



SCORPIUS

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Astronomical Society of Frankston Inc.

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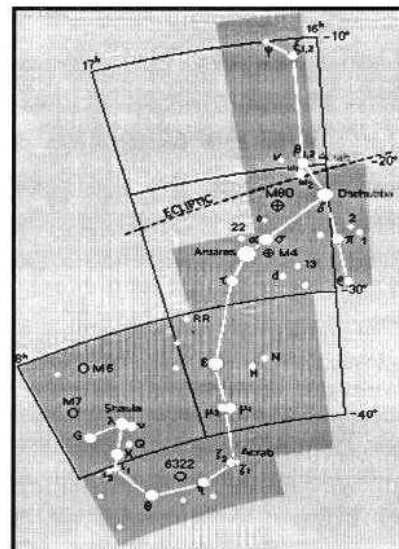
The Astronomical Society of Frankston was founded in 1969 with the aim of fostering the study of Astronomy by amateurs and promoting the hobby of amateur Astronomy to the general public. The Society holds a General Meeting each month for the exchange of ideas and information. Regular observing nights, 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.

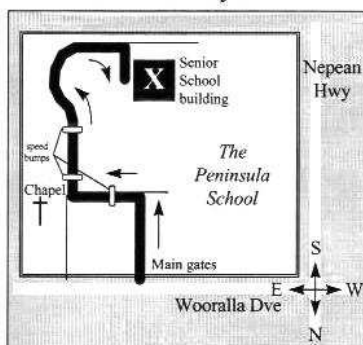
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E-mail: skywatch@iprimus.com.au



Visitors are always welcome!



Annual Membership

Full Member	\$50
Pensioner	\$45
Student	\$35
Family	\$65
Family Pensioners	\$60
Newsletter Only	\$22
Organisation	\$70

Due 1st Jan Each Year

President

Peter Lowe 0419 355 819

Vice President

Ian Sullivan

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Secretary

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Editor

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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:

WED 17 Mar 2004 at the Peninsula School.

Session 1: Speaker: Peter Lowe - "The Earth's Upper Atmosphere"

Session 2: Video: Galileo's battle for the heavens Part 2.

Session 3: Open Forum and Sky for the Month.

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 12th/SAT 13th, FRI 19th/SAT 20th,
FRI 26th/SAT 27th March,

FRI 9th/SAT 10th, FRI 16th/SAT 17th,
FRI 23rd/SAT 24th April, 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.**

* Remember the Society's 8 inch telescope, 80mm refractor, and binoculars are available for loan to financial members. Contact David Girling on (0408) 364 754, or speak to him at a Society function, to arrange the loan of the equipment.

Public, School & Community Groups Viewing/slide nights:

TUE Mar 9th - Camp Manyung for Campbell Grammar. Starting time

is 8pm. Around 50 expected, 4 telescopes are required.

MON Mar 29th - Mt Eliza Secondary College. Starting time is 8pm. Around 45 VCE students expected, 3 telescopes are required.

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*.

The next nights are **FRIDAY 5th March and FRIDAY 2nd April**, all at 8pm. Assistants are required. New members are welcome to watch and participate if desired.

Welcome to the following new Society member(s):

David Parsons

Current number of members is 198.

New members are reminded that their nametags are ready to be picked up from Terry Ryan at General Meetings!

Long term popular members **Bruce Tregaskis** and **Roger Chandler** have recently spent a spell off their feet in hospital. We wish them well for a speedy recovery back to observing.

**Ken Bryant Scope Day
The Briars. SAT March 27th.**

KBSD for this year as I presented before is on March 27. This day is our premier Telescope day so all members are encouraged to come along and show their telescopes off.

KBSD starts at 12:00 noon and goes into the night if people want to stay that long. The day is really there for people to see the different telescopes used in our society.

A raffle will be on this day at two dollars a ticket, now I'm not going to tell you the prize but come along and enjoy the day, buy a ticket and if you do win I'm sure you will like the prize!

Prizes will be given to the best three displays. Also, members will give short talks and helpful hints. The day will include a BYO lunch. Tea and coffee will be on all day. We can supply dinner for those who want to stay and have a BBQ. So please book with myself or Rhonda Swaosz at the next meeting or by e mailing me at dave47tuc@bigpond.com We need to know food numbers by March 22. I look forward to everyone coming along and enjoying what hopes to be a great day.

Remember the KBSD will be cancelled if raining but will go ahead if only cloudy. Please ring me on my mobile 0408364754 by 11am on the day if unsure.

Regards.
Dave.G.

Social Events

Sally Zetter has been busy



organising events of a social nature for 2004, the first being the Dava

Dinner on Friday March 19 at the Dava Hotel, the Esplanade, Mount Martha, from 6:30pm. RSVP to Sally Zetter 59762679 or 0419342148 by Wednesday 15th March.

Also on the horizon are a bowling night, complete with trophy as well as other informal get-togethers. If you have any ideas yourself, talk to Sally.

