



SCORPIUS

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

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(Jul - Aug)

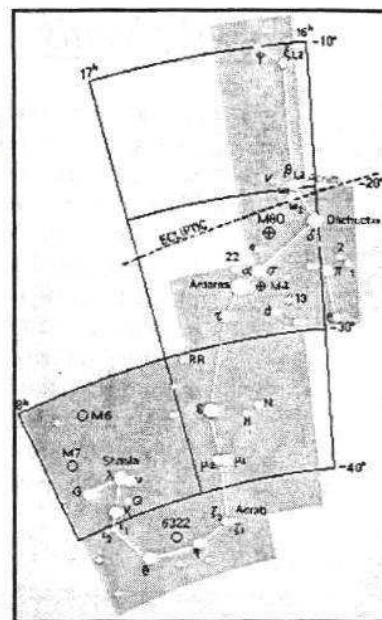
The Astronomical Society of Frankston was founded in 1969 with the aim of fostering the study of Astronomy by amateurs and promoting the hobby of amateur Astronomy to the general public. The Society holds a General Meeting each month for the exchange of ideas and information. Regular observing nights,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

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

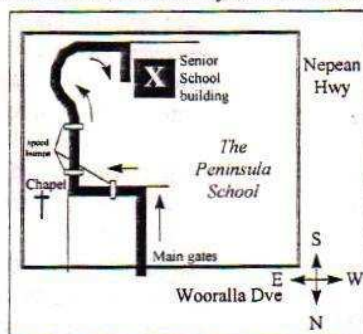
Phone: 0419 253252

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

Email: aggro@peninsula.starway.net.au



Visitors are always welcome!



Annual Membership

Full Member	\$32
Pensioner	\$27
Student	\$22
Family	\$43
Family Pensioners	\$37
Newsletter Only	\$16

DUE 1st OF JANUARY EACH YEAR

President & Acting Editor
Ian Porter (03) 59 854203

Vice President & Loan Instruments
Richard Pollard (0419) 100 802

Treasurer
Bob Heale (03) 9787 1748

Secretary
Roger Giller (03) 9702 2685

Committee of Management
John Cleverdon, Don Leggett, Peter Lowe,
Peter Skilton, Sally Zetter

All phone calls before 8:30pm please.

FUTURE EVENTS

General Meetings:

Wed 20th Sept 2000 At the Peninsula School

Session 1: Forum

Session 2: Loan telescope outside if weather is clear.

Session 3: Video

Wed 18th Oct 2000 at the Peninsula school

Session 1: Beginners session – Navigating the night sky.

Session 2: Forum

Wed 15th Nov 2000 at the Peninsula school

AGM and guest speaker

Viewing Nights:

Members Only:

Sat Sept 23/30 Oct 21/28 Nov 25 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 5985 4203 before attending. 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 6th October and Fri 3rd November, all at 8pm. Assistants are required.
- Thomas Mitchell Primary School in Endeavour Hills sometime in term four. Date to be confirmed so keep an eye on the "Whats On"

Phenomenal Events:

- Venus and Mercury have returned to the evening sky. Jupiter and Saturn continue to rise earlier in the evening (around midnight)

Social Events

- A group of members will be heading out to see the new Australian movie, "The Dish" on Sat Oct 21. The movie, produced by the same team that brought us "The Castle" is a comedy set at an Australian Tracking station during the Apollo program. More details will appear in the "Whats on" and at the next two monthly meetings.

YOUR SOCIETY

NEW MEMBERS

Welcome to the following new Society members:

Max Anderson
Michael Balfour-Smith
Tanya Hill & Alex Merchant
Mark Hillen
Jim Imrie
Ian Sullivan

The ASF is one of the largest astronomy groups in Australasia. Membership is currently at 157. 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 and glories 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.

RECENT MEETINGS

- July's meeting saw us making full use of the lecture theatre, including the multi media projector for the first time. After the usual presentations, we adjourned into the usual two groups, including a beginners introduction to telescopes and an informal chat session.
- August's meeting saw an excellent turnout to hear our guest speaker, Tanya Hill. Tanya is the resident astronomer at the Melbourne Planetarium and is completing a P.H.D in Astronomy at the University of N.S.W. Her presentation was superb and we have had an enormous amount of positive feedback from members who enjoyed the night tremendously.

SCHOOL AND PUBLIC NIGHTS

- On the first day of the GST coming into effect, the ASF visited the Young Scientists of Australia group, who were staying in Rosebud for an annual event. This group of 30 included senior school students up to those currently doing their PhD's. Unfortunately the weather was most unkind, precluding telescope observations, so Ian Porter and Peter Skilton talked to the assembly, fielding the anticipated curly questions as they went.
- On July 7, the monthly public viewing night was held at The Briars visitors' centre, and saw 17 in attendance under 50% cloud cover, which meant that both observing and Q&A were possible.

