



SCORPIUS

The Journal of the
Astronomical Society of Frankston Inc.
P.O. Box 596, Frankston, Victoria 3199

Reg. No. A268

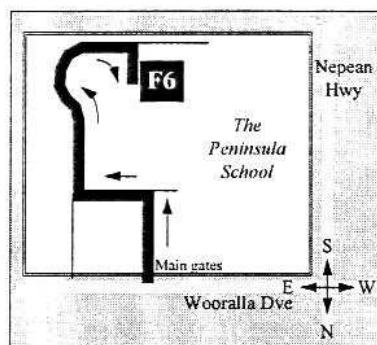
Volume VIII, No. 2 1999
(Mar - Apr)

The Astronomical Society of Frankston was founded in 1969 with the aim of fostering the study of Astronomy by amateurs and promoting the hobby of amateur Astronomy to the general public. The Society holds a General Meeting each month for the exchange of ideas and information. Regular observing nights, both private and public are arranged to observe currently available celestial objects. For decades the Society has provided *Astronomy on the Move* educational presentations or observing nights for schools and community groups exclusively in the area bounded by Moorabbin, Dandenong and Tooradin.

Meeting Venue: *Peninsula School*, Wooralla Drive, Mt.Eliza (Melways map 105/F5) in room F6 at 8pm on the 3rd Wednesday of each month except December.

Internet: <http://www.peninsula.starway.net.au/~aggro>

Visitors are always welcome!



Annual Membership

Full Member	\$30
Pensioner	\$25
Student	\$20
Family	\$40
Family Pensioners	\$35
Newsletter Only	\$15

DUE 1ST OF JANUARY EACH YEAR

President & Editor
Peter Skilton (03) 9776 5898

Vice President
Ian Porter (03) 5985 4203

Treasurer
Bob Heale (03) 9787 1748

Secretary & Loan Telescope
Richard Pollard (0419) 100 802

Committee
John Cleverdon, Roger Giller, David Girling,
Don Leggett, Peter Lowe

All phone calls before 8:30pm please.

FUTURE EVENTS

General Meetings:

Wed 17th Mar '99

Session 1: Barry Adcock of the ASV and BAS will speak on *The Planet Mars*. There will be no video this month as we have a guest speaker.
Session 2: Richard Pollard's loan telescope outside if weather is clear.

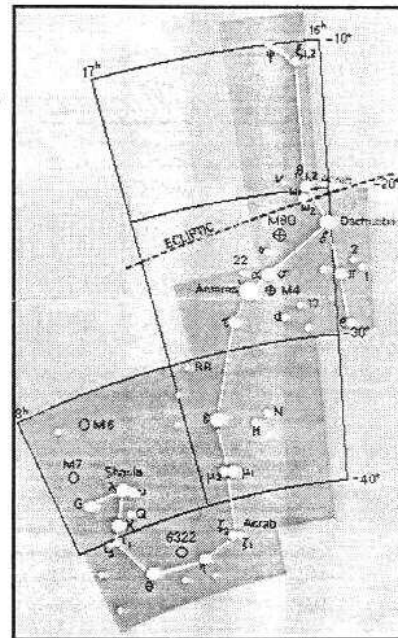
Sat 20th Mar '99 - Beginners' Talk and Observing by Richard Pollard and Ian Porter. This will start in any weather at the Visitors' Centre at *The Briers*, Nepean Hwy, Mt.Martha at 8pm or after, and progress outside afterwards. Bring *Aerogard* just in case.

Wed 21st Apr '99

Session 1: Peter Norman will speak on *Light*.
Session 2: Video on *Electric Skies* all about lightning.
Session 3: Loan telescope outside if weather is clear.

Wed 19th May '99

Session 1: Informal chat and "meet the committee" session and a chance to air your ideas about the ASF.
Session 2: Video on *The Mir Cosmonauts*.



Session 3: Loan telescope outside if weather is clear.

Wed 16th Jun '99

Session 1: A speaker yet to volunteer. Remember it's a great non-threatening environment in which to learn how to talk in front of a group of people.
Session 2: Video on *To the Moon and Beyond*.
Session 3: Loan telescope outside if weather is clear.

Wed 21st Jul '99

Session 1: Peter Skilton will speak on *The 30th anniversary of Apollo 11 and Us - The Eagle has Landed*.
Session 2: Video on *The Great Pyramids - Gateway to the Stars?*
Session 3: Loan telescope outside if weather is clear.
Being our 30th anniversary, a special tea-break will be arranged - so don't miss out.

Wed 18th Aug '99

Session 1: *30th anniversary of the Murchison Meteorite Fall* by a speaker yet to volunteer.
Session 2: Video on *The Eagle Has Landed* for those who miss July's talk.
Session 3: Loan telescope outside if weather is clear.

Wed 10th Nov '99

This is the Annual General Meeting and **NOTE THAT THE DATE HAS BEEN MOVED FORWARD 1 WEEK TO ACCOMMODATE LEONIDS METEOR STORM OBSERVERS.**

Session 1: A Primer for the Leonids Meteor Shower on 17th Nov, and for the Transit of Mercury on 16th Nov.

Session 2: Video on Fingerprints of God.

Session 3: Loan telescope outside if weather is clear.

Viewing Nights:

Members Only:

Sat Mar 13/20, Apr 10/17, May 8/15, Jun 12/19, Jul 10/17, Aug 7/14, Sep 4/11, Oct 9/16, Nov 6/13, Dec 4/11 all at *The Briars*, Nepean Hwy, Mt. Martha (Melways 151/E1).

