MACARTHUR ASTRONOMICAL SOCIETY Inc.

Journal

PRIME FOCUS

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President's Report

Please forgive my non-appearance at last month's meeting but by all accounts my more than able Vice President John Rombi handled the proceedings with great aplomb. My thanks to John and the other Committee Members who supported the evening.

Last month's guest speakers are to be congratulated for all the time and effort put into their presentations. Well done Dick Everett, Phillip Kidd and Peter Druery.

Tonight it gives me great pleasure to introduce as our special guest Don Whiteman. Apart from his expertise in all things telescopic Don is also President of the NSW Astronomical Society.
He's speaking to us tonight about collimation. For those who don't know collimation is making sure the optical path of your telescope is in perfect alignment. Our thanks to Don for taking time out of his very busy schedule to talk to us.

I know that the Universe is expanding but closer to home Attila and his wife Andrea have expanded their family with the birth of their son Anniken. Congratulations. Also expanding is the family of one MAS President with the quite unexpected arrival of a daughter named Natasha. A walkie talky type of baby that has made an impact greater than a comet.

Important Matters

Tonight we continue to promote our fundraising efforts with the Big Raffle. As you would agree the prizes this year are just fantastic, so we have decided to continue the raffle into October. I am sure everyone will support the Society as generously as in previous years.

We are still on the lookout for anyone with a current First Aid Certificate or would be willing to apply for one. The reason for this is to have such a person able to give assistance if required on the Observatory Public Nights.

Upcoming Events

22/09 Uni Public Open Night
13/10 Uni Public Open Night
15/10 MAS General Meeting
20/10 Members Field Night
Venue TBA
10/11 Uni Public Open Night
17/11 Members Field Night
Venue TBA
19/11 MAS General Meeting
08/12 Xmas Party at Dome
15/12 Members Field Night
Venue TBA

Please note that the Field night venues will be advised when more information comes

to hand. They will probably be at The Oaks but at this stage some exciting new opportunities may arise and I would like to keep our options open, just for a while.

The speakers for October will be John Rombi who will bring us all up to speed on the Messier Hunt, Daniel Ross will explain that size really does matter and of course Peter Druery with the latest discoveries in Astronomy.

Our last meeting for 2001 will be in November and our Special Guest speaker will be Dr Russell Cannon. Russell recently wrote to me about his exciting work studying Spiral Galaxies with another Fibre Fed instrument on the Anglo Australian Telescope. Instead of having individual movable fibres like the 2df instrumentation this one has a fixed closed pack of 512 fibres.

With conventional equipment astronomers who want to study a galaxy in detail need to take many separate spectra for different points in that galaxy. For example, to build up a picture as to how that galaxy is rotating.

The new Spiral instrument can take simultaneous spectra for an entire galaxy. This is producing spectacular results and again puts Australian professional astronomers like Dr Cannon at the forefront of Astronomical research .

I thank Dr Cannon for his permission in allowing me to convey the contents of his letter to our society. His talk will be a great way to end the year.

Well that's all I can say right know and I look forward to catching up with many of you at tonight's meeting .

Noel Sharpe (MAS President)

Virtual Particles

Up until the 1970s, everyone thought that once Black holes formed they last would last for eternity. But then Stephen Hawking discovered Black Hole evaporation. These evaporations are caused by so called Virtual Particles.

These virtual particles exist only a very short period of time and participate in the interaction or collision between two or more particles. Virtual particles become real in very strong electric or gravitational fields when the energy used up by the field to accelerate them during their brief existence is equal to the mass of the particles. When one of these real particles escape from the black hole, the gravitational field of the black hole, thus the black hole itself has lost energy. With large number of particles escaping, the black hole will eventually evaporate.

Smaller black holes run hot and use up more energy, there fore the evaporation process is much quicker - under one billion years. Those with a mass of a large mountain should evaporate within 14 billion years. Black holes with a solar mass will last for 10^{57} billion years while ones at galactic centres will take billions of years longer.

