PERTH OBSERVATORY
Department of Conservation and Land Management

PERTH OBSERVATORY VOLUNTEER NEWSLETTER

June 1999

Editor: Bevan Harris

Editorial

IN THIS ISSUE

The onset of winter marks the closure of yet another successful tour season – with many thanks due to the volunteer staff who have assisted in a wide range of the Observatory's activities throughout the year. However, while this newsletter is all about supporting and recognizing the volunteer contribution to the effective running of the Observatory's programs, it would be remiss if credit was not given to the permanent staff in return for the support they have freely provided us. I am sure that I speak for all the vollies when I say thankyou to the permanent staff, not only for the support they have given us, but also for the opportunities and rewards we have received. Thank you, "permies"!

There are a couple of changes in the pipeline for the newsletter. At an initial glance the first of these – to marginally increase publication frequency to once every 29½ days – may seem a trifle strange, however there is a solid rationale behind it. Until now the newsletter has been produced on a more or less monthly basis, which is perfectly acceptable in most instances, but this has brought about a peculiar problem for us. Because our star viewing nights are based on the phases of the Moon, the release of newsletters (notwithstanding the editor's personal scheduling hassles) has been constantly slipping against regularly scheduled events.

The Navigator's Tools

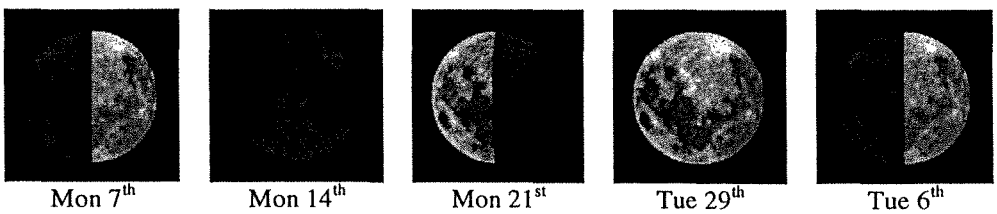
Binding the publication of newsletters to a particular phase of the Moon, say the week following Full Moon, will ensure they are always produced in adequate time to be posted before the next training night – something I am sure will be appreciated by all and sundry. Of course this will play havoc with issue numbering, but there are a wealth of options to choose from! It also means that we will have an extra issue "once every blue moon". Hmmm... what shall we call THAT one?? ☺

The second change is in response to a number of requests for the newsletter to be produced in electronic form as well as the conventional paper form. Those of you with access to the Internet will soon be able to view the newsletter online. Stay tuned for more details on this one!

Highlights in the Sky

Early winter means several things astronomers, not the least being that it marks the Sun's most northerly progression in its annual journey around the ecliptic. Our winter solstice occurs on June 22nd at approximately 0400 WAST, giving us both our shortest day and our longest night, and is actually defined as the moment the Sun passes through point of 6 hours Right Ascension. Coincidentally, the Sun also moves into Gemini from Taurus at this time, which may puzzle a few people who, like myself, have always been told they are a "Gemini". Taurus... pretty much sums it up really.

P·H·A·S·E·S OF THE MOON



Mon 7th | Mon 14th | Mon 21st | Tue 29th | Tue 6th

If you have a penchant for watching the Moon cover and uncover objects in its path, watch out on Sunday 27th when the Moon occults the 8th magnitude globular cluster M9, which is located in Ophiuchus. It probably won't be as spectacular as last February's solar eclipse but I, for one, will be looking out for it. It occurs from about 1840-2020, but you'll probably want to head out a few minutes earlier.

Subsequent to its recent (May 26th) passage through superior conjunction, **Mercury** now appears as an evening object though it is likely to be too close to the Sun for easy observation during the first week. It moves from Taurus into Gemini on the 7th and then into Cancer on the 24th. On the 15th it will be visible adjacent to the whisper-thin one-day old Moon.

Venus begins the month located near Pollux in the constellation Gemini before moving into Cancer on the 3rd. On the 13th it brushes over Praesepe, otherwise called the Beehive Cluster, and will be near the Moon on the 16th and 17th before moving into Leo on the 24th. Venus is at Greatest Elongation East on the 11th, reaching its highest position in the evening sky. Thereafter it will fall gradually back towards the Sun.

