



# SCORPIUS

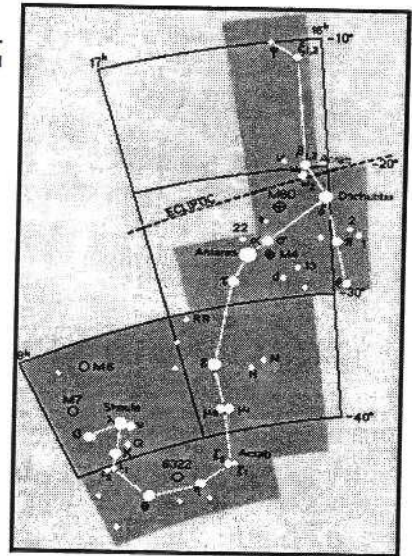
The Journal of the  
Astronomical Society of Frankston Inc.

RegNo: A268 ABN: 34569548751 ISSN: 1445-7032

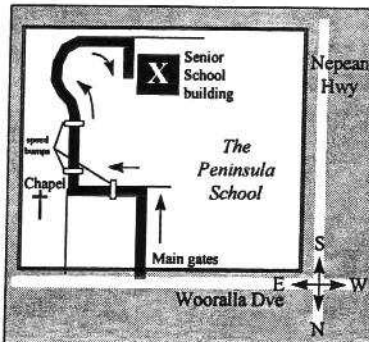
Volume XII, No. 1 (Jan 2003)

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

**Meeting Venue:** Peninsula School, Wooralla Drive, Mt. Eliza (Melways map 105/F5) in the Senior School at 8pm on the 3<sup>rd</sup> Wednesday of each month except December.  
**Phone:** 0419 253 252 **Mail:** P.O. Box 596, Frankston 3199, Victoria, Australia  
**Internet:** <http://www.asfnet.20m.com>  
**E-mail:** [aggro@peninsula.starway.net.au](mailto:aggro@peninsula.starway.net.au)



Visitors are always welcome!



Annual Membership

Full Member	\$35
Pensioner	\$30
Student	\$25
Family	\$45
Family Pensioners	\$40
Newsletter Only	\$16
Organisation	\$50

**DUE 1<sup>ST</sup> JAN EACH YEAR**

President  
David Girling (03) 5975 6506

Vice President  
Peter Skilton (0414) 645 077

Treasurer

Marty Rudd (03) 5977 8863

Secretary  
Sally Zetter (03) 5976 2679

Editor  
Richard Pollard (0419) 100 802

Committee of Management:  
Roger Chandler, John Cleverdon, Don Leggett, Jane McConnell, Ian Sullivan

The public officer is Russell Thompson.

All calls after hours and pre- 8:30pm please.

## FUTURE EVENTS

### General Meetings:

**WED 15 January 2003:**  
Session 1: Hugh Carman, recently back from travelling overseas fossicking, will speak on "Fossils", and may bring some along.  
Session 2: Video on "Accidents in Space"

### Session 3: Informal interaction

**WED 19 February 2003:**

Session 1: TBA

Session 2: video on "John Harrison and His Timekeepers"

Session 3: Informal interaction.

The Library will be open at General Meetings from 7:15pm to 7:55pm and again during the tea break.

### Viewing Nights:

Members Only:

**NOTE:** Members nights are also now held on Fridays!

January 3<sup>rd</sup> /4<sup>th</sup>, 10<sup>th</sup> /11<sup>th</sup> and 24<sup>th</sup> /25<sup>th</sup>, also Jan 31<sup>st</sup>

February 1<sup>st</sup> and 7<sup>th</sup> /8<sup>th</sup>, and 28<sup>th</sup> all at The Briars, Nepean Hwy, Mt. Martha.

New attendees must always confirm with David Girling on 5975-6506 or 0421 452 428 **before** attending. Remember for security reasons you can only attend on planned Members' Nights, unless by prior arrangement



with David who will liaise with *The Briars* accordingly. Last person out must switch on the shed security light. All attendees must sign the visitors' book in the observatory for insurance reasons.

### Public, School & Community Groups Viewing/slide nights:

If you can assist, please contact the Secretary.

**FRI January 10<sup>th</sup> and FRI 17<sup>th</sup>:**  
Coast Action night at the Briars Visitors Centre. Very popular in past years. Coast Action does the organising; the ASF supply the scopes. We need as many as possible to help out with scopes for these two nights. Starts at 8pm.

**MON 3<sup>rd</sup> and WED 5<sup>th</sup> February,**  
Whitefriars College at Camp Manyung, 8pm. Uncertain numbers, so please, help out if you can.

**Frankston City Council Mayors Picnic Sunday 2nd March.** 10am - 4pm. Is anyone interested in setting up a scope and promoting ASF on the day? We need to know by next members meeting in Jan or let Sally know on members night.

**TUES 11<sup>th</sup> March,** Camberwell Grammar at Camp Manyung, 8pm.

**FRI 14<sup>th</sup> March,** Braeside park, 8pm.

The once-a-month basic public viewing nights at *The Briars* will continue on the first Friday of each month. The next nights are 3<sup>rd</sup> January, 28 January and 7<sup>th</sup> February, all at 8pm. Assistants are required. New members are welcome to watch and participate if desired.

**NOTE: The additional public viewing night on January 28!**

### **Astro Tour Excursion Planned**

A trip is being organised for a group of members to see 'Astro Tour', Swinbourne's Centre for astrophysics 3D virtual tour through the Solar System and the Universe. The tour would start at 6.30pm on a weeknight with a charge of \$10.00 per head; unfortunately they do not run it at the weekend.

The theatre will hold a max. of 35 with a minimum group of 20, and as it is in Hawthorn the ASF can look at hiring buses for the journey.

The date will be in May or June 2003, so if any member is interested in going I will take names at the January Meeting, if you cannot get to the meeting let me know on E-Scorpius.

Roger Chandler

## **YOUR SOCIETY**

Welcome to the following new Society member(s):

Alois Dvornik  
Scott Gordon  
Ross Lawrence  
Michael Ward

Current number of members is 174.

### **Presidents Report**

Hello All,

Firstly welcome to a New Year. I would like to thank the out-going committee.

Welcome to the new committee.

There are two new committee members - Roger Chandler and Doris Weigert.

Doris was co-opted on to help with some of the duties of the committee. Peter Skilton and I have done a swap this year to give Peter more free time and to see how I go steering the ship! The New Year should be a fruitful one; we would hope to negotiate a new lease at the Briars, more work on our site, T.L.D.'s will be on again, many more viewing nights and with Mars at its best opposition in August, a viewing highlight.

Please keep an eye on newsletter's and e Scorpius e-mail service for up to date information on the ASF.

Thanks to Ian Sullivan for producing this year's calendar. Keep it on your fridge so you know what we are doing week-to-week.

I hope to see you at our Briars site and at meetings throughout 2003.

