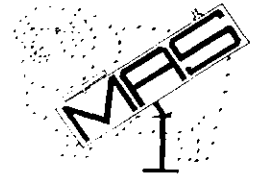


MACARTHUR ASTRONOMICAL SOCIETY Inc.

Journal



# PRIME FOCUS

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## President's Report.

### If You Missed It!

It was great to see the many new faces at last months meeting. Would you believe that we now have 71 members, that's our highest since we started our little club. Also I'm aware that several new purchases of the telescopic kind have taken place which is just fantastic. It's a big sky out there with plenty to go around, good luck to all of you.

Our speaker last month was of course the inimitable "Dr Fred Watson" from the Anglo Australian Observatory. As usual he had us all spellbound with his excellent style of presentation, humour and overall knowledge about the world of astronomy.

I was most fascinated with the topics discussed, in particular

the research that's involved in measuring the radial velocity of stars and the technology that goes behind it. Dr Watson really fired along with his Volume Phase Holographic Gratings and references to the Advanced Fibre Optic positioning system that will be installed on the giant Subaru telescope - was that an "Echidna" or "Ukhidna"?

Also on the night Dr Watson attended to his regular ABC National Radio interview which was broadcast live, just outside our room. He was most complimentary about our society, indeed later that night in the ca park Fred said he would be most keen to come back and see us again. What a night!

### Annual General Meeting

Yes folks, it's AGM time again and next month it will all be happening, reports to present and elections to be

had. The Annual General meeting is the time to take stock in what we have accomplished as a society over a 12 month period.

The present Committee positions will be spilled and as such expressions of interest will be sought from the membership of the society for the following positions:

President; Vice President  
Treasurer; Secretary  
Committee Positions

The application forms are near the attendance book and if placing an expression please remember that it must be nominated and seconded by other financial members. All nominations must be received by the Secretary no later than the 7th of April and if possible by meetings end tonight, otherwise mailing to PO Box 17 MINTO 2566 will suffice as long as it's before the expiry date.

## The Dues are Due!

It would be most appreciative if we could have as many members as possible renew their membership tonight. Please note that an error occurred last month in advertising the cost of Prime Focus mail out, it's still \$5, not \$6 as went to press. Sorry, but someone goofed (That'd be me – mea culpa! Ed). The expiry date for renewal is end of April. Remember, if you joined October 2002 or later you are covered - what a bargain!

## The Dates

05/04/03	The Oaks
12/04/03	Public Night
21/04/03	AGM/Gen Mtg
03/05/03	The Forest
19/05/03	General Mtg
24/05/03	The Oaks
31/05/03	The Forest
16/06/03	General Mtg

## Bits and Pieces

We have finally secured our Public Liability Insurance. This means we can continue our activities and make future plans. It's been a tough battle which could have had drastic consequences for us if we could not renew.

The Community Care Underwriting Agency has come to our rescue and replaces the GIO. An increase in the cost of insurance has been allowed for in the decision to adjust our

membership fees and we should be well placed to meet future outlays if current costs remain static.

## Trials and Tribulations!

I continue my struggle with my new telescope, but in saying that it has been an opportunity to research and learn so much more, from focal lengths to eyepiece design, collimations and procrastinations, and of course the fight with fast optics against the allowances of longer focal lengths.

The rules of optics do seem set in stone, no magic cures here but there is a lot of physics and science to contend with. Into the mix comes the images of the sky that are important to you. I agree that fine contrast planetary views are awe inspiring, but what about imaging galaxies that lie millions of light years away. However, let's not disregard the exceptional views of our lunar neighbour, through any telescope it's a real gem of a sight.

For anyone that owns a telescope it would seem old adages ring true - size does matter - as long as it's not too fast and the only good telescope is the one you actually use!

Farewell and good observing

Noel Sharpe ■

## A View from Mt Annan

I had MacDob out in the backyard on Friday 7<sup>th</sup> March to do a bit of viewing of multiple stars and clusters in the constellation Monoceros (the Unicorn).