If weather forecast for the Saturday looks bad, the Friday before may be used instead. New attendees must always confirm with Ian Porter on (03) 5985 4203 or 0414 308 072 (if no answer) before attending. Follow the signs at *The Briars* from the Visitor Centre (Melways 145/F12). Remember for security reasons you can only attend on planned Members' Nights, unless by prior arrangement with Ian who will liaise with *The Briars* accordingly. Last person out must switch on the shed security light.

Public, School & Community Groups Viewing/slide nights:

If you can assist, please contact the Secretary.

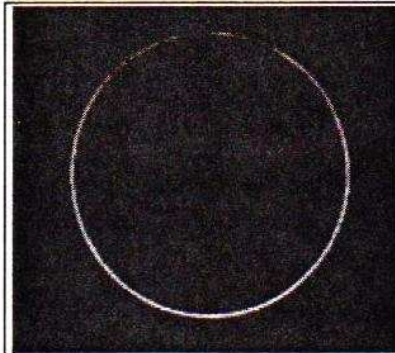
- The once-a-month basic public viewing nights at *The Briars* will continue on the first Friday of each month. The next nights are on Fri 2nd Apr and 7th May all at 8pm. Assistants are required. Please contact the co-ordinator, Don, on (03) 5985 4927.
- St.Kilda Primary will have a viewing night on Tue 20th Apr at Camp Manyung, Sunnyside Rd, Mt.Eliza, Melways 105/A6. Help is needed with telescopes as 60 expected at least.
- St.Francis of Assisi Primary will have two viewing nights on Mon 26th Apr and Wed 28th Apr at Camp Manyung, Sunnyside Rd, Mt.Eliza, Melways 105/A6. Help is needed with telescopes as 60 Grade 5's expected on the first night and 90 on the second.

Phenomenal Events:

- On 1st Feb the Moon travelled into the Earth's penumbral (outer) shadow, causing a lunar eclipse that

was visible on the peninsula, though not spectacularly so.

- On the 16th Feb, we experienced a partial solar eclipse locally, where the Moon covered 53% of the Sun at the mid-point of the eclipse. It was reported in the local papers that were published beforehand, and was seen at a convenient hour. First contact, where the Moon first took a "bite" out of the Sun was at 5:36pm AESuT, mid-point was at 6:37pm AESuT, and last contact just before the Moon left the face of the Sun was at 7:32pm AESuT. Those lucky enough to be in Geraldton, about a 3 hour drive north of Perth, experienced an annular eclipse where 99% of the Sun was covered by the Moon. The word "annulus" comes from the Latin word meaning "ring" which aptly describes the ring of light left around the Moon in such an eclipse.



Annular Eclipse of 1999 Feb 16, maximum coverage was 99% at Geraldton in WA at 3:28pm local time. Photo passed on courtesy of John Cleverdon. Notice you can see several of the mountains of the Moon where they block the light from the ring of Sun.

The event was video-taped by a contingent of USA and European occultation timing observers who travelled to WA specifically for this event to time the so-called *Bailey's Beads*, where at certain times during the eclipse the bright surface of the Sun briefly flashes through the valleys on the lunar surface. By timing when these "beads" of light occur, astronomers can accurately deduce the profile of the lunar limb without having to send surveyors to the lunar surface.

- Predictions for minor planet occultations of background stars have arrived from New Zealand for the first half of 1999. There is a naked eye one for Fri 19th Mar,

when the 524th asteroid, *Fidelio*, is predicted to pass in front of the magnitude 3.6 background star *Tau Librae* (τ Lib). If you can see the stars of the *Southern Cross*, then you can see this star with your eyes with the help of a star map. Some time around 1:45am (+/- 15 minutes) on the night of Fri/Sat 19/20th March, this nearly 70 kilometre diameter rock in the solar system may pass in front of this star for our region of Australasia. Although *Fidelio* is too dim to see with small telescopes, the star will disappear to your eye if the rock happens to eclipse it (and thereby casts its shadow over you). Ideally, if you can time when this occurs to the nearest second the data is extremely valuable for finding out the size and shape of *Fidelio*. Instructions are available from the Editor, and would make a great school project of value to astronomers. Even if you only notice it disappears without timing anything, or that it didn't disappear at all, this is valuable as it tells us where its shadow did or didn't pass and thereby constrains any estimates of its true size.

- There is also another **VERY IMPORTANT** minor planet occultation prediction for around 9:39pm on Fri 26th Mar for those with telescopes of 2.5 inches diameter or greater. Minor Planet **444 Gyptis** is expected to block a faint background star. This observation is important because information was obtained a few years back by our Society and others on this asteroid, and more information is needed desperately. Please attempt this one if at all possible, even if you are a novice at this. Instructions from the Editor.
- There was a close approach of Venus and Jupiter in the morning sky of 23rd and 24th Feb, noted on many radio stations as a UFO. This so-called "conjunction" of these two planets was reported by several members, and on our advice kindly presented by Edwin Maher on ABC News evening television.
- Observers of the eclipses of Jupiter's moons are reminded that the current apparition has finished, with Jupiter moving behind the Sun. Please submit any timings you have made to New Zealand (or

to the Editor who will forward them) right away. An email report form is available for convenience.