If you have something to say on the ASF or have any problems in the Society please do not hesitate to see me or phone me on 0421 452 428 or e-mail me at [dgirling@pen.hotkey.net.au](mailto:dgirling@pen.hotkey.net.au).

Clear Skies

*Dave Girling.*

## IMPORTANT NOTICE

### **Planned Meeting to Discuss Name Change**

Hello All,

At our February members' meeting there will be an open discussion on the thoughts of members to change the name of our Society. A name change has been talked about for many years.

This years committee has decided to see if the membership wants a name change and to what.

This is YOUR chance to have your say on why and what name you would like.

In the open discussion at the meeting you will have 5 mins to put forward your views. No interruptions, everyone will get their chance. This notice gives you plenty of time to think of what name you think would be appropriate for now and the future. This is a big decision and will not be taken lightly.

We would hope to narrow it down to 4 suggested names by meetings end and vote on the appropriate name at March or April's meeting.

If you are unable to attend any meetings but want a say, please e-mail me your thoughts.

[dgirling@pen.hotkey.net.au](mailto:dgirling@pen.hotkey.net.au)

Thank you

Regards

Dave Girling.

President

### *News, Events and Member Contributions*

#### **SOLAR DAY -Sat Feb 8 at 'The Briars'**

This will be the subject of the 'Telescope Learning Day' to which members are encouraged to bring their telescopes for solar viewing. Barry Adcock ( ASV ) will bring his refractor fitted with the new Coronado 65 mm solar filter.



Members and guests should arrive by 1pm to calculate and observe sundial noon and measure the declination of the sun. Come earlier if you want to have lunch on the site. You could also have lunch after the observance. Tea and coffee will be available all afternoon. Members may also stay on or go and return for evening observing.

## PROGRAM

**1:00 pm:** Preparation for sundial noon.

**1:30 approx:** Observance of sundial noon.

**1:45:** Demonstration and discussion of sundials including that to be installed on the site.

**2:30:** Discussion on sunspot counting with practical exercise.

**3:00:** Discussion on hydrogen alpha, and other filters

**4:30 approx:** End of solar viewing activities

Members may contact me if desired after Jan 27 on 9555 6913 or the President, David Girling, before or after that date.

Ian Sullivan

# Vastroc '03

Please be aware that VASTROC is calling for papers from interested amateur and professional astronomers for 2003 by February.



It will be hosted by the Ballarat Astro Society from Friday evening May 2nd to Sunday afternoon May 4th. The venue will be the Ballarat Municipal Observatory and Sovereign Hill.

If you are interested in presenting at this Victorian Astronomical Convention (which historically has been mostly Victorian amateur astronomers) then please let Judith Bailey know on bas@cbl.com.au or by phoning (03) 5341 779 or by writing to Convenor VASTROC 2003, PO BOX

284, Ballarat, Vic 3353, indicating if you wish:

- to present a full paper (20 mins plus 10 mins of questions).
- to prepare a poster only.
- to give a Take-10 (10 mins of information content only).
- facilitate a workshop.

If you are interested, please provide the title and a 3 or 4 line description of the talk.

The topics in past years have ranged far and wide over an interesting diversity in anything to do with astronomy and the sky, including history, technical details, observing methods, instrumentation, results of observing and original research, cosmology, background information on a plethora of topics, phenomena, meteoritics, weather etc. A call for registration has not yet been issued, and this is merely an advice of a call for papers.

## SUNDOGS SEEN

David Girling from Mornington reported observing a definite halo around the Sun at 1030 AESuT on 17<sup>th</sup> November, together with two sundogs on the eastern and western ends of the halo. The halo was also seen by Val Rolfs from Mornington.

Within the solar halo ring, on either side of the sun, one often sees two bright spots called "sun dogs" or "mock suns".

These optical effects and others like them are caused by the reflection and refraction (bending) of light by the small ice crystals. Sun dogs and halos always are at an angle of 22° from the sun. That particular angle, curiously enough, occurs because the refracting ice crystals have hexagonal (six-sided) faces.

## NAMETAGS FOR MEMBERS

When members join the Society, there are nametags produced for them. However, several members have yet to collect their nametags. These nametags can be picked up from me at most society events.

John Cleverdon

## Astronomy 2003

The publication *Astronomy 2003* shows what's in the night sky throughout 2003, and is written by amateur astronomers for all astronomers, from raw beginner to expert. This year includes a solar eclipse, a transit of Mercury and close approach of Mars, to name a few. RRP is \$20 to the public, \$18 to society members.

Copies are available at any ASF gathering (meetings, schools, social events), or by cheque to P.O. Box 596, Frankston 3199 while stocks last.

As usual, proceeds from the sales go directly towards improving your library by purchasing new items. If you have any requests for titles, don't be shy and please pass them to any committee member by February.

Hurry, it's first come, first served.

## Leonids 2002: A Bit of a Fizzer

ASF members Richard Pollard, Adam Marsh, Jane McConnell, Sally Zetter and Marty Rudd, along with members of the ASV, recently took some time out to view the Leonid Meteor shower from Lake Cullulleraine, some 60km west of Mildura. Despite a near full moon, hopes were high that there may be some moderate meteor action. Patient viewing on the first night resulted in very few Leonid meteors being recorded, although there were a few bright sporadics. The second night was heavily clouded over and no observing hours were logged: it was hoped the third and final night might produce more favourable conditions. However, the first rain in several months started falling in the late afternoon and was still doing so when the remainder of the group packed up and headed home the following day. The locals welcomed the downpour, even if we didn't. Later reports from around the globe put the peak rates for the shower well below those for 2001, so it was reckoned we didn't miss much... now, for 2003...



## Ken Bryant Scope Day

November 9<sup>th</sup> was the date of the annual Telescope Day, and happily the weather played its part, providing clear sunny skies.

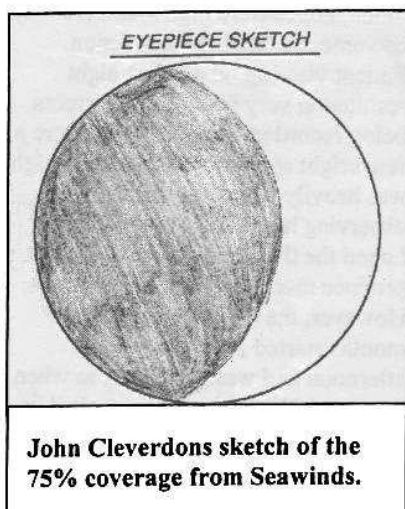
On display were a host of new scopes, and much of the day was spent with members getting to know their new instruments. Also available was a buy, swap and sell table topped with various astro-goodies.

A free raffle was held, with Peter Densley taking the prize: an eyepiece donated by the family of Ken Bryant, a long-term member who sadly passed away earlier in the year. Appropriately, David Girling announced that the annual event would now be known as the Ken Bryant Scope Day in recognition of the tireless hours Ken put into the Society.

