



SCORPIUS

The Journal of the
Astronomical Society of Frankston Inc.
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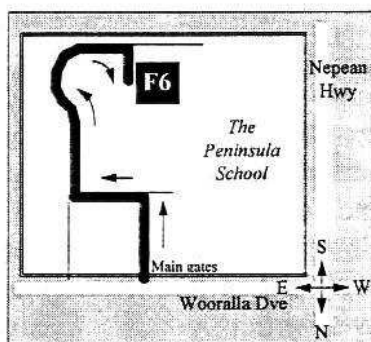
(Nov - Dec)

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 or observing nights for schools and community groups exclusively in the area bounded by Moorabbin, Dandenong and Tooradin.

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

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

Visitors are always welcome!



Annual Membership	
Full Member	\$30
Pensioner	\$25
Student	\$20
Family	\$40
Family Pensioners	\$35
Newsletter Only	\$10

Due 1st of January each year

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Committee
Ken Bryant, Roger Giller, Bob Heale,
Peter Lowe, Richard Pollard

All phone calls before 8:30pm please.

FUTURE EVENTS

General Meetings:

Wed 19th November '97

Annual General Meeting. *Nominations for committee positions and other assistants for 1998 can be made on the form on the back page (or simply on a copy).*

Session 1: Peter Skilton will talk on the *Meteorites of Cranbourne*.

Session 2: A video from David Malin on *Colouring the Stars*.

REMEMBER there is NO meeting held in DECEMBER.

Wed 21st January '98

Session 1: Excellent NASA video of *An Astronaut's View of the Earth*.

Session 2: Informal chat session.

Wed 18th February '98

Session 1: David Girling tells us about *Meteor Observing*.

Session 2: Informal chat session.

Wed 18th March '98

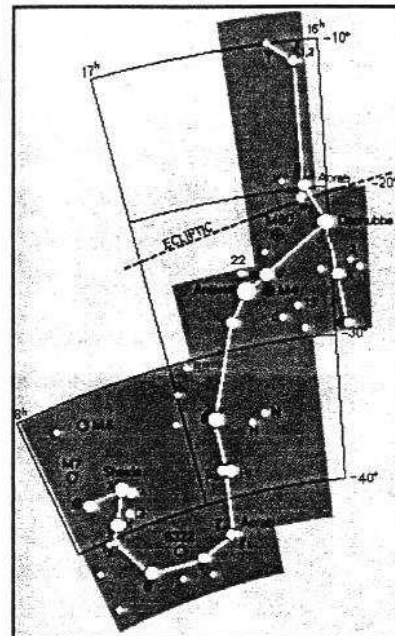
Session 1: To be arranged.

Session 2: Video on *Planet Hunters*.

Viewing Nights:

Members Only:

Sat Nov 22 & 29, Dec 6 & 27 all at *The Briars*, Nepean Hwy, Mt.Martha



(Melways 145/E12).

If weather forecast for the Saturday looks bad, the Friday before may be used instead. New attendees must always confirm with David Girling on the phone number above before attending. Follow the signs at *The Briars* from the Visitor Centre. Remember you can only attend on planned Members' Nights, unless by prior arrangement with David.

Public, School & Community Groups Viewing/slide nights:

If you can assist, please contact the Secretary.

- Skye Primary School, Ballarto Rd, Skye, on Fri 7th Nov at 8pm. About 70 expected. Melways 132/A7.
- The traditional weekly public viewing nights at *The Briars* will be held on the first 4 Friday evenings of January 1998, starting 8pm.

Phenomenal Events:

- There will be two meteor stream observing nights at the members' viewing nights at *The Briars* on 1st Nov and 6th Dec. Bring a deck chair,

blanket, insecticide, binoculars or just your eyes.

- The 18th NACAA (National Australian Convention of Amateur Astronomers) is being held next Easter 10th-13th Apr, 1998 in Sydney. Register by 31st Jan.
- Ballarat Astron. Soc. have astro-photographer David Malin on a weekend seminar at Ballarat Observatory on 9th-10th May, 1998.
- Predictions for seeing the spacestation *Mir* are available at meetings or on the Internet.

Social Events

- A Halloween dinner (without costumes) of members and friends was held at the Dava Hotel on Fri 31st Oct as advertised at Oct's meeting.
- Annual Christmas break-up barbeque at *The Briars* on Saturday afternoon 6th Dec.

YOUR SOCIETY

NEW MEMBERS

Welcome to the following new Society members:

Michelle O'Neill

The ASF is one of the largest groups in Australasia. Membership is currently at 101. Please feel free to say hello at general meetings. Specialised badges, windcheaters, T-shirts, books & posters are available at meetings. Society name tags are free to new members who attend meetings. Members are able to borrow library books and are entitled to attend special viewing nights at *The Briars* where you can discover the secrets of the night sky.