At 10.30pm, as a temporary digression, I turned MacDob onto Jupiter which had finally come over my side fence to the north. There was good seeing so I increased the magnification to 130x, giving a beautiful view Jupiter's disc and the four Galilean moons. Two of the moons were very close together on one side of Jupiter.

But what was that round black dot on Jupiter, between the main cloud bands and 1/3<sup>rd</sup> the way in from the edge? I thought at first that it was a speck on my eyepiece, but I changed eyepieces and it was still there. I knew then what I was witnessing – one of the moon's shadow was transiting Jupiter.

When I checked *Astronomy 2003* I found that the two close moons were Io and Ganymede, with the shadow coming from Ganymede. As I watched (between patches of cloud), the two points of light slowly merged into one as Ganymede moved in front of Io and the shadow moved towards the planet's edge. Fantastic! 600 million km away but as if right in my backyard.

If you have a telescope, check out Jupiter. These shadow transits are happening every night (at different times) for the rest of the year. RB

## What IC This Month March 1 - April 20, 2003

### Bright Star Tour

Capella in far north, stars of Orion, Sirius, Castor and Pollux in Gemini, Regulus in Leo, Spica in Virgo, Arcturus in early morning with Libra and Scorpius. Turning to the south we have Achernar in southwest, Canopus, False Cross, stars of Corvus overhead, Centaurus and Southern Cross.

### The Moon Diary

Full Moon 18/3 and 16/4  
Last Quarter 25/3  
New Moon 1<sup>st</sup> April  
First Quarter 8/4

New Moon this month is April Fool's Day. Before 154 BC the Roman calendar celebrated New Years Day on April 1<sup>st</sup> which was also the Spring equinox. With the coming of the more accurate Gregorian calendar, and a new year starting on January 1<sup>st</sup>, those who 'forgot' and continued to use April as the New Year became the butt of jokes and pranks. A bit like the change to daylight saving time each year for us

### Evening Sky Planets

**Mercury** begins the month in Aquarius leading the Sun into the west. It becomes visible in the evening about 10/4 and ends up at its highest in the sky on the 17/4, near the tail of Aries. It will set within an hour and a half after the Sun. A rare event will happen on

the 7<sup>th</sup> May, when Mercury will pass across the face of the Sun between 3.15 pm and sunset. **\*\*CAUTION\*\*** Using a Mylar solar filter very safely will enable you to see it with telescope and maybe binoculars.

**Saturn** remains in Taurus slowly moving to the west each night. On 7<sup>th</sup> April the crescent Moon and Aldebaran will form a flat triangle. At the same time the rings will be opened to their widest position tilted up. From now to 2010 they will gradually tilt down and disappear as we look at them edge-on.

**Jupiter** is in Cancer and past its brightest but during this month will remain close to the manger and Beehive Cluster.

### Morning Sky

**Mars** rises just after midnight in Sagittarius and will pass across the face of M22 on the 18/3. Being 90° to the Sun from Earth now Mars will appear very egg-shaped in a telescope. It is now only 3 months to opposition and "the 2003 Mar's show".

As Jupiter sets **Venus** will rise in Sagittarius and quickly move through Capricornus into Aquarius and Pisces. Rising big and bright just after 3.00 am Venus will have close encounters with **Neptune** and come within ½° of **Uranus** on the 29/3.

Good seeing IC

## Portents in The Sky

**CRUX "The Southern Cross"** is the most famous constellation in the southern hemisphere. Just as people here have heard of "The North Star" many visitors from the north want to see "the Cross" for themselves. Once part of Centaurus, the sight of such a brilliant cross in the sky was so compelling that it took on an identity of its own.

