SCORPIO

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

Volume IV No. 3 1995

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. In addition, the Society provides the services of its members for educational presentations or observing nights for schools and local community groups.

Meeting Venue:
The Peninsula School
Wooralla Drive, Mt Eliza
(Melways Map 105, F5)

Room F6 at 8.00pm on the third Wednesday of each month except December.

Visitors always welcome

Annual Membership Fees

Full Members	$20
Concession Members	$15
Family Members	$30
Family Pensioners	$25

Membership fees are due 1st January each year.

President
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Treasurer
Peter Brown (03) 9789 5679

Secretary
Don Leggett (059) 85 4927

FUTURE EVENTS

General Meetings:

Wed 16th August
Session 1: Peter Lowe will present *"Asteroids and Minor Planets"*.
Session 2: David Girling & Bob Heale on *Practical Astronomy*.

Wed 20th September
Session 1: Peter Lowe will present *"A Case of Solar Wind"*.
Session 2: David Girling & Bob Heale on Practical Astronomy.

Wed 18th October
Session 1: Video commemorating *Apollo 11 Man-on-the-Moon*.
Session 2: David Girling & Bob Heale on Practical Astronomy.

Wed 15th November
Annual General Meeting.
Other details to be advised.

Viewing Nights:

Members Only:
Sat 22nd & 29th July, 19th & 26th August all at *The Briars*, Nepean Hwy, Mt.Martha. Always confirm with David Girling on (059) 76-2806 before attending. Meet at the Briars' Visitor Centre at 7 pm sharp.

Public:
None advised.

School/Community Groups Viewing nights or slide nights:
None advised.

Social Events:

Possible film night late August/early September for "Apollo 13" starring Tom Hanks. Further suggestions are welcomed.

Phenomenal Events:

Lunar Graze expedition Wed 9th August 7:40 pm at Cranbourne. Meet at 6:30 pm. See Peter Skilton for details. The last one at Hastings was a success (for those who found us).

Lectures:

While the ASF lectures did not go ahead this year, the University of Melbourne is conducting two free public lectures of Astronomical interest. They are both at 8pm in the Laby Theatre on Swanston Street at the University. Refer to the Map in your Melways.

Fri 4th August
"Just How Much Matter Is There in the Universe"
by Dr. Rachel Webster

Fri 11th August
"The Solar Neutrino Problem: What's Cooking in the Sun"
by Dr. Mark Thomson.

NEW MEMBERS

A warm Winter welcome to the following new members of our Society:

Renato Alessio
Evelyn Boudville
Anjali Chandnani
Peter Elias
Roger Giller
Keith Mutch
John O'Sullivan
John Randall
Gwen Thomas
Betty & Cyril Vennells
Jeannette Williams

As a guess, total membership is around 60-70 at the moment, making us the second largest Society in Victoria. Please make them feel welcome at all general meetings, and remember that everyone starts somewhere. Society badges and Planispheres are available from the Treasurer at General Meetings.

HELP NEEDED

Does anyone have a normal slide projector they wish to give the Society?

Material is needed for the newsletter. Please pass on to the new editor (Peter Skilton) at meetings or c/o GPO Box 596 Frankston. Photos will be returned if requested.

COMMITTEE NEWS

Very little happened at this month's committee. As you have probably gathered, the Winter Lectures did not go ahead this year due to insufficient speakers as a result of work pressures. Please remember that you do not have to be a polished speaker to contribute. Our Secretary will be providing the details in this column for future editions. Stay tuned as he uses his new computer.

EDITOR'S BIT

Welcome to the newish looking newsletter. As you may know, Peter Lowe has passed on the honour of this position to me. In the past Peter collated articles, studiously wrote some, then with Vivienne's help stapled and mailed out the newsletter. I am sure you will all join with me in thanking him for his invaluable service over the past 3 years. Much effort was clearly involved. From now on, Ros and I will produce the newsletter, with David Girling kindly offering to do the copying, stapling and posting. If all goes to plan, newsletters shall be ready by every second general meeting, where members can collect them. Of course, those who are unable to attend meetings will still have theirs posted in the usual way.