HELP NEEDED

Articles, features, book reviews, member observations and points of general interest for this journal are always welcome. New contributors are encouraged. For example do a bit of reading and pass on some information, but remember not to plagiarise. Hand



written material is fine; computer text files are perfect.

We need further assistance by members at school viewing nights. If you have never attended before, but are curious as to what occurs, please come along as an observer. If you have a scope or binoculars to bring, then great, but even if you don't, or are not confident at finding anything in the sky (even the Moon), you can help with ushering children to each instrument. After doing several of these nights, you could find yourself quite familiar with the main objects in the night sky. Leave your name on the roster sheets at meetings, or phone the Secretary.

SECRETARY'S JOTTINGS

The society has decided to buy a laser collimator for use by all members at *The Briars* for aligning their optics quickly and accurately, as such a device is beyond the means of most members individually. Ken Bryant has offered to build a replacement mirror cell for the Peter Norman telescope, based on his scope's design and, together with restoration help from Richard Pollard, it is hoped to have this up and running in the new year. Further work is being done to determine the feasibility of the society purchasing a scope for members to borrow for a small charge. A first aid box has been kindly assembled and stocked by Peter Lowe, and is now in one of the cupboards at monthly meetings.

Don Leggett

RECENT MEETINGS

September's meeting was chaired by the President and, on a clear night, saw 45 pay their respects to absent members by a

one minute's silence. After the introduction, Bob Heale presented *Sky for the Month*, christening our new overhead projector (proudly introduced by Richard Pollard), followed by Ian Porter's *What Goes Up* segment showing a veritable constellation of Iridium communications satellites launched during the month. A new regular *Lowe Down on the Internet* segment was then introduced by Peter Lowe. He reported on a predicted outburst of the variable star Eta Carinae in the next few months. This star can be easily viewed and measured in binoculars, so here is your chance to spot it first for immortal fame. The optical source of gamma ray bursters is now thought to be at cosmological distances, and was covered as well as thoughts on the self-replicating nature of our Universe, possibly via super massive black holes. Many members had viewed the recent partial and total lunar eclipses and had brought their photos along for inspection. The latter event had been severely clouded over for most observers, though Rene Skilton had reported trying 3 times during the night before succeeding in seeing the shadow-enshrouded Moon. Bruce Tregaskis reported more sunspot activity, there were no comet observations of any great note reported during the month, and Russell Thompson reported dark spots in Jupiter's northern belts. After tea break, most reconvened to view the video on the *Quest for Mars* (just as the Mars Global Surveyor had entered Martian orbit during the week), with a smaller group of others preferring to discuss diverse astronomy topics. Meeting closed at 10:30pm.

October's meeting was chaired by the President, and saw 42 in attendance, including visitors. Under the watchful eye of a video camera (for use in a member's daughter's school project), details of the many successful school nights this month were related. Bob Heale presented *Sky for the Month*, Ian Porter gave his *What Goes Up* segment (there were a few launches and an update on the Mars Sojourner vehicle), and Peter Lowe gave his *Lowe Down on the Internet*, focussing on the strangely massive stellar object discovered near our Galaxy's centre this month. During tea break, members inspected Ian Porter's 8 inch Meade Dobsonian to assess its suitability as a loan telescope for members to borrow. All seemed to agree we should proceed. After the break, everyone reconvened to hear Renato Alessio tell of his personal quest to view almost every Deep Sky object his 14 inch telescope can see. He has viewed an amazing 1,697 objects in the last few years, and adds another 25 every evening he observes. After questions, the meeting closed at 10:25pm.

LYNDHURST EXPEDITION

In the pre-dawn skies of 22nd Sep, local time, a group of observers braved misty conditions along Taylors Road in Lyndhurst to catch a bright magnitude 4.8 star grazing the Northern limb of the Moon. Using instruments ranging from 4 inch to 8 inch (though any size would have sufficed), the group consisted (North-South) of Peter Skilton, Herwig Waldhuber, Brian Amey, Alfred Kruijshoop, Marj Walker, Patricia Larkin and Jim Blanksby. Propagation of

VNG on 5 MHz was poor, however, 2.5 MHz was quite useable. Some of the sites were troubled by fog, radio signal propagation, or nearness of the star to the bright limb of the Moon. No site saw a graze, as the actual path of the event was significantly further North than the prediction indicated. Total occultations were witnessed instead. Concurrent observers in Geelong (Rob Cowdell, Frank Baker, Miles Charlesworth and Reiner Klose), who were stationed further North of the Lyndhurst crowd, similarly saw totals, except for the northern most observer who apparently reported seeing a miss. The local observers had a quick coffee before driving home to get ready for work. The exercise will nevertheless place valuable constraints for future predictions on this part of the Moon.