Attila Kaldy ■

Astronomy at Home

10/8/01 – On my computer I had the web site www.physicsweb.orgm and the HST site and learned that the galaxy M84 in Virgo has a super massive black hole with a jet nearly as fast as the speed of light. The picture from Hubble is amazing. I wonder if there is anything in the universe which is faster than the speed of light?
19/8/01 – On other websites I received some news about Ursa Major – the Big Dipper, which is my favourite constellation now because I saw it in the north when we were travelling overseas in Germany. Another reason is that astronomers found a second planet around a star similar to our Sun. The planet is ¾ the size of Jupiter. The first planet they found was 2 ½ the size of Jupiter.
It is in 47 Ursa Majoris.

There is also a galaxy NGC3079 in Ursa Major in which the core is bursting and drives bubbles 3,000 l.y. wide and 3,500 l.y. above the galaxy's disc.

Ursula Braatz ■

What IC This Month
September 17 – October 14, 2001

Highlights:
Mercury & Spica get close while Mars is away to the galactic star fields. In the morning watch for a secret meeting of Venus with Regulus, and Saturn makes eyes at the Moon

Trivia Answer
What's the largest visible astronomical object in the southern sky? Not Jupiter, not the Orion Nebula, The Magellanic Clouds? No. It's The Galaxy Milky Way!! Many people forget that all those bright dots in the sky are actually part of one object, and you don't need anything but your eyes to enjoy it

Evening Sky Planets

Mercury rises this month in Virgo and between 18-20 Sept. will be within 2° of Spica. On the 19th it will be at its highest in the western sky and 7° away from a very thin crescent Moon. It is still visible early October before losing height each night on its way to inferior conjunction between the Earth and the Sun on 14th.
Mars rises in daylight in Sagittarius. After spending all night in the 'Teapot Lid' it sets about 2 am. On 24-25/9 it will hang around the ¼ Moon, and on 30/9 it will compete with Sigma Sagittarii in the handle of the Teapot. Early October Mars will move off towards Capricornus in the east, and set about 1 am. By the 15/10 it will look definitely egg-shaped through a telescope as the Sun illuminates only 86% of the disk
Earth is at Spring Equinox on 23/9, meaning sunlight and darkness are equal in length
Uranus & Neptune are both still in Capricorn and coming to the end of their retrograde journey to the east. Rising at 9 pm Uranus will be 3° from an almost Full Moon on 28/9 and Neptune 3° from the same moon the following night

Trivia Question
What would you be looking for if you deliberately put ice in your telescope to improve the view?

Morning Sky Planets
Saturn will rise in Taurus just after midnight. On the 27/9 it will be stationary in its orbit then move to the evening sky rising about 11 pm by 1/10. On 8/10 a waning Moon will be 1.5° from it before 1 am.
Jupiter will rise about 2 am above the twins Castor and Pollux in Gemini and will meet the same waning Moon on the 10/10
Venus will cross from Cancer into Leo before sunrise and will be ½° from Regulus on 21/9. It will slowly move to be lost in the glare of the Sun reappearing as the evening star next year

Favourite Star
Phil Kydd's favourite is the bottom star of the Cross.
α **Crux** is twin blue-white B class stars shining at 0.8 vmag. α Crux 1 and 2 orbit each other over 1500 years. α Crux 1 is really a close binary itself. That makes three. Phil likes it because it's in his favourite constellation and he can split 1 and 2 with his own telescope

Meteors
Late September brings the **Piscids.** Not much to say about them really, but if you are lucky 3 an hour may be seen north of Fomalhaut. The **Orionids** in October are fast, bright, and come about 20-30 an hour after midnight. Look north of the upraised arm of Orion near M35

Comets
Only one comet **Borrelly** this month but you will have to get up in the morning to see it. Fading gradually (9-10 mag) in Cancer and Leo

Constellation of the Month
Remember the Aviary in the sky? We're off to see some of the southern birds around the SCP.