- There will be a Lunar Grazing Expedition in the early morning of **Sat 13th Mar**, with mid-graze being at 5:12am about 5 kilometres from Frankston. Interested observers and new comers who would like to watch or participate should contact the Editor for details of meeting place and time beforehand. You will need at least a 4 inch diameter telescope to see the phenomenon.
- Pluto will swap positions with Neptune to become the furthest planet from the Sun again on 15th Mar, as indicated in a later article in this edition.
- **VASTROC**, the *Victorian Astronomy Conference* and premier gathering of backyard astronomers in Victoria, will be held once again by our Society on the Labour Day weekend of NSW/SA this year on **Sat/Sun 2nd & 3rd Oct**. Mark it in your diaries now. The venue is Norwood House Reception Centre, Nepean Hwy, Mt.Eliza, with its adjacent hotel rooms for those who wish to stay on-site, and local transport may be arranged if you find it difficult to attend for lack of it. Booking will be on a first paid, first served basis, with a discount for early birds, and registration for one or part days will be possible. No age limits apply, though astronomers over the age of 8 will appreciate the talks most. The theme of the conference is "**Epoch 2000**". If you wish to give a 20 minute talk on any astronomy or sky related topic then please contact David Girling who is organising speakers on 5976 2806 or email to davekez@peninsula.hotkey.net.au. If you wish to reserve a place with a \$30 holding deposit, please contact Bob Heale now.
- Never seen our nearest neighbouring star, the dim red dwarf Proxima Centauri? Well, we are hoping to have a "Proxima Centauri hunt" at a members' night one Saturday this year. A volunteer is sought to arrange it, print out star maps, etc. to help others.

Social Events

- The barbecue at Ballam Park, Frankston, on Sun 21st Feb saw only 7 members attend on a very

warm evening. Those that did attend were treated to some fine red wine from Bob Heale. It is believed the late preceding viewing night at *The Briars* kept some away, and others had spent the afternoon helping to put up the storage shed at *The Briars*, and we inadvertently also timed the barbecue with the Australian International Airshow being staged at Avalon airport.

- This year is both our Society's 30th anniversary, and the 30th anniversary of the Murchison meteorite fall. Events celebrating these milestones are being planned, such as a trip to Murchison.
- To mark both the cross-over date for Pluto and that of the Equinox, members and friends are invited to a buy-your-own dinner at the Dava Hotel on Fri **19th Mar** at 7pm, upstairs. The Dava is on the Esplanade, Mornington, Melways 145/C6. No bookings necessary.
- The Astron. Soc. NSW is holding its 7th *South Pacific Star Party* on 19-22nd Mar this year near Mudgee. The theme is *The Magellanic Clouds* and cost is \$35 entrance, plus food, accommodation, etc.
- The Brisbane Astron. Society is running the Queensland Astronomy Education Conference on 20th Mar. The theme is *Excellence in Education through the Space Theme* and cost is \$54.90 plus food, accommodation, etc. A2-size info poster will be at our next meeting.

YOUR SOCIETY

NEW MEMBERS

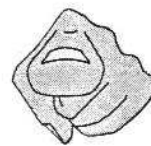
Welcome to the following new Society members:

Simon Birch
Peter Calder
Brendon Elliget
Edwin Geach
Paul Gwynne
Jurgen Klein
Allan Methel
Derek Rowland
Doris Weigert

The ASF is one of the largest groups in Australasia. Membership is currently at 126,

though many are yet to renew for 1999. Please feel free to say hello at general meetings. Specialised badges, windcheaters, T-shirts, books & posters are available at meetings. Society name tags are free to new members who attend meetings. Members are able to borrow library books and are entitled to attend special viewing nights at *The Briars* where you can discover the secrets of the night sky.

HELP NEEDED



Articles, features, book reviews, member observations and points of general interest for this journal are always welcome. New contributors are encouraged. For example do a bit of reading and pass on some information, but remember not to plagiarise. Hand written material is fine; computer text files are perfect. The editor will even correct any mistakes you might make, so don't be bashful.

Does any member have any wood working skills and/or timbers to help make some picnic tables (like those in public parks) for *The Briars* site? Did anyone pick-up a video tape at last September's meeting? The VHS tape that was mislaid was on the Russian attempt at a manned Moon landing. If you found it, please drop it off to the Library or phone the editor. Do we have any imaginative woodworkers who can make a speakers' lectern for VASTROC and for meetings. It must be able to be collapsed for transport and sturdy when assembled and in use. Please contact the Editor for guidance.

RECENT MEETINGS

The first meeting of 1999 saw 54 in attendance on a warm night, with the President chairing, and the format reverting to its former order. There were several visitors in attendance. After going through the many viewing nights and social events that had been undertaken since last meeting, material on the February annular eclipse was handed out and members were reminded that Pluto was shortly to become the ninth planet again after a twenty year lapse at being only the eighth furthest from the Sun. Bob Heale then presented his *Sky for the Month*, complete with handout, including details on the February eclipses and on current comets, including Hale-Bopp that is now a midnight object. The newly discovered comet Tilbrook in Sculptor was also reported, and members were reminded they could receive email messages for free of such discoveries as they occur,

if they provide their email address to Ian Porter. Email addresses are available for free with certain organisations, and you can access them via free local facilities in our public libraries on the Peninsula. David Girling reported on the Leonids from Woomera and presented some spectacular fireball photographs taken by member Martin Rudd in central Australia, showing bright, persistent trains. Ian Porter then presented his *What Goes Up* session. Mention was made of the latest developments in the International Space Station, for which no-one can agree a suitable name, and the two new spacecraft recently launched for Mars; the Mars Climate Orbiter and the Mars Polar Lander. Peter Lowe then showed some photos of his completed "Dog House Observatory" and told members that the Society internet pages were currently under review by him and John Cleverdon, and any feedback was eagerly sought - either positive or negative. Peter also displayed some photos he had taken of Sun Haloes and Sun Dogs he had taken around Christmas last year. These are light phenomena caused by high level water vapour or ice crystals in the atmosphere.

