CANOPUS

The Astronomical Society of Southern Africa

Johannesburg Centre

Monthly Newsletter for August 2002

Contents:

The Sir Herbert Baker Library, 18a Gill Street, Observatory, Johannesburg
P.O.Box 93145, Yeoville, 2143

Editorial

Mid-Winter is now long gone and we are now well into the 2nd half of 2002. Where does the time go? It never used to go this quickly when we were kids at school and wishing that the terms would go more quickly - mind you, we didn't want the holidays to go as fast! July has been largely clear and cold with pretty good seeing most of the time, and Venus is shining like a veritable beacon in the evening skies.

And talking of good seeing - now that there are specialised asteroid and NEO telescopes hard at work, they are finding many new chunks of rock orbiting around up there - quite a few of which are potentially of significance to us down here on Earth. One of these, 800 metres in size, will pass close enough to us to be viewable in ordinary binoculars. This could cause quite a dent if it had to land down here.

Another new Asteroid has been discovered in an orbit tilted quite sharply to the plane of the Ecliptic. What makes this one special is that is the first to be awarded a positive Torino (or is it Palermo?) number, as it could potentially collide with the Earth in 2060, and at it's size of 2Km, could cause global catastrophe. There is more information on these items in these pages.

Eric Brindeau has submitted an article showing us how to use the Digitized Sky Survey and **Brian Fraser** gives us some details of a few heavenly happenings for the next 2 months. **Eben van Zyl** answers Val's question on the expansion of the Universe, and **Bert van Winsen** shows us how he built and uses his snug little observatory.

ECLIPSE chasers - remember we have a solar eclipse on 4th December. If you would like to be there, contact a committee member, or Brian Fraser for further details on how to get to the area of interest.

The Editor

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ASSA Jo'burg Centre - Calendar of Events

Month	Day/ Date	Event	Details
Aug	Fri 9	*Public Holiday* - probably no viewing	
	Mon 12	Committee Meeting 17:30	
	Wed 14	**Monthly Meeting**	"Finding the SCP" **Dave Gordon**
Sep	Fri 6	*Public viewing*	
	Mon 9	Committee Meeting 17:30	
	Wed 11	**Monthly Meeting**	Quantum Computing **Evan Dembskey**
Oct	Mon 7	Committee Meeting 17:30	
	Wed 9	**Monthly Meeting**	Eyepieces and telescope mounts **Chris Stewart**
	Fri 11	*Public viewing*	
Nov	Fri 8	*Public viewing*	
	Mon 11	Committee Meeting 17:30	
	Wed 13	**Monthly Meeting**	"Consciousness Mapping" **Prof Marilyn Lucas**
Dec	Tue 3	Star Party at Tshipese before	
	Wed 4	Solar Eclipse 2002	
	Mon 9	Committee meeting	
	Wed 11	**Year End Monthly Meeting**	Informal get together and viewing

Reminders

2002	ASSA Symposium / hosted by Pretoria Centre/ At Aloe Ridge Hotel and Conference Centre LEONIDS Nov 19 **December 4, Solar Eclipse**
2003	Centenary of Flight **August: Mars opposition** **Mercury Transit**
2004	Centenary Sir Herbert Baker Library Building Johannesburg Centre to host 2004 ASSA Symposium **June 8, Venus Transit**

Annual Subscription Fees

There is a small change to the Johannesburg Centre's subscription fee structure for the 2002/3 year. The joining fee remains R50-00 and the Annual fee is now R125-00. The Family subscription fee is now R150-00. The Family membership is restricted to couples and their co-resident dependants and although all Family members receive full rights as members of the Centre, only one copy of the monthly magazine, Canopus, will be posted to the family address. The annual subscription form is included with this issue of the Canopus and we would like to urge you as members to pay your subs as early as possible to enable your committee to plan the Centre's projects for the year ahead.

