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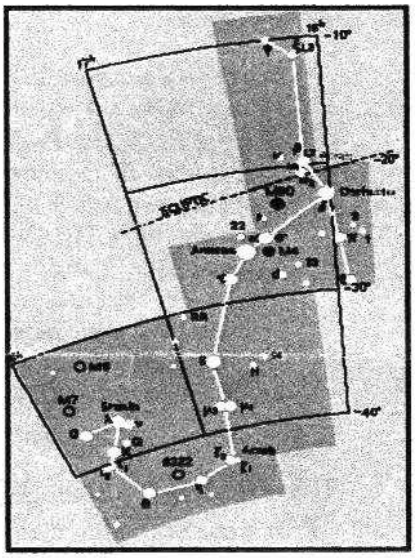
The Journal of the Astronomical Society of Frankston Inc.

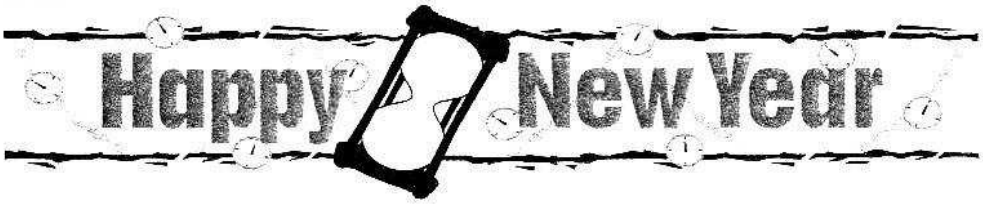
Reg No: A268 *ABN: 34569548751* *ISSN: 1445-7032*

Volume XIII, No. 1 (Jan 2004)

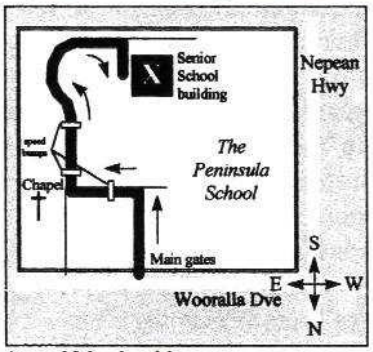


The Astronomical Society of Frankston was founded in 1969 with the aim of fostering the study of Astronomy by amateurs and promoting the hobby of amateur Astronomy to the general public. The Society holds a General Meeting each month for the exchange of ideas and information. Regular observing nights,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

Meeting Venue: *Peninsula School*, Wooralla Drive, Mt. Eliza (Melways map 105/F5) in the Senior School at 8pm on the 3rd Wednesday of each month except December.
Phone: 0419 253 252 Mail: P.O. Box 596, Frankston 3199, Victoria, Australia
Internet: http://www.asfnet.20m.com
E-mail: skywatch@iprimus.com.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 1st Jan Each Year

President
Peter Lowe 0419 355 819

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Ian Sullivan

Treasurer
Marty Rudd (03) 5977 8863

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Bob Heale

Editor
Richard Pollard (0419) 100 802
e-mail: rlpollard@iprimus.com.au

Committee of Management:
Peter Skilton, Sally Zetter, David Girling, Don Leggett.

The public officer is Rhonda Sawosz.

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

Future Events

General Meetings:

January 21: **Lucky Dip:** Informal presentations by several members on various aspects of astronomy.

February 18: *Session 1*: David Girling presents "The Classics"
Session 2: Video TBA
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!

FRI 2nd/SAT 3rd, FRI 16th/SAT 17th, FRI 23rd /SAT 24th January, FRI 13th/SAT 14th, FRI 20th/SAT 21st, FRI 27th/SAT 28th February, all at The Briars, Nepean Hwy, Mt. Martha.

New attendees must always confirm with **John Cleverdon on 5987 1535** before attending. Remember for security reasons you can only attend on planned Members' Nights, unless by

prior arrangement with John 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:

None at time of printing.

If you can assist, please contact the Secretary.

The once-a-month basic public viewing nights at *The Briars* will continue on the *first Friday of each month. **In January, they are held every Friday night.*** The next nights are **FRIDAY 2nd, 9th, 16th and 23rd January and FRIDAY 6th February**, all at 8pm. Assistants are required. New members are welcome to watch and participate if desired.

Welcome to the following new Society member(s):

Tony, Sue, Catherine & Clare Bland
Louise Turnbull & George Dus.

Current number of members is 198.

NOTICE OF MOTION

As per the Constitution, notice is hereby given that voting on the following motions will occur at the General Meeting on January 21:

1) "It is moved that the name of the society be changed from **"The Astronomical Society of Frankston, Inc"** to **"The Mornington Peninsula Astronomical Society, Inc"**

2) "It is moved to increase the annual membership subscriptions as proposed by the Treasurer."

From the Treasurer:

At the Astronomical Society of Frankston's extended Annual General Meeting, due to be held on January the 21st, current financial members will be asked to vote on a motion to increase the annual membership fees of the society.

Much discussion by committee has gone into making the decision to raise annual membership fees, and it is felt that an increase now will greatly benefit the Astronomical Society of Frankston both now and into the future.

No significant increase in fees has occurred for over, at least, the last five years. The fee increases that have occurred only just cover the recently implemented GST, an extra expense that has been placed on the ASF.

A report in January 2003 was done to establish whether or not membership fees alone could sustain the ASF. It was found that membership fees alone were not and that the random income from school and public nights were relied upon to help keep the ASF up and running. From the results of the report, it was determined that the running of the ASF should be more reliant on membership fees rather than the income from school and viewing nights.

A rise in annual fees will also benefit the ASF enormously in helping develop better facilities for the use of all members.

The proposed raises are listed below.

	Current	Proposed
Full	$35.00	$50.00
Family	$45.00	$65.00
Pension	$30.00	$45.00
Fam. Pension	$40.00	$60.00
News	$16.00	$22.00
Student	$25.00	$35.00
Organisation	$50.00	$70.00

Martin Rudd
Treasurer ASF

Meetings

The public viewing night on November 7th saw 80 in attendance on a mild, cloudless evening. The assembly viewed Venus through the telescopes initially, then moved inside to the talk given by Peter Skilton. This was followed by the international space station making a bright passage across the western horizon, then back out onto the telescopes for Mars, the Moon and the other regular sky objects on show at this time of the year. Thanks to Don Leggett for organising supper, and for help in the field with instruments to John Cleverdon, Richard Pollard, Phil Snelling, Greg and Val Walton, Simon Birch, Ian Sullivan, Alois Dvornik, Peter Lowe and later Sally Zetter.

The public viewing night on December 5th under mostly overcast conditions saw 55 in attendance, including a coach load from the 2nd Mornington Sea Scouts. The talk was given by Peter Skilton. Thanks to Don Leggett for handling the important table tasks, and in the field with instruments were Greg Walton, John Cleverdon, Bruce Tregaskis and Bob Heale. Present was a Year 11 student with eager aspirations to talk to a professional astronomer before committing to do this as a career, but unfortunately none were there on the night – Tanya? As the evening was concluding near 11:30pm, an aurora alert was raised from northern Tasmania, just to cap it off.

The November 19th meeting at the Peninsula School was the Annual General Meeting and was chaired by the President on a warm night, and saw 49 members in attendance. The usual business of the AGM was conducted and the Committee of Management for 2004 was selected, though because of an oversight on notification of special

business to members, this final agenda item on special business for the AGM was adjourned until the January gathering of the society after such notification will have occurred to all members.

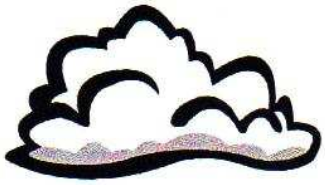
Peter Skilton reported in the President's report that the logged number of attendees over the years at school/public viewing nights was now at the impressive 25,988 mark, with an average cloud cover of about 43% at these attendances. Ian Sullivan reported on the dates of the next astronomy classes in Mt.Eliza, and Peter Skilton noted that Newbies nights were now underway thanks to the efforts of Paul Taylor. Predictions for a lunar grazing occultation of kappa Capricornus was relayed to members by the President who was assembling those to participate in an observing fence in the south-eastern suburbs. Predictions for Jovian satellite eclipses from the RASNZ, and red spot transit times for Jupiter observers, were handed out.

