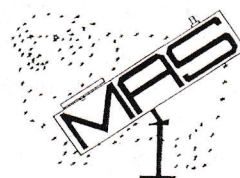


MACARTHUR ASTRONOMICAL SOCIETY Inc.

Journal



PRIME FOCUS

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President's Report.

Previously at MAS.

Greetings to one and all and welcome to tonight's meeting. The year is certainly flying by and it's hard to believe it's June already. At last month's meeting our guest speaker was Dick Everett who gave us some insights on Jupiter's moons as well as what to expect with the upcoming visit of Mars. Thanks Dick for a great talk

Unfortunately the planned Oaks field night back on May 24 was cancelled due to the bad weather, but the Forest night on May 31 was a real bobby dazzler. A great turnout of members were greeted by a zillion stars proudly on display. The conditions were perfect as can be attested to by the bleary eyed brigade the next morning.

Peter D and I were very busy taking as many photos as we could. The night was delightfully crisp and hardly any dewing to speak of. The mighty messier hunters bagged many scalps that night and I had the opportunity of viewing an eyepiece full of galaxies which reside in Virgo. What a night!

Last month we mentioned "The Festival of Astronomy North Sydney" (FANS) being held on Sunday night the 20th July. At the moment we will be represented by about 6 scopes, which is good but we need more. As you may know this star night is held to support the International Astronomical Union's General Assembly which is being held in Sydney next month, about 2000 professional astronomers will be transporting in. This will be the one of the biggest star parties on the planet.

This is the chance to support the entire astronomical community and our attendance will definitely be appreciated. We expect the number of keen stargazers to number in the thousands so let's play a big part.

You can see myself or Bob Bee for nominations to attend and be part of this great event. Even if you just wish to just come along and take it all in let us know.

It's around the corner.

16/06/03	General Meeting
21/06/03	The Oaks
28/06/03	The Forest
12/07/03	Could be The Oaks
20/07/03	FANS
21/07/03	General Meeting
02/08/03	The Forest (Special Students Night)
18/08/03	General Meeting

Other Things of Note

We have enjoyed many great nights down at the Forest. It is with the permission of the University of Sydney that we are able to use their grounds and cabin and we have a formal hire agreement in place with them. As part of that agreement a hire fee is payable based upon the number of members who use the facilities.

A modest fee of \$8.00 per night is payable and as determined by the committee. A fee of \$4.00 is payable for those who use the site but do not stay over. I mention this as it would make my life a lot easier if you could see me early in the night so I can sign you off and relieve you of your brass razors.

This will free me up to enjoy all those stars out there without giving organisational thoughts to much bother. My appreciations go in advance.

Waiter!... there's a Bat in my soup.

I was under the impression that it was only Students and Astronomers that resided in the log cabin down at the forest. You can imagine my surprise when I was warned to be careful as there were bats dive bombing unsuspecting members who dared enter their domain.

Being the President sometimes means you have to take a risk and I bravely

poked my head through the door. Rats it's Bats, fury winged little devils dive bombing my head, honing in with their echo location. It was terrifying and it was a war zone in there.

Well actually it was (one baby bat and a mummy bat who was sleeping behind the curtain) but we won't let that get in the way of a good story!

Until next time we meet, stay safe and enjoy your Astronomy.

Regards from the Bat Cave
Noel Sharpe President

Double Double, Toil and Trouble

Many of us develop our own specific interests in the wide field of astronomy. One of our members, Ian Cook, seems to have gained an interest (passion even?) in double stars. See his excellent "What IC this Month" in this and other issues. After I have finished my Messier hunt, I may take off after him, because doubles can be both a challenge and a source of joy. Laying it on a bit thick? You be the judge when you go out with your scope and successfully split a close double and identify their wide range of colours.

The June 2003 issue of *Sky & Telescope* has two articles on

doubles. The second article (p105) has a list of delightful coloured doubles. An edited version of it appears below.

Star	Mags	Sep
Antares	1.1, 5.4	2.6"
β Scorpii	2.6, 4.9	14"
α Librae	2.8, 5.2	231"
ι Librae	4.5, 9.4	58"
λ Ophiuchi	4.1, 5.2	1.4"
ϕ Ophiuchi	5.4, 6.9	10"
21 Sagittari	4.9, 7.4	1.8"
56 Herculis	6.0, 10.6	18"
α Herculis	3.5, 5.4	4.6"
ρ Capricorni	5.0, 6.7	248"
σ Capricorni	5.5, 9.0	56"
11 Aquilae	5.2, 8.7	18"
23 Aquilae	5.3, 9.3	3.1"
β Cygni (Albireo)	3.1, 5.1	34"
HN84 (in Sagitta)	6.5, 8.9	28"
ϵ Lyrae AB	5.4, 6.5	2.6"
ϵ Lyrae CD	5.1, 5.3	2.3"
δ Cygni	2.9, 6.3	2.5"
β 441 (Vulpecula)	6.2, 10.7	5.9"
94 Aquarii	5.3, 7.3	13"
41 Aquarii	7.1, 7.1	5"
γ Delphini	4.3, 5.5	9.6"

Why not start using Ian's hints plus the above to start collecting doubles. They can be very rewarding, and face it, there are plenty of the up there ... more than half of all the stars are multiples.

