SCORPIUS

The Journal of the Astronomical Society of Frankston Inc.

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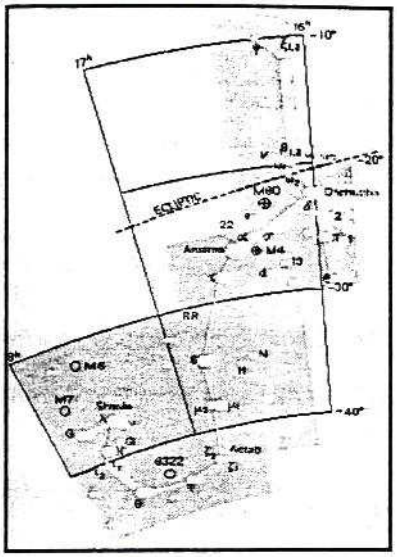
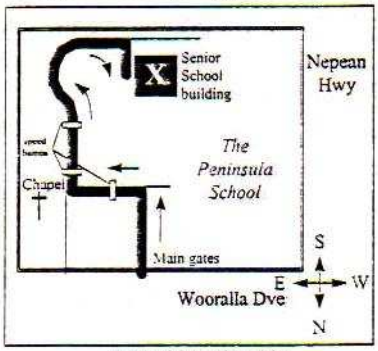


The Astronomical Society of Frankston was founded in 1969 with the aim of fostering the study of Astronomy by amateurs and promoting the hobby of amateur Astronomy to the general public. The Society holds a General Meeting each month for the exchange of ideas and information. Regular observing nights, 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.
Phone:	0419 253 252
Internet:	http://www.asfnet.20m.com
E-mail:	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 1ST OF JANUARY EACH YEAR

President
Peter Skilton a/h (03) 9776 5898

Vice President & Editor
Richard Pollard 0419 100 802

Treasurer
Bob Heale a/h (03) 9787 1748

Secretary
Sally Zetter

Committee of Management:
John Cleverdon, Marty Rudd, Peter Lowe, Russell Thompson, Ian Sullivan

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

FUTURE EVENTS

General Meetings:

July 18
Session 1: Peter Norman on "*The Story of Stardust: Stellar Nucleosynthesis from Hydrogen to Uranium and Beyond*".
Session 2: Two videos on "*Cycles of the Sky*" and "*Earth's Interior*".
Session 3: Informal Interaction

August 15
Session 1: David Girling on "*Video Astronomy*".
Session 2: Video on "*The Structure of the Cosmos*"
Session 3: Informal Interaction

September 19
Session 1: Peter Lowe on "*Cosmology in the 20th Century*"
Session 2: Video on "*An Astronauts' View of Earth*"
Session 3: Informal Interaction

Viewing Nights:

Members Only:

NOTE: Members nights are also now held on Fridays!

Jul 13, 14, 20 and 21 and August 17, 18, 24 and 25 all at The Briars Historic Park, Nepean Hwy, Mt. Martha.

New attendees must always confirm with **David Girling** on 59762806 or 0407883165 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.

Public, School & Community Groups Viewing/slide nights:

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 July 6 and August 3, all at 8pm. Assistants are required. New members are welcome to watch and participate if desired.

Social Events

Working bee at the Briars. SUN Jul 8. The working bee will run from 10am to 1pm, with a BBQ at 1pm. Food will be provided; BYO drinks. Tasks include mowing grass and clearing weeds, as well as clearing

damage caused by intruding cattle.

Longitude. The pre-release film, Longitude was screened at the school theatrette for 17 members and family who came along on Saturday afternoon, June 23. It told the story in the 18th century of the lifelong hunt to determine a reliable measure of longitude at sea. Unfortunately the member viewing night to follow it was totally clouded out.

FREE LECTURES

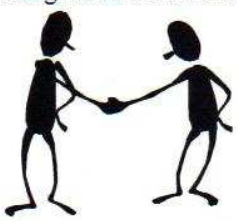
The annual free evening public lectures in physics are on again at the University of Melbourne in the Laby Theatre, School of Physics, Swanston Street, as follows:

Jul 13, 8pm, The World of Nature seen with Neutrons, Prof. Geoffrey I. Opat
Jul 20, 8pm, Fermi in your Computer, Dr Jeff McCallum
Jul 25, 7pm, X-ray Vision: The New Generation of X-Ray Optics, Dr. Andrew Peele
Jul 27, 8pm, Out of Africa: a 2 billion year old nuclear reactor, Assoc Prof. David Jamieson
Aug 5, 8pm, Fermi and the Weakest Link in Nature, Assoc Prof. Ray Volkas
Aug 22, 7pm, Physics below the Ocean Waves, Dr Jeff MacCallum

YOUR SOCIETY

A BIG THANK-YOU

Back in early May, the Society had one of its busiest periods with regard to viewing night commitments in recent years. There were no less than four consecutive working day nights (does that make sense?) starting with the increasingly popular public night on Friday the 4th. Monday night was for St Francis of Assisi Primary School at Camp Manyung, followed by Tuesday night at Langwarrin Park Primary and back to Manyung for St. Francis's second night.



I wish to thank everyone who helped out, and I know that a few even attended all four nights; your effort is very much appreciated.

ATTENTION!

E-SCORPIUS E-MAIL LIST TO CLOSE!

Listbot, who run the free email server for E-scorpius, our society mailing list, will be shutting down all free services as of Aug 6. Therefore, this list will cease to exist as of that date.
I urge you all to join a Yahoo group at the following URL.

http://groups.yahoo.com/group/E-Scorpius

Like the Listbot service, this is totally free. However unlike the Listbot service, there are many additional features available from the above site: a 'files' page for photos, documents and small programs, a calendar, even a chat module. You will need a Yahoo ID to access the features of the site: if you have one, you can use that, if not, it's a simple process to sign up.
I also run the EAMN (Eastern Australia Meteor Network) group at Yahoo and there have been no problems at all.

