SCORPIO

Journal of the Astronomical Society of Frankston Inc

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FUTURE EVENT

GENERAL MEETING

16th MARCH 1994

Show and Tell Night.

20th APRIL 1994

General Meeting back at Peninsula School.

Topic : NACAA REVIEW

VIEWING NIGHTS

see at right

COMMITTEE MEETING

The committee will be held at the Brown's residence on:-

24th March 1994

28th April 1994

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. In addition the Society provides the services of its members for educational presentations or observing nights for schools and local community groups.

COMING EVENTS

With the end of daylight saving we can really get down to some serious observing.

A number of events are planned for the next few months:-

9th March - Special Viewing for RMIT Golden Valley Ranch, Baldry's Rd. Flinders

10th & 16th March - Special Viewing for the St. Leonard School. This coincides with the General Meeting and some members will be forgoing the meeting to help at this event.

12th March - Members viewing night at The Briars start 8pm.

16th March General Meeting

19th March - Public Viewing Night at Ballom Park start 8pm.

21st - 25th March - Mornington Environment Week at Briars. Volunteers needed.

26th March - The Big Bang BBQ at Ballom Park. BYO everything. Starts 7pm.

1st - 5th April - NACAA in Canberra

9th April - Members viewing night at The Briars starts 8pm.

20th April General Meeting

30th April - The Jupiter BBQ at Ballom Park starts 7pm.

If you have an ideas for future events or Society activities please send me a letter or contact a committee member. Remember we want to make our Society activities as much fun as possible.

MEMBERSHIP FEES

Annual subscriptions are now due.

Don't forget we have changed the due dates from July to January.

If you are unsure of your membership status contact P.Brown.

Meeting Venue:

The Peninsula School

Wooralla Drive, Mt Eliza

(Melways Map 105, F5)

Room F6 at 8.00pm on the third Wednesday of each Month

Visitors are always welcome

Annual Membership Fees

Full Members	**$20**
Concession Members	**$15**
Family Members	**$30**
Family Pensioners	**$25**

Membership Fees due 1st January each year

President

Peter Lowe (03)775 9347 (AH)

Vice President

Peter Skilton (03) 776 5898

Treasurer

Peter Brown (03) 789 5679

Secretary

Don Leggett (059) 85 4927

Committee

Ros Skilton	**(03) 776 5898**
Tony Hales	**(03) 781 3251**
Laurie McIntyre	**(03) 786 6120**
Steve Malone	**(03) 789 6239**

Don't forget if you have any comments or contributions - please contact the Editor

SOCIETY NEWS

The Briars Summer observing programme didn't get off to such a great start. Of the four public viewing nights held, only one was successfully held. Fortunately this was also our first open air general meeting at The Briars. We had a very successful meeting with numerous members of the public joining in. A special welcome went to Messrs. Don Driver and Norm Hunter who rejoined the society after nears twenty years absence. Welcome back.

The observing at Ballam park was more successful with regard to public viewing. Several families stayed on till nearly mid-night and we hope there might be some new members there. With the move from daylight saving back to "real time" we will be starting our school education observing program. Tony Hales has already started planning these. Remember the monies raised on these programs add to the savings for our observatory so please help out where you can.

CRANBOURNE VIEWINGS.

We have had two more attempts at viewing nights in the Cranbourne area. The members night at the Royal Botanic Gardens was clouded out however it was nice to see such a good attendance of members despite the 100% cloud cover.

A public viewng night at the Cranbourne High School was a little more successful. Although the weather was a little variable {Tonys Dobsonian on wheels proved its worth for dodging rain showers}, the skies did clear later to reveal a few objects. Of interest was the Society display boards, shown for the first time. These boards will be displayed at the coming NACAA as a display poster. Peter Malone showed the advantages of using CCD video for viewing nights when he displayed realtime images of the moon and shots of Venus he had previously recorded. A selection of videos made up by society members looked very professional and will be a valuable asset for future viewing nights.

While we have not had great success at Cranbourne, we will keep trying.

Work on the observatory at The Briars has started. The site was surveyed during late January in preparation for a the development of working drawingsto be submitted to The Brairs management and Mornington Council. The submission accepted by the council last year requires us to develop a one year lease. After this we would negotiate a longer term lease prior to construction of a more substantial observatory. The photo below shows Peter and Ros .Skilton with D.Leggert discussing the site survey.

