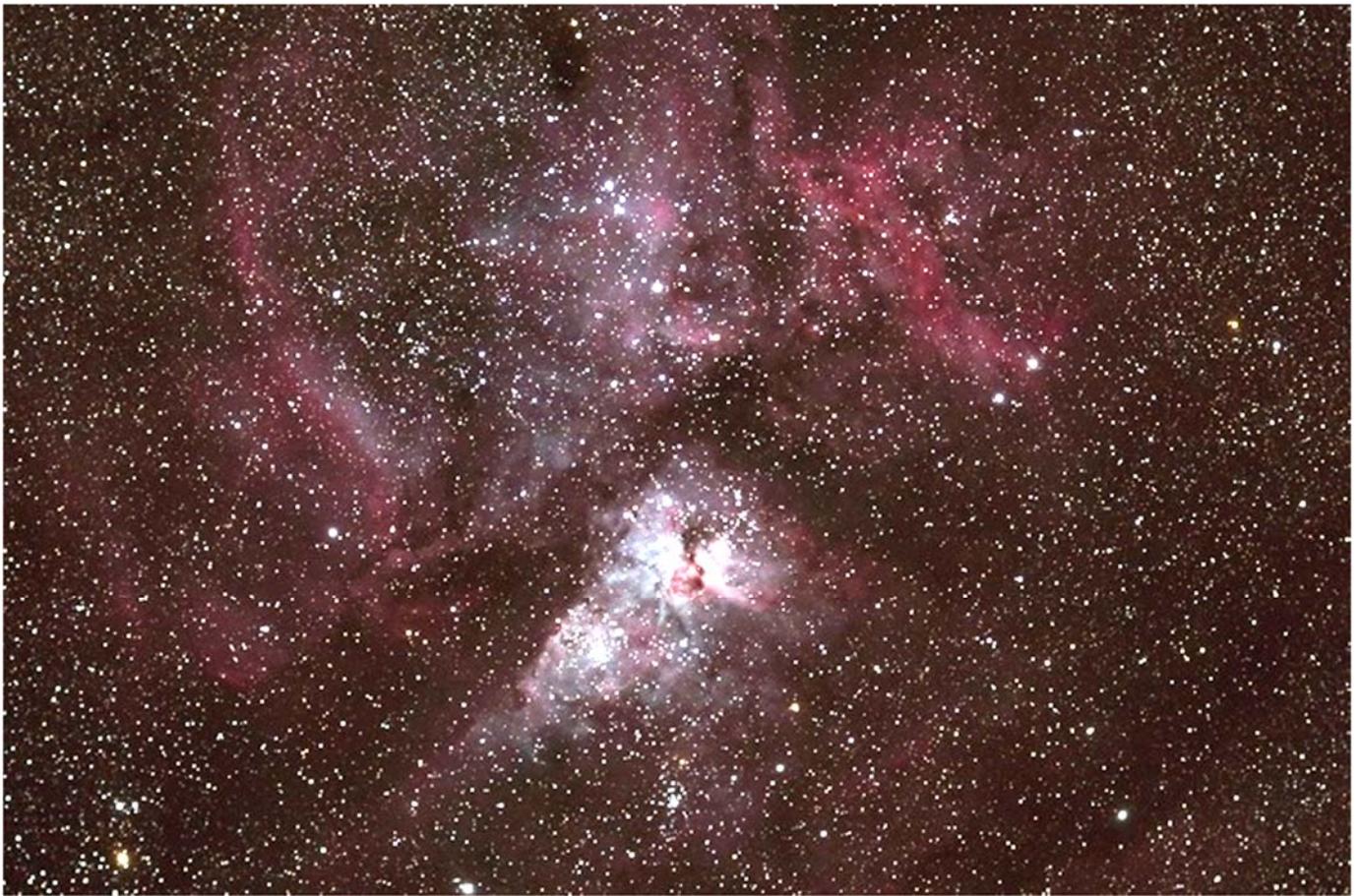
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Comets & Meteors	Michael Mattiazzo	0420 959 664
Planetarium	Paul Curnow	0402 079 578
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Schools Viewing Nights Coordinator	TBA	
Webmaster	Phillip Pudney	0408 818 839 webmaster@assa.org.au



Members' Gallery

Highlighting members' astrophotos



Above: The Eta Carinae Nebula (NGC 3372) imaged by **Jamie Presser** at the Alpana AstroCamp in August this year.

Below: The Helix Nebula (NGC 7293) imaged by **Jamie Presser** at Stockport Obs, 20 Sep 2014, using a SkyWatcher Black Diamond ED80 refractor on HEQ5 Pro mount with Orion StarShoot guider, and Canon EOS 700D DSLR camera.