Have fun.

RB

What IC This Month

June 16 – July 20, 2003

Bright Star Tour

This month you will see in the northern sky, Orion low on the western horizon, Sirius in the north-west, then Regulus, Leo's tail, Spica, Arcturus, Vega and later Aquila. In the south we still have Regor (Vela), the Cross, the Pointers, Antares (Scorpius), Sagittarius, Capricornus and Fomalhaut (Pisces Aust), and later Achernar comes up from the south-east.

Moon Diary

22/6 Last Quarter

30/6 New Moon

7/7 First Quarter

14/7 Full Moon

Evening Sky Planets

Jupiter is still in Cancer but setting by 8.30 will move into Leo by 29/6. It is still large and bright but try to catch it before it gets too low.

Mars rises about 10.45 pm in Capricornus appearing larger each night. On 2-3/6 it will be close to the tail of the Goat (Deneb Algiedi, delta Cap) and its disk will be larger than Venus in a telescope.

Brightness will continue to increase for another couple of months.

Uranus rises in Aquarius late evening and will be 4° N of Mars mid June with the closest approach on the 21/6. Within the same binocular field of view, Mars will be at the edge of the field.

Neptune remains in Capricornus and on the 16/5 Mars will be seen just 2-3° south of the king of the Oceans. Neptune has yet to complete one orbit around the Sun since it was 'discovered' in 1846 close to delta Capricornus. At the moment it has 10° travel to complete the circle but it will take the next 7 years to do so.

Dawn Planets

Saturn will set before 7 pm in May then moving into conjunction with the Sun on 25/6 will appear in the dawn sky about mid July.

Venus and **Mercury** are both rising in the morning twilight in Aries. They will have some close grouping before end of May; then separate and come together again early June. They both race downward after that to bathe in the Sun's glare before rising in the evening.

Comets

65P/Gunn at 12th magnitude will stay close to sigma Sagittarii (Nunki in the teapot handle) during May before heading off SW to pass in front of M54 on 14th June.

Portraits in the Sky

Our portraits start this month with a massacre in ancient Greece.

LUPUS –

"The Spitted Wolf"

Lupus is located between the Pointers in Centaurus and the Claws of Scorpius in the north east with Norma to the east.

Although small it is packed with interesting items, especially double stars, due to its position in the Milky Way

The constellation refers to King Lycaon who ruled Arcadia with his fifty sons. Called 'Lightning Wolf' he was a cruel ruler who continued human sacrifice long after other parts of Greece had abolished it as barbaric.

One day Zeus (or Jupiter if you're Roman) visited Arcadia disguised as a simple traveller. Lycaon offered him soup with the meat of goats and sheep, but included was parts of his own son Nyctimus. Zeus leaped to his feet overthrowing the table in angry disgust. With a click of his fingers Nyctimus was re-assembled and brought back to life, while Zeus proceeded to barbecue Lycaon and all his fifty sons with lightning bolts. Hence the 'wolf or beast', impaled on the spear. Maybe it's a roasting spit?

Even before the Greeks put their story on it, the constellation represented a sacrificial animal of some sort. The shape is not obvious, and difficult to differentiate from Centaurus its closest neighbour, but the 'beast' seems to be carried on the spear of the Centaur.

It is probably best to start at the spear of Centaurus which are all 2nd magnitude stars about 15° nor-east of Omega Centauri and star hop to kappa

Centauri. In the same field to the south is beta Lupi, which at 2.7 magnitude is slightly brighter than kappa Cent, and down to the southwest 5° you'll find alpha Lupi.

Alpha Lupi called Kakkab meaning "The Star Left of The Horned Bull" is the brightest star of the constellation at 2.3 magnitude. The horned bull is Centaurus. Kakkab is a hot B class giant 10 times larger than our Sun. It has an unequal multiple pulse. Size-wise it is just on the dividing line between those stars that will blow up and those that will collapse into massive white dwarfs.

Double stars in Lupus:

Gamma Lupi is a very close mag 3.0 binary with a nearly edge-on orbit whose period is 147 years. Unfortunately the separation of 0.68" is too tight for easy viewing. **Epsilon Lupi** is also a difficult close binary: 3.4, 5.5; 0.6".