Peter Skilton

July's Meeting

A "Show and Tell" night was combined with a parallel session on Practical Astronomy. Some features of the Show and Tell were a video of an occultation enabling members to experience their own indoors! The VNG time signal station was broadcas enabling members to set their watches accurately. Scopes of various sizes filled the room, with David sporting about a 8 incher and showing off his new observing freezer suit for keeping warm. Bob Heale had his laptop computer on display demonstrating Astronomical software. Several other members had smaller bits and pieces, all of which were most interesting.

Name tags were handed out at the July meeting for all financial members, though newer members who had not reached "the List" were omitted and will receive theirs at the August meeting. The aim of this is to assist in people getting to know each other. Those who have been issued them should bring them to all future meetings. Leave the tags in your car glovebox so as not to forget them. Lost or damaged name tags can be replaced for $2.

JUST FOR STARTERS

A corner-cube reflector is an arrangement of 3 mirrors forming a corner (or apex) of a simple box. A home-made

example was shown at the last "Show and Tell" meeting.

This relector has the intruiging property that any light that strikes it is reflected back along exactly the same path as it arrived. If you look into the reflector, all you will see is your own eye, irrespective of where you position your head in front of the cube. The orientation of the mirrors is therefore unimportant.

Apollo 11 left an array of corner-cubes on the Moon, and many Earth-orbiting satellites have them fixed over their outside surfaces. The reason is that if an Earth-based laser beam is directed at them, the reflected beam will be received at exactly the firing point a short time later. Measuring the time difference, and knowing light travels at a speed of 299,792 kilometres per second, enables the round-trip distance to be calculated accurately. In this way we know where many satellites and the Moon are in space to within a centimetre or so, enabling quite accurate orbit predictions. For example we now know that the Moon is slowly moving away from the Earth by a few centimetres each year.

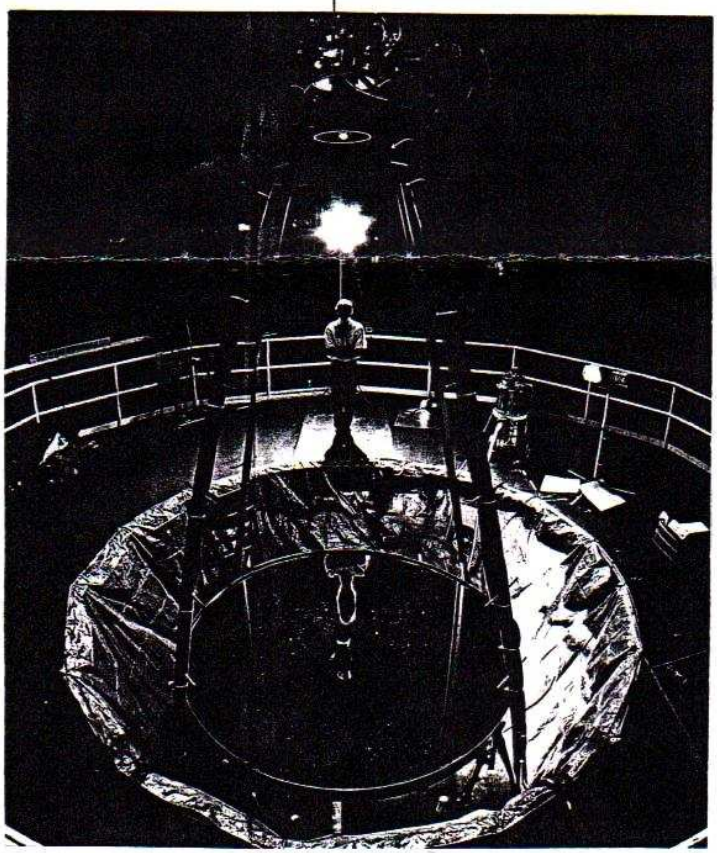
MERCURY MIRROR

In the previous edition of Scorpio, a method was outlined of how to cast your own telescope mirror on a record player, and mention was made of mirrors constructed of liquid mercury (of the same type as fills thermometers). Some members were sceptical of the existence of these. A picture of a 3 metre diameter one containing 300 kilograms of silver mercury is shown here. It is located in New Mexico. NASA in the USA uses the mirror to hunt for space junk that could endanger orbiting spacecraft, and the future Space Station. Its performance is quite satisfactory, despite the fact that it is not steerable. Mercury vapour is quite toxic, and so close operation near the mirror surface requires the donning of suitable breathing apparatus. That is why broken thermometers must always be cleaned up thoroughly. The mirror rides on air bearings, and it is said that a single push of the mirror by hand will set it spinning for over an hour.