BALLAM PARK GRAZE

A nearby graze expedition on the early evening of 7th Oct saw the Ballam Park area as the centre of interest. In an attempt to see a magnitude 8.4 star slip into the southern Cassini region mountains and valleys of the Moon, six observers set up in anticipation. Spread North-South in the Frankston area were Jim Blanksby, Marj Walker, Alfred Kruijshoop, Bruce Tregaskis, Ken Bryant, Peter Skilton and also Rob Cowdell and several observers from the Astronomical Society of Geelong positioned near the Shell Refinery on the outskirts of Geelong. All, however, were thwarted by thick cloud in the half hour before the event.

Thanks to the following members who participated in one or more of the viewing

nights below: Ken Bryant, Ian Cuthbertson, Peter Elias, Roger Giller, Tony Hales, Bob Heale, Karen Helweg, Bronwyn Isarin, Peter & Vivienne Lowe, Darryl Moule, Richard Pollard, Ian Porter, Ros & Peter Skilton, Sue Stoner, Russell Thompson, Bruce Tregaskis.

About 130 excited Grade 3/4 pupils, parents and teachers at Aldercourt Primary school were treated to a marvellously clear night on 12th Sep, when a gibbous Moon and all planets except Mercury were available in the evening sky. Apparently, they had prepared for this evening all school term.

Eighty grade 5 pupils and their teachers from Resurrection Primary, St.Albans attended a viewing night at Camp Manyung on 6th Oct at which, under slightly cloudy conditions, they were shown the night sky splendours with 7 telescopes. The intrepid members who attended were treated to tea and cake afterwards by the school.

On a balmy evening on 9th Oct, over 50 eager 4 year olds and teachers at Erinwood Pre-school, Frankston were treated to clear skies under a first quarter Moon. Red cellophane covered torches were the order of the evening. On show was the lunar terrain, a gibbous Venus, red Mars, splendid Jupiter with 3 of its attendant moons, and a glorious Saturn. In addition, 3 predicted Russian Cosmos satellites were spied by the children and intently followed across the sky. All handled an iron meteorite, created an impact crater in sand, inspected globes, and saw slides of the planets, of which the kids were most

familiar. A very successful evening ended when parents and siblings arrived, but not until after they had a quick peek through the scopes!

On the same night, Baxter Primary School was also visited, this being our first visit there. Richard Pollard presented his inaugural talk to a packed house of around 250 grade 2 students, teachers and others (we expected 60!), then the suitably hyped crowd swelled outside to view the sky through the available instruments. They apparently swarmed around the telescopes for over 2 hours before being either satiated or soporific. All enjoyed the night.

Kingsley Park Primary School, saw 130 grade 6 pupils and teachers attend the viewing night on 20th Oct, and about 40 grade 5 pupils on 22nd Oct. Although unfortunately solid cloud prevented telescope usage, all were treated to an entertaining talk and vigorous question time.

About 90 lively grade 3 & 4 students from Riddells Creek Primary attended Camp Manyung on 28th Oct. With fewer telescopes than planned, including one the school brought along, the queues at each were longer than desirable, though everyone persevered and good views of the planets were had by the children and teachers. Several satellites and meteors were spotted during the evening.

LIBRARY MATTERS

Please remember to return all books after one month's borrowing time. They can be re-issued if necessary. This saves me telephone calls trying to

chase them on behalf of others. Don't forget we have several folders of magazines, and other society newsletters, which make for very interesting reading.

Kathy Stabb

The Quasar Publishing excellent *ASTRONOMY 1998* year book is now available to members at the Society's bulk discount rate. Enquiries to the editor ASAP.

ECLIPSE ON THE NET

It appears the lunar eclipse in September was broadcast live on the internet from the Calwell Lunar Observatory in Canberra. Run by amateur Byron Soulsby, this event was tracked by two CCD cameras, one at high resolution and the other at low resolution. Conditions were clear at the time. Unfortunately no-one seemed to know this was happening locally. In previous eclipses, we have received advanced notice with predictions to do crater timings as the Earth's shadow moved across the lunar surface, however, this time the predictions were only advertised over the internet, precluding a lot of observers. The site was at <http://jump.to/lunar-eclipse>, and has the eclipse animations as recorded.