Please post your subscription fee, or deposit/transfer it directly into the Society's bank account at **NEDBANK**.
The Account information is as follows:-

Bank:		NEDBANK
Branch	Name:	Park Plaza
	Code:	19 21 42 44
Account	Type:	Current Account
	Number:	1921 013761
	Name:	ASSA Johannesburg Centre

Please remember to write your name on the deposit slip or to include your name as a reference on a direct transfer. Then fax the details to the Treasurer to let him know that you have paid via direct deposit or transfer so that you will be kept on the Canopus mailing list.

Using the Digitized Sky Survey (DSS) for serious deep sky observing

I am sure in some way or another many of us are using computer technology, which has really changed our hobby. Be it a desktop planetarium or venturing into CCD photography, it is all about increasing our knowledge and getting more out of what we do. In an age of being on-line – we have everything at our fingertips. Amateurs now have access to the same information the professionals have. It is only a matter of finding the right tools and learning how to use them.

Since my interest in astronomy and introduction to deep sky observing, I have been enjoying observing articles from past greats like the late Walter Scott Houston to today's enthusiasts in our hobby like Tom Polakis and Steve Gottlieb. Most of these articles use images from sky survey plates to accompany their articles. Only recently did I realise how easily accessible these sky surveys were – a digital photograph of the *entire* sky.

With all the technology available to me, I am still of the old school and rely on star charts for my observing sessions. I find the charts made using desktop planetariums awkward to use and difficult to get an accurate printout of the area of interest. The stars are too bloated and objects are not quite to scale or positioned accurately. With a Digitized Sky Survey (DSS) image, you get more detail in the star fields and galaxies as they actually appear.

My first experience using DSS images at the eyepiece was hunting down the Fornax galaxy cluster, provided by the "Observer's Page" (S&T Jan '98, Pg 109). Finding many of the brighter galaxy clusters (Abell, Hickson etc.) are not too difficult, but identifying which faint smudges are which is far more challenging. Seeing several galaxies in the same field of view and matching them against a finder chart will enable you to determine a benchmark for your telescope aperture, eyesight acuity and sky conditions.

You no longer have to obtain the over 100 CD's of the full DSS archive, since it is now available on-line. For the first time, amateur astronomers have access to the actual sky survey plates used for more than thirty years by research astronomers. The unprecedented level of telescopic detail, especially of galaxies, clusters and nebulae is invaluable.

There are several sky archives though, which you will soon find out when you to search the net. One of the latest sky surveys is the Sloan Digital Sky Survey (SDSS), which is busy systematically mapping one-quarter of the entire sky, producing a detailed image of it and determining the positions and absolute brightness of more than 100 million celestial objects! The total quantity of information produced is about 15 terabytes (trillion bytes) and rivals the information content of the Library of Congress.

History of Digitised Sky Survey

DSS images are based on photographic data obtained using the Oschin Schmidt Telescope on Palomar Mountain.

The National Geographic Society's Palomar Observatory Sky Survey project was a seven-year effort to construct a photographic atlas of the sky. Completed in 1958, this project produced thousands of 14 inch square glass plates, each of which encompassed a 6.5 degree square area. Photographed in two wavelength ranges (red and blue), nebulas and stars down to about magnitude 20 were recorded. These images became a basic research tool for astronomers because of the vast amount of information that they contained.

The Space Telescope Science Institute (STScI) digitized the Palomar Observatory Sky Survey as part of an intensive eight-year effort to create the Guide Star Catalogue (GSC) for the Hubble Space Telescope. It took five years to accurately scan the plates and convert them into a database. The resulting scans represented a huge quantity of data, which were later compressed by a ratio of ten to one using a custom algorithm to minimize information loss and make it more accessible to researchers. In 1994, the compressed data, dubbed the *Digitized Sky Survey*, was released to researchers on 102 CD-ROM's. The CD ROMS were then placed into jukeboxes for rapid access. Users can then easily retrieve image information for any part of the sky. The jukebox apparently gets over 1500 hits a day!

A Powerful Research Tool

DSS images may be retrieved through the Web.

- Go to the DSS Digitized Sky Survey website - http://archive.stsci.edu/dss/

- Take the "Simple Retrieval Form" link on the left navigation.
- On the retrieval page are several links, which provide help files on specific topics.
- If you don't know your object coordinates, you can retrieve them from either the linked SIMBAD or NED databases.