During the tea break members picked up their newsletters, and some may have mistakenly collected those of other members (please check the mailing label in the future). As a result, if any member did not receive their first edition for 1999 by mail, please contact Ian Porter who can forward another copy. After the break, a third of attendees decided to view the video on Black Holes, while the rest heard Ken Bryant deliver a presentation that started with the history of the Dobsonian telescope. John Dobson (its inventor) actually visited us in 1988 and stayed at the home of member Tony Hales for some time. Both he and Ken had the privilege of viewing the heavens with John using Tony's 12.5 inch Dobsonian telescope. Ken then went on to illustrate how he recently built his 18 inch Langwarrin Leviathon telescope from a *Galaxy Optics* mirror ordered from the USA, lengths of *handy angle* struts from the hardware store, PVC pipe picked up from the gutter, and other ingenious bits and

pieces. After question time, the meeting closed at 10:25pm.

February's meeting was chaired by the Vice-President and saw about 45 in attendance. The meeting had some seating difficulties as the school had moved a number of study corrals into our regular meeting area. Nevertheless, the attendees squeezed into the library room where we used to meet with some success. During the meeting the two recent Mt.Martha primary school nights were reported. Mention was made of member observations of the partial solar eclipse. Bob Heale presented *Sky for the Month*, including details of how to observe Comet Jager and two minor planets favourably placed for observation. Ian Porter reported of satellite launches, including the *Stardust* sample return mission. The raffle was replete with prizes, although some doubt was expressed over the use of several "Prophecies of Nostrodamus" books included in the prizes! After the tea break most watched the video "*The Challenge of Mars*" narrated by Patrick Stewart of Star Trek fame. Others retreated to another room for an informal chat. The meeting closed at 10:10pm.

Thanks to the following members who participated in one or more of the viewing nights below: Ken Bryant, John, Roger & Marj Cleverdon, David Girling, Bob Heale, Neil Hewson, David Huby, Don Leggett, Peter Lowe, Pam Marchington, Richard Pollard, Ian Porter, Peter Skilton plus anyone else who may have inadvertently been missed - please make yourself known at these nights. New, inexperienced assistants will be shown the ropes, so don't be shy.

The Briars public night on 15th Jan saw 25 in attendance to see screeching sulphur crested cockatoos on a hot evening, complete with mosquitoes. Peter Lowe delivered the talk while the cloud cover cleared sufficiently to allow observations through the half dozen telescopes in attendance. One mother had brought along her children to see some of the sights she remembered being shown as a girl by a society like ours.

The Briars public night on 22nd Jan saw 20 attend with local

kookaburras laughing while thunder and lightning were on show, but nothing celestial unfortunately. Nevertheless, David Girling and Richard Pollard presented the talk and demonstrated the different telescopes on site. The Society is now wealthier by the dedicated efforts of an anonymous Dromana member (named JC to protect his identity) who relentlessly fished in the dark with a long pearl-clutch between the wooden slats on the Visitors Centre verandah for a one dollar coin that had fallen between the slats a week earlier. After much probing and prodding he succeeded in retrieving it and proudly handed it to the Treasurer.

Mt.Martha Rotary Club on 25th Jan at the Mornington Golf Club saw 50 interested Rotarians staring down scopes on the fairway. David Girling and Richard Pollard did the presentation, and the attendees were reportedly suitably stoked and interested in our activities, including seeing through Neil Hewson's impressive 8 inch Schmidt Cassegrain telescope on a sturdy mount.

The Briars public night on 5th Feb saw only 5 in attendance, with total cloud cover, a hot night and unfortunately no pre-advertising of it in the local papers. Nevertheless, those who attended were treated to an outside slide show on the verandah followed by looking over the telescopes.

About 90 grade 4 pupils were visited at Mt.Martha Primary school on 10th Feb, however, the skies were totally clouded, precluding any viewing. Nevertheless, Ian Porter had great fun talking to the assembly, including explaining something unmentionable about the planet Uranus and its gas composition.

A week later, about 200 grade 5 & 6 pupils, teachers and parents from Mt.Martha Primary school had perfectly clear conditions at a viewing night on 15th Feb. Following the talk and questions in the school hall, the troupe retired to the netball courts where all saw the heavenly objects on offer. There were several bright satellites and quite a few meteors as well, with Jupiter putting on a low altitude appearance. It was a very

successful and enjoyable warm night all round.

SECRETARY'S JOTTINGS

Long time member and past President, Peter Lowe, was recently in hospital just after completing his observatory-building race. Similarly, long time member Bruce Tregaskis has also been in hospital. Both are now recollimating and we hope to hear their presence at meetings soon. The Society has been informed that we are now on the shortlist of five applications for receiving a major Federal Grant to build an observatory and large-scale orrery at *The Briars*. We should know if we were successful in a few months time. Society membership currently consists of 35% females, and we are hoping to increase the balance further, especially on committee. Our web pages have been reviewed by John Cleverdon and Peter Lowe and are looking good. John has agreed to be our webmaster, so if you notice anything out of date or in need of being displayed, please approach him. All key astronomy organisations in Victoria and surrounding States have been notified by letter or email of VASTROC and the call for papers. The venue has been booked and costings are being calculated. We are investigating listing ourselves in local phone books to increase membership levels, as several other astro societies have done around the country (including the ASG and ASV in Victoria). John Cleverdon is preparing a list of all members who live within a certain radius of other members to allow each (if they wish) to contact others with a similar interest a short walk away. Address details will not be given out without permission and the procedure is yet to be finalised. Members who have only provided a P.O.Box number for delivery of *Scorpius*, and wish to take up on this idea, can forward their residential address to the Editor. The shed has been constructed and erected with dynabolts at *The Briars*, with walls up the right way, enabling utilities to be connected soon and hence the observatory to advance. Thanks to Don Leggett, Ian Porter, & Peter Lowe for progressing this, and to others who helped at the working bee to clear the site of debris on 28th Feb. The tree that