Meetings

The public viewing night at The Briars on January 2nd saw 42 people attend on a warm night. Richard Pollard delivered the talk and fielded many questions. The international space station made two passages overhead during the evening, and Saturn, Venus and Mars were on show to the assembled instruments, not to mention the gibbous Moon. Thanks to the telescope operators of Greg Walton, Ian Sullivan, Bob Heale and John Cleverdon, and for help in the field to Peter Lowe, Peter Skilton, Don Leggett, Sally Zetter and Mary Westaway. Due to an oversight by The Briars, we unfortunately did not appear on their annual summer programme advertising campaign. As a result, no additional public viewing nights were held during January as is our usual practice for assisting The Briars over the school holidays with extra activities.

The community viewing night at The Briars on February 6th saw 92 people attend, with bookings having filled and closed over a week earlier. Richard Pollard and Peter Lowe delivered two talks in sequence. An extremely bright iridium flash was seen later in the evening, and grand views were had by all of the many planets on offer during the evening, especially Saturn and Jupiter. Cloud cover prevented serious observing of the new comets and deep sky objects. Thanks to the telescope operators of Greg Walton, Bob Heale, Trevor Sweetman and Angela (with 6 megapixel Nikon camera photographing the Moon), John Cleverdon, Peter Skilton, and thanks in the field to Don Leggett, Louise Turnbull, George Dus, Andrew Thornton, Rhonda Sawosz, Bruce Tregaskis and possibly other unrecorded members in the crowd.

The January meeting of the Society was chaired by the new President, with 41 in attendance. The AGM Special Business, held

over from November last year, was transacted first, with apologies sent by Bruce Tregaskis. The motion to change the society name to be the Mornington Peninsula

Astronomical Society was voted upon by the assembled people and passed with 2 votes against. The motion to increase the membership fees was discussed and voted upon and passed with 1 absention and no votes against. Following the conclusion of the AGM, the general meeting commenced. David Girling presented a powerpoint show about the upcoming TLD and KBSD member days, followed by a quick walkthrough of the *Carte Du Ciel* free software from the internet. Marty Rudd then showed video footage from the internet of the recent NASA bounced landing of a rover on the surface of Mars. Following the tea break, the video on *The Day the Earth Nearly Died*, about the Permian extinction event, was played in the Library room, while in the main theatrette, Peter Lowe presented a show on why it's so difficult to land on Mars, focusing on the various reentry techniques possible (heat shield ablation, parachute, shock absorber, rocket or explosive deceleration). Peter Skilton then showed two video footages taken of the rare Mars grazing lunar occultation near Parkdale last year, and followed by reporting the known Aurora Australis sightings (with local photos) for the year 2003 in southern Australasia. Meeting closed 10:35pm.

The Telescope Learning Day held January 25 was a huge success. Around 15 attendees took part in cloudy but warmish weather, starting at 3pm.

A talk on observing Saturn and Jupiter was given by myself with enthusiastic comments and tips from members. We then proceeded to the upper observing slab to set up telescopes.

Many different telescopes were on show, with 3 Meade ETX's of all sizes from 90mm to 125mm, a Meade LXD55 10 inch and other scopes on hand of various sizes.

We had a BBQ and once twilight began skies cleared to a very nice night of observing.

So all had a great day and night and we look forward to your company at our next TLD on April 24 starting at 3p.m. Topics for April will be 'observing projects with your telescope.'

Cheers.
Dave G.

(see back page photo)

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.

These sky almanacs will be available at any society gathering (i.e. meetings, viewing nights, school nights etc.).

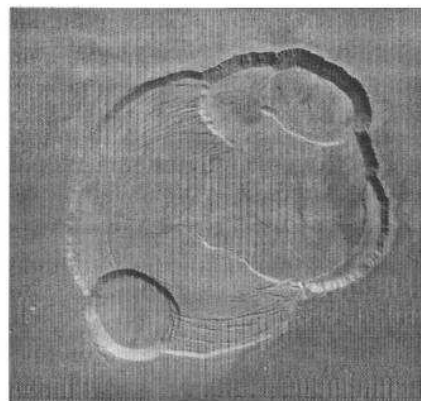
AstroNews

Mars Missions Status Report

In late 2003, four separate spacecraft were on route to Mars. Here's the latest on each one:

1. Mars Express Orbiter (ESA)

is currently functioning perfectly as an observational platform and a communications relay for the US MER missions. In conjunction with NASA's Mars Global Surveyor, Express is busy photographing and mapping of the Martian surface. Below is an image taken by Express of the caldera of Olympus Mons.



The fate of the Beagle 2 lander, which was part of the Mars Express Mission, remains a mystery, and several enquiries are underway to determine just what went wrong. No signal has been received from the lander since it supposedly touched down on Christmas Day.