Questions naturally included the upcoming total lunar eclipse, and how best to observe and photograph it.

- On August 4, the next public night saw 25 in attendance, but cloud completely prevented observations.
- On August 26, Peter Skilton spent the afternoon and evening with the Pearcedale Girl Guides, a combined group from 6 years of age up to 23 years of age. Their camp near Shoreham included a thorough walk through of *Pipehenge* (a piece of equipment that will be the subject of an article in a future edition) during the late afternoon before Sunset, followed by a talk and Q&A session on the solar system, capped off by telescope observing. Unfortunately rain prevented any external night sky viewing, however, the assembled crowd of 50 girls took contentment looking through my instrument placed indoors, and viewing distant terrestrial signs at differing magnifications, and peering in neighbouring windows to see what was happening on distant hilltops. The lesson is, even when in rural areas – always close the curtains because you never know who might be watching!
- On the 5th of Sept, 45 5th graders from Black Rock primary enjoyed a windy viewing night at the Briars. Despite the wind they had a great night, and were one of the best groups I have ever given a presentation to... Thanks to Bob Heale, David Huby, Bruce Tregaskis, Peter Skilton, John Cleverdon, Ken Bryant, Sally Zetter,

Richard Pollard and Roger Giller for help with school and public nights (if I missed someone let me know!)

SECRETARY'S JOTTINGS

Effect of the GST

Over the past two months, Bob Heale, our treasurer, has put an enormous amount of energy into dealing with the issue of GST compliance for the society. Because we supply services to schools and the Public we have had to register for the GST (if we did not, schools would not deal with us), and we must pay GST on Membership fees collected. As a result, membership fees have had to increase an average of 8%. The new fees are:

Annual Membership	
Full Member	\$32
Pensioner	\$27
Student	\$22
Family	\$43
Family Pensioners	\$37
Newsletter Only	\$16

Our charges for public nights are now:

Adults \$6 Children \$3 Family \$18

We are investigating ways in which the society might be made GST exempt.

- Donations of tables and shelves for the new building would be greatly appreciated. Thanks to several members who have donated chairs.

EVENTS

FREE SCIENCE PUBLIC LECTURE SERIES.

The Faculty of Engineering and Science
VICTORIA UNIVERSITY presents
Its FREE public lecture series for
2000 titled.

September 14th
Our solar system: Is it unique or

commonplace in the universe?
Professor Ross Taylor

October 11th
Dark Matter
Professor Ken Freeman

Please note all lectures are free and will be held at a Victoria University city campus, level 12, 300 Flinders St (opposite Flinders St Station). All lectures will begin at 6pm and will run for approx 1 hour. Light refreshments will be provided after the lectures. For bookings please phone 9688 4241 or fax 9688 4806 or e-mail vulectures@hotmail.com

Feature Article

NSW ASTRO ODYSSEY

It has been a longing of mine to see the big telescopes of central New South Wales. To that end, I dedicated my last leave to traveling north in order to see as many of the telescopes in this area of Australia as I could gain access to. With such a reputation for clear dark night skies and good "seeing", I anticipated an excellent time.

The first telescope I came across was the Parkes Radio Telescope. This telescope which is situated some 26 Km to the northeast of the town proper, was one of the first of its kind in the world, and at 64 metres across (about 200 feet), is still on an impressive scale as the world's third largest. An information building, which is under expansion, has a number of displays of radio astronomy and the function of the scope itself and is open free to the public. For a fee of \$3 per adult, (concession and family fee available), you can see a 25 minute audio-visual display in the small theatre. Of interest just to the left before you enter the building, you can see a small apple tree, a scion of one of the apple trees from Sir Isaac Newton's garden. Though now some decades old, the dish of Parkes is still so accurate that it is only out of shape over the whole dish by 1 mm. This accuracy is a testament to the builders who did all

the welding at night, so as not to cause any distortion to the metal during the day by the heat of the sun. While speaking to some workmen I was told of a telescope near Dubbo that I might be able to see.

