



PERTH OBSERVATORY
Department of Conservation and Land Management

PERTH OBSERVATORY VOLUNTEER NEWSLETTER

MARCH 1999

Editor: Bevan Harris

Editorial

Editor's note – Please accept my sincere apologies for the extreme lateness of this month's newsletter. Illness, amongst other things, has been my adversary.

Pardon my self-congratulatory attitude, but I felt it should not be allowed to pass without mention that this month marks my first anniversary as editor of this august journal. During the past year I have introduced a number of changes to the newsletter and have construed the feedback received from these efforts to be that of general encouragement. For this I must thank you all.

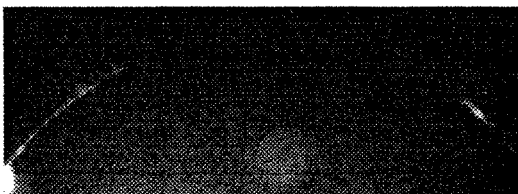
However, for all the changes I wrought, the one thing which remains untouched is the name. Sitting back and considering it for a moment the title seems adequately descriptive, in fact one cannot fault it from that perspective, but it somehow lacks pizzazz, don't you think? Perhaps it may be time for a change.

My thinking here is something a little shorter (I almost fall off the chair typing the current one) with a definite astronomical bent to it. Perhaps not blatantly obvious, but not so obscure that you'd need a higher degree in cryptography to decode it. As an example, the Journal of the Astronomical Society of Western Australia has for some years been known as *The Sidereal Times*. A nice little play on words that is perhaps not immediately obvious to all, but most importantly is more economical on both the typing fingers and the ink. Does anyone have any suggestions?

Highlights In The Sky

Astronomically speaking, another year ticks over this month with the northern vernal equinox (our autumnal equinox) occurring at 1000 on the 21st. From our perspective, the Sun appears to cross the celestial equator heading north in its annual progression around the ecliptic. This point, which is known as the ascending node, marks the position RA 0h00m00s and Dec 0d00m00s and is the basis of our celestial coordinate system. Conversely, if we were to view Earth from the Sun, it would be located at its descending node situated at RA 12h00m00s Dec 0d00m00s.

As an interesting aside, the Sun's southern limb will brush over the corner of Cetus during our daylight hours on the 28th. Cetus is one of four non-zodiacal constellations that the Sun lies either partly or wholly in at various times throughout the year. The other three are Ophiuchus, Orion and Sextans.



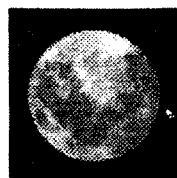
Solar prominences at third contact - Image by Derek Hatch

Mercury remains in Pisces for the entire month. For the first week it is visible low in the west shortly after sunset, setting around 1930 on the 1st and progressively earlier thereafter. It is lost in the Sun's glare by mid-month and passes through inferior conjunction on the 20th before reappearing in the morning sky during the last week. This marks the beginning of this fleet planet's best morning apparition for the year, lasting through until May.

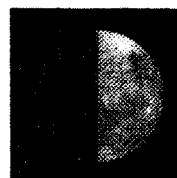
Following its close approach to Jupiter last month, **Venus** continues to rise in prominence in the evening sky. It is located in Pisces at the beginning of the month, but moves into Aries on the 17th where it will be visible in a spectacular appulse with Saturn and the three-day old Moon on the 20th.

P · H · A · S · E · S
OF THE

MOON



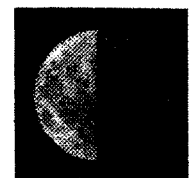
Tue 2nd



Wed 10th



Thu 18th



Wed 24th

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Heading towards opposition late next month, **Mars** remains a late evening object throughout March. Located near the star Zubenelgenubi in the constellation Libra, it rises around 2145 as the month opens. It will be near the Moon on the 6th and 7th and appears stationary on the 18th prior to entering its retrograde loop across the sky. As with all the outer planets, Mars performs this seemingly bizarre manoeuvre each year as it is overtaken in its orbit by Earth. It returns to its usual easterly, or *prograde*, motion in June (a more complete discussion of retrograde motion is contained on p60 of Astronomy 1999). By month's end, the red planet will be rising around 1945.