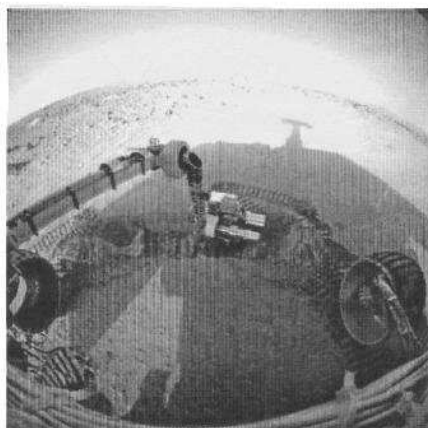
2. Mars Exploration Rover A (Spirit)

is over half way through it's predicted science mission as it sends back a torrent of information from it's landing site (named Columbia Memorial Station in honour of the lost shuttle crew) in Gusev Crater.

But there have been some hiccups along the way; several days of data were lost when the rover developed a problem with it's onboard flash memory (similar to the flash memory cards in all digital cameras). Seems the memory became clogged with data enroute to Mars and had to be reformatted from

Earth. That done, Spirit returned to perfect health and has covered some serious distance since.

When the rover reached the point called "Laguna Hollow," it had driven 131 metres from Columbia Memorial Station. The rover heading is 45 degrees to the northeast. Over the relatively flat traverse, Spirit has made observations of rocks such as "Adirondack" and utilized the tools on its arm to investigate soil in several locations. Spirit stayed at "Laguna Hollow" for 3 sols, dug a trench and observed the floor and wall of it with three of the instruments on its arm: the Moessbauer spectrometer, the alpha particle X-ray spectrometer and the microscopic imager. (See Below)

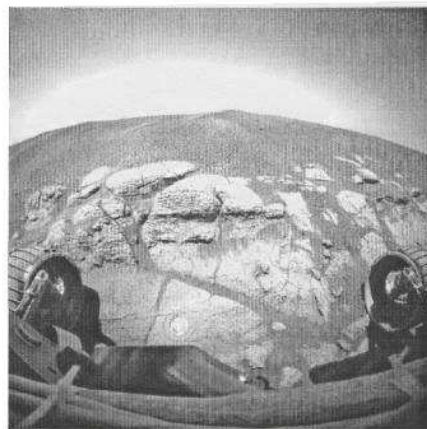


Spirit is about halfway to the edge of the crater dubbed "Bonneville." As of February 27, Spirit was about to drill a hole in a large rock called 'Humphrey'.

3. Mars Exploration Rover B (Opportunity) has also been busy on the opposite side of Mars to Spirit, at Meridiani Planum.

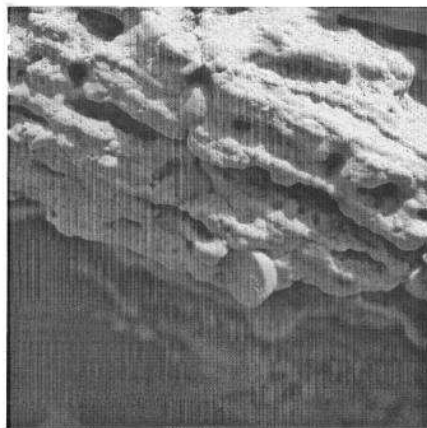
Performing a cosmic hole in one, Opportunity came to rest in a shallow crater on an otherwise exceptionally flat (even by Australian standards) plain. This has proved to be a scientific bonanza as close to the rover were several outcrops of bedrock that would possibly shed light on Martian geology below the surface. The only drawback could be when the rover tries to climb out of this small crater

to look around. The surface is very fine and powdery and Opportunity may end up like a bug caught in a hole in the sand.



In the last few days, Opportunity has used its RAT or Rock Abrasion Tool to examine the nearby outcrop.

Earlier examination with the microscopic camera revealed strange spherical objects embedded in the rock, and lying loose on the ground. Let's just say the scientists are doing a bit of overtime trying to come up with an explanation for what the science team at JPL have labelled 'blueberries'.



Editors Note: At the March General Meeting I will be showing some of these images on the 'big screen' as well as some of the 3D images sent back from Mars.

Due to their red/cyan colours, it is not possible to include them in this edition of Scorpius.

Will you need special glasses to view them? Yes, but I have received an order for 100 pairs of these and

they will be available to borrow or you can buy a pair for \$1.00.

4. Nozomi (Japan) Efforts to put the Nozomi spacecraft into Martian orbit have been abandoned. An attempt to fire thrusters to orient the craft for a Mars orbit insertion burn failed on December 9. The smaller thrusters were successfully fired and Nozomi flew past Mars at a distance of 1000 km on 14 December and went into a heliocentric orbit with a period of roughly two years.



Nozomi, **above**, (Japanese for Hope and known before launch as Planet-B) was planned as a Mars orbiting aeronomy mission designed to study the Martian upper atmosphere and its interaction with the solar wind and to develop technologies for use in future planetary missions.