On the outskirts of Dubbo, just before the Western Plains Zoo is a military Museum just off the highway and on a dirt road. It advertised "Telescope viewing", so curious I entered. In a corner of the museum was a "poor man's science works" and two 8 inch Dobsonian telescopes. I was informed that for group tours, an extra \$3 would get you a nighttime look at the sky. Inside the house of the owner however was a rather nice 14 inch, home made and unused Dobsonian of the truss variety. The gent at the museum said that he did not believe the night viewing would be available for very much longer. The telescopes that the workmen had told me about were really to be found at the Dubbo Observatory, not at the military museum. Two kilometres down this dirt road, however if you continue on the highway a brown "tourist" sign informs you that the Dubbo Observatory is some 3 kilometres away on the sealed road past the entrance to the Dubbo Western Plains Zoo.

The Dubbo observatory consists of a large metal shed where the talks are held. At the entrance to the centre is a large antenna approximately 20 feet across, but more of this later. There are two parking spaces for handicapped, and wheelchair access throughout the centre. Out the back on a fully concreted path and slab, is an outdoor viewing area with provision for three 12 inch, Meade LX-200 Schmitt-Cassegrain scopes and an adjustable stand for binoculars. Other mounds and objects about this slab gave me much to think about. For instance, what were the several "horseshoe" shaped mounds used for? I am still at a loss to explain them and their use. The charge is \$10 per person with concessions available for families.

My next stop was just 64 Km up the road at a small town called Gilgandra. Here for over

twenty-five years an observatory has stood right in the centre of town. Built by a local farmer who used some bush ingenuity in its construction. For example, the mechanism for opening the slot in the dome is from bits of tractors and milking machines. Now owned by a local schoolteacher and some helpers to run things, it is open to the public every night from 7 PM to 10 PM. The cost is \$8 per adult. The building is a brick structure with large dome and an adjacent meeting room to the side. Under the dome is a small display area. The telescope is a Newtonian 12.5 inch reflector (f6) on an equatorial base. The dome rotates quite easily by hand.

Travelling north I turned off the main highway to take the scenic route to the Warrumbungle National Park, home to the Siding Springs Observatories. Set high up in the Park and makes up a small village with private motel and fire station. It is the home of many large telescopes, including the world famous Anglo-Australian telescope (3.9 metres) and the UK Schmitt 1.2 metre scope. Various Australian universities and one from Sweden, also operate a number of smaller scopes. Only the AAT is available to the public. Admission is \$5 through the kiosk (open every day except Christmas from 09.30 to 4PM), with a display area off to the side. As instructed I followed a winding path to the base of the structure that is the dome. Taking the lift to the fourth floor gets you to the bottom of the telescope. What can I say about my first impression of this telescope, **it's big**. Straining my neck to look up as high as I could was necessary just to see the top of the scope. If you can think of a large building the size of the Peninsula building in Frankston, and topped with a large white dome, you get an idea of the general scale of this beast. Leaving the Warrumbungle's and heading for Coonabarabran I passed the "Skywatch Observatory and Astro golf" centre.

Situated just on the outskirts of Coonabarabran the dome houses a newtonian scope on an equatorial mount of around 16 inches. Other smaller scopes can be

placed outside on a viewing area as needed. An entrance fee of \$10 gets you into the display area with static displays and theatre while waiting to have your turn at the scope tour. The dome is made of wood with hexagonal wooden frames, and is at the highest point on the property. Another large static dish stands out front. There is also an eighteen hole mini golf course with a space theme if you like that sort of thing.

My trip took me as far north as The Australia Telescope at Narrabri. This is a large complex of five radio telescopes weighing 270 tonnes each, running on a three kilometre track that is 9.8 metres wide. Another dish is sighted three kilometres away to the west. When the track was put in they had to cut out enough soil to straighten out the curvature of the earth, that is 2 metres. Together with dishes at Siding Springs, Parkes, Tidbinbilla and a small dish outside Hobart, they can all be joined to form a radio telescope on a scale of over 1400 Kilometres. There are also some optical scopes at the site, some appear to be for observing the sun. There is also many of the very old radio telescopes to be found. Some look like telegraph poles that run off in different directions. Others are dish like of around 20 feet across. Some of these have been turned into static displays at some of the observatories around the state, remember Dubbo and Coonabarabran.

My last offering for you is the Darby Falls Observatory, about 20 Kilometres outside the town of Cowra. Run by Mark Monk, who has a large shed, which is used for talks and storage and a shielded outdoors viewing area. Mark has a number of scopes. Some are very large indeed, where 20, 30 and 40 centimetre scopes are available, along with a 16 inch (45cm) and a 20 inch (0.5 metre) Dobsonian's. The last two are very unique, having a truss make up on a ball base. This allows the scopes to be swivelled quite easily, and along with a mounting track that powers the scope in right ascension for half an hour before it has to be reset. Up to fifty people can see the stars at this centre. The place is in a very dark sky area, so the "seeing" is

excellent. Mark charges \$5 per person for a session from 7 to 10 PM, other times by appointment.