  SIMBAD stands for **S**et of **I**dentifications, **M**easurements, and **B**ibliography for **A**stronomical **D**ata; NED stands for **N**ASA **E**xtragalactic **D**atabase.

  SIMBAD and NED only catalog fixed objects, like stars and galaxies. These databases don't track moving targets, like planets, comets, and asteroids. The Sky Surveys were designed to avoid bright solar-system objects anyway, so there won't be any images in the DSS of Saturn or comets.
- If you only want to download an image, make sure you change the selection from "FITS" to "GIF".

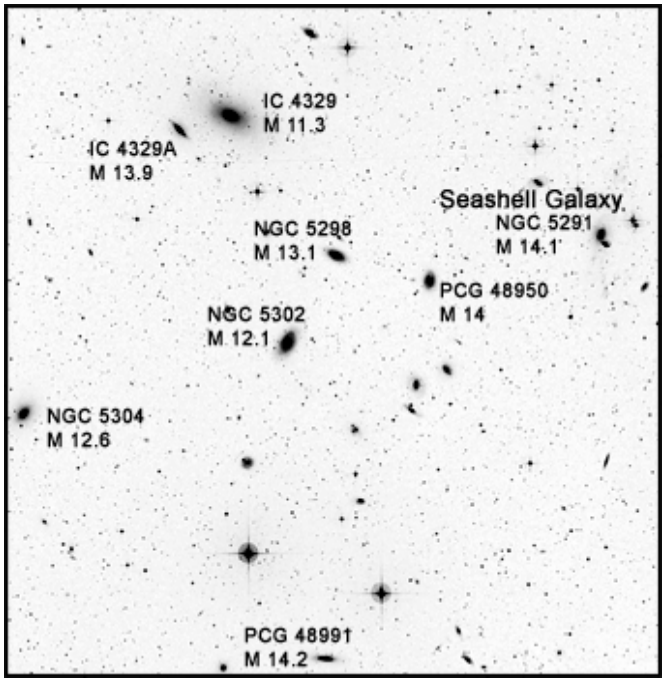
  The Flexible Image Transport System, or FITS, is the format adopted by the astronomical community for data interchange and archival storage. A data file in FITS format consists of a series of Header Data Units (HDUs), each containing two components: an ASCII text header and the binary data. The header contains a series of header keywords that describe the data in a particular HDU and the data component immediately follows the header).
- Experiment with the image size by entering a height and width in arcminutes. Requesting a larger image size significantly influences the downloaded image byte size. The default size is 15' x 15', which yields a GIF image of usually around 160 kilobytes. Images from the Second Generation scans will be larger than from the First (not all of the Second Generation DSS scans have been loaded).

  The First Generation comprises the older surveys, scanned at about 1.7 arcseconds per pixel. The Second Generation is from a newer ongoing survey, scanned at about 1 arcseconds per pixel.
- Before printing the image for use at the eyepiece, use your favourite graphics-editing program to "invert" it (white page with black stars and deep sky objects). This makes it easier to see in the dark and saves on printer inks.

Make sure you visit the "Gallery" section, which has interesting object outtakes from the survey. The images were collected while going through the scans of the photographic plates.

Acknowledgements

If you're using images from the DSS for research, teaching purposes and other non-profit activities, you may use them freely, and only have to acknowledge the source. For commercial applications you require a license.



Success!

On a recent dark sky trip, we were able to positively identify eight galaxies of Abell 3574 galaxy cluster in Centaurus (near M83) using a 12inch *f*/7. Appearing almost in the same field of view: IC 4329 (M11.3); IC 4329A (M13.9); NGC 5298 (M13.1); PCG 48950 (M14); NGC 5302 (M12.1); NGC 5304 (M 12.6); PCG 48991 (M14.2); NGC 5291 (M 14.1 – Seashell Galaxy).

