SCORPIUS

The Journal of the Astronomical Society of Frankston Inc.

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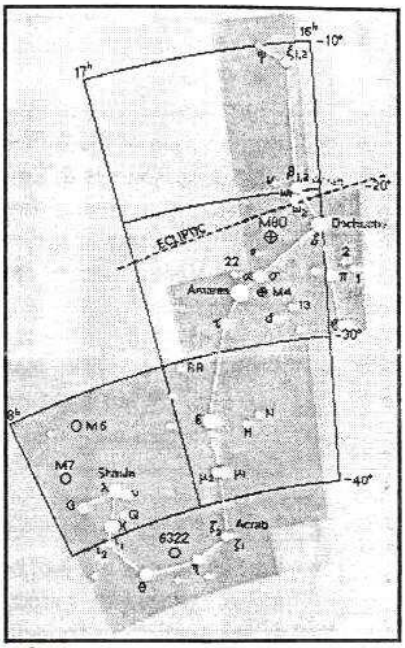
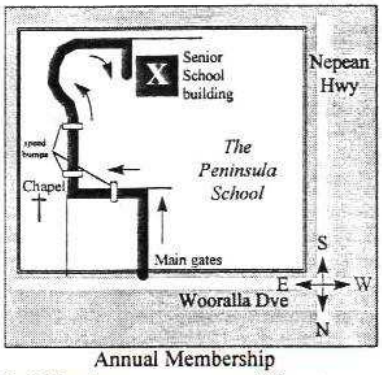
(Nov - Dec)



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.
Internet: http://www.peninsula.starway.net.au/~aggro/index.html
Email: aggro@peninsula.starway.net.au

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 & Briars Co-ordinator
Ian Porter (03) 5985 4203

Treasurer
Bob Heale (03) 9787 1748

Secretary & Loan Telescopes
Richard Pollard (0419) 100 802

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

All phone calls before 8:30pm please.

FUTURE EVENTS

General Meetings:

Wed 10th Nov '99
Annual General Meeting. Nominations for committee positions can be made on the back page form or a copy.
***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.

Please remember there is NO monthly meeting held in December.

Wed 19th Jan 2000
Session 1: Yet to be finalised, though we are working towards getting the new Planetarium astronomer, Tanya Hill down to speak with us early in the new year.
Session 2: Video on *The Challenger Disaster*. What really happened?
Session 3: Loan telescope outside if weather is clear.

Viewing Nights:

Members Only:
Sat 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 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 5th Nov (Guy Fawkes night) and Fri 3rd Dec, all at 8pm. Assistants are required.
- Thomas Mitchell Primary will be having a viewing night at Endeavour Hills on Fri 12th Nov. About 100 grade 5 pupils, staff and parents are expected. Assistants are

Mornington Peninsula Astronomical Society

required. Melways 91/G5.

- The first Cranbourne Scouts will be visited on Wed 15th Dec from 7pm to 9pm at Meteorite Park, Camms Road, Melways 133/J1. Thirty attendees are expected, but details are yet to be confirmed.
- The usual annual 4 Friday public evenings at *The Briars* in Summer will most probably go ahead as per our lease arrangements, though we are yet to receive confirmation from *The Briars*.
- Coast Action, an activities based organisation of the Bureau of Natural Resources & Environment, is planning to have a viewing night on 10th Jan 2000 at 8pm at *The Briars* Visitor Centre. Melways 145/F12.
- Camp Manyung, Sunnyside Rd, Mt.Eliza, is planning for a viewing night on 17th Jan 2000, and 14th Mar 2000. Details are yet to be finalised. Melways 105/A6.

Phenomenal Events:

- Predictions for asteroid occultations of background stars are available, as are predictions for eclipses of Jupiter's moons for 1999/2000. If you have a small telescope and are interested in making these observations for NASA please contact the Editor for instructions.
- There will be a rare grazing transit of Mercury on Tue 16th Nov, when the small planet passes in front of the Sun during the daytime (of course). Transits of Mercury occur about 13 times every century, though are not always visible from any one spot on the Earth. This time the transit is visible from Australia, and Mercury will only form a small dent in the side of the Sun's limb (unless you are prepared to travel North of Brisbane). The last transit was in 1993, and the next will be in 2003. As normal, you are warned that trying to view the Sun can cause permanent blindness particularly due to wavelengths of light that are not visible to your eyes. In local daylight savings time, first contact of Mercury with the Sun will be at 8:18am at 30 degrees East of North; Mid-transit will be at 8:41am; final fourth contact will be at 9:03am at 15 degrees East of North.
- The famed Leonids meteor shower, associated with Earth passing through the remnants of the tail of Comet Tempel-Tuttle, will occur between Nov 14th to 21st, with peak activity estimated to be in the early morning hours of Nov 17th, between midnight and dawn - probably. This year, 1999, is the famed 33 year occurrence when storm levels are anticipated. You MUST get outside and look for these as you *might* otherwise miss a once in a lifetime experience. In past times when the Leonids went into storm activity, there were up to 2,400 meteors seen per minute! The meteors appear to radiate from a point in the North East sky near the sickle-shaped asterism of the constellation of Leo. No guarantees though!

Social Events

- WORKING BEE - a working bee will be held on Sun 28th Nov from 2pm at *The Briars* to plant, stake and settle in about 30 extra indigenous species, kindly propagated by our horticultural friend, Gary Fowler. Member help with spades is needed please, and with drink bottles and rubber bands to connect watering bottles to each. Everyone is welcome. Garden stakes and plant protectors will be provided. Planting takes longer than what you might think in *The Briars'* soils. Bring along your rocket bottom lemonade bottles with lids having a 1/16 inch hole drilled in their middle, and one of the rocket-bottom knobs cut out.
- The annual society Christmas breakup BYO barbecue will be held on Sat 4th Dec at 4pm at Mt.Martha Park, Forest Dve, Melways 150/H7. With luck we might tempt Santa Claus to appear again this year in the children's playground there, but no promises here - we can only send him an invitation. *The Briars* planned members' night might also be held afterwards, depending on demand and, of course, the weather.
- Unfortunately, *Blue Planet* at the giant IMAX cinema in Carlton has finished its run, so a group trip is now excluded. Early next year we'll plan a trip to the newly opened digital Planetarium at Science Works in Spotswood and you'll be able to judge for yourselves whether it is better than the old planetarium.
- NACAA 2000. The 19th National Australian Convention of Amateur Astronomers is to be held in Perth over Easter (Apr 21-24) next year, and the 2nd circular has now been issued, calling for registration and papers. For more information, see any Committee member for details.