fell on the property has been cleared away, providing a safer environment for all. Members after free firewood are invited to contact Ian Porter to arrange a time to collect some. We are scouting out portable whiteboards for use at viewing and meeting nights. Our society is definitely becoming known internationally. We have been approached by a similar sized society in Iran (who have an English teacher to translate us) who wish to have contact (they have only 40% males in their group). Peter Lowe is checking this one out, and no doubt learning Arabic in the process. Our Beginners' sessions for new comers to the Society, or those who just want a refresher of basics, is being started again this year. See the notice earlier in this edition.

LIBRARY MATTERS

The library has acquired some more material that is available for borrowing. Our librarian, Kathy Stabb is more than willing to show you what is available.

Members are reminded that borrowings are for a period of **one month only**, and can be reissued if necessary if you take the courtesy of phoning Kathy or any of the committee members who will relay the request. This helps keep track of all our books, and saves the expense of having to contact overdue borrowers and keep others on the waiting list waiting longer than is fair. Habitual over-borrowers may lose their borrowing rights.

Teach Yourself Astronomy by Patrick Moore (pp 216). This is another title in the excellent *Teach Yourself* series that covers a range of science subjects. This one covers basic facts, what you can see with your eye & simple equipment, covers astronomical photography and introduces cosmology for the beginner.

Starware (2nd edition) by Philip Harrington (pp 376) is the amateur astronomer's ultimate guide to choosing, buying and using telescopes and binoculars. This comprehensive guide is a great help to anyone, especially the novice, who is wondering what to get, and includes many reviews of equipment, pearls of wisdom and tricks of the trade on all aspects of telescopes and skygazing in

general. Experienced astronomers are also guaranteed to pick up something new in this work.

Advanced Amateur Astronomy by Gerald North (pp 400) is a book for those who wish to move beyond elementary star gazing and wish to try some challenging observing projects. It covers topics in optics, the atmosphere and how it behaves, telescope hardware, astrophotography and electronic imaging. Projects then cover not only the solar system but also stars and galaxies, photometry, spectroscopy and even radio astronomy for enthusiasts in this part of the spectrum.

Galileo and the Solar System, by Paul Strathern (pp 96). This book tells the life story and achievements of the great scientist, Galileo, who helped reveal the true nature of the solar system and our place in the Universe. He developed the first practical telescope and trained it on Jupiter, and invented the thermometer amongst other achievements revealed in this book.

RedShift Version 2 on CD ROM is astronomical planetarium and night sky simulation software, and has been kindly donated by Richard Pollard. It can run on either Macintosh or IBM Windows-based computers.

COMPUTER DONATED

The Society was recently donated a school's Macintosh computer, complete with *Voyager II* astronomical planetarium software, by new member Brendan Elliget of Baxter. It is currently being configured for use and will become available for loan to interested members.

JUST FOR STARTERS

MAGNITUDE BRIGHTNESS

Magnitude is the term given to the brightness of a star or any other celestial object. The so-called magnitude scale ranges from very dim objects which have a large negative magnitude value (for example the more distant galaxies in the observable Universe are magnitude 26 or larger, which means they are incredibly faint). At the other end of the scale, very

bright objects have large negative values. For example, the Sun is magnitude -26. The lowest (most negative) number therefore is the greatest brightness.

The magnitude scale was introduced by the Greek astronomer Hipparchus around the year 120 BC as a means of classifying the brightnesses of the stars he observed. He ranked the stars from a value of one (being the brightest he could see) to a value of six (being the faintest he could see). Note that he was using only his naked eyes.

In 1856, the astronomer N. Podgson decided to make this scale a bit more rigorous and suggested that a difference of 5 magnitudes (i.e. from Hipparchus' one to six) correspond to a difference in brightness of exactly 100. Therefore a magnitude 1 star is 100 times brighter than a magnitude 6 star by definition (your eye receives 100 times as many photons of light from it in a given time interval). The scale is therefore logarithmic.

If two objects differ by one magnitude in brightness, then the brighter is 2.512 times brighter than the dimmer one. If they differ by two magnitudes, then the brighter is $2.512 \times 2.512 = 6.310$ times brighter than the dimmer one. If you get your calculator out you'll see that a five magnitude difference is $2.512 \times 2.512 \times 2.512 \times 2.512 = 100$.

The value of 2.512 (the fifth root of 100) is historically called Podgson's ratio in honour of the proposer. The zero point of the magnitude scale was arbitrarily set from a small group of stars near the North Celestial Pole at the time.

The brightness of a star depends not only on its intrinsic (self) brightness, but also on its distance from Earth: a further star from Earth will be fainter than an identical star much closer to Earth. The term *absolute magnitude* then applies to the true brightness of a star if you could stand a fixed standard distance away from it. The standard distance is taken as 10 parsecs. In contrast, what we see from Earth is called the *apparent magnitude*.