Eric Brindeau

A unique little Observatory

You may be forgiven for thinking that this is a toolshed or, judging from the pipe sticking out the bottom, some kind of toilet. But no, it is an amateur(ish) observatory.
The reason why it sits at a jaunty angle on it's base is because it rotates; the entire structure runs on castors in a circular track in the floor.
One could intuitively grasp that such a structure is probably not that complicated, and indeed it is not. It is at least a lot simpler than trying to get a rotating roof to stay on fixed sides, which would really be going professional. But why go to the trouble? I had some good reasons for going this route, as opposed to the more "traditional" roll-off roof type structure.

Standing in the observatory does not give one the grandiose feeling of solitude and "oneness" with the telescope and the clear open sky above stretching from horizon to horizon that I experienced in Dave Gordon's roll-off-roof observatory at a star party a little while ago. Indeed, it is somewhat pokey inside; and one has to exercise caution moving about inside in the dark, lest you receive a sharp rap on the head or kneecap from a mount counterweight. But it was not designed for human occupation. It houses a 10inch Newtonian on a German equatorial mount, and a CCD.

There-in lies the key for my choice of a rotating dome. CCD's tend to be small in size, unless one has plenty of bucks, and therefore span a rather small section of sky(typically 10 to 30 arc minutes). This, coupled with the fact that one can achieve image resolution of a few arc seconds, means that you don't need the wind pushing the open end of a Newtonian around while trying to record fine detail during an exposure of anything up to an hour. Hence the desirability of a narrow slit, and subsequently a kind of a dome to hold the slit! There are other advantages; stray light from neighboring security lights or your own kitchen becomes much less of a factor. And it also has a small footprint, which can be an advantage on small properties.

The way I use the observatory is as follows; I decide on an object to image. I go into the observatory and manually slew the telescope to the desired starfield using my setting circles, rotate the dome so that the slit is above the business end of the telescope, and center on the object, or the section of the starfield where I know the object is, with a 26mm eyepiece. The scope tracks automatically. I then replace the eyepiece with the CCD, switch off any lights that may have been on, close the door of the observatory behind me, and cross over some lawn to the toolshed where my computer is installed. There I work under pleasant lighting, coffee close by, and control all further telescope and CCD functions from the computer. I like it.

The open slit is visible here. The slit is wide enough so that the scope can track for about an hour, which means that there is no need for automatic rotation of the dome. Although I sometimes have to nudge the dome a little from outside. The pipe is obviously used for power and signal cabling between the observatory and the computer in the shed.

Construction

This is a view of the scope on it's mount behind the open door. I decided to use my portable pier on legs in a tripod fashion here, because I often strip the scope down for trips to dark sites, and I was probably too lazy to make a solid pier in concrete. But it works well enough. The tripod legs extend through holes in the floor and rest on a concrete plinth below the floor. That means that I can walk around inside or rotate the dome without disturbing the stability of the scope.

Cables come up through the center of the floor next to the pier, and go direct to the electronics.

Four fairly heavy duty castors are mounted in the middle of each side of the structure. They run in a shallow track cut into the pine floor. This was easy to make; I simply mounted a router at the end of a strip of plank, and held the other end of the plank in the center of the floor with a single nail. The thing worked like a drawing compass, with the router switched on, I rotated the router held in place by the plank round and round in the floor, cutting the track exactly where I wanted it. I had to move the router in a little along the plank for subsequent grooves, thereby making the track to the desired width.

You might notice from the top pictures that the sides seem to be assembled from 2 sections. I used 2.44m x 1.22m x3.2mm (standard size) exterior plywood in two sections, giving me a square dome measuring 2.44m x 2.44m. All plywood sheeting was joined in the middle and corners with 38mm pine brandering and plenty of chipboard screws with an electric screwdriver. Believe me, you don't want to assemble the entire structure with a manual screwdriver. The corners and joins were also clad with narrow wooden strips to prevent rainwater from entering the joins.

Because the structure is square, I also had to reinforce the corners inside with triangular wood sections (done at the base) for rigidity required for rotation. The roof provides rigidity at the top.

This last picture shows one of these triangular corner sections, a little work table mounted in the corner, one of the pier legs, a castor mounted in the middle of one of the sides, and some skirting at the bottom made from canvas, that drags across the floor when the dome is rotated, to prevent dust blowing in from outside. The interior sides and roof were left untreated. The floor, however, was painted top and bottom with polyester resin for waterproofing.