Thousands of years ago the four main stars were significant objects in the Near East, but due to precession they moved gradually south. Two thousand years ago, they were just visible at the horizon before disappearing altogether from the view of people above 25° north. Some have entertained a link with their disappearance and the Crucifixion of Christ.

It was the Portuguese explorers of the early sixteenth century who "rediscovered" the Southern Cross. For these adventurers the constellation was not only a brilliant religious sign but also an important clock. From all latitudes below 30° south, Crux was circumpolar. When at the meridian the Cross was straight up and down, and by noting the angle of the  $\alpha$  -  $\gamma$  stars around the pole, the navigators could calculate the time. This is still true today!

The principal star in the constellation is **Acrux (alpha Crucis)**, a splendid binary.

The combined visual magnitude results in a magnitude of 0.72. The stars are 320 light years away, and each is approximately 10 – 14 times the size of our Sun.

*Alpha Crucis* belongs to a moving cluster group called the "Scorpio-Centaurus Association" and seems to be moving very slowly in the direction of our Solar system, along with *Beta*, *Delta*, *Zeta*, *Lambda*, and *Mu Crucis*.

*Beta Crucis (Mimosa)* is the brightest star of the group, a blue-white giant (nearly five times the Sun's size) with a visual magnitude of 1.25. The star is variable, has a luminosity of nearly 8000, and is estimated to be 580 light years away.

*Gamma Crucis (Gacrux)* forms the top of the cross, and although a suspected binary system is only an optical double. The stars have been tracked moving in different directions and therefore cannot be gravitationally bound. *Theta A and B* are also not gravitationally bound to each other.

*Delta Crucis* is at the end of the western arm, very similar in size and distance to *alpha*, and part of the star cluster mentioned above.

#### Double Stars in Crux:

*Alpha Crucis* is by far the best of the group: a splendid binary of almost equal blue-white stars: 1.58, 2.09. The separation of 4.4" requires quite high magnification.

While *Alpha-2* is a single star, *Alpha-1* is a very tight double which can only be detected by spectroscopic motion. Such high masses suggest that both main stars will someday explode, while the tight companion of *Alpha-1* may escape to become a massive white dwarf.

*Beta Crucis* has a very faint companion: 1.2; 11.0; separation 44.3".

*Eta Crucis* has a faint distant companion, 3.6, 10; separation 44".

*Iota Crucis* is an easy binary to resolve: 4.7, 7.5; sep 27".

*Mu<sup>1</sup> and Mu<sup>2</sup> Crucis* form a fixed binary, easily seen in small telescopes: 4, 5.2; separation 35".

#### Deep Sky Objects

*The Jewel Box (NGC 4755)* is an open cluster of over a hundred stars and is southeast 1.5° from *beta Crucis*. A mix of colourful supergiants, red and blue mingle with yellows and whites, giving rise to the name. The cluster is very young, no older than ten million years. The central star is *kappa Crucis*, a blue sixth-magnitude supergiant which gives it its second, or third, name – 'the *Kappa Crucis* star cluster'.

*The Coal Sack* is a dark nebula only 550 light years away, found just to the south of the Jewel Box and visible to the naked eye. Dark

nebulae are massive clouds of interstellar gases and dust, blocking out most of the light from stars behind it. The Coal Sack is the largest one visible to the unaided eye.

**MUSCA - "The Southern Fly"** was introduced by Johann Bayer as *Apis*, "The Bee". It went through several name changes before ending up as *Musca Australis vel Indica*, (The Southern or Indian Fly). This was deemed necessary due to its Latin similarity with "Apus", and confusion with *Musca Borealis* – The Northern Fly, which is now abandoned but survives as the 'Flies of Aries' over the rump of the Ram. Although a small constellation it stands out just to the south of Crux.

