

MACARTHUR ASTRONOMICAL SOCIETY Inc.

Journal



PRIME FOCUS

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President's Report

Previously at MAS

Dr Stuart Ryder from the Anglo-Australian Observatory was our special guest at last month's meeting. It was great to hear all about the research that Stuart has been doing. Imagine sending off a request to have the orbiting Chandra space telescope take a peek at the super nova that Bob Evans recently discovered.

Imagine going straight to the top of the observing list and having the request granted, and imagine gaining research time at the giant Gemini telescope. Imagine being at the forefront of research in proving exactly what causes gamma ray bursts.

Well imagine no longer, Dr Stuart Ryder has turned all of the above into reality. He must be very well connected and obviously has a tad bit of clout! It was a great night and

Stuart has agreed to come back next year. Fantastic!

At time of writing this report I am due to head off to a much anticipated observing night at The Oaks. I just got off the phone from Michael West of the Mars Society and can confirm his attendance at tonight's meeting. Last time Michael spoke to us it was about the possibilities of future missions to Mars. This time he will leave his "Mars Skin" at home and speak to us on rocket propulsion. It's stating the obvious that we need better systems in place in order to journey further, faster and safer. I am sure everyone will make Michael feel welcomed tonight.

It was good to see Dr Ragbir Bhathal at our meeting last month. He was keen to hear Stuart's talk and it was a great to catch up with him afterwards. I am sure many of you will grab the chance to catch up with Ragbir on our up coming observatory program.

The List of Dates

23/10/04	Public Night Dudley Chesham Sportsground
06/11/04	The Oaks
08/11/04	Special Combined Rotary Star Night, Campbelltown Observatory
13/11/04	The Forest
15/11/04	Monthly Meeting
19/11/04	Campbelltown Rotary Observatory Public Night
04/12/04	The Oaks
11/12/04	The Forest

Things can change quickly when your on the hop, so please call to confirm before heading off. Either call John Rombi, or myself on 0410 445 041.

An Update on Things!

You may have noticed that we are getting involved again with the nights for the Campbelltown Rotary Observatory. It would be very appreciated and welcomed by all parties involved to have MAS well represented for these nights. Just to put everyone in the loop I have been involved in numerous discussions for some time now over the use of the observatory. Between the Rotary Club, the University and our Society we have come up with a short program as listed in the dates above.

We are monitoring the turnout of the public by taking bookings, along the same lines of the Nepean Observatory. I have spoken to the booking officer at the University and this seems a sensible idea. We are attempting to effectively manage the crowds in order to fall

into line with the various regulatory authorities.

I will have more of a chance to see which way we are headed next year when I speak to various members of the Rotary Club at the special star night on Monday 8th November. This night will involve several local Rotary Clubs and overseas tourists. It's a Monday as that's when Campbelltown Rotary holds their meetings at the Catholic Club. From there they will make their way up to the dome.

I continue to receive some very positive feedback about how our society conducts itself within the local community. This includes all of our activities as well as our relationship with the university. This is always great to hear, so let's get cracking and have as many members involved as possible.

Thanks Heaps

Noel Sharpe

President

Quark

For those of us who enjoy a bit of cosmology and quantum physics, the following may be interesting – but from a slightly different approach to usual.

Kel Richards (the Australian wordsmith) writes:

"I like the definition of quark in the Longman Dictionary of Contemporary English: "a very small part of something, which is smaller than an atom". That much I understand. Then I turned to the World Book Encyclopaedia for more information. It told me that a quark is a particle that physicists believe to be the basic

sub-unit of neutrons and protons. Every neutron and proton consists of three quarks. Quarks do not seem to exist singly, but always in combination with other quarks. They are bound together by a force transmitted by particles called gluons. Each quark carries an electric charge that is either one-third or two-thirds the charge of an electron.

I lost the plot of that explanation some little way back. But the story behind the word quark is an interesting one. It seems that the quark theory was first proposed in 1963 by two American physicists, one of whom, Murray Gell-Mann came up with the name. He says that he noticed the word quark in the James Joyce's novel *Finnegan's Wake*. The line in which it appears is: "Three quarks for Muster Mark." And for the scientific reasons referred to (which I don't understand) Murray Gell-Mann thought that the allusion to three quarks seemed perfect – so this new small something was called a quark.

There is another meaning for the word quark – it is a low-fat soft cheese of German origin. (Possibly that's where James Joyce found the word quark to use in *Finnegan's Wake*.) So used, quark comes from the German word for curds (as in curd or cottage cheese)."

So... to summarise it all, the universe originally came from a cow?

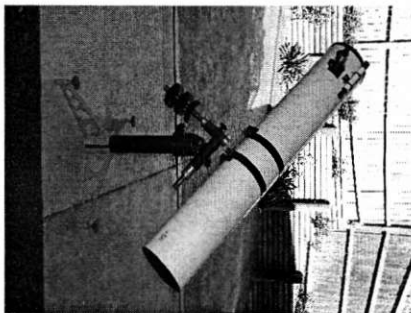
FOR SALE

8inch (200mm) Newtonian Telescope
1250mm @f11

Cost = \$600

(Ian Palmer, Ph 43210293 – Gosford.)

