

CANOPUS

The Astronomical Society of Southern Africa

Johannesburg Centre

Monthly Newsletter for October 2001

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

Editorial

The pictures and video of the events in the U.S. of 11th September will horrify me for as long as I live. The total lack of humanity and/or regard for life leaves me aghast - whatever is our world coming to? However, life *does* go on, so rather than dwell on this barbarity - let me move on to more pleasant topics.

In my last editorial, I complained about the dust in the air which caused diminished seeing and said that we needed the rain to clear the muck out of the air - well, here in Randburg, when the rains arrived a few days after that editorial, they arrived in megalitres and bucketed down for a couple of days. But I was right - the skies are much clearer and the Stars and Planets looking good again. Mars still shines brightly above us in the evening, but less so than a couple of months ago. In the morning skies, Saturn and Jupiter are still prominent but Venus is rapidly diving into the sunrise, and will soon be the evening star again.

Wolf Lange supplies the 2nd in the series of "The A to Zee of Astronomie" moving onto the items of interest beginning with "B" and talking of "B", our friend **Bill Wheaton** from the Infrared Processing and Analysis Centre at Caltech (which operates NASA's JPL) reflects on our place in the universe after the horrendous events of 11th September.

Eben van Zyl tells us of the circumstances surrounding the death of Stars and why this occurrence leads on to the beginnings of the next generations of Stars (*a kind of "Circle of Life" to borrow a song title from the Disney movie, the Lion KingEd.*).

Brian Fraser has supplied us with a general guide to the skies above for the next 2 months; and gives us some news regarding accommodation in the area of the total Solar Eclipse of 4th December 2002. It looks as though all the suppliers of accommodation in the Messina area are going to make an absolute fortune in rentals over the period of the eclipse.

Trevor Gould supplies information regarding the visit to the SAFARI-1 reactor - there is a limited time in which to book your place on the "tour".

Those of you who were at the last monthly meeting were treated to a great presentation by Tony Voorvelt and some fascinating views of solar prominences taken from the new Solar Observatory which has been set up on the roof of the Physics building at Wits University. We plan to visit this new observatory either at the end of this year, or early next year - it should be quite an eye-opener.

The Editor

chris@penberthy.co.za

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Notice of Meeting

The Monthly Meeting of the Johannesburg Centre of the Astronomical Society will be held in the Sir Herbert Baker Library, 18a Gill Street, Observatory, on Wednesday the 10th of October, 2001 at 20:00.

Recent developments on Mars and their implications for the Earth

by: Bill Sheehan

(co-author of "The Lure of the Red Planet")

Future Meetings

November 17th
and 18th

December
January 9th 2002

**Annual Star Party
and Leonids viewing**

No meeting

Multi-wave Astronomy

**at Dave Gordon's fairly
dark site in Midrand**

Tom Marsicano

If you have any ideas for topics or subjects that you feel should be presented at future meetings of the Johannesburg Centre, please contact one of the Committee members, or email us with the details thereof.
The Editor.

Annual Star Party 2001 - 17/18th November
*At Dave Gordon's fairly dark site in Midrand
where we will also be able to see the Leonids.*

Public Viewing (*weather permitting*)

Public viewing nights are on the Friday nearest First Quarter, and are held at the Old Republic Observatory, 18a Gill Street, Observatory, Johannesburg. Starting time around 19:30.

Please note that the Public viewing nights are held subject to suitable weather conditions.

19th October

23rd November

Annual Subscription Fees

There are no changes to the Johannesburg Centre's subscription fee structure for the 2001/2 year. The joining fee remains R50-00 and the Annual fee R100-00. The Family membership subscription fee also remains unchanged at R125-00. 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 was included with the September issue 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: <u>ASSA Johannesburg Centre</u>

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.

Jo'burg Centre Outings for 2001

Boyden - We are busy attempting to negotiate a suitable weekend with Martie Hoffman. The 60" is out of commission at present (maintenance), but the other instruments are pretty useful in their own right.

The Suikerbosrand Nature Reserve. Wolf Lange has organised several enjoyable visits to this site near Heidelberg and says it is an ideal spot for clear viewing. He will continue with these outings and if you are interested, contact him by phone or email as per the table under the editorial.

Tswaing Crater - we're still trying to set up a day visit under the guidance of Prof. Reimold. This will probably be done on a Saturday but we'll have to wait and see what can be set up.

We will be organising two "outings" involving **Tony Voorvelt** - one to see the new solar observatory on top of the Physics building at Wits and one to be entertained / amazed by his Great Magic Physics Show.