Ian Sullivan was about to wing off on a jumbo down to Antartica for the total eclipse later in November, where only a 40% partial eclipse would be visible locally, with weather prospects locally being poor. A good aurora was seen on October 29th in Victoria and Tasmania, and the outgoing President showed available photos, and members were reminded that the sunspot that gave birth to the largest ever recorded solar flare earlier in the month, would shortly reappear around the other side of the solar disc.

The audience then adjourned for tea break, before reconvening. One parallel session heard Peter Lowe speak on observing Penumbral eclipses, and handed out sheets on how to set up simple astronomy projects that anyone can do at home, as well as a fact file sheet on the space elevator, while the other session watched the video on Parallell Universes in the Library. Afterwards, Bob Heale gave his Sky for the Month, with handout sheets, and Marty Rudd gave a rundown on the Leonids latest repredictions in light of surprisingly weak activity this year. The meeting was video taped and will be available in the library, and closed at 10:30pm. There is no December general meeting scheduled as in previous years.

Derinya Primary school year 5/6 students were visited at The Briars Education Centre on 11th December. Peter Skilton delivered the talk in a very hot and humid venue, then the group moved outside under perfectly clear skies to see the planets on show in my comfort. Several satellites were also seen throughout the evening, and some very keen teachers stayed behind to see Saturn rising in the east. They had to lay on their bellies on the concrete pad to view it at 2.5 degrees above the horizon in the 18 inch telescope. Thanks for helping out with telescopes to Simon Birch, Greg Walton, Peter Lowe, Don Leggett and Alois Dvornik.

GRAZE WAS CLOUDED OUT



A grazing lunar occultation of Kappa Capricornus was predicted for November 29th across the south eastern suburbs of Melbourne. This relatively bright star was predicted to the slip in and out of the lunar mountains and valleys. Three keen participants made the journey to Glen Waverley, but unfortunately were clouded at around the event time of 11:20pm.

LEONIDS 2003

In the early morning of November 14th, from midnight to sunrise, about a dozen meteor gazers assembled at The Briars, cameras and videos assembled on tripods, some with tape recorders in hand, awaiting the first of this year's Leonids, predicted to peak at 4:17am AEDST. Two observers even brought along a bed and a comfy recliner chair – we kid you not – they observed in sheer style. Reports varied from seeing no meteors all night, to less than half a dozen overall, including sporadic ones not associated with the Leonids shower. A low lying fog developed during the night in the valley to the east of the observatory site, and would have made a surreal photograph resembling a lake of billowing cloud over the land, with the radiant in Leo above it. All were kept company by a farmer doing hay baling all night long over the other side of the misty valley, and somnolent cows in the accompanying paddock. Present were an assortment of the Mitsy's with various instruments and cameras on hand, Trevor Sweetman, Sally Zetter, Don Leggett, Peter Skilton, Marty Rudd, Terry Ryan, Adam Marsh, Roger Vodicka, Lance Kelly and possibly others not obvious in the dark. Richard Pollard observed while "working" and similarly saw nothing. Despite not seeing anything, all got a buzz from the reasonably mild conditions on this Leonids mission, with many waiting to photograph the rising Sun before heading for home or work.

Observing on the same night from home were Louise Turnbull in Somerville (who also saw no meteors), and Bruce Tregaskis in Mt.Eliza (who saw one sporadic and an unusual flash in the east just before 5am).

T.L.D.

Telescope Learning Day's are back this year; T.L.D's are your opportunity to learn how to get the best out of your telescope. We can teach you using and caring for your scope. We also talk on new equipment, eyepieces, filters all the things that is necessary and not so necessary for you scope. All members and visitors are welcome. Members are invited to show of new Telescopes. Telescope making techniques new Go To scopes anything that mite be of interest. T.L.D's are for you to learn from experienced members and talk to each other on how to get the most out of viewing the night sky.
Dates this year are January 25th. Special TLD and combined Lunar Night March 27th. April 24th. Also combined TLD and Messier night on May 22nd.
All day's starting at 3pm and going into the night. All at our Briars site. BYO food and drinks. Tea and Coffee provided.
Any questions to Dave Girling. E mail dave47tuc@bigpond.com or phone 59756506. A/H. Before 8.30pm

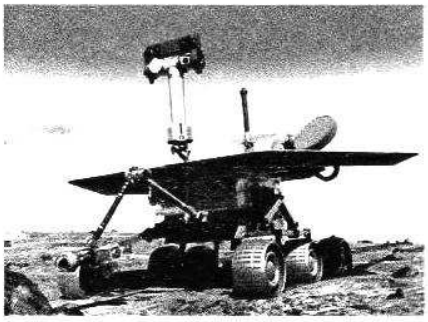
K.B.S.D.

Ken Bryant Scope Day is our once a year event that is a show and tell day basically. All members and family and friends are invited. On this day all members with Telescopes are encouraged to bring along and show of their Telescopes. Some members will give small talks. We will have a raffle and a prize for the best display. More details will follow in the next newsletter. This is to let you know dates and some details so you can make it a priority date on your calendar. KBSD is named after one of our dearly remembered member Ken Bryant who was a passionate observer.
KBSD will be on March 20th starting at Noon and going into the night. BYO lunch, but dinner will be supplied, salads and sausages and chops. Or else, BYO. Please book with me if your going to have the dinner supplied by us.
Contact details are the same as for TLD's.

Regards Dave.

AstroNews

Mars Rovers Head for Exciting Landings in January



Artist's concept of Mars Exploration Rover

NASA's robotic Mars geologist, Spirit, embodying America's enthusiasm for exploration, must run a gruelling gantlet of challenges before it can start examining the red planet. Spirit's twin Mars Exploration Rover, Opportunity, also faces tough Martian challenges.

"The risk is real, but so is the potential reward of using these advanced rovers to improve our understanding of how planets work," said Dr. Ed Weiler, associate administrator for space science at NASA Headquarters, Washington, D.C.

Spirit is the first of two golf-cart-sized rovers headed for Mars landings in January. The rovers will seek evidence about whether the environment in two regions might once have been capable of supporting life. Engineers at NASA's Jet Propulsion Laboratory, Pasadena, Calif., have navigated Spirit to arrive during the evening of Jan. 3, 2004, in the Eastern time zone.

Spirit will land near the center of Gusev Crater, which may have once held a lake. Three weeks later, Opportunity will reach the Meridiani Planum, a region containing exposed deposits of a mineral that usually forms under watery conditions.

"We've cleared two of the big hurdles, building both spacecraft and launching them," said JPL's Peter Theisinger, project manager for the Mars Exploration Rover Project. "Now we're coming up on a third, getting them safely onto the ground."

Since their launches on June 10 and July 7 respectively, each rover has been flying tucked inside a folded-up lander. The lander is wrapped in deflated airbags, cocooned within a protective aeroshell and attached to a cruise stage that provides solar panels, antennas and steering for the approximately seven month journey.

Spirit will cast off its cruise stage 15 minutes before hitting the top of the Martian atmosphere at 5,400 meters per second. Atmospheric friction during the next four minutes will heat part of the aeroshell to about 1,400 C and slow the descent to about 430 meters per second. Less than two minutes before landing, the spacecraft will open its parachute.

Twenty seconds later, it will jettison the bottom half of its aeroshell, exposing the lander. The top half of the shell, still riding the parachute,

will lower the lander on a tether. In the final six seconds, airbags will inflate, retro rockets on the upper shell will fire, and the tether will be cut about 15 metres above the ground.

Several bounces and rolls could take the airbag-cushioned lander about a kilometre from where it initially lands. If any of the initial few bounces hits a big rock that's too sharp, or if the spacecraft doesn't complete each task at just the right point during the descent, the mission could be over. More than half of all the missions launched to Mars have failed.

JPL Director Dr. Charles Elachi said, "We have done everything we know that could be humanly done to ensure success. We have conducted more testing and external reviews for the Mars Exploration Rovers than for any previous interplanetary mission."

Landing safely is the first step for three months of Mars exploration by each rover. Before rolling off its lander, each rover will spend a week or more unfolding itself, rising to full height, and scanning surroundings. Spirit and Opportunity each weigh about 17 times as much as the Sojourner rover of the 1997 Mars Pathfinder mission. They are big enough to roll right over obstacles nearly as tall as Sojourner.