Fitted to "Sampson" equatorial mount
 Adjustable tripod base
 Counter weights - cast iron
 Centre shaft – steel
 Tripod legs – cast aluminium
 6x30 Finder Scope
 Unitron 25mm lens; Unitron 9mm lens



(Sorry about the side view – best I could do.)

New Theory Vies with Big Bang

From the website astronomer.com I got a report from the newspaper Chicago Sun Time, which told of a new theory of the Big Bang. Two researchers of the University of Chicago think that the Big Bang may have been smaller than we suspect and the universe already existed when the Big Bang happened. That means that our 14 billion year old universe came out of a universe much older than that.

The two researchers are Sean Carroll, assistant professor in the university's Physics department and Jennifer Chen, a Chicago graduate student in physics. They believe that the Big Bang was more like a little bang and more local.

Their conclusion is that if we go back far enough, we will find a universe in which time is running in the opposite direction of ours. We will never meet up with these people in the opposite running universe. Sean Carroll said: "Our universe is in the process of emptying out, cooling down and becoming quieter, so if we wait long enough, another universe will come into being inside ours. But don't hold your breath. It will take a fantastically, unimaginably long time in the future."

I am not a professor and do not understand much about physics, but I am thinking a lot about the universe. I did hear before that there are stars nearly older than our 14 billion year old universe and scientists are wondering about it. So I think the old stars must have been from a thinning universe before and our big (or little) bang made the space full again.

I never could imagine that there was completely nothing before the Big Bang, there was always something there, the universe or universes go always in circles. But how will a human being ever find out how it really goes, whether he is a professor of physics or a simple person?

Ursula Braatz

[I'd really like to thank Ursula for submitting this article. It's great that members spend time thinking about the bigger issues of the universe, even if they (like myself) don't fully understand them. It's easy to poo-poo ideas like the one Ursula reports, but I've learned the hard way that stranger things have been found to be true. Take the acceleration of the expanding universe and 'dark energy'. Who would have given that any serious thought ten years ago?

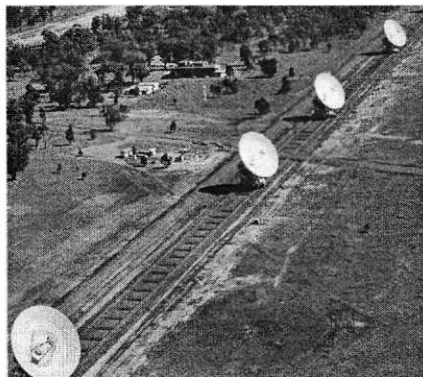
Keep them coming, please, Ursula. Ed.]

An Astronomical Trip to Queensland (or 3...2..1.. Braatz Off!)

We started our trip with our friends on the 13th July 2004. The next day we were in Narrabri to see the Australia Telescope. I was amazed to see the five radio antennae on tracks. The sixth is a bit further away so I did not see it. We went to a display room to look at all the pictures and posters.

Then we saw a video about the history of the Australia Telescope. Parkes 64 metre dish was the first to be built in 1961 and now it is connected with the one near Coonabarabran (in Mopra) and the six in Narrabri to simulate a telescope of 320km diameter. The telescope can be linked with other telescopes in Australia and telescopes overseas to

simulate the Very Large Telescope (VLT). We had learned this already, but is always amazing how you can work with computers to simulate one big telescope.



(The Australia Telescope, near Narrabri)

We traveled on. The next town was Moree where we had an artesian bath. After that came Condamine, Miles, Taroom, Rolleston, Emerald, Rubyvale. We saw the minefields and learned about digging for gemstones, first with shovels and sieves, then with big machines.

From inland, we went to the coast near the Whitsunday Islands and camped at Seaforth. I decided it was time to try my new Meade computerized telescope which was a surprise birthday present from my husband and two sons. We had practiced already in our backyard, so I knew how to handle it. It was on the 4th August, with a $\frac{3}{4}$ moon. But the trees in the caravan park are too high and I got other lights than Jupiter and the Moon in focus. So I wanted to practice in another place.

On the 9th August we arrived at Airlie beach in the Whitsundays and camped in the Sea

Breeze caravan park in Connonvale. We had a great time and made a cruise on the 11th from Shut Harbour to the Great Barrier Reef to Fantasea Reefworld, which is 39 km off the Whitsunday coast. People were snorkeling in the Moonpool but we preferred seeing the corals and fish from the submarine. On the Reefworld we saw the marine life in an underwater observatory. Airlie Beach is a nice town and there is a beautiful swimming pool which we enjoyed.

On 18th August I decided to try my telescope again. [They meade you do it? Ed.] The sickle moon and Jupiter were close together. This time it worked out well, first with the Moon in focus, then Jupiter. The next night I did not plug the lead of the computer in properly and after the computer refused to work I was worried. [First rule of electronics Ursula... if at first it won't work, check the connections. Ed.] The next day I tried it in daylight and it was fine. That night the computer worked perfectly and I had the moon in focus, then Jupiter with its four moons. I was very happy with that. I was able to identify the four moons in Astronomy the next day.