YOUR SOCIETY

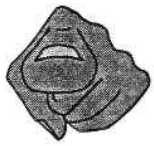
NEW MEMBERS

Welcome to the following new Society members:

Roz Berrystone
Greg Walton & family

The ASF is one of the largest astronomy groups in Australasia. Membership is currently at 162. 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.

We will need another 50 one litre rocket-bottom plastic drink bottles for the working bee in November, with lids, for use in watering the extra native shrubs to be planted on our site during this working bee. The working bee will also need to complete the construction of the shed, by fitting the door that is on-site into its frame and fixing wire mesh. So bring your tools.

RECENT MEETINGS

Exact minuted details of the September and October meetings were not available at the time of going to print due to VASTROC workload. However, September's meeting on a very windy night was chaired by the Vice-President, and featured short talks

given by several different members. October's meeting was also chaired by the Vice-President on a fine evening with Jupiter clearly showing in the sky. After the break, the group split into two with half chatting informally, and half preferring to watch the thought provoking video on *Rhythms of Life*. Meeting closed at 10:25pm.

Thanks to the following members who were reported to have participated in one or more of the viewing nights below: Ken Bryant, Cleverdon family, Bob Heale, Neil Hewson, Vivienne & Peter Lowe, Max Perrott, Richard Pollard, Ian Porter, Peter Skilton, Bruce Tregaskis, Trent Veitch. Thanks also to Richard Pollard and Bob Heale for organising these, and Bob Heale for supper. Apologies to others who might have attended but were inadvertently not communicated to the Editor in time for printing.

September's public night at *The Briars* only saw 12 turn up on a very windy and overcast evening. Ian Porter and Peter Lowe provided the talk, followed by brief viewing through cloud. There was no public night held in October due to VASTROC starting early the next morning.

Black Rock Primary was visited on day one of their camp at *The Briars* on 6th Sep. Over seventy grade 5 pupils, teachers and the Principal attended and were treated to gloriously clear sky conditions, despite it drizzling in Frankston. Mars was the only planet on show, with good views available of Omega Centauri and other deep sky delights.

Kunyung Primary School had a viewing night following a cool change on 18th Oct. About a hundred grade 5/6 pupils and parents attended, though details were not available at the time of going to print.

St. Monica's Primary was visited at the Education Centre on 25th Oct. Eighty grade 6 pupils and teachers were given the traditional show by Richard Pollard and Peter Skilton, but unfortunately the conditions were totally overcast, precluding viewing through telescopes afterwards. Nevertheless all thoroughly enjoyed the experience and got to hold an asteroid before bedtime.

AURORA NETWORK

Last edition reported that we were setting up a network of people keen to be told when an aurora was visible in our night skies. Because this phenomenon cannot be predicted well in advance, your only real chance of seeing it is either by luck or by someone else telling you when one is occurring. On the peninsula and surrounding regions, the southern lights are readily seen by eye, and are due to increase substantially in number in the next 12 months as our Sun enters its active phase. If you are interested in finding out more about this network for members, please contact Roger Giller on (03) 9702 2685 who is co-ordinating it.

SECRETARY'S JOTTINGS

Member Simon Birch has been kind enough to raid his street's recycling bins for plastic rocket bottom drink bottles for use in watering our plants at *The Briars* and Ian Porter has been busy drilling them. The Society has applied for a substantial grant to continue planting at *The Briars*, lay pathways, erect some fencing and remove the potentially dangerous tree and other site preparations for the Observatory. We were unsuccessful in another grant application for a loan telescope geared towards our more mature members. Bob Heale obtained a quality display whiteboard and pinboard combination from our last successful grant, and these were used in recent meetings to good effect. Ian Porter has been gathering initial quotes for building part or all of an Observatory as best our finances permit and as best the quality of our building plans permit. Building costs seem quite expensive at the moment, probably due to high demand prior to the GST tax coming in middle of 2000. Quotes are also being obtained for a ready-built Sirius dome observatory as a practical option. The Railway Preservation Society has officially taken ownership of the old ex-army water tank stand at *The Briars*. The storage shed at *The Briars* is nearing completion with the door yet to be fixed and the room fitted with wire mesh to keep out unwanted visitors. VASTROC looks like having brought a reasonable revenue for our Society this time, with many facets being learned from the last time we hosted it. This was good given the effort that went into our hosting it, but it is now only fair that we pass this opportunity to another astronomical society for the next time in 2001. It is expected that the ASV will take up the responsibility of host next time.

There are a few society "blue logo" windcheaters available, perfect for the colder months ahead. They are in sizes L or XL and are priced at $20 to clear. If interested, please see the Treasurer Bob Heale or any committee member.

School Nights... We do need your participation!

Now that Spring is in full swing, bookings for school and community group viewing nights are on the increase.

Regrettably, even though we require only eight or so telescopes for these nights, we often struggle to get members to attend. We have a total membership exceeding 160; eight people isn't too many.

These nights are a prime source of income for our Society. Without them there would be no Observatory and member subscriptions would need to rise substantially.

One common comment is the misconception that you have to be extremely knowledgable to show kids things through a scope... not true. If you feel you fit into this category, or your scope is limited, then the Moon is a good option. Another is the star Alpha Centauri. Just familiarise yourself with the basics of your target.

Please call me (Richard Pollard) on 9793 5998 if you can help out. We really appreciate it, and the kids will love you.

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. It has been brought to my attention that some members have been holding onto books for many months without notifying Kathy. Please return your materials otherwise borrowing privileges may be affected.

Exploring the Moon: The Apollo Expeditions by David M. Harland. This wonderful book focuses on the exploration carried out by the Apollo astronauts while on the lunar surface, and not on the technology of getting them there. It shows the actual panoramic photos they took and gives the transcripted words they said at the time. It is presented in a travelogue format, giving what was said and felt as they explored the barren terrain, and answers precisely what they found on the Moon and how it changed our perceptions of the Solar System and the Earth/Moon system forever. A very readable book of their discoveries.

JUST FOR STARTERS

OUR SUN'S TWIN

The Sun has a twin, *18 Scorpii*, in the constellation of Scorpius, that resembles our star more closely than any other studied. About 4% of all stars are so-called yellow G-type stars in our Galaxy, that burn hydrogen and helium in their cores. Sun-like stars are obvious candidates if you are looking for life elsewhere in the cosmos, at least based on our humble experience. This star is 46 light years from Earth and is visible to the naked eye. It matches the Sun's mass, temperature, colour, gravity, rotation speed, surface activity and iron abundance almost exactly, with only the luminosity being 5% more than the Sun, and this star being just slightly older than the Sun. Who knows, there may be another Earth there just discovering us in their night skies.