"Think of Spirit and Opportunity as robotic field geologists," said Dr. Steve Squyres of Cornell University, Ithaca, N.Y., principal investigator for the rovers' identical sets of science instruments. "They look around with a stereo, color camera and with an infrared instrument that can classify rock types from a distance. They go to the rocks that seem most interesting. When they get to one, they reach out with a robotic arm that has a handful of tools, a microscope, two instruments for identifying what the rock is made of, and a grinder for getting to a fresh, unweathered surface inside the rock."

JPL, a division of the California Institute of Technology in Pasadena, manages the Mars Exploration Rover project for NASA's Office of Space Science, Washington. For information about the Mars Exploration Rover project on the Internet, visit http://mars.jpl.nasa.gov/mer . For Cornell University's Web site about the science payload, visit http://athena.cornell.edu

Editors note:
At the time of printing, no contact had been made with the European Mars lander, Beagle 2, which supposedly landed on Mars on Christmas Day.

Cracks in Earth's Magnetic Shield

Dec. 3, 2003: Earth is surrounded by a magnetic force field--a bubble in space called the magnetosphere, tens of thousands of miles wide. Although many people don't know it exists, the magnetosphere is familiar. It's a far-flung part of the same planetary magnetic field that deflects compass needles here on Earth's surface. And it's important. The magnetosphere acts as a shield that protects us from solar storms.

According to new observations, however, from NASA's IMAGE spacecraft and the joint NASA/European Space Agency Cluster satellites, immense cracks sometimes develop in Earth's magnetosphere and remain open for hours. This allows the solar wind to gush through and power stormy space weather.

"We've discovered that our magnetic shield is draughty, like a house with a window stuck open during a storm," says Harald Frey of the University of California, Berkeley, lead author of a paper on this research published Dec. 4 in Nature. "The house deflects most of the storm, but the couch is ruined. Similarly, our magnetic shield takes the brunt of space storms, but some energy slips through its cracks, sometimes enough to cause problems with satellites, radio communication, and power systems."

"The new knowledge that the cracks are open for long periods can be incorporated into our space weather forecasting computer models to more accurately predict how our space weather is influenced by violent events on the Sun," adds Tai Phan, also of UC Berkeley, co-author of the Nature paper.

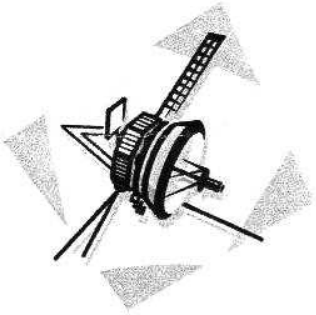
The solar wind is a fast-moving stream of electrically charged particles (electrons and ions) blown constantly from the Sun. The wind can get gusty during violent solar events, like coronal mass ejections (CMEs), which can shoot a billion tons of electrified gas into space at millions of miles per hour.

Fortunately, these cracks don't expose Earth's surface to the solar wind. Our atmosphere protects us, even when our magnetic field doesn't. The effects of solar storms are felt mainly in the high upper atmosphere and the region of space around Earth where satellites orbit.

Big Questions

HAS VOYAGER 1 FOUND THE EDGE OF THE SOLAR SYSTEM?

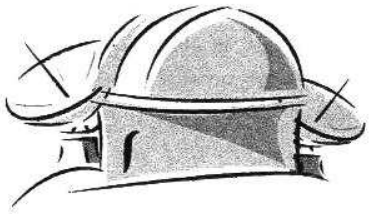
The furthest manmade thing, the Voyager 1 spacecraft, has recently detected a change in its local environment in the form of a greatly enhanced density of energetic particles.



This is the first evidence that Voyager has finally begun to encounter at a distance of 85 astronomical units or 85 times the Earth-Sun distance our solar system's "termination shock," the region of space where the outward going river of solar particles flags from supersonic to subsonic speeds in its confrontation with the interstellar medium. One would expect the shock front to be a good accelerator of particles, and the observed upswing in fast particles is suggestive.

Voyager 1 and its twin, Voyager 2 (some 20 AU behind in the effort to leave the solar system) were launched way back in 1977. The detection of this change in particle density may represent Voyagers transition from the Solar system into true interstellar space and mankind's transition into a space-faring species.

CAN WE DIRECT IMAGE EXTRASOLAR PLANETS?



Direct imaging of extrasolar planets might be easier than astronomers initially thought. Evidence for the existence of planets around nearby stars comes mostly in the form of tiny Doppler shifts in the star's spectra as one or more orbiting planets tug on the star. In a few cases the transit of a planet across the face of a star can be detected from a minute dimming of the star's emission. These approaches are indirect. The problem of imaging extrasolar planets directly is that the planet is far outshone by the nearby star. One proposed way of getting around this glare problem is to use nulling interferometry. In ordinary interferometry the light waves from two or more telescopes are added together in such a way that the resulting observation is equivalent to one made with a single telescope with a much wider diameter than any of the component scopes. But instead of maximizing the composite signal from the distant object, the telescope components can be adjusted to minimise it. When the composite signal is minimised a weaker nearby object, like a planet, might suddenly emerge from what had been irrepressible glare. Scientists from the Goddard Space Flight Centre have performed extensive studies of the interferometry nulling technique, especially the way in which increasing the precision of component detectors increases the degree to which the star's image is truly nulled, the better to see either smaller planets or planets that are closer in toward their parent star. Both the smaller and closer criteria are pertinent when searching for earth-like extrasolar planets. This new study shows that with the right configuration of detectors, the spatial resolution of the overall interferometer (which is related to its size) can be less than have been thought, an important consideration for what would be an orbiting space-based observatory. It is envisioned that a first-round nulling interferometer using two half-meter-sized telescopes separated by a 12-meter boom could observe already discovered extrasolar planets (including spectroscopic studies of atmospheres). With a later, larger version of the nulling interferometer one could hope to search for earth-like planets harbouring characteristic molecules such as ozone, and/or oxygen, plus carbon dioxide, water, and methane. Detecting these molecules could help determine the age of the planet and what life processes might be occurring there.

IS THE SUN MORE ACTIVE TODAY?

Evidence for an unusually active Sun since the 1940s comes from a new estimation of sunspots back to the ninth century. Many natural phenomena such as solar radiance and sunspots vary according to natural cycles. The variation is subject also to additional fluctuations (arising from as yet unexplained effects), which complicates any study that examines only a short time interval. The longer the baseline, the more confident one can be in drawing out historical conclusions. In the case of sunspots, the direct counting goes back to Galileo's time, around 1610. But earlier sunspot activity can be deduced from beryllium-10 traces in Greenland and Antarctic ice cores. The reasoning is as follows: more sunspots imply a more magnetically active sun which then more effectively repels the galactic cosmic rays, thus reducing

the Earth's atmosphere. Be-10 atoms precipitate on Earth and can be traced in polar ice even after centuries. Using this approach, scientists in Finland and the Max Planck Institute in Germany have reconstructed the sunspot count back to the year 850, nearly tripling the baseline for sunspot studies. They conclude that over the whole 1150-year record available, the sun has been most magnetically active (greatest number of sunspots) over the recent 60 years.

UNIVERSAL CONSTANTS TIED DOWN

A map of the universe produced by the Sloan Digital Sky Survey contains 200,000 galaxies at distances of up to two billion light years, and spread out across 2400 square degrees of sky. According to Sloan astronomers this is "the best three-dimensional map of the universe to date." The Sloan effort uses an automated telescope in New Mexico optimised to record spectra from many galaxies at the same time. One of the standout features of the map is the Sloan Great Wall of galaxies, some 1.37 billion light years long and the "largest observed structure in the universe". Combined with data from other telescopes, such as the Wilkinson Microwave Anisotropy Probe (WMAP), the new Sloan observations help tamp down uncertainties in several pivotal astronomical numbers. The new best value for the Hubble constant is 0.70 with an uncertainty of about 0.04; the amount of energy in the universe vested in matter is 30% with an uncertainty of 4%; the upper limit on neutrino mass is 0.6 eV; and the age of the universe is 14.1 billion years with an uncertainty of 1 billion.