{ I think they were trying to find North !! }

AUSTRALIA DAY PARADE

The ASF joined in the Frankston Australia Day Parade and public celebrations this year. Our "Astronomy on the Move" caravan made a great float followed by the 400mm Newtonian on a trailer. Interestingly we were right behind the army with their 100mm cannons. Our scope look more impressive even if it didn't make as much noise!!

We set up a display tent featuring our poster display for NACCA and a variety of telescopes. The response from the public was tremendous.

Mirror grinding displays were very popular and we had members of the public having a go at grinding a mirror.

The whole event was followed up with a BBQ at the Royal Botanic Gardens the next week. As usual a great day.

Special thanks to Steve and Laurie for their organising abilities.

ASF MEMBER WINS PRIZE.

Peter Skilton does it again and has won The Nervo Shatterini Prize for the second time. To win this prize one must correctly answer the questions in the Night Sky Newletter issued by the Binocular and Telescope Shop, NSW.

Last time I spoke to him Peter was understandable happy but mumbling something about: questions too easy and looking for a real challenge !!

Congratulations Peter.

ODDSPOT

While picking up some petrol the other day, I asked for a car wash. The attendant asked if I wanted the $4, $6 or the 8$ wash.

"What's the difference ?" I asked. "One's $4, one's $6 and the others $8" the attendant replied.

No doubt about it You can't argue with logic like that !!!

WHAT'S NEWS IN ASTRONOMY

SPACE TELEPRESENCING

By their very nature spacecraft must be remote controlled vehicles. Current research into more effective remote control took a big boost recently when American operators controlled a prototype Mars rover using "tele-operator" methods to simulate the communication conditions likely from a Mar Mission. The operator is able to take in video and other information then directly control the vehicle. The time delays to exchange signals between the operator and the rover can take between 8 to 40 minutes depending on the distance between Mars and Earth. The operator is thus constrained to go slow. Telepresence technology will allow the operator to manoeuvre the vehicle using a virtual reality facsimile constructed from data sent back by the vehicle's instrumentation. While the vehicle is stationary, stereo pictures are taken to build up a virtual reality computer simulation of the vehicle's immediate surroundings. Once generated the operator can confidently move the rover around within this simulation without the problems of time delays between commands and actions on the planet.

ADAPTIVE OPTICS & LASER GUIDE STARS.

A major reason to put a telescope into space has been to get above the Earth's murky atmosphere. Temperature variations, winds and general blurring covered under the generic term "seeing" means our atmosphere is in a state of perpetual motion. Every amateur has seen boiling telescopic images due to thermal activity in the skies above us. In fact the best seeing locations in the world can rarely match the theoretical resolution of a 400mm (16") telescope. The real advantage in bigger instruments is increased light gathering capacity to see fainter objects. The Hubble Space Telescope is above all this and capable of being pushed to the theoretical limit of resolution for its size. Telescopes in space are exceedingly expensive and difficult to operate in such a hostile environment. It would be much better if ground based telescopes could better handle the general variability of the atmosphere. Adaptive optics is a technique where a computer monitors the quality of a star's image, usually using a camera, and adjusts the shape of the telescope's mirror to compensate for the changing conditions. If this is done fast enough the telescope effectively adapts in real time to the atmospheric seeing, allowing astronomers to view objects at the telescope's resolution limit. One new method recently declassified by the US Defence Department is a new form of adaptive optics. Instead of monitoring a bright star, the new system creates an "artificial" star by firing a laser as a beacon to gauge the instantaneous atmospheric distortion and then adjusts the telescope mirror accordingly. The technique depends on a green laser shone into the sky and reflected off oxygen and hydrogen molecules in the lower atmosphere. The control computer samples the atmospheric conditions along the telescope's line of sight some 2,000 time per second and adjusts the telescope optics 150 times per second. Pictures from a USAF 1.5m telescope were made public at the American Astronomical Society in January and showed areas of the Orion Nebula in sharper detail than can be produced by the Hubble Space Telescope. The images revealed stars with previously unseen clouds of ionised hydrogen streaming away like comets. These first pictures are dramatic proof that ground based telescopes can be controlled using adaptive optics to achieve their theoretical resolution limit.