PLANE SCARY

For those who have seen the movie Apollo 13, you would be aware of several scenes where the actors performed in zero gravity conditions, yet obviously they could not be transported into orbit aboard the Space Shuttle for such an activity. So how was it done?

The answer lies with NASA's so-called Vomit Comet. This is a modified KC-135A jet aircraft that flies a specially programmed flight path, the shape of which is basically a parabola. You will be most familiar with a parabolic shape if you point a water hose pipe in the air and allow the water stream to rise, turn around, and fall back to the ground. The shape of the path of water is a parabola.

Imagine yourself flying along inside the aircraft. As it nears the turning point apex of the parabola, everything within the craft becomes weightless. In effect you are being thrown into the air and allowed to drop unhindered; the plane merely follows you down as you are falling. The experience is similar to that which you experience in an elevator that descends too rapidly, and leaves your stomach behind.

Of course the effect is more enhanced than this, hence the "Vomit Comet" name.

Apparently, in the Vomit Comet most people become quite nauseous, even seasoned pilots. The aircraft is designed principally to test new devices that might not function correctly in space, the idea being to detect any faults in zero gravity on Earth before a costly space mission is mounted. Of course, the weightless conditions of zero gravity only last about 25 seconds before the plane must pull out of its steep dive. However, even this small amount of time is sufficient for most purposes.

A typical flight on the Vomit Comet will involve the craft shifting from normal 1-g, to 2-g as it noses itself upwards by 45 degrees, to no gravity as the craft coasts through a gentle arc at the top of its flight path, and back to 2-g as it pulls out of its dive. This occurs at least 40 times in a typical 3 hour flight.

Those who have flown on the aircraft say first you think it's like a roller coaster, then like a BIG roller coaster, then you realise its something new. In fact [illegible] Comet get sick, and many simply scream uncontrollably, just as you might on an amusement ride at a fair. Some people will do almost anything in the name of science.

Peter Skilton

IN THE NEWS

WOOMERA - THE RUSSIANS ARE COMING

An international consortium is looking at launching converted Russian ICBMs (Intercontinental Ballistic Missiles) from the Woomera launch site in central Australia. The SS-25 *Start* booster can place a payload of up to 500kg into orbits as high as 600km, but has only been used once as a launch vehicle, when it failed to place two satellites into orbit in 1995.

In other news, Woomera in South Australia's far north will host a test flight for a new NASA rocket engine that could revolutionise space travel. The tests will be on a so-called Scramjet. This is an air-breathing, supersonic, combustion ramjet engine. If the experiment succeeds it could revolutionise delivery into orbit of small space payloads such as communications satellites.

DEEP IMPACT

NASA has revealed it plans to excavate the interior of a comet as part of its Discovery Programme. The so-called *Deep Impact* mission will send a half tonne copper bullet-like projectile into comet P/Tempel 1, creating a crater as big as a football field and as deep as a seven-story building. A camera and infrared spectrometer on the spacecraft, along with Earth-based observatories, will study the resulting icy debris and pristine interior material during and after the impact.

Deep Impact will be launched in January 2004 towards an explosive encounter with the comet on (appropriately for the USA) July 4, 2005. It will use a copper projectile because that material can be identified easily within the spectral observations of the material blasted off the comet by

the impact, which will occur at an approximate speed of 10 kilometres per second.

WATERLESS MOON

Final results are in from the Lunar Prospector mission that ended on July 31 when the craft was commanded to smash into a crater near the Moon's South Pole. The aim was to see if any water would be detectable in the debris thrown into space, using ground-based telescopes and the Hubble Telescope. The result now is that no water ice was detected. The worldwide search focused on looking for emission from hydroxyl radicals; an expected by-product of the impact.

This is odd as large amounts of hydrogen were measured from lunar orbit by the same craft earlier in its spectral mapping mission phase.

The explanations include that the spacecraft might have missed the target crater; it might have hit a rock or dry soil at the target site; water may have been chemically bound as hydrated minerals rather than being free ice (the crash had too little energy to release water from the minerals); the studies themselves were inadequate; released debris may not have risen above the crater wall to be observable from Earth; or more simply there is no water on this part of the Moon (if at all)!

WE ALL SLOW DOWN

In August, the Cassini space probe on its tortuous way to the planet Saturn, skimmed past the Earth at a distance of 1171 km above the surface. As it passed our home planet, the huge two storey high NASA craft, robbed a little energy from the Earth, in its orbit about the Sun, and sped itself up in the process, sling-shotting Cassini on its way to Saturn. In the process, the Earth therefore has slowed down a little, making the new millennium about a millionth of second further away now, and slightly increasing our planet's distance from the Sun.

URANUS IS TOPS NOW

The planet Uranus now has the most moons of any of the planets in our Solar System. Astronomers have found two more moons using ground-based telescopes, bringing the tally for Uranus to 20. The latest discoveries are the faintest moons ever discovered from the Earth, and each is about 20 km wide, and do not orbit near to the planet's equator, leading to speculation that they are captured asteroids.

IN A FLASH

The search for life elsewhere in the Universe has recently taken a new turn. Researchers at Harvard University have begun combing the skies for flashes of optical laser light that might be emitted by advanced alien civilisations. Up until now, only radiowaves have been searched for this purpose. To do this they piggy-back a camera onto a 61 inch telescope that is performing a survey of 2,500 Sun-like stars, and scan its images for any sign of repeating optical signals in the field of view. So far 1,000 stars have been scanned, with 30 "intriguing" flashes obtained. However, none has survived repeated scrutiny at a later date. Even if they did, the researchers would then have to rule out some new physical phenomenon. The search continues.

ROOM WITH A VIEW

NASA's Jet Propulsion Laboratory has unveiled a facility available free over the Internet that enables you to see the view you would get if you were standing anywhere in the Solar System from more than 25,000 planetary, lunar, asteroid or spacecraft views. The facility was originally designed for space probe communications so that the direction of Earth could be ascertained and the craft's antennae pointed in that direction. Now astronomers can use it to get a different perspective during various planetary alignments or just out of interest. It can be found at http://ssd.jpl.nasa.gov/horizons_doc.html.