DARK ENERGY COSMOLOGICAL THEORY

Cosmology theories come and go as new information becomes available. The geometry and nature of the universe must be one of the most fascinating questions for the human species. Early Egyptians thought the universe was a rectangular box. Alexandrian Greeks pictured the cosmos as a set of concentric crystalline spheres, a view adopted by the medieval Catholic Church, which executed Giordano Bruno for holding that the universe was infinite in extent. In the 20th century Hubble's surveys of receding galaxies supports the idea of an expanding space-time scaffolding. This model, now called the big bang, is generally the accepted overarching theory, but it has been amended several times to include an early "inflationary" phase and, more recently, the existence of dark energy, an entity or mechanism which apparently allows the expansion of the universe visible to our telescopes to be speeding up, and not slowing down. Also not slowing down is the list of new cosmological ideas. Last year's entrant was the "ekpyrotic" model according to which our universe and all the energy and matter residing therein arises from the collision of two immense membranes embedded in an even larger multi-dimensional volume. This interesting new cosmological development suggests the universe is finite and has a dodecahedral, (soccer ball) geometry. Recent Hubble Space Telescope observations of very distant (8 to 10 billion light years away) and unusually bright supernovas, accords with this dark energy model which holds that the general expansion of the universe was relatively slow 10 billion years ago and afterwards got much faster, owing to the propulsive effects of the dark energy winning out over the attractive and slowing effects of gravity.

LISA COMPONENT PRE-TESTING ON TRACK.

The laser interferometry space antenna (LISA) is not due for launch until 2012 but tests of components are of course going forward now. LISA will search for gravity waves passing the sun's vicinity by watching how the distance between two test masses changes. A gravity wave can be thought of as a travelling disturbance in space-time itself; such a wave would temporarily shorten and then lengthen the path between the test masses. In this case the test masses would be 5 million km apart, an interval that would be monitored every instant by the interference of laser beams travelling back and forth between the masses. Actually three pairs of test masses would be mounted on three far-flung satellites, spread out in space in an equilateral triangle where each leg is 5 million km long, with all three craft in independent orbit around the sun. While the space-borne LISA would look for waves with very low frequencies (.001-.1 Hz), the earthbound detector LIGO would search for gravity waves in a higher frequency range (100-1000 Hz). As an interim step toward deploying LISA, the European Space Agency (ESA) plans to launch in 2007 its Pathfinder mission, a craft serving as a miniature version of LISA, two free-floating test masses 35 cm apart (small thruster rockets will be used to reposition the spacecraft so its sides do not come in contact with the test masses), will be tried out. The test, watching that the masses move along in parallel trajectories, is not unlike the famous (or apocryphal) experiment conducted by Galileo Galilei to affirm that two objects, one light and one heavy, would fall at the same rate from the Leaning Tower of Pisa. And to perform the test in 2007 some terrestrial tests have now been carried out in 2003. Basically, scientists at the Universita' di Trento (Italy) are attempting to understand all the

attempting to understand all the possible forces, in addition to gravity, that could influence the motion of the test mass. In an ideal experiment, the test mass (2 kg or, in units of weight, about 20 newtons) would be hung from a thin wire and surrounded by all the apparatus that will accompany it into space, including the motion sensor needed to reorient the spacecraft, and all extraneous forces on the mass, down to a precision of a femto-newton (10^-15 newtons) would have to be accounted for if the desired levels of precision needed for LISA were to be achieved. Such precision is not possible with ground-based detectors, so the experimenters used not the full test mass, but a hollow facsimile. At this early stage in understanding, the Trento physicists found a satisfactorily "quiet" force environment, but there are still a fact of 10 away from the precision needed for Pathfinder and a factor of 100 away from the precision needed for LISA.

FIRST LIGO GRAVITY WAVE SEARCH RESULTS COME IN

With two completely independent detectors located in Washington State and Louisiana, the Laser Interferometer Gravitational-Wave Observatory (LIGO) is essentially a giant strain gauge. In the LIGO set-up laser light reflects repeatedly along each of two perpendicularly oriented 4-km-long pipes. A passing gravity wave will distort the local space-time, stretching very slightly one of the paths while shrinking the other, causing the interference pattern of the two merging laser light beams to shift in a characteristic way. LIGO does not measure static gravitational fields, such as those from the Sun or the Earth itself. Rather it strives to see ripples in space-time radiated by such events as the in-spiral of two neutron stars toward each other, a phenomenon which would typically produce a strain in the LIGO apparatus as large as one part in 10^{20}. That is, a passing gravity wave is expected to change the distance between mirrors some 4 km apart by about 10^{-18} meters, a displacement 1000 times smaller than a proton. Such a measurement represents a physics and engineering feat of extraordinary delicacy. But at long last the LIGO team has prepared its instrument and recently reported its first official results from the initial "science" run conducted over 17 days in September 2002. In this first run no gravitational wave events were observed, but palpable knowledge was gained as to what the sky should look like when viewed in the form of gravity waves. So great is LIGO's sensitivity that it has been able to set the best upper limit on the output of gravitational waves from three of the four prime source categories. These four expected waveforms are as follows: bursts from sources such as supernovas or gamma bursters; chirps from in-spiralling objects such as coalescing binary stars; periodic signals, perhaps from sources like spherically asymmetric pulsars; and a stochastic background source arising from gravity waves originating from the big bang itself. These initial observations set new upper limits on the rate at which gravitational waves were being produced. In the coalescing binary category, for instance, LIGO has established an upper limit of 164 per year from the Milky Way, a factor of 26 better than the previous limit. The second scientific run currently underway will be some ten times more sensitive than the first run. If in the first science run LIGO was essentially sensitive to gravity waves from the whole of the Milky Way, then in the second science run (conducted Feb-Apr 2003), featuring a ten-times improvement in sensitivity, the region of space patrolled would effectively reach out to about 15 million light years, a realm that includes the nearby Andromeda galaxy.

Astronomy 2004

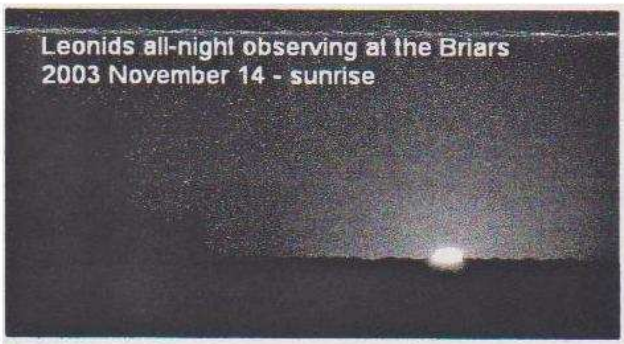
The excellent annual Australian publication, Astronomy 2004, is still available. The book shows what's in the night sky throughout 2004, and is aimed at all levels of amateur astronomer, from newcomer to expert. RRP is $22 to the public, though society members can get it at the discounted rate of $20. Orders and payments can be made in person at any Society gathering, by cheque to P.O. Box 596, Frankston 3199, or by phone by leaving a message on 0419 253 252. As usual, proceeds from the sales go directly towards improving the content of your library by purchasing new books, videos, CD ROMs etc. If you have any requests for library titles, please pass them to any committee member by January. These sky almanacs will be available at any society gathering (i.e. meetings, viewing nights, school nights etc.). The society only orders in a specific quantity each year, and it's first come, first served.

From the Question Box:

Q: Do carrots improve your eyesight?

A: There is some truth to this claim, often used to coax children into eating them. Carrots are high in Vitamin A, and a deficiency in this vitamin can reduce a person's ability to see in low light. If your intake of Vitamin A is adequate, taking more will not improve your eyesight, in fact, too much is dangerous as it can produce permanent bone and skin abnormalities.