Richard Pollard.

LONG-SERVICE RECOGNITION

Early in the year, a suggestion was made to the Committee to introduce new Society nametags to include long-service recognition. These would be for those members who have been in the Society at least 3 years.
I took on the task, and after discussing designs, started producing the new nametags, and eventually began handing them out at the June general meeting.
As each member reaches the 3-year mark a long-service nametag will be produced for them, and as they pass 5/10/15… years, updated nametags will be produced.
Several members will find their first long-service nametags with this edition of Scorpius. Future long-service nametags will be given out to members at Society meetings and events, or posted out with Scorpius. However, because of privacy reasons, individual members won't be listed in Scorpius.

John Cleverdon

LIBRARY MATTERS

After several years of highly commendable service to cleaning up, organising and running the Society's library, Kathy Stabb has understandably decided to step aside for health reasons following major heart surgery. Everyone wishes her the very best for the future, and thanks her greatly for the time she has devoted both at monthly meetings managing the borrowings and returns, and also between meetings by punching holes in other societies' newsletters and cataloguing new materials, as well as pursuing errant borrowers. Andrew Thornton, who is studying mathematics at Melbourne University, has kindly offered to pick up the reigns of this important and visible role of Librarian. Feel free to say hello to Andrew in the time before each monthly meeting starts, or during its tea break interval. Thanks to those other members who have also subsequently kindly offered their time to help with the library.

Heinz and Ilse Rummel have kindly donated a video on "The Aurora Explained" from the Geophysical Institute of the University of Alaska. Thanks again Heinz and Ilse!

NEW MEMBERS

Welcome to the following new Society members:

Mary Westaway
Eron Cripps
Donna Skeldon
Mavis & Don Campbell
Simon Judge

The current number of members is 163.

RECENT MEETINGS

May's meeting, chaired by the President, was attended by 51 on a cool and overcast evening. The school had provided a second VCR and left the control cabinet open for us, however, the video data projector was totally inoperative, possibly due to failed projection globes. This meant that the meeting had to revert to former technologies, which frustratingly proved the better of more than one speaker who were relying on the projector. Bruce Tregaskis opened with info on the Sun in his Great Balls of Fire segment, followed by Bob Heale presenting Sky for the Month, including a quick quiz on lunar features and reporting possible sightings of Martian features in his telescope (not

canals!). Ian Sullivan, who was soon to embark on a solar eclipse expedition to deepest, darkest Africa as part of a tour group, took the opportunity to explain about the circumstances of this eclipse. David Girling outlined some prospective minor planet occultation events that required observers with telescopes or binoculars, then Ian Porter gave his What Goes Up segment.

Russell Thompson was to continue with his Pluto exposition, however, he required the video projector and so will defer the talk once again. Roger Giller was unable to give his Sky Lights segment as he was touring in northern Canada under the aurora borealis, which he'll no doubt try to photograph. Several members reported having seen a definite one degree tail on comet Linear, which is now binocular/naked eye brightness in our southern skies. David Huby reported having observed two tails the previous night. Bruce Tregaskis reported on the status of the newly variable star, delta Scorpii, and had some handout sheets (in Japanese!) with comparison stars for estimating its magnitude with time.

After the tea break, about a dozen members decided to watch the video *Under a Purple Sky*, about the quest for Mars, while the others either talked technical matters in the tea room, or were seated in the theatrette to hear Ian Sullivan talk about *Transits of Mercury and Venus*. Special thanks to Ian for standing in as a contingency speaker for the meeting, as Peter Lowe was unable to present his talk on *Cosmology in the 20th Century* this month due to the equipment failure. This will be deferred until later in the year. Meeting closed at 10:35pm.

June's meeting was chaired by the President and saw 39 members brave cold and raining conditions. The meeting started with one minute's silence for the passing of long-time member, Loma Palmer, known to many in the room. The public, school and member nights and social events were then reported on, and notification of a planned lunar grazing occultation expedition for an observing fence of telescopes in the Mt.Martha area that weekend was given. An almost certain occultation shadow passover of minor planet 308 Polyxo later the night of the meeting was presented by David Girling. The Royal Astronomical Society of New Zealand was particularly interested in southern hemisphere observers following this one as the track of the asteroid was based on nearly a century's worth of astrometry and so was unusually reliable. Advance notice was given of the imminent closest approach of Mars to Earth, of the impending partial lunar eclipse and of Pluto's opposition.

This month a portable data projector was at hand, enabling Bob Heale to present a lively Sky for the Month in colour. Bruce Tregaskis followed with details of the Sun, then Roger Giller reported on his recent intrepid trek up near the Arctic Circle where he was unable to see any aurorae because the Sun only set far enough during the middle of the night to give a slight twilight! David Girling handed out the prize for the inaugural annual Telescope Day and showed brand new astronomy books available on the night for purchase by attendees. Russell Thompson was able to give quite a complete story of the planet Pluto in a colourful show, from its properties to the discovery of its atmosphere, the nature of its moon Charon, and the controversy about whether it's really a planet or not.

Following the tea break, the group split into three sessions. One session attended the library or watched the video on Rumble in the Jungle, about a bolide fall in South America. Another settled for an informal technical chat, while the majority watched member Doug Gardner give an enlightening talk on astronavigation, including demonstrating his sextant, obtained at great cost after World War 2, giving the history and functionality of the instrument and explaining just how it is used in practice to obtain latitude and longitude under various meteorological conditions. Doug went to sea for many years in the merchant marine and was required to be absolutely proficient in the use of sextants on a daily basis, before the advent of navigational aids such as Omega and GPS. After fielding a large number of questions, the audience then showed their appreciation of Doug's knowledge in the usual manner. Following the main talk, Roger Cleverdon then added a history of an antique sextant which is an heirloom in his family, and was used many decades ago for survey work in Australia by one of his ancestors. Meeting closed at 10:30pm.