GLOBE IS WARMING

With the world apparently starting to succumb to a greenhouse effect, a giant ice berg has broken away from the Antarctic continent and is drifting North toward South America. The island of solid ice is larger than Port Phillip Bay and is currently on a course for Argentina. A scientific vessel sent to study the ice berg took 12 hours to steam around it, because of the sheer size. Named B10A, this ice monolith has drifted into shipping lanes at a speed of 13 kilometres per day and appropriate warnings have been issued not only for it, but also for large bergs the size of football fields that break away from it. It is believed that the Earth has warmed nearly 2.4 degrees Celsius since 1930, due principally to the burning of fossil fuels such as oil, gas and coal, and one of the consequences of this global warming is fragmentation of the Earth's polar sheets.

CLOSE CALL IN JUNE 1178

Just over 800 years ago, it is thought that our Moon shielded us from a huge impact that would have wiped out human civilisation. An Italian mathematician believes the moon suffered this impact in June 1178, and that this impact was witnessed from Earth. Smaller fragments from the same inbound body crashed into the Pacific Ocean, sending out massive tidal waves and affecting our climate. This scenario came about from poring over historic accounts and legends from that time from around the world.

The annals of Canterbury on June 18, 1178, describe how four wise men were sitting star gazing on a warm, cloudless night when they suddenly noticed a flame spurt from one tip of the half phase Moon. The Moon was then described as trembling and over the next few hours its colour changed from brilliant yellow-white to a blood red. This colour remained for the rest of the Moon's phase cycle.

It is believed in New Zealand Maori folk lore that a Tunguska-sized body exploded over the South island about 800 years ago. The story tells of the horns of the Moon that broke off and fell to Earth. Fire from the sky burned most of the forests and killed the moas (giant emu-like birds). Evidence of massive forest fires, in the form of soot, has been found near Dunedin in New Zealand.

Interestingly, the first Apollo mission to the Moon photographed a large fresh crater near the Moon's North Pole. It is known to be recent due to the absence of other craters within it. The crater, called Giordano Bruno, is

believed to have been formed from a comet or asteroid about 3 kilometres wide. If it had struck the Earth, instead of clipping the Moon, it would have unleashed a destructive energy of several hundred million megaton hydrogen bombs, substantially more than the Earth's entire nuclear arsenal.

The impacts noticed on the Earth would have most likely been smaller secondary fragments that accompanied the larger piece that collided with the Moon. It is interesting to note that both this event, and the massive 1908 impact in Tunguska, Siberia, both occurred in June, just when the Earth passes through the Taurid meteor stream. Remember that next June.

MORE EVIDENCE ON DINOSAUR KILLER

Two new impact crater sites in Belize and Mexico add further evidence that an asteroid or comet collided with Earth about 65 million years ago killing off the dinosaurs and 75% of all other species on the planet.

A new site has been discovered in Alvaro Obregon, Mexico, about 230 kilometres from the rim of the main Chicxulub crater, which itself is centred on the Yucatan, Mexico, and is about 200 kilometres across. This crater was formed when a roughly 10 kilometre wide asteroid or comet collided with Earth.

The site contains two layers of material thrown out by the impact and which flowed across the surface like a thick fluid. This is the closest surface exposure of ejecta from the Chicxulub crater that has yet been found, and is the only known example of this phenomenon on Earth.

The Earth orbits the Sun in a swarm of so-called Near-Earth Asteroids, with currently only about one-tenth of the population of these collision threatening bodies having been detected.

A geological expedition to another ejecta site about 480 kilometres from the crater rim in Belize found tiny spheres of altered green glass, called tektites and took drill cores. Tektites are rocks that have been melted to glass by the severe heat of an impact. These tektites were similar to those found in Haiti and northern Mexico. This finding links the Belize sites to the more distant Caribbean and Mexican ejecta sites.

FEATURE

THE FINAL VASTROC OF THE MILLENNIUM

All photos are kindly supplied by Richard Pollard, who also set up a special VASTROC web page on the internet.

The 7th Victorian Astronomy Conference was hosted by our Society on the weekend of October 2 and 3, ably chaired by Ian Porter, as the writer had to work that weekend on matters Y2K related.

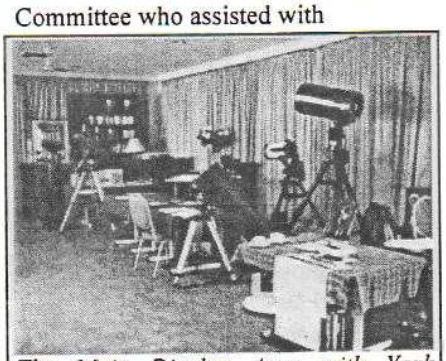
As with the last one we hosted two years ago at Norwood House Receptions in Mt.Eliza, this was a resounding success with the participants enjoying the fine talks, presentations, vendor displays and sales and of course each others' company. It is a credit to all those who selflessly put forward their time to make it such a success, and a credit to the reception staff who provided the creature comforts for attendees.

Presenter Peter Lowe demonstrates the properties of teeny weeny pulsars to an appreciative audience.

The theme for this VASTROC was Epoch 2000, signifying that we are about to enter the year 2000 for which all star charts at the moment are customised. The title was also a play on words in that we are about to enter the new millennium. Typically every 50 years star charts need to be redrawn for the new epoch to account for the slight movement of the nearer stars in the sky, and movement of the Earth's axis, which can potentially distort constellations.

Barry Clark of the ASV gave stunning views of solar prominences with this specialist telescope at VASTROC... who say's there's nothing to see during the day?

Special thanks of course to the speakers for their investment of time, especially the newer ones, and thanks to David Girling for organising these from around Victoria, and to Richard Pollard for masterfully organising the bookings at all hours of the day and night, and organising the circular mail outs. Thanks also to the rest of the Committee who assisted with



The Main Display Area with York Optical, The Binocular and Telescope Service Centre and other sponsors.

VASTROC and other volunteers on the day. Member Shaun Simonsen, a professional photographer, was kind enough to take the group portrait of VASTROC this time round. If you are interested in acquiring a copy, please see the Secretary for details.

To those who missed out, as did I unfortunately, there is always another VASTROC just two years away, somewhere in Victoria.