If you have something you'd like published in Scorpius, e-mail it either in a document file or as part of an email to: rlpollard@iprimus.com.au Or post it to **9 Genista Rd, Cranbourne 3977.** Thanks, Richard Pollard (Editor)



Left - Solar Day on 28th February 2004

Photo - *By John Cleverdon*

Above - Telescope Learning Day at the ASF Briars site on 25th January 2004

Both Photos - *By John Cleverdon*

Kindly reproduced by Jane McConnell and collated/posted by Mary Westaway

Mornington Peninsula Astronomical Society Inc. CALENDAR 2004

P is Public Holiday ● New Moon ○ Full Moon

	January	February	March	April	May	June	July	August	September	October	November	December	
1	Th Saturn Oppn	Su Working Bee	M Scorpius deadline	Th	S Scorpius deadline	T	Th Scorpius deadline	Su Working Bee ○	W Scorpius deadline	F Public Night	M Scorpius deadline	W	1
2	F Public Night	M	T	F Public Night	Su	W	F Public Nt ○	M	Th	S	T P	Th	2
3	S Scorp d line	T	W	S Working Bee	M	Th ○	S	T	F Public Night	Su Working Bee	W	F Public Night	3
4	Su	W	Th Jupiter Opposition	Su	T	F Public Night	Su	W	S Lunar Night	M	Th	S	4
5	M	Th	F Public Night	M ○	W Lunar Ecl ○ eta Aquarids Peak	S	M	Th	Su Fathers Day	T	F Public Night	Su Working Bee	5
6	T	F Public Night ○	S	T	Th	Su Working Bee	T	F Public Night	M	W	S	M	6
7	W	S	Su ○	W	F Public Night	M	W	S	T	Th	Su	T	7
8	Th ○	Su	M P	Th	S	T Venus Transit	Th	Su	W	F	M	W	8
9	F Public Night	M	T	F NACAA P	Su Mothers Day	W	F	M	Th	S	T	Th	9
10	S	T	W	S NACAA	M	Th	S	T	F	Su	W Committee nom. close	F	10
11	Su	W	Th	Su NACAA	T	F	Su	W	S	M	Th	S Xmas BBQ	11
12	M	Th	F	M NACAA P	W	S	M	Th	Su	T	F	Su ●	12
13	T	F	S Members Nt	T	Th	Su	T	F	M	W	S ●	M	13
14	W General Meeting	S	Su	W	F	M P	W	S	T	Th ●	Su 'Astronomy 2005' available	T Geminids peak	14
15	Th	Su	M	Th	S Comet Night	T	Th	Su	W General Meeting ●	F	M	W	15
16	F Public Night	M	T	F	Su	W General Meeting	F ●	M ●	Th	S	T	Th	16
17	S SUBS DUE	T	W General Meeting	S	M	Th	S ●	T	F	Su	W Annual Gen. Meeting	F	17
18	Su	W General Meeting	Th	Su ●	T ●	F ●	Su	W General Meeting	S	M	Th Leonids Meteor Shower	S	18
19	M	Th	F Sth Pacific Equinox	M	W General Meeting ●	S	M	Th	Su	T	F	Su	19
20	T	F ●	S KB Scope Day ●	T	Th	Su	T	F	M	W General Meeting	S	M	20
21	W Comm Mtg	S	Su Star Party	W General Meeting	F Comet Night	M Solstice	W General Meeting		T	Th Orionids peak	Su	T Solstice	21
22	Th	Su Solar Day ●	M	Th	S Messier Night	T	Th	Su	W Comm Meeting	F	M	W	22
23	F Public Night	M	T	F	Su	W Committee Meeting	F	M	Th Equinox	S	T	Th	23
24	S	T	W Committee Meeting	S Tel L'ng Day Lunar Night	M	Th	S	T	F	Su	W Committee Meeting	F	24
25	Su Tel L'ng Day	W Committee Meeting	Th	Su P	T	F	Su	W Committee Meeting	S	M	Th	S P	25
26	M P	Th	F	M	W Committee Meeting	S	M	Th	Su	T	F	Su P	26
27	T	F	S	T	Th	Su	T	F	M	W Committee Meeting	S ○	M ○	27
28	W	S	Su End of DST	W Comm Meeting	F	M	W Committee Meeting	S	T ○	Th Murchison ○ Met. Anniv.	Su	T	28
29	Th	Su	M	Th	S	T	Th S delta Aquarids peak	Su	W	F	M	W	29
30	F		T	F	Su	W	F	M ○	Th	S	T	Th	30
31	S Members Nt		W		M		S	T		Su Start of DST		F	31
	January	February	March	April	May	June	July	August	September	October	November	December	

General Meetings are held at 8 pm at the Peninsula School, Wooralla Dr, Mt Eliza - *Melway 105 F5 (drive to Senior School at rear)*
Library at Peninsula School is open on General Meeting nights for borrowing by members.
All nights especially Members, Special nights, any Fri & Sat, are for sky viewing at *'The Briars'* Nepean Hwy Mt Martha - *Melway 145 F12, and new attendees may call phone 0419 253 252 for guidance.*
Telescope Learning Days, at *'The Briars'*, normally begin at 3 pm
Working Bees are held at *'The Briars'* (see above) normally commencing at 11 am .

State School Holidays

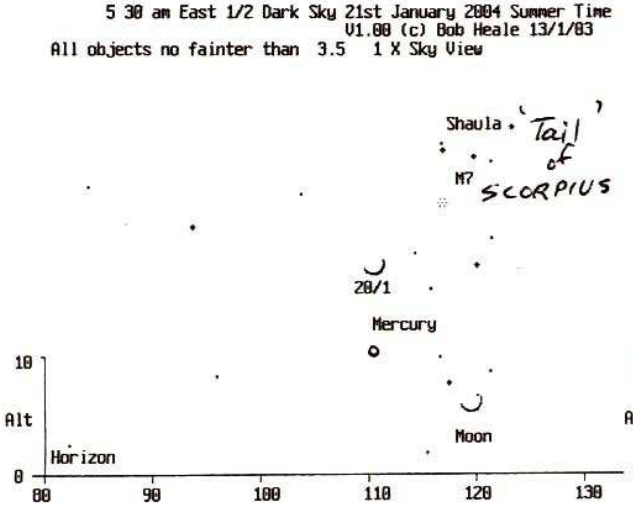
Public Nights for sky viewing are held at 'The Briars' Visitors Centre (Melway 145 F12) at 8 pm all year. Booking is preferred, but not essential.
For bookings and enquiries , phone 0419 253 252