Mars is located near Spica (α Virginis) for the entire month. It appears stationary on the 3rd prior to resuming its usual prograde motion. The Moon will be near the Red Planet on the 22nd and 23rd

Jupiter rises shortly after 0330 at the beginning of the month in eastern Pisces Moon. It will be close to the Moon on the morning of the 10th and will finish the month by the border of the constellation of Aries, rising a little after 0200.

Saturn, located in the constellation Aries, now rises well clear of morning twilight. It will be near the Moon on the 11th and by the month's end will be rising just after 0300.

Located in Capricornus, **Uranus** and **Neptune** have both returned to prograde motion during the last month - they were stationary on May 22nd and May 7th respectively. The Moon will pass the pair (in reverse order) on the succeeding mornings of the 4th and 5th. **Pluto**, in Ophiuchus, was at opposition on May 31st and hence was visible for the entire night.

Due to their great distance from the Sun, little change occurs with the position of these outflung members of the solar system – it will not be until 2002 that Uranus will venture out of Capriconus and into neighbouring Aquarius, while Neptune will remain in Capricornus until the year 2010. Tiny Pluto, which is still "speeding" along in the wake of its perihelion passage in 1989, will move from into Serpens from Ophiuchus in 2003.

"Cuisine & Culture" Night - July 5th 6:30pm

End of year volunteer recognition event

Volunteers have not been forgotten. The annual "end of year" volunteer recognition event will be conducted at the Innaloo Pizza Hut and the adjacent Innaloo Megaplex cinema complex. There are no prizes given for guessing what food we will be eating (Hint: used and recommended by astronomers world-wide). It was a hard choice, but the film chosen is STAR WARS #1! *All those interested should contact Jamie Biggs before noon Monday June 28.* As usual this event is for volunteers only – the main aim of the event is to attempt to thank and recognize volunteers for their efforts, as well as fostering some social interaction between all members of staff. Please note the early start time – 6:30pm at Innaloo Pizza Hut. This is in order that we can attend the 8:00pm movie session.

Volunteer Training Nights

Astronavigation Practice night (7.00 p.m.) Monday 99/06/14

On May 17th about 10 volunteers were treated to a talk on the theory of astronavigation by superstar star viewing volunteer Bert Hollebon. Notes on the theoretical work presented last month by Bert are in preparation and will be available to those staff who desire a copy. Thanks again Bert for this extra work. This month (June 14th) we will conduct the practical component with Bert's (and Jacquie's) sextant where all attendees will attempt to find the Observatory's latitude and longitude! Telescope practice will follow. The usual courtesies apply, if you are planning to attend this session, would you please notify Greg Lowe on 9293-8255 of your intention.

"Cuisine & Culture" night - July 5th

See end of year volunteer recognition event.

Proposed History lecture - August 9th

We have tentatively booked Professor Les Marchant of Notre Dame University in Fremantle to present a lecture on the French exploration of WA in the early 1800's. He is WA's foremost historian and will present the historical background as well as the detail of this exemplary scientific and navigational work. On first hearing you may not appreciate that this is an astronomical subject but the success of these explorations was crucially dependent on the quality of their astronomical work. We may open this talk to members of the WA Historical Society (if appropriate).

June 14th	July 5th	August 9th	September 6th
Astronavigation (practical)	Cuisine & Culture night	Proposed History lecture	TBA

Y2K Upgrade

The Observatory computer network server and PCs will now be upgraded to Y2K compliance in mid June. (How else do think we could still produce the newsletter?!)