OCCULTATION TIME

The August 11 issue of *Time* magazine this year had an article entitled "*Calling All Amateurs*", in which the central theme was the participation of amateur astronomers in watching a bright star grazed by our Moon. Hundreds of Americans rose early one morning to record a time signal onto their home video cameras via the US cable TV Weather Channel. Leaving

the camcorders running, they then went into their backyards and videotaped the night sky just as Aldebaran moved behind the Moon. No other instruments were necessary. Participation was summoned via the Internet, and proved very popular with some 7,400 hits to the web site of the *International Occultation Timing Association*. Hundreds of video tapes are now eagerly being viewed, and will greatly assist professional astronomers determine the exact profile of our neighbour in space.

DOG OF A DAY

I noticed a prominent "Sundog" (sometimes called a mock Sun or parhelion) on Friday, 26th Sep about 7:30am. A small, bright region was visible 22° to the left of the rising Sun and displayed the colours of the rainbow (red being closest to the Sun, and blue furthest away). Sundogs are caused by refraction of light by ice crystals in the atmosphere. They typically occur in pairs, one on either side of the Sun, or as a circular halo around the Sun. Did anyone else see it?

YOUR VARIABLE STAR OBSERVATIONS ARE USED

The ASF has several members who contribute Variable Star brightness estimates to the *Royal Astronomical Society of New Zealand*. These are eagerly sought by professional astronomers. For example, recently Pulkovo Observatory used data provided on RY Lupi, Keele University used data on RR Tel, Livermore University used OY Car data, and there are many other instances. It sounds difficult to be able to measure

the brightness of a star whose magnitude varies from day to day with just your eye, a pair of binoculars or a telescope, but it really isn't once you've been shown how. If curious, please ask at a meeting for a simple project (maybe for school).

JUST FOR STARTERS

FALLING INTO LINE

A conjunction is an alignment of two or more bodies with the Earth, so that they appear to an Earth-based observer to be at the same place, or nearly so, in the sky. In the 1980's, there were books written about the so-called *Jupiter Effect*, when several planets were meant to align and supposedly cause catastrophe on the Earth due to their combined gravitational tug on our planet. Well we survived the 1980's, however, one member indicated in the monthly meeting's suggestion and question box, that they had seen a television program about a rare alignment (or in other words conjunction) of planets on 5th May 2000. Using the computer program *Voyager II*, it is possible to search forward and backwards in time for any alignments of Solar System bodies.

It turns out that on 4th May 2000 at 8:24 UT, the Sun, Moon, Mercury, Venus, Mars, Jupiter and Saturn will all be within 12.5° in the late afternoon sky, which is about the equivalent of an outstretched handspan. As the Sun is part of this alignment, this will occur in the daytime and so you won't readily see it. Neptune, Uranus and Pluto are out at nearly right angles from this alignment, and so do not

contribute. Searching 1,000 years into the past, and 1,000 years into the future, indicated there was a 10.3° alignment of these same bodies on 15th Aug 1007, and a 7.2° alignment on 15th Sep 1186, and there will be a further 10.5° alignment on 19th Mar 2675. So, yes, this year 2000 alignment is very rare and worth the wait.

Out of interest, I searched the previous 2,000 years, and the next 2,000 years looking for any alignment of all the planets, the Sun and Moon in the sky. On 18th Aug 947, they all lined up within a span of 30.6°. The best is actually on 22nd Jul 3888 when the separation is 28.2°. It is at 10:16 UT so will be visible in the evening from Australia if you wish to put it in your diaries. In all these cases, there is no cause for concern from the gravitational pull involved as it is almost entirely due to the Moon (since it is close to us), and the Sun (since it is so massive, even though it is a good distance away). The Sun and Moon are used in the calculation of tides on Earth, whereas there is negligible effect if the planets are factored into the calculations.

IN THE NEWS

A BIG WAVE GOOD-BYE

There is an aboriginal legend of a "white wave" that fell out of the sky and wiped out aboriginal culture more than 200 years ago. Up until now it was interpreted by historians to mark the coming of the white man to Sydney Cove in January, 1788. However, it is now believed by an Australian Geologist, Prof. Ted Bryant, that the legend was really referring to a tsunami, or

tidal wave. This wave was a natural disaster that devastated the south coast of NSW after an asteroid strike in the Tasman Sea. Indeed, there have been two such disasters in the last 1,000 years along the same area. Travelling at a speed of about 350 km per hour, the wave of water picked up telephone box-sized boulders, and swept them high into a cliff face near Merimbula, well above the storm surge line. This was the clue to the event. The impact is known to have occurred in the daytime, around mid-summer, because the legend describes the wave as coming in very hot and sultry weather, with people lying around resting. The next day, the survivors apparently went down to the coast and found large new sea caves dug out along the cliff faces. Soberingly, waves of this size will easily ride over Sydney Heads into Sydney Harbour, or over our Heads into Port Phillip Bay, creating at least 4 metre high waves that slosh back and forth around the bay for several hours afterwards, causing much damage especially in low-lying areas.