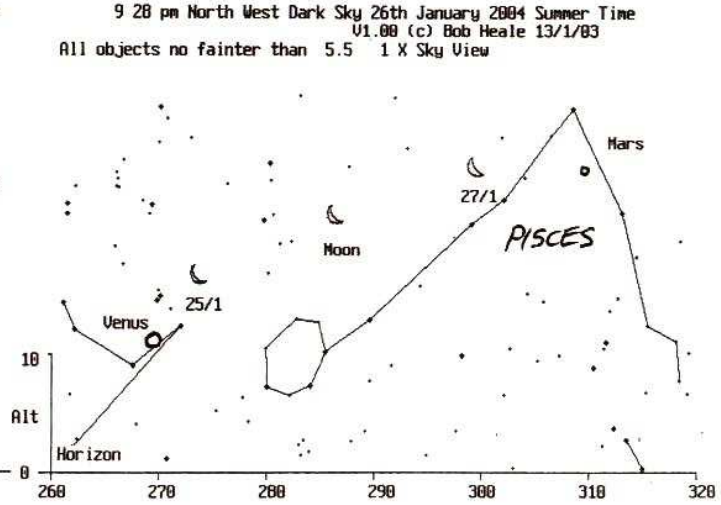
Second Draft

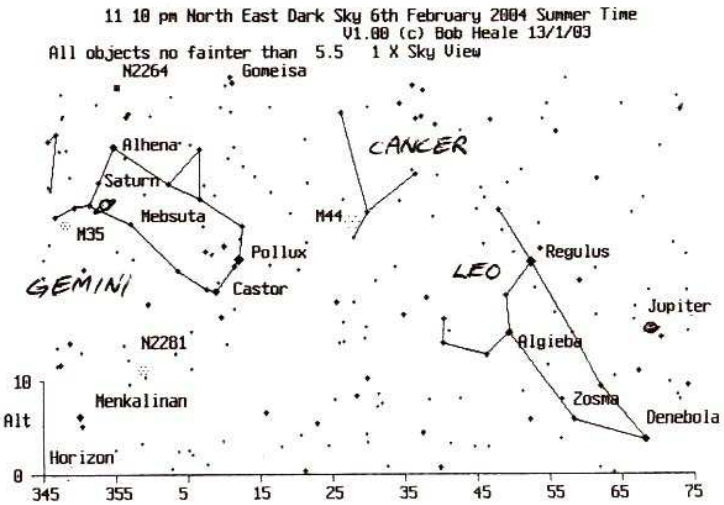
Prepared by Ian Sullivan

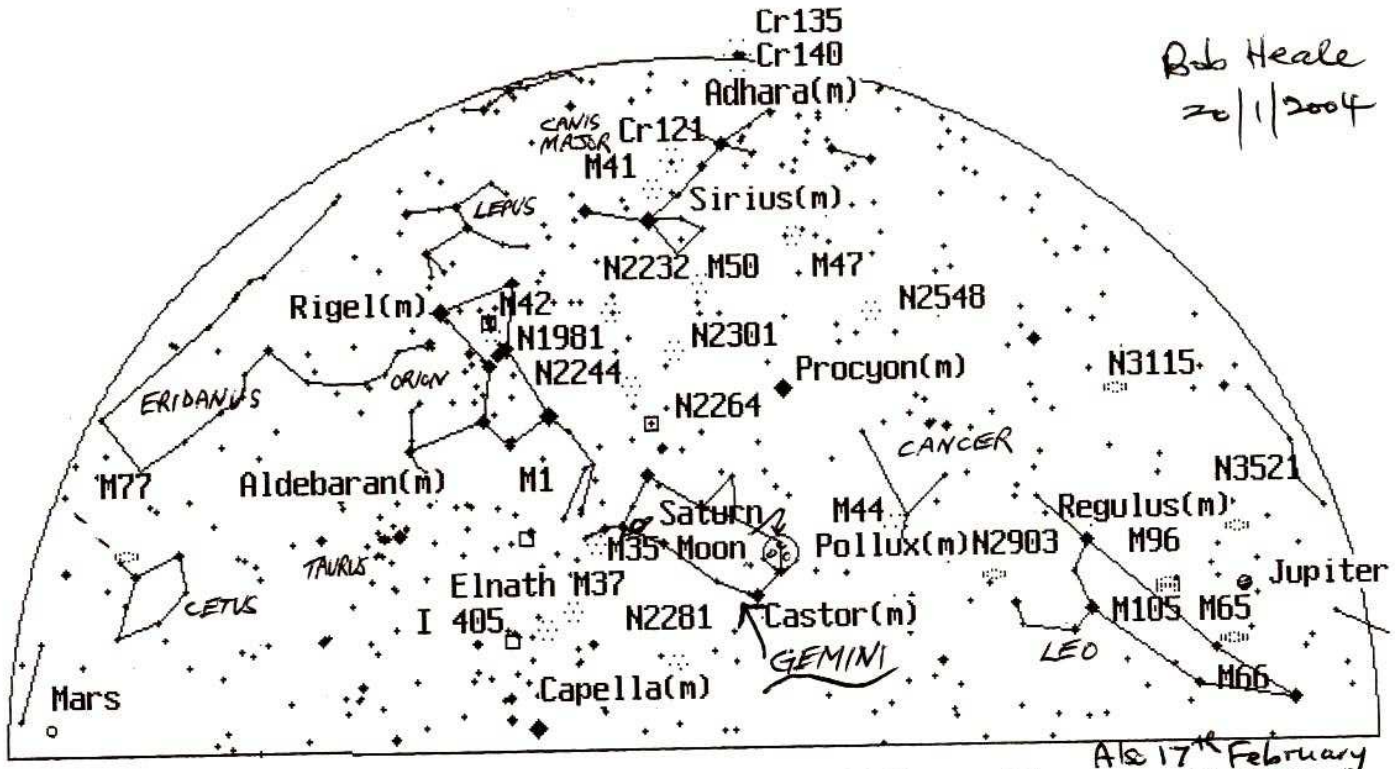
Mornington Peninsula Astronomical Society

SKY FOR THE MONTH 21ST JANUARY TO 17TH FEBRUARY 2004 MORNINGTON PENINSULA



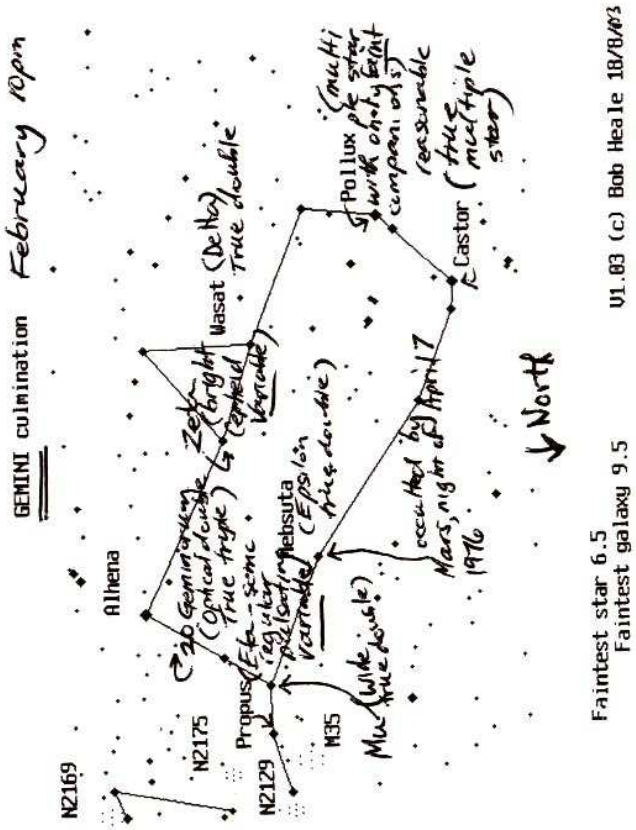






11 20 pm 4th February North Dark Sky 2004 Summer Time

Also 12 20 am 21st January Not Moon or planets



Mornington Peninsula Astronomical Society

Castor (Alpha Geminorum) is one of the brightest 'double star' which is a triple-double which was closing towards 1969, now widening to 7" around 2085, but primary A is mag 1.9, B is 2.9 so very bright so poor seeing turns them into a blurr (Bob's computer does not) Also has a wide 7" C at mag 9.2 – there's the triple and each A, B and C is a spectroscopic binary (2 stars indicated on the spectrum) so a triple-double or T-D indicating DT (double trouble

Pollux (Beta Geminorum) – a pox on this one as well its companions are faint and wide except for one, and I had to walk hard to construct this. A true multiple with at least 5 faint components

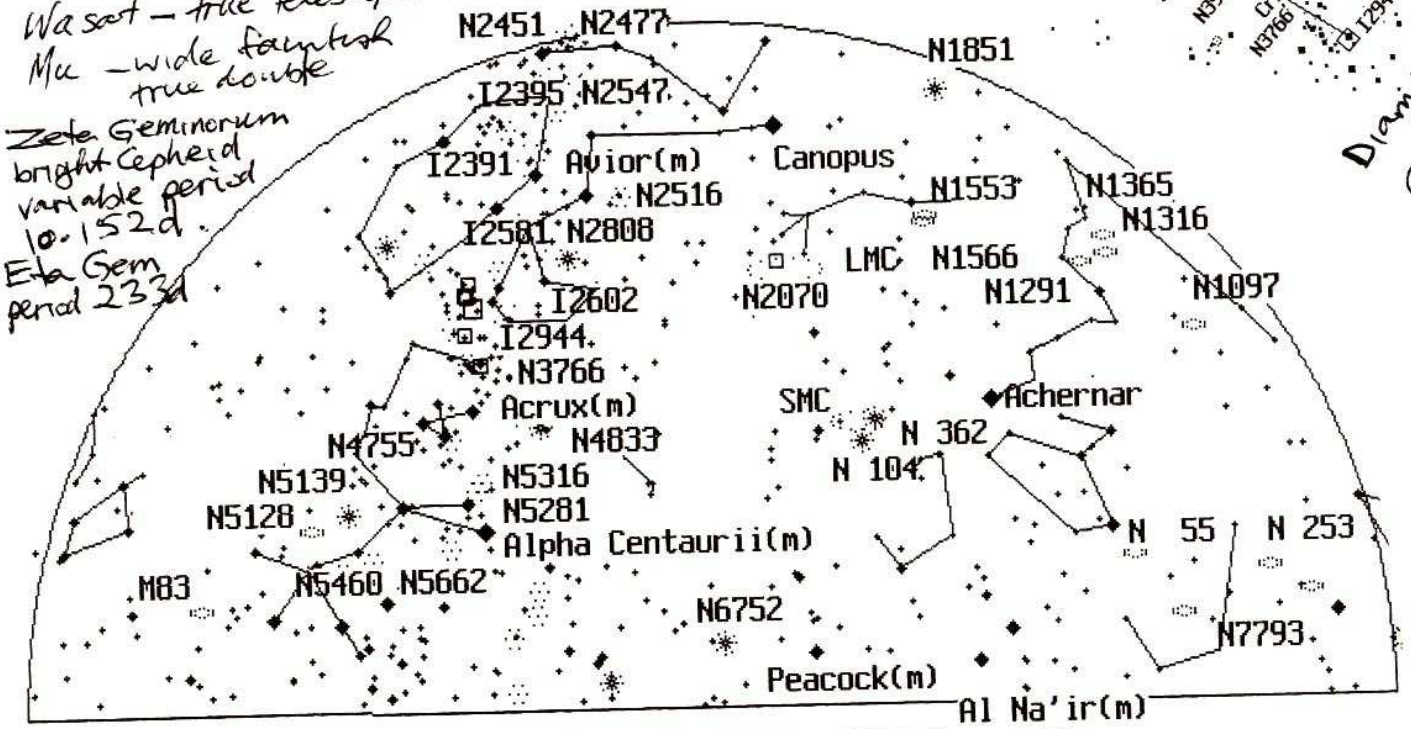
20 Geminorum sort of pretty easy optical double with fainter true third making it also a true double as well – OOOOhh!

