



SCORPIUS

The Journal of the
Astronomical Society of Frankston Inc.
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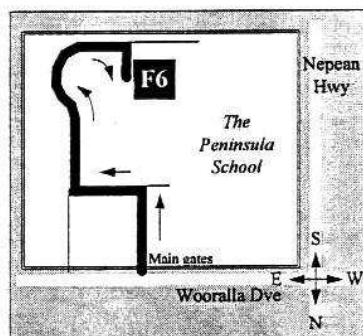
==== (Sep - Oct) ====

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/asf>

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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Peter Skilton (03) 9776 5898

Vice President & Briars Viewing
David Girling (059) 76 2806

Treasurer
Peter Brown (03) 9789 5679

Secretary
Don Leggett (059) 85 4927

Committee
Ken Bryant, Bob Heale,
Peter Lowe, Ros Skilton, Ken Stratton

Phone calls before 8:30pm please.

FUTURE EVENTS

General Meetings:

Wed 18th September '96

Session 1: Peter Norman spends an hour on *The First 3 Minutes*.
Session 2: Ken Bryant takes you far away *Measuring Distances*.

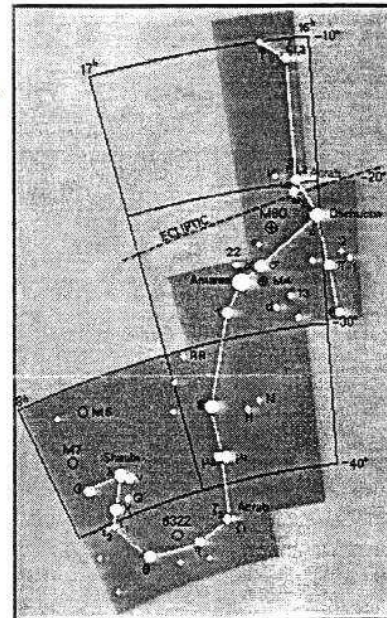
Wed 16th October '96

Session 1: Macho session. John Goss the Ranger takes us on a tour of *The Briars*. **This meeting will be held at The Briars Visitors Centre** and will be held outdoors, so dress warmly and bring insecticide.
Session 2: Wimp session of an informal chat in the warmth.

Wed 20th November '96

Session 1: Annual General Meeting (20 minutes long is the target!). Followed by Roger Giller getting high on *Tides*.

Nominations are hereby called for Committee for 1997. Use the back page or make a copy.



Session 2: Feedback from the *Leonid All-Nighters* & Bob Heale dishes out *Christmas/New Year Fare in the Skies*.

December '96

Remember there is no meeting held this month.

Wed 15th January '97

Session 1: Roger Vodicka of the ASV streaks in with *Meteors*.

Viewing Nights:

Members Only:

Sat Oct 5th & 12th, Nov 2nd & 9th, Dec 7th & 14th 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.

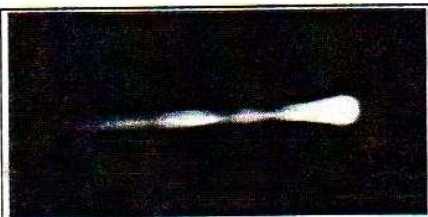
- Mentone Girls Secondary College on Mon 21st Oct at 7:30pm. About 100 pupils. Melways 86/H6, enter oval at Charmans Rd and drive to the portable classrooms.
- Hastings Primary school on Wed 23rd Oct, details to be confirmed at meetings.

Social Events:

- The dinner at the Mornington Dava on 23rd Aug was very popular with 25 in attendance. There will be another on Fri 18th Oct at 7pm.
- There will be a Slab Party once the concrete has been poured and set. Details advised at monthly meetings.
- The annual breakup will be held on Sat 7th Dec.

Phenomenal Events:

- Remember Sun/Mon 17/18th November for our inaugural "Leonids All-nighter" meteor watch at *The Briars*.



A Leonid meteor glows in full flight.

- Comet Tabur (1996 Q1) was discovered by Canberra Society member Vello Tabur in August. It passes near to NGC2169 on Sep 20, and 3 degrees North of Castor on Sep 29. At the time of disappearance over our East horizon at the end of Sep it should be just naked eye visible at magnitude 6.

- Comet Hale-Bopp continues to brighten and is naked eye magnitude at the moment.

BY JOVE IT'S BALLAARAT

Ballaarat Astronomical Society is planning an exciting weekend all about Jupiter (and the missions to this planet) on 2nd & 3rd Nov. Guest speakers include Dr. Andrew Prentice. Costs are yet to be finalised, based on likely attendance numbers. Further details at our monthly meetings.

