MACARTHUR ASTRONOMICAL SOCIETY Inc.

Journal

PRIME FOCUS

Volume 9 Issue 7 **July 2004**

President's Report

Not Really a Small Club!

I looked around at last months meeting and it seemed that we were playing in the big league, with well over 30 members and guests were present. It was by any measure a fantastic turn out. Best of all we welcomed several new members to the ranks. Due to organisational duties I was not able to get around to everyone and have a chat this time round. Please accept my apologies.

Dr John O'Byrne, senior lecturer from The School of Physics, Sydney University was our guest speaker last month and gave us many insights into the world of Adaptive Optics (AO). John is an accomplished speaker and researcher, in speaking to him we agreed how important it was in having professional astronomers outreaching to the amateur societies.

The talk given was of a highly specialised nature and downloaded some great information, like powerful lasers shooting up the night sky, bimorphing mirrors and isokinetic angles. The overwhelming refinement that AO gives can even allow ground based telescopes to image the surface of Jupiter's moon Io. Now that's impressive.

We were also brought up to date around NIFS, Near Infra Red Spectrograph, this is the ground breaking instrument that is destined for the giant Gemini North Telescope. This instrument unfortunately was reduced to a pile of molten glass and metal due to the destruction of the Mount Stromlo Observatory in the Canberra fires. Fortunately the instrument is now rebuilt and almost ready to be delivered. Go you Aussies!

A Round of Applause

Again let me pass on congratulations to everyone who helped out with the recent

Transit of Venus viewings. Mr Ian Cook held a neighbourhood party and made his telescope available for all to see. Bob Bee ducked out of a work conference and managed to share around his binoculars with his colleagues, most impressive. Quite a few members of MAS were at the local high school. Daniel Ross also held a transit viewing at the MacQuarie Boys Technology High School.

Last month's Prime Focus carries details of the above, however I wish to again officially acknowledge those fantastic efforts. Also I am aware that some of our other members carry the flag so to speak. Several names come immediately to mind, like John Koster who holds daytime talks to the Probus Club, Bruce Reardon held a lunar viewing night to his son's cub group

Philip Kidd who is a school teacher is engaging his students with some of the information given by last month's guest speaker John O'Byrne. Also Philip is planning to bring some of those students out to the Oaks for a viewing night with the club. Great work guys.

Recently when I was buying a sandwich for lunch, the lady serving me asked when our next star night was. That was a real surprise as I just know her to smile at when crossing the road, and buying the occasional lunch. Nearly every day at work I get to spend a little time talking about astronomy, it just seems to come up.

It's always in the news, it might be a meteor blowing up Bulli, or the latest from Mars or Saturn, people keep asking me questions believing I am some kind of expert! Maybe it's the spectacles and a slightly nerdish appearance that gives that illusion.

Important News

We have been approached by Mount Carmel High School to hold a special astronomy afternoon and viewing night on the 14th of August. This will be to support National Science week and will be a great opportunity to again outreach into the community and promote our society.

As we are at the Forest the week before for the university students night we now have taken the opportunity to re-arrange our schedule. Please pay close attention to the revised dates.

The Dates

19/07/04	Monthly Meeting
24/07/04	Sports Ground Public Night, The Oaks
07/08/04	Special Students Night, The Forest
14/08/04	Mount Carmel High School
16/08/04	Monthly Meeting
11/09/04	The Forest
18/09/04	The Oaks
09/10/04	The Oaks
16/10/04	The Forest
18/10/04	Monthly Meeting

As opportunities arise we may need to reschedule some dates, so please look out for these. Contact John Rombi or myself to confirm if we need to cancel at the last minute due to bad weather.
My mobile is 0410 445 041.

Over and Out

Well that's all from me. It seems like we are having a good year for our community involvement. Please join in and help support our society. On a completely different note I noticed that the last series of Star Trek Voyager has materialised (finally – Ed.) on Channel Nine, so check your sensor log for the right star date.

Beam Me Up

Noel Sharpe President ■

What exactly are pulsars?

Pulsars are stars that are exceptionally small and quite dense. 260 million pulsars could fit into one Earth, and 1.3 million Earths would fit into the Sun. Though a small fraction of the Earth's size, pulsars can have a gravitational field that is 1 billion times stronger than that of Earth. Astronomers believe that these pulsars, or neutron stars are the remnants of collapsing stars, or supernova. As a dying star loses energy it begins to collapse. As it collapses, all its matter is squashed together, becoming more and more dense. As more of the stars matter moves toward its centre, the star spins faster and faster in much the same way the figure skaters spin faster as they pull their arms inward. This is a consequence of the law of Conservation of Angular Momentum. This explains the incredibly rapid rotation of certain pulsars.
(This article was purchased from e.s.a. website) Lloyd.