Schools and Community Groups:

A viewing night was held at The Briars Education Centre on May 24 for St.Catherines Primary. Conditions were initially almost totally overcast and rain was falling in Frankston, however, the conditions cleared almost completely affording good views for the 60 pupils and teachers of the skies through the available instruments. Peter Skilton gave the talk with the Society's newly acquired slide projector, and received intense questioning about the death of stars. Several meteors were observed, and good views were had of Mars. There was some concern about a rogue cow, escaped from elsewhere on The Briars, moving about the observing site while everyone was there. Thanks to Bob Heale and David Huby for helping out in the field.

The public night at The Briars on June 1 saw 27 in attendance on a very overcast evening. Nevertheless, the attendees included the President of the Ballaarat Astronomical Society, Judith Bailey, and also an ecstatic visitor from Germany who discovered us on the internet and was therefore not surprisingly the last to leave! Thanks to Richard Pollard and Peter Skilton for providing the talk, Bob Heale for the supper and table duties, and in the field were Ken Bryant, Bob Heale, John Cleverdon, Russell Thompson and Phil Snelling. The evening highlight, aside from the Moon and Mars peeking through the clouds, was a glorious lunar halo due to high altitude ice crystals.

The Winter Solstice night on June 21 saw a Mars viewing night for Bittern Primary school for grades 3 and 4, along with parents and siblings. The Society was welcomed for the first time to a school hall adorned with pupils' space projects on display and a giant black banner reaching from floor to ceiling and including our Society's name woven as part of the space theme. It was begging for a photograph but no-one had a camera with film! This was a very impressive effort and clearly showed what had recently been on the

curriculum. The 150 people present actively participated in the talk by Peter Skilton, who had to field plenty of great questions and insightful "statements" as he went along. Because of threatening weather, small groups of children were taken out to the telescopes (some with umbrellas occasionally put over them) for a look at the sky between rain clouds, before returning to the school hall. Following the talk, everyone moved to the school quadrangle where 5 telescopes were in action, mostly aiming at the Red Planet, Mars. Before rain set in about 10pm, everyone had at least seen a few objects in the sky, especially the markings on the much anticipated Mars. Thanks in the field to Jeremy Scott, Bob Heale, Bruce Tregaskis, David Huby, Don Leggett and John Cleverdon.

On June 29 the ASF held a viewing night for 40 children and teachers from St. Michaels Primary School at the Briars Education camp. After a somewhat extensive slideshow peppered by some enthusiastic questioning, the group ventured outside to the Observatory site. Once again, the cloud was a problem, limiting the viewing to periodic glimpses of the Moon and Mars, and as the children succumbed to the late hour, the teachers took the opportunity to view other sights as they came visible. Thanks in the field to everyone for their help on a less than favourable night.

MAD COW

Disaster struck on The Briars site sometime between the May 24 (school night) and the members' viewing night on May 26. One or more cattle had escaped from elsewhere and strayed onto our site, destroying many of the rare and endangered native plants we have been planting for the last 2 years as windbreaks and light shields. Most of the plants had been impacted, completely trampled underfoot, snapped off or bent. Their wooden stakes were uprooted and scattered about and plastic protection bags were torn out, and dispersed by the wind across the paddocks to the East. This was an expensive blow to the Society's efforts to improve the site, and the effort of many working bees and watering trips has been wasted. In total, on 26 May we counted 52 plants affected. A working bee on June 3 helped repair a small part of the damage done, including retrieving many plastic plant shields from across the paddocks.

NACAA

The Society has received advance notification about the next NACAA (National Australian Convention of Amateur Astronomers) which will be held in 2002 between Friday March 29 and Monday April 1, inclusive (Easter). It is being hosted once again by the Astronomical Society of South Australia at the Royal Coach Motor Inn in Adelaide (which if I recall correctly might be the exact same venue they held it at last time they hosted it some years back – which was a great success and walking distance from Adelaide central and the Botanical Gardens). Note the dates in your diary. Registration details and a call for papers are not available yet, but should be released in August. All amateur astronomers are welcome, no matter what your previous experience level. In the meantime, the ASSA have set up a website for information at http://www.assa.org.au/nacaa2002.

OBSERVATIONS:

Comet Linear C/2001 A2:

Comet Linear C/2001 A2 has now moved into the morning sky and since its perihelion in May, has undergone a second brightening to mag 3.5, due to its nucleus splitting again. This outburst was only a temporary one, however and by the end of June had dimmed to 4.5.
That doesn't mean it's not worth a look: there's a finder chart on the last page of *Scorpius* where the cartoon usually is: a more detailed document is available in the Files section of the Yahoo E-Scorpius page and other sites on the Internet.

Does any member have access to any spare portable 12 volt TV monitors that could be connected directly to portable CCD cameras mounted on telescopes in the field? The CCD security cameras are low light level (0.1 lux) and can feed directly a mono audio and video input, but will not directly feed via a TV antenna without some sort of converter.

JUST FOR STARTERS

PRODUCT REVIEWS:

30MM WIDESCAN TYPE II EYEPIECE

This eyepiece has a focal length of 30mm, has an ultra wide 84 degree field of view and weighs half a kilogram. I bought it for US$200 from Apogee in the US. Their postage charge was around US$16.