YOUR SOCIETY**NEW MEMBERS**

Welcome to the following new Society members:

Lorna & Des Crossett
Wendy & Martin Foreman
Ian Freeman-Wright
Yvonne Healy
Byron Hulbert
John Johnston
Susan Milton
Bob Parsons
Richard Pollard
Ian Porter
Xenia Radic
Martin Rudd & Leanne Gale
Dorothy Sharp
Barbara Smith
Domenic Spagnolo
Carole Turner
Greg & Trent Veitch
Margaret & Stan Zimmerman

The ASF is the 2nd largest Society in Victoria. Membership is 94. Please feel free to say hello at general meetings. Badges, windcheaters, planispheres, books & posters are available at meetings. Special name tags are free to new members who attend meetings. Replacements are \$2.

HELP NEEDED

Is your mailing label correct? If not, please inform the Secretary.

**SECRETARY'S JOTTINGS**

The lease at *The Briars* has been signed, and the go ahead has been given to pour the main foundation slab for the observatory. This will occur when the wet conditions clear. The Education Centre adjacent to our site might not proceed. All Victorian societies have now been informed of our intent to host VASTROC next year over the Queen's Birthday weekend, and have been asked for their suggestions. Committee has deliberated much on VASTROC so far, but all ideas are welcome. An Internet home page for our Society has been set up (see top of page 1). Details from its creator might follow in a later newsletter edition. Two extra library cupboards have been obtained with the assistance of member Byron Hulbert.

Don Leggett

RECENT MEETINGS

Seventy attended July's combined meeting and Winter lecture, including LVAS visitors, making an excellent mid-Winter attendance. Peter Skilton chaired the meeting, while Bob Heale did his usual monthly Sky for the Month and both Bob and Peter Lowe showed recently downloaded comet images. The first naked eye reports of comet Hale-Bopp were reported from members. After tea break, where Carl Moser coped admirably, the group split into two. David Girling (No side) and Peter Lowe (Yes side) ran a debate on whether *Something is out There*. The consensus was "probably". Next door, Bob Heale showed images he obtained of comets Hyakutake, Hale-Bopp,

22P/Kopff and Brewington, then the President talked on Occultations, grazes, eclipses, appulses and transits, while Roger Giller gave a demo of *Dance of the Planets*, demonstrating these phenomena very graphically, including the 1999 Cornwall solar eclipse.

August's meeting was chaired by Peter Skilton and attended by 60. Bob Heale presented Sky for the Month, David Girling ran the raffle and Richard Pollard presented a video about the Hubble Space Telescope. After tea break, one session viewed a video on the formation of the Solar System, while next door Bob Heale talked about the colour of stars.

RECENT VIEWING NIGHTS

About 150 children and parents were entertained and educated at the Derinya Primary School nights held in early August. Despite cloud cover, the shows were a great success. Thanks to Don Leggett, Richard Pollard, Ken Bryant and Peter Lowe for assisting me.

A viewing night attended by only teachers was held at Woodleigh College on Tue 27th Aug. Thanks again to Don and Richard for assisting.

Special thanks to Steve Malone who selflessly missed our August meeting night to field the Karingal Cubs' questions at Ballam Park with just 30 minutes notice.

The Winter lectures at *The Briars* were also a success once again, and thanks go to the presenters and organisers. Topics were *The Solar System*

(Peter Skilton), *Asteroids* (Ken Bryant), *Life in Space* (Peter Lowe & David Girling) and *Finding Your Way Around the Sky* (Roger Giller).

GRAZE AT THE PROM

Two expeditioners arose early on Sunday August 11 to travel to Foster, near Wilson's Promontory, to observe a relatively bright star graze along the Northern edge of the Moon near to the cusp just before 6am local time. Conditions were very pleasant for Winter, with no wind, clear, dark skies and a balmy 9 degrees Celsius, with plenty of meteors observed. Unfortunately the path of the graze was shifted by a couple of kilometres resulting in one site (mine) registering only 1 event (an occultation reappearance) and the other site (Jim Blanksby) recording 2 events.

JUST FOR STARTERS

TANKS FOR THE FUEL

Have you ever wondered how tanks of liquid rocket fuel behave in space under zero gravity? On Earth, petrol in a car's fuel tank simply settles to the bottom of the tank under the pull of gravity and tubing is placed there to draw it off to the engine. Under zero-g conditions this doesn't happen as there is no force present to pull fuel to the tube. So how is it done?