The sides were varnished using probably one of the best and most expensive treatment varnishes, called "Rubbel", available from Barney's Paint outlets. I still have to varnish once a year. The roof was clad with fiberglass medium weight cloth and polyester resin, and painted white with Plascon Glatex 8 enamel. Maybe I should have fibreglassed the whole thing, that would have circumvented yearly maintenance of the sides; next time.

By the way, I can dissemble the dome and floor and take it with me, should I ever decide to move to a darker (future retirement) location.

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THE EXPANDING UNIVERSE

Val Eraser's three questions - May 2002:

1. Are the objects which are 15 billion light years away at the centre of the universe? *No. They are seen by the light which left them 15 milliard years ago and are not at the "centre of the universe" -- the universe has no centre.*

2. How is it possible to be looking at both the edge and the centre of the universe at the same time? - *The objects formed at the distance of 15 milliard light years were not at the "centre".*

3. Where exactly are astronomers looking when they say the edge of the universe? *They are looking at objects so far away that their speeds of recession are almost equal to the speed of light.*

These answers do not do justice to the questions asked by Val. In the late 1920's E P Hubble, H Shapley, M L Humason and V M Slipher discovered the expanding universe in which the galaxies are receding from each other. One can visualise this as a balloon with spots on it to represent the galaxies. When the balloon is inflated all the spots move away from each other as they move outwards. A tiny ant crawling on the surface of the balloon from galaxy to galaxy finds no end to the surface and he thinks his universe is infinite, yet we with our better point of view and superior know- ledge know that the ant's universe is finite. Wherever the ant finds himself he sees himself as being at the centre of the universe and his observable edge is the circle representing his horizon. Similarly, we see ourselves as if we were in the centre, not only of the universe, but also at the centre of our Galaxy which trails right across the sky as the Milky Way and we can see the stars describing their diurnal and annual motions across the sky with us in the middle. But there is no centre to the universe and the observable edge depends on the position from where the universe is viewed.

Objects further and further away are receding faster and faster. When they reach the observable edge of the universe their speeds of recession approach the speed of light and if they were to recede at the speed of light, we would never be able to observe them, even with the mightiest telescopes.

How far away is this edge of the universe?

The redshift z is the percentage by which the spectral lines of an object are shifted towards the red end of the spectrum and it can be measured very accurately. If the speed of recession of a body is v and the speed of light is c, then $\sqrt{\frac{c+v}{c-v}} = 1+z$ so that $\frac{c+v}{c-v} = (1+z)^2$.

The greatest redshift yet measured stands at z = 6. Therefore $\frac{c+v}{c-v} = (1+6)^2 = 7^2 = 49$,

so that 49c - 49v = c + v and 48c = 50v.

The speed of recession v in terms of the speed of light c is given by $\frac{v}{c} = \frac{48}{50} = 0{,}96$ or 96% of the speed of light which is 300 000 km**.** s^{-1}.

How far would this object having a redshift of 6 be? From the equation of Hubble's law the distance

$D = v \div H_o$ where H_o is the Hubble constant. This constant can be anything between 55 and 100 kilometres per second per mega parsec ($km.s^{-1}$ Mpc^{-1}). So if we consider a body having a speed of recession of 96% of the speed of light and using a Hubble constant of say, 64 $km.s^{-1}$ Mpc^{-1} , we get a distance $D = \frac{0{,}96 \cdot x \cdot 300000 \cdot km.s^{-1}}{64 \cdot \text{km.s}^{-1}\ \text{Mpc}^{-1}}$.

