MACARTHUR ASTRONOMICAL SOCIETY Inc.

Journal

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# **PRIME FOCUS**

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PRESIDENT NOEL SHARPE VICE PRESIDENT IOHN ROMBI

SECRETARY IAN COOK MAS : Postal Address PO Box 17 MINTO 2566 Phone 0415915771 EDITOR BOB BEE Ph 46474335

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# **President's Report**

# Last month at MAS

Some fantastic astrophotography was on display last month courtesy of our resident photographer Peter Druery. Peter said to me previously that he had taken some of his best photos yet - now that's a big statement! - and the results on display last month certainly backed that up. Just fantastic! Well done Peter.

Recorded on those photos were the Gum Nebulas. Bob gave us some information about our friend Mr Colin Gum whose discoveries of super nova remnants is very significant. However very little is known about him. If someone could shed some more light on Mr Gum it would be appreciated.

Also on the agenda last month was the Festival of North Sydney night. As discussed it went very well indeed. That night confirmed to me and others why we love this hobby so

much. There were some priceless moments to remember that night.

TREASURER

DICK EVERETT

## Speakers,

Dr Russell Cannon from the Anglo Australian Observatory joins us as our special quest tonight. After recent sojourns to Germany and India, Russell will probably testify that life for him in retirement is very busy indeed. Well I guess it's a claytons retirement, i.e. the retirement you have when your not really retired, Russell still maintains a continuing position with the Anglo-Australian Observatory and we are very honoured he has taken the time to talk to us

I believe Russell will talk tonight about the latest in new telescope projects which carried much focus at the recent International Astronomical Unions seminars in Sydney. It should be a great night.

The Things That Are Planned	
18/08/03	General Meeting(tonight)
23/08/03	The Oaks
30/08/03	The Forest
06/09/03	Observatory Night
15/09/03	General Meeting
20/09/03	The Oaks
27/09/03	The Forest
18/10/03	The Oaks
20/10/03	General Meeting

Remember that sometimes we will observe at The Oaks 'off the plan' so to speak, like the night of the night 26/7, so please give me a call on 0410 445 041 to see if anything is on, but be aware of gremlins.

## The Gremlins

The above mentioned note about The Oaks highlights the need to contact myself, Lloyd or John Rombi. We were faced with a lock out on 26/7. Without the help of Bernard, one of our more recent members, we would have been stuck. Some swift last minute organising saw us heading towards his property at Werombi. Yes, it was mighty cold that night with a wind chill factor of minus 10, but the stars were proudly on display.

Lloyd, myself and Bernard played a game of "Lets see which filter is the best for Mars", about 30 odd foot of filters in various colours were put through their paces. A score out of ten was allocated by the judges and the winner was a Miss Wratten No 13, dressed in the slightest shade of yellow she scored a 9. Some hands-on advice was given in polar alignment and photography and in between the frostbite made for a very productive night, and one that would not have gone ahead without the generosity and support of our friend as above mentioned, just great!

# **Students Night**

We found ourselves down at the forest on Saturday the 2nd of August. International House students from the University of Sydney were there to discover the wonder of the night sky. Myself and Peter Druery showed some slides and it was just the most fantastic night.

The students were really switched on to astronomy. The night was advertised primarily as a night of stargazing with the "Astronomers" from the Macarthur Astronomical Society. 45 keen students and about a dozen representatives from International House were treated to all the sights. Bob Bee held several discussions during the night and was never short of an audience. Dick, Lloyd, John Rombi and Ned joined in with some fine views from their scopes and answered the myriad of questions posed. It went so well we have been invited back next year.

The log cabin has been upgraded with a beaut new kitchen with all the trimmings, the night sky down there is a ripper. Bob pointed out that you could see the "Coat hanger" with naked eyes, the one in the northern sky that is.

Well that all folks for now and I wish you good health and great stargazing.

Noel Sharpe President

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# What IC This Month

August 18 - September 14, 2003

The Earth is at Spring Equinox on the 23/9 with equal night and day hours

## The Moon Diary

20/8 Last Quarter 28/8 New Moon 3/9 First Quarter 11/9 Full Moon

# **Evening Sky Planets**

**Mercury** is at its highest in the sky after sunset in Leo. Located above Regulus and Jupiter it will move into Virgo at the end of August, then sink rapidly to disappear in the Sun to inferior conjunction on the 11/9. Very late September it will re-appear in the dawn light.

## Mars

Situated in Aquarius with a huge disk of 25 arc", Mars is only 55.7 million kilometres away. With the Sun behind the Earth at night and Mars showing full face, it shines brighter than Venus and should give terrific views of the polar caps and many dark surface details. On 9/9 it will be 1.2° south of an almost full moon at 8 pm. At the end of September Mars will complete its time of retro-motion and become stationary for a few days.