Well that's about it; hopefully I can have all of these places transferred to videotape soon so you can see for yourself.

Regards,
David Huby

AURORA SEEN

There was a reported sighting at 0615am local time on 16th July (i.e. preceding the total lunar eclipse that night) of a glorious Aurora Australis. It was seen clearly through a house window by Thurley and George Fowler of Frankston who witnessed an extremely broad, rose red curtain of light to the South South West direction, which persisted for at least 15 minutes. During this time, rays of light danced around the region, and flashes of light were also very noticeable.

Upon notification, the society's Aurora Alert network swung into action, letting others know of the event. If you would like to be added to the telephone list for the Alert network, and have the simple procedures to follow explained, just call Roger Giller on 9702 2685 after working hours.



A brilliant display of the Aurora Australis as seen from low Earth orbit by NASA's space shuttle (the tail section of which is to the left).

AND THEN THERE WERE TWO

The Hubble Space Telescope and the Chandra X-ray observatory, both in low Earth orbit, recently observed comet LINEAR (C/1999 S4) and were fortunate enough to catch the visitor to our region of the solar system in a brief, violent outburst when it blew off a piece of its crust.

The eruption, the comet's equivalent of a volcanic explosion (though temperatures are far below freezing - about minus 40 degrees Celsius) in the icy regions of the nucleus or core, spewed a great deal of dust into space. This mist of dust reflected sunlight, dramatically increasing the comet's brightness over several hours. Hubble viewed the chunk of material jettisoned from the nucleus and imaged it floating away along the comet's tail.

The fragment moved away from the core's weak gravitational grasp at an average speed of about 10 km/hour, which is a little more than a quick walking pace.

Comet LINEAR was named for the observatory that originally discovered it in September 1999. LINEAR is the acronym for Lincoln Near Earth Asteroid Research, a project to search for Earth-approaching objects.



Comet LINEAR, as observed by the Hubble Space Telescope. Notice the comet brightens as the fragment is dislodged in the second image. The bright fragment is clearly separated in the third frame.

CALLING ALL VARIABLE STAR OBSERVERS:

The variable star *BL Tel* is known to undergo eclipses once about every

778 days, and the next one is predicted to be centred around **late September 2000**. The star is located in the constellation of Telescopium (which is abbreviated to *Tel*), next to the tail of Scorpius, the scorpion.

But how can a single star be eclipsed? The answer is that the system actually consists of 2 giant or supergiant stars in orbit around each other; one being fainter than the other so that once around the orbit, the fainter star blocks off some of the light reaching the Earth from the brighter star. It takes several weeks for the fainter star to move right across the face of the other star (from our line of sight).

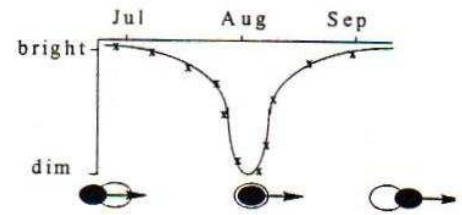
The result is the combined light observed from the system is seen to dim during this period, reaching a minimum light level at mid-eclipse. The stars are so far away that telescopes cannot separate them individually. For *BL Tel*, the normal brightness is about magnitude 7, which is easily seen in 7x50 binoculars. At mid-eclipse it can drop to magnitude 9 or 10, requiring maybe a 2-3 inch telescope.

It is surprisingly easy to determine the magnitude (or apparent brightness) of a star to the nearest decimal point, once you've been shown how. The aim is to monitor the star every few days (or more frequently around mid-eclipse) and just estimate its brightness at a time and date convenient to you; just record what it was and the date/time also. By combining such results from all observers (even if only one or two from each person), an average "light curve" can be built up, showing the eclipse in detail. Previous light curves have been published for example in *Sky & Space* e.g. April 1997.

Members are asked to start observations immediately, and continue until *BL Tel* returns to its normal brightness. This exercise makes an excellent astronomy project for students or beginners to Variable Star observations, and who might have access only to binoculars.

Further instructions from the basics

onwards, and a simple finder chart can be obtained from any of our keen variable star observers and from the author. Just phone a committee member if unsure. It really is straightforward and a rewarding experience, once you've been shown how.



Typical behaviour of BL Tel over time as the two stars approach and eclipse each other. Typical observations are shown by an 'x' each time, permitting the light curve to be drawn through them. Why not try it and pass observations to Peter Skilton for processing.