Peter Skilton

BINOCULAR REVIEW

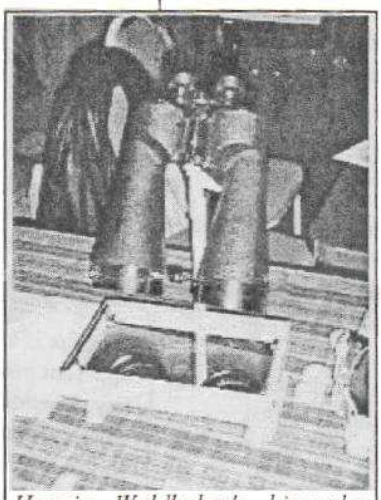
HELIOS/KRONOS 20x60 BINOCULARS - These Russian Binoculars are sold at *Astro Optical* for around $230. They do have Bak4 prisms, but they do not have a tripod adaptor socket. You have to attach them to a tripod with a separately purchased adaptor, for them to be of any use. Their image is pretty good, but isn't that sharp toward the edge of the field (as it is in premium binoculars). None-the-less, I've seen some pretty spectacular sights with these binoculars, both in my backyard and at a dark sky site. The Moon and Jupiter were pretty impressive, as was the Jewel Box and the Andromeda Galaxy.

If you want binoculars more powerful than what you have, but don't want to spend large amounts of money, then these may be worth considering. I've noticed in the British magazine *Astronomy Now* that this manufacturer also makes 80mm binoculars at fairly good prices, so it may be worth waiting to see if these are imported anywhere.

NIKON 10x70 HP BINOCULARS - Ted's Camera store were getting rid of these at less than half price. The "HP" model designates the professional model. The "SP" model is the ultimate in Nikon or any binoculars, but costs around $400 more than the HP model.

Nikon binoculars have had some pretty impressive reviews, so I bought them, having decided that it would nag me the rest of my life if I didn't buy them. I was impressed - but only after I modified them. When I tried them, I decided that the image quality was spectacular, but that I couldn't see all of it. The problem was the eyepiece adaptors to which the rotatable rubber eyeguards were attached. It was hard to comfortably see the whole field. After I took the adaptors and eyeguards off, and replaced them with my own contoured eyeguards, I was very happy. Unlike cheaper binoculars, these have a sharp, black, well-defined edge at the edge of the field.

While they can be hand held for a small amount of time, they are best put onto a tripod. There is no tripod socket, and you have to supply the adaptor. The Nikon adaptor costs $100. The one I bought from *Astro Optical* works just as well for around $25.



Herwig Waldhuber's binocular mount at VASTROC 7 ... simple and effective....

FUJI 7x50 BINOCULARS - For the last 5 years, the guy I bought my C8 from has been laughing at me whenever I mentioned my K-Mart binoculars. He claimed I wouldn't understand what he was talking about until I had viewed through Fujis. Walking past Tradeorama one day, I noticed a pair of beaten up Fujis in the window, which looked as if they had spent the last 20 years in the back of a boat. I bought them.

The night I tried them, I immediately retired my old pair of 7x50s, and haven't used my 10x50s since. In effect, these Fujis look like a shrunk down version of my Nikon 10x70s. After much observation, I determined that the Fujis were a little inferior to the Nikons at the edges. What I found of most interest was how well a pair of premium binoculars held up over years of frequent rough use.

Renato Alessio

Roger Davis with has astro wares at VASTROC. Notice the proximity of the bar, naturally for the cleaning of optics.

THE T&T SUPER SIDE BINOCULAR MOUNT

Back in its January 1998 issue, *Sky and Telescope* reviewed the Virgo T&T Binocular mount. At the time, the mount cost around US$125. After the very favourable review, the price went up to US$175, and I lost interest. On the internet, I noticed the same mount selling in the UK for 300 pounds! (This may have been due to their GST).

Fortunately, T&T (short for Tom and Tony) started selling their mounts independently of Virgo, with prices at realistic levels. Their binocular mounts all have the typical parallelogram type design, but come in two basic styles. The first is where you stand or sit directly behind the parallelogram. The second is where you stand, sit or lay at right angles to the parallelogram.

T&T sell their standard mount for US$110, and their beefed up version for US$125, both of which are rated suitable for 80mm binoculars. Their Sidesaddle mount costs US$145, and the beefed up version is US$180, both of which can handle up to 100mm binoculars. In my opinion, these were pretty reasonable prices until our dollar collapsed. They also have more solid mounts for the larger sized binoculars.

Reasons for possessing a binocular mount.

1. The images are steady, at any angle.
2. It is much easier to find objects, since you can refer to maps without having to put down the binoculars.
3. You can see much higher in the sky than you would otherwise see with a normal tripod.
4. You can show other people what you are looking at. The parallelogram design enables the binoculars to be moved up or down, and still show the same image.

What I bought.

I purchased their Super Side Mount, the beefed up version of their Sidesaddle Mount. Cost was US$180 and postage of US$50. The mount is advertised as handling up to 100mm binoculars, with one hand operation. The binoculars are attached to a friction wheel, with one of the three supplied attachments. These

attachments cope with affixing most binocular types. One of the attachments is a base with velcro straps, for attaching binoculars that do not have the standard ¼ inch-20 thread attachment point. This strap attachment is only for use with 50mm binoculars.

How it Worked.
The mount was simple to assemble, and I attached it to my Manfrotto tripod. The mount needs a fairly solid tripod for good operation. The mount had no problems handling my heaviest binoculars, a pair of 10x70s, with one hand operation. A handle attached to the friction wheel is all that is used for aiming. Whether in a standing or sitting position, the mount performed as advertised, and was very easy to use. For easier handling, the tripod should be very extended when one uses the mount in a standing position, and shortened when used in a sitting or lying down position.

However, when I was lying back on a banana lounge to view directly overhead, I was having extreme difficulty and was getting very frustrated trying to point the binoculars at certain objects. This was because I could not move my head and upper body in the same way I could in the standing and sitting positions. I attached an accessory I had in my camera case, a Bogen Swivel-Tilt Piggyback Adaptor, to the mount's attachment devices. With this, I could easily move the binoculars from left to right. This solved the problem of viewing directly overhead for long periods of time. The Bogen adaptor had previously cost me US$27.

Is a Mount Worth Getting?
Should a binocular user buy one of the various T&T mounts (or try to build one)? In my opinion, the answer is that it depends. If you have a pair of either large or high power binoculars, then the answer is yes. You would otherwise not be doing justice to your binoculars, as you would not be getting all that they are capable of delivering. You would be missing many views that could otherwise be easily observed.

On the other hand, if you have a pair of small 7x50 or 10x50 binoculars, the mounts fall into the "nice to have on some nights" category. While viewing is much improved over hand holding the binoculars, I get reasonably good views by the method of just holding a regular tripod and binoculars. The mount is pretty heavy, and I doubt that most people would routinely take it out on a viewing night, just for use with small binoculars.