*Alpha Muscae* a 2.9 mag star passes the meridian March 31, one day later than *Alpha Crucis*

#### Double Stars in Musca:

*Beta Muscae* is a rapid visual binary with a period of 383 years. Magnitudes of 3.7, 4.0; and 1.3" separation will test the optics and collimation of your telescope

*Theta Muscae* is a fixed binary: 5.5, 8.0; sep 5.3". Easy to find on the southeastern edge of the Coal Sack. John Herschell found two doubles in Musca; **h4498** 6.0, 8.0; separation 9" can be found midway between *lamda Muscae* and *alpha Crucis*, and **h4432** 5<sup>th</sup> and 6<sup>th</sup> magnitude

separated by a tricky 2.3" is midway, and slightly north, between *lamda Muscae* and *IC2602* in Carina

### Deep Sky Objects:

*NGC 4372* is a rather faint globular cluster 1° SW of *gamma Muscae*.

*NGC 4833* is a fairly bright (8th mag) globular cluster 1° north of *delta Muscae*.

*NGC 5189* is either a planetary or a reflection nebula. Compact and slightly flattened it is an interesting and curious object.

### CENTAURUS –

#### “The Centaur Chiron”

Hercules came to visit Pholus, a kind and timid Centaur who was a friend of his. Centaurs were half-men, half-horse and usually rather wild. Finishing the sumptuous meal provided by Pholus, Hercules behaves foolishly and badly by opening a special wine reserved only for Centaurs. The Centaurs in the area catch the perfume of their special wine, wafting across hill and dale, and they fly into a rage. They rush over to the dinner party picking up huge boulders, ripping out trees for clubs, and arming themselves with axes.

Pholus takes fright and hides, leaving the battle to Hercules. After killing a number of Centaurs single-handedly, Hercules chased the rest of them over the hills to the cave of their king, Chiron who was a kindly patron of Hercules and a great friend.

Hercules shoots an arrow at one fleeing Centaur, but it passes through him and strikes Chiron on the knee. Hercules' arrows were all dipped in poison, so each was fatal, no matter how slight the wound, and our hero was devastated. He tried to assist Chiron, but there was nothing he could do.

Chiron was immortal, so the poison couldn't kill him but cause him great pain that would last forever. Going deep inside his cave, his screams of agony echoed throughout the cavernous walls.

After many weeks of listening to his torture, Prometheus takes pity on the long-suffering king of the Centaurs, and offers, if Zeus agrees, to take Chiron's immortal place and allow him to die. Zeus agrees to the exchange and Chiron died, his agony finally coming to an end. Zeus placed the great king of the Centaurs in the heavens.

However flashing back in our story for a minute; while Hercules was away chasing Centaurs, his friend Pholus looked over the dead and dying and wondered how Hercules' arrows could be so deadly. Pulling an arrow from a body to inspect it more closely, it slipped through his fingers and jabs him in the foot, killing him instantly.

Hercules hearing of the tragedy, returned to bury his friend. Zeus (or Jupiter as the Romans knew him) had

highly regarded Pholus, and put his likeness in the heavens along with Chiron. Thus the constellation Centaurus represents two Centaurs: Chiron and Pholus.

Centaurus is one of the largest constellations in the sky with a clearly discernible shape. The huge form faces east, with a sword waving menacingly toward Lupus the Wolf on the west. The constellation has an almost complete list of Bayer stars except for *omega*, which isn't a star, but a well known globular cluster. The front hooves are two bright stars: alpha and beta Centauri, known also by the Arab names of Wazn and Hadar.

*Alpha Centauri* is best known as "Rigel Kentaurus", or the Centaur's foot. This is a three star system which is the closest to our own Sun.

*Alpha<sup>1</sup> and alpha<sup>2</sup> Centauri* are a noted binary, 4.3 ly away, and each is approximately the size of the Sun. They have an orbit of 79.9 years and are separated by 14”.

The closest star to us is actually *alpha<sup>C</sup>*, known as *Proxima Centauri*. This is a red dwarf star with visual magnitude 11.0 and a distance from us of 4.2 light years. The star has a diameter of about five times that of the Earth and is about a sixth of a light year away from the other two. *Proxima Centauri* is also a flare star and is known as variable *V645 Centauri*.