**Uranus** is also in Aquarius just 7° NW of Mars. It is at opposition on 24/8 so visible all night. Coming up to a new moon is a good time to seek this mystery planet out. **Neptune** continues in Capricornus without any drama just 2.5° west of *delta Cap*. With a solar orbit of 164 years, Neptune has not completed one orbital period since it was discovered in 1846. It will complete its orbit in 2010 when it comes much closer to *delta Cap.* 

Both **Venus** and **Jupiter** are lost in the glare of our Sun until late September when Jupiter will appear in Leo and Venus in Virgo before sunrise. Venus will move to be an evening object and stay there until 2004.

# Morning Sky

**Saturn** appears above Castor and Pollux in Gemini about 4.30 am and will get earlier as the time goes on. On 24/8 a thin crescent moon will be just below to the north.

# Portraits in The Sky

# AQUILA – "The Eagle"

Aquila, The Eagle, is a constellation with an ancient story about Ganymede. Hebe, the daughter of Zeus and Hera, was the goddess of youth and responsible for pouring the wine at religious functions. She gave up the post after her marriage to Heracles, although some gossip said she was promptly sacked for wilfully exposing herself in one ceremony.

Zeus sought a suitable replacement and came upon Ganymede, a splendid Trojan prince. Not content with simply offering the young man a job description he couldn't turn down, Zeus disguised himself as an eagle, and grabbed Ganymede from his native land and took him to Mount Olympus where he became the wine-pourer for all the gods. This explains why the moon Ganymede is Jupiter's brightest and largest companion: Jupiter being the Roman name for Zeus. The constellation is supposed to represent the eagle carrying away the youth. Four to five fairly bright stars just below were previously called "Antinous" to represent the boy, but this is not used any longer. Eventually Zeus honoured Ganymede by putting his own image in the skies. This we now call Aquarius - the water bearer of the gods.

The aborigines call Aquila 'Totyarguil' a mythical person killed by a fish while bathing in the river.

Aquila's Bayer stars are generally third and fourth magnitude, except Altair (*alpha Aql*), the twelfth brightest star in the sky, and the southern-most of the three stars which make up the "Summer Triangle. Seen from 30 degrees north Altair, Vega and Deneb in Cygnus make a bright triangle at the zenith during summer months. It is somewhat distorted from our perspective

Altair magnitude 0.77 spins very rapidly at 210 kilometres per second, completing one revolution every 6.5 hours. This deforms the star making Altair's equatorial diameter twice its polar diameter. Though 10 times brighter than our Sun, Altair is still on the main sequence burning hydrogen into helium and surprisingly cool at only 7500°K.

#### Double stars:

**Beta Aquilae** has a faint red dwarf companion: 3.7, 11.6; with a fixed orbit and separation of 13".

**Zeta Aquilae** magnitude 3.0 also has a very faint 12.0 mag. dwarf companion separated by 6.5". Big magnitude change will make this difficult.

*Pi Aquilae*: 6.0, 7.0, is also hard due to small separation of 1.4".

**15 Aquilae** 5.4, 7.2 is a nice yellow and purple, and **57 Aquilae** 5.8, 6.5 is easy at 36" separation.

Struve 2404 is a beautiful orange pair of K class stars 6.9, 8.0; in a star-filled field. Separated by only 3.5" you can find it in the same field as NGC 6709 (below) 4-5 arc mins to the NE.

#### Deep Sky Objects:

NGC 6709, open cluster mag 6.7 is a loose cluster about 13' size, of about fifty stars. There are two apparent double stars on the eastern edge. It is approx. 2500 light years away and is located 5° SW of zeta Aquilae.

6755-6756 are two Open Clusters 7.5 mag and 0.5° apart. 6756 is NE.

Looking like three dark fingers 1° in size and 1° west of Gamma Aquilae are the Barnard dark nebula **B143** / **142**. Another one called **B133** is 2° south of Lamda Aquilae.

NGC 6804 is a 31" planetary nebula of 12.0 magnitude and a filmy structure. NGC 6781 is a large PN of 2' or 109" size and 11.4 magnitude. Good object for larger apertures.

There is a small globular 9.1 mag. 5° SW of Delta Aquilae called NGC 6760

#### INDUS - "The Indian"

Johann Bayer wanted to honour the American Indian in his collection of new constellations for his 1603 book *Uranometria*. Indus is located in a sky sector squeezed between Grus and Sagittarius. Its stars range from 3.1 to 5.3 visual magnitude and it is hard to disentangle them from Pavo in the south and Telescopium in the west.