OBSERVING WITH A BOOMERANG

An international team of cosmologists has released images that reveal the structure that existed in the Universe when it was 1,000 times smaller and hotter than it is today. Project BOOMERANG (Balloon Observations of Millimetric Extragalactic Radiation and Geophysics), used an extremely sensitive telescope suspended from a balloon that circumnavigated the Antarctic in late 1998. The balloon carried its telescope to an altitude of almost 37 kilometres.

Today, the Universe is filled with galaxies and clusters of galaxies. But 12 to 15 billion years ago, following shortly after the Big Bang, the universe was very smooth, incredibly hot and dense. The intense heat that filled the early universe is still detectable today as a faint glow of microwave radiation visible in all directions. This radiation is known as the cosmic microwave background

Since the Background Radiation was first discovered by a ground-based radio telescope in 1965, scientists have eagerly sought to obtain high-resolution images of it. NASA's COBE satellite discovered the first evidence for structures in 1991.

The BOOMERANG images are the first to bring the cosmic microwave background into sharp focus. They reveal hundreds of complex regions visible as tiny variations in temperature of only 0.0001 degrees Celsius. The patterns observed are consistent with basically sound waves racing through the early universe, creating the structures that by now have evolved into giant clusters and super-clusters of galaxies.

The BOOMERANG images cover about 3 percent of the sky, and indicate that our Universe appears to be flat, not curved, consistent with the inflationary theory of the formation of the Universe. This theory hypothesizes that the entire universe grew from a tiny subatomic region during a period of violent expansion occurring a split second after the Big Bang. The enormous expansion would have stretched the very geometry of space until it was flat.

The balloon used for BOOMERANG was massive, having a volume of 800,000 cubic metres, which was required to lift the two tonne telescope to required altitudes.

LATEST ASTRO ANNOUNCEMENTS

One of the world's premier gatherings of career astronomers, the International Astronomical Union General Assembly, had its 3 yearly meeting last month. Over 1,700 astronomers from 87 countries went to Manchester in the UK to talk for 11 days about the latest discoveries.

The infamous Hubble Constant, that relates the speed at which the Universe is expanding, has been notoriously difficult to pin down for decades now, with many

contradictory results obtained. It appears that the Hubble Space Telescope has now finished one of its key projects; the determination of the expansion rate. Since 1990, the orbiting telescope has been measuring the distances to many galaxies out as far as the Virgo Cluster, about 60 million light years away. When combined with measurements of how quickly these galaxies are receding from Earth, it has yielded a value for the Hubble Constant of 74 ± 7 kilometres per second per megaparsec. This translates to a galaxy 100 megaparsecs from us (i.e. 326 million light years away) as receding at 7,400 km/sec, and one at 1000 megaparsecs from us as receding at 74,000 km/sec. This rapid movement away from us is due not so much to the movement of the galaxy through its local neighbourhood, but rather to the very fabric of the Universe expanding and taking the galaxies along with it for the ride. As an analogy you can think of the galaxies as being like ants located randomly on the outside of a balloon that is being rapidly inflated. The ants can move around a little if they wish, but the main reason any two ants appear to be receding from each other is because the balloon is getting bigger very quickly. As the balloon inflates, the ants all move apart.

Also mentioned at the assembly was the fact that now over 50 planets have been discovered orbiting around other stars. One of the more recent ones is only 10.5 light years away in Epsilon Eridani, virtually in our cosmic backyard. This star is very much like our own star, the Sun, and the discovered planet is about as far from Epsilon Eridani as Jupiter is from our Sun, and has mass and orbital period that are not too different from those of Jupiter. Another planet the mass of Saturn was also detected around a star HD83443, about 141 light years away, and was announced at the gathering.

Peter Skilton

Astrocars

Doing the amount of driving I do, I got to thinking about "astronomical" car makes and models.

So, I sat down and had a think:

Holden has the **ASTRA** and **NOVA**, the **GEMINI** and, if you like, the **APOLLO**.

Ford gives us the **TAURUS**, the **MERCURY**, the **GALAXY**, the **TELSTAR** and stretching it a bit, **LASER**.

Toyota has the **CORONA** and **STARLET**: Nissan has the **PULSAR** and for spacecraft, Mitsubishi presents, rather ominously, the **CHALLENGER**. There's the Land Rover **DISCOVERY**, the Honda **ODYSSEY**, the Nissan **PATHFINDER** and the Chrysler **VOYAGER**.

There are probably lots more: if you think of one or two, send them in to the editor.

Incidentally, if any car-namers are reading this, here are a few suggestions:

The Holden **GALILEO**, the Ford **CALLISTO**, the Toyota **HYAKATAKE** or the Nissan **CHARON**?

Mercedes Benz, who only give numbers to cars, could go with the exiting sounding **PSR1257+12**.