Jupiter is now almost lost in the glare of evening twilight, its last hurrah being a pleasing alignment with Mercury and Venus early in the month. Following its conjunction with the Sun in early April, Jupiter will reappear as a morning object late next month.

Pursuing Jupiter towards an April conjunction, **Saturn** sets a little after 2100 in the early part of the month and before 1930 at month end. Together with Venus, it will appear just below the thin crescent Moon on the 20th. Having been situated in Pisces for several months, Saturn skips briefly into Cetus on the 29th before passing into Aries on the 30th.

Both **Uranus** and **Neptune** can be seen climbing steadily in the morning sky in the constellation Capricornus. A close approach by the Moon on the 14th and 15th is the precursor to a series of occultations beginning next month and continuing into next year, though unfortunately none of these will be visible from Western Australia. Once again the outermost planet, **Pluto** remains in Ophiuchus, rising just prior to midnight on the 1st and some two hours earlier at the month's end. Similar to Mars, Pluto will enter retrograde motion this month, appearing stationary on the 15th.

I Fell into a Burning Ring of Fire

Last month seven volunteers (Jacquie Milner, Karen Kotze, Marcel Forstch, Lyall Bell, Tricia Turner, Mark Emmons and Bevan Harris) traveled with the Perth Observatory expedition to Greenough to witness the last annular eclipse of the millennium. Permanent staff who made the trip were Peter Birch, Ralph Martin, Andrew Williams, Greg Lowe, Janet Bell, Sheryle Smith and David Tiggerdine. Accompanying us were 29 paying expeditioners and a handful of other visitors who were guests of the Observatory.

Upon our arrival in Greenough, we were joined by two other volunteers, Keith Ford and Lynley Hewitt, as well as by Jamie Biggs (who afterwards was leading a Landscape tour group to the Abrolhos Islands). After setting up the necessary observing equipment we were ushered inside to an enjoyable luncheon, which was accompanied by a short talk and slide presentation by Observatory guest and veteran eclipse chaser, Professor Jay Pasachoff.



First contact! - Image by Bevan Harris

At first contact a tinge of excitement spread through the assembled crowd, and as the eclipse deepened into an eerie twilight a deep sense of awe permeated amongst those present. Crescent images of the Sun danced slowly in the shade of trees while the brighter planets popped plainly into view against a strangely colored sky. Whether viewed through special filters or as a projected image, the Moon appeared to move deceptively fast as annularity approached, though in fact we were seeing the actual orbital motion of our nearest neighbour, undisguised by Earth's own rotation.

Annularity itself passed all too quickly, with just scant seconds passing until third contact, but the response to this brief spectacle was unanimous. First there was hushed amazement and awe, quickly followed by a cheer and applause. Quite simply put, there is absolutely no substitute for actually being there under the Moon's shadow to watching its darkened disk edge across to cover the Sun's blazing orb leaving only a burning ring of fire.

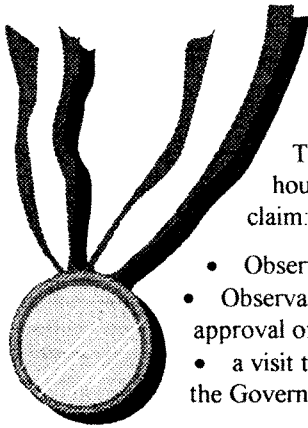


Crescent sun images - Image by Bevan Harris

With third contact past, the euphoria was also gone and most people began packing their gear away, or were engaged in animated discussion about what they had just witnessed, or where and when the next eclipse would be. Indeed, to many of those present this eclipse was just a dress rehearsal for the total eclipse visible in Europe in August this year – the last total solar eclipse of the millennium. For my own part, I may not make it to Europe for the next one, but there are others – June 21 2001 in Africa, December 4 2002 in Africa (twice in 18 months, the lucky so-and-sos) and Australia, November 23 2003 in Antarctica.... Perhaps the Observatory might organize another expedition?