A visit is being scheduled (13th October) to the SAFARI-1 Nuclear Reactor, Pelindaba where we will be able to see the famous Cherenkov radiation. *See Trevor's invitation on page 11.*

Another visit to the Gamma Ray observatory in Potchefstroom is also in the offing.

Other ASSA Centres (e.g. the Pretoria Centre) – to try to see if we can organise some joint ventures.

If any of our members have places they would like the society to visit, approach one of your committee members with the request and we'll discuss it in committee. Alternately, just send an email to the editor and I'll make sure it is brought up in committee.

Telescope Making Classes

Would you like to make your own telescope?...or finish off a partially finished one? Well your opportunity has arrived (once again). Join the Telescope Making Class being held under the guidance of Brian, Evan and Chris. Contact Brian on (016) 366-0955 if you are interested.

Andy McCrae

Previous chairman Andy McCrae with his homemade 14-inch and 8-inch telescopes, in Aberdeen, Scotland.



Brian Fraser

Telescope for Sale

Orion 8" f4 Skyview Delux EQ Newtonian

on an equatorial mount and gold anodised tripod.

with

8x30 finderscope
4, 18, 25, and 40 mm eyepieces
2x barlow
moon filter.
Meade camera adapter.

Asking **R5000** for the lot.

Scope was bought in Jan 2001 and I am only selling because I hate collimation.

If anyone is interested contact **Coenie vd Merwe** in Pretoria at (083) 785-1371.

US Space and Astronomy News

Bill Wheaton, Caltech

2001 October

Carl Sagan's Perspective:

The WTC disaster reminds us once again that truly, we are in our tiny boat all together, sailing a dangerous void on an uncertain voyage, towards some destination far far away "*in the deeps of time, amongst the innumerable stars*" *. A while before his untimely death, Carl Sagan helped arrange for the Voyager spacecraft, then out beyond Pluto on the cold dark fringes of the Solar System, to take a picture looking back from whence it came. It is a famous picture, and I am sure many will remember it. In it you see our little family of planets, warming themselves about the Sun. Sagan's commentary on the image was sent out again this week by Craig Tupper, one of my fellow space freaks at NASA. Here it is:

"We succeeded in taking that picture [from deep space], and, if you look at it, you see a dot. That's here. That's home. That's us. On it, everyone you ever heard of, every human being who ever lived, lived out their lives. The aggregate of all our joys and sufferings, thousands of confident religions, ideologies and economic doctrines, every hunter and forager, every hero and coward, every creator and destroyer of civilizations, every king and peasant, every young couple in love, every hopeful child, every mother and father, every inventor and explorer, every teacher of morals, every corrupt politician, every superstar, every supreme leader, every saint and sinner in the history of our species, lived there on a mote of dust, suspended in a sunbeam.

The earth is a very small stage in a vast cosmic arena. Think of the rivers of blood spilled by all those generals and emperors so that in glory and in triumph they could become the momentary masters of a fraction of a dot.

Think of the endless cruelties visited by the inhabitants of one corner of the dot on scarcely distinguishable inhabitants of some other corner of the dot. How frequent their misunderstandings, how eager they are to kill one another, how fervent their hatreds. Our posturings, our imagined self-importance, the delusion that we have some privileged position in the universe, are challenged by this point of pale light.

Our planet is a lonely speck in the great enveloping cosmic dark. In our obscurity -- in all this vastness -- there is no hint that help will come from elsewhere to save us from ourselves. It is up to us. It's been said that astronomy is a humbling, and I might add, a character-building experience. To my mind, there is perhaps no better demonstration of the folly of human conceits than this distant image of our tiny world. To me, it underscores our responsibility to deal more kindly and compassionately with one another and to preserve and cherish that pale blue dot, the only home we've ever known."

It seems to me that if our explorations into the cosmos can only assist the human family to comprehend these stupendous realities even a little more clearly, to grasp them a little more firmly, then the money and effort invested on astronomy and space exploration have been worthwhile indeed.

Next month we will return to report on MAP (the Microwave Anisotropy Probe) and see whatever happened to DS-1.

* *Tolkien.*

Bill Wheaton

Welcome to new Members

We would like to welcome the following new members to the Johannesburg Center:

Liesl Kloppers
Paul Ludick

Diane Barnwell
Peter Hambammer

Craig Kuhnert
David Botha

We wish you clear skies and many wonderful nights of astronomical viewing.

The “A to Zee” of Astronomiee.

By: Wolf Lange

A selective mixture of interesting terminology, objects, people of interest to all that love and are involved in Astronomy. Compiled by Wolf Lange who will deny any wilful exclusions

Sources include: Collins Dictionary of Astronomy 2nd Edition, Burnham’s Celestial Handbook Revised and Enlarged Edition, Patterns in the Sky by Julian DW Staal and the Amateur Astronomers Handbook by JB Sedgwick.