Richard Pollard

ANNUAL AGM

Members are reminded that the societies annual general meeting will be held on Wednesday 15th November at the Peninsula School, starting at 8 pm.

There are likely to be several committee positions vacant, so we are keen to receive nominations.

Member Database

We have found this year that we do not have the phone numbers of many members and that some of the other information we have is out of date. We are including in this newsletter a form which you may post or return at a meeting updating such information

Member Information – Please update this and post or return this at a general meeting if your details have changed or you would like to provide extra information

Please Note that providing this information is optional.

Name: _____ Address: _____

Membership Type : Single ____ Family ____ Pensioner ____ Newsletter only ____

Numbers of Years in Society : _____

Telescopes Owned : _____

Observing interests : _____

Phone No : _____ Email: _____

Would you like to receive:

Email updates on society events? _____

Email updates on Astronomical Events? _____

The Newsletter by Email in Word format? _____

Any comments or suggestions you would like to make:

Nomination for AGM

If you wish to nominate for a position on Committee for 2001 please complete the form below and post to The Secretary of the Astronomical Society of Frankston Inc. P.O. Box 596, Frankston, Victoria 3199

ASF Inc. Annual General Meeting (AGM) Elections

Nominee: _____

Proposer _____

Secunder: _____

} must be current financial

Position (tick 1 or more ***):

Office Bearers: President Vice President Treasurer

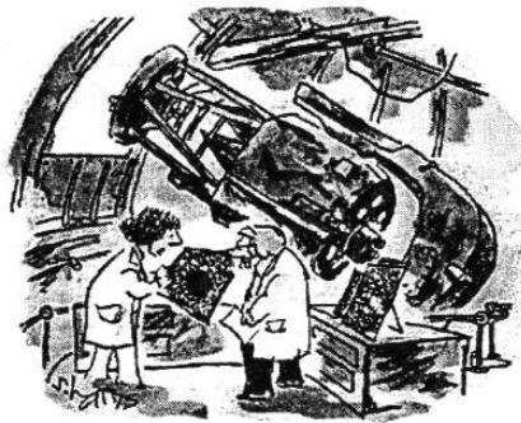
Ordinaries: Public Officer Ordinary Committee Member

(5 of these)

Editor Librarian Public Relations

Acceptance Signature of Nominee: _____ Return to Secretary prior to 7 days before

*** Note that one person cannot nominate for multiple Office Bearer



"It's black, and it looks like a hole.
I'd say it's a black hole."

if undeliverable, please return to
Astronomical Society of Frankston Inc.,
PO Box 596, Frankston, Victoria 3199.

Right - Richard Pollard mowing the ASF Briars site



If your name and address details have changed or are incorrectly shown on this label, please send your updated details to the above PO Box number.

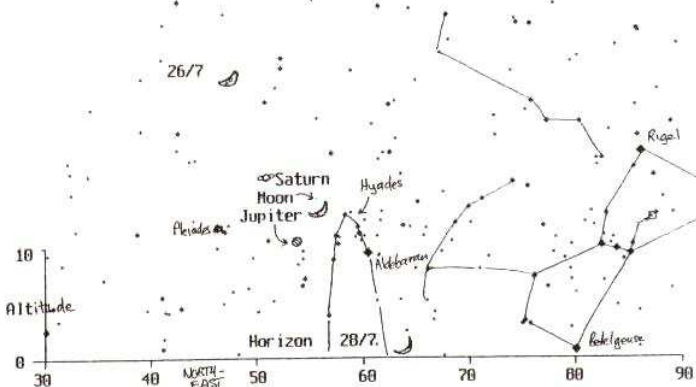
Kindly reproduced by the efforts of Ken Bryant, and collated/posted by Sally Zetter.

SKY FOR THE MONTH JULY 19 - AUGUST 15 (INCLUSIVE)

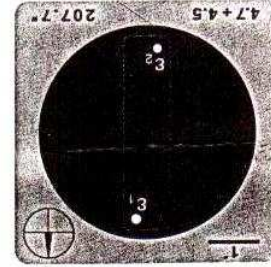
4 20 an Dark Sky 27th July 2000 Standard Time
 V1.00 © Bob Heale 18/4/99
 All objects no fainter than 5 1 X Sky View

Telescope view:

Epsilon 1 mag 5.0, 6.1 2.7"
 Epsilon 2 mag 5.5, 5.2, 2.3"
 requires 92X at least to split either