The 2003 KBSD will be on Saturday, 28<sup>th</sup> November.

## The December 4 Total Solar Eclipse: Members Share Their Experiences

### *Eclipse From Seawinds*



John Cleverdons sketch of the 75% coverage from Seawinds.

December 4 was Eclipse day, and while most people headed west to S.A., some of us had to stay home and work and what not. Through the day we had storms rain, hail, thunder... all of it.

I stood at my printing machine and said "Typical Melbourne, or Mornington Peninsula."

We had organised with Parks Victoria to observe the Eclipse at Seawinds on Arthur's Seat. On my way home, I was looking forward to a warm house and dinner.

Don Leggett rang me around 4.15pm and said, "Would you believe it is clearing down here". I did not believe him but sure enough when I got to Mornington it was clearing.

So by 6.45pm I was set up with my scope with full aperture solar filter. John Cleverdon brought his scope for projection viewing. Sally, Mary, Don, and Gabriel turned up along with Dave and a few others for the show. We did not see the Eclipse like others but we enjoyed the 75% coverage we got.

We froze in December, had a nice view and could not wait to get home.

We all enjoyed the Eclipse in our own way. Yes, we do get 3 seasons in one day: not 4 it was never warm or hot!!

Clear Skies  
Dave Girling.

## Outback Eclipse: A Personal Account By Richard Pollard

They say it's one of the most awe inspiring of nature's spectacles.

I have to say that seeing the sky darken and the sun become a black disc surrounded by an eerie white corona is something I will never, ever forget.

Those who have witnessed a total solar eclipse also often say that seeing just one is not enough, and it's this that leads people to become eclipse 'chasers', travelling the world in the pursuit of longer, darker events.

While I may never become a bona-fide chaser, I definitely plan to see another after what I saw in the late afternoon of December 4.

I was with a group of ASF and ASV members who usually gather to observe meteors, but, being amateur astronomers, can be enticed to view other phenomena. Marty Rudd had

organised accommodation at a caravan park in Wilmington, just over 35km from Port Augusta, and it was there Lance Kelly from the ASV, Phil Snelling and myself arrived on Monday afternoon.

Tuesday was spent in Port Augusta, picking up any last minute items we'd forgotten to pack. The remainder of the group arrived late that night and we set about deciding on a viewing location.

The most popular destination, Ceduna, was having problems with cloud, and the second most popular, Lyndhurst, was hosting a three day party, with the sound being heard over a 30km radius!

Other options were Purple Downs, near Roxby Downs or our final choice, in the middle of nowhere along the Stuart Highway between Pimba and Glendambo.

The next morning, armed with a GPS unit with which we were able to pinpoint the location where the eclipse path crossed the road, we set off, with stops in Port Augusta for lunch and Pimba for fuel and drinks.



Setting up in the desert...

The day was surprisingly cool, a comfortable 23 degrees, with a brisk southwesterly forcing back the desert heat.

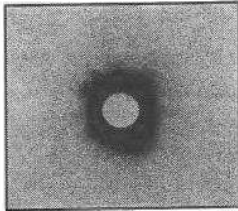
As we neared our point, we came to a fenced off area for public parking, but even at this early stage (four hours before first contact) it was apparent the area was far too small, and one minor official had his hands full trying to muster the arriving throngs. In the end, I think he just gave up. We parked, unpacked and set up our gear.

We filled in the time with talking, checking exposure guides, checking cameras, tossing a tennis ball around and soon enough, bang on time, the



first indentation appeared on the solar disc. We tuned to the ABC, who were crossing between Ceduna and Lyndhurst, talking with visiting astronomers and members of the public who wondered what all the fuss was about.

It's hard to describe the effect the eclipse had, both on the observers and the environment. As the strange light levels were becoming more obvious, people became more anxious and excited and as totality was almost upon us,



my feeling was that something truly bizarre was about to happen. I remember the call of "look at *THAT!*" as a cone of darkness came racing toward us and the yells of excitement as the last of the shining crescent sun was...gone.

Everyone fell silent. No yelling, not so much as a gasp. There it was... the image we'd all seen hundreds of times in books... the disc of the sun, black, with the wispy corona and pink prominences, but now it was real...just hanging there in the desert sky. The 28 seconds of totality passed much too quickly and as the first flash heralded the return of sunlight, we gazed at each other in stunned silence. Then came the excited talking, hand shaking and pats on the back. We opened the champagne and toasted our experience.

Once the now partially eclipsed sun had set, we departed for Pimba, Port Augusta and finally our camp at Wilmington. Tired, dusty, and still dazed by the event, we had a short debrief which included a pledge to make the next accessible eclipse a priority.

In 2003 there is one eclipse, over Antarctica, another favourable one is in 2006 over Africa, Turkey and Khazikstan. Australia's next event is in 2012 over the Gulf of Carpentaria and Far North Queensland. But, if you can last till 2038, I'd advise spending Boxing Day along the Murray. This eclipse path runs from the WA coast near North West Cape to south eastern Australia, passing along the VIC-NSW border and will occur during the middle of the day.

## Recent Meetings

November's gathering of the Society was chaired by the President and saw 49 in attendance on a mild evening. The proceedings started with the Annual General Meeting to elect the next year's committee, which included for the first time in ASF history an election because there were six candidates for five available positions, though it was pointed out that the various subcommittees do not require members to be on committee in order to contribute great value to the benefit of the society. Peter Skilton delivered the President's report for the year, showing the society continues to grow in strength and number with a lot of very interesting happenings occurring during 2002, and offered thanks to those who have helped substantially during the year with time and/or resources. The AGM closed at 8:30pm, though because of the unexpected absence of the Treasurer, the Treasurer's report will be ratified before the January general meeting of the society.

Following the AGM business, Dr. Chris Fluke, a young astrophysicist lecturer from Swinburne University of Technology in Hawthorn gave an excellent Powerpoint presentation on *Just Three Numbers – An Introduction to Modern Cosmology*. This gave an insight into just what these numbers that define the future of the entire Universe are in a physical sense, and the history and current thinking on what are the numerical values. Swinburne offers online tertiary courses in astronomy ([www.astronomy.swin.edu.au](http://www.astronomy.swin.edu.au)) for anyone via the internet, and about a third of all registered students across the world are amateur astronomers and about a third are teachers requiring accreditation in a science curriculum subject. This can lead eventually, if you so wish to put in the time and effort, to receiving a Masters degree in Astronomy.

The 3 mysterious numbers are:

- (a) The Hubble constant, which shows the recession speed of galaxies as a function of distance, and the values today are asymptotically approaching 60-70 kilometres per second per megaparsec.

- (b) Omega naught, which is a measure of how much matter there is in the universe and so which governs whether the universe expands forever or will crunch back down on itself under gravity given long enough. The current best value is 0.3 from Australian work with the 2DF redshift survey, indicating that our universe will expand forever.
- (c) Einstein's cosmological constant, lambda naught, which is Einstein's self-called "greatest blunder" and which is arguably his greatest discovery, and is a type of "anti-gravity" component. COBE and later supernova results from Hubble give this value currently as 0.7, which is too great to cause the Universe to collapse back on itself.