The constellation has a few binaries, and one of the closest stars to our own Solar System. Matching closely our own sun, **Epsilon Indi** has been studied as a possible candidate for planets, however none have yet been found.

The alpha star in "The Indian" is one of the few stars in dim constellations to have a proper name. For reasons unknown, Jesuit priests in China had named alpha Indi **"The Persian"** before Bayer, and so it remains today. It is a K class 3<sup>rd</sup> magnitude orange giant, 11 times larger than the Sun but shining 62 times brighter. Slowly dying as it burns its helium centre into carbon and oxygen, it is 'super-metal-rich' probably acquired from being born in the inner part of the galaxy and bathed in heavy metal elements from supernovae.

If you think of the Persian as the Chief of the Tribe, then on each side of him, there is a Red Indian, making this a tribe of three. One is mentioned below but the other is a 13<sup>th</sup> magnitude dull red M class star

#### **Binary Stars:**

**Alpha Indi** is a wide binary orange with a very faint red M class companion: 3.1, 12.5; separation 67.4".

*Theta Indi* is two white stars not so easily resolved because of magnitude difference: 4.4, 7.0; separation 6". You will need 200x at least, to split the components.

# **Deep Sky Objects**

There are 3 spiral galaxies within range of backyard telescopes and one irregular one.

**NGC 7041/7049** are two spiral galaxies in the same field. They are faint, 11 and 10<sup>th</sup> magnitudes and similar in size, 4"x2". You can find them 8.5° from Al Nair, which is brighter, on a straight line to Alpha Indi.

NGC 7090 is a wide but thin 10<sup>th</sup> magnitude spiral halfway between Delta and Theta Indi.

IC 5152 is a dwarf irregular galaxy 5 million light years from Earth. A 150mm scope will show mottled star clumps in the galaxy and a bright 8<sup>th</sup> mag star in the foreground.

## TELESCOPIUM

Just east of the Scorpion's stinger lies the faint constellation of Corona Australis. To its south is found the 4<sup>th</sup> and 5<sup>th</sup> magnitude stars of Telescopium.

Devised by Lacaille in the mid-eighteenth century, it is a shame that the most important instrument for astronomers should be associated with a portion of sky so poor in telescopic interest. Even the small right angle asterism occupies only a small area immediately south of Corona Australis

A patent application for a practical telescope was made in the Netherlands in 1608. However the application was turned down because the process of manufacture was deemed to be common knowledge and too easy to copy. In the following year Galileo used a 3x telescope of his own design and made the invention famous with his discovery of Jupiter's moons.

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Two of Galileo's telescopes survive in a Florence museum. They are well made but they do have chromatic aberration, being single element design, and the optical quality is not good over the whole lens area.

One is a long paper tube, with a double convex objective lens of 51 mm and a focal length of 1.3 metres. The other is a shorter focal length of 980 mm and a 37 mm objective. Both have paper diaphragms stopping the aperture down to 26 and 16 respectively to align the light waves where the optical quality was best. This gave an F ratio of 51 for the long tube and 61 for the short one.

Imagine the double star splitting ability of an f/61 refractor! On the down side with the glass tinged green by the iron content, and an aperture of only 25 mm or 1 inch giving a field of view a quarter of the moon's diameter, it must have been like looking through a straw.

Alpha Telescopii is a B class blue subgiant 250–750 light years away. It is six times bigger than our Sun and shining 900 times brighter. The star is rather peculiar by being very rich in helium but still burning hydrogen. A detected slow rotation may mean that we are looking from above with its pole pointing at us. In several million years it will lose all its hydrogen layers and become a massive white dwarf.

#### Double stars:

**Dunlop 227** is just over 5° west of alpha Pavo. A yellow star and blue-white companion 6.1, 6.8, separation 22".

#### Deep Sky Objects:

Both these objects are small and may be difficult to find. However if you're in the mood for a challenge and it's a good sky, look in the area:  $2^{\circ}$  north of Dun 227 for **IC 4889** a  $12^{th}$  magnitude bright core circular galaxy about 1.5' in size.

8° north of Dun 227, and 5° west of the Persian, a small cluster of very faint galaxies surrounds **NGC 6868**, an elliptical galaxy. Although 10<sup>th</sup> mag. it is very small.

Eagles, Indians and telescopes - sounds like a great adventure story!