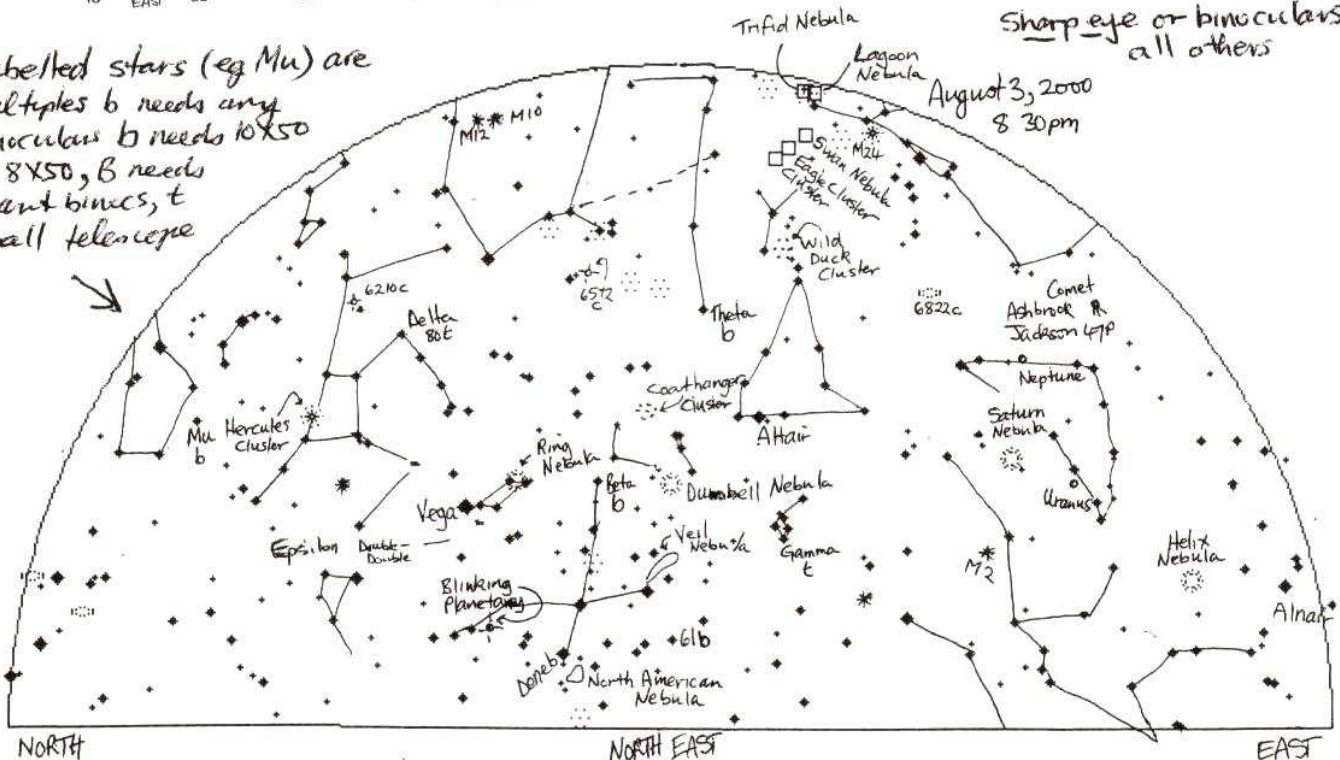


Right: Epsilon Lyrae, the well-known "double double," one of the best-known multiple systems. Sharp eyes or binoculars can discern two components; a telescope of over 60 mm diameter reveals that each of them in turn breaks up into two components.

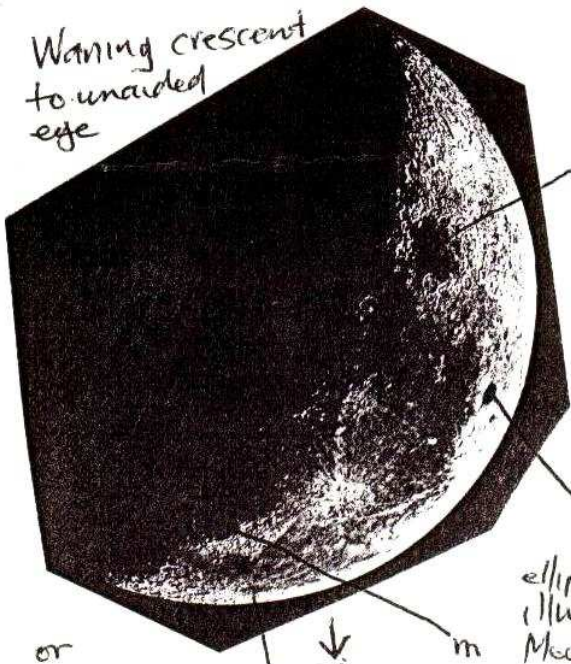


Sharp eye or binoculars for all others

Labelled stars (eg Mu) are multiples b needs any binoculars b needs 10X50 or 8X50, B needs giant binocs, t small telescope



Waning crescent to unaided eye



m Sinus Iridium Bay of Rainbows - was a complete crater, but southern wall washed away when lava from Mare Imbrium I crashed against it

Mare Humorum, (Sea of Moisture) nearly circular dark plane - the oldest of the maria?