Phoenix - The Fire Bird
In mythology the Phoenix was a bird of great beauty that lived for 500 years. It would build a nest of twigs and fragrant leaves which would catch fire by the rays of the noontime Sun (must have been gum leaves). The flames consumed the Phoenix, but a small worm would wriggle out of the ashes, bask in the sunlight and quickly evolve

into a brand new Phoenix. The legend was common throughout the ancient world and pictures have been found in ancient Egypt and on Roman coins.

Introduced to the western world by those intrepid navigators Pieter Keyser and Frederick Houtman in 1590. Bayer in 1603 was the first to put it on a map but the Chinese were the first to put a Fire Bird in the sky. Phoenix lies to the left of Grus between Achernar and Fomalhaut, both 1st mag. stars. Lots of faint galaxies, no Messiers, but interesting stars

The Arabs saw a boat in this area on the banks of Eridanus The River. **"The Boat"** can be traced by the stars α κ μ β ν η a curving line down and to the left of α.
α is a yellow giant shining at 2.4 mag. standing out from the nondescript other 4th mag. Stars. β is a double yellow, which can be split with 100mm. γ is an orange giant shining at mag. 3.4. ζ is a complex multi star. The main star is an eclipsing variable at mag.3-4 fluctuating every 1.5 days, and a companion star at 6.9, which is also a double.

Tucana - The Toucan

Another constellation invented by Keyser and Houtman in 1590 from their observations in Sumatra. Located immediately to the south (underneath) of Phoenix and Grus, the bird's beak is to the right, and in early maps it was drawn sitting on the Small Magellanic Cloud like an egg. Often overlooked as we zero in on the SMC there are some sights to be had here. α is an orange giant 120 ly away. β is a multi system, B1 and B2 are two identical bananas in blue-white pyjamas. B2 has a binary companion, which will take more than 200mm to split. Close by is a white star called B3. κ is also a multi system with a double able to be split by small scopes and another companion which is also a binary double, that can be split with 150 mm. λ is an easy double for small scopes located above the SMC.
The Small Magellanic Cloud, a sister galaxy to the Milky Way, is visible to the naked eye and yields many galaxies and swirling gas clouds to scopes of all sizes and binoculars. There is a belief that it is being torn apart by forces from the Milky Way and the LMC so get an eyeful now.

To the upper right of the SMC is the best visual Globular for small scopes. **47 Tuc.** an awe inspiring sight, is more centrally condensed and more able to be resolved than Omega Cent.. Originally thought to be a star, hence it's name, but now known to contain more than 500,000 stars. Always reminds me of a certain Friar in Robin Hood.

On the top edge of the SMC you will find NGC362 a bright GC visible in binoculars at 7.0 mag. NGC362 is really not in the SMC at all but part of our own Milky Way

Grus – The Crane

Introduced by Keyser and Houtman in 1590 it was named after the long necked crane, a bird that was a symbol for astronomers in ancient Egypt. It has been called 'flamingo', 'stork' and even 'the fishing rod', the Arabs made it part of their 'Southern Fish'. It looks like a crooked cross when at culmination but takes a dramatic header to the western horizon later. Faint galaxies are visible to 200mm and over. The naked eye doubles are strikingly attractive. Many of the faint ones, discovered by Dunlop, are good for small telescopes because of their brightness and wide separation.

α is a large blue star about 70 times more luminous than our Sun 57 ly away called Alnair. It appears brightest because it is closest to us.
β is much larger, a red giant 800 times brighter than the Sun 140 ly distant, therefore fainter than Alnair. γ is a blue giant bigger than the others but 230 ly away. The obvious doubles visible in the long

neck of Grus are δ, a pairing of two unrelated stars, one red, and the other yellow, and μ, two yellow giants appearing in the same line of sight but unrelated.
Sights for medium telescopes include **NGC7213,** a small galaxy that looks like a distant globular in the same field of view as Alnair. The glare of Alnair makes it difficult but careful looking and high magnification will reward you.