Another negative consequence of using a mount arises if you own cheap, poorish quality binoculars. Aberrations at the edge of the field, which were hardly noticeable when hand holding the binoculars, really stand out when the image is steadied.

T&T sent me a few copies of their catalogues. They are into recycling, and build sturdy products on the cheap. For example, they sell what appear to be extremely sturdy wood and aluminium tripods for US$50 and US$60 respectively. These prices are extremely cheap for solid tripods. How do they do it? By using recycled crutches! See me if you want a copy of their catalogue.

Renato Alessio

WHAT IS THE MATHS BEHIND RISE AND SET TIMES?

This is a particularly interesting submitted question as your humble editor used to plot the rise and set times for all of the planets, Sun and Moon when I was in my teens at high school - for the fun of it. In fact I still have the wall-size plots! Clearly a mis-spent youth. The data came from *The Age* newspaper which in turn would have originated from the Museum of Victoria and earlier from the Astronomical Almanac from the U.S. Naval Office. The aim was that, after many years of diligently plotting the data, the mathematical equations that underpinned them would become clear.

Well, the sinuous plots of rise and set times varied with time in *very* complicated ways, governed mostly by the equations of spherical trigonometry since we live on an oblate spheroid planet, and each of the bodies orbits in elliptical orbits around its parent planet.

An excellent soft cover book that explains all from first principles, including giving algorithms, is *Practical Astronomy with your Calculator* by Peter Duffett-Smith. There was also a follow up edition called *Practical Astronomy with your Computer* that provided all the Basic language algorithms on diskette to save retyping them and having to debug them for errors. Another excellent hardback book is Jean Meeus' *Astronomical Algorithms*. The library doesn't have either of these books yet, but may acquire one of them early next year, or sooner if some kindly member cares to donate them to the library.

With planets, rise and set times depend mostly on your latitude on the Earth and the declination of the object in the celestial sphere. Of course there are secondary smaller effects such as parallax and refraction.

Parallax is an effect that alters the apparent position of an object in the sky depending on how far away in the solar system it is to you. Therefore the Moon is a lot closer than Pluto, and its position will be far more sensitive to the position of the observer on the Earth's surface.

The calculation of secondary effects is considerably more complicated and usually involves a high empirical content.

Refraction of light as it passes through our atmosphere can cause the planet to appear above the horizon when it really is below it. In addition, if you have hills rather than a sea-level horizon, or your elevation is high (e.g. if you are standing on a hill) then this will also affect the times. Furthermore, planets, the Sun and Moon are not points of light, but disks, and hence calculating when the centre of the disk rises may not be your intention. For example, the Sun rises when the first tip of its limb rises above the horizon, and Sets when the last tip of its limb disappears below the horizon, not when the centre of the solar disk reaches that level.

In addition, for fast moving objects the object itself can move along its orbit in the solar system significantly during the day, changing its declination and hence it setting time.

So as you can see, there are many effects, even if you don't consider the

mutual gravitational attractions of each planet on the other planets.

POSITION, POSITION, POSITION!

The following was found recently while checking for company credentials on the ASIC homepage:

At the current low interest rates, you might have considered investing in property and, with property prices rising in major cities, perhaps you looked out of town. Well, why limit yourself to this country - indeed to this planet!

According to this entry, The *Mars Land Authority* based in Dandenong, Victoria, is having a land sale offering CASH only land packages of 100 to 1000 hectares on Mars for just $10 to $45!

Prices quoted include a deed certificate in your name showing lot boundaries. You can even choose your preferred outlook from the popular "Mountain view" or "Canyon view" to the possibly less tempting "Polar region".

Prospective Martians are urged to "Secure your very own piece of Mars today!" as "LOTS are selling out FAST!".

Peter Lowe

LONG LIVE THE SPEC

This one may seem an odd addition, but please read on as all becomes clear.

The US Standard railroad gauge (distance between the rails) is 4 feet 8.5 inches. That's an exceedingly odd number. Why was that gauge used? Because that's the way they built them in England, and the US railroads were built by English expatriates.

Why did the English people build them like that? Because the first rail lines were built by the same people who built the pre-railroad tramways, and that's the gauge they used.

Why did "they" use that gauge then? Because the people who built the tramways used the same jigs and tools that they used for building wagons, which used that wheel spacing.

Why did the wagons use that odd wheel spacing? Well, if they tried to use any other spacing the wagons would break on some of the old, long distance roads, because that's the spacing of the old wheel ruts.

So who built these old rutted roads? The first long distance roads in Europe were built by Imperial Rome for the benefit of their legions. The roads have been used ever since.

And the ruts? The initial ruts, which everyone else had to match for fear of destroying their wagons, were first made by Roman war chariots. Since the chariots were made for or by Imperial Rome they were all alike in the matter of wheel spacing.

Thus, we have the answer to the original question. The United States' standard railroad gauge of 4 feet 8.5 inches derives from the original specification for an Imperial Roman army war chariot.

So, the next time you are handed a specification and wonder what horse's rear end came up with it, you may be exactly right. Because the Imperial Roman chariots were made to be just wide enough to accommodate the back ends of two war horses.

Now the twist to the story....There's an interesting extension of the story about railroad gauge and horses' behinds.

When we see a Space Shuttle sitting on the launch pad, there are two big booster rockets attached to the sides of the main fuel tank. These are the solid rocket boosters, or SRBs. The SRBs are made by Thiokol at a factory in Utah. The engineers who designed the SRBs preferred to make them a bit fatter, but the SRBs had to be shipped by train from the factory to the launch site. The railroad line to the factory runs through a tunnel in the mountains. The SRBs had to fit through that tunnel. The tunnel is slightly wider than a railroad track, and the railroad track is about as wide as two horses' behinds. So a major design feature of what is arguably the world's most advanced transportation system was determined by the width of a horse's rear end!

THROWING DOWN THE ASTRO GAUNTLET

As the rest of us are about to enter the third millennium at the end of this year, Renato Alessio has already achieved it and about to start his fourth. With the observation of the galaxy NGC 238 on the night of 13th September, Renato has now directly observed his 3,000th night sky object and at the time of writing his score is up to 3,014. It is believed that Renato's aim in life is to keep a thousand objects ahead of member John Cleverdon. The challenge has been issued to all likely contenders for the crown of most prolific observer.