I packed up the telescope because we traveled further south: Clairview, Yeppoon and Noosa. The last stop was Bundjalong National Park and there I hoped to use my telescope again and make out more than Jupiter and the Moon. But the sky was cloudy And we had rain one day and sunshine the next. But I did not unpack my telescope.

On 3rd September we arrived home and now I have plenty of time to practice with my telescope in our backyard.

Ursula Braatz. ■

What I See This Month

October 18 – November 14, 2004

Overhead at 8.30 pm

Scorpius, Sagittarius in the west, Andromeda rising in the east, just about directly north there is Lyra, Aquila, Cygnus, Aquarius, Capricornus, and Pegasus galloping to catch up.

Turning to the south we have the Pointers and the Cross sinking in west, then the faint star area of Ara, Telescopium, Pavo, Indus, Fomalhaut, and the long neck of Grus before we see the Magellanic Clouds, large and small, underneath Eridanus, Phoenix and Horologium. Orion will rise later in the evening.

The Moon Diary

20/10 First Quarter Moon
28/10 Full Moon
05/11 Last Quarter
10/11 Occultation of Venus
by moon in daylight
12/11 New Moon

Evening Sky Planets

Mercury will rise in Libra in the sunset as we begin our month but it will climb higher in the western sky each night till near the end of November. Starting in Libra but moving to Scorpius and Ophiuchus during early November it will set about one hour after sunset.

Uranus and **Neptune** are both high in the sky most of the night. Neptune although very small in size at the moment can be found just 0.5° to the north of 19 Capricornus, and Uranus about 0.5° west of 57 Aquarius.

Morning Sky

Saturn will rise between 1.30 and 12 am in Gemini just ahead of Castor and Pollux. By the time of our next meeting it will be rising just before 11 pm moving to the east into Cancer for the new year. Last minute checks are well underway for the launch of the Huygens probe to Titan that will happen soon.

Next to rise is **Venus** at 3 am in Leo on a date to meet Jupiter near the end of October. The two will be just over 5° apart on the 30/10 before the Sun comes up. Early November will see them much closer together on the 5th before Venus moves on to a close pass with Mars on the 25th November.

On 10th November around midday you can see Venus pass behind the 27 day old Moon during daylight. 34° west of the Sun look for a slim crescent Moon. Once you can see it naked eye, put binoculars on it and look above and right of the sunlit side for the speck that is Venus. If you time it right you will see it disappear behind the sunny side and reappear one hour later out of the clear blue sky on the other side of the Moon.

Jupiter will rise at 4.30 closely followed by **Mars** in the dawn sky but the Sun is right on their tails. If you have to be up at sunrise look for them both in the brightening eastern sky. By mid November Jupiter will rise at 2.30 am and Mars at 3.35 both in Virgo.

Meteors

Maximum rate for the Orionids is the 21st October, but at 15-30 an hour they are worth watching for all through October. Some are smoky but all are fast so you have to be looking in the right direction, which will be northeast.

Comets

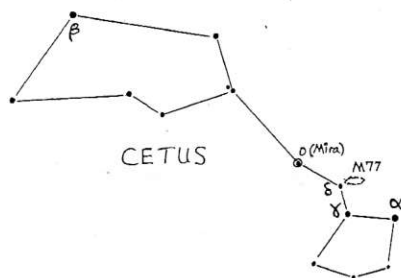
K4 Linear is on its way out from the Sun in the morning sky. Find Corvus and search around for something around 7-8th magnitude. It will move higher into Hydrus and Centaurus during November and rise around midnight, so be a little patient before it fades too much.

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

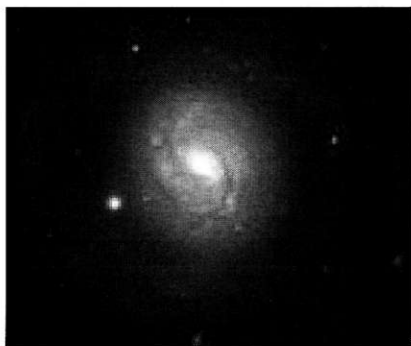
starting point if you are hunting for NGC 253, 288 and 55 in Sculptor.

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

\circ **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.

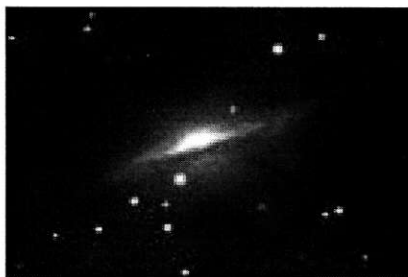


M77

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. ly arc around us. **Cetus A** is a radio source like a mini quasar, within the core.

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

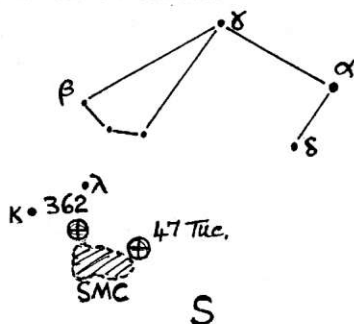


NGC1055

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.

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.

Good seeing

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