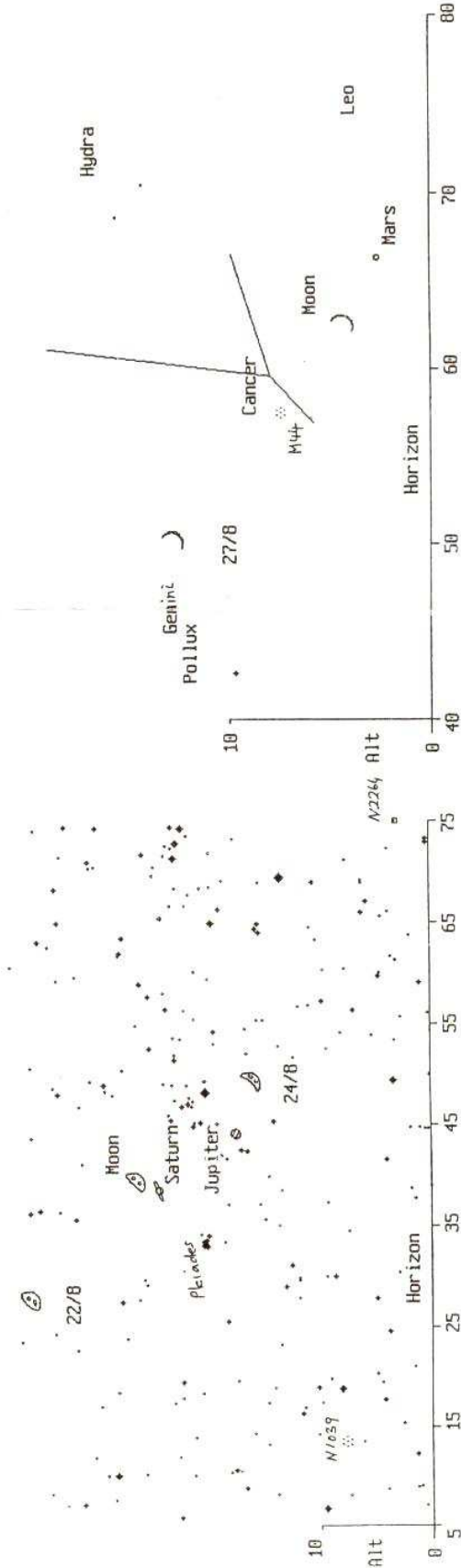
Pis Pythagoras - its walls may be spotted in giant binocs along with faintest hint of a central mountain

Grimaldi oval dark patch elliptical shape an illusion caused by Moon's curvature

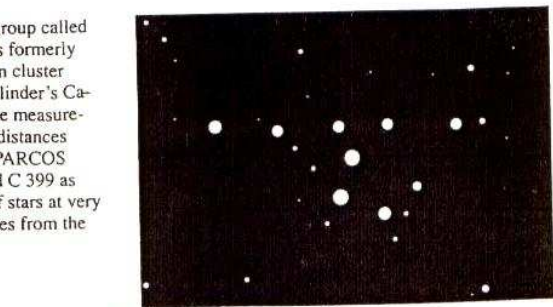
18/7/2000 Bob Heale, ASF

SKY FOR THE MONTH 16th AUGUST — 19th SEPTEMBER (inclusive)

3 40 am Dark Sky 23th August 2000 Standard Time
 U1.00 ☉ Bob Heale 18/4/99
 All objects no fainter than 5 1 X Sky View



6 28 am 2/3 Dawn Sky 28th August 2000 Standard Time
 U1.00 ☉ Bob Heale 18/4/99
 All objects no fainter than 3 1 X Sky View



Right: The star group called Coathanger was formerly classified as open cluster C 399 in the Collinder's Catalogue. Accurate measurements of stellar distances made from HIPPARCOS satellite revealed C 399 as random group of stars at very different distances from the Earth.

7 10 pm 2/3 Dark Sky 19th September 2000 Standard Time
 U1.00 ☉ Bob Heale 18/4/99
 All objects no fainter than 3 1 X Sky View