DEEPEST, DARKEST AFRICA EXPEDITION

The Astron. Assoc. Queensland is arranging a tour for 35 people of Southern Africa to catch the June 21st total solar eclipse in the midwinter of 2001. The tour is from 15/6/2001 to 25/6/2001. Zimbabwe (formerly Rhodesia) has apparently reasonable infrastructure and the tour will be via bus, enabling some last minute change of plans if the day is cloudy. Eclipse totality lasts for over 3 minutes, with the sun being 27 degrees above the north-west horizon. Aside from this the trip will visit Victoria Falls, various game parks and other tourist features appealing to non-astronomical companions. If you wish further details and itinerary we have a promotional leaflet, so simply see a committee member. Their president, Peter Anderson, will be leading the expedition - or is it a *safari*?

TELESCOPE FOR SALE

8 inch f/6 Astro-Optical Dobsonian with 2 inch focuser, 7x50 finderscope and 3 Vixen LV eyepieces (25mm, 15mm, 9mm). The scope also has a Telrad base, but the actual Telrad is not for sale. $800, phone Russell Thompson on (03) 9787 0079. Also a separate Meade 8x50 finderscope (no bracket) is for sale and has never been used, $90.

ASTRONOMY 2000 IS HERE

Orders for the next edition of the excellent and highly popular annual sky almanac *Astronomy 2000* will be taken at the November general meeting, or to the Treasurer Bob Heale afterwards on (03) 9787 1748. Price is still $16 to members, or $18 to non-members. Ordered books can be collected at any society get-together, viewing night or monthly meeting, or by special arrangement with Bob.

Why not order an extra one as a Christmas present for someone special to you?

As in all previous years, remember that all money made on the sale of these books supports the library for purchase of all books, videos and other material, so please don't buy these elsewhere - support the growth of your Society instead.

WATCH OUT FOR THE OLD GIRLS AFTER DARK

South Australian University researchers have determined that it is more dangerous to be bitten by a mosquito after 10pm than earlier in the night. They found that mossies carrying viruses such as Ross River fever, Japanese Encephalitis and Murray Valley Encephalitis are more likely to be in search of human flesh for a meal later in the night.

The work found that younger female mosquitoes dined earlier in the night, having to eat early before mating, while older mossies not needing to mate came out in full force after 10pm. While both male and female mossies feed off plant juices, only female mosquitoes bite and instinctively home in on blood for the development of eggs in their bodies.

Younger mosquitoes are less dangerous because they are less likely to have bitten an infected animal or bird and picked up a disease before settling on a human - most likely an astronomer after dark.

The researchers also pointed out that in general, people with warmer bodies who have a higher metabolic rate and produced more carbon dioxide were the likeliest mosquito magnets. Meteor observers, who prefer watching after midnight, might take note.

SETI SEARCH TOPS THE MILLION MARK

Just three months after it started, the scheme to enlist household users across the globe in the search for an intelligent signal from outer space has exceeded all expectations. Over a million volunteers in over 200 countries have installed the provided screen saver for their computers that downloads radio signals from the Arecibo radio telescope in Puerto Rico and analyses them for the presence of an extraterrestrial signal while the screen saver is activated. Together, the users have inadvertently created the largest supercomputer on planet Earth. You can find out more on the internet at http://setiathome.ssl.berkeley.edu. Who knows - you might be the discoverer of ET! So far there have been a few hoax attempts, but internal checks have quickly weeded these out.

NATIONAL GEOGRAPHIC

Member Renato Alessio relates that October's edition of National Geographic magazine in newsagents has a positively superb double-sided "space and our place in it" poster inserted as part of it, one of the best he's ever seen. Check out this end of millennium special map insert while copies last. Looks great.

SPECIAL BUSINESS FOR ANNUAL GENERAL MEETING

In accordance with our constitution, please be advised that minor constitution changes are proposed by the Committee to be voted upon at the 1999 AGM. The changes relate to:

(a) replacement of gender-specific wordings with gender-neutral wordings; after all it's only a matter of time before we progress to having a female President like in many other Societies. Specifically the words "him", "his", "he" and "chairman" are being replaced as appropriate in rules 3.2, 3.6, 3.7, 3.8, 6.1, 7.3, 7.5, 11.1, 12.4, 13.1, 13.2, 14.1, 15, 16.3, 17.1, 17.2, 18, 19.1, 21.3, 21.4, 22.2, 22.3, 24, 25.6, 25.9, 28.1, 34.

(b) 2.1 will add a definition of a "Chairperson" as the person presiding over a meeting of the Association.

(c) Rule 15 will be reworded for grammatical correctness to be "A question arising at a general meeting of the Association shall be determined on a show of hands unless, before or on the declaration of the show of hands, a poll is demanded. The Chairperson shall declare that a resolution has, on a show of hands, been carried or carried unanimously or carried by a particular majority or lost. An entry shall be made to that effect in the Minute Book of the Association as evidence of the fact, without proof of the number or proportion of the votes recorded in favour of, or against, that resolution".

(d) Rules 36, 37, 38 are to replace the word "Society" with "Association" to bring it into line with consistent naming elsewhere in the constitution and as properly given in the Associations Incorporation Act (1981) itself.

For those interested in the exact wordings, the changes will be available for inspection prior to the AGM, and may be obtained from the Secretary beforehand if desired.

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 collection.

Astron. Assoc. Queensland (Qld) - They have recently formed a Variable Star section, and undertake several public field nights each month. Membership is 102. Member Rob McNaught was awarded the Edward Corbauld Fund monies this year to further his fireball tracking network. A very detailed report of his work and equipment is given - did you know that car hubcaps are used as all-sky mirrors? The group is very active in lunar grazing, minor planet and jovian satellite occultation work. Review of freely available astro software, with glossary of terms and recommendations. Reports from 21 members who went on a bus trip to see the Australia Telescope and Siding Spring. Series on the basics of using your telescope.

Astron. Soc. South Australia (SA) - An ASSA article provided to a reporter was misinterpreted and published incorrectly, apparently encouraging South Australians to watch the solar eclipse earlier this year through sunglasses. This is definitely not safe. A major media effort was then necessary to undo this dangerous misinformation as best as possible. The society also received an angry phone call from the Health Minister

due to this reporter error. It goes to show you have to be careful with eclipses and the media. Article on supernovae and on Canis Major. They have a society display of astronomical paraphernalia that travels from one public library glass display cabinet to another each month. One member has just had an asteroid named after him. Three members caught the minor planet occultation of *(444) Gyptis* earlier this year (on which we were clouded out). This was their first ever attempt at this type of observation. The society participated in this year's Science Week in early May. They have also produced a TV programme on astronomy for Junior Primary children. They are already planning eclipse expeditions for the 4th December, 2002 total solar eclipse over South Australia. Society meetings are typically attended by about 100 members and visitors. Article on the history of the celestial maiden, Virgo, and on the transits of Venus across the Sun's face. Captain Cook visited Tahiti, at Point Venus, to observe the 1769 transit before going on to find Australia. The next such transit is in 2004. Article on determining the age of the Universe, detailing how this has been attempted to be answered over this century - and there is still controversy here. The Edgar Wilson cash prize for discovering comets has recently been finalised for 1999, with half of the wealthy winners being Aussie amateurs in South Australia and New South Wales.