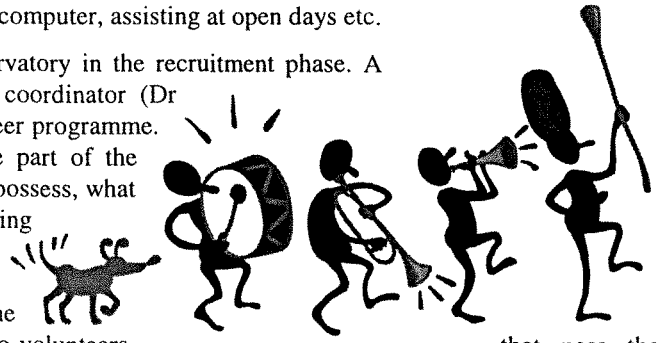
Star Viewing Summary

Thanks to all Star Viewing Volunteers who assisted us in this activity. A total of 4,098 visitors attended the night sessions in 1998/99, which is about 70 short of our previous record. The cloudy weather of December, January and March was the major factor, even though more tours were scheduled for this year's summer months. Overall, in 1998/99 only 60% of scheduled star viewing sessions were conducted. This corresponds to only 111 sessions, a figure much lower than for the two previous financial years when 127 and 120 sessions were conducted. If the weather permitted another 12 sessions to be conducted (thus raising the total to the average of the previous 2 years) then attendance would have been increased significantly by about 400 visitors.

Volunteer Recruitment 1999

Volunteer numbers assisting with the Star Viewing noticeably decreased in 1999. There are many reasons for this and it is not a matter of blaming anyone. Volunteers are an integral part of the Observatory staff and vital to the success of many projects. However, the drop in numbers does strain the permanent staff and highlight the Observatory's need to recruit. Also, the long overdue archiving project is scheduled to commence in October.

The tentative schedule for this recruitment is: advertise in August, interview in September, train in October, and set to work in November. The three main projects where volunteers can assist is the star viewing sessions (and the related astronomy field nights), archiving and preserving the Observatory's records, and Observatory assistance in such jobs as rearranging the library, inputting the library database onto computer, assisting at open days etc.



Current volunteers are most welcome to assist the Observatory in the recruitment phase. A written application to the Perth Observatory volunteer coordinator (Dr James Biggs) is necessary to be considered for the volunteer programme. The applicant should outline why they wish to become part of the programme, what skills, qualifications or experience they possess, what realistic amount of time they can contribute, and anything else that they think is relevant. Please note that the qualification requirement is not really very stringent - what is really important is simply the desire to assist the Perth Observatory. Part of the Observatory's obligation to volunteers that pass the scrutiny of the written application and interview is training - we don't expect our volunteers to know everything about astronomy before their first visit.

The Inconstant Moon revisited

In last month's abridged *Highlights,* I drew attention to the appearance of the upcoming full moon (now past) and how it compared with the full moons observed late last year. It is widely recognized that the Sun culminates considerably higher in the sky during mid summer than it does during winter and that this is caused by Earth's axial tilt, but how many realize that the exact opposite occurs with full moons? The effect is modified somewhat by the Moon's own inclination to the ecliptic, but it is a simple extension of thought that because the Full Moon is diametrically opposite the Sun, then it will culminate low when the Sun is high and vice versa.

This month provides another opportunity for you to observe this for yourself. Full Moon occurs early on the 29th, less than a week after the winter solstice, so hotfoot it outside about midnight on Monday 28th (0:00 on the 29th) and take a gander at the Moon. You'll see that it's way up high in the constellation of Sagittarius. Keen eyes will also notice that it is literally surrounded by some of the most spectacular deep sky objects in the sky – such a shame that the Moon will render them all but invisible. For the record though, the Moon will be at a declination of some 20 degrees South and culminates at almost 78 degrees above the horizon. Now it's the Sun's turn. Nip outside for a tick on the Tuesday at midday (Monday is just as good) and take a quick (!!) peek at the Sun's position. You'll see that it's wa-a-ay down on where the Moon was, a little less than 35 degrees above the horizon. I'm not asking you to find any background stars, so I trust you'll believe me when I say that it will be near to μ (mu) Geminorum. Again for the record, the Sun's declination will be a shade over 23 degrees North. Simple arithmetic shows the difference in height of culmination is about 44 degrees.