Two degrees south of the head of the Crane (Gamma Gru) is the faint (mag. 11) planetary nebula **IC5148** discovered by a Sydney amateur astronomer in 1894. Larger mirrors than 200mm reveal a thick ring but the central star only shows on photographs.

Now here's a challenge! See if you can find (NGC7582/ 90/ 99/ 52). **The Grus Quartet** four small spiral galaxies approx. 2° away at 10 o'clock from Theta Gruis and shining mag.10. Theta Gruis is at the end of the left wing of the crane and 2° north.
Enjoy the shapes and colours of these Birds in the Aviary.

Good Seeing IC

Sky & Telsecope

I'm asking members to help me help them. Via paths too bizarre to explain, I find myself in correspondence with the Marketing Manager of the American Magazine 'Sky & Telescope.' He has asked me to provide him with feedback on the magazine's content as seen by amateurs in the southern hemisphere. i.e. What would we like to see in the magazine, from a southern perspective, that it doesn't already include? If they were to appoint a 'southern editor', what kind of articles should he be providing? If you have any ideas on this, please let me know. I want to write back to him no later than October.

Bob Bee ■

SECTION LEADERS

The following are the coordinators of these special interests in particular fields

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Borrowing MacDob

The Society's own telescope, a 6" Dobsonian, is available for loan to financial members. It is easy to transport, set up and use. If you would like to borrow MacDob for a month, speak to Bob Bee (at Meetings or on 46251623) who is its custodian. Though there is no hiring fee, members are invited to make a donation of their choice which will go towards the upkeep and upgrade of MacDob

Stargazer Widows

How do we feel when our men abandon us, for a dark, mysterious, sometimes distant, mistress called the Night Sky? Some words that immediately spring to mind are Lonely, Sad, Abandoned, Deserted, 'left for another woman' and I'm sure you may be able to think of many more to describe the way you may feel.

I can only speak for myself, and perhaps offer a different way of thinking when it comes to the Mistress that holds our men's attention so well and so long. This 'Night Sky' as she is named, seems to effortlessly gain and maintain our men's attention in a way that we may feel unable to combat. Perhaps we are just a little insecure when it comes to knowing how our

men feel about our place in their universe?
We must first look at our men. We need also to look closely at the other men that they consider to be Good Friends and Colleagues; the people they sit around the Telescope with and present their Secret Men's Business to. The same Friends don't judge them for thinking a certain way. They appreciate that they are different from most other men. They love Science. This alone in Aussie culture is almost unheard of. These are the type of men that are perfect roll models for our sons, and our daughters.

I may be different from many of you because I do have an interest in what they do and hope to join in the fun once my children are old enough to look after themselves. I must point out though, that the astronomer that leaves my front door, deflated by our busy, complicated lives, comes home a little tired, but almost elevated to a new plane. He comes home able to be better at being a husband and a dad, even if they have been attacked by 'FOGGO the THICK', and "WE COME IN PEACE" - Space Aliens.

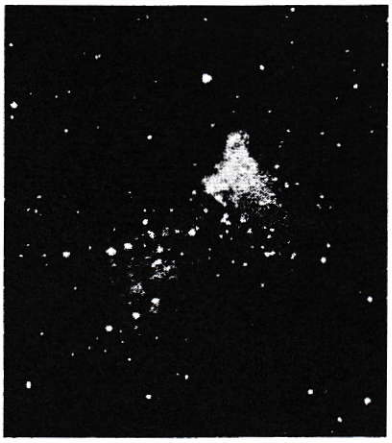
I understand that the pressures of life can weigh on all of us heavily. If you have no interest at all in what he does, how can we then expect them to be excited by our latest Cross Stitch or what ever takes your fancy at this moment in time. Yes, they can sometimes get so enthused by "what is out there" that they may be blind to what is happening under their noses. I know that for the most part, a gentle reminder and a genuine interest in what they do, goes a long way toward them being attentive and interested in what we do.