There are two solutions that aerospace engineers have used. Within the propellant tank is placed a rubbery, flexible diaphragm that cuts the tank into two parts. One part holds the fuel, such as hydrazine, and the

other part holds inert helium gas under pressure. The area above the fuel in a tank is known as ullage (either in space or in Earth based vessels). As fuel is used up, the helium ullage expands, pushing the diaphragm and hence the fuel towards the outlet piping thereby maintaining a flow of fuel to the engines. The Magellan probe to Venus used this solution.

A second, experimental method will be used by the Cassini mission to Saturn. This still involves pressurisation with helium, but there is no rubber diaphragm involved. Instead a surface tension management device is employed in the tank, consisting of petal-shaped vanes connected to a centre post feeding into a sump, and looking like a flower. The sump is made of plates with many microscopic holes in them. The idea is that when fuel touches the vanes, it is slowly "wicked" into the sump as a thin film via surface tension, where it stays, being unable to pass out of the sump through the holes. This wick action ensures that bubbles of helium are not drawn into the sump along with fuel and hence into the engine.

IN THE NEWS

PLANETS DETECTED

Yet another set of planets has been indirectly detected around another star. This time, however, the star is in our own backyard. *Lalande 21185* is 8.2 light years away and is a magnitude 7.5 red sun (type M2). From observing wobbles in its motion over many months, it is now thought to have two planets definitely, with the

possibility of a third. The wobbles are caused by the gravitational tug of the planets on their parent star as they orbit around it. One of the planets is calculated to have 300 times the mass of the Earth and be about the size of Jupiter with its orbit at almost exactly the same distance from its star as Saturn is from our star, the Sun. At that distance it will probably be mostly a gaseous planet, like our gas giants. The second definite planet orbits at a distance equivalent to about half way between the Earth and Mars, and the possibility is therefore raised of the existence of life within this habitable zone.

Lalande 21185 is the 6th closest star to our Sun, coming after Proxima Centauri, Alpha Centauri A and B stars, Barnard's Star and Wolf 359. It sits in the North constellation Ursa Major at position RA 11hr03.4m, Dec +35deg58m (epoch 2000).