Astron. Soc. Tasmania (Tas) - Tasmania recently received its first ever visit by an astronaut, when Pamela Melroy visited. Article on observing Pluto from your backyard. A historical article is given on comets and on supernova hunting. They are celebrating their 65th anniversary this year, with only one founding member being alive today. Their observatory is being demolished by working bees and moved to Mt.Canopus where the University of Tasmania has a 16 inch dome. A brief history of the AST is given. One member is currently grinding his own 16 inch mirror. The society is gearing up for increased aurorae in the night sky in the next 6-8 months.

Astron. Soc. Vic (Vic) - Article from a member who made a 6 inch f/22 refractor, grinding the lenses himself with no former experience. It took 250 hours to make the lens alone. They now have some limited use of the government's Observatory Gate facilities. A member from Flinders recently spent a few months in Antarctica after travelling there in a 19 metre yacht, and is still there. Continuing article on eclipses. Drilled for bore water on their Heathcote site, but gave up at 60 metres depth due to the cost and salinity encountered.

Astron. Soc. New South Wales (NSW) - Reports on the February annular eclipse and much on observing Mars. Article on Near Earth asteroids and numerous book reviews. Feedback from the 1999 South Pacific Star Party. Speculation on the discovery of a chain of meteorite craters, called the Lorne Basin, near Port Macquarie in NSW, with one being 30km wide. Bright comets of the last two centuries are profiled. Article on how to make setting circles for alt-azimuth and Dobsonian telescopes. The society is installing pit toilets at their Wiruna site to replace existing buildings that have been consumed by termites. Article on why the dichotomy of Venus (i.e. the phase being a half-circle) cannot be accurately predicted. They are thinking of changing their logo for the new millennium. Series of introductory pieces on amateur radio astronomy.

FINAL PRONOUNCEMENT - MIRA

Arguably the most famous star in the sky is Mira *(pronounced "My-rer")*, also called Mira Ceti or Omicron Ceti. It is a red giant star in the constellation of Cetus and was discovered by the Dutch astronomer David Fabricius in 1596 at a brightness of magnitude 3 (comparable to the Southern Cross main stars). However, when he looked for it a few months later it had disappeared. Later in 1609 he found it again at the same magnitude with his naked eye. Clearly this star varies in brightness from night to night and is the prototype of a type of star system called a "variable star". Mira varies between magnitude 2 (easily seen with the eye) to magnitude 10 (you would need a small telescope to find it) over a period of about 11 months. The name, appropriately, is Latin for *"wonderful"*. One area where backyard observers can make a real contribution to career astronomers' work is in observations of variable stars. If you are interested in this pastime, there are members present at the monthly meeting who would be pleased to provide guidance and suggestions.

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.

TO BOLDLY GO .....

Split infinitives aside, due to heavy workload and family commitments, this edition marks the end of a nearly 5 year era under my Editorship, and I shall be handing over the journalistic reins to the incoming Committee for someone else to carry on the journal's development. The widespread advent of computers nowadays in our membership will ease this transition.

I've enjoyed the time performing this visible role, and I hope you have enjoyed the material and stories over the years. But it is now time to move on and allow someone else to have the opportunity of communicating the happenings in the world of astronomy and the direction your Society is taking. I offer special thanks to those members who have been thoughtful enough to contribute material regularly over the years, and I thank the readers for their many very positive comments who have enjoyed reading *Scorpius*. I shall still contribute the odd article every now and then, so it's not farewell forever.

For the same reasons, after 4 years officially as President and 2 years as Vice-President at a time when the membership has healthily increased more than five-fold, it is time for a bit of a well-earned rest. However, I shall still be nominating for a position on the Committee of Management as an ordinary member at the AGM and will continue to support the Society as it emerges into the new millennium and faces the many significant challenges ahead.

Thanks again for your support and encouragement in my time as President. Live long and prosper.

Peter Skilton.....

ASF Inc. Annual General Meeting *(AGM)* Elections

Nominee: _____

Proposer: _____ } must be current financial members

Seconder: _____

Position (tick 1 or more***):

Office Bearers: ❑ President ❑ Vice President ❑ Treasurer ❑ Secretary

Ordinaries: ❑ Public Officer ❑ Ordinary Committee Member (5 of these)
❑ Editor ❑ Librarian ❑ Public Relations
❑ Briars Coordinator ❑ Phenomena & Observations

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

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

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

Above - The Advanced Technology Telescope
Photo - Neil on November 1999

Left - Xmas BBQ at Mt Martha Park,
on the 4th December 1999
Photo - *By John Cleverdon*

COMPETITION It's time for a competition again as we head for the Year 2000 boundary. The question is to name 3 meteorites or meteorite craters in Australia. First received correct entry wins; if no correct entry is received, then the most original will do. Andrew Thornton has kindly donated from his collection some postage stamps having a space theme. The prize is these space stamps, a poster of the Parkes Radio Telescope, near Parkes in NSW, and a copy of October's National Geographic with its special universe map, as mentioned elsewhere in this edition. Answers should be written on the back of an envelope and sent to the Society's PO Box 596, Frankston 3199 address to arrive before year 2000 arrives (just in case the post office box isn't Y2K compatible).

A DRINK TO THE EARTH The world's reservoirs of drinking water have a noticeable effect on the Earth. This is because the water has been shifted from the equator, where ocean water would normally be concentrated due to centrifugal force, to mid-latitudes where most reservoirs are situated. Since these latitudes are closer to the Earth's axis, the shift speeds the Earth's rotation in much the same way as an ice skater speeds up on pulling their arms in close to the body. So far it has caused the length of the day to shorten by 1/1000th of a second, and the asymmetrical distribution of reservoirs around the Earth has also tilted the Earth's axis.

Kindly reproduced and collated by the efforts of Ken Bryant, and posted by Shari & Ian Porter.