"Now wait on", I hear. "What's this about a difference in the size of the Moon?" Well... if you took my hint and read (or recalled) the *Inconstant Moon* article from last October you'd have most of the answer. Reiterating briefly though, the difference in the apparent size of the Moon is caused by the eccentricity of its orbit. The effect is further accentuated when perigee or apogee occurs close to a full or a new moon. Last November we witnessed a near coincidence between the full moon and perigee, resulting in the Moon's apparent diameter bloating to more than 2010 arcseconds. The recent coincidence of the full moon with apogee (May 29th) saw it diminish to a rather puny 1764 arcseconds, with the difference in apparent size approaching 14 percent.

In the Eyepiece - Sombrero Galaxy

M104, or NGC4594, is a fine example of a large spiral galaxy seen very nearly edge-on. It is though, more popularly known as the *Sombrero Galaxy* – or *Sombrero Hat* – because of its striking appearance in long-exposure photographs. Such photographs show a bright bulging nucleus encircled by a dusty ring of spiral arms which combine to form an image that is strongly reminiscent of the ubiquitous Mexican hat.

The galaxy was discovered in 1781 by P Méchain and has the distinction of being the first object added in the supplement to Messier's originally published catalog *Connaisance des Temps*.

Although visible in smaller instruments, an aperture of at least 150mm is required to reveal the dark lane of dust around its rim. Burnham describes it in his Celestial Handbook as a bright bulging main mass with a nearly stellar nucleus and a well-defined dark lane traversing the equatorial plane.

The Sombrero lies centered in a very attractive field of some half dozen 7th magnitude stars on the Virgo-Corvus border. Despite its separation of some 20 degrees from the main concentration is considered to be a part of the Virgo Cluster of galaxies, a view that is reinforced by the galaxy's computed distance of about 50 million L.y.

Having an estimated total mass of 1.3 trillion solar masses, this is one of the brightest and most massive galaxies. It also contains a rich population of globular clusters with several hundred able to be counted in long exposures from large telescopes.

However, the Sombrero is most noted for its links with the discovery of the cosmic expansion. It was the first galaxy found to have a large redshift (it has a recession velocity of about 1,000 km/sec) offering support for the "island universe" theory.

FACT *file*

Name :	M 104
Type of object :	Galaxy
Other names :	NGC 4594
Constellation :	Virgo
RA :	12h 39m 52s
Dec :	-11° 36' 46"
Magnitude :	8.0
Distance :	50 M L.y.
Size :	8.9'x4.1'
Diameter :	130000 L.y
PA :	90°
Type :	Sa
Dreyer Description :	!vB,vL,eE92, vsmbMN

"A remarkable, slightly curved, clear-cut lane runs along the entire length to the south of the nucleus; probably the finest known example of this phenomenon..." *Lick Observatory*

Decrypting Dreyer Descriptions

Ever since the advent of *In the Eyepiece* a year ago, I have quietly included the rather cryptic looking NGC (or Dreyer) description amongst the fields in the Fact File. You know, the one that looks a bit like swearing.

Dreyer descriptions were originally devised by John Dreyer to use as a form of shorthand to describe objects when he compiled the famous New General Catalogue. The original descriptions have been refined over the years with input from a large number of observers. This particular version has been sourced from the Saguaro Astronomy Club (Arizona USA) deepsky database, which credits a number of prominent amateurs, as well as publications such as Deep Sky Magazine, Astronomy magazine, Sky and Telescope magazine and Burnham's Celestial Handbook. This database is freely available on the Internet at < http://www.primenet.com/~dickson/sac.html> and is used in many of today's shareware and commercial star charting programs.

Check through the key below and see how it has been applied in the examples given, the have a go at the Dreyer description for this month's feature object, the Sombrero Galaxy.