CLEMENTINE TO THE MOON

The first US mission to the Moon since the early 1970's has successfully past its first lunar mapping objectives. The Clementine 1 craft is unusual because it is manufactured mainly from proven off the shelf components. Using this approach the craft was developed in less than two years for a total cost of only $80 million including the launch vehicle and mission control. Clememtine first undertook a extensive lunar mapping which will be followed by a flyby of the near Earth asteroid 1620 Geographos. The development of space craft like Clementine is considered important because it has several advantages over larger, more complex craft. Large complex craft can take decades to develop requiring the development of new technologies, enormous costs and as in the case of the Mars Explorer, the whole lot can be lost without trace. Smaller craft can be quickly developed using the latest available technologies, launched at low cost and thus a total loss of the craft is less traumatic. Clementine could become the first craft in a new wave of solar system exploration {see below}.

MORE PROBES TO MARS

After the loss of the Mars Observer probe last year NASA is rushing to get more probes on the way to the Red Planet. Instead of a large complex craft, the plan is to send several smaller probes and spread the risk. The first probe will map the Martian surface leaving a second probe to analyse the atmosphere.

FROZEN MARTIANS

Three million year old bacteria found in Siberian permafrost has given exobiologists some hope of finding frozen life on Mars. Fossilised river and lake beds discovered by space probes shows that liquid water was once plentiful on the Martian surface. As Mars lost its carbon dioxide greenhouse gases, it slowly cooled until all liquid water froze. No permanent liquid water has existed on Mars for some 3 billion years. Compared with the 3 million year old Siberian bacteria, any frozen Martians are much, much older however the possibility of finding life is hopeful. Possible sites have been identified to be photographed by future Mars Missions.

NEW DATA ON OZONE LAYER

As many would be aware, the Earth's Ozone layer is gradually diminishing as a result of human activity over the last couple of decades.

Ozone is a colourless gas that smells like the ocean to some people. Others register it as a sort of metallic, fresh smell. You can easily smell it if you have an improperly adjusted photocopier machine or near anywhere that issues a high voltage discharge, or spark, through the air.

Its claim to fame is undoubtedly that it forms a relatively narrow layer in our upper atmosphere (the Stratosphere) that effectively absorbs the higher energy ultraviolet waves that reach our planet from the Sun. These wavelengths of light are known to promote the chance of getting skin cancers and eye cataracts in humans and animals, as well as causing damage and mutation in crops and plants.

If the protective Ozone layer is thinned out, then more of these rays are able to reach the surface of our planet, and consequently the incidence of these unpleasant afflictions increases. The incidence increases exponentially with exposure, not just linearly, meaning that a halving in the thickness of the layer would much more than double any unpleasant effects.

A measurable thinning of the layer has now been occurring for several years, due mostly to so-called halocarbons, including the well-known CFC's, or ChloroFluoroCarbons. This class of chemicals is almost exclusively manmade with them being used in diverse applications such as the propellant in many spraycans, the refrigerant in many fridges, the propellant in yellow BCF fire extinguishers for electrical fires (BromoChloroFluorocarbon), and even in dry cleaning. In these applications, the gas is non-toxic and does not chemically react, thereby enabling it to be stored for long periods of time and posing little or no risk to the operator.

However, when released into the atmosphere (the fridge is dumped at the tip and slowly leaks, the spraycan is used etc.) the gas slowly makes its way upwards in the atmosphere and, because it lasts a very long time, after a few decades it finally reaches the levels where ozone is plentiful.

Here, the high energy UV rays from the Sun are absorbed by the CFC's causing them to break down into highly reactive compounds known as radicals. These rapidly destroy ozone molecules, but unfortunately do not themselves get used up in the reaction. Therefore one molecule of CFC can readily destroy many millions of molecules of ozone. Hence we have been able to cause a planet wide effect on the layer in a relatively short time. It is also why we cannot just produce ozone at ground level and pump it up there as a solution.

The damage currently inflicted on the layer is due to gases that left the Earth's surface a couple of decades ago, with the amount that has been released since then slowly rising upwards through the atmosphere.