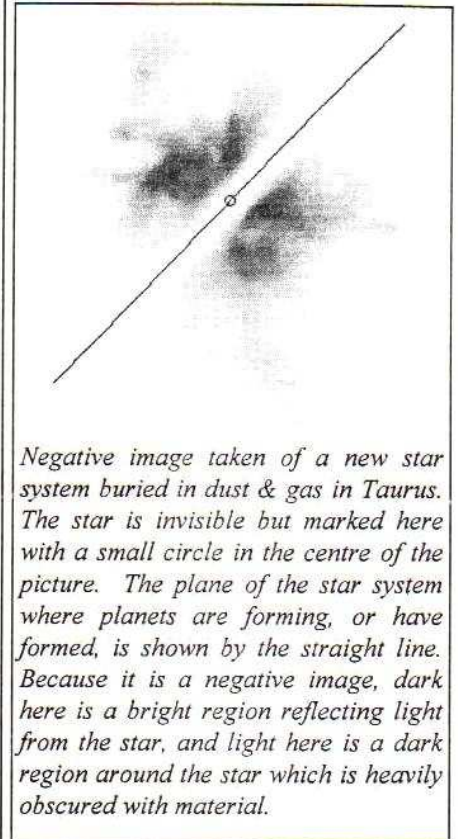
IN THE NEWS

A PEEK AT EROS

Asteroid 433 Eros has been found to have at least two medium-sized craters, a long surface ridge and a density comparable to the Earth's crust, according to measurements from NASA's *Near Earth Asteroid Rendezvous* (NEAR) spacecraft. NEAR is now on course to rendezvous with Eros to begin a year-long orbital mission starting in mid-February 2000, after an aborted attempt earlier this year.

During the flyby in Dec/Jan, which came to within 3,800 kilometres, over 200 photos were taken and from these a model of its shape was deduced from horizon profiles, shadows and measured landmarks (refer to diagram). Eros was found to have a size of $33 \times 13 \times 13$ kilometres, it rotates once every 5.27 hours and has no detected moons. The photographed ridge-like feature, combined with the measurements of high density, suggests that Eros is a homogeneous body rather than a collection of rubble. The surface of Eros is pocked with craters. The two largest craters are 8.5 and 6.5

km in diameter. The existence of fewer, smaller craters could be an indication that Eros has a relatively young surface.

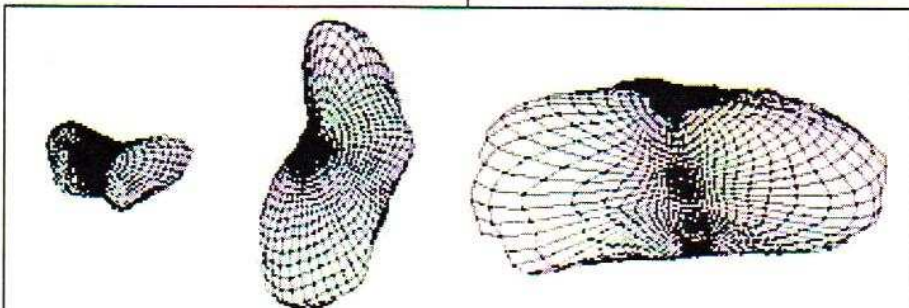


Negative image taken of a new star system buried in dust & gas in Taurus. The star is invisible but marked here with a small circle in the centre of the picture. The plane of the star system where planets are forming, or have formed, is shown by the straight line. Because it is a negative image, dark here is a bright region reflecting light from the star, and light here is a dark region around the star which is heavily obscured with material.

BIRTH OF NEW SOLAR SYSTEM

The Hubble Space Telescope has been imaging an eerie disk of dust encircling a young nearby invisible star (called IRAS 04302+2247) in the constellation of Taurus recently, providing a unique look at what the very early formative stages of our Solar System were like. The planets of our Solar System are believed to have condensed from a pancake-like disk of dust and gas about 4,500 million years ago, very similar to these images from 450 light years away.

The picture shows an edge-on disk of dust and gas that is a likely planetary construction zone. Such disks are notoriously hard to see because the glare from their parent star overwhelms the feeble light reflected from the disk. The current picture by chance has the disk exactly edge-on to the Earth's line-of-sight, and so the dark dust and gas completely hides the star buried within it. The disk is about 15 times the diameter of Neptune's orbit. The disk above and below the plane of the distant star system is illuminated by the



Computer generated models of asteroid Eros as determined from images sent back by the NEAR spacecraft. The images show the minor planet tumbling over a period of about 2.5 hours when the spacecraft closed from a range of 10,000 km (at left) to 4,000 km (at right) distance from the body. Its shape has been described as a shoe, a battered boat or even a peanut.

Neptune's, and for a period of about 20 years Pluto is slightly closer to the Sun than Neptune. Most planets only make small excursions of a few degrees in the vertical (out of the page) direction, but Pluto is an extreme case at over 17 degrees.

Pluto was discovered on February 18th, 1930 by Clyde Tombaugh, a 24 year old American lab assistant at the *Lowell Observatory*, and it remains the only planet that has not been visited by a spacecraft...yet. Pluto was officially labelled the ninth planet by the International Astronomical Union in 1930 and was named for the Roman god of the underworld, though there has always been controversy over whether it is really a planet or merely a large asteroid.

Pluto and Neptune are in what is called a 3:2 resonance that prevents their collision or even any close approaches, regardless of their separation in the vertical dimension. In fact, the minimum Pluto-Neptune separation is 17 AU, compared to the minimum Pluto-Uranus separation of 11 AU.