To convert this distance into light years we must multiply by 3,26 and to obtain milliards, we must divide by 1000. Therefore $D = \frac{0.96 \cdot x \cdot 300000}{64} = \frac{3{,}26}{1000}$ = 14.67 milliard light years namely 14,67 x 10^9 light years**.**

For a redshift of 8, the same calculation gfves a speed of recession of 96,9% of the speed of light and a distance D of 14,9 milliard light years and for a redshift of 10, a speed of recession of 98,36% of the speed of light and a distance D of 15,03 light years. The greater the speed of recession, the greater is the distance, When the speed of recession becomes 100% of the speed of light, the distance works out to 15,28 milliard light years, BUT THE REDSHIFT IS THEN EQUAL TO infinity. This distance must then be the edge of the observable universe and we can never observe it because bodies at that distance are receding at the speed of light. Such a speed is impossible because Einstein proved that it requires an infinite force to accelerate a material body to the speed of light and there can be no thing like an infinite force. There is, however,

nothing to stop the expansion of the universe beyond the observable edge.

The speed of recession of galaxies gets closer and closer to the speed of light: it approaches the speed of light asymptotically, but can never reach the speed of light.

So, the objects at the observable edge of the universe are not at the centre of the universe, but we do see them by the light which left them 15 milliard years ago, when the universe was young, just after the Big Bang (A far better name would be the cosmo-genesis). This event was not limited to a single point. It took place throughout the universe, which at that time consisted only of radiation. Matter came into existence according to Einstein's equation $E = mc^2$ where the energy E is in ergs and it was converted into mass m in grams multiplied by the square of the speed of light in centimetres per second, namely (300 000 x 100 000)2 namely 9×10^{20}.

A distance of 15 milliard light years in all directions around us does not fill up all of space. Far, far beyond that limit there must be other universes, some undergoing expansion like ours; others undergoing contraction down to a Big Crunch; others in the beginning stage of the cosmo-genesis and so on ad infinitum. This is the concept of the Multiverse. But all of it forever beyond the edge of the observable universe.

Jan Eben van Zyl

Asteroid 2002 NT7: Potential Earth Impact In 2019 Ruled Out

Don Yeomans
July 28, 2002

With the processing of a few more observations through July 28, we can now rule out any Earth impact possibilities for February 1, 2019. While we cannot yet completely rule out an impact possibility on February 1, 2060, it seems very likely that this possibility will be soon ruled out as well as additional positional observations are processed. Because the SENTRY system tracks a multitude of test particles in an effort to map the uncertainties of the asteroid's future positions, some of these test particles can take slightly different dynamical paths. Hence there are currently two entries for 2060 in our IMPACT RISK table (http://neo.jpl.nasa.gov/risk). The entry with the higher risk (larger Palermo Technical Scale) would be the value that would then take precedence.

Asteroid 2002 NY40

NASA Science News
July 30, 2002

Relax, there's no danger of a collision, but it will be close enough to see through binoculars: a big space rock, not far from Earth.

Astronomers discovered the nearby asteroid, named 2002 NY40--not to be confused with better-known 2002 NT7--on July 14th. It measures about 800 meters across, and follows an orbit that ranges from the asteroid belt to the inner solar system. On August 18th, the asteroid will glide past our planet only 1.3 times farther away than the Moon.

"Flybys like this happen every 50 years or so," says Don Yeomans, the manager of NASA's Near-Earth Object Program office at JPL. The last time (that we know of) was August 31, 1925, when another 800-meter asteroid passed by just outside the Moon's orbit. In those days there were no dedicated asteroid hunters--the object, 2001 CU11, wasn't discovered until 77 years later. At the time of the flyby, no one even knew it was happening.

2002 NY40 is different. We know the asteroid is coming, and astronomers have time to prepare.

For more information about 2002 NY40, including an up-to-date ephemeris for sky watchers, please visit JPL's Near-Earth Object Program web site.