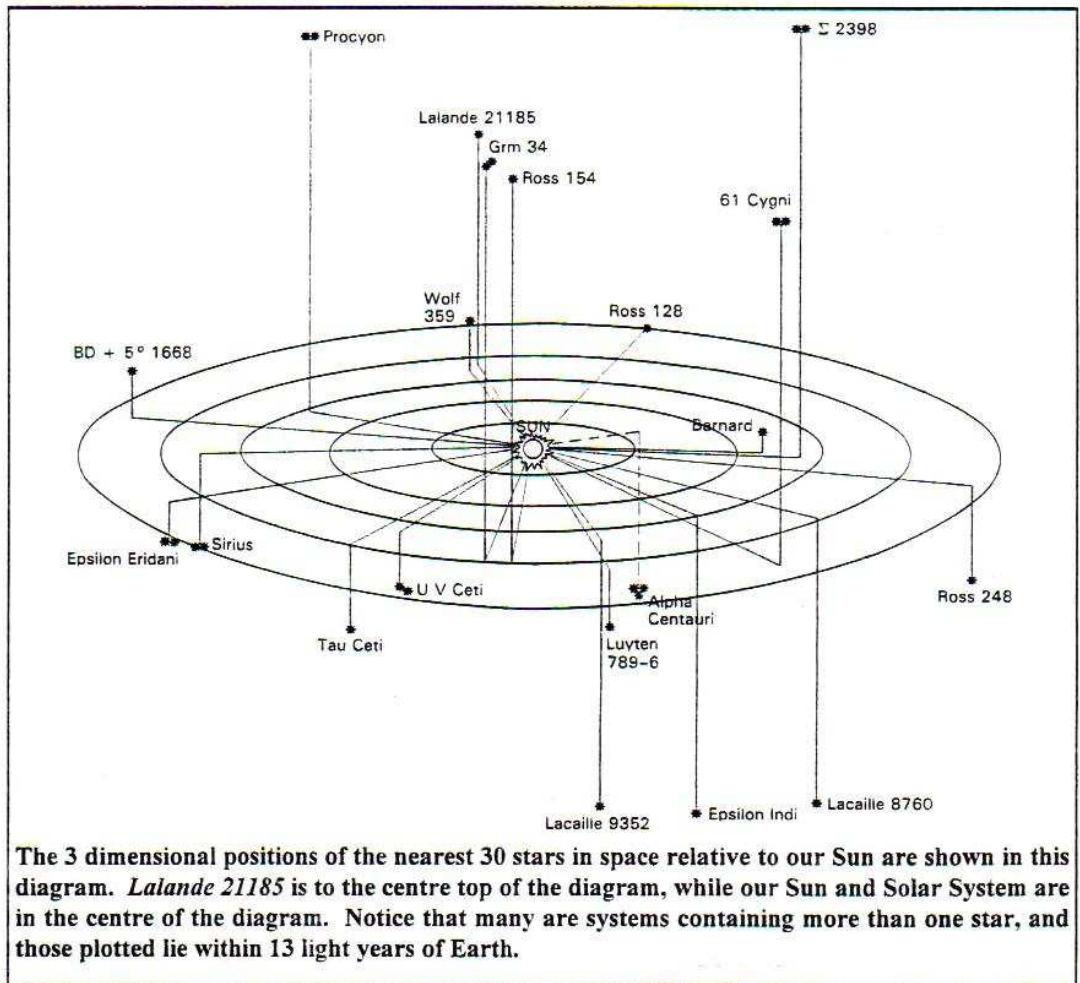
.....AND MORE DETECTED

Several years ago a ring of dust was discovered around the star beta Pictoris by viewing it in the infrared region. The theory was that the dust ring was a planetary nebula ring that was slowly condensing to form planets around this star. Now old data, formerly discarded, has been re-examined by a team of

French scientists, and it shows surprising results.

In 1981, a team of astronomers was monitoring beta Pictoris relative to other stars with the intention of using it as a reference star of constant brightness. However, they were sadly disappointed when they discovered it varied in brightness

inadvertently detected by the team. Observations in 1981 were made with different colour filters, and all showed identical brightening and dimming over time. If the variation were due to the star being an intrinsic variable star, then the variation would be different at different wavelengths. If, on the other hand, it is due to the system



by 2 percent over a period of hours. Being useless for their needs, they archived the data away. Now, the team has re-examined the tapes with a view to studying this anomalous variation. Other stars studied at the same time in 1981 did not show any brightness variation, thereby ruling out any defects in their instruments at the time.

It is now thought that a large planet, embedded in the dust ring, might have been

being a binary association of the visible star and an invisible planet, then the observations can be directly explained. As the tiny planet (relative to the star's exposed area) passed in front of the stellar surface, it would block out some of the light and hence the brightness observed would be slightly diminished. When the planet left the star's surface, the brightness seen would return to normal. Further observations are in progress to see if this theory is correct.

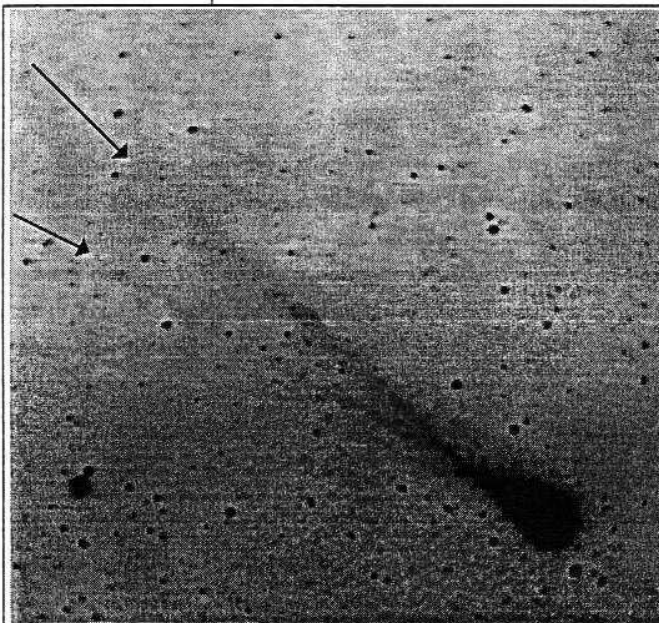
WATCH THIS SPACE

Radio Astronomy is about to undergo a significant advance. In September this year, the MUSES-B satellite will be launched by Japan and will become the world's first orbiting radio telescope. The aim is to do VERY Long Baseline Interferometry, where two or more widely separated telescopes can have their output mathematically combined so as to act as if they were a single telescope of diameter equal to their separation apart. By combining the MUSES-B 8 metre dish, orbiting 20,000 km above the Earth, with dozens of other ground based telescopes, it will be possible to simulate a single radio telescope dish up to an astounding 30,000 km across!