Jenny Rombi. ■

Vulpecula – The Fox

Vulpecula (the Fox) is not easy to see in itself as its stars are so faint (mag. 4.4 +) but it contains some interesting objects. It's one of those constellations not shown on an average star wheel, so a book or Star Chart is handy. You'll find it between Cygnus and Sagitta (also not on my Star Wheel.) Sagitta is relatively easy to find as it lies beneath (i.e north of) Aquila, featuring that trio of stars with Altair at the centre. Sagitta looks like an arrow, or dart and it points generally from west to east.

So what's in Vulpecula? Two things of interest to amateurs. Firstly, **M27**, a very nice planetary nebula called **The Dumbbell Nebula**.



This is actually visible in binoculars, but appears fairly small. It is best viewed in a scope with magnification around 50x or 100x. I was fortunate enough to find it in my 9.25" and it was great – it actually looked like a dumbbell. (I suspect the more light you collect with long exposure, the less it looks like a dumbell and more like a planetary nebula. (Feel free to disagree.)
M27 is conveniently located exactly 3° due north of the star γ Sagittae, the point of the Arrow. An easy way to find it is to mentally rotate the arrow anti-clockwise around its point for 120°. Where the centre star of Sagitta would end up, that's where you'll find M27. For your info, M27 is a mere 1,000 l.y. away.

Another brilliant (but faint) object to observe is one of those optical peculiarities in the sky. (Much like the Face on Mars, you can see anything up there if you look long enough.) I am referring to Collinder 399, Brocchi's Cluster or, more popularly, the **Coathanger**. When I first saw this, I thought someone was having me on and checked for something stuck over my binocular lens.

The Coathanger is certainly best enjoyed in binoculars or, at most, a very low magnification telescope. To find it, again locate Sagitta (the Arrow). Imagine a line from the arrow's tip running west about 30° below the arrow's length. Less than 2

arrow lengths along this line you will see the unmistakable shape of the Coathanger.

(Photo by Jerry Lodriguss)

Six stars in a dead straight line with a perfect hook sticking up from the centre of the six. It's uncanny.

It's called an 'asterism', which the dictionary defines as 'a group of stars.' But it's not a genuine cluster. ■

Pluto Dogged by Luck

I came across a piece of astronomical trivia the other day that tickled my funny bone and also reinforced my belief in one of the greatest forces in the universe – Serendipity.

I have always been fascinated by the mathematical brilliance of the astronomers who could, without computers, crunch zillions of numbers and predict the location of a yet undiscovered planet from the irregular movement (perturbation) of another observable planet.

So it was that Adams and Le Verrier calculated and found the position of Neptune in 1846 based on the observed perturbation of Uranus. And, so it was that the American Percival Lowell and his astronomer assistants, after endless calculations based on Uranus's other unanalysed perturbations, predicted two possible positions for yet another planet beyond Neptune – Planet X.

Ultimately in 1930, Clyde Tombaugh who was continuing Lowell's work, discovered Pluto on photographic plates very close to the second predicted position after the first came up planetless. This was brilliant history making stuff. All that mathematical effort had paid off.

But now we know what really happened. Latest calculations of Pluto's mass confirm that it could have had no meaningful effect on the orbit of Uranus. Not one bit. Those were Pluto-less perturbations. It was all a happy accident – serendipity – that a large Kuiper belt object, Pluto, just happened to be passing near the predicted spot at the time Tombaugh was looking. A year earlier or later and – no 9th planet. Like the overnight success actor or singer, Pluto happened to be in the right place at the right time. Serendipity – don't you love it?