BURNHAM PASSES AWAY

Robert Burnham Jr, author of the classic and hailed three volume set, *Burnham's Celestial Handbook*, died in September. A lengthy biography of this talented man can be found on the internet at <http://www.phoenixnewtimes.com/1997/092597/feature1-1.html>. It relates the extremely sad life of this man, who died a penniless recluse, despite selling enormous numbers of his life's work in the handbook (which is available in the Library). Most sales were apparently made by Book Clubs worldwide, that sold them for \$1

or so each to entice new people into their membership. This swamped the market with his work, and forced his royalties to be negligible per copy sold, causing him great hardships and trauma throughout his life, and much stress because his life's work was being sold for the cost of the paper in the books alone. A very sad tale indeed.

OZ ASTRONAUT FOR MIR

Adelaide born 46 year old astronaut, Andy Thomas (who lectured last year in Melbourne), is to fly to Mir for a 4 month stay early in 1998. This will be the final USA visit to prepare for the International Spacestation. Arriving home after his previous trip in space, he said "*Space flight is just an incredible experience. The things I have been able to see and live through are just mind boggling - its the stuff dreams are made of*". While the thought of visiting the troubled Russian spacestation would daunt many, he brushes the concerns aside.

CASSINI AWAY

The NASA Cassini mission was flawlessly launched on its 3.5 billion kilometre journey to Saturn on 15th Oct. It is one of the biggest, heaviest and most complex craft ever sent into interplanetary space, comparable to a school bus in size, with over half its weight in rocket fuel. The 11 year journey will see the onboard Huygens probe parachute into the atmosphere of Saturn's main moon, Titan, in search of possible primitive life-forming molecules. It is expected to either hit the surface or splash down. The journey to Saturn will not be direct, but will rather use the now customary

slingshot interplanetary billiards method, by first visiting Venus in April 1998, then Venus again in June 1999, then come within 800 km of the Earth in Aug 1999, then Jupiter in Dec 2000, before reaching Saturn in July 2004 for a 4 year mission.

THE PISTOL STAR

The Hubble Space Telescope has discovered the brightest known star. Known as the *Pistol Star*, after the pistol-shaped nebula which is around it, it radiates as much energy in 6 seconds as our Sun does in an entire year. This giant star is near the centre of our galaxy, the Milky Way, and is probably about 200 times as massive as our Sun, assuming that it isn't really a close collection of similar stars which cannot be resolved by the telescope. It is most likely only about a million or so years old, and will end its days as a supernova explosion in about another 3 million years. Live it long or live it fast.

FEATURE

WALTZING BY MATHILDE

The Near Earth Asteroid Rendezvous mission (NEAR) was launched on February 17, 1996, the first in NASA's Discovery series of "faster, cheaper, better" planetary exploration missions. Its primary mission is to study the asteroid called *Eros*, named after the Greek god of love.

By chance, it was noticed that the chosen trajectory to *Eros* would also take the small craft near another asteroid, *Mathilde*, albeit at the expense of using some precious supplies of fuel

and possibly introducing the risk of premature mission failure due to impacts with dust around *Mathilde*. Nevertheless, a minor detour to the mission was approved, and the NEAR craft flew by *Mathilde* at a speed of 10 kilometres per second (10 times faster than a rifle bullet) on June 27 this year. Because of this planned fast flyby, large Earth-based instruments were trained on this rock in the outer Solar System to measure as many physical properties as possible. Also, all observations (including from amateurs) taken since its discovery have been used to see how its orbit has changed over time.

Discovered on November 12, 1885 by Johann Palisa in Vienna, *Mathilde* is named after the Paris Observatory director's wife at that time. Asteroid (253) *Mathilde* is a carbon-rich rock of large proportions 50x50x70 km. As such, it is considerably larger than the minor planets (243) *Ida* and (951) *Gaspra* which were pictured as the Galileo spacecraft sped by on its way to Jupiter in 1993 and 1991 respectively. From Earth-based observations, *Mathilde* is known to rotate slowly once every 17.4 days and takes 4.31 years to orbit once around the Sun, out near the asteroid belt between Mars and Jupiter. It is also one of the blackest objects known in the Solar System, and only two other asteroids are known to rotate slower about their own axis. The cause of this slow rotation is a considerable mystery.

The 800 kilogram NEAR vehicle was not designed for rapid flyby photography in that its camera cannot be panned around (this was a cost-cutting measure), therefore to picture *Mathilde* was

quite a technical challenge in that its position in space needed to be known to within 25 kilometres or so to enable the entire craft to be slewed for the photography. In addition, the cameras had to contend with the extra factor of the position of the Sun during the imaging time, which meant the cameras only saw a part of *Mathilde*.