The assembly then broke for tea, and during this time Alfred Kruijshoop from the

ASV assembled a Global Positioning System time signal demonstration for occultation observations, using the KIWI program on his laptop in the library room for those interested in an alternative solution once the National Standard Laboratory's VNG radio signal goes off the air end of 2002. This successfully locked onto 7 satellites, giving a reliable signal each second from the atomic clocks on-board the GPS satellites.

After tea break, the raffle was drawn and the group split into three parallel sessions. The video on *Space – Destiny*, was shown in the library room, while the instrument making group had an informal chat in the tea room. In the main theatre, Bob Heale delivered *Sky for the Month*, handing out his information sheets and pointing out the seasonally relevant Christmas Tree cluster, and gave some personal views on various pros and cons of computer operated telescopes available in the amateur price range. This was followed by David Girling who showed some pictures from the recent *Ken Bryant Scope Day* that was a huge success at the Briars. Ian Sullivan then



followed with some information on safe eclipse viewing, appended by some helpful advice from Alfred Kruijshoop (who had chaired a panel on eclipse viewing in Papua New Guinea when he used to live there). The PNG advice for those without any safe solar viewing filter was simply to turn your back to the Sun, poke a hole in a piece of paper with a biro pen, and look at the projected image, which obviously would be small and would show no more detail than the partial phase of the solar disc. Solar eclipse viewing glasses were then sold to interested members after the meeting and were snapped up. The only reported sighting of Leonids meteors this year were from Mildura where Sally Zetter reported seeing 4, and Marty Rudd reported seeing one. Other members saw none locally.

As usual, the meeting was video taped, and this will be available for borrowing in the library by members. The outgoing President reminded the attendees that no meeting is held in December and took a vote of interest if this situation were ever to be changed in future years. The overwhelming consensus was that a December meeting was a good idea should this be possible. Meeting closed at 10:30pm.



## SCHOOL/PUBLIC NIGHTS

The viewing night at The Briars Visitors Centre on November 1<sup>st</sup> was a great success, with 60 members of the public and society members in attendance, and a chorus of frogs (though not as many as the previous month). The skies were cloudless throughout and the temperature was pleasant. The solar system talk, with an emphasis on the total solar eclipse and the International Space Station, was given by Peter Skilton, before the group hurried outside to see the ISS pass overhead. Unfortunately it was low down in the south west, and must have been just occulted by the trees. Nevertheless, half an hour later a very bright magnitude -8 Iridium satellite flare was anticipated in the Eastern skies, and while the event was seen, it

never really went beyond magnitude -3 or -4. So much for predictions. In fact several attendees reported seeing a very bright satellite almost directly overhead about half an hour beforehand, and this wasn't predicted at all. The flock of telescopes present was its typical impressively varied number and type and apertures, and these evenings are becoming quite a social event on the society calendar. Thanks to Sally Zetter for taking care of the table tasks, and in the field were members Roger Chandler, Richard Pollard, Phil Snelling, Peter Densley, Greg and Val Walton, Jane McConnell, Bruce Tregaskis, David Huby, John Cleverdon, Jeremy Scott and David Girling and kids, Don Leggett, Bob Heale and a welcome appearance from our Science Works astronomer, Tanya Hill and her husband Alex Merchant who travelled south to the wilderness, dodged the unexpected roaming cattle on the road, and brought along RMIT's physics department pride and joy telescope to much darker skies (Alex lectures there).

## AstroNews

### Surprise Comet Streaks Into Solar System

Astronomers have received a holiday bonanza in the form of the arrival of a previously unknown comet that has entered our part of the solar system. The comet was discovered by a Japanese amateur astronomer, Tetuo Kudo, early on the morning of December 14. The comet, Kudo-Fujikawa (and officially designated C/2002 X5), is a swift-moving object and currently is visible in the northeastern skies during pre-dawn hours, showing a pretty distinct tail and large coma (head or halo, caused by the emanation of gases and other materials as the comet warms up on its approach to the sun). The tail appears to be slightly less than one-half degree and several spikes in this tail have been recorded (on December 15) by imagers in New Mexico.

The jury is still out regarding just what kind of show Kudo-Fujikawa would provide Earth-based viewers when it is closest to the sun, but there is a prospect that it would be a "textbook comet." However, the visibility during

its greatest brilliance...will be greatly hampered because of the comet's angle of approach to the sun and the Earth-sun-comet positioning during that period.

In February the comet will be more favourably placed for observers in the southern hemisphere, and there are some estimates that suggest that the comet could attain a brightness equal to the bright planet Venus (a magnitude of less than 4.) Much of what Earth will be able to see of Kudo-Fujikawa is contingent on the activity that occurs when it is closest to its pass by the sun (perihelion) on January 28, 2003, at that point it will be only 25 million kilometres from the sun. (*National Geographic News*)

*See attached Finder chart with this edition !*

### X-37 Rises From the Ashes



ST. LOUIS (AP) -- Hoping to develop technology to replace its aging space shuttles, NASA has awarded Boeing a \$301 million contract to complete the X-37 spaceplane. St. Louis-based Boeing Phantom Works announced on November 25 it will complete its X-37 Approach and Landing Test Vehicle and conduct flight tests as part of the Space Launch Initiative, a \$4.8 billion NASA program.

"The X-37 is a technology demonstrator, just proving certain technologies that will ultimately lead to a replacement for the space shuttle," said Bill Cole, a spokesperson for Phantom Works.

With the contract, Boeing will complete the final assembly of the unmanned X-37 and conduct a flight test in April 2004. The contract also initiates a design for an additional X-37 long-duration orbital vehicle, scheduled to be tested in July 2006.

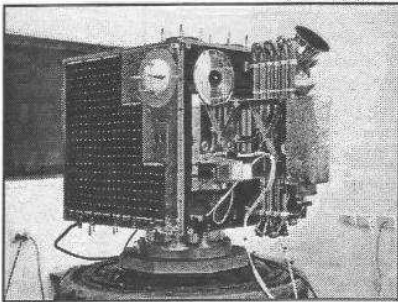
The plane, 8.4 metres long with a wingspan of 4.5 metres, is in final



assembly at the Boeing Phantom Works X-Vehicle Assembly Facility in Palmdale, Calif. When fielded, the unpiloted and autonomously operated X-37 will be the only X-vehicle capable of conducting continuous on-orbit operations for up to 21 days. The vehicle also will serve as a test bed for approximately 30 airframe, propulsion and operation technologies, such as a high-temperature thermal protection system. (Space.com)

## Australia's FedSat Up and Away

The first Australian built satellite in over 30 years has been successfully launched in Japan, in a move that is hoped to revolutionise remote telecommunications.