Baileys Beads – a string of brilliant points of sunlight sometimes seen, very briefly, at the moon’s edge just before or after totality in a solar eclipse. They are the result of sunlight shining through the valleys on the moon’s limb as the sun disappears or emerges from behind the moon. (Great for astrophotography!)

Barlow lens – an achromatic (see under A in previous issue) diverging lens placed between the eyepiece of a telescope and the secondary mirror in order to increase the effective focal length of the primary mirror – this in turn increases the magnification (at the cost of loss of some light).

Beta Centauri (β Cen, Hadar, Agena). A luminous remote but still conspicuous bluish-white giant that is the second brightest star in the constellation Centaurus. (See also α Cen or Alpha Centauri).

Spectral type B 1 II at a distance of 100pc.

Betelgeuse (α Ori) – pronounced “beetlejuice” or also Bet el jooze; its meaning comes directly from the Arabic: “The keeper of the twins” (referring to Gemini) – sort of a “shepherd” of the twins. A remote luminous red supergiant that is the second brightest star in the constellation of ORION. It is also a semiregular variable with a period of 5.8 years ranging in magnitude from 0.3 to 0.9. According to IRAS it’s a strong source of infrared radiation which is emitted from three concentric shells the largest of which is 1.5 parsecs, ejected within the past 100 000 years. Spectral type M2 Iab; with a diameter of 500x solar at a distance of 150parsecs.

Big Bang Theory – a cosmological model in which all matter and radiation in the universe originated in an explosion at a finite time in the past. Another theory is that of the Inflationary universe (see later on in this series). The Big

Bang theory has been remarkably successful in explaining the expansion of the universe, the background radiation and the cosmic abundance of helium.

George Gamow in the 1940s suggested a hot Big Bang in which the temperature of matter and radiation decreases with time. This was verified by the discovery of the cosmic microwave background in 1965. It is estimated that the universe came into existence some 10 to 20 billion years ago (10 000 to 20 000 million).

See also some related topics later in this series covering *Neutrinos, Quarks, Redshift, Planck Time and Microwave background radiation.*

Big Dipper (Brit. Plough) – a group of stars in Ursa Major (Big Bear) that contains the seven brightest stars in that constellation, nearly all with similar magnitudes! In order of brightness these are: Alioth, Dubhe, Alcaid, Mizar, Merak, Phecda and Megrez. Very interestingly the shape of the Big Dipper is slowly change because of the stars Alcaid and Dubhe having different values and direction of Proper Motion than the other 5 (the apparent angular motion per year of a star on the celestial sphere i.e. in a direction perpendicular to the line of sight – resulting from both the actual movement of the star in space and the star's motion relative to the solar system).

Black Hole – simplistically described as “an object so collapsed that its escape velocity exceeds the speed of light”. (Earth’s escape velocity is 11.2km s⁻¹ = +/- 26 000km/hour and the speed of light 299 792 458 m s⁻¹ a value adopted by the IAU in 1975.)

It becomes a black hole when its radius has shrunk to its Schwarzschild radius: $R_s = 2GM/c^2$ where G is the gravitational constant and c the speed of light e.g. for our sun the radius would be three km.

Light cannot escape. The event horizon marks the boundary inside of which all information is trapped. Space and time become highly distorted inside the event horizon.

The most promising candidates for black holes are massive stars that explode as Supernovae leaving a core in excess of 3 solar masses. See also White Dwarfs and Neutron stars later on .

Blue shift – an overall shift of the spectral lines in a spectrum towards shorter wavelength as a result of the Doppler effect. It is observed in the spectra of celestial objects approaching earth. (If the object is large enough and indicates a shift to blue -- i.e. a fearful chill may also be observed in humans observing such an object approaching at speed!)

Bok globules – small dark cool (10K) clouds of gas and dust seen as near circular objects against the background of stars or of an H II region. Named after Dutch-American astronomer Bart J Bok. (NOT what you first thought they were! What is it in Afrikaans?)

Bolide – a brilliant METEOR that appears to explode, i.e. a detonating fireball. (*This author has seen at least three*). The brighter ones are caused by ablating Meteorites (= loss of material from the surface as a result of vaporisation, friction etc) that subsequently fall to earth. About 500 bolides are observed each year.

Brightest stars – there are approx 9 500 stars brighter than the visual magnitude of 6.5. Brightness may be the result of being close to earth, being very bright or both. The most luminous lie in the supergiant and giant regions of the Hertzsprung-Russell diagram (and not in the vicinity of Hollywood).