Bob Bee ■

Strangers in the Night

Many things in my life have changed recently and I find myself having many different perspectives. eg last months committee meeting was cancelled at my request and a change of circumstances prevented my attendance at the general meeting. Even the last Public Observing night was in doubt.

However Mr Sandman weaved his magic spell and the kids were off to a golden slumber at 8.15pm precisely. The car was prepacked as it always pays to be prepared and I made my way to the Observatory unannounced and definitely not expected. What greeted me was a rather surreal experience, very remindful of that great old movie staring James Stewart called "It's a Wonderful Life." I was able to operate under a stealth mode mingling with the general public and even lining up to observe through the telescopes. I could even witness conversations without detection.

This was all a tad bit disconcerting as giving my six years of input and my profile as President. In one instant it was like I never existed. What were these people doing with the strange instruments? Why so many people and what were they thinking?

For a while I was on the outside looking in until my cover was blown by a MAS member called Ned. In the

night time it's hard to recognise people as you would agree but even in strong Moonlighting I was able to operate covertly utilising my alias of Robert Stack and the Undetectables!

Noel Sharpe ■

Music to Astronomise By

I think this is one of those things that Jenny Rombi was alluding to when she mentioned "secret mens' (astronomy) business." I am busy finishing the editing of this issue (and as you may guess, filling a gap.) I am home alone and therefore able to indulge. I have a CD going at approx 80dB, playing a compilation of the great sci-fi classical and movie themes. At this very moment, it is the movie credits for the second Star Trek – Next Generation movie. Great stuff! There is nothing like stirring music from a subject close to your heart to inspire. I confess to singing along with much of it, especially the Star Trek – Voyager theme. Other people probably wouldn't understand why loud renditions of Star Trek (its many versions), Stargate, Star Wars, Holtz's Planets, 2001 Space Odyssey, etc stirs a some men's blood. Probably for the same reason that we wouldn't understand their passion for whatever turns them on.

I suspect the same passion is what makes us go out in the dark and cold to gaze at those faint blobs of light.

We look forward to you joining us in the future Jenny, but first, could I recommend you getting a copy of a certain CD and learning to like it?

More About That Night

The August Public observing night was a restrained success, evidence of what happens when you don't advertise – the people still come, but in more manageable numbers.

Unfortunately, I can only comment from the perspective of one person manning his telescope down the far end of the slab. I have absolutely no idea of what was happening down at the 16" dome end and everywhere in between.

Not true... I suppose I got some idea when a group of people arrived at my scope, asked what I was aimed at (Omega Centauri or Jewel Box etc) and said "Oh, we just saw that in the dome."

Even though we played cat and mouse with the clouds at one stage, the public were very patient, good humoured and understanding. Compared to the past public nights, I think we had a good sky.

Some of the highlights for me that night were:

- Showing people the craters on the Moon. We often snub the Moon in favour of our faint fuzzies, but without exception the public were 'blown away' by the craters on the terminator, especially on high mag when I showed craters within craters. (Thanks to Phil Kidd for a loan of his moon filter.)
- Showing Uranus to a group. There were a lot of jibes about the pronunciation, but after we got past that, they were fascinated that the (very) small blue-green disc was a planet 2.5 billion km away. I showed them how to find it in my binoculars and some couldn't wait to get home and show the kids.
- A mixed group of about eight HSC aged students from Mt Carmel High. They were delightful young people, full of humour and energy, but also very courteous. They said they have a compulsory Astronomy unit in their Science subject, and I found my brain being picked from all directions. (I hope I gave them the right answers.) The thing I liked about these kids was that they seemed to enjoy my style of humour, so we all had a great time joking about things astronomical, ET etc. (I **said** they were courteous - they probably just humoured the old guy.) One particular issue we discussed was peripheral vision. I explained what I meant with a demonstration of looking at the girl in the centre but pointing to the boy at the end of the row. Then I showed them M57, the Ring Nebula. When they all said "yeah, it works," I knew I had a winner. ■