The FedSat satellite was constructed over the last four years by the Cooperative Research Centre for Satellite Systems (CRCSS) and was the first foreign satellite launched by Japan's Space Agency.

FedSat carries a Ka-band transponder designed to handle the new experimental usage of the high frequency and high-capacity Ka part of the radio spectrum. The next-generation Ka-band satellites use multiple pencil-like spot beams to provide full two way services to and from small earth stations about the same size as a satellite television dish.

The satellite also contains the world's first use of reconfigurable computing technology in space. Reconfigurable computers can change their physical circuits via software control, allowing new circuits to be added by remote control. This means satellites can be rewired without having to retrieve them, which could open up new realms of spacecraft adaptability, including re-use of old spacecraft.

## The Guts of a Neutron Star

Amid the fury of 28 thermonuclear blasts on a neutron star's surface, scientists using the European Space Agency's XMM-Newton X-ray satellite have obtained a key measurement revealing the nature of matter inside these enigmatic objects. The result captures for the first time the ratio between such an ultra-dense star's mass and radius in an extreme gravity environment.

The neutron star -- the core remains of a star once bigger than the Sun yet now small enough to fit within the size of a city -- contains densely packed matter under forces that perhaps existed at the moment of the Big Bang but which cannot be duplicated on Earth. The contents offer a crucial test for theories describing the fundamental nature of matter and energy.

The measurement probed the neutron star's interior by measuring for the first time how light passing through the star's half-inch atmosphere is warped by extreme gravity, a phenomenon called the gravitational redshift. The extent of the gravitational redshift, as predicted by Einstein, depends directly on the neutron star's mass and radius. The mass-to-radius ratio, in turn, determines the density and nature of the star's internal matter, called the equation of state. It is only during these bursts that the region is suddenly flooded with light and we were able to detect within that light the imprint, or signature, of material under extreme gravitational forces.

The neutron star is part of a binary star system named EXO 0748-676, located in the constellation Volans, or Flying Fish, about 30,000 light-years away.

Scientists estimate that neutron stars contain the mass of about 1.4 Suns compacted into about a 16-kilometre-wide sphere. At such density, all the space is squeezed out of the atoms inside the neutron star, and protons and electrons squeeze into neutrons, leaving a neutron superfluid, a liquid that flows without friction.

By understanding the precise ratio of mass to radius, and thus pressure to density, scientists can determine the nature of this superfluid and speculate on the presence of exotic matter and forces within -- the type of phenomena

that particle physicists search for in earthbound particle accelerators.

EXO 0748-676's mass-to-radius ratio is 0.152 solar masses per kilometre, based on a gravitational redshift measurement of 0.35. This provides the first observational evidence that neutron stars are indeed made of tightly packed neutrons, as predicted by theory estimating mass-radius, density-pressure ratios. We have now established a means to probe the bizarre interior of a 16-km-wide chunk of neutrons thousands of light-years away.

In a quark star, which is denser than a neutron star and has a different mass-to-radius ratio, neutrons are squeezed so tightly they liberate the subatomic quark particles and gluons that are the building blocks of atomic matter.

## NEED A NEW TRIPOD?

**Peter Densley can manufacture a high quality wooden tripod for almost any type of telescope.**

You may have seen some of his handywork at recent Briars events; David Girling had one made for his new refractor.

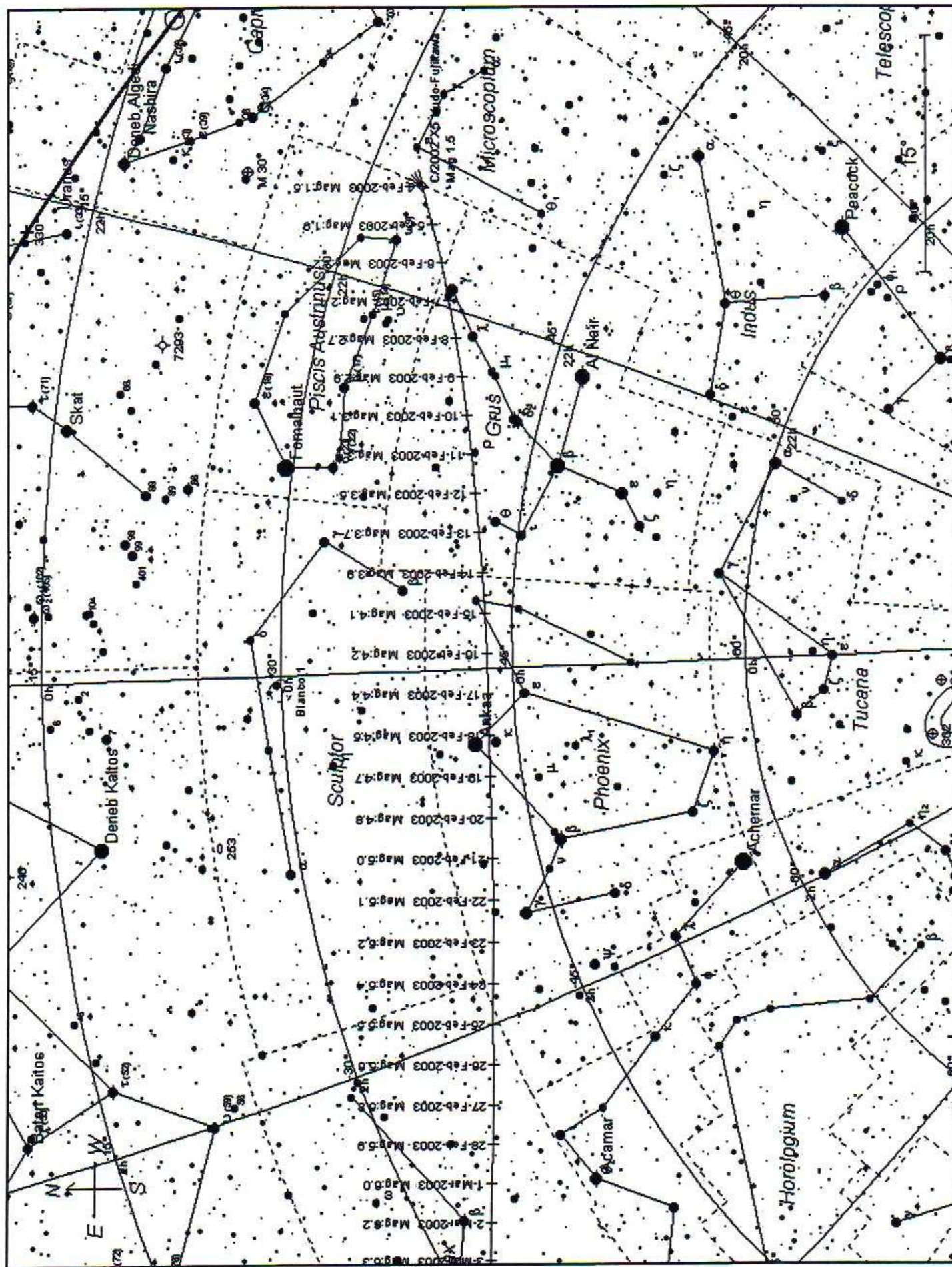
If you're interested phone Peter on **5952 3080** or catch up with him at the next Briars night. Prices vary depending on the size and type of telescope.