FIRST LIGHT

Sitting around a fire in Nylsvley with Eric Brindeau, Bert van Winsen, Peter Baxter and Gerhard Koekemoer (and after drinking perhaps too much astronomy fluid), it was decided that, since finishing my mirror 7 years earlier, it was high time I had a working scope. A star party had been planned for July, and Val was going to go with her 6" telescope in working order. Bert had already built a really lightweight fibreglass tube and mirror cell for me, and I had purchased one of Walter Bacchio's focusers at the ScopeX event. The following weekend, at Gwyn Baxter's kind suggestion, we all got together at the Baxter home, and work began. This included detailed plans for the tube, which Eric project managed using his CAD software. Gerhard generously gave me the secondary mirror and spider. Peter put together a really superb Dobsonian mount, and Bert supplied an old storage disk to assist with a smooth movement for right ascension between the base and the mount. A "box" was also made to cradle the tube into the mount as well and handle the declination. Eric built from binocular casings and lenses, a very special 8 x 50 finder for my scope. Gwyn looked after us, and kept us supplied with food and drink, and really put up with a lot that day. At the end of it, the mirror and focuser were collimated, and we tested out the scope, but the sky was disappointingly overcast, and seeing was very poor. I took the scope home, in some anxiety (I was so scared that the mirror would not live up to all the work put into the scope), and painted the inside of the tube and the mount. All the while I counted the hours till the star party …

Well, the trip to Monk's Cowl in the Drakensburg turned out to be truly "awesome" (hey Eric!), and my mirror saw it's real first light. Eric helped me take "Mrs Ples" (another story) through "his" (another story) paces, and I was so amazed, relieved, overjoyed, to find that we were able to see so clearly, many objects during the four nights we spent out there. These objects included Omega Centauri and Eta Carina, the edge on galaxy NGC4945, M6 and M7 in Scorpio, M10, M12 and M14 in Orphiucus, and even B86, a dark nebula in Sagittarius. We also looked at the Lagoon Nebula and the Trifid, and many other objects.

My appreciation for all that Eric, Bert, Peter and Gerhard have done for me is beyond words, and I consider myself really fortunate to belong to a society where people help each other in this way. Thanks guys, it has been a great learning experience, and hey, I'm having soooo much fun!!

Now I'm counting the hours to the next trip!!!

Val Fraser

A Request…

Hi Folks

Look out for the conjunction between Saturn and M1 (Crab Nebula) in the early hours of the morning of 25 July 2002. Saturn rises at 4.15am but we should see a good conjunction from about 4.45am onwards until twilight.

Let me know what you see.

Dave Gordon

…and a Report

Hmmm…got up at 04h20, was outside by 04h35, and awake by 05h00. Saturn rose above my horizon just as I started to get my wits together, so that was well timed.

The seeing near my horizon was dreadful, and the Cassini division was not discernable in my ETX 105, although I was able to split Rigel easily. I could see (at least) 3 moons of Saturn. M1 is on the limits of visibility in dark skies, so I wasn't too hopeful.

Using averted vision, I (may have) glimpsed M1 about half a field of view away from Saturn using a 12 mm eyepiece - i.e. roughly 15 mins of arc separation. Saturn was south of M1. The moonlight coupled with high altitude cloud didn't help.

"The Sky" claimed that Saturn would be within 1.5 mins of M1, so I'm not sure whether what I saw was floaters, artifacts caused by the light cloud cover, or my imagination. It could also have been M1.

Clear skies

Bruce Dickson

ASSA SYMPOSIUM 2002

The Fifth ASSA Symposium will be held from Friday November 29 to Sunday December 1 at the Aloe Ridge Hotel and Observatory, and is being organised by the Pretoria Centre of ASSA.

The Symposium will bring together professional and amateur astronomers to present and listen to papers on a wide range of topics. There will be papers on latest research, instrumentation, amateur observing, history, and an entire session devoted to the total eclipse of the sun which takes place on the morning of December 4 from northern South Africa, the first total eclipse of the sun visible from South Africa since 1940.

We are privileged to confirm Dr Janet Mattei will attend from the AAVSO.

Persons interested in presenting a paper at the Symposium, or attending the Symposium can contact the Chairman of the Organising Committee, Tim Cooper, at *tpcoope@mweb.co.za*, or on *011-967-2250*.

Registration forms will be sent out shortly and will also be available electronically.

Tim Cooper

Accommodation for 2002 Total Solar Eclipse

If, at this late stage, you are still planning to find accommodation in Messina for the 4 December Solar Eclipse ... forget it. The town is long since totally sold out. However, if you are willing to rough it a little, there is a farmer 20km west of Beitbridge offering accommodation for the event. It is a mere 20 km off the centre line with the eclipse at 8.19am local time.