Very recent measurements from the orbiting Nimbus 7 satellite show that at the latitude of Melbourne, the ozone layer has decreased by 1/25 since measurements were taken in 1979. This corresponds to a 6 percent increase in likelihood of skin cancer. Therefore, during the daytime, remember to cover up. If you were at the South Pole, the ozone levels have apparently decreased by over 1/5.

Of course, many governments have now started to take action to limit the release of the more damaging compounds and various international protocols have been signed. Nevertheless, even if we all stopped using these compounds today, it would be several decades before levels would decrease in the Stratosphere.

There is some good news though. Ozone is present in the smog surrounding cities, providing a degree of UV protection to the inhabitants. They succumb to the pollutants instead!

SELF CONTAINED LIVING.

For over a century now, sci-fi writers have been exploring the possibilities of manned interplanetary travel. This exploration has included everything from hyperspace drives to crew hibernation or just taking a bit of Earth with you. The only interplanetary travel todate has been to our own moon and this used the latter method. Given the short duration of the flight, sufficient resouces was taken to keep the astronauts alive without recycling wastes. For long flights a bigger bit of Earth is needed. If a large enough piece of Earth could be taken it would be possible to grow food, regenerate oxygen and recycle all water and food wastes. The big question is "How big a bit of Earth is required"? As we approach the first long term interplanetary flights and lunar colonies, the question of long term life support is being addressed. An experiment current underway in the USA has entered a second phase. For the last two years people have been living in a sealed, self-contained laboratory. The laboratory possesses sufficient space, soil, air, water and power to hopefully achieve a self-sustaining environment. During the first two year period, the team ran into serious problems. Firstly there was insufficient plants to recycle carbon dioxides back to oxygen. Bacteria in the soil was found to be having a bigger effect than anticipated. Water started to become polluted and plants started to die off. It became necessary to introduce mechanical contrivances to scrub CO_2 from the air and aerate the water. A lot has been learnt through this first trial period and the second trial will hopefully be more successful. This first attempt to replicate an Earthlike environment is severely limited, given it is being conducted on Earth and thus still receiving solar energy, heat from the surrounding environment, all the protection of the atmosphere above us and of course gravity. It is however an important first step to the question "How big a bit of Earth"?

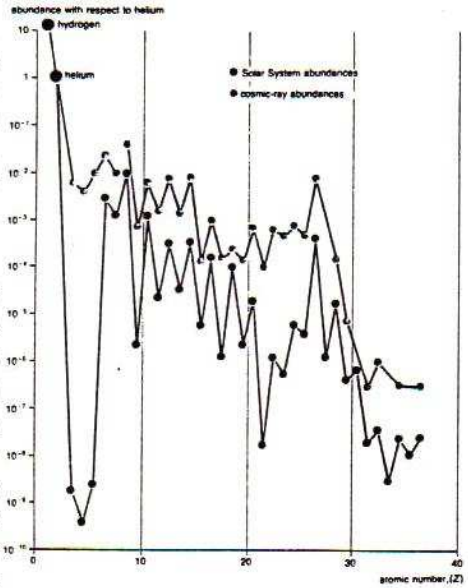
DISCUSSIONS - COSMIC RAYS

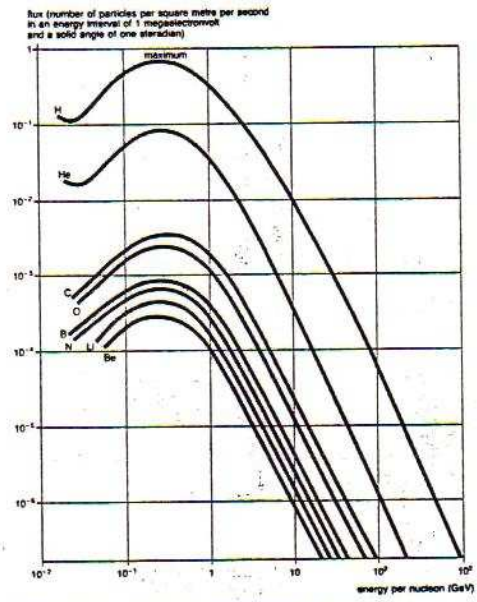
Around the turn of the century, the underlaying principles of magnetism and electricity were being slowly explored. One avenue of exploration was the ionization of gases where an early discovery was the apparent self ionisation of the air and gases under high vacuum conditions. Even with the best shielding around their apparatus, experimenters found gases under high vacuum still had a level of self-ionisation present. Some theorists suggested this might be due to high energy celestial radiation however it seemed a far fetched idea and there were still many more Earthly possibilities. While the evidence built up slowly, the quintessential observation was made in 1912 when the Austrian physicist Victor Hess took two electroscopes in a balloon to a height of ten kilometres. He found the electroscopes discharged faster as the balloon rose higher. This was the first direct evidence of an ionising agent whose influence increased with altitude. An extraterrestrial source of radiation hitting the Earth's upper atmosphere was strongly suspected but could not be confirmed until the development of the Gieger-Muller counter and the nuclear cloud chamber. The radiation source consisted of charged particles covering an enormous range of energies. These particles were collective dubbed Cosmic Rays and it has taken most of the twentieth century to pin down their characteristics and origins.