1995 JULY 3 GRAZE EXPEDITION

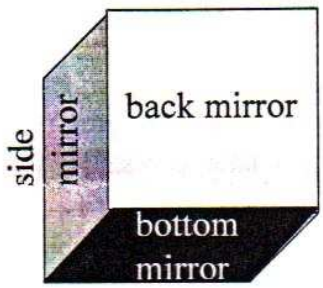
The predicted graze of a magnitude 8.1 star near Balnarring in the cool early evening proved a 60% success. Three telescopes (two 6 inchers and an 8 incher) were set up near the Southern corner of Coolart Road and Frankston-Flinders Rd. Between Jim Blanksby, Alfred Kruijshoop and I, a total of 15 disappearances and reappearances were recorded of the star on the lunar limb before rain clouds interfered and prevented the final reappearance from being observed. You could say they put the dampener on things. VNG time signal propagation was good, though seeing was only average at the time. The latter two stalwart observers from the ASV travelled down the Peninsula to team up with our Society.

Roger Giller and Peter Lowe found an ambiguity in the issued instructions and set up on the *Northern* end of Coolart Rd which also intersects Frankston-Flinders Rd a *second* time. They naturally saw no graze, being a



20 minute drive too far North. In future a Melways reference number will be given beforehand if possible. Nevertheless, the profile of 2 lunar mountains a couple of kilometres high was obtained in a region of the Moon that is fairly poorly mapped, and will be passed on to ILOC in Japan for processing.

Peter Skilton



A corner-cube reflector made from 3 mirrors.

HITTING THE BRAKES

Engineers some months back now have tried a technique for manoeuvring a space craft that has up until now only been suggested in science fiction. In the classic Arthur C. Clarke films 2010 (and its predecessor 2001 A Space Odyssey), a craft sent to Jupiter was inserted into orbit around the planet by slowing its velocity by "aerobraking", effectively ramming into the planet's atmosphere at a shallow angle and relying on the encountered gaseous resistance to slow the craft down.

Although it could be argued that getting the Apollo astronauts back home through our atmosphere employed aerobraking, these craft had purpose-built heat shields for the job, and were designed to penetrate the atmosphere rather than descend in a controlled manner.

The aerobraking technique was tried on the unmanned Magellan spacecraft formerly orbiting Venus. It has no shielding whatsoever. Originally in a high elliptical orbit, NASA experimented with aerobraking to bring the spacecraft into a low circular orbit to enable closer studies of the planet's gravity field and surface. Since the craft had insufficient fuel onboard to perform the manoeuvre on its own, the only option was to employ the planet itself, though it did run the risk of turning the spacecraft into a meteor.

The technique may be applied to future missions to the planets so as to conserve the amount of thruster propellant they need to carry.

Closer to home, during times of high solar activity, the Earth's atmosphere can heat up and expand slightly, causing increased drag on low orbiting satellites, sometimes causing them to drop out of orbit prematurely. How many members remember the uncontrolled demise of the U.S. Skylab spacecraft over Australian skies a number of years ago?

I wonder how long it will be before other ideas are pursued from science fiction classics, such as rotating spacecraft so as to generate artificial gravity for the occupants in order to eliminate bone and muscle degeneration that have plagued long duration astronauts and cosmonauts to date?

A NEW MOON ARISES

The crippled space probe Galileo on its way to Jupiter, has encountered 2 asteroids. One of these is called Ida. Ida is in the main asteroid belt 500 million kilometres from Earth, and is only 56 kilometres across. Nevertheless, photographs taken by the craft in 1991, and analysed in 1994, indicate it has a small orbiting moon.

The newly discovered moon may be a fragment of the same large parent asteroid that originally formed Ida, or else could be a relic of a more recent cratering blow to the minor planet. This moon is only 1.5 kilometres across, and is officially named "Dactyl".