The mass of *Mathilde* was able to be judged by the slight deflection it had on NEAR's flight path, which can be measured ultra-accurately, and from the volume measured photographically, the minor planet's density could be gauged. The density then tells whether *Mathilde* is solid, or just a collection of fairly loose rubble.

Images taken show the asteroid to be a very black, dark lump of rock, riddled by craters. The asteroid has one crater over 25 km across, so maybe instead it could be called a crater, riddled by rock. A major surprise was that scientists determined the density of the asteroid to be about 1.3 grams per cubic centimetre, not much more than that of ice. A value about 8 grams per cc is more like that expected for solid rock, suggesting that *Mathilde* may not be solid rock, but rather an association of rubble with gaps. It may be that the crater-forming impact nearly shattered *Mathilde*, or did so and it has since reformed.

Once arriving at the final destination of *Eros* on January 10, 1999, the NEAR craft will

spend a year in orbit around it. *Eros* is thought to be about 30 km long, midway in size between that of *Ida* and the smaller *Gaspra*. The craft will map it in detail to a resolution of 3 metres, and determine surface composition using its multispectral camera, x-ray and gamma ray spectrometers. Laser ranging will then be used to determine the asteroid's shape to an accuracy of 10 metres, and the effect on the orbit will determine *Eros*' mass, and hence density, to unprecedented accuracy. The orbit will be as low as 15km at times. Then on February 6, 2000, NEAR will attempt a soft landing on the surface of *Eros*! Since NEAR has not been designed to survive a landing attempt, this

performed by Renato. Further reviews are hoped for}.

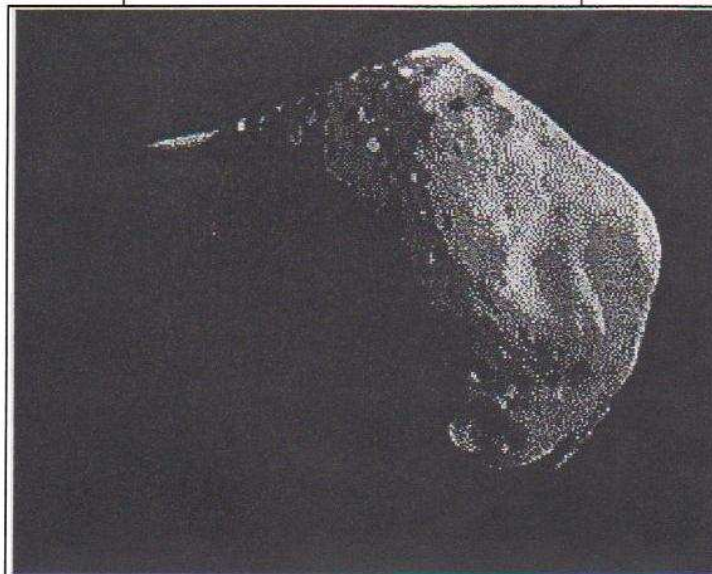
It is my opinion that everyone should eventually own a nebula filter. But do not go out and buy one straight away, as I did. My thoughts on trying out my just purchased *Celestron LPR* filter was - "Yuk". After two weeks of having the same thoughts, I put it into the accessory case, not to be touched for another year and a half.

What had annoyed me was that while the *Celestron LPR* did indeed enhance emission nebulae, it was at the expense of dimming stars, leaving the view most displeasing to my eye. Time passed, and eventually I found myself wanting to view

planetary nebulae like the Helix nebula, and other faint and star-like planetaries. I found the *Celestron LPR* to be invaluable for this task. Moving it slowly over the top of a low power eyepiece, easily showed the location of the planetaries. If you are going to buy only one filter, I believe the *Celestron LPR* should be your first choice, for two simple reasons. First of all, it's the

cheapest of the various brands. Secondly, it is the most versatile, as it enhances the most commonly viewed nebulae, and it does a decent job on most planetaries. The *Celestron LPR* is really a narrow broad band filter, lying between the Lumicon *DeepSky* and *UHC* filters in performance.

In 1991, *Astronomy* magazine



NEAR probe photograph of minor planet (253) *Mathilde*. Note the incredibly large cratering on the left of the image (in shadow).

manoeuvre could very well spectacularly mark the end of the mission. Either way, our messenger from Earth will become a permanent landmark on this distant asteroid in the depths of space, possibly to greet a traveller in the distant future.