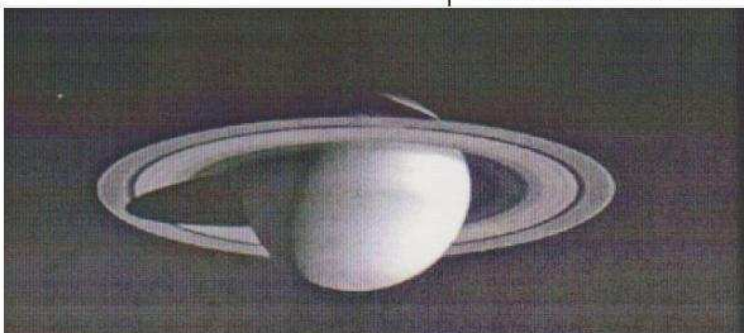
Launched back in 1998, the spacecraft has been plagued with all manner of problems. Put into a 'parking orbit' after launch, it made two lunar flybys to accelerate past the Earth, using a slingshot effect to put it on a Mars rendezvous in 1999. However, a faulty fuel valve caused the craft to lose speed and fuel during the Earth flyby and attempt at course corrections left the probe low on fuel. It was then put into an orbit around the Sun (heliocentric) and plans were made to attempt a December 2003 Mars encounter with two Earth flybys in December 2002 and June 2003. In April 2002 solar flares damaged the onboard communication and power systems. An electrical short caused the fuel heaters to fail and the remaining fuel froze, but the flyby was successful. The trajectory could not be corrected and the mission was abandoned.

Cassini on track for Saturn Rendezvous

With all the focus on the current Mars Rover Missions, the Saturn bound Cassini probe is quietly closing in on its destination.

Launched in 1997, the Cassini Orbiter's mission consists of delivering a probe (called Huygens, provided by ESA) to Titan, and then remaining in orbit around Saturn for detailed studies of the planet and its rings and satellites. The principal objectives are to: (1) determine the three-dimensional structure and dynamical behaviour of the rings; (2) determine the composition of the satellite surfaces and the geological history of each object; (3) determine the nature and origin of the dark material on Iapetus' leading hemisphere; (4) measure the three-dimensional structure and dynamical behaviour of the magnetosphere; (5) study the dynamical behaviour of Saturn's atmosphere at cloud level; (6) study the time variability of Titan's clouds and hazes; and, (7) characterize Titan's surface on a regional scale.

The spacecraft was originally planned to be the second three-axis stabilized, RTG-powered Mariner Mark II, a class of spacecraft developed for missions beyond the orbit of Mars. However, various budget cuts and rescopings of the project have forced a more special design, postponing indefinitely any implementation of the Mariner Mark II series.



Cassini is currently planned to take a similar tour of the solar system as did Galileo, referred to as a VVEJGA (Venus-Venus-Earth-Jupiter Gravity Assist) trajectory. Several opportunities exist for Cassini to make observations of asteroids, although exact encounters remain to be determined after the spacecraft has been launched as it depends on the launch date. Current plans call for an arrival in June 2004. Shortly after entering orbit around Saturn, Huygens will separate from the Cassini orbiter and begin its entry into the atmosphere of Titan. Cassini is then expected to make at least 30 loose elliptical orbits of the planet, each optimized for a different set of observations.

Cassini's instrumentation consists of: a radar mapper, a CCD imaging system, a visible/infrared mapping spectrometer, a composite infrared spectrometer, a cosmic dust analyzer, a radio and plasma wave experiment, a plasma spectrometer, an ultraviolet imaging spectrograph, a magnetospheric imaging instrument, a

magnetometer, an ion/neutral mass spectrometer. Telemetry from the communications antenna as well as other special transmitters (an S-band transmitter and a dual frequency Ka-band system) will also be used to make observations of the atmospheres of Titan and Saturn and to measure the gravity fields of the planet and its satellites.

The narrow angle camera onboard the Cassini spacecraft took a series of exposures of Saturn and its rings and moons on February 9, 2004, which were composited to create a stunning, colour image. At the time, Cassini was 69.4 million kilometres

(43.1 million miles) from Saturn, less than half the distance from Earth to the Sun.

Orbit insertion for the probe will take place on July 2nd, 2004.

Black Hole Mayhem

Two x-ray telescopes have caught a black hole in the act of ripping a star apart.

Thanks to two orbiting X-ray observatories, astronomers have the first strong evidence of a supermassive black hole ripping apart a star and consuming a portion of it. The event, captured by NASA's Chandra and ESA's XMM-Newton X-ray Observatories, had long been predicted by theory, but never confirmed ... until now.

Astronomers believe a doomed star came too close to a giant black hole after being thrown off course by a close encounter with another star. As it neared the enormous gravity of the black hole, the star was stretched by tidal forces until it was torn apart. This discovery provides crucial information about how these black holes grow and affect surrounding stars and gas.

Observations with Chandra and XMM-Newton, combined with earlier images from the German Roentgen satellite, detected a powerful X-ray outburst from the centre of a galaxy named "RX J1242-11." This outburst, one of the most extreme ever detected in a galaxy, was caused by gas from a star that was heated to millions of degrees Celsius before being swallowed by the black hole. The energy liberated in the process was equivalent to a supernova.

"Stars can survive being stretched a small amount, as they are in binary star systems, but this star was stretched beyond its breaking point," said Stefanie Komossa of the Max Planck Institute for Extraterrestrial Physics (MPE) in Germany, leader of the international team of

researchers. "This unlucky star just wandered into the wrong neighbourhood."