The mission is a collaboration of Japanese, US, European and Australian technologies. With such a gargantuan dish, angles as small as 0.0001 arc second will be achievable at radio wavelengths, enabling unprecedented views of galactic cores. In addition, from its spot in space, the satellite will be able to view anywhere in the sky, at any time, unlike its ground based predecessors which are limited by the placement of the horizon. With the recent success of the

US Space Shuttle deploying a 14 metre inflatable antenna in orbit, larger dishes will no doubt follow.

NASA also has preliminary plans for a large scale search for planets outside our Solar System. By 2015, it is hoped to have a space based interferometer array operating in the infrared region, located out as far as Jupiter's orbit. With it, spectra could be obtained from the atmospheres of nearby Earth-like planets in a concerted search for extraterrestrial life. There are also plans for an interferometer in Earth orbit, observing visible light wavelengths. Incredible angular resolution will be achieved, such that the distance to any star in the Milky Way will be directly measurable, including Cepheid variables (standard candle stars) which are crucial to finding distances to other galaxies.



Comet Hyakutake as photographed by Roger Giller in Berwick. North is down, East to the right. Taken at 1996 March 22 1426 UT. 10 minute guided exposure using 100mm lens and Ilford XP2 black & white film. The negative image of the comet (from digitising the positive) is shown here to emphasise tail details. Note the prominent forked tail, indicated by the added arrows at upper left.

MISSED BY THAT MUCH

On the 20th May, a mostly metallic asteroid, whose impact with the Earth would threaten civilisation's very existence, passed within a cosmic hair's breadth of us. A lump of rock half a kilometre across hurtled across Earth's orbit bound for a quick loop around the Sun. Object 1996JA1 was as large as any of the fragments of comet Shoemaker-Levy-9 that collided with Jupiter a couple of years ago, and the effects on Earth upon a collision would have been similar; globally devastating, releasing energy hundreds of times larger than the biggest man-made nuclear explosion. The object missed us by 35 Earth diameters this time, a mere whisker in astronomical terms. Astronomers had 4 days warning of the asteroid's arrival, which is insufficient to take any preventative action had it been on a collision course. Ten years' warning is currently what would be required to mount a mission to deflect an inbound body. This particular body swings around the Sun every 4 years, presenting future opportunities for throwing darts at the bullseye, though orbital calculations show we are safe for the next few decades at least.

MAGELLAN DEATH DIVE

The incredibly successful mission of the Magellan space probe to Venus finally came to an end a year ago. On October 11 last year, NASA ground controllers ordered the craft to begin a final death dive into the Venusian atmosphere.

The \$900 million probe fulfilled

more than the planned objectives for the mission by mapping the entire surface of Venus at high resolution with special radar over a period of years. This radar easily penetrated the choking greenhouse-induced clouds that shroud the Venusian surface at optical wavelengths. In fact, Venus is now the best mapped planet of all of them, including the Earth!

Even in orbit, the craft had to endure going from night to day and day to night every 90 minutes, causing all components onboard to heat, cool, heat and so on continuously over the years. It is a testament to how well designed and built the vessel was that it operated flawlessly to the date of its demise. One key reason for its success has also been that a twin copy of Magellan was built at the same time. Therefore all commands sent from NASA were tried on the Earth-based twin first, before being transmitted to its sister in orbit around Venus. Mistakes were therefore trapped before they happen.

It is worthy to note that the smaller, faster, cheaper missions, that are nowadays politically correct, do not go for this redundancy option of building a second craft. As a consequence, you get things happening such as the 1993 Mars Observer spacecraft lost and tumbling uncontrolled before entering Mars orbit, or the 1994 Clementine spaceprobe lost and tumbling uncontrolled due to rocket misfiring.

Even though Magellan ended its life last October, additional

information was gained in its majestic death throes.

As the orbit was gently lowered, the craft began to spin and tumble due to friction. Ground controllers then were able to measure the viscosity of the Venusian atmosphere by the reaction caused as they used Magellan's booster rockets to try and correct for the spinning. This in turn gave them an idea of the atmospheric composition at these altitudes. It is to be hoped that future NASA missions to the planet are as successful and memorable.

LAY IN A COURSE FOR ALPHA CENTAURI ENGAGE

It is now technically feasible that a space probe could be launched by the end of this century to the star Alpha Centauri, the second closest star to outside our Solar System (the closest being the very dim 11th magnitude dwarf Proxima Centauri). Alpha Centauri is the brightest star of the two pointers near the constellation of the Southern Cross.

