MACARTHUR ASTRONOMICAL SOCIETY Inc.



Journal

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President's Report

Hi everyone and welcome. It's been very pleasing that we have had such a strong influx of new members to our society recently, which is just fantastic.



This was a very enjoyable night and Paul proved himself to be a very accomplished speaker. He touched upon the fact that our eyes are not the best receptors of information; our eyesight only operates in a narrow frequency bandwidth and combines just three colors, namely red, green and blue to give us colour vision.



However our hearing is much more adaptive to frequencies and we can decipher multiply inputs of information. Paul played us simulations of what some of our favourite deep sky objects might sound like.

It was great that our members were able to make the night such a success by asking some excellent questions. This was commented on by Paul and I know he got great pleasure in delivering the lecture, so much so he offered to pay us a return visit. Well done to all!

Tonight

Recently we were contacted by our planned speaker for tonight, namely Tim Bedding from the University of NSW with a request to speak next month instead of tonight. Our planned speaker for next month has kindly agreed to speak to us tonight! So it gives me great pleasure to introduce to you George Descala. George will speak to us about how amateur astronomers can make contributions to the professional field.

George is a junior science and senior physics teacher at Pairiewood High School. He also runs the Double Helix science club at the school. He runs school viewing nights and takes the senior physics students on excursions to dark sky sights. George is a member of the Southerland Astronomical Society.

He has been undertaking research into variable and eclipsing binaries and has obtained some funding from the QLD Astronomical Society to write a publication. He does his observations from his back yard observatory using a 12" Meade telescope.

We thank George for taking the time to visit us, should be a great evening.

The Dates

21/10/06 The Forest 18/11/06 The Forest 20/11/06 Monthly Meeting 25/11/06 Stargard Field 08/12/06 Campbelltown Rotary Observatory Watch out for any Critical MAS emails as we may from time to time hold some off schedule field nights.

Space Cadets

We are putting the Cadets on hold for a while as the longer daylight hours does not lend itself for telescope viewings at around 6.30pm, which was a real highlight at the end of the meetings. Also I now find myself more pressed for time than I otherwise would have thought. We had a couple of great meetings and then some when the turnout was disappointing. My thanks for those members who contributed and it may be worthwhile to look at a similar idea for next year's activities for the society.

Stargard Field.

The field continues to prove itself to be a suitable observing venue for us and recently many members enjoyed some clear dark sky observing. Sometimes we see a little fog roll in but it seems to cause us no problem.

Things are progressing quite well with our plans for the field and I can now report that John Rombi and I had a meeting with Pat Farmer. Pat is the Parliamentary Secretary to the Minister for Education, Science and Training and Spokesperson for Western Sydney. Also Pat is the sitting member for Macarthur.

As you know I have gone into quite some detail about these plans in previous issues of Prime Focus so please refer to those issues if needed.

The meeting went very well indeed and Pat is most happy to endorse our funding

application for the 30inch "Stargard Field Telescope". In fact Pat thinks it's a great idea. This being said John and I are very busy with an application to complete and supporting letters to be obtained from some local high schools which will strengthen our application.

The grant if successful will have a strong basis on its educational and outreach value. This was a suggestion made by Pat. i.e. to obtain supporting letters. Obviously we need to align ourselves in that regard in order to have a chance to be successful.

Certainly we have proved to be a very community minded organization and have held many successful school star parties, so focusing in on student observations and research sits well within our existing objectives.

There is much work to do so we better get on with it, but whilst I am very happy that our application is being supported it still relies on meeting certain departmental criteria, and this may be out of Pat's hands. So I cannot state clearly enough that we have no guarantees, however there is room for some cautious optimism.

Other Things!

At time of writing we hoping that our "Macastro" star night at the sports ground will be just as good as the one held on Sept the 2nd. We have had some good advertising for the night so I hope the weather is clear and all goes well.