The black hole in the centre of RX J1242-11 has a mass of about 100 million times Earth's Sun. By contrast, the destroyed star probably had a mass about equal to the Sun. Astronomers estimate that only one percent of the star's mass was ultimately consumed, or accreted, by the black hole. The rest was flung away from the black hole.

The force that disrupted the star in RX J1242-11 is an extreme example of the tidal force caused by differences in gravity acting on the front and back of an object. The tidal force from the Moon causes tides in Earth's oceans. A tidal force from Jupiter pulled Comet Shoemaker-Levy apart, before it plunged into the giant planet.

Black holes aren't the only things that cause strong tides. Jupiter can do it, too. Comet Shoemaker/Levy crashed into Jupiter in 1994, after the comet was torn apart by the giant planet's tides. Although on a very different scale, the physical mechanism for the breakup of Shoemaker/Levy also caused the disruption of the star in RX J1242-11.

The odds of a stellar tidal disruption in a typical galaxy are low, about one in 10,000 annually. If it happened at the centre of the Milky Way Galaxy, 25,000 light-years from Earth, the resulting X-ray outburst would be about 50,000 times brighter than the brightest X-ray source in our galaxy, but it would not pose a threat to Earth.

Other dramatic flares have been seen from galaxies, but this is the first one studied with the high-spatial resolution of Chandra and the high-spectral resolution of XMM-Newton. Both instruments made a critical advance. Chandra showed the RX J1242-11 event occurred in the centre of a galaxy, where the black hole lurks. The XMM-Newton spectrum revealed the fingerprints

expected for the surroundings of a black hole, ruling out other possible astronomical explanations.

Supermassive black holes in the centres of galaxies are familiar to astronomers. There are many of them, including one at the heart of our own Milky Way. Now astronomers have a way to find more: look for x-ray outbursts when stars are ripped apart by black-hole tides. Observations like these are needed, say researchers, to determine how quickly black holes can grow by swallowing neighbouring stars.

Greenhouses for Mars

When humans go to the moon or Mars, they'll probably take plants with them. NASA-supported researchers are learning how greenhouses work on other planets.

Confused? Then you're just like plants in a greenhouse on Mars.

No greenhouses exist there yet, of course. But long-term explorers, on Mars, or the moon, will need to grow plants: for food, for recycling, for replenishing the air. And plants aren't going to understand that off-earth environment at all. It's not what they evolved for, and it's not what they're expecting.

But in some ways, it turns out, they're probably going to like it better! Some parts of it, anyway.

"When you get to the idea of growing plants on the moon, or on Mars," explains molecular biologist Rob Ferl, director of Space Agriculture Biotechnology Research and Education at the University of Florida, "then you have to consider the idea of growing plants in as reduced an atmospheric pressure as possible."

There are two reasons. First, it'll help reduce the weight of the

supplies that need to be lifted off the earth. Even air has mass.

Second, Martian and lunar greenhouses must hold up in places where the atmospheric pressures are, at best, less than one percent of Earth-normal. Those greenhouses will be easier to construct and operate if their interior pressure is also very low -- perhaps only one-sixteenth of Earth normal.

The problem is, in such extreme low pressures, plants have to work hard to survive. "Remember, plants have no evolutionary preadaptation to hypobaria," says Ferl. There's no reason for them to have learned to interpret the biochemical signals induced by low pressure. And, in fact, they don't. They misinterpret them.

Low pressure makes plants act as if they're drying out.

In recent experiments, supported by NASA's Office of Biological and Physical research, Ferl's group exposed young growing plants to pressures of one-tenth Earth normal for about twenty-four hours. In such a low-pressure environment, water is pulled out through the leaves very quickly, and so extra water is needed to replenish it.

But, says Ferl, the plants were given all the water they needed. Even the relative humidity was kept at nearly 100 percent. Nevertheless, the plants' genes that sensed drought were still being activated. Apparently, says Ferl, the plants interpreted the accelerated water movement as drought stress, even though there was no drought at all.



That's bad. Plants are wasting their resources if they expend them trying to deal with a problem that isn't even there. For example, they

might close up their stomata -- the tiny holes in their leaves from which water escapes. Or they might drop their leaves altogether. But, those responses aren't necessarily appropriate.

Fortunately, once the plants' responses are understood, researchers can adjust them. "We can make biochemical alterations that change the level of hormones," says Ferl. "We can increase or decrease them to affect the plants' response to its environment."

And, intriguingly, studies have found benefits to a low-pressure environment. The mechanism is essentially the same as the one that causes the problems, explains Ferl. In low pressure, not only water, but also plant hormones are flushed from the plant more quickly. So a hormone, for example, that causes plants to die of old age might move through the organism before it takes effect.

Astronauts aren't the only ones who will benefit from this research. By controlling air pressure, in, say, an Earth greenhouse or a storage bin, it may be possible to influence certain plant behaviours. For example, if you store fruit at low pressure, it lasts much longer. That's because of the swift elimination of the hormone ethylene, which causes fruit to ripen, and then rot. Farm produce trucked from one coast to the other in low pressure containers might arrive at supermarkets as fresh as if it had been picked that day.