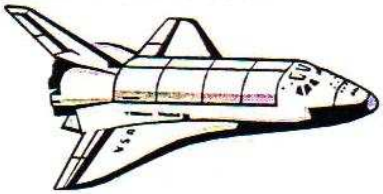
The image in the centre of the eyepiece is very sharp, but starts to distort at around 60% of the way out along the radius. Some people refer to this degradation as "softening", but I think of it as distorting. And it gets worse going out to the edge where, admittedly, you have a hard time seeing it because it's right at the very edge of your vision.
Some years ago I bought a 2inch star diagonal for my C8, thinking to use the 2inch eyepieces I use on my Dobsonian. But I never made much use of it, feeling that it wasn't worth the bother. But this eyepiece changed that, and it is absolutely great in my C8. It gives the bright "porthole into space" experience that was somewhat lacking when I used my 9mm Nagler and 14mm Ultrawide.
However, I wasn't too impressed with this eyepiece in my 14.5inch Dobsonian or 80mm refractor. These are f/4.5 and f/6.25 telescopes and the distortion at the edges was more annoying. Also, I couldn't get the Widescan to come to focus using my Paracorr.
Thus if you have a fast telescope and tend to get annoyed with edge distortion at the periphery of your vision, I don't think you would like the Widescan. You will just have to save up the twelve or thirteen hundred dollars to get the 31mm Nagler instead. But if you have a slow telescope like my f/10 C8, and are not annoyed by edge distortion of the type seen in Erfles and Konigs, I think you would love this eyepiece.

Renato Alessio

Did you know that Sydney is host to a real space shuttle?

Direct from the Soviet Union, floated out of Russia on giant river barges and shipped through the Panama Canal, the Buran 002 Space Shuttle is open to the public at Sydney's Darling Harbour. Buran is not a model or a replica, it's a real space shuttle that flew from secret Soviet cosmodromes in the 1980s. Furthermore, this exhibition is a world first - the Buran is the only Space Shuttle to go on public exhibition anywhere in the world.
On 15 November 1988, space history was re-written when a Soviet Space Shuttle, known as Buran (Russian for "snow storm"), was launched, orbited the earth twice and touched down at Baikonur Cosmodrome, Russia.

This monumental occasion was the first time a reusable Soviet spacecraft entered orbit and returned to land intact ready to be used for future flights and was a milestone in the never-ending "space race" between Russia and the United States of America.



The Buran weighs over 105 tonnes and measures 36 metres long, 17 metres high and 24 metres wide. Capable of lifting a thirty tonne 17 metre x 4.5 metre payload into orbit and returning one of up to 20 tonnes, Buran is the result of a development program costing in excess of US$14 billion. Now you can experience it for yourself. Contact details are:

Buran Space Shuttle Exhibition
Wharf 13, Darling Harbour (Opposite Star City Casino)
Inquiries: (02) 9518 5998
www.buran.com.au

The Buran on display, 002, was used for drop tests rather than going to space itself. However, it is essentially the same vehicle, well worth a visit.

STOP PRESS!

Russia plans to revive Buran shuttle

By SPACE.com Staff
posted: 10:45 am ET, 28 June 2001

The Russians reportedly plan to revive their Buran space shuttle, thanks to a booming business in Proton launches and the growing need to transport more heavy payloads to the International Space Station. The Buran, based on more advanced technologies than the older U.S. space shuttle fleet, flew only once and was mothballed in 1992 by a cash-strapped Russian government. Its return to service brings a vehicle capable of carrying 100-ton payloads -- five times more than any Western space vehicle.
"There is a future for this program," said Leonid Gurushkin, director of launch operations at Baikonur. "By extending the length of Buran we can carry 200 tons. There is no alternative to Buran and I don't see any coming."
In 1988, Buran succeeded with a crewless flight when it orbited Earth twice and landed at its custom 2.8-mile landing strip in Baikonur Cosmodrome. Recently, Buran has been readied for flight and was shown to Western aerospace engineers last week by RSC Energia, the state company that built Buran. Buran machinery remains in place at Baikonur and the Energia hangars are packed with spare parts.
Russia plans to finance the Buran redevelopment by selling more tourist trips, like Dennis Tito's, to the space station, the magazine reported. Western space dollars also have flowed to Russia as payments for Proton rocket launches which recently have pushed up 17 commercial satellites in the same number of months, earning the nation more than $100 million per launch.
Energia initially built two Buran shuttles and three main boosters. The program, designed to employ 30,000 people and make up to 30 launches a year, survived a while with military dollars despite a crumbling Soviet Union. Buran was seen as vital to missile defence. The shuttle's only imported component was heat-resistant paint. Buran, which means snowstorm in English, lacks main engines so it has higher payload capability. It relies entirely on strap-on boosters, rather than the U.S. shuttle's orange external tank, giving Buran more lifting power than the U.S. shuttle.
On top of that, its uses liquid-fuel boosters rather than solid boosters. That means Buran's boosters are throttle-able and theoretically safer -- they can be regulated in intensity and turned on and off to avoid blow-up tragedies like Challenger.
The Russian shuttle is assembled horizontally and lifted to vertical at the launch pad, unlike the U.S. shuttle which is assembled vertically.
Energia believes Buran's time has come with the need for larger payload transportation to the International Space Station. "We have been dreaming of this time," said Gurushkin.