Cosmic rays consist almost entirely of highly energetic atomic nuclei. The elemental breakdown of cosmic rays shows a composition identical in abundances to the elements found in the Solar System apart for a few important exceptions. It appears the interstellar and probably intergalactic space around us is infused with a gas of ordinary terrestrial-type matter but highly ionised and highly accelerated to speeds very close to the speed of light. The vast majority of cosmic rays consist of hydrogen and helium with all the other elements present in smaller quantities. At the lower energy ranges of a few million to a few hundred million electron volts(eV), the flux of radiation increases and peaks at an energy about 100MeV then steadily declines. The number of cosmic rays detected at the lower energies is strongly effected by the Sun's solar cycle. At maximum the solar wind is enhanced and the interactions between the solar wind and the cosmic rays reduces their flux at the Earth. The effect is called Solar Modulation. At the very high energy range, the energy of the cosmic ray particle is so high it can come barrelling in the Earth's atmosphere unaffected by the solar wind. Particles with energies as high as a few thousand, million, million electron volts have been detected. Consider that we a talking about a single atomic nucleus with enough energy to lift a person a meter off the ground. Fortunately they don't get that far.!!

It appears cosmic rays consist of atoms of ordinary matter, ionised and accelerated by some process to speeds close to that of light. The discovery of neutrons stars, pulsars, blazers, quasars, active galactic nuclei and most probably black holes at the core of some galaxies presents us with a myriad of possible sources for cosmic rays. We now see strong evidence that particles are being accelerated and ejected along jets of matter associated with fast rotating, highly compact objects. The apparent impossibly energetic blazers are thought to be jets of accelerated material beamed in our direction.

The term Cosmic Ray has become a generic term for all high energy particle radiation bombarding our Earth from space. Some of it coming from nearby energetic objects such as our next door neighbour The Crab pulsar, or the active core of our own galaxy while other particles will have come from the enormous linear accelerators jetting out from distant galaxies.





The form of the cosmic-ray flux. Three regions can be distinguished in this representation of the flux of cosmic rays as a function of energy. At energies less than about 10^{-1} gigaelectronvolts (GeV) the flux of cosmic rays decreases strongly with energy. These cosmic rays come from the Sun. There are more particles in this energy range when the Sun is active, that is, when there is a greater number of solar flares, which happens on an eleven year cycle. For energies from 10^{-1} GeV up to a few GeV (1 GeV = 10^{9} eV), there is an increase in flux, reaching a maximum at about 1 GeV. These particles are of galactic origin (they come from all the exploding objects and their remnants scattered throughout the galactic disk). In this energy range, cosmic-ray particles are strongly affected by solar modulation: the less energy they have, the more they are prevented from penetrating into the region occupied by the Solar System, hence the maximum at 1 GeV. The maximum flux varies strongly with solar activity. Finally, for energies greater than 10 GeV, solar modulation no longer affects the cosmic radiation. The flux decreases as the energy of the particles to the power 2.6 because it is easier to accelerate particles to low energy than to give them very high energy.

SUCCESS IN CETUS: MINOR PLANET GYPTIS BAGGED

by Peter. F. Skilton

Much interest has been generated in recent times with the small number of so-called Earth-crossing asteroids, which potentially could pose a collision threat to our planet. However, there are many more such bodies which stay well away from Earth, out beyond the orbit of Mars. The size and shape of these very distant minor planets cannot be directly viewed, even with the most powerful Earth-based telescopes. Nevertheless, valuable information in this respect can be gleaned in certain rare circumstances with only modest equipment.