Normally, the International Astronomical Union (IAU) only names minor planets once their orbits have been precisely determined, so that there is no possibility of the body being "lost". However, in this case they bent the rules since the moon is orbiting around Ida, whose orbit is well characterised.

The name arises from Greek mythology, where the Dactyls were magical beings that lived on Mount Ida.

The IAU also named some of the features on the second asteroid encountered by Galileo. This asteroid, named Gaspra, was originally named after a Ukranian spa bath town. Therefore, it now has its larger craters named after other spa bath towns, including Bath. Galileo is due to encounter Jupiter in December this year. More details shortly.

REVIEW OF 1994

The 25th year of our Society was particularly rich with natural phenomena able to be observed from the Southern hemisphere.

In January, the shadow of minor planet Gyptis (located in the constellation of Cetus), swept over Frankston. Six observers world-wide recorded its passing and enabled its shape and size to be determined. The better results were provided by Melbourne and Frankston observers, being well spaced apart and concordant. The results were subsequently published at the RASNZ Annual Conference and hailed as the best minor planet effort of the last decade.

In April, the eclipsing binary stars *BL TEL* and *W CRU* reached their predicted minimum light levels. These two variable stars were well observed in Australia in a program co-ordinated by amateur Peter Williams in Sydney. Five Frankston members contributed nearly half of the submitted observations, enabling a reliable light curve to be determined.

April also saw several members making the pilgrimage to NACAA 16 in Canberra, where a poster paper was presented on the ASF's activities over the years, and one member presenting an oral paper.

A couple of alerts to New Zealand on R Corona Borealis stars were issued in April, as these special stars began their random fading in brightness. *V CrA* subsequently did not fade completely, but has hovered in an intermediate state. Eclipses in May and June of the binary systems *Z CHA* and *OY CAR* were followed and light curves constructed from the results. All results have been forwarded as usual to the RASNZ for analysis.

Collaboration between the ASF, ASV and LVAS continues as strongly as ever. An early morning graze expedition to Balnarring produced nearly 20 events for 3 observers, as well as a rayed display of the Aurora Australis southern lights.

Occultations of brighter stars, notably Spica, by the Moon were tried during 1994, with one member trying his hand with a newly acquired CCD camera. Eclipses of Jupiter's satellites were timed throughout 1993/94 and forwarded recently to New Zealand for reduction before passing to the Jet Propulsion Laboratory in Pasadena for use. The ASF has contributed roughly 10% of all Southern hemisphere results.

Jupiter was clearly the centre of attention for the media in 1994, with the impact of comet Shoemaker-Levy-9. Melbourne fortunately was the best place on Earth to observe the impacts and consequently saw NASA's Kuiper airborne observatory pay us a visit.

Members trained their telescopes on the giant planet, eagerly anticipating each impact event. They picked out impact features in even modest 6 cm instruments. One member even witnessed the fireball of one of the fragment impacts in his 15 cm scope, as reported in an earlier newsletter edition.

Many sketches of the Jovian surface were made, and showed dark impact spots slowly sweeping across the planet. These persisted for months, until now new dark bands have disappeared in Jupiter's Southern hemisphere.

This was indeed a fitting tribute to the 25th anniversary of the Society, and required much effort to arrange!

1994 provided many exciting astronomical events for the active members of the Society. Remember, the more you participate, the more you enjoy.

FINAL PRONOUNCEMENT

It is now almost 10 years since Halley's comet graced our Southern skies. The name is today pronounced "*hal-ees*", sounding like "*Sally's*", though at the time I went rummaging through contemporary newspapers of the era and discovered that Sir Edmund Halley actually pronounced his own name as "*hawl-ee*". A later variation that emerged during the 1950's was "*hail-ee*", being influenced at the time by the popular music group Bill Haley and the Comets.

If you have any Astronomical word that has been niggling you for years, why not drop it in the suggestion and question box at a General Meeting and let us find out the right answer for you?

BACK ISSUES

Copies of past editions of the ASF Newsletter are available at $3 each from the Editor.

☐ Note: If this box is ticked then membership has lapsed and this will be your last edition of the newsletter. Please contact the Treasurer in this case.

Above - ASF BBQ at the Cranbourne Botanical Gardens on the 21st January 1995

Photo - *By John Cleverdon*