If you have something you'd like published in *Scorpius*, simply e-mail it to me, either in a document file or as part of an email to: [alphacent@iprimus.com.au](mailto:alphacent@iprimus.com.au) or, post it to **9 Genista Rd, Cranbourne 3977**.

Also, please note, the new calendar shows the *Scorpius* deadline as the 1<sup>st</sup> of the month. This has changed to the 15<sup>th</sup> of the previous month; i.e. items for the March/April edition must be received no later than February 15. This will allow you to get your copy by 1<sup>st</sup> March.

Thanks, and best wishes for 2003!  
Richard Pollard (Editor)





Path of Comet Kudo Fujikawa through February 2003. Supplied by John Cleverdon.



# Astronomical Society of Frankston Inc. CALENDAR 2003

● New Moon ○ Full Moon

P is Public Holiday

● Scorpius deadline

January	February	March	April	May	June	July	August	September	October	November	December
1 W Scorpius deadline	P S	S	T	Th	Su	T	F	M	W	S	M
2 Th Public Night	Su	Su	W	F	M	W	S	T	Th	Su	T
3 F	M	M	Th	S	T	Th	Su	W	F	M	W
4 S	T	T	F	Su	W	F	M	Th	S	T	P
5 Su	W	W	S	M	Th	S	T	F	Su	W	F
6 M	Th	Th	Su	T	F	Su	W	S	M	Th	S
7 T	F	F	M	W	S	M	Th	Su	T	F	Su
8 W	S	S	T	Th	Su	T	F	M	W	S	M
9 Th	Su	Su	W	F	M	PW	S	T	Th	Su	○
10 F	M	M	PTh	S	T	Th	Su	W	F	M	W
11 S	T	T	F	Su	W	F	M	Th	S	T	Th
12 Su	W	W	S	M	Th	S	T	F	Su	W	F
13 M	Th	Th	Su	T	F	Su	W	S	M	Th	S
14 T	F	F	M	W	S	M	Th	Su	T	F	Su
15 W	S	S	T	Th	Su	T	F	M	W	S	M
16 Th	Su	Su	W	F	M	W	S	T	Th	Su	T
17 F	M	M	Th	S	T	Th	Su	W	F	M	W
18 S	T	T	F	Su	W	F	M	Th	S	T	Th
19 Su	W	W	S	M	Th	S	T	F	Su	W	F
20 M	Th	Th	Su	T	F	Su	W	S	M	Th	S
21 T	F	F	M	P	S	M	Th	Su	T	F	Su
22 W	S	S	T	Th	Su	T	F	M	W	S	M
23 Th	Su	Su	W	F	M	W	Su	T	Th	Su	T
24 F	M	M	Th	S	T	Th	Su	W	F	M	W
25 S	T	T	F	Su	W	F	M	Th	S	T	Th
26 Su	W	W	S	M	Th	S	T	F	Su	W	F
27 M	P	Th	Su	T	F	Su	W	M	Th	Th	S
28 T	F	F	M	W	S	M	Th	Su	T	F	Su
29 W	S	S	T	Th	Su	T	F	M	W	S	M
30 Th	Su	Su	W	F	M	W	S	T	Th	Su	T
31 F	M	M	Th	S	M	Th	Su	F	F	Su	W

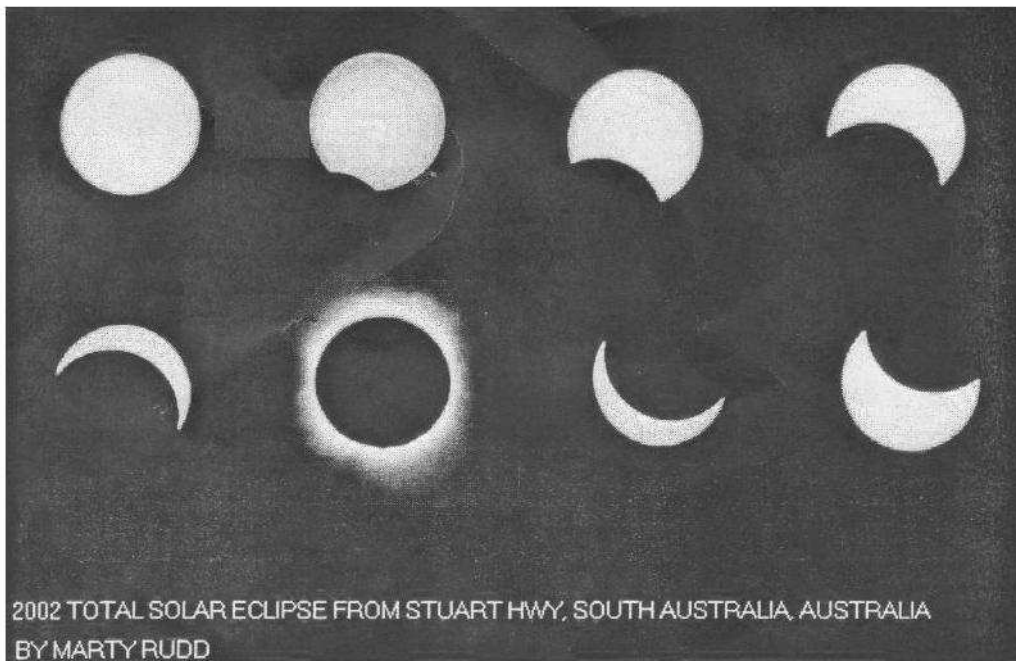
General Meetings are held at 8 pm at the Peninsula School, Wooralla Dr, Mt Eliza - Melway 105 F5 (drive to Senior School at rear)  
 Members Nights are all Fri and Sat nights for sky viewing are at the 'The Briars' Nepean Hwy Mt Martha - Melway 145 F12  
 Special nights are indicated above. - and new attendees must confirm with David Gilling 0421 452 428 before attending  
 Working Bees are held at 'The Briars' (see above) in the morning, normally commencing at 11 am.  
 ASF Library at Peninsula School is open on General Meeting nights for borrowing by members.