**Beta Centauri (Hadar)** is 0.6 visual magnitude and a difficult double because of the primary's brightness 0.58, compared to the companion 3.95. The separation is 1.3". The orbit has not been calculated, but is thought to be at least several hundred years.

**Gamma Centauri** is a visual double of two nearly identical stars 2.9, 2.9 mag. Separation 1.0" with an orbit of 84.5 years:

**Eta Centauri** is a binary with very faint companion: 2.3, 13; separation 5.6".

**Kappa Centauri** also has a faint companion: 3.1, 11; separation 3.9"

### Deep Sky Objects:

**NGC 5139**, also known as **Omega Centauri**. This globular cluster is the finest in the heavens. It's so bright and compact, Bayer thought it was a hazy star, and named it omega. The cluster is estimated to be from 15,000 to 25000 light years away, and may have over a million stars. It lies between *gamma* and *zeta* Centauri, about 5° west of zeta.

**Centaurus A NGC 5128** is a radio galaxy that emits 1000 times more radiant energy than the Milky Way. Located 4.5° north of Omega Centauri it appears as a giant elliptical galaxy with a strange dark band across the centre that you can see with 100 mm telescope or larger. It is thought the band is the result

of a collision with a spiral galaxy in the past.

An interesting area near the hind legs of the centaur (on the Carina side) holds **NGC 3766** a naked eye open cluster and **NGC 3918 – The Blue Planetary**. Discovered by John Herschel it looks similar to Uranus but three times larger.

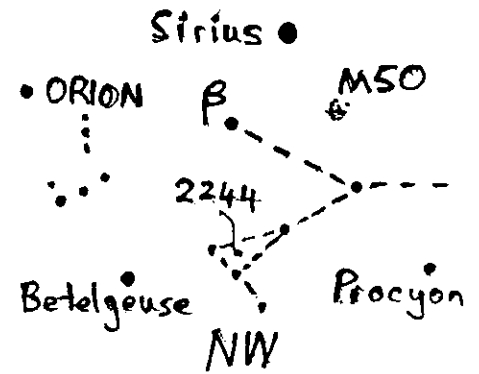
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## A Horny Constellation – Monoceros

I was inspired by an article in the February 2003 *Sky & Telescope* to go exploring the very faint (almost invisible in suburban skies) and apparently featureless constellation of Monoceros, the Unicorn. Monoceros is effectively located inside the triangle formed by Sirius, Procyon and Betelgeuse, which is just as well because otherwise you would never find it.

But once found, it does hold a number of interesting, but also challenging, objects for both telescope and binoculars.

I have to confess at this point that I didn't complete my survey of Monoceros, as I was interrupted by the onset of heavy clouds and also my happy discovery of Jupiter's moon shadow transit. (See article on page 2.) I'll get back and finish it another night. But here's what I saw.



**M50**, while its location was easily found from the map, and I identified the hazy patch in my binoculars, nailing it confidently with the telescope wasn't so easy. In the end I believe I had it, but was surprised at how 'few' stars there were in the open cluster. I'm not ticking this off my Messier list yet.

**β Mon** was a delight. Easily found visually 1/3<sup>rd</sup> the way from Sirius to Betelgeuse. Getting it in your finder scope and eyepiece is another matter. (Memo: brush up on star hopping skills.) To quote S&T, "β is a skinny acute triangle of stars that shine at mags 4.5, 5.2 and 5.6. Once I thought I'd found it, I had to pump the magnification up from 70x to 133x to covert what appeared as a close binary into a triple, with one of the binary components just splitting. No doubt more magnification would give a better view. They weren't kidding about acute triangle.

I started on NGC 2244, got frustrated and turned to Jupiter. Serendipity!

Stay tuned for more. RB