This effect occurs due to an exchange of angular momentum with Neptune. When Pluto is "catching up" to Neptune, it gains angular momentum at Neptune's expense. Pluto moves into a higher orbit, but falls behind Neptune, since higher orbits involve slower velocities. Many years later, as Neptune seems poised to overtake Pluto, the opposite exchange takes place. Pluto loses angular momentum to Neptune, falling to a lower (but faster) orbit.

Neptune is relatively bright compared with 14th magnitude Pluto, and can be viewed in binoculars. Pluto, however, requires a telescope of at least 6-8 inches aperture and dark skies.

Well, which crossover dates are the correct ones? For my money, it seems to be on the side of **January 21st, 1979** and **March 15th, 1999**. If *NASA* is sending a probe shortly to Pluto I'd say they know its orbit as well as is possible given chaotic perturbations to it. However, it is very, very odd that the *Lowell Observatory* (that discovered Pluto) differs by a few weeks in both of these dates. I am sure the matter will not rest here, and other

Astronomical publications will come up with a host of other possible dates in the coming months.

Peter Skilton

HAWAII ROCKS

On Jan 14, about 4am local time, a large rock disintegrated high in the skies above Hawaii in an airburst that was felt by residents and produced a blinding flash likened to someone igniting a welder's torch. The fireball bolide that exploded over the islands with an atom-bomb-like force reached an amazing brightness of magnitude -20 (the Sun is magnitude -26).

Amateur astronomers outside at the time witnessed the body shattering into fragments accompanied by smoke trails, and a loud explosion was heard that resembled thunder and rumbled on for about half a minute. No damage has been reported.

WHY I LIKE GRUS

I have a nostalgic fondness for Grus. It is both distinctive and simple to find in the southern sky, and it's where I got the galaxy hunting bug. Until I started on Grus, I had only viewed a few galaxies, whereas now I've viewed over 1350.

Grus has the easiest galaxy to find in the entire sky. Just an eyepiece field below and east of Alpha is NGC 7213, a nice brightish little galaxy. I've had no trouble finding this galaxy from my light polluted backyard, with my 8 inch Celestron. Furthermore, there are lots of other galaxies of moderate brightness in the area, most of which are conveniently located near easy-to-spot guide stars. To my mind, while the galaxies of Virgo, Fornax, Sculptor and Leo are better, they are nowhere nearly as easy to locate.

If galaxy hunting has been a problem for you and your scope, I would recommend cutting your teeth on this constellation. Be warned, it can become addictive.

Grus also has a big bright planetary nebula, I5148, which is not plotted in early editions of *Sky Atlas 2000*, even though it is more impressive than a large number that are plotted. If you have *Sky Atlas 2000*, just look for it

close to the intersection of the plotted 22hr and -40 degree lines (it's just short of each line).

Renato Alessio

USING BINOCULARS WITH A TRIPOD

I've noticed from conversations and observation that many people don't use tripods and binoculars the way I do. Most just put the tripod on the ground, and view through the binoculars. Used this way, you get the steadiest images, but you can't see too far above the horizon.

I've found that the holding of the actual tripod itself reduces much of the shaking in the binoculars, in comparison to just holding the binoculars themselves. This enables you to get a pretty decent view near the zenith. Furthermore, you can wrap your arms around the tripod legs, which is a bit more stable still, and which saves you using your hands in near zero environments.

Renato Alessio

COMPETITION WINNER

The winner of the December space stamps competition was Cassandra Skilton who submitted the shortest and longest astronomical or space-related terms by the closing date in January as being "Sun" and "Space shuttle" giving a score of $12/3 = 4$.

ASV ASTROLOGER?

A few correspondents tell me that they saw last year's President of the *Astronomical Society of Victoria* on the TV recently trying seriously to explain precisely what is a "Blue Moon" (which is simply the second full Moon that falls within a calendar month, and has nothing to do with the Moon's actual colouration).

Unfortunately the publicity may backfire and attract a different genre of new member. With an air of authority in the matter, Channel Ten repeatedly referred to him as the "ASV Astrologer". I will have to check out (tongue in cheek) the website of the Astrological Society of Victoria sometime to see what's in the stars for their society.

FROM AROUND THE PLANET

Leading Astronomical Societies exchange each other's newsletters to assist in sharing items of interest. This column grabs some of the highlights of recent receipts. You can find out more in the library.



Ballaarat Astron. Soc. (Vic) - They have applied for a Federation Grant to fund a 16 inch telescope accessible by wheelchair, and connected with a CCD camera. Article given on Galileo. Several members are currently making telescope mirrors from glass blanks, and the society's 26 inch Baker telescope has just had its clockwork mechanism and cast-iron mount cleaned and repaired. Their new web site is up and running at <http://www.giant.net.au/astronomy>.

Astron. Soc. Tasmania (Tas) - A report on a recently observed occultation of Jupiter by the Moon, and musings on the poor weather last year for observing. The society has recently conducted several successful public viewing nights in Launceston. Reports on current auroral activity are given, and on the 1998 Leonids shower, with 22 meteors being the most observed. Three members trekked to Darwin Crater, 30km South of Queenstown and discovered in 1972, searching for tektite glasses which they did manage to find. Conditions were wet and leech infested - just right for an adventure to remember. The society is listed in their state's phone books and fielded over 100 calls last year on all sky topics.