Eta Lupi is a pleasant fixed binary with slight colour contrast: 3.4, 7.8; 15".

Kappa¹ and kappa² form a wide fixed binary: 3.9, 5.7; 27".

Mu Lupi is a multiple system. AB: is tight at 5.1, 5.2; 1.2". The third component is much easier at 24".

Xi¹ and xi² Lupi are a fixed pair. This double is great for any telescope, the most

attractive binary in Lupus: 5.3, 5.8; 10.4".

h4788 is the southern-most of a triangle of stars a few degrees east of epsilon Lupi. A close double at 2.2" the stars are bright at 4.7, 6.7

h4690 NW of alpha is an orange and white double 6.0, 9.0, 19" separation

Deep Sky Objects in Lupus:

NGC 5822 is a very large open cluster 3° SW of zeta Lupi. of about a hundred stars. The cluster is located two thirds the distance from alpha Cent to zeta Lupi.

NGC 5927 is a dim globular cluster in a busy star field, 5° NE of zeta Lupi.

Right next door to the above glob is our next "picture".

NORMA –

"The Builder's Square"

Norma is another of those relatively insignificant constellations in the Southern Hemisphere. Invented by Nicolas Louis de Lacaille in the mid-eighteenth century, the constellation represents the scientific instruments, "the level" or rule and square. The original name was "Norma et Regula" (the level and the square).

Since Lacaille's time, the principle stars of Norma have been redistributed to other shapes, leaving it with few Bayer stars. It lies in a rich part of the Milky Way and has a number of interesting

clusters, clearly seen from backyards with binoculars

Easiest route to enter the asterism is along a line through Beta and epsilon Lupi to the right angle of 4th mag stars making up the square.

Double stars:

Epsilon Normae is a fixed binary: 4.8, 7.5; separation 22.8". Both of these stars also have a spectroscopic companion.

Iota¹ Normae is a multiple. AB is a rapid binary 5.6, 5.8; sep 0.5" too close to split with an orbit of 26.9 years. However component C: is easy at 8.0 mag, separation 10.8".

Dunlop 195 is not hard to find at 7.2, 8.0, 12", 1.5° SW eta Normae

Dunlop 193 is an unequal pair 6.0, 9.0; sep 18" just over 3° west of kappa Normae which I am still looking for myself.

h4777 is in the southern part of the constellation 3° north of beta Circinus. Stars of 7.7, 9.3, separated by 6" surrounded by a fine star field.

Deep Sky Objects:

NGC 6067 is an obvious cluster 4° south of gamma of about a hundred 10th magnitude stars. This cluster is in the same field and to the north of kappa Normae.

NGC 6087 is another cluster, some 3500 light years away, comprised of forty or so stars, ranging from 7-10 magnitude. The group is 2° east of ι^1 3.5° south of 6067. It includes the cepheid variable S Normae.

Sp 1 is a bright planetary nebula, 5° west-southwest of γ^2 Normae.

NGC 6167 is a faint grouping within a framework of three bright stars 2° west of γ^2 .

NGC 6134 is a faint group of stars 1.5° NE of γ^2 .

A further 4° south of 6087 just over the border into Triangulum Australe is a curiously shaped cluster that looks like the logo for the ABC TV. **NGC 6025** can be found at the point of a crooked arrowhead of stars.

Now let's move westward about one and a half hand spans and find the circlet of stars that mark:

CORONA AUSTRALIS

"The Southern Crown"

Corona Australis is a small compact constellation nestled between Sagittarius and Scorpius, just east of Scorpion's stinger. The constellation is old, and is said to be the crown worn by the centaur Sagittarius. Some people know it as "Corona Sagittarii".

Though only 4.1 magnitude the alpha star is called Alfecca Meridiana. This is a deliberate play on words to complement "Alphecca - alpha Corona Borealis" which is in the northern sky at a similar time. The word 'Meridiana' refers to noon-time and from the northern hemisphere to see the meridian at noon you must look south. So we have the crown in the south! Easy isn't it!

Alfecca Meridiana is a common hydrogen fusing dwarf, more than twice the size of our Sun. However it has a fast spin; making a full rotation in only 18 hours compared to the Sun's 25 days.

The most interesting deep sky area lies between Avior (epsilon) and gamma.

Double stars in CrA:

κ^2 and κ^1 CrA form a gorgeous fixed double. κ^2 is the primary: 5.9, 6.6; separation an easy 21.4".

BSO 14 are two nearly equal blue stars 6.6, 6.8 and 18" separation in between epsilon (Avior) and gamma.

h5014 is a close visual binary with an orbit of 191 years. These are two equal stars: 5.7, 5.7. but a very close 0.9" separation.