Much work remains to be done. Ferl's team looked at the way plants react to a short period of low pressure. Still to be determined is how plants react to spending longer amounts of time -- like their entire life -- in hypobaric conditions. Ferl also hopes to examine plants at a wider variety of pressures. There are whole suites of genes that are activated at different pressures, he says, and this suggests a surprisingly complex response to low pressure environments.

To learn more about this genetic response, Ferl's group is bioengineering plants whose genes glow green when activated. In addition they are using DNA microchip technology to examine as many as 20,000 genes at a time in plants exposed to low pressures.

Plants will play an extraordinarily important role in allowing humans to explore destinations like Mars and the moon. They will provide food, oxygen and even good cheer to astronauts far from home. To make the best use of plants off-Earth, "we have to understand the limits for growing them at low pressure," says Ferl. "And then we have to understand why those limits exist."

Ferl's group is making progress. "The exciting part of this is, we're beginning to understand what it will take to really use plants in our life support systems." When the time comes to visit Mars, plants in the greenhouse might not be so confused after all. (NASA News)

and finally...

Just a reminder of some of the interesting ways of getting your science fix.

If you're up late on a Sunday evening, you might like to tune into the ABC's Star Stuff, an hour long astronomy and space sciences show, broadcast on the old AM dial at 1026 kHz. Aimed at the beginner and seasoned alike, Star Stuff can also be heard anytime on the Internet at:

<http://www.abc.net.au/newsradio/star.htm>

John Cleverdon was sent an email on the following:

Florida State University has put up a fascinating page on their site.

It begins as a view of the Milky Way Galaxy viewed from a distance of 10 million light years and then zooms in towards Earth in powers of ten. Ten million, to 1 million, to 100,000 light years and then it finally reaches a large Oak tree. After that, you begin to move from the actual size of a leaf into a microscopic world that reveals leaf cell walls, the cell nucleus, chromatin, DNA and finally, into the subatomic universe of electrons and protons. See it at:

<http://micro.magnet.fsu.edu/primer/java/scienceopticsu/powersof10/index>

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.**



Above - ASF BBQ at Roland & Anna Knabes place on 25th April 2004

Both Photo - By John Cleverdon



Left - Telescope learning Day at the ASF Briars site on 24th April 2004

Photo - By John Cleverdon



Below Left - Society Dinner at the Dava Hotel on 19th March 2004

Photo - By John Cleverdon

Below - Working bee at the ASF Briars site on 4th April 2004

Photo - By John Cleverdon



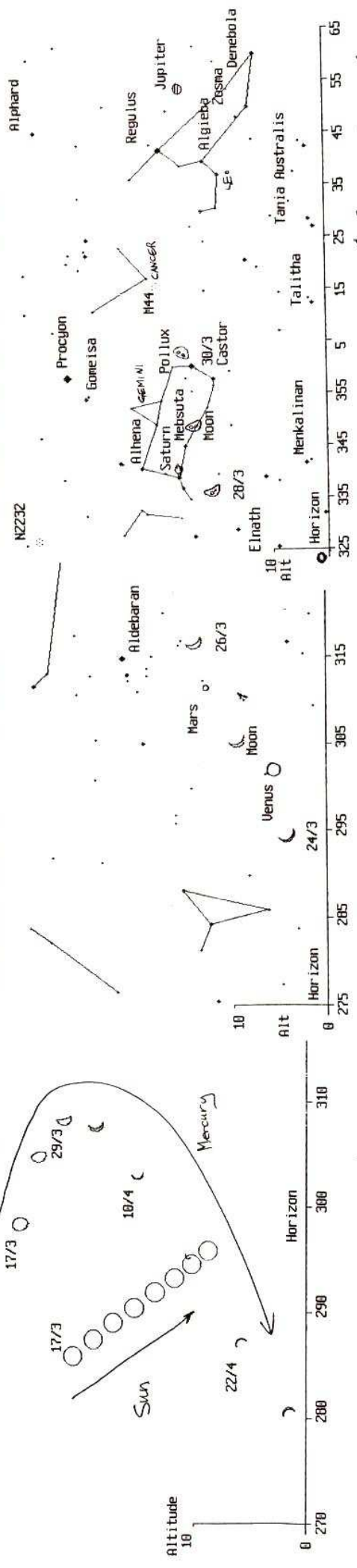
Kindly reproduced by Jane McConnell and collated/posted by Mary Westaway

SKY FOR THE MONTH 17 MARCH TO 20 APRIL 2004 MORNINGTON PENINSULA (now here else!)