What IC This Month
July 20 - August 16, 2004

The Moon Diary

25/7	First Quarter	01/8	Full Moon
08/8	Last Quarter	16/8	New Moon
23/8	First Quarter	30/8	Full Moon

Two full moons in August makes the second one a Blue Moon; according to the books anyhow. I seem to remember reading somewhere that a "blue moon" was a second **new** moon in the month which happened last year in May. There is no authority on the subject apparently so whatever strikes your fancy you may start a tradition.

Evening Sky Planets

Mercury rises in Cancer trailing the Sun; then will join Mars and Jupiter in Leo during August setting by 6.45 pm when next we meet. On 20/7 Mercury will be 5° south of a very thin crescent moon at 11 pm.

On the same night it will be midway between Mars on the horizon and Jupiter 30 mins after sunset. 25/7 will see it less than 2° from Regulus in Leo, and on the 27/7 it will be highest in the sky from the Sun before beginning its sweep back to disappear in the sunset.

Mars is in Cancer then Leo as it hovers on the western horizon before being swallowed in the Sun during August. It will re appear as a morning object in October but views will not be good till late December.

Jupiter remains in Leo, rising in the daylight and setting between 9 and 7.30pm this month. At 11pm on the 21/7 Jupiter will lie just 3° south of a first qtr moon. Visibly shrinking in size now as we orbit apart, the "chief of planets" and a thin crescent moon will be only 2° apart on Sunday the 18/8.

Neptune rises in Capricornus between 6.30 and 4 pm this month and will be visible all night as it approaches opposition on the 6/8. Neptunian life will have a treat this month as a double planet will transit the Sun for them. Namely us! The Earth and Moon will transit the face of the Sun just like Venus did for us. I hope someone is watching!

Uranus rises in Aquarius as it has done for the past year. Also visible all night approaching opposition.

Saturn is in conjunction with the Sun and will reappear in late August as a morning object near Castor and Pollux the Gemini twins.

Morning Sky

Venus rises in Taurus the Bull around 4 am shining at its brightest at the moment. It is moving eastward into the horns of the Bull and eventually into Orion and Gemini with Saturn. It will reach its highest point in the morning sky on 18/8 before slowly descending to meet the Sun once more.

Comets

With careful planning you may still find **T7** in Sextans this month. Only 9th magnitude, you will benefit from a map if you can find one. **2003/ K4** will be visible at 8th magnitude on 28/7 near NGC 5466 in Hercules. Good hunting!

Meteors

The **Perseid** shower is active between 17/7 and 24/8 with maximum on the 12/8. 100 per hour is not unusual but southern hemisphere not the best location. Better luck with the **delta Aquarids** from 15/7 to 25/8 max on the 8/8 at 4 per hour.

Portraits in The Sky

SAGITTARIUS – "The Archer"

Sagittarius has a muddled history from ancient times. The asterism of three bright stars in a curved line is commonly associated with a Bow; and different cultures have built up the surrounding stars to picture their own legends of an Archer with the bow.

Both Greek and Roman writers confused the constellation with Centaurus, the half man-half horse. It was the Romans who named the constellation Sagittarius ("sagitta" Latin for 'arrow'). Centaurs used bows and arrows and the link to the Archer was too good to resist so Sagittarius became half-man, half-beast with bow, and was placed in the heavens to guide the Argonauts in their travels.

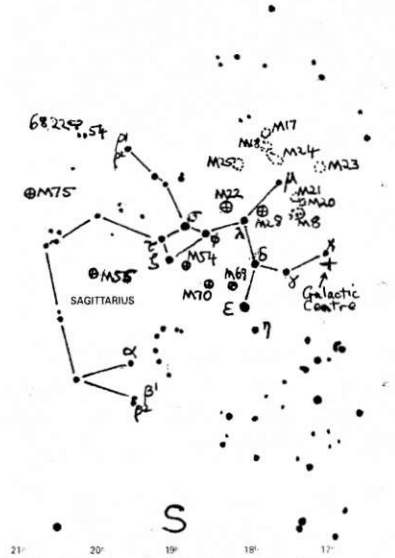
The Sumerians in Iraq, pictured the Archer as Nergal "Lord of the Great Abode", (the Underworld). Yet there are few details to provide a picture of this god. He is called "the

fighter without rival who brings victory", but he was also the god of plagues, and destruction. To consider Nergal as the prototype of Sagittarius seems to be "drawing a long bow", or stretching the evidence.

Things were not helped by the Indians who saw a horse and rider in this region, or the Arabians who saw Ostrich, Camels or Cows drinking from a river, and even an over turned chair. The Arabs named most of the bright stars and without exception they all refer to an archer with a bow. However one writer saw the beam over a well and the pulleys hanging down to draw water, which is not a bad analogy, when you look at the teapot from our southern angle!