The farmer is asking R100 per person. You will be allocated a camp site with access to toilet facilities. Ice, firewood and drinking water is included in the price; braai packs and beer will be on sale.

This is a dark sky site so bring your telescopes along. The location is far enough north to see constellations not visible from Johannesburg/Pretoria.

If you are interested, contact Dave Gordon on (011) 702-1219 or 083-746-2200.

Telescopes for Sale

Meade 285

Diameter 60mm
Focal length 900mm

Contact: Mrs. **E Siber**
011 786 7930
083 743 9979
083 471 9297

Meade ETX 125EC

#497 Autostar Computer Controller
Meade Deluxe TX Field Tripod

Price: R15 000.00 O.N.C.O.

Contact: **Shane**
Tel: 083 266 0319
Email: *m.smith@mweb.co.za*

Meade LX200 12"

It is unused (except for an initial test)
and comes with**:**

the standard 26mm eyepiece
giant field tripod
8mm wide angle eyepiece,
dew shield,
computer connecting cable
and 110v transformer.

Price: R60 000.00 O.N.C.O.

Contact: Mr **Alan Bowen**
Tel: 031 464 3654

The Sky this Month

August 2002

dd hh		dd hh	
1 11	**LAST QUARTER**	15 11	**FIRST QUARTER**
2 00	Neptune at opposition	20 01	Uranus at opposition
5 04	Saturn 2.0 S of Moon	21 05	Neptune 4.2 N of Moon
6 05	Mercury 0.9 N of Regulus	22 09	Venus greatest elong. E(46)
7 18	Jupiter 3.1 S of Moon	22 14	Uranus 4.1 N of Moon
8 19	Mars 3.2 S of Moon	22 23	**FULL MOON**
8 19	**NEW MOON**	26 17	Moon at apogee
10 02	Mercury 4.3 S of Moon	27 11	Pluto stationary
10 23	Mars in conj. with Sun	29 00	Mars 0.8 N of Regulus
11 01	Moon at perigee	31 03	**LAST QUARTER**
11 23	Venus 6.1 S of Moon		

September 2002

dd hh		dd hh	
1 06	Mercury greatest elong. E(26)	14 12	Mercury stationary
1 07	Venus 0.0 S of Spica	17 09	Neptune 4.2 N of Moon
1 17	Saturn 2.5 S of Moon	18 18	Uranus 4.2 N of Moon
4 14	Jupiter 3.6 S of Moon	21 15	**FULL MOON**
6 10	Mars 3.9 S of Moon	23 05	Equinox
7 04	**NEW MOON**	23 06	Moon at apogee
7 16	Mercury greatest brilliancy	26 07	Venus greatest brilliancy
8 05	Moon at perigee	27 18	Mercury in inferior conjn.
8 17	Mercury 8.6 S of Moon	29 03	Saturn 3.0 S of Moon
10 03	Venus 8.1 S of Moon	29 17	**LAST QUARTER**
13 18	**FIRST QUARTER**		

LOCAL TIMES of RISE and SET for the MAJOR PLANETS, 2002

Site Location:- Long. **+28.0** deg. Lat. **-26.0** deg. Local Time:- UT **+2.0** hrs.

Date	Sun		Mercury		Venus		Mars		Jupiter		Saturn	
	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set
Aug 09	06.43	17.44	07.44	19.06	08.59	21.09	06.49	17.46	05.53	16.36	03.23	13.57
Aug 19	06.35	17.49	07.46	19.36	08.46	21.15	06.30	17.36	05.21	16.06	02.48	13.22
Aug 29	06.25	17.53	07.38	19.53	08.31	21.18	06.11	17.26	04.49	15.37	02.12	12.46
Sep 08	06.15	17.57	07.19	19.53	08.14	21.19	05.51	17.15	04.17	15.07	01.35	12.09
Sep 18	06.04	18.01	06.41	19.21	07.53	21.14	05.31	17.04	03.45	14.36	00.58	11.32
Sep 28	05.53	18.05	05.43	18.03	07.28	21.01	05.10	16.53	03.11	14.05	00.20	10.54