Latrobe Valley Astron. Soc. (Vic) - Brief review given of *Guide* and *The Sky* astronomy software. Held their annual starbecue at a member's residence. Reports of the Leonids meteor shower in 1998 are given from interstate and overseas. The UK saw about 1 meteor per minute, these being very fast moving, with most brighter than magnitude 1, and even visible through thick cloud. Some were magnitude -9! This gave observers the amazing appearance of a World War 2 artillery bombardment. Similar reports came from Hawaii, with 80% of meteors being fireballs with a green tinge to them.

Astron. Soc. South West (WA) - Continued their public open nights over the holiday period. Members are rostered to give a brief talk on selected constellations at these nights, and show interesting objects within the constellation. Their 50cm equatorially mounted reflector recently had its mirror dusted and its observatory is being spring-cleaned. They have a web site at <http://www.netserv.net.au/yvan/assw>.

Astron. Assoc. Queensland (Qld) - They are sub-leasing their clubhouse to a railway modellers' group. They will shortly be hiring a mini-bus to tour the Australia telescope and Siding Spring observatory. Leonids reports are given for South East Queensland, with ordinary levels being seen in 1998. The 1998 Queensland Astrofest had a 4.5 kilogram telescope counter weight tossing competition. They now have a web page at <http://www.aaq.org.au>. The society has progressed in 1998 and has reached the 100 members mark. Article on the bizarre Lightning Ridge observatory, shaped like a medieval castle.

Astron. Soc. South Australia (SA) - A vote of their members at the AGM decided to buy a \$10,000 Stargazer 2000 telescope. A 16 inch mirror was donated to the society by a member. Membership is 400. Reports from over a dozen observers on the Leonids meteor shower in 1998 suggested 16 meteors per hour, with 3 fireballs seen per hour locally. Member Justin Tilbrook discovered a comet earlier this year. Article on Orion, the Hunter, the attempt to reclassify Pluto as an asteroid, and the star Alnilam in Orion. Biographical article on cosmologist Brandon Carter. Reports from overseas of deaths associated with observing the Leonids last year (one fell off a bridge by mistake, four died in traffic accidents on the way to observe, and another was caused by the other driver being distracted by goings on in the sky).

Astron. Soc. Victoria (Vic) - The society's 27 inch Dobsonian went on show at their annual star party in Heathcote - unfortunately it needs a very tall step ladder to reach the eyepiece, but the bought mirror is

apparently well figured. Mt. Stromlo has loaned a historical 30 inch mirror to the society (known as the Common/Reynolds). A useful tip that cheaper 60 mm refractors can be spruced up by using a 1 inch-to-1.25 inch adaptor tube and employing 1.25 inch eyepieces, instead of the poorer quality 1 inch ones usually supplied by the manufacturer. Meteor observer from our Society, David Girling, is featured with his new observatory. Article on the upcoming Mars Opposition and a report on the 1998 Leonids from Woomera. The society's use of the Old Melbourne Observatory facilities is under quite some doubt.

FINAL PRONOUNCEMENT - OBLIQUITY OF THE ECLIPTIC

The ecliptic is the average plane of the Earth's orbit around the Sun. Its name actually arises because Solar and Lunar eclipses can only ever occur when the Moon passes through this plane. Because most of the other planets have orbits that are inclined to the ecliptic plane by only very small angles, their observed positions in the sky are always near to the ecliptic. The band of constellations in the sky through which the ecliptic passes (at least at 2,000 years ago) defines the traditional zodiac. Astrological zodiac signs are supposed to represent the times when the Sun is in such a position in the sky that it falls within a particular zodiac constellation.

The so-called "obliquity of the ecliptic", pronounced "Oh-blick-kwit-ee" is the angle at which the Earth's equator is inclined to the plane of the ecliptic. This is equivalent to the tilt of the axis of rotation of the Earth that passes through the North Pole and South Pole of our planet. Its present day value is 23 degrees 26 minutes (this is the tilt that your globe of Earth at home is tilted from the vertical). Because the Earth is spinning one revolution per day, it acts as a giant gyroscope and wobbles or nutates over a period of about 26,000 years. During this time, the obliquity of the ecliptic varies from 21 degrees 55 minutes to 24 degrees 18 minutes.

If you have any Astronomical query that has been niggling you, drop it in the question box at a General Meeting and let us look into it for you.



Left - Working Bee at the ASF
Briars site on the 28th February 1999

Photo - By John Cleverdon



If this box is ticked then membership needs immediate renewing and this may be your last edition, so please contact the Treasurer. Newer members who join late in a calendar year will have this time taken fairly into account when renewing in January, and should remind the Treasurer of this.

The constellation of Grus, the Crane (i.e. a bird), lies South of the bright naked eye star Fomalhaut (alpha Piscis Austrini). It is best observed in the Southern hemisphere due to its declination. For Arab astronomers in antiquity, the stars within the present Grus were actually part of the constellation Piscis Austrinus, and astronomers in ancient Egypt considered the constellation being their symbol. Grus was first shown in its present form by the German astronomer Johann Bayer who depicted it in his Uranometria star atlas of 1603. Bayer is best remembered for introducing the naming of stars by Greek letters of the alphabet from the brightest in each constellation being alpha, the next dimmer being beta, the next gamma, the next delta and so forth. The constellation was, however, originally proposed 6 years earlier by Pieter Dirksz Keyser and Frederick de Houtman. During the Middle Ages, Grus was known as the flamingo (Phoenicopterus). Its brightest star, alpha, is blue-white and called *Alnair*, meaning "bright one". The next brightest star, beta, is a red variable star, and gamma is a blue giant. The constellation covers only 0.8% of the sky and contains 24 stars visible to the naked eye. It contains some faint galaxies accessible by telescopes of 8 inch diameter or greater.