Time
 8:35 pm North West 5/6 Dark Sky 29th March 2004 Summer Time
 01.00 (C) Bob Heale 13/1/03
 All objects no fainter than 4.5 1 X Sky View

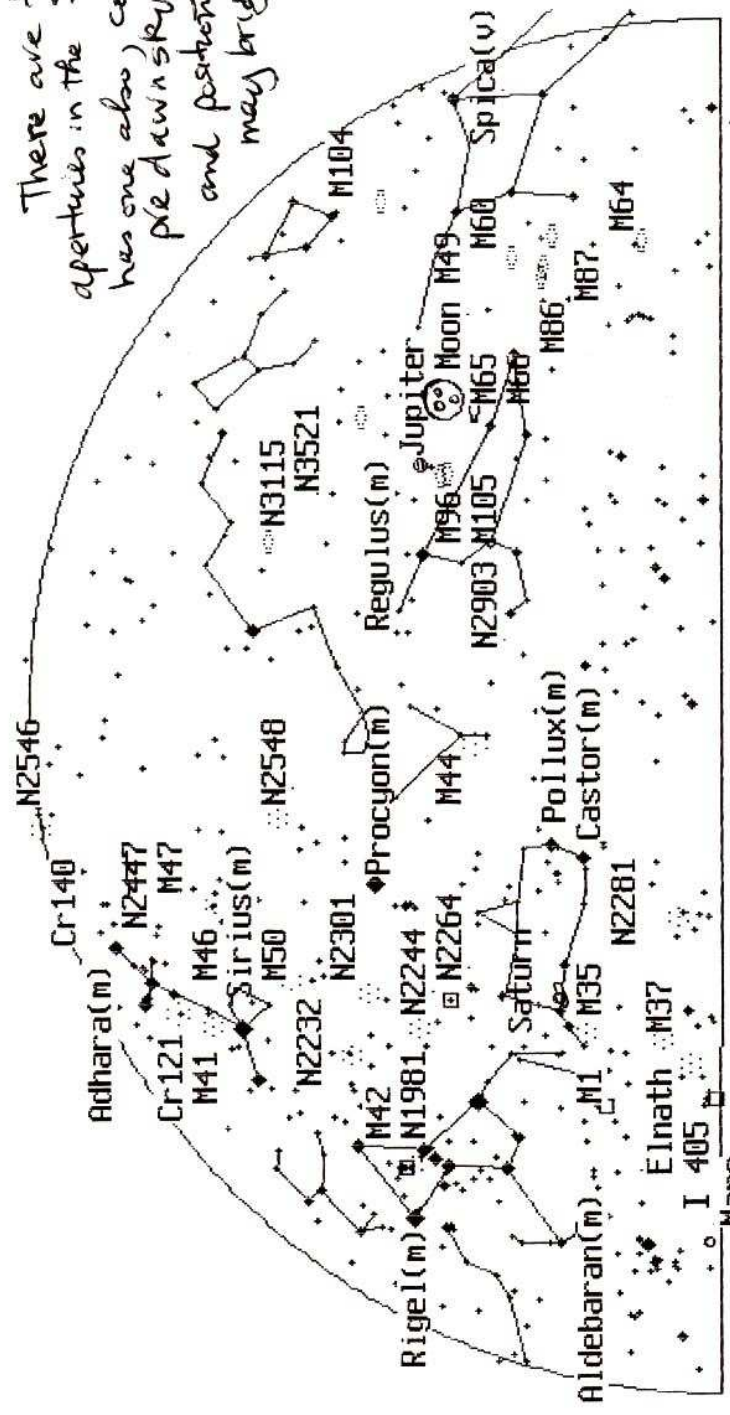
Time
 20:35 pm North-West 5/6 Dark Sky 25th March 2004 Summer
 01.00 (C) Bob Heale 13/1/03
 All objects no fainter than 4.5 1 X Sky View

Time
 NO GO for Mercury until mid-late April 2004
 LARGE Binocular View or Telescope View (Phases upside down, reversed or both)
 © Bob Heale