Abbreviations used

!	remarkable object	g	gradually	r	not well resolved, mottled
am	Among	IF	irregular figure	rr	partially resolved
att	Attached	inv	involved	rrr	well resolved
bet	Between	irr	irregular	S	small
B	Bright	L	large	s	suddenly
b	Brighter	l	little	s	south
C	Compressed	mag	magnitude	sc	scattered
c	Considerably	M	middle	susp	suspected
Cl	Cluster	m	much	st	star or stellar
D	Double	!!	very remarkable object	v	very
def	Defined	n	north	var	variable
deg	Degrees	N	nucleus	nf	north following
diam	Diameter	neb	nebula, nebulosity	np	north preceding
dif	Diffuse	P w	paired with	sf	south following
E	Elongated	p	pretty (before F,B,L or S)	sp	south preceding
e	Extremely	p	preceding	11m	11th magnitude
er	easily resolved	P	poor	8...	8th magnitude and fainter
F	Faint	R	round	9...13	9th to 13th magnitude
f	Following	Ri	rich		

Example descriptions

NGC#	Description	Decoded descriptions
214	pF, pS, lE, gvlbM	pretty faint, pretty small, little elongated, gradually very little brighter in the middle
708	vF, vS, R	very faint, very small, round
891	B, vL, vmE	bright, very large, very much elongated
7009	!, vB, S	remarkable object, very bright, small
7089	!! B, vL, mbM, rrr, stars mags 13.....	extremely remarkable object, bright, very large, much brighter middle, resolved, stars 13th magnitude and dimmer
2099	! B, vRi, mC	remarkable object, bright, very rich, much compressed
6643	pB,pL,E50,2 st p	pretty bright, pretty large, elongated in position angle 50 degrees, two stars preceding

Sombrero Galaxy

4594 !vB,vL,eE92, vsmbMN

Field Stop

Now I'm going to let you all in on a secret ☺. The real reason the Observatory doesn't run star viewing tours during winter is that it is the business end of the football season and the "guys up the hill" are too busy sitting in front of the telly and sinking tinnies to worry about "lookin' at them steenkin' stars". Okay – not really, but it does serve as a lead in for the following little pearl of knowledge.

Who of you watch the Channel Nine news bulletin? If you do, you're probably aware that each Monday during footy season there is a one-minute segment by the Eagles' Guy "Bluey" McKenna. Saddled with the rather unimaginative moniker "Bluey's Minute", this rather stunning (NOT!) piece of investigative journalism consists wholly and solely of a "feel good" interview by Bluey of some local football identity. As you can well imagine with the off-field expression of the average sports personality, it's pretty scintillating stuff. In one rather bizzarre episode several weeks back, Bluey actually interviewed himself!

About now you're probably wondering what the relevance of all this is to astronomy, but I urge you to stick with me as I'm getting there "real quick like". A couple of Mondays back it was the turn of coach Mick Malthouse to sit in the hot seat. Bluey began firing some pretty much standard questions at his boss – no surprises there – but it was Mick's responses which piqued my interest. While I can't promise you a word-for-word recital of the conversation, the pertinent bits did go something like this...

BLUEY: "If you could have anything in the world, what would it be?"

MICK: "A big telescope. I already have one which is pretty nice, but I'd like to have one which is bigger."

BLUEY: "What gives you the most pleasure?"

MICK: "Looking at the stars through my telescope and enjoying the night sky."

BLUEY: "Which person, alive or dead, would you most like to meet if you had the chance?"

MICK: "Albert Einstein because of his thoughts on space and all that stuff..."

STOP PRESS STOP PRESS STOP PRESS

Get Well Soon, Peter!

The Observatory was shocked to hear the news recently that long time volunteer Peter Crake has been seriously injured in a motorbike accident and is facing a protracted stay in hospital while he recuperates. He is currently in Royal Perth Hospital, but will soon be transferred to the Shenton Park annexe where he will remain for several months while undergoing physiotherapy.

For those of you who have met Peter, let him know that you're thinking of him and send him a get well soon card. I'm sure he would welcome you as a visitor as well.

For those of you who don't know Peter, he has Peter Birch's stalwart observing assistant for a considerable number of years. He may also be familiar to some of you as the former manager of Precision Optics (now York Optical) when they were based in Leederville.

Peter – we're all thinking of you mate! Get well soon!!!

If you have something to contribute to the newsletter, you can submit it to me via fax on (08) 9250 8240 or e-mail to <bmh@bigpond.com>. Alternatively, submissions may be pinned to the volunteer notice board for collection. Thanks, Bevan