For us Western peoples with Greek/ Roman traditions the one thing beyond dispute is that Sagittarius refers to an Archer with a Bow. When the select group of twelve Zodiacal constellations was codified sometime in the third millennium BC, The Archer was already one of them.
Several stars carry Arabic names that identify which portion of the constellation they represent. Alpha Sagittarii is named "Rukbat al Rami" – The Archer's knee. Beta Sgr is "Arkab" -Tendon.

Three stars outline the Bow:
Lambda Sgr: "Kaus Borealis" - the northern part of the bow.
Delta Sgr: "Kaus Meridionalis" - the middle of the bow.
Epsilon Sgr: "Kaus Australis" - the southern part of the bow.
Gamma Sgr the tip of the arrow is "Al Nasl" - the point.



While the shape of the bow is quite apparent, it takes some imagination to see the archer, whatever beast he is, pulling back on the string. Perhaps it helps to know that zeta Sagittarii is named "Ascella" (the armpit of the archer), while nu Sgr is "Ain al Rami" - The Eye of the Archer.
The Bayer stars are generally third and fourth magnitude. The brightest star is **Epsilon Sgr**, while **Alpha Sgr** is nearly 4th magnitude. In fact, there are fourteen stars brighter than alpha. The constellation has a number of fine binaries, and several superb deep sky objects.

Double Stars:

Nu^1 Sagittarii is a close fixed binary mag. 5.0, with a faint companion, 10.8; and a separation of 2.5". Note that nu^1 and nu^2 are not gravitationally bound, although they form an optical binary of some historical importance: these two stars caused Ptolemy to write about "a nebulous double star" long before Hershel coined the term "binary".

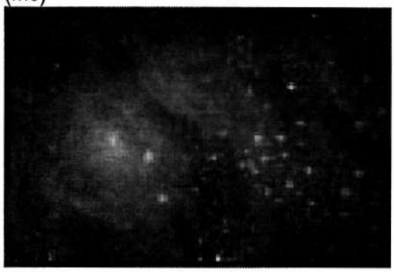
54 Sgr also catalogued by John Herschel as **h599** is a multiple system: AB: 5.4, 12; separation 38"; AC: 8.9; 45.6". The primary has a reddish tinge.

Rho^1 and rho^2 AB: 8.0, 8.3; 23.4", and AC: 8.6; 24", form a nice triangle with **h2866**.

Deep Sky Objects:

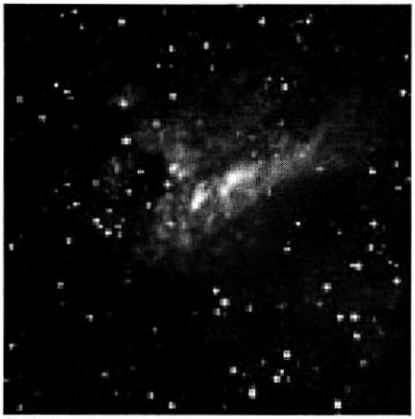
Sagittarius has fifteen Messier objects, far more than any other constellation, however of varying quality. Three are spectacular, and a number of others are bright and impressive.

M8 (NGC 6523) is a marvellous diffuse nebula known as the "Lagoon Nebula" 5° west of lambda Sgr and 1° north. A naked eye object from 3,500 to 5,100 light years away, with a dark band dividing the nebula in two. A wealth of detail can only be brought out with at least a medium sized scope.
(M8)



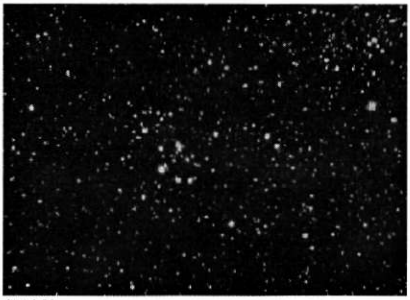
The open cluster **NGC 6530** is contained in the eastern part of the nebula. The young cluster (only several million years old) is nicely contrasted against the nebula.

M17 (NGC 6618), the "Swan Nebula" or the "Omega Nebula", and occasionally known as the "Horseshoe Nebula". This nebula resembles the tail of a comet with a bright diffuse trail of light with a bit of a hook on it. The Swan Nebula is 5° north of mu Sgr, and 1° east.



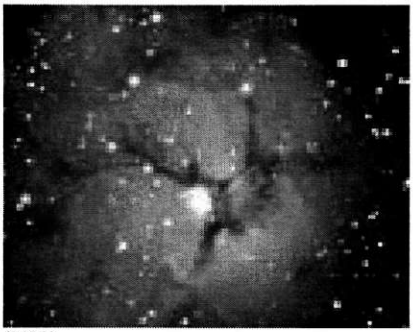
(M17)

M18 (NGC 6613) is an open cluster of about twenty stars found 1° south of M 17.