Brown dwarf – a theoretical star formed by the contraction of a lump of gas with a mass too small for nuclear reactions to begin in the core. This sad state of affairs results in an object “glowing” for about 100 million years before cooling off. The first brown dwarf, named Gliese 229B, was unambiguously identified in 1995 with the Palomar 60 inch telescope. It orbits the red dwarf star Gliese 229A. One spectrum signature unique to brown dwarfs is the presence of methane lines. The stellar mass limit is perceived to be in the region of 0.08 solar masses. *Perhaps our two giant planets could have been “near” candidates to becoming brown dwarfs?*

B-type Asteroids –see *C-type asteroids!*

Butterfly diagram – a diagram representing the distribution of sunspots on both sides of the sun’s equator over a long time period of about 100 years, will show high density between 35 degrees north and 35 degrees south in the shape of a butterfly’s wings. This also confirms the 11-year sunspot cycle.

B stars – Stars of Spectral type B that are massive hot blue stars with surface temperatures of about 10 000 to 28 000 Kelvin for main sequence stars and up to 30 000 Kelvin for supergiants. Absorption lines of neutral helium (He I) dominate the spectrum, reaching maximum intensity in B2 stars. A few B stars also have emission lines from a circumstellar shell of gas. These stars can be found e.g. in the spiral arms of galaxies. Examples in our galaxy are: Spica, Rigel, Bellatrix and Alpha Crucis.

Wolf Lange

Questions & Answers

Why does light travel at 300 000 km/s?

Val Fraser

Well - are there any erudite Astronomers/Physicists/Boffins out there who can tell us why light travels at "the speed of light"? Ed.

THE DEATH OF STARS

After a star has cast off its upper layers of gas, the rest which collapses on to the core must not exceed the Chandrasekhar Limit which is 1,44 solar masses. If the remainder exceeds this limit it will go on collapsing to become a neutron star. Whereas the size to which the white dwarf collapses is about the same as the size of the Earth, the neutron star collapses to a size of about 20 kilometres. The density of a white dwarf is 88 kg per cubic centimetre (8000 times the density of lead) while that of a neutron star is the same as that of a large atomic nucleus, $2,7 \times 10^{14}$ grams per cubic centimetre. It is all that is left when a star undergoes a supernova explosion - the rest gets blasted into space.

Stars that are more than 2,5 times the mass of the Sun cannot blast off enough material to be left with less than 1,44 solar masses and they therefore go supernova and collapse down to the neutron stage or even down to a black hole.

Stars of mass 5 times that of the Sun spend only a few hundred million years in the Main Sequence of the Hertzsprung-Russell diagram whereas sun-like stars spend 10 milliard years there. Stars of 10 solar masses spend only 30 million years in the main sequence. Sanduleak -69° 202 in the Large Magellanic Cloud had been well studied and was known to be a star of 8 - 10 solar mass, a B3 giant of absolute magnitude -6,5. It went supernova on 24 February 1987 when it was photographed in the act by Professor Ian Shelton of Toronto University while he was in Chile. The light curve of this supernova SN 1987A, was the first curve to show a drop in brightness due to the collapse before the bolometric magnitude showed an increase in brightness of magnitude 1,6 to a broad peak, typical of Type II supernovae.

The Hubble Space Telescope succeeded in photographing rings around the star which are due to light reflected from the layers of gas which had previously been blown off from the core of the star, previously being some hundreds of thousands of years ago!

Although the bubbles of gas blown off from a supernova, gradually dissipate into space and become invisible, the region in the immediate vicinity of the Large Magellanic Cloud shows

some 30 such bubbles as remains of supernovae that must have taken place not so many millions of years ago. The brightest stars in the Magellanic Clouds have the same absolute magnitudes as the brightest stars in the Milky Way Galaxy that are due to go supernova eventually.

Many white dwarfs have companion stars. Because the gravity of the white dwarf is so highly concentrated, the white dwarfs in binary systems strip gas off from the companion stars so that the masses of these white dwarfs increase. When their masses exceed the limit of 1,44 solar mass they undergo mighty supernova-explosions in which all the matter of the star is blown into space and no residue in the form of neutron stars is left. This type of supernova is the mightiest known and it is typified as Ia. These Ia-supernovae are being monitored at the very edge of the observable universe, 6 to 10 milliard lightyears distant.