On Saturday 1994 Jan 08/09, not long after midnight local time, a dim background star, designated PPM145700 in the constellation of Cetus, cast a shadow of the minor planet Gyptis onto the Earth's surface over Australia.

As the asteroid moved in its orbit around the Sun, the shadow swept across Victoria and NSW in a roughly SW to NE direction, travelling at over 8 kilometres per second on the ground. Originally predicted to pass over Adelaide and Brisbane, the shadow path was instead observed to be significantly shifted South.

Minor planet Gyptis, number 444, was discovered in 1899 Mar 31 by J. Coggia at Marseilles. It was named in honour of the wife of Protis, chief of the expedition from Phocaea which founded Marseilles. Marseilles is the most ancient city in France, dating back to about 600 BC. Gyptis was the daughter of the king of the Segobrigs, who assigned the ground where Marseilles was originally built.

Local observers at Frankston (Peter Skilton, ASF & ASV), Gisborne (Jim Blanksby, ASV), and Mt.Waverley (Alfred Kruijshoop, ASV) successfully timed the rare transit of the shadow over their locations. Three others at Canberra (Patrick Purcell, Steven Ring and Byron Soulsby) similarly reported successful passages, though these observers were not as widely geographically separated as the local team. Due to late arrival of predictions, at least 3 other Frankston active members were unfortunately denied the opportunity of observing the event.

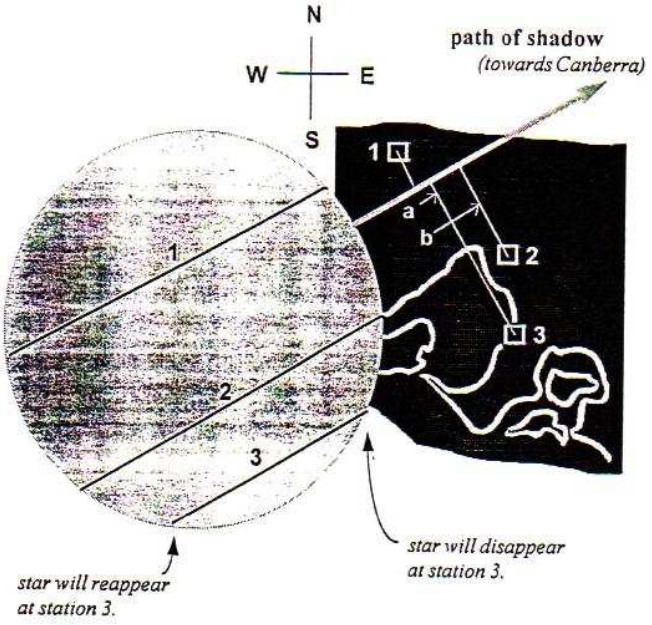
Figure 1 presents an aerial view of the circumstances of the event, depicting the asteroid shadow about to pass over the Port Phillip bay region. The shadow is notionally represented here as being circular for clarity.

As observing stations pass into the leading edge of the shadow, they observe the background star "wink out" for the duration. As they emerge from the trailing edge of the shadow, the star reappears. By exactly timing these moments of disappearance and reappearance of the star, the size and shape of the shadow, and hence ultimately of the minor planet itself, can be deduced, since each station will produce a single chord across the shadow as indicated.

It is entirely possible for secondary shadows to exist due to the asteroid maybe being a close binary association. None was observed in this case.

All observers used the VNG 5 MHz

Figure 1: Aerial view of shadow path of Gyptis over Port Phillip bay, 1994 Jan 08 1327 UT.



Local observation stations shown at:

1.	Gisborne	*Jim Blanksby*
2.	Mt.Waverley	*Alfred Kruijshoop*
3.	Frankston	*Peter Skilton*

standard time signal service with tape recording, with the exception of the Gisborne observer who used the less accurate "eye and ear" method due to forgetting the expected time for the event.

We can determine the dimension of the shadow perpendicular to its path by knowing the distances of the stations from the centre line by using a map. For example, this is shown as the line marked (a) in Figure 1 for Frankston, and (b) for Mt.Waverley. To determine the dimension parallel to the path, we combine the predicted velocity of the shadow with the observed times, taking due account of the time delay for the shadow to travel along the path from one station to the next. All times are therefore adjusted to be relative to one observing station for comparison purposes.