Rewards for Superstar Performers

Jamie Biggs expresses his apologies for the delay, but he has finally calculated the hours of assistance provided by the volunteers. He is truly astounded at the number of hours donated. This translates into more things getting done around the Observatory that are just beyond the time available to the permanent staff. Additionally, there is a welcome by-product in that the Observatory is able to share with, and get to know, some very fine individuals. Thanks from all the Observatory staff for your assistance.



Congratulations to the volunteers who have accrued sufficient hours in the Night Tours and Astronomy Field Night programmes, and/or the Observatory Assistant and Archiving and Preservation programmes to become eligible for a volunteer reward. The rewards are a modest token of the Observatory's appreciation for the assistance rendered.

The following volunteers (in order of decreasing hours) have accrued more than sixty five hours (200 hours for Assistants and/or Archiving programme) of service and are thus eligible to claim:

- Observatory (or CALM) items to the value of \$40,
- Observatory funding of further appropriate training, eg Senior First Aid certificates - subject to the approval of the Night Tour Volunteer co-ordinator, and
- a visit to the Observatory accompanied by up to 3 others, out of hours, subject to the permission of the Government Astronomer and those using telescopes etc.

Night tours

John Morris
Bert Hollebon
Marcel Fortsch
Bevan Harris
Jacquie Milner
Keith Ford
Don Hartley

Archiving

Per-Olov Eriksson
Andreas Andersson
Brian Goynich
Tricia Turner

The following volunteers (in order of decreasing hours) have accrued more than forty (100 hours for Assistants and/or Archiving programme) but less than sixty five hours (200 hours for Assistants and/or Archiving programme) of service and are thus eligible to claim:

- Observatory (or CALM) items to the value of \$20, and
- Observatory funding of further appropriate training, eg Senior First Aid certificates - subject to the approval of the Night Tour Volunteer co-ordinator.

Night tours

Karen Kotzé
Mark Haslam
Bob Taylor
Mark Emmons
Lyll Bell



Please note: The last date to claim your reward is **31 May 1999**.

Training Night - Monday March 15th

A "post mortem" of the annular eclipse will be conducted at this month's training night, so please bring along any slides or videos you have of the event to share on the night. As usual there will be telescope training conducted in the latter half of the evening.

Star Volunteer Bert Hollebon has volunteered to teach us astronavigation on the April and May training nights. The first night, April 12th, will be dedicated to a discussion on the theory of astronavigation while on the second night (May 10th) Bert will lead us through the practical work. Thanks for sharing your expertise with us Bert!

Please notify Greg Lowe if you will be attending any of these sessions. June 14th is also a training night. If you haven't done so already, would you please mark these dates in your diary.



Sun & Stars Festival



Safe Solar Observing - Image by Bevan Harris

According to Yanchep National Park staff, the recent Sun & Stars Festival drew an attendance of around 4,000 people. Activities and displays on the day included (amongst others) boot-scooting, bands, emergency services demonstrations, snakes, cave tours, nature walks, wall climbing, aerial water bombing displays and a bunch of kids' activities, but the star attraction of the day was Perth Observatory's telescopes.

Four volunteers and four full-time staff were present to ensure that things went smoothly, with most also bringing along their families to join in the fun. A big thank you to vollies Karen Kotze, Marcel Fortsch, John Morris and Bevan Harris for the assistance they rendered.

Bickley Valley Harvest Festival – Advance Notice

Following on from successful events over the last couple of years, the Observatory will once again be conducting an "Open Day" in conjunction with the upcoming Bickley Valley Harvest Festival. This year's event is to be held on May 2nd, commencing at 12.00 noon and running through to 5.00pm. Volunteer assistance would be appreciated on the day, so if you can assist on this occasion would you please advise the Volunteer Coordinator, Jamie Biggs, as soon as possible.

Observatory News

- The observatory's intruder alarm system will be extended within the next two weeks in order to provide a more complete security coverage of the main building. Volunteers will not notice any difference to the current system.
- The Observatory has purchased a "messages-on-hold" unit that will soon be integrated into the telephone system. So instead of hearing music while on hold, callers will receive information about the most popular activities at the Observatory and some general and topical astronomy information. Such systems are not everybody's "cup of tea" but it will hopefully assist the office staff in their attendance to some of the most common information requests. The message will be updated about every 6 months, and the background music more regularly than that.