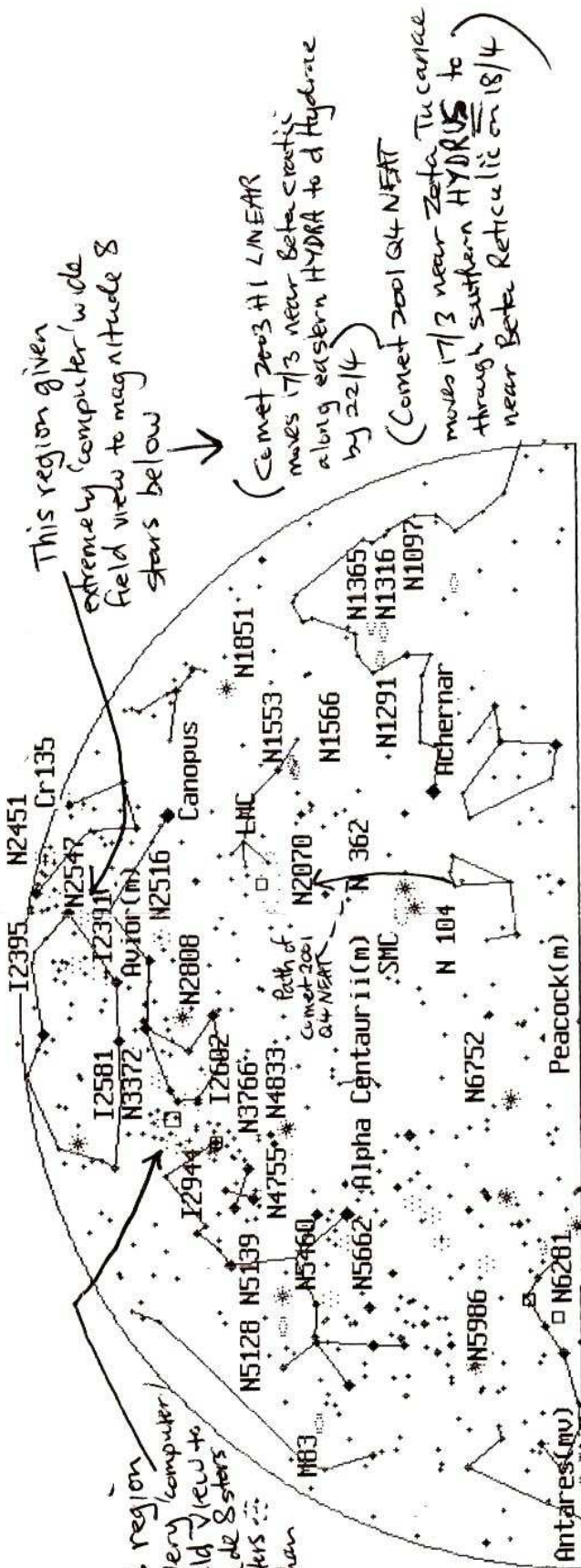


There are two within visibility of small to medium apertures in the Southern sky, but Northern sky has one also, named 2002 T7 LINEAR emerging in Pleiades sky, maybe as bright as magnitude 5 and positioned in PISCES moving South, and may brighten to mag 3 by end month

Bob Heale
 17/3/2004

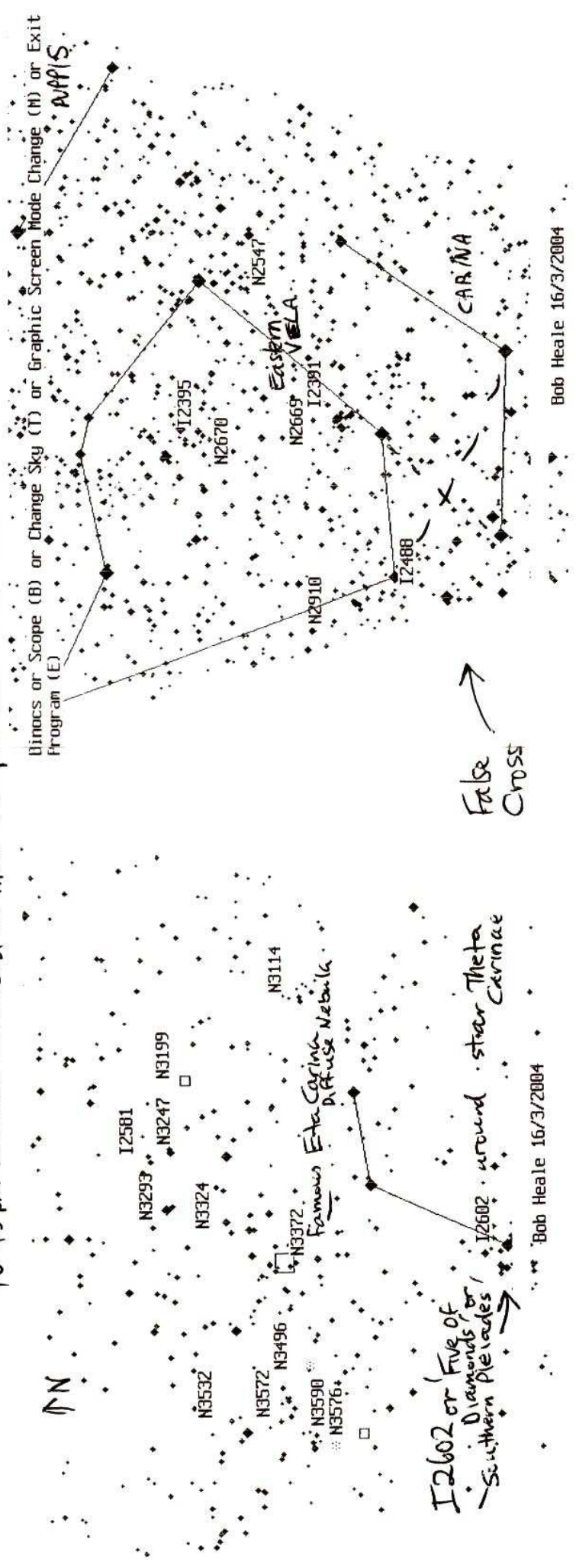


8:30 pm Standard Time 3rd April North Dark Sky 2004, Also 17 March
 10:45 pm Summer Time and 10 April 7:20 pm Standard Time (not Moon or Planets)



Bob Heale
17/3/2004

10 45 pm Summer Time and 20 April 7 20 pm Standard Time
8 30 pm Standard Time 3rd April South Dark Sky 2004 also 17 March



Bob Heale 16/3/2004

Bob Heale 16/3/2004