Good seeing IC

# Astronomical Pot-Pourri

## A Bayer's Dozen

Astronomy is full enough of its own frustrating little mysteries so it is very confusing to find that different reputable astronomy sources sometimes offer contrary information on matters of fact. This occurred recently after I had written a Heavens Above! column for the Chronicle in which I described the twelve obscure constellations near the South Celestial Pole - Apus, Grus, Chamaeleon, Dorado, Hydrus, Indus, Musca, Pavo, Pheonix, Triangulum Australe, Tucana and Volans (mostly all named after exotic birds and animals, except the triangle and Indian) as being devised by two Dutch navigators Pieter Dirkzoon Keyser (c. 1540 - 96) and Frederick de Houtman (1571 - 1627). This information I obtained from the very reliable and excellent book 'Collins Pocket Guide to Stars & Planets' (Ed. 3) by Ian Ridpath and Wil Tirion

What is confusing is that other equally reputable sources (including the *What I See this Month* by our own Ian Cook in this issue of Prime Focus) attribute these very same 12

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constellations to Johann Bayer (in the same era), who also is famous for devising the naming of stars by use of Greek letters.

To quote a well known blonde fish shop owner – "please explain?"

Now I have my own little theory about this apparent conflict of fact. It based upon pure conjecture and not on any research I have (or haven't) done.

I suspect that the Dutch duo Keyser & Houtman travelled down south and filled the then existing gaps in the southern sky maps with these quaint but obscure constellations. (Let's face it – they didn't have a lot of bright stars to work with around the SCP.) At least they used some imagination and picked exotic subjects, not the boring collection of tools and instruments chosen by the imagination-bypassed Lacaille.

They then returned home and submitted their star maps to the astronomers of the day. Bayer, being an astronomer of note, probably used these constellations in his work and, somehow, these constellations became associated with him. (I am not suggesting he stole the credit from K&H – these things sometimes just happen.)

That's my theory. Here's a challenge for someone in MAS who likes to do reading and research. Go search for references to these constellations, to Bayer and also Keyser and Houtman and try to find out what *really* happened. Who really first devised the names and scope of these constellations? And if it was K&H, why do some books credit them to Bayer? Go to it... oh yes, and please let me know so we can pass this gem of information on to our members (and maybe even advise some publishers.)

## Barking up a Gum Tree

I'm pleased to say that since I requested people to try to find more information about Australian astronomer Colin Gum, I have received responses from Lesley Southwell and a large amount of material from Bob Monkcom, who has been hitting the Google search engine hard.

There is still a lot of tracking down of details to be done from various sources identified by Bob, but I can present some bits and pieces of his activities in a brief summary form (not necessarily in any chronological order.)

In 1995 he published a paper on the survey of southern HII regions.

He carried out a photographic survey of the southern Milky Way in a search for nebulae.

The nebula NGC2736 was named in his honour (The Gum Nebula.). There are source discrepancies (see!) on when the originating supernova occurred – some say 9,000 – 11,000 BC, other say only a few hundred years ago.

He did studies of some eclipsing binaries, and also of the determination of the principal plane of our Galaxy.

We know he worked for a while at Mt Stromlo, and it seems he died tragically in a sking accident.

More details when we have them.

# Amateur Extraordinaire

Assumptions are amazing things, and they are usually wrong. By chance I was reading an astronomy reference the other day and come across information about the famous astronomer William Herschel who discovered the planet Uranus in 1781. (By the way, there were two Herschels, William and John, father and son, and it's easy to get them confused, just like the Bachs but there were more of them.)



Anyway, I had always assumed that William (and John) Herschel were fully paid up professional astronomers when they made their famous discoveries, and maybe John was, but I'm not talking about him. However, it seems that for most of his astronomical life, William was making a living as a musician. He did his astronomical observations (not to mention making his own telescopes – can you imagine anyone doing that) in his spare time. Ye gods! The man was one of us – an amateur astronomer. And his discovery of Uranus was not a result of a systematic search based on calculated positions from aberrations in an inner planets orbit – he was just looking one night for comets, saw this non-starry looking object, registered it with the astronomical body for such things, they said "Sorry Bill, that's not a comet" and he said "By George, then it must be a planet." And it was. After that he was famous, gave up his day job and became a full time astronomer.

There's hope for us all yet.

RB

# Feedback Please

This is the second edition of Prime Focus with the new A5 page format. There has also been a change in font in this issue in an effort to fit more information on each page.

We have made this experimental change for a few reasons, one of which is to reduce the cost of printing Prime Focus, one of our major expenses each year. This new format should contain close to the same amount as it would if produced in A4 size. Not exactly but close.

I am after your feedback as to how you like (or dislike) this format. Do you find it easier to handle? Is it suitable for reading, or do you find the font too small? Please let me, or any committee member your views on this.

As to content, I can easily add an extra sheet (4 pages) if I receive more articles to fill them. That's a hint, dear members. Please write about your astronomical experiences, or thoughts on astronomical subjects. This is YOUR journal. Please support it.

Bob Bee Editor