State School Holidays

Public Nights for sky viewing are held at 'The Briars' Visitors Centre (Melway 145 F12) at 8 pm all year. Booking is preferred, but not essential.  
 For bookings and enquiries, phone 0419 253 252

Prepared by Ian Sullivan





Left - Working Bee at the ASF Briars site on 2nd February 2003

Photo - *By John Cleverdon*

Below - Solar Day at the ASF Briars site on 8th February 2003

Both Photos - *By John Cleverdon*



*Kindly reproduced by Jane McConnell and collated/posted by Sally Zetter*

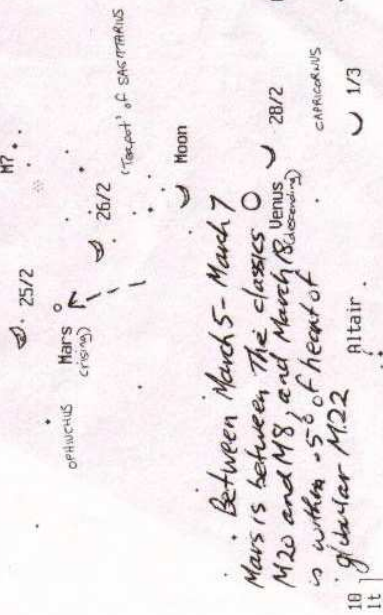






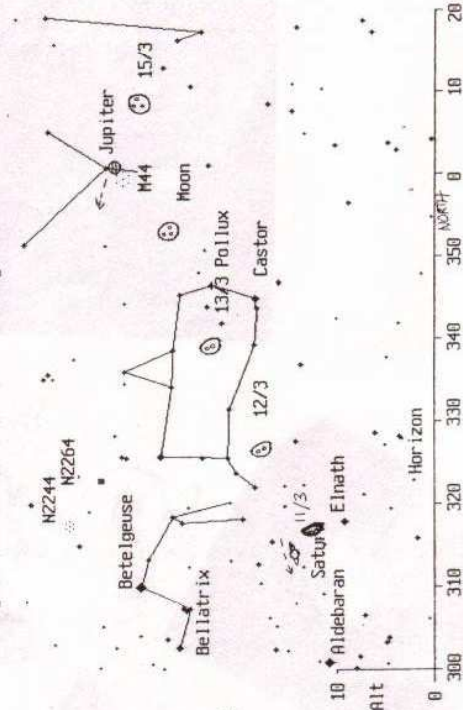
SKY FOR THE MONTH 19 FEBRUARY - 18 MARCH 2003 MORNINGTON PENINSULA

5:48 am East 2/3 Dark Sky 27th February 2003 Summer Time  
 U1.00 (c) Bob Heale 13/1/03  
 All objects no fainter than 3.5 1 X Sky View  
 M7



Between March 5 - March 7  
 Mars is between the classes  
 M20 and M8, and March 8  
 is within 5% of heart of  
 Jupiter M22

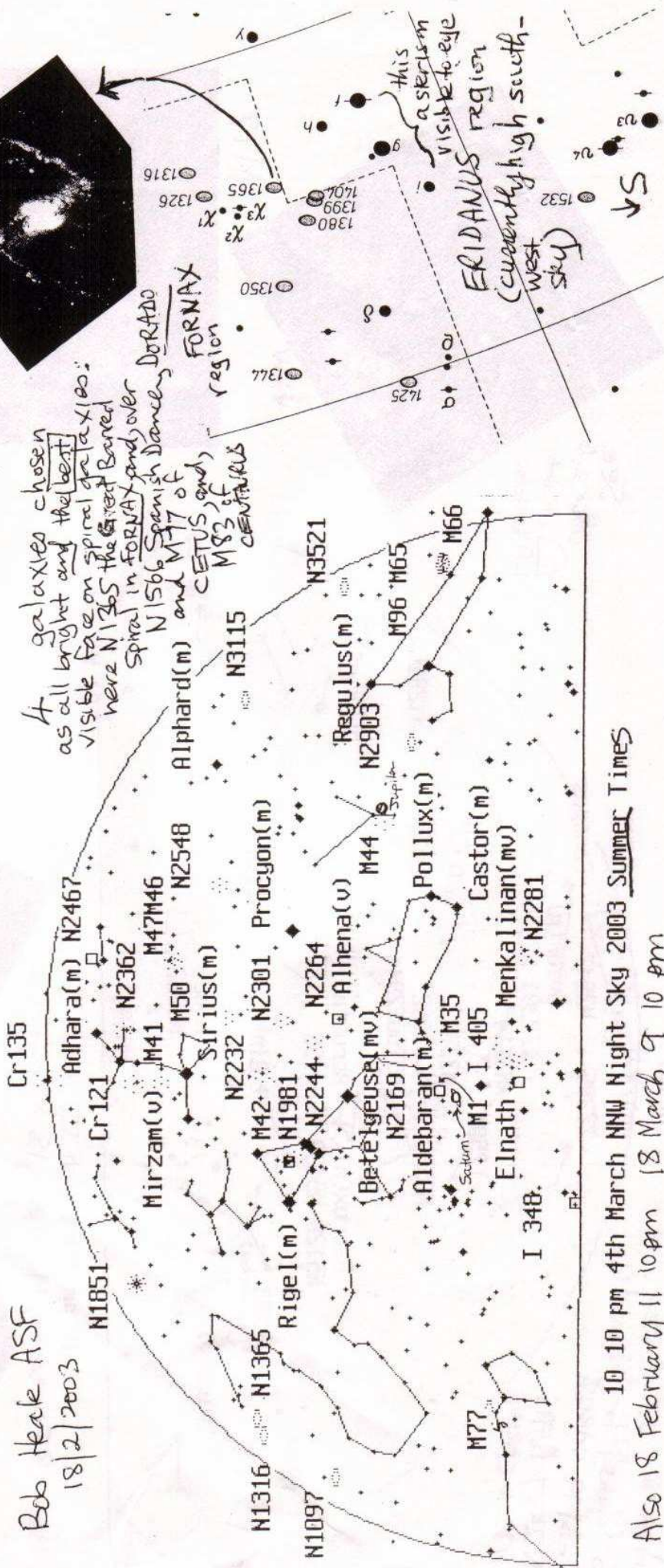
10:30 pm North Dark Sky 15th March 2003 Summer Time  
 U1.00 (c) Bob Heale 13/1/03  
 All objects no fainter than 5 1 X Sky View



Our early March sky sees our  
 Milky way running from the north  
 horizon up vertically to the zenith  
 (directly overhead) and down vertically  
 to the south horizon and characterised  
 by heaps of open star clusters  
 bright stars, many of which are multiple  
 stars (m) or variable (v) or both (mv),  
 many planetary nebulae and some  
 galaxies, few globulars. All of this  
 preceded by some early summer  
 galaxies, but to be followed by many  
 Autumn