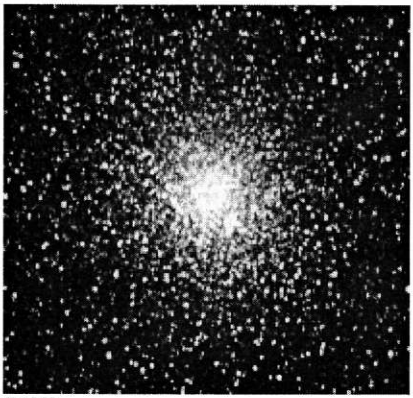


(M18)

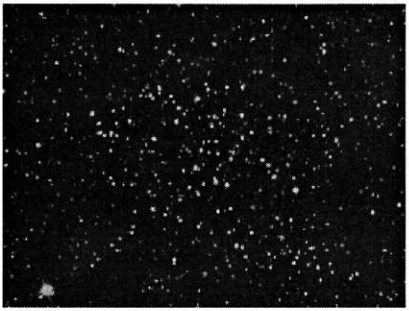
M20 (NGC 6514), the "Trifid Nebula", is another delight, but only with larger scopes, which will bring out the three dark lanes familiar on photographs. The Trifid Nebula is found 1.5° north of the Lagoon Nebula.
In the same field is **M21 (NGC 6531)** an open cluster of about fifty stars less than 1° NW of M20.


(M20)

M22 (NGC 6656) is one of the most notable northern hemisphere globular clusters. Lying 2° NE of lambda Sgr. it is a highly concentrated group of perhaps five hundred thousand stars in total, about 20,000 light years away.


(M22)

M23 (NGC 6494) is a pleasantly scattered open cluster of about 120 stars located four degrees northwest of mu Sgr and 1° north.


(M23)

M24 is a bright naked eye "star cloud", which contains the open cluster **NGC 6603**.

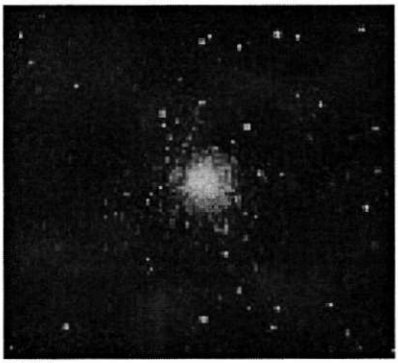
M25 is a bright open cluster but without much to hold interest.

M28 (NGC 6626) is a bright-condensed globular cluster 1° NW of lambda Sgr. Less spectacular than M 22 but a fine object none the less.

M55 (NGC 6809) is a large scattered globular cluster, which leaps out of the sky at you in binoculars. Located 7° east of zeta and tau Sgr. and 1° south, it is about 20,000 light years away.

I always think of the next three together because they are so similar. **M54 (NGC 6715)** is a globular cluster, difficult to resolve into individual stars. **M69 (NGC 6637)** much like 54, and **M70 (NGC 6637)** 2° east of M69. They are all small and strung along the base line of the teapot.

M75 (NGC 6637) although small, faint and difficult to find with binoculars, is easily found in a scope, using guide stars from Capricornus.



(M75)

NGC 6822, "Barnard's Galaxy". This irregular dwarf galaxy is about 1.7 million light years away, making it one of the closest of its kind. It's in the same region as 54 Sgr, 6° north-east of rho Sgr. Very faint; the larger the scope the better.

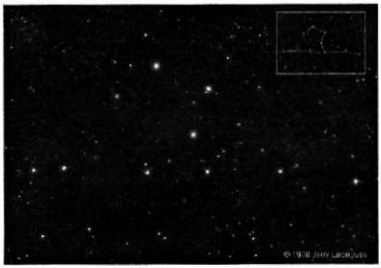
Since Sagittarius sits at the very heart of the Milky Way, there are many more deep sky objects to study than can be named here. Planetary nebulae abound, both bright and dark nebulae, and of course star clusters, especially globulars.

Good seeing IC

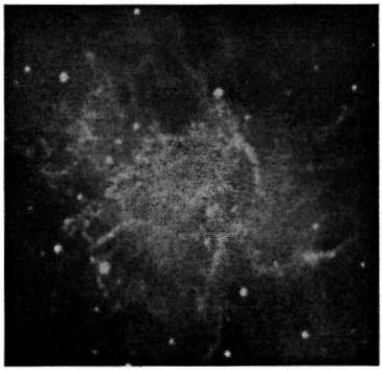
Recognition Quiz

No prizes, but test your astronomy recognition skills on the following images. Answers will be in next issue of Prime Focus.

(Q1)



(Q2)



(Q3)

Good Seeing RB