IN THE NEWS

Australia, Russia, Sign Space Activities Agreement

Australia and Russia signed an agreement on May 23 to cooperate in space activities, including launch facilities.
"This agreement will facilitate the start of proposed space launch projects by providing for the transfer of information and technology between our two countries," Sen. Nick Minchin, Australia's minister for Industry, Science and Resources said in a statement.
Three companies plan to use Russian rockets to launch payloads from facilities under development in Australia. The firms include Asia Pacific Space Centre Pty. Ltd., which plans to operate from Christmas Island in the Indian Ocean; Spacelift Australia, which expects to operate from Woomera, a government-controlled location in South Australia; and United Launch Systems International Pty. Ltd., which is planning to build a facility on Hummock Hill Island, south of Queensland.
Many ventures to launch Russian rockets from Australia have been proposed over the last decade, but none have materialised.
"The agreement declares our intention to become a major player in the international space industry and consolidates our position with Russia in the face of interest from a range of other countries," Minchin said.
The agreement addresses such matters as intellectual property, forms of cooperation, liability, relief from customs duties and technology security, the statement said. **(Space.com)**

Manned Mars Missions by 2021

WASHINGTON (Reuters) - Humans could venture to Mars in 20 years or less, NASA chief Daniel Goldin said recently, in comments that made orbital space flight sound positively last century.

"We have been locked in Earth orbit for too long, but we are going to break out," Goldin told a symposium on the 40-year history of U.S. human space flight.

"Let's burn into our brains that this civilisation is not condemned to live on only one planet," he said. "Let's burn it into our brains that in our lifetimes, we will extend the reach of this human species onto other planets and to other bodies in our solar system and build the robots that will leave our solar system to go to other stars, then ultimately to be followed by people."

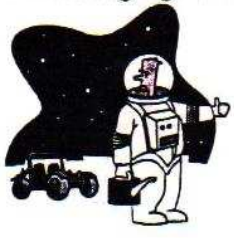
He detailed NASA's plans to launch a precision lander spacecraft toward Mars in 2007, with Martian samples to be collected and returned to Earth by 2009 to 2011.

During the next five or six years, he said, scientists would figure out how to surmount "unbelievable health problems" on the International Space Station and how to escape Earth orbit with humans aboard.

"In no less than 10 -- and if we decide to do it, it could be done in 10 -- and certainly no more than 20 years we'll start writing history again and not looking back but looking forward," Goldin told the symposium at George Washington University.

The occasion for his remarks was the anniversary of the first U.S. human space flight on May 5, 1961 by Alan Shepard. He collected the NASA Distinguished Service Medal at the White House exactly 40 years ago on May 8, 1961. Shepard died in 1998.

Officials at the National Aeronautics and Space Administration have been generally wary of predicting when humans might go to Mars, Earth's next-door planetary neighbour.



At a briefing in March, Ed Weiler, head of NASA's office of space science, said upcoming unstaffed missions to the Red Planet aimed to check on the presence of radiation and water, two key factors that could determine whether humans might survive on Mars.

The Russians are also keen to go. Anatoly Grigorev, head of the biomedical institute affiliated with the Russian Academy of Sciences, was quoted by Tass as saying that Russian scientists are aiming to send a manned probe to Mars sometime between 2016 and 2020.

Grigorev said the Mars mission would be the next major space project after construction of the International Space Station (ISS) is completed and urged the countries taking part in the ISS project -- primarily the United States, Europe and Japan -- to participate in the Russian Mars exploration plan.

According to Grigorev, Russia is expected to come up with an outline of the Mars expedition plan by 2005.

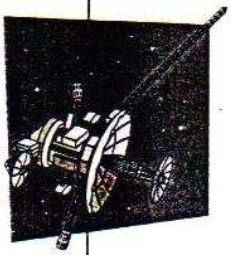
Grigorev said the Mars probe would be manned by a crew of four to five cosmonauts, who would spend close to two years in space. It takes nine months for a spacecraft to travel to Mars.

Deep Impact (Not a Movie)

NASA's approval of the $279 million Deep Impact mission means humanity will no longer be only on the receiving end of comet impacts. Now we're going to go and slam into a comet ourselves. Or at least send a robot to do it.

With the announcement, development will now proceed on the robotic mission to carry a camera-packed copper probe that will smash into Comet Tempel 1 on American Independence Day 2005. The launch is targeted for January 2004.

Scientists will study the impact from ground-based telescopes. And, depending on how things go, the fireworks might even be visible to everyone on Earth.



Deep Impact will launch one year after the European Space Agency's 2003 launch of Rosetta -- a kinder, gentler mission that will rendezvous with Comet 46 P/Wirtanen rather than pummeling it. But Rosetta will take a circuitous route to its target, gaining gravity assists from Earth and Mars in an effort to save fuel on an eight-year journey.

Like a low-budget Hollywood flick headed for video cassette, Deep Impact will take a more direct route, reaching its prey and making fireworks on July 4, 2005 -- six years before Rosetta catches up with its target.

Michael A'Hearn, a University of Maryland astronomer, will manage the mission.

A'Hearn said that while most NASA missions are passive in terms of how they explore an object, Deep Impact is "completely different, because it is a real experiment in which we do something to another body in the solar system and see how it reacts."

The 350 kilogram probe will hit the comet at 36,000 kilometres per hour and penetrate 5 to 10 metres. Much, but not all of the probe will be vaporised. Then a bunch of the comet's innards will spew outward at about half the speed that the projectile came in. Over the course of about 200 seconds, more material will be excavated, carving a hole as big as a football field and seven stories deep.

Before impact, the comet will be visible in a good amateur telescope. But the freshly ejected material will enlarge the halo of debris around the comet, off of which sunlight reflects, and it will brighten dramatically.

"It should be easily visible in good binoculars, and it might be easily visible with the naked eye," A'Hearn said in a telephone interview.

The impact will be strong enough to alter the comet's orbit, and there has been some public concern over whether humanity's impact of a comet might alter its orbit enough to cause it to threaten Earth.

No such retribution is possible, A'Hearn said. The comet's present orbit would never come within 80 million kilometres or so of our planet, and the force of the probe's impact won't change that by more than 100 metres. The point of the impact, of course, is to learn about comets. But comets never sit still. At least not until they crash into a planet or something.