A recent feasibility study, involving over 100 scientists, recommended a probe weighing 100 grams (about the size of a small block of butter) could reach our neighbouring star in a reasonable time if propelled through space by a powerful particle beam fired from Earth orbit. The source of the particle beam would be a spin off from those already built by the US Star Wars program.

The craft itself would be wheel-shaped and coated with micro electronic circuits, including a

battery of sensors and camera systems. At the centre of the wheel would be a target plate, at which a beam of deuterium ions would be directed. The particle accelerator producing these would stay in Earth orbit. The rocket force of the particles hitting and rebounding from this plate would propel the miniature craft forward at up to 1/3 the speed of light.

It is proposed to carry both the craft and accelerator machinery into orbit on board a space shuttle, before a 50 MEV beam was directed at the small voyager for about 4 hours in duration. In that time the maximum speed would be reached, and it would be a matter of coasting all the way to Alpha Centauri. Further acceleration past the initial 4 hours is not practical since it would be almost impossible to keep the beam tightly focused once it begins interacting with the Solar Wind.

Of course there is no stopping once you get to your destination, or manoeuvring about as you please once within the new star system (other than by sling shot effects with any bodies present in the new star system).

At this speed, the tiny ambassador from Earth would take just 13 years to cross the void to Alpha Centauri, which is 4.3 light years away, and would enable mankind to explore another planetary system.

It is predicted that a prototype could be launched within the decade, once some small technical hitches have been overcome and the field of nanotechnology is better

understood. This field involves constructing circuits and machines on the same scale as molecules. I think it will be some time yet before larger passengers make this journey.

CAUGHT IN A STORM

Canadian physicists have warned NASA of something that has been mostly overlooked to date: meteor storms can be dangerous to the proposed Space Station in orbit. The next major anticipated storm is the *Leonids* in 1998 or 1999, at which time much of the station will have been constructed. The last *Leonid* storm was in 1966 when 150,000 meteors an hour were observed and lasted fully for several hours.

Such an onslaught in space, where there is no atmosphere to protect you, could be devastating. Major structural damage could occur to the modules of the station and solar panels could be literally sandblasted (or is that meteoroid blasted). The station is more so vulnerable because it has been designed to cover a large area, which unfortunately also means presenting a large target for meteors to hit, and a large mass which means manoeuvring it out of harm's way will be impractical.

In 1993, NASA rather embarrassingly had to cancel a Shuttle flight when they overlooked the fact that the *Leonids* were going to peak at the same time as the Shuttle was in orbit. Meteoroids can be deadly. In 1993, the \$800 million Olympus communications satellite was

seriously damaged by a single impact.

Now with the space station they have at least designated 20 critical areas on the structure. These include the crew modules, fuel tanks and gyroscopes. Each will be protected by a double layer of aluminium plate that is capable of stopping an aluminium sphere 1 centimetre across and travelling at a speed of 10 km per second. The idea was tried successfully on the *Giotto* spacecraft that was launched at Halley's comet some 10 years ago now. The first sacrificial layer shatters the incoming meteor (and gets peppered with holes in the process), while the second inner layer mops up the energy released in the shrapnel. Other strategies include having steerable solar panels that can be temporarily aimed to be edge-on to any incoming meteor stream so as to minimise the chances of a strike, and placing the crew module in such a position as other parts of the massive structure are between it and the shower.

FEATURE

IS JUPITER A LOW MASS BROWN DWARF?

If you sort stars by their masses, the vast majority are low mass dwarfs. Only a few percent of stars have masses close to our Sun and the very bright, very massive stars we easily see in the sky are also very rare. They appear abundant only because they are very bright and easily seen. Below our current instruments' level of detectability, it is postulated

there are a vast number of very low mass objects that have insufficient material to become visible stars. They are known as *Brown Dwarfs*.

As dust and gas coalesce in interstellar clouds to become proto-stars, the material initially becomes hot through gravitational heating; that is as local self-gravitation draws the material into a central condensation, the pressure and thus the temperature rises. During this phase the material can become very hot and can only cool down again by radiating energy out into space.

If enough matter is absorbed into the proto-star the temperature and pressure at its centre may rise to a level at which some low temperature (a million degrees or so) nuclear reactions can occur. These reactions add more energy to the proto-star material which gets hotter still. Carrying this process further ignites ever more energetic nuclear reactions and the traditional star is born.