If you get a chance take a look at the Queensland Astrofest site on the internet, several large aperture scopes are represented on the field and a couple by Peter Read from SDM scopes. Peter is assisting us with the possible purchase of the Stargard Field Telescope.

On a matter not exactly but somewhat related to astronomy, next weekend is the Richmond Air show, out at the RAAF base at of course Richmond. I love air shows, but only when they involve very fast jets of which several will be flying. I keep thinking about the movie "The Right Stuff". It's the story about NASA'S Mercury program which centers on the training of future astronauts. Sadly many did not make it. The story features the attempts to break the sound barrier; this was eventually achieved by a test pilot, namely one "Chuck Yeager".

Chuck Yeager is arguably the world's most influential test pilot who has played a crucial role in development and training of astronauts. He is accredited with also achieving Mach 2, twice the speed of sound, I think in the early fifties. I won't go on to much about it but if you are not familiar with his achievements then there is a ton of info on the internet.

I think Chuck never made it into space which is quite ironic, but behind the scenes his contribution was invaluable.

So why am I fascinated by all this? Well I am drawn to things that involve speed and distance. Knowing that Alpha Centauri is about 39 trillion kilometers away gives me a perspective when I see it in the sky, whilst on this mortal coil, we call Earth we are orbiting our Sun at a velocity of just under 30 kilometers per second.

We cannot build spacecraft to break the light barrier, but we can build jets and shuttles that

break the sound barrier. Space and how to get there is a very big subject. A few years back we were with some friends walking along Darling Harbour. It was night and all of a sudden a tremendous noise threatened to blow apart every window in the city, a great ball of flame was seen streaking high in the sky menacing the harbour. It's a UFO, it's the end of the world!

My friends all turned to me for an explanation, obviously I am such an expert on this end world stuff! With a great deal of confidence I explained that it was simple a RAAF F-111 fighter jet completing a dump and burn maneuver

I have seen this before and also I read in the paper detailing that the RAAF were doing a display over Sydney that night. Still armed with all that my friends to this day still believed they saw a UFO.

A lot of physics go into terrestrial and space flight. At one such air show a fighter jet was coming in very very fast, so fast I noticed that the roar of the engines was behind what I saw, i.e. the sound was traveling behind the iet. It was an experience I will never forget, lets hope they keep the speed up next weekend.

Well that's about all for now, I will keep you posted on any developments with the Stargard Field Telescope as they come to hand

Kind Regards Noel Sharpe

US duo win Nobel for work on Big Bang theory

US scientists John C. Mather and George F. Smoot won the 2006 Nobel Physics Prize for their work on the Big Bang theory on the origin of the universe. The pair were honoured for their discovery of the black body form and anisotropy of the cosmic microwave background radiation.

Under the Big Bang theory, the cosmos was formed from a cataclysmic explosion that happened about 13.7 billion years ago. The timescale and geometry are measurable by shockwayes called cosmic microwaye background (CMB) that continues to wash over us.

Mather, 60, is a senior astrophysicist at NASA's Goddard Space Flight Centre in Maryland, while Smoot, 61, is a professor of physics at the University of California at Berkeley. Mather and Smoot worked on the COBE satellite launched by NASA in 1989, whose results provided increased support for the Big Bang scenario, as this is the only scenario that predicts the kind of cosmic microwave background radiation measured by COBE. These measurements also marked the inception of cosmology as a precise science.

Mather coordinated the entire process and had responsibility for the experiment that revealed the black body form of the microwave background radiation measured by COBE. Smoot meanwhile had the main responsibility for measuring the small variations in the temperature of the radiation.

[This is an interesting observation on how Nobel Prizes are awarded. The pair have been recognised NOW for something they achieved 17 years ago. This seems to be a fairly common experience. The sad thing is they get the money in their senier years rather than when they were younger and probably could have used it.

As another observation, I read the book by Smoot et al on this very experiment. I believe it was titled 'Wrinkles (or ripples?) in Space'. It's in Campbelltown Library and well worth a read. Ed.]