Deep Sky Objects:

NGC 6541 is a globular cluster, quite large and bright,

about 15,000 light years away. Located thirty arc minutes ($30'$) east of theta Sco. and nearly midway to theta CrA.

NGC 6023 is another GC within the same low power field of view as epsilon CrA, 30 arc minutes to the north east.

The nebulous region is **NGC 6726/6727**, which form a figure eight. Just to the SE is **NGC 6729**, which is much fainter, containing R CrA, an irregular variable that goes from 9.7 to about 12. As the star brightens, so does the surrounding nebula. The easiest way of finding the nebulosity is to drop 7.5° south of zeta Sagittarii.

IC 1297 is a planetary nebula with a 7" inner disk situated east of beta 1.5° . Larger scopes will show a disk out to 22" and maybe the 15th mag central star.

So get your scope "levelled out" and enjoy the barbecued wolf with a "crown".

Good seeing

IC

In an interesting article in the June edition of *Sky & Telescope* about parallel universes in extra dimensions (10 dimensions, actually), Steven Hawking made this delightful quote:

"A tiny black hole will not gobble up Earth as some newspaper stories would have you believe. Instead it would evaporate in a puff of hawking radiation and I would win a Nobel prize."

Great Galaxies Batman

On 31st May a good number of MAS members went to Belanglo Forest for our dark sky night. What a ripper of a night it was! After a perfect cloudless day, at sunset we began to get a bit worried by wispy clouds moving in. We needn't have feared, however, as they soon evaporated and left a gloriously clear and dark sky. Even better, I don't think anyone had any major dewing problems.

Speaking of dewing, I had had to call it an early night on the previous Belanglo night as my SCT's finder scope had hopelessly dewed over, and although my main scope was perfectly clear (with a large dew shield) I couldn't find a thing with a submerged finder scope. This night, however, I was prepared. I'd rigged up a dew shield for my finder scope using a length of cardboard which I rolled around its end. It gave me a 100mm cylindrical extension of the finder scope. At least I didn't get any dew so my viewing was great all the time up to when I went home, about mid-night.

I had set myself a viewing program to increase my Messier count, optimistically setting a target of 25 objects in Coma Berenices, Virgo, Ophiuchus, Serpens, Puppis and Scutum. I didn't really expect to find that many, knowing how difficult it would be to tell one galaxy from another. I mean, it's easy

enough to see a galaxy up there on a dark night if you point a scope in the general direction of Virgo. But the point of the exercise is to know what that object is, and hopefully how you actually found it.

So I began with Coma Berenices. There's a lovely cluster of galaxies (with M numbers) in the top left (or south west) corner of the 'square' formed by Coma B's reverse 'L'.

With Dick Everett's help and a simpler chart than my large Bobroff (which had more galaxies than you could poke a scope at), I found a guide star 6 Com and hopped from there. Wonders of wonders, I fairly quickly found M98 (an edge on galaxy), then M99 (a face on galaxy.)

As a temporary detour, but without leaving the area, I hopped a short distance into the Virgo cluster and found M84 and M86. What a discovery! Each is a bright elliptical galaxy and can be seen in the same field of view. They provide one of those delightful optical quirks, combining with another smaller elliptical and an edge-on galaxy NGC4388 to suggest an alien face. It was a bit spooky, in fact.

Back into Coma B, again starting from star 6 Com and locating a particular chain of 3 faint stars, I found M100 (a very nice face-on spiral) between the 2nd and 3rd star.

At this stage, I decided that star hopping is fun... as long as you have suitably detailed (but simplified) star chart. More star hopping south east to M88 (a partly edge on spiral), then slightly further east to M91, a fainter and more open structured spiral.

By then *I was smokin'*. Actually the Virgo and Coma Berenices galaxies are all part of the Virgo Cluster, so it was natural to continue on star hopping to the Virgo Messiers. I moved directly up (i.e. south) of M91 and found M90, a lovely spiral with a concentrated core, almost like a fuzzy star. Then 1° SW to M89, a bright but smallish elliptical, a smidge SE to M58, a loose spiral with a large core, then about 1° east to M59 and M60, two elliptical galaxies 0.5° apart.

I have to say I was feeling mighty chuffed at that stage, not only at my success (which many have done before me) but at the wonder of having seen so many galaxies (trillions of stars over 50 million light years away). I felt a degree of awe. I then switched to Ophiuchus and 'nailed' 7 globulars (Ms 9, 10, 12, 14, 19, 62 and 107.)

In all, I had added another 19 Messiers to my list, so I went home quite content, thankful for two things – star hopping and a knowledgeable friend. Thanks Dick.

RB