If, however, the matter build-up ceases early, an object massive enough to gain some heating from low temperature nuclear reactions but not massive enough to become a visible star results. This is a *Brown Dwarf*.

Dwarfs are exceedingly difficult to detect because they only radiate in the infrared and are very dim. While in recent times some "candidate" objects have been found, it is fair to say that our first positively identified *Brown Dwarf* has yet to be discovered. Astronomers, however, believe *Brown Dwarfs* exist out there somewhere in vast numbers.

Once formed, *Brown Dwarfs* are extremely long lasting. Their surface temperatures may only be a few hundred degrees and so they radiate very little energy into space. This means their inner temperature can remain hot for many billions of years.

To gain an appreciable amount of internal energy from low temperature nuclear reactions, a *Brown Dwarf's* mass would need to be about ten times that of Jupiter. However, even an object the mass of Jupiter could gain some energy from these sources but at a very low rate. Remember nuclear reactions don't occur in the chain reaction type explosions we produce in nuclear weapons.

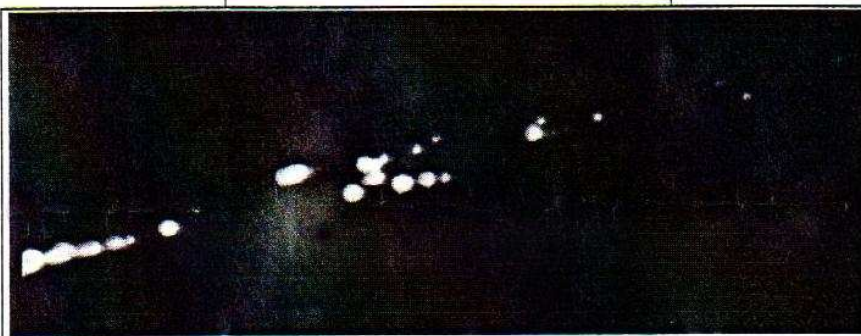
Measurements from the recent Galileo atmospheric probe to Jupiter strongly suggest that an internal energy source is driving the atmospheric convection. It has been known for some time that Jupiter emits more energy than it receives via sunlight and the probe is helping to localise this additional energy source.

Whether we are just seeing the residual energy of gravitational heating from Jupiter's formation or whether some energy is being contributed from low temperature nuclear reactions is yet to be determined, but it does suggest that Jupiter may be on the low mass end of the *Brown Dwarf* limits. I wonder what the story is at Saturn!!

Peter Lowe

STORM WARNING: THE LEONIDS METEORS

We are all, as watchers of the skies, familiar with the sudden flash of a bright meteor across the night sky. Sometimes, however, at rare intervals, instead of a single flash in the sky, the whole heavens may be transformed into a glittering spectacle of meteors flashing in



A Leonid meteor disintegrates spectacularly on entering Earth's atmosphere.

huge numbers, like a celestial snow storm across the sky, in what is termed a "*meteor storm*".

Such meteor storms have been associated with *the Leonids*, a regular November meteor shower appearing to originate from the constellation *Leo* as far back as 902 AD, with the years 1799, 1833 and 1866 producing spectacular storms, whilst in 1966 a tremendous storm was viewed from North America.

The next anticipated storm is forecast for 1999, with the intervening years expected to produce significant and increasing shower numbers each November.

Meteor showers and storms are associated with particular comets. In the case of *the Leonids* with Comet Tempel-Tuttle, which takes 33 years to go once around our Sun. The

showers and storms result from the Earth colliding with any dispersed cometary material and tail debris spread along the comet's orbit but mainly concentrated near the comet itself.

Maximum activity of the shower occurs when the comet is at its closest to Earth's orbit and with *the Leonids* this is further

enhanced by the meteor stream encountering Earth head on, producing at its peak up to 100,000 meteors an hour in the sky - a sight to remember!

The Society is planning *Leonid* observing nights for November in the years leading up to 1999, with the first such night scheduled for this November. Why not make it a date?

Ken Bryant

SIGNS OF THE ZODIAC

Member Peter Hyson has been watching the Astronomy series offered as part of Open Learning on television with a keen eye, and offers the following observation:

"I was horrified to see one program in the series apparently confirming an astrological fallacy. It showed the signs of the Zodiac and the time intervals associated with the Sun supposedly residing in these signs. The dates shown were those usually given by astrological sources, namely entry and exit of the Sun in these signs as the 21st of the month.