Was sort – true telescope double mags 3-5/8 6" 220°

Mu – wide faintish true double

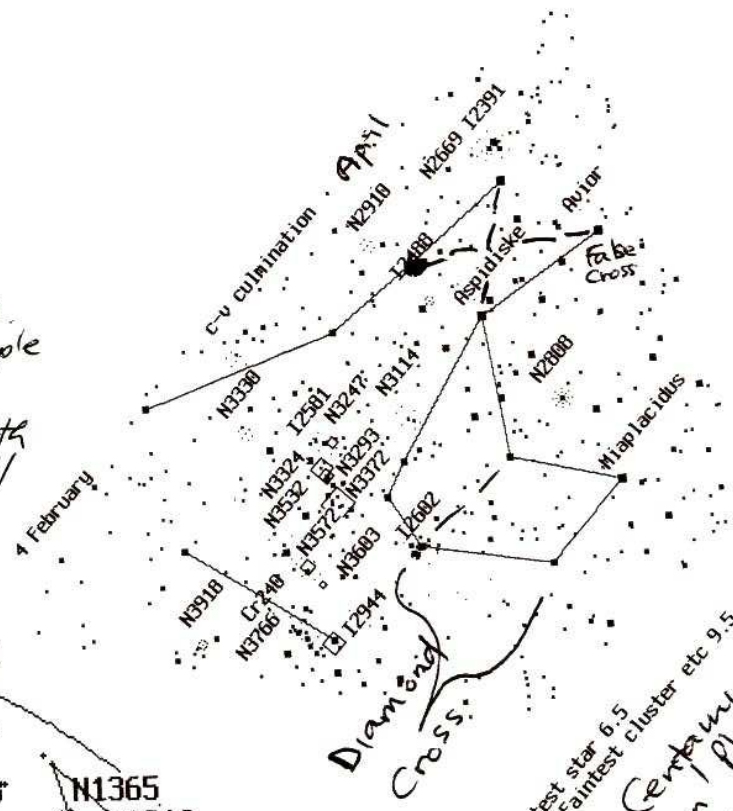
Zeta Geminorum bright Cepheid variable period 10.152d.

Eta Gem period 233d



11 20 pm 4th February South Night Sky 2004 Summer Time

Also 21st January 12 20am, 17th February 10 20pm (not Moon or planets)



Faintest star 6.5
SS 01 Faintest cluster etc 9.5

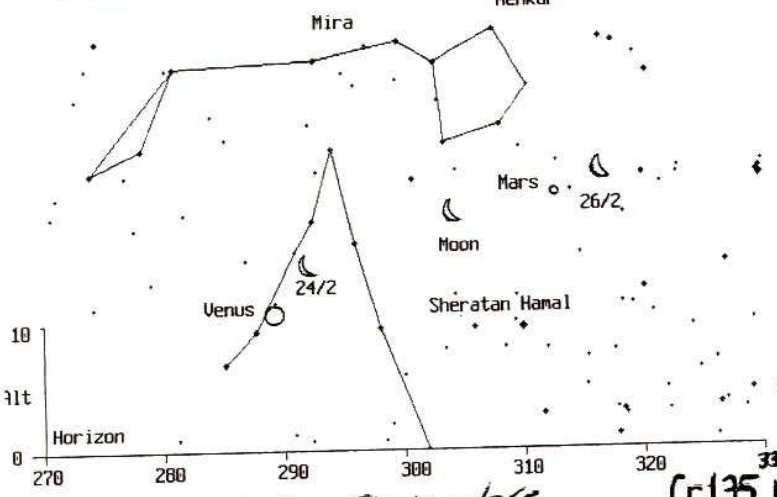
N3766 lambda Centaurus wide c/uster
I2602 Southern Pleiades complex
N3372 Eta Carinae
N3918 cute planetary and bright!

Bob Heale
20/1/2004

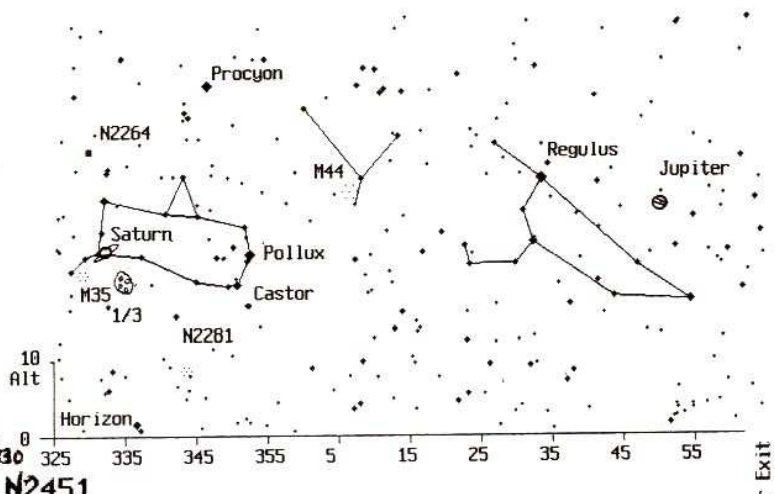
Mornington Peninsula Astronomical Society

SKY FOR THE MONTH 18 FEBRUARY TO 16 MARCH MORNINGTON PENINSULA 2004

7 50 pm North-West 1/2 Dark Sky 25th February 2004 Summer Time
V1.00 (c) Bob Heale 13/1/03
All objects no fainter than 5.5 1 X Sky View