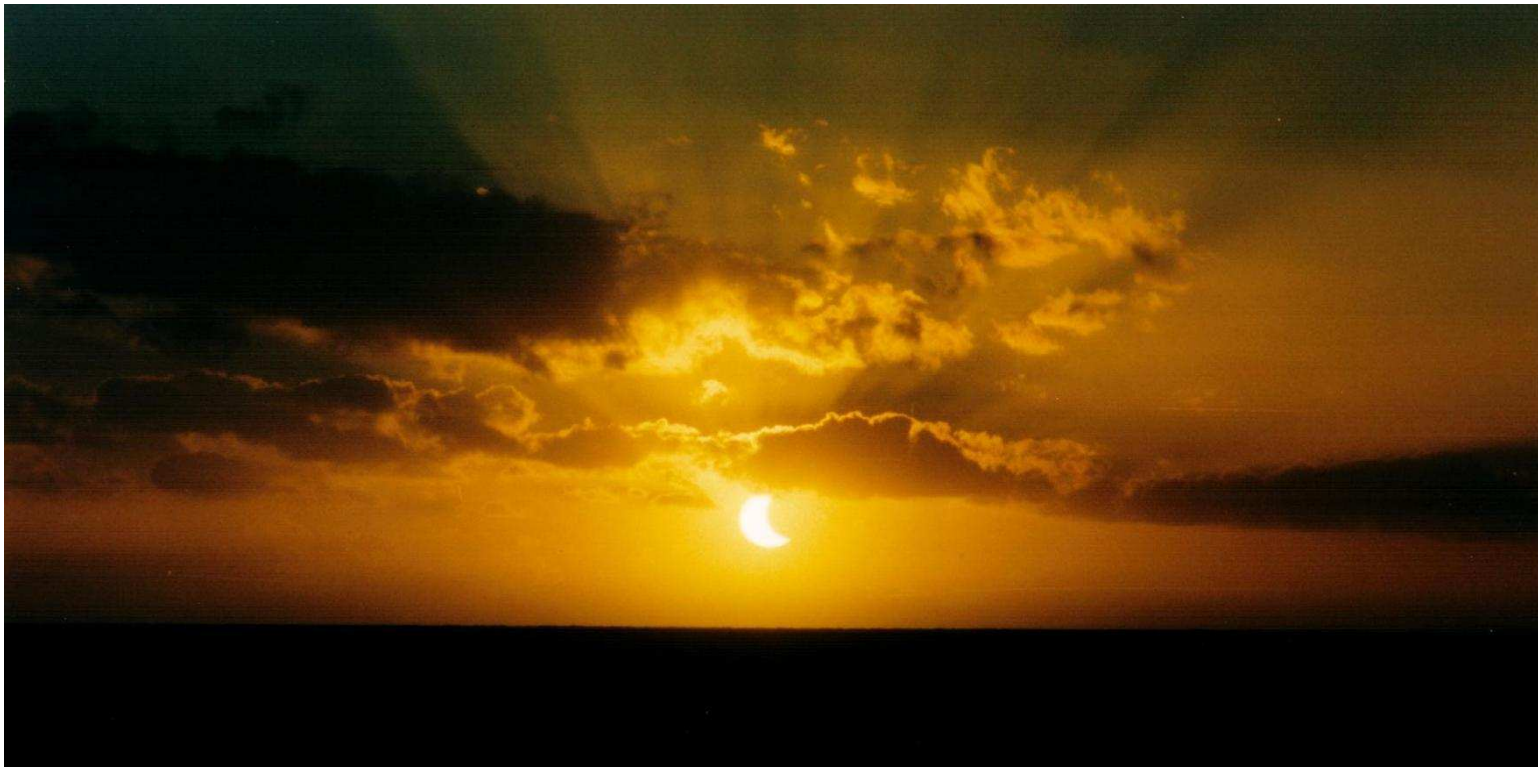


A galaxy chosen  
 as all bright and the best  
 visible face on spiral galaxies:  
 here N1365 the Great Barred  
 Spiral in FORNAX and over  
 N1566 Spanish Dancers, Dorado  
 region  
 FORNAX  
 region



10:10 pm 4th March NNW Night Sky 2003 Summer Times  
 Also 18 February 11:00 pm 18 March 9:10 pm



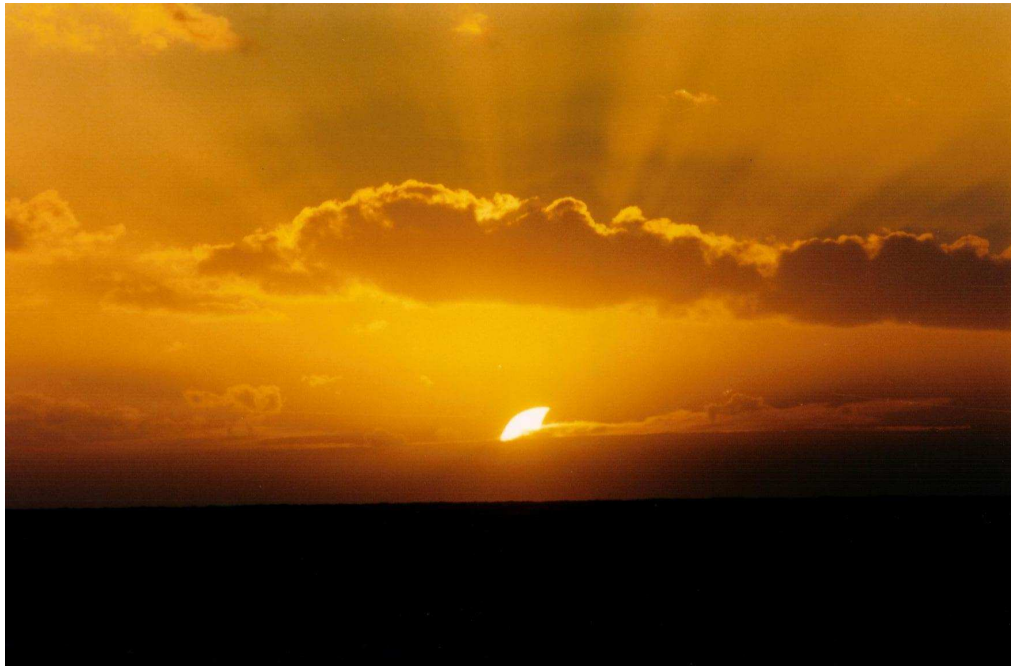


Above -  
Solar eclipse 8pm 4th December 2002

Taken with 135mm lens f16 1/500 of a second using 400 iso film

Both Photos at Right -  
Solar eclipse 8pm 4th December 2002

Taken with 300mm lens f16 1/125 of a second using 400 iso film



Many MPAS member went in South Australia to view the total eclipse, I stayed at home & imaged the parshall eclipse from Bonbeach. The west horizon was cloudy but luckily for me this made a beautiful sunset shark fin eclipse, it happen all too quickly & then it was all over. I used my manual focus 135mm & 300mm lens, focusing on the horizon before I pointed the camera at the sun.

I sighted through the camera from a distance, as I was concerned about damaging my eyes. The light meter on my Rico old film SLR works very well.

The next day I put the film in for processing. When got them back, I was very pleased with my photos. I scanned them & adjusted them with iphoto.

*By Greg Walton*

*Solar eclipes 4 Dec 2002 8:00pm Pentax SLR 300mm Lens ISO400 film F16 1/125sec*

*By Greg Walton Bon Beach scan from print 300dpi*