MACARTHUR ASTRONOMICAL SOCIETY Inc.

Journal

PRIME FOCUS

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President's Report

Hi to all. Last month's meeting, so I was told, was very successful, thanks to our speakers and chief organiser for the Society. As my time as President winds down, I am feeling a little sad but relieved at having to hand over the reigns to another person, but I am certain they will do a great job and bring fresh ideas into the club.

The weather is once again in 2000 our nemesis, with rain and cloud spoiling most of our star nights and the great viewing we have at Cobbitty.

Next month is our Annual General Meeting, so if anyone is interested in a position on the committee please let Noel or myself know so we can give you a nomination form so someone can nominate you for any position on the committee from President, Vice President, Secretary, Treasurer and other non designated positions on the committee.

Once again I urge members to come out and talk on any subject related to Astronomy, or find someone they know or can contact and can be a guest speaker.

Phil Ainsworth ■

A Steady Base For Your Binoculars

A problem with using binoculars for looking at stars and planets is holding them still enough to get a good view. And if you want to show someone else something they have to be able to find it themselves to appreciate the sight.

When I first got binoculars my son bought me a camera tripod bracket and that led to making a tall tripod for better seeing. It is made up of three parts: a base plate, an adjustable saddle which swivels, and legs.

THE LEGS are straight one piece wooden curtain rods one metre long which are attached with bolts to ribs on the base plate.

THE BASE PLATE is a triangle of laminated chip board with 3 ribs glued and screwed in line with each of the points of the triangle. Use a hole saw to make a hole through the plate to receive a length of curtain rod 30 mm dia.

THE SADDLE also has 3 parts: an adjustable rod for height and azimuth movement with peg holes at appropriate intervals; a collar with hole to

hold the vertical height; and a saddle device for alt setting. The collar is made from wood with a suitable hole in the centre for a firm fit with the rod and another small hole to fix the height. A dowel peg is inserted here to fit with peg holes drilled in the rod as the collar slides up and down. The weight of your expensive binoculars rests on this height arrangement so it has to be a good firm fit, yet easily adjusted when necessary.

THE SADDLE is a U shape with one side plywood, the others are 12 mm wood. The ply-wood is cut in a semi circle. The saddle sits astride the height rod with a flat plate sliding against the ply. A coach bolt goes through the saddle and the rod to give vertical movement. A further bolt with penny washers and rubber washers sandwiches the ply and plate on the rod to fix the altitude angle of the saddle when you want to do so. The saddle has the camera bracket fixed to the top.
The height rod can be varied in length to reach whatever height you need.

Since I made this device I have seen two other ways of fixing binoculars for steady viewing, and I am thinking to modify my own.

Ian Cook ■

ELEMENTARY MY DEAR WATSON

Sherlock Holmes and Dr Watson went on a camping trip. After a good meal and a bottle of wine they lay down for the night and went to sleep. Some hours later, Holmes awoke and nudged his friend. "Watson, look up at the sky and tell me what you see."
"Watson replied, 'I see millions and millions of stars.'
'What does that tell you.' Holmes asked.

Watson pondered for a moment, 'Astronomically, it

tells me that there are millions of galaxies, and potentially millions of planets.
Astrologically I observe that Saturn is in Leo.
Horologically I deduce that the time is approximately a quarter to three.
Theologically I can see that God is all powerful and that we are small and insignificant.
Meteorologically, I suspect that we will have a beautiful day tomorrow.
What does it tell you?

Holmes was silent for a minute, then spoke, "Watson you idiot, some mongrel has stolen our tent."

What's To See This Month?
20th March – 16th April

This is going to be a great month for conjunction watchers, both pre-sunrise and post sunset.

Mercury: For that rare breed, Mercury Watchers (yes Phil, I'm sure there are some), this is a very good month. For pre-dawn observers, Mercury was very close to Venus in mid-March (see this column in the February issue). From now until late April, Mercury viewing will be at its best, reaching maximum elongation on 29th March. At the start of April, Mercury is high above its brighter morning partner, Venus. In these mornings, there are some nice alignments and arrangements between Mercury, Venus and the crescent Moon.

Having drifted apart from Venus after its 16th March encounter, the two approach again, preparing for their big menage-a-trois with Jupiter on 29th April. (More about that next month).

Venus: very much immersed in the dawn twilight, and its big moments involve Mercury. See above.

Mars, Jupiter & Saturn: The three Amigos, the Three Tenors (well, they are getting old) – that's the Three Planets Mars, Jupiter and Saturn. You will have seen these three stretched out across the

western sky for a number of weeks now. You will also have noticed (especially if you read this column last month or Astronomy 2000) that they have been gradually creeping together as their orbits prepare to overlap (from Earth's perspective). There will be some very interesting encounters with these three (and the Moon) in the coming weeks, and here are three of them:

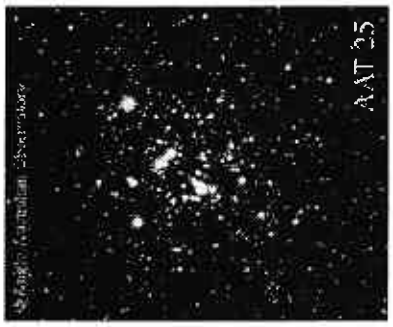
22nd March (*Jumping Jupiter, Batman, that's this Wednesday!*), the three will be in perfect line, exactly 7.5° apart (with Jupiter in the middle). But you have to be quick after sunset, as Mars will be close to the horizon and heading over.