For example, the Sun is supposed to reside in the sign of Virgo from 21st August to 21st September. These dates were not too far out about 2,000 years ago (presumably about the time of the origin of astrology and predicting the future from the stars), but due to the precession of the equinoxes, they are now out by almost a month.

I have compiled the following table of the dates when the Sun resides approximately in the centre of the Zodiac signs. The delineation of these signs is far from regular so this is rather imprecise, but serves the present purpose quite well.

	<i>Astronomy</i>	<i>astrology</i>	<i>Difference in days</i>
Aries	1/5	6/4	25
Taurus	1/6	6/5	26
Gemini	5/7	6/6	29
Cancer	31/7	6/7	25
Leo	29/8	6/8	23
Virgo	7/10	6/9	31
Libra	12/11	6/10	36
Scorpius	27/11	6/11	21
Ophiuchus	9/12	whoops, they missed this sign altogether!	
Sagittarius	4/1	6/12	29
Capricornus	1/2	6/1	26
Aquarius	28/2	6/2	22
Pisces	30/3	6/3	24

Shown is the date when the Sun is at the centre of each Zodiac sign.

The average departure from the realities of constellation positions in the sky is 26.4 days or almost 4 weeks."

Peter Hyson

FROM AROUND THE PLANET!

Astronomical Societies as a rule 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. Western Australia (WA) - Images are given of comet Hale-Bopp. Marking the 6th anniversary of the Hubble space telescope, an overview is given of its achievements.

Astron. Soc. Alice Springs (NT) - Details are given of Galileo finding an iron core in Jupiter's moon Io. Hubble finding the expanding gas and dust lobes of eta Carinae from its outburst last century, and the SOHO mission studying our Sun.

Astron. Soc. of the South West (WA) - A microwave phone tower 35 metres high is being built next to their observatory. They are trying to reduce its effect on their field of view by getting the company to put it behind a nearby tree instead. There are some concerns about its emissions affecting

their CCD and other electronics at such short range (not to mention their Astronomers). The society held its first astro camp in over a decade recently at a nearby site. Hyakutake (the man) recently visited Perth Observatory.

Astron. Soc. New South Wales (NSW) - The 4th Pacific Star Party held in May

at their property 230km from Sydney was a success. Details are also provided by those who attended the Texas Star Party, and the Riverside Telescope Makers Conference in the USA. The society is proposing to upgrade its buildings at Wiruna.

West Cornwall Astron. Soc. (UK) - Yes that's right, Cornwall. A relative of mine has put us in contact. Founded in 1985, they have about 50 members and have recently been registered as a charity, enabling the raising of funds by avenues otherwise unavailable. WCAS is currently applying for a \$20,000 grant to support speakers, and \$1.4 million!!! to build a planetarium and observatory.

Comet Hyakutake was breathtaking on 3-4 April during a total lunar eclipse the UK experienced. Their Treasurer, Bernard Mannik, says "I do not have the poetry in me to describe adequately what I saw, suffice to say I felt privileged to have seen it". He also points out that Cornwall is eagerly awaiting a total solar eclipse on 1999 Aug 11, and that hotel space is already at a premium since this is also the height of the tourist season and Cornwall is a popular spot anyway. With Melbourne having experienced such an event in 1976, I can understand the excitement. Their newsletter contains many well-written and informative articles, including photographic guiding hints, ellipses and orbits, and several excellent CCD colour images. We hope to exchange further material and experiences with the WCAS.



FINAL PRONOUNCEMENT - EQUULEUS

The Northern constellation of Equuleus means the Foal, a horse, and was known to Ptolemy in the year AD140, being included in his original list of 48 constellations. Its name is pronounced "ekk-woo-oo-lee-us". It is an inconspicuous collection of stars, lying just North of the ecliptic and containing only 5 stars that can be seen with the naked eye (though none is bright). It has no associated meteor showers, no asterisms, no Messier objects and is small, with only Crux (the Southern Cross) being smaller.



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

NEXT ISSUE
Halley's Comet Remembered & Life on Mars

ASF POSITION NOMINATIONS FOR 1997 AGM

ASF Inc. Annual General Meeting (AGM) Elections

Nominee: _____

Proposer: _____

Secunder: _____

} 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 society dinner at the Dava Hotel on the 18th October 1996
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.



The density of a neutron star is about 100 million million times that of water. A teaspoon full of the dark material of a neutron star would weigh more than 100 million tonnes on Earth. Assuming you could survive on the surface of a neutron star, you would weigh 10,000 million times more than you do on Earth and would strain your bathroom scales considerably.