Observatory Heritage Listed!

In recognition of our ongoing, unique, scientific and cultural activities, Perth Observatory has been entered at Category A level in the Kalamunda Shire Inventory of Heritage Places. The implications to the Observatory site of this listing are:

- Noted that it is worthy of maximum protection,
- Recommended for entry into State registry of heritage places - which imbues it some "legal protection",
- Maximum encouragement is given to preserve its integrity, and
- Development requires consultation with Heritage Council of WA and the Shire.

In the Eyepiece – The Beehive Cluster

M44, or the Beehive Cluster, is an easily visible object located in the faint constellation of Cancer, which is wedged between its more prominent neighbours Gemini and Leo. Also known as *Praesepe* (Latin for "manger"), it is one of the largest, brightest and nearest galactic star clusters.

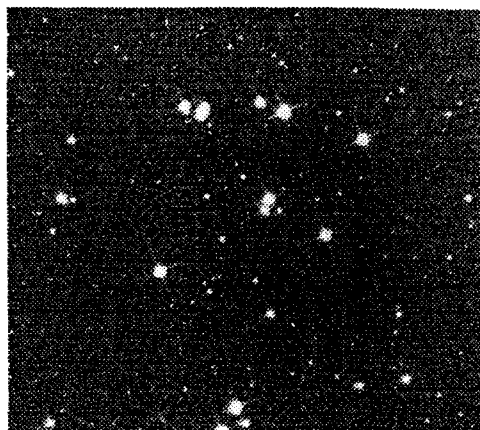
In his *Celestial Handbook*, Burnham states that this cluster was used in ancient times as a weather indicator. Both Aratus and Pliny are recorded as saying that invisibility of the object in otherwise clear sky was considered to forecast the approach of a violent storm.

Although it is one of the few clusters mentioned in antiquity, its true nature was not realized until Galileo's time and the invention of the telescope. Appearing as a nebula to the unaided eye, it is best suited to viewing with binoculars or a low power scope and wide-angle eyepiece.

Larger telescopes reveal that the cluster contains about 200 stars ranging in brightness from 6.3 to 14th magnitude. Its brightest member is Epsilon Cancri, a metal line star with a luminosity some 70 times that of our Sun. Other interesting stars include the eclipsing binary TX Cancri and several Delta Scuti-type variables.

Praesepe is too distant for reliable measurement via traditional parallax methods, with previous best estimates placing it some 522 light years away, but a recent determination by the *Hipparcos* satellite has refined this to 577 light years.

The cluster has an estimated age of some 400 million years, similar to that of the Hyades cluster in nearby Taurus. There is also a striking similarity in the proper motion of the two clusters and although they are now separated by hundreds of light years, it is thought that they have a common origin in some great diffuse gaseous nebula which existed 400 million years ago.



FACT File

Name :	Beehive Cluster
Type of object :	Open cluster
Other names :	M 44, NGC 2632
Constellation :	Cancer
RA :	8h 40m 3s
Dec :	+19° 59' 04"
Magnitude :	3.1
Distance :	577 L.y.
Size :	95 0'
Dimensions :	40 L.y.
Number of stars :	200
NGC Description :	!!Praesepe

"The nebula called Praesepe, which is not one star only, but a mass of more than 40 small stars."

Galileo

Field Stop

No doubt some of you will have seen the following joke, in fact it has passed my way so many times over the past few months that I have no choice but to pass it on to you. Enjoy (or wince) as you will!

Sherlock Holmes and Dr. Watson went on a camping trip. After a good meal a bottle of wine, and smoke around the campfire, they lay down for the night, and went to sleep. Some hours later, Holmes awoke and nudged his faithful friend

"Watson, look up at the sky and tell me what you see."

"Sir," Watson replied, "I see millions and millions of stars."

"And what does that tell you?" pursued Holmes.

Watson pondered for a minute. "Astronomically, it tells me that there are millions of galaxies and billions of planets. Astrologically, I observe that Saturn is in Leo. Horologically, I deduce that the time is approximately a quarter past 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?"

Silent for a moment, Holmes replied: "Watson, someone has stolen our tent!"

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