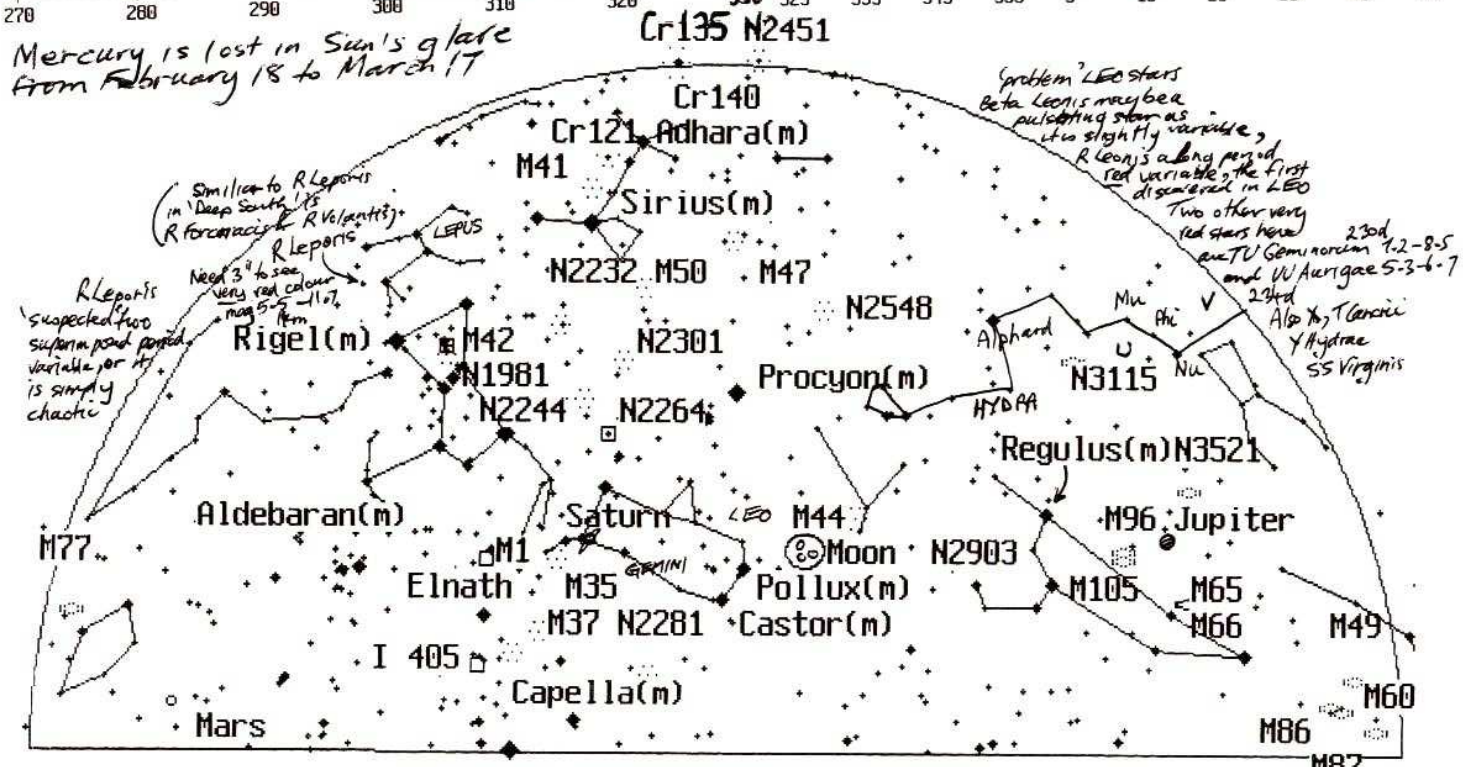
11 00 pm North Dark Sky 29th February 2004 Summer Time
V1.00 (c) Bob Heale 13/1/03
All objects no fainter than 5.5 1 X Sky View



See over for a chart and notes on U and V Hydrae two red carbon stars

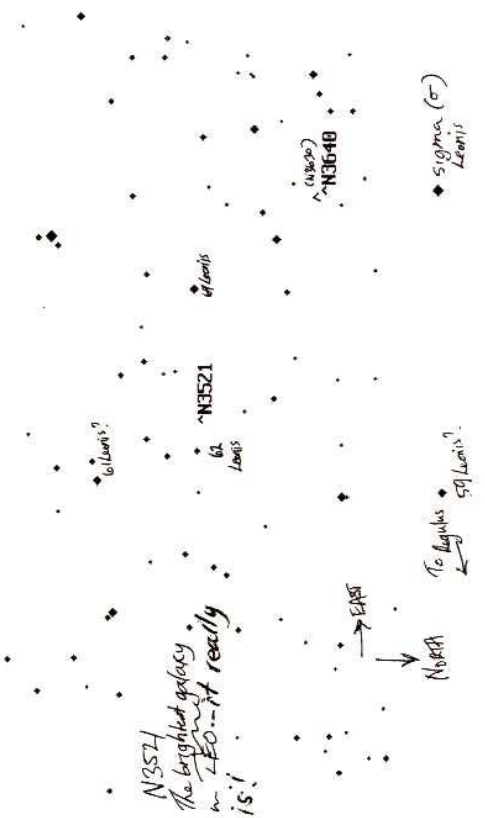
17/2/2004 Bob Heale ASF

Mercury is lost in Sun's glare from February 18 to March 17

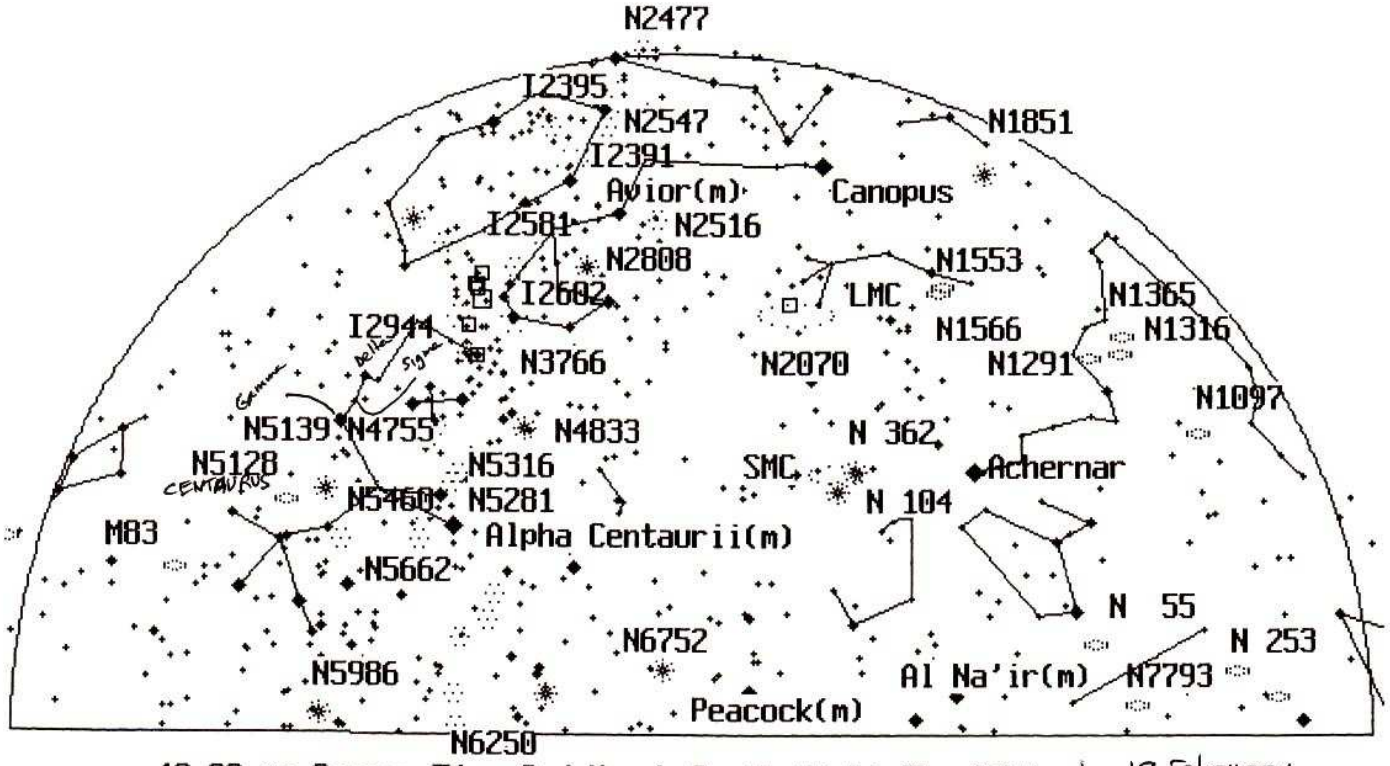


10 03 pm Summer Time 3rd March North Dark Sky 2004, also 18 February 11.03pm and 9.03pm 16 March Summer Times – not Moon or planets

Binocs or Scope (B) or Change Sky (T) or Graphic Screen Mode Change (M) or Exit Program (E)



Mornington Peninsula Astronomical Society



10 03 pm Summer Time 3rd March South Night Sky 2004, also 18 February

11 03 pm and 9 03 pm 16 March Summer Times