Peter Skilton

NEBULA FILTERS

{This is the final in the current series of road tests of astronomical hardware

pointed out that the best overall filter combination was the *OIII* and *DeepSky* filters from Lumicon. I purchased them, and I have to agree with *Astronomy's* assessment.

The *DeepSky* filter does not increase contrast as much as the *Celestron LPR*, so it does not show nebulae as well. However, it also does not diminish the brightness of stars as much, leading to aesthetically much more pleasing views of the field. While Lumicon does not recommend the low exit pupils that I regularly observe at with the *DeepSky* filter, I find them the most pleasing feature of using this filter.

The *OIII* line filter really does diminish background stars severely, to increase a nebula's contrast. Finding planetary nebulae is simple, even in light polluted suburbia (providing you cup your hands around the eyepiece to stop stray light getting in). This filter simply is in a class of its own in providing enhanced views of nebulae, including emission and planetary nebulae. I am mystified as to why there are no competitors.

However, one night I did directly compare the *Celestron LPR* attached to a 20mm eyepiece (100x) with the *OIII* on a 40mm eyepiece (50x), on the Helix nebula. While the *OIII* image was much brighter, I couldn't honestly say that I saw any more structure than was visible in the *Celestron LPR* filtered view.

The Lumicon filters have one very big problem, which limits my use of them. They have smooth rounded edges, giving me the feeling that they could slip out of my fingers any

second, if I am not extra careful. As I view on a gravel area, this is not a pleasant feeling to have. The *Celestron LPR* does not have this problem, explaining why I have not retired it.

Finally, idle curiosity led me to purchasing the Lumicon *H-Beta* filter. This is a line filter of limited application, and it is not that easy to use. Instead of seeing sharp brightish images as with the *OIII*, nebulae are more of a brighter-than-background-sky glow in the *H-Beta*.

To use the *H-Beta*, you have to have a low power eyepiece, and an eye cup, to stop any stray light being visible out of the edge of your eye. I had to make one up for my 40mm eyepiece.

The Horsehead nebula was not easily visible in my Celestron 8 inch scope through the *H-Beta* filter. Only when I fitted a focal reducer to give the 40mm eyepiece a 6mm exit pupil, did the Horsehead stand out easily.

The California nebula was not very difficult, and IC2118 in Orion was detectable with the *H-Beta*. M43, which is just under the Orion nebula, is very interesting to observe with filters. Viewing it with the *OIII* shrinks it dramatically. However, on viewing it with the *H-Beta*, it glows nicely and has a very distinctive comma shape.

To summarise, if you are only going to buy one filter, buy the cheapest, the very versatile *Celestron LPR*. The best combination of filters is the *DeepSky* and *OIII* filters. I

can offer no opinion on narrow band filters like the *UHC*, as I have never tried one, other than they are probably more contrasty than the *Celestron LPR* and less contrasty than the *OIII*. Finally, if you want to view through an *H-Beta* filter, you are better off borrowing mine for a night, when Orion is high in the sky.

Renato Alessio

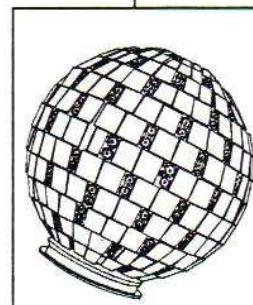
THE CROWDED SKY - BOOGIE ON DOWN AT THE SPACE DISCO

Flares, wide purple ties, collars like the wings of a 747, Saturday night fever and mirror balls have all faded into memory with the passing of the age of disco – or have they? Thousands of years from now, when alien cruise ships pass by for a look at the mysterious ruins of the Earth, the memory of the mirror ball will live on! Joining them in orbit around Earth will be a bevy of geodetic “mirror ball” satellites with orbital lifetimes of millions of years.

Geodetic satellites allow precise measurements of phenomena such as continental drift, the movement of the poles and tidal variation. Most geodetic satellites are dense spheres covered in reflectors. The satellites are placed in super stable orbits, allowing laser

measurements of Earth positions to be made to millimetre accuracy.

One of these satellites, a Japanese satellite called EGP (Experimental Geodetic Payload) is easily visible in binoculars, as a slowly moving series of strobe-like flashes of magnitude 4-5.



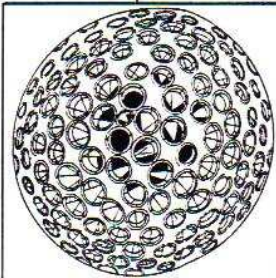
The EGP satellite.

One of the first geodetic satellites launched by NASA was LAGEOS, launched in 1976. At the instigation of Carl Sagan, a "message to the future" was placed inside the object. How long will the object last? Well, barring accident, the orbital lifetime of LAGEOS will be around 8 million years! Will mankind be around then? Who knows? But the 70's will live on.....