If we do not include the Canberra results, we can consider as negligible the complicating secondary effects of the Earth's rotation between each station during the passage of the shadow, and the curvature of the Earth. For example, in the time the shadow took to travel from Melbourne to Canberra, the Earth had rotated almost 20 km, affecting the arrival time in Canberra. We have also omitted taking into account any effects due to differences in altitude of the observing stations, though we believe this is insignificant for the local observations.

In this way, we can arrive at Figure 2, with the observed adjusted local timings shown by the horizontal chords.

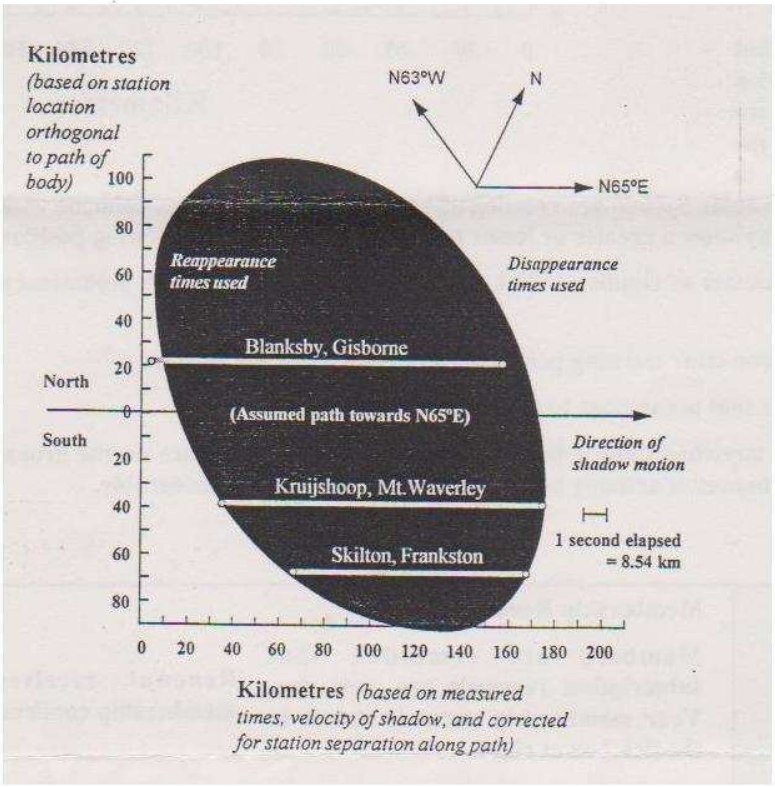


Figure 2: Aerial view of estimated shadow profile for minor planet Gyptis (444) occulting star PPM145700 in Cetus 1994 Jan 08 1327 UT.

The dimensions of the shadow are dependent on the direction of its path over the Earth's surface. The assumed path was that predicted for the event, and confidence in this assumption is borne out when this bearing is extrapolated from Melbourne and is then predicted to indeed pass over Canberra, as observed.

Several other astronomical societies could have been beneath the track of the shadow. It also passed over Geelong, Ballarat, Bendigo, Albury-Wodonga and Sydney. However, I am aware of no other reports, with the latter region probably being overcast by the smoke of recent major bushfires.

Incorporation of the Canberra results, taking into careful account of all secondary complicating factors, will await detailed analysis by Graham Blow of the RASNZ.

It is immediately obvious from Figure 2 that the minor planet is large, and that the results do not adequately fit a circularly shaped shadow.

Because the event did not occur directly overhead, the shadow will be extended somewhat in the direction of Cetus in the sky at the time. The degree of extension is dependent on the local altitude of Cetus. As an analogy, if you project a torch beam at right angles to a surface, a circular image will be presented. However, if projected at an angle, an ellipse will result.

Cetus was in the North to North Western sky at the time, which exactly correlates with the long axis of the shadow ellipse, indicating some stretching of the long axis has occurred due to this effect. Therefore the minor planet profile itself is more circular than suggested by its shadow.