This propensity to threaten their neighbours -- which can make a planetary mess of things -- makes comets supremely interesting to scientists, who still know very little about what's inside the icy bodies with their long, wacky orbits around the Sun. Some comets travel a fifth of the way to the next nearest star.

And then there's the fact comets hoard a vault of pristine information about the formation of the very planets they like

to smash into. The recent breakup of a comet provided researchers with an unprecedented view of its nucleus, and scientists were thrilled at what they learned.

Along with ground-based observations, a camera and an infrared spectrometer on the Deep Impact mother ship will watch the action. A'Hearn said that after the mother ship has transmitted all the data back to Earth, which will take about two days, the craft is slated to be abandoned to wander through the solar system.

"There are currently no plans" to utilise the mother ship for any further purpose, A'Hearn said.

Comet Tempel 1, the target, was discovered in 1867. It's what is called a short-period comet, orbiting the Sun every five and a half years.

Scientists are eager to learn whether comets exhaust their supply of gas and ice to space or seal it into their interiors. They would also like to learn how a comet's interior is different from its surface.

Creating a crater in a comet is also expected to teach researchers how craters form.

A side benefit of the mission is that it will teach researchers something about how to deflect a comet or asteroid, in the event that one ever is heading our way. **(Space.com)**

NASA Researcher Validates Discovery of Planets' Gravitational "Dance"

A team of planet hunters recently announced a discovery that will help researchers better understand planet migration and how planets' gravitational pulls influence each other. The discovery was announced at the American Astronomical Society meeting in San Diego.

The planet sleuths from the University of California at Berkeley, NASA and other institutions discovered the planetary pair locked in what appears to be "resonant" orbits, moving in synch around the star with orbital periods of 60 and 30 days. Because of the 2-to-1 ratio, the inner planet goes around the star twice for each orbit of the outer one. They gravitationally tug on each other to maintain this synchronicity as they orbit around the star known as Gliese 876, a dim red dwarf 15 light years from Earth in the constellation Aquarius.

The two gravitationally linked planets have masses of at least 0.5 and 1.8 times the mass of Jupiter. The inner planetary companion was not recognised at first because the orbital resonance allowed the pair of planets to masquerade as a single planet with an elongated orbit.

The two orbiting planets are located relatively close to each other, within 0.08 Astronomical Units (the distance between the Earth and the sun) of each other, less than one-third the distance from the Earth to its nearest neighbour, Venus.

In our solar system, the only known resonance between a pair of planets is Pluto, which orbits the sun twice for every three times Neptune circles the sun.

Asteroid or Comet Caused Largest Extinction in Earth's History

New findings provide evidence that Earth's most severe mass extinction -- an event 250 million years ago that wiped out 90 percent of the life on Earth -- was triggered by a collision with a comet or asteroid.

Over 90 percent of all marine species and 70 percent of land vertebrates perished as a result, according to the NASA-funded research team, led by Dr. Luann Becker of the University of Washington, Seattle. The team's findings will be published in the journal Science.

The collision wasn't directly responsible for the extinction but rather triggered a series of events, such as massive volcanism, and changes in ocean oxygen, sea level and climate.

That in turn led to species extinction on a wholesale level, according to the team.

And now... Funerals in Space.

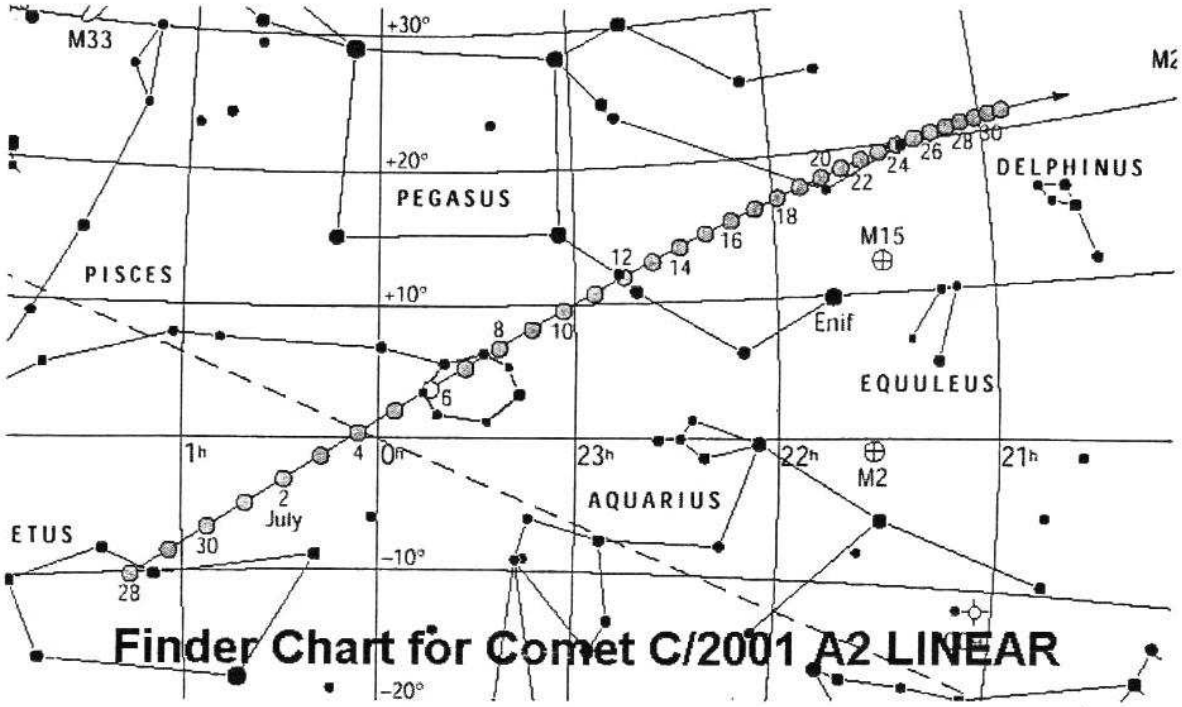
Since news that remains of astronomer and comet discoverer Eugene Shoemaker were scattered on the lunar surface when the Lunar Prospector probe was intentionally crashed, interest has been growing in the concept of so-called space funerals. In the US, a company called Celestis is offering various services in which a portion of a person's ashes are carried into space, and depending on which service is required, are either placed in Earth orbit, scattered on or put in orbit around the Moon, or sent off into deep space. The Earth orbit option, called Earthrise, will put an inscribed container, about the size of a lipstick case into orbit, where, after an undisclosed period, it reenters the atmosphere in a blazing tribute. The cost is surprisingly low: US$5,300.00. The Lunar option puts the container on or around the Moon for $12,500. The deep space option (called Voyager) will have your loved one leaving the solar system altogether, for the sum of $12,500. These last two choices depend greatly on the availability of a spacecraft, as all services are part of existing payloads. There are currently no 'funeral only' launches, due to the huge costs involved.