4th – 8th April, close after sunset, Jupiter and Mars will be cheek to jowl (1° at their closest) with Saturn about 6o higher. A thin crescent Moon will be hovering very close by.

15th – 17th April, Mars approaches Saturn, coming within 2.4°. Can you pick Mars from Saturn? Two hints: Mars is the ruddier colour, and Saturn is the brighter. Jupiter will be nearer the horizon to those two. But you'll have to be sharp as they will be close to the horizon in twilight.

Constellations:

Crux (the Southern Cross) is rising higher these nights, bringing with it the delightful Jewel Box and nearby Omega Centauri. that king of globular clusters.



The Jewel Box (NGC 4755)
Photo by D Malin (Used by permission)

Also up high is the deceptive **False Cross** and its nearby "Toyota'd If I Know" cluster. If you're new to the society, you'd better ask Noel how that got its name. (It's really NGC2516, a naked eye cluster of about 80 stars, delightful in binoculars.)

In the northerly direction, **Leo** is making its appearance. It has its share of 9th and 10th magnitude spiral galaxies. (M65 and M66 are spottable in large binoculars on a clear night, and M95 and M96 can be discerned as circular smudges in small telescopes.)

At the opposite end of the False Cross to NGC2516 is Vela, a constellation full of interesting open clusters. Let your binoculars or telescope roam over this area (3 to 4 times the size of false Cross) and enjoy these small groups of stars. As abonus, there is NGC3132, a small but bright 8th mag. planetary nebula.

Bob Bee ■

SECTION LEADERS

The following members have offered themselves as leaders (or coordinators) of those members with special interests in particular fields

DEEP SKY:
Pete & Bobbie Elston
Phone 02 46474491. e-mail: eclipse@lightstorm.com.au

ASTRO COMPUTING:
Daniel Ross (02 9790 5838)

AMATEUR TELESCOPE MAKING: Dick Everett
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Mobile 0410 445 041 for checking field conditions.

TELESCOPES : NOVICE/INTERMEDIATE
Noel Sharpe
ADVANCED: Peter Druery.

ASTROPHOTOGRAPHY:
NOVICE: Noel Sharpe
ADVANCED; Peter Druery

Borrowing MacDob

The Society's own telescope, a 6" Dobsonian, is available for loan for members. It is easy to transport, set up and use. If you would like to borrow MacDob for a month, speak to Phil Ainsworth, its custodian. Though there is no hiring fee, members are invited to make a donation which will go towards the upkeep and upgrade of MacDob

Magnitudes of Stars

A piece of astronomy jargon often encountered and equally often misunderstood is the term 'magnitude.'

Basically, this term is synonymous with a star's 'brightness.' That is, to say a star has a magnitude of 1 means it has a brightness of 1 (whatever that means.). What confuses most people is that a star with a magnitude of 2 is actually less bright than a star with a magnitude of 1.

Before we go into the actual magnitude numbering system, let's clear up one point. In general conversation, 'magnitude' means the apparent brightness of a star. i.e. as we see it from Earth. This is different from 'absolute magnitude' which tries to define a star's 'true' brightness if it was seen from a standard (but arbitrary) distance of 10 parsecs (32.6 light years.) So, if two stars of identical absolute magnitude were different distances away from us, they will have different apparent magnitudes (or just plain magnitudes.)

Now to the numbering system, and this is what confuses most. Historically, Hipparcus and Ptolemy divided the naked eye visible stars into six groups. The brightest were called 1st magnitude, the next brightest (but dimmer) were called 2nd magnitude, etc, and the least bright (and barely visible) were called 6th magnitude.

Like Sherlock Holmes, you notice something unusual here? Yes, the less bright stars have a higher number. Or putting it in reverse, the higher the magnitude, the fainter the star. This system is historical and ingrained. We have to live with it.

This numbering system has been developed over the years to include negative numbers (e.g. –1, -4) and even, with the benefit of precise measuring instruments, decimal numbers. (e.g. Sirius is mag. –1.47).

Is there any method in this madness? Very much so. The magnitude scale is (for the maths buffs) a logarithmic scale, with each step of 1 magnitude representing a ratio in brightness of 2.512. This odd number is the 5th root of 100. Or, 2.512 multiplied by itself 5 times gives 100. So a difference in magnitude of 5 represents a difference in brightness of 100.

Difference in Magnitude	How Much Brighter?
-1	x 2.512
-2	x 6.3
-3	x 15.8
-4	x 39.8
-5	x 100

Of course, our naked eyes cannot determine magnitudes to that accuracy. The best we can do is no better than good old Hipparcus. But it is very important to understand what the numbering system means. e.g. if a book tells us that a certain deep space object (a galaxy say) is magnitude 11, that tells us it is 5 magnitudes fainter (1/100th the brightness) of the faintest star our naked eye can see (mag. 6.)

It also tells us that when Venus is blazing at mag. -4.47 it is 3 magnitudes (2.512^3 = 15.8) times brighter than Sirius, the brightest star.

Omega Centauri
Photo by D Malin – Used by permission

Of course, stars not visible to the naked eye have magnitudes higher than 6. And the galaxies at the far reach of Hubble's light grasp are much much fainter still.

A mag. 29 galaxy, a test even for the Hubble or Keck telescopes, is 25 mag. fainter than our humble 4th mag. globular cluster ω Centauri. i.e. $100^5 = 10^{10}$ (ten thousand million) times fainter.

At the other end of the scale, although our Sun has an absolute magnitude of 4.8, being so close, its apparent magnitude is –26.7.

Get the idea?

Bob Bee ■