Figure 3 shows the shape of the shadow after I have made an exact altitude correction for this effect. The star was about 20 degrees above the horizon at the time of the event

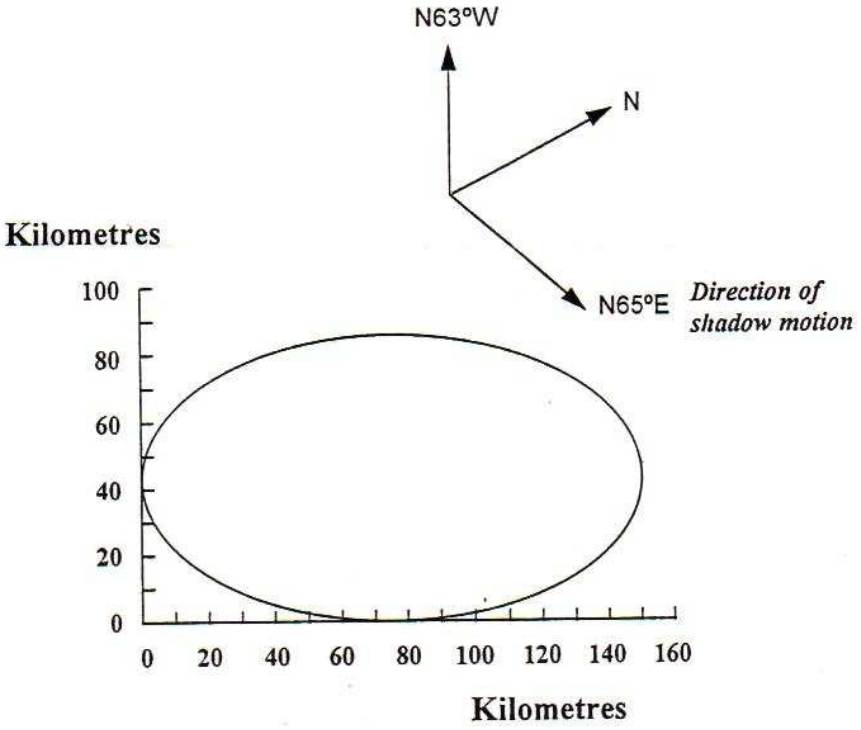
As can be seen, the minor planet is

still roughly an ellipse in shape, being 150 km long and 85 km wide.

The observers were well distributed orthogonal to the shadow path, enabling a good estimation of its profile. A more accurate analysis will eventually ensue from the RASNZ, including a necessary refinement of the body's orbital parameters. The Southward shift of the track is probably due to a combination of uncertainty in the orbit of the minor planet, and in the catalogued position of the star.

Certainly, all minor planet-like bodies directly observed by spacecraft cameras in recent times have tended to be far from spherical. For example, recall the potato shape of the nucleus of Halley's comet, or the irregular shapes of the images of Gaspra and Ida. Therefore, a non-circular profile is not unreasonable in the case of Gyptis.

Figure 3: Deduced profile for minor planet Gyptis.



The profile, of course, is that projected at the time of observation and will change depending on the body's orientation with respect to the Earth bound observer, since in general these rocky members of the Solar System are rotating about an axis that may not coincide with one of the ellipse axes. Therefore the minor planet may show a greater or lesser profile depending on our viewing position at the time.

The published estimation of the diameter of Gyptis is 170 km, in good agreement with the preliminary results presented here.

After this successful event, there is one clear learning point that no-one has told me to date:

Watch for minor planet occultations that occur close to the horizon !

This is because the shadow will be stretched quite a bit and will span far more distance on the ground than the size of the asteroid itself. Therefore your chances of actually being under it are enhanced considerably.

FOR SALE

AT GENERAL MEETING

Society Badges $5

Planospheres $8

ASF "T" Shirts $30

Telescope Making Equipment

Mirror Blanks, Grinding & Polishing Compounds, Spherometers, Eye-pieces, Secondary Mirrors, Spiders

Membership Renewals

Members are reminded that subscription renewals are now due. Your membership status is shown in the tick box at right.

After March, those members who haven't renewed will be removed from the mailing list.

Remember for those members unable to attend the meetings, a Scorpio subscription can be made for $10 per year.

Renewal received and membership confirmed. ☐

Renewal not received. ☐

ASF BBQ at the Cranbourne Botanical Gardens on the 5th February 1994 Photo - *By John Cleverdon*