Ian Porter

FOR SALE

One unground 8 inch telescope lens and unused gradings paste for \$90. Contact Simon Hamm on (03) 9789 5032.



The LAGEOS satellite will boogie on a while.

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.



Astron. Soc. South Australia (SA) - Book review provided of *Longitude* by Dava Sobel, which resides in our library. The story of the accidental discovery of comet Tilbrook in the TV CRV variable star field by their member Justin Tilbrook. You can be lucky. General letter from Carolyn Shoemaker published. Review of the new Hipparcos Tyco star catalogue. Hubble views of the variable star Mira.

Sutherland Astron. Soc. (NSW) - An internet home page has been put together at <http://www.ozemail.com.au/~sasi/>. Very detailed observing hints, drawings and diagrams are shown for Jupiter, for even experienced observers. The behaviour of several variable stars being observed is summarised. Updates provided on the Galileo, Hubble and Pathfinder craft.

Latrobe Valley Astron. Soc. (Vic) - They have purchased a surplus 12mx6m shed from the SEC which is to be moved to their Wirulda site and put

on a concrete base, which also proudly boasts an ATCO hut.

Astron. Soc. Alice Springs (NT) - Includes details of Mars Pathfinder and the NEAR mission results to asteroid Mathilde. Also the basics of refraction and reflection of light. The society is gearing up for overseas visitors as the warmer nights approach.

Astron. Soc. South West (WA) - Their \$39,000 ablutions block is now completed, and was built with the assistance of grants from various state bodies and volunteer labour, including Rotary Club sponsorship. The society constitution is undergoing a significant rewrite at the moment. The mobile phone tower 50 metres from their observatory is built, but not switched on yet. Members are considering wearing clothing containing metal thread as a shield to its possible effects.

Astron. Assoc. Qld (QLD) - Held a new annual astro quiz where meeting members were split into teams based on birth month. The society had a major success in recording the recent stellar occultation by Triton by CCD, with a video being prepared. Member Brendan Downs discovered supernova 1997de in NGC6769 with a CCD and a 31cm scope. Article on starting off in prime focus astrophotography, including guidance on films and hypering. The Edward Corbould Research Fund is now seeking applications to assist amateurs and students in undertaking projects. An explanation is given of why the Moon is perceived as being larger when near the horizon than when overhead.

Astron. Soc. Vic. (Vic) - A continuation of their chronology is provided up to the present, including a brief history of the Meteor Section. The 27 inch scope under construction with a purchased mirror is hoped to be ready for first light by end November. They are considering purchasing a video detector for use at public nights.

FINAL PRONOUNCEMENT - GEOSYNCHRONOUS

Every satellite in orbit about the Earth is constantly falling back downwards towards the Earth, just as if you had dropped it. However, a satellite is also moving forward in its orbit at great speed (29,000 km per hour or so) due to the velocity of the rocket that placed it into that orbit originally. The result is that even though the satellite is dropping in free fall, the Earth, being a sphere, curves away beneath it before it hits the ground. The result is that it never reaches the ground, and hence stays in orbit. This is why astronauts in the Mir spacestation are weightless. Imagine yourself in an elevator descending a building very quickly, or jumping out of an aeroplane. You become weightless while you are in free fall (and your stomach ends up in your mouth initially). The satellite is always in free fall, and hence experiences weightlessness continuously.

Travelling at such a high velocity, most satellites pass from horizon to horizon over an Earth-based observer in a matter of minutes. However, if they occupy a special circular orbit on the equator at an altitude of 39,500 kilometres, where the time to go once around the orbit is 24 hours, then they will stay in one place in the sky because the Earth, too, rotates once in 24 hours. This orbit is known as geostationary, and is an example of a geosynchronous orbit (pronounced "gee-o-sin-kro-nus"). Its existence was predicted originally by science fiction author Arthur C. Clarke, and literally means *synchronised in time with the Earth*.

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.

ASF Inc. Annual General Meeting (AGM) Elections

Nominee: _____
 Proposer: _____
 Seconder: _____

} must be current financial members

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.



Left - ASF XMAS BBQ at the Briars on the 6th December 1997
 Photo - By John Cleverdon



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

Most of the stars in the night sky are double star systems, involving two stellar companions perpetually dancing around each other. If one has a different brightness to the other, and if the plane of the orbit is favourably aligned with the Earth, then it is possible to see total or partial eclipses as the dimmer star blocks the other brighter one. During eclipse, the overall light level you see will decrease from its normal value. These eclipses are gradual and can take days or weeks. This is a particular type of *Variable Star* that you can observe (although technically it is not one star, but two) even though you might never resolve the separate stars in your telescope.