PORTRAITS IN THE SKY

High overhead this month is

Cetus – The Sea Monster.

Drawings of 400 years ago show the monster to look something like a sea elephant basking beside the river (Eridanus), minding his own business and not looking fierce at all. This much misunderstood creature is also likened to the Whale from the Biblical story of Jonah.

The constellation is large but faint, located between Aquarius and Taurus in an area that has few stars brighter than 2nd or 3rd mag. Best viewed looking north the head of the monster is towards Taurus.



 α called **Menkar** (nose) is a bright orange star at mag. 2.8. The brightest star is β called **Diphda** (the tail) a yellow star at mag.2.2 over 40° from Menkar. Diphda is also a good starting point if you are hunting for NGC 253, 288 and 55 in Sculptor.

 γ Kaffaljidhma meaning 'short hand' (maybe flipper?) mag.3.6, is a double star yellow and blue.

o Omicron Ceti called Mira (the Wonderful Star) is a large long period variable changing in magnitude between 9 - 3 over 331 days. Mira is so large its diameter is the same as the Earth's orbit around the Sun. ζ called **Baten Kaitos** (the belly star) is an orange yellow star 10° from Mira to the south.

Star hop from α through γ to the neck of the beast where you will find δ a mag. 4 star 6° from Mira to the north. This is the jump off point for M77 just 1 deg. to the right.

M77 is a magnificent spiral with broad distinct arms and is one of the biggest galaxies in Messier's list. It's about 60 million light years distant and unique and peculiar for several reasons.



It is classed as a Seyfert Type II galaxy with giant gas clouds moving away from the central core at hundreds of km/sec. To generate these speeds enormous energy is generated in a strong active nucleus filled with interstellar matter. Intense star forming activity is going on in the inner disk indicated by very bright ultra-violet imaging. This is the most luminous star forming region within a 100 mill. Iy arc around us. **Cetus A** is a radio source like a mini guasar, within the core.

NGC 1055 is an edge on spiral galaxy just 0.5° to the NNW at mag.10.



NGC1055

Turning to the south lets drop into the aviary of the sky and look at -

Tucana - The Toucan Bird.

This is another constellation invented by Keyser and Houtman in 1590 from their observations in Sumatra.



Located immediately to the south (beneath) 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 star that can 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 cluster for small scopes. **47 Tuc.** is an awe inspiring sight, 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.



47 Tucanae

On the top edge of the SMC you will find NGC362 another satisfyingly bright globular cluster visible in binoculars at 7.0 mag. Well defined and in a nice field of stars, it looks better in a telescope but NGC362 is really not in the SMC at all but part of our own Milky Way.

Grus - The Crane

This distinctive star shape was introduced by Keyser and Houtman the Dutch explorers 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' even 'the fishing rod' and 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 when setting. 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.



NGC7213

3

2° south of the head of the Crane (Gamma Gru) is the faint planetary nebula **IC5148** (mag. 11) discovered by a Sydney amateur astronomer in 1894. Larger mirrors than 200mm reveal a thick ring but the central star only shows on photographs.



Grus Quartet

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.

Good Seeing IC

[This article is a reprint of two What IC articles written by Ian Cook for the 2004 August and October issues of prime Focus.]

Mars Up Close

An news article this week tells how the MRO (Mars Reconnaissance Orbiter) which reached Martian orbit last week has provided unprecedented close-ups of a Martian crater that could open up new knowledge of the red planet.

Crater Victoria was the biggest crater that NASA would probably get to and it gives NASA a window on the distant past of the planet. The images taken by MRO show that the crater, about 800 metres in diameter, has scalloped edges of cliff-like promontories that appear to record a longer span of Mars' history than the rover has studied in other craters.

The cliffs are up to several hundred metres high and there are boulders measuring up to 2.7 metres in diameter. This seems to excite the NASA scientists who are "running out of superlatives" to describe the "stunning" images of Mars.

The MRO is searching for evidence that water existed on Mars for a long enough period to provide a habitat for life.

RB.