The world's first memorial spaceflight occurred on April 21, 1997. The air-launched Pegasus rocket carrying the flight capsules of twenty four people was deployed over the Canary Islands. The second 'mission' took place on February 10, 1998. The launch occurred from Vandenberg Air Force Base, aboard a Taurus rocket provided by Orbital Sciences Corporation. The Celestis spacecraft was attached to the final stage of the Taurus. The vehicle's primary payloads are Geosat Follow On --a Navy satellite-- and two Orbcomm communication satellites. The third, *The Millennial Flight,* was launched December 20, 1999, again aboard an Orbital Sciences Corporation Taurus rocket from Vandenberg Air Force Base. On board were participants from countries around the world, including USA, China, Japan, Germany and the Netherlands.

For more information, you can visit their website at www.celestis.com.

If you have something you'd like published in Scorpius, simply e-mail it in a document file to me at alphacent@iprimus.com.au, or, post it to me at 10 Stanhope Street, Dandenong 3175

Thanks, Richard Pollard (Editor)



Finder Chart for Comet C/2001 A2 LINEAR

Left -
ASF Society Dinner at Kirkpatrick's Hotel

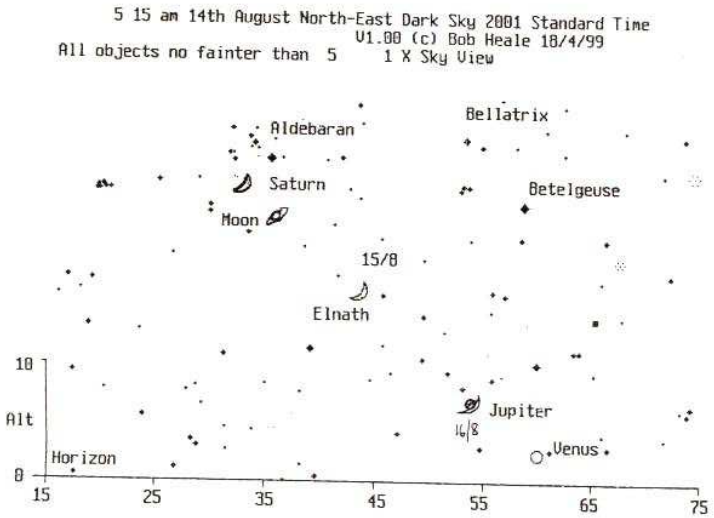
Photo - *By John Cleverdon*

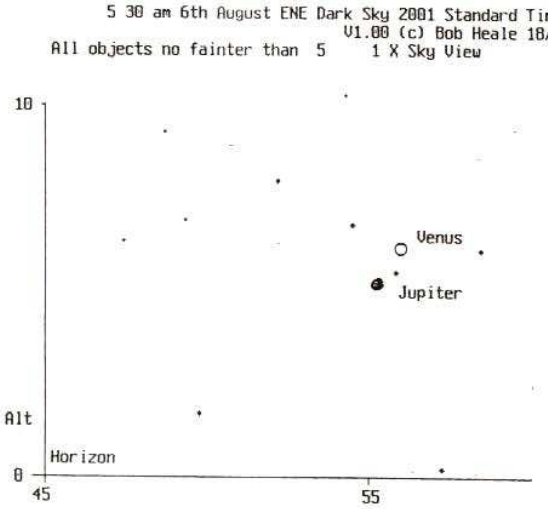
Below -
ASF Scope Day 19 May 2001

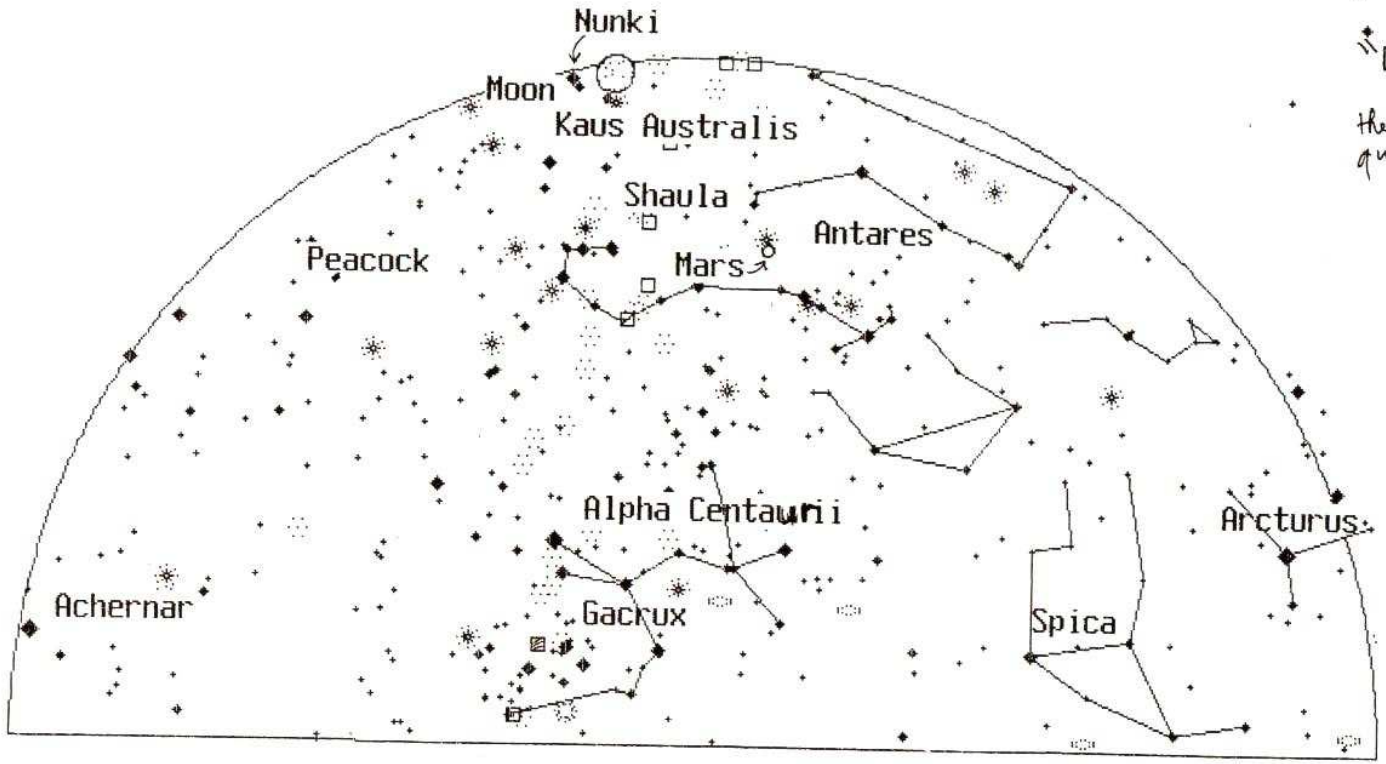
Both Photos - *By John Cleverdon*

Kindly reproduced by Ken Bryant, labelled by Ian Porter, and collated/posted by Sally Zetter.

SKY FOR THE MONTH JULY 18 - AUGUST 14 2001 inclusive



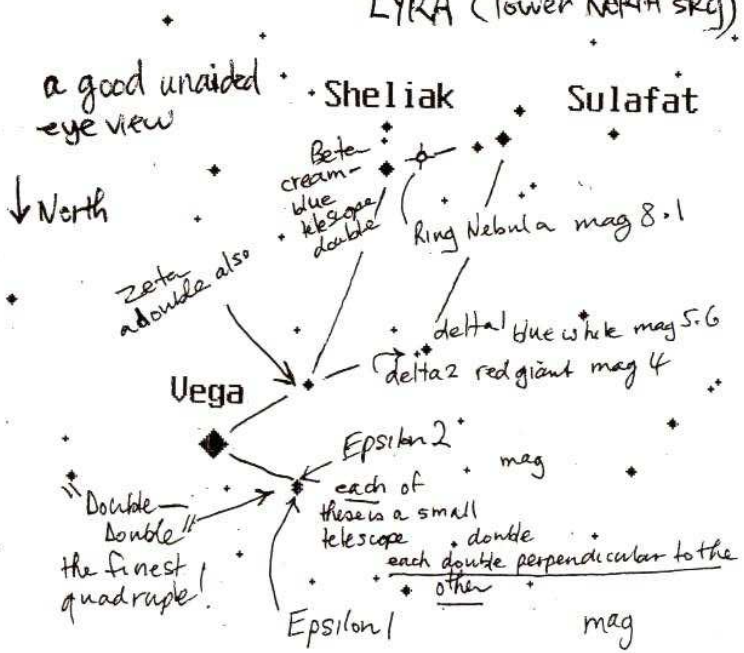


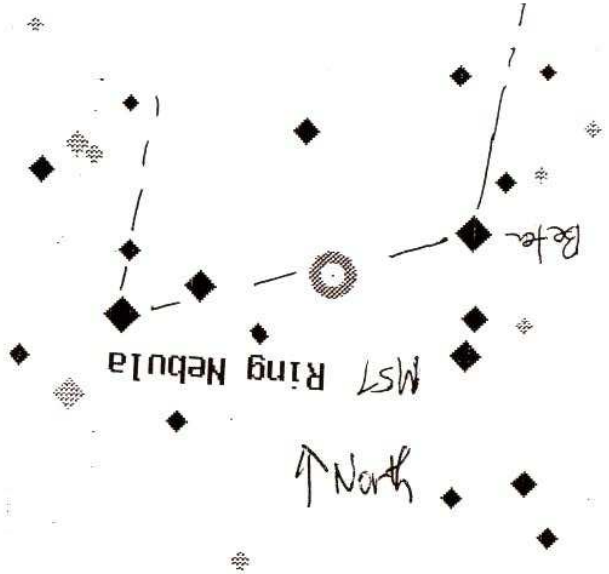


10 pm 1st August 2001 South-West Night Sky Standard Time

18/7/2001 Bob Heale, ASF

LYRA (lower North sky)





Mornington Peninsula Astronomical Society