The redshifts of these Ia supernovae show that their speeds of recession are greater than those calculated from the Hubble formula $V = H_0 D$. The astronomers studying these Ia supernovae therefore conclude that the expansion of the universe is accelerating. This goes against the laws of dynamics which state that the rate of expansion of the universe must decrease and eventually come to zero. What the astronomers who propound the idea of an acceleration in the rate of expansion, lose sight of, is that the light from the Ia supernovae left their sites of origin 6 to 10 milliard years ago when the rate of expansion of the universe was greater than it is now, thus proving that the rate of expansion is continually decreasing. .

It has been calculated that the rate of expansion of the universe will come to zero after 60 milliard years. Then an ever-accelerating rate of increase of contraction will follow for another 50 milliard years, to be followed by another big bang. The universe is thus cyclic by nature, having an endless series of expansions and contractions. This dispels of the question: "What was there before the big bang?" Before the big bang there was a previously contracting universe which led to the singularity of the big bang and before that

there was an expanding universe and so on ad infinitum...

Throughout the life of the universe, the matter spewed into space by supernovae is recondensed into succeeding new stars and planets. The most massive stars were the first to go supernova, to be followed later by less massive stars. D N Schramm in his treatise "The Ages of the Elements" found that there were two peaks of

supernova explosions after the big bang, one 9 milliard years ago and another 5 milliard years ago. It was during this last peak of supernovae that the Sun and its planets were born. The Sun is thus a third generation star since the big bang. The death of stars therefore means the regeneration of new stars!

Jan Eben van Zyl

S.A. Amateur discovers Supernova

To All,
Here is some fantastic news!!
This is probably the first supernova to be discovered by a South African amateur since Jack Bennetts discovery.(??) Well done Berto!
Now if someone can just get the skies to clear for tonight, please.
regards,
Brian

-----Original Message-----

From: Berto Monard
[mailto:Lagmonar@csir.co.za]
Sent: 19 September 2001 12:10
Cc: brian.fraser@Macsteel.co.za;
janhers@pixie.co.za
Subject: SN in NGC 1448

Dear VSNET and other observers,

I have pleasure in announcing my first visual supernova discovery, which has been confirmed since.

The SN will have to be named still by IAU, hopefully later today.

The following details apply:

Galaxy : NGC 1448 at position 03 44 32 -44 39
The position of this relatively bright supernova (suspect) in this relatively nearby galaxy (approx 15 Mpc) is about 15" North and 9" West of the galaxy nucleus. From this position it is not clear if it belongs to the disk or the bulge. Improved positions and descriptions will be announced in the circular.

There is a 14.8 V (approx) foreground star just to the North of the SN suspect.

My most recent observations of NGC 1448 in UT /

20010825.96 <14.6V
20010917.064 14.5V

20010917.108 14.5V
20010917.930 14.3V

Since then clouds have taken over here but I received reports that the SN has brightened further.

The magnitudes were estimated vs a comparison sequence based on UCAC1 and USNO-A2.0 B and R data.

The following stars can be used to estimate SNe near NGC 1448. They are derived from UCAC1 magnitudes and USNO-A2.0 B and R magnitudes (used mainly for the colour indication). R magnitudes are preferably used to measure in the R band, which is approximately the case with CCD measures without any optical filter. Since SNe are expected to be blue it means that the SN V-value equals its R-value.

(2000) position RA / DE / Magnitudes

034407.8 -443551 / 13.8V / 13.4R
034413.6 -443909 / 14.5V / 14.4R
a blue star / good reference
034417.3 -443746 / 14.7V / 14.4R
034421.8 -443839 / 15.7V / 15.3R
034429.5 -443728 / 14.8V / 14.4R
close by but reddish
034437.8 -443934 / 12.75V / 12.39R *
* from LONEOS data base

All magnitudes are estimated to be accurate to within 0.2 magnitude in both bands. The LONEOS data are accurate to much better, approx 0.05 magnitude.

Enjoy your observations.

Kind regards,

Berto Monard / Pretoria

Eclipse December 4th 2002.

It sounds like a long time away and most people aren't accustomed to making arrangements that far in advance, but if you want to make plans to see the eclipse next year then you probably need to do so very soon. In fact it is already too late as all the accommodation in the Messina area is already booked out and most other places will probably report the same.

HOWEVER due to the foresight and ingenuity of some of the Pretoria centre members we have been offered 250 camping sites at the resort in Tshipese, near Messina. Tshipese is just inside the eclipse line and people staying there have the choice of either seeing a short totality or traveling up the road to get closer to the centre line which will have about 1 min 22 secs of totality.

Each camping site can accommodate up to 9 people and can take 2 medium sized tents, or a

large one or a caravan etc. There are respectable ablution facilities, a swimming pool and a restaurant in the resort.

If you don't have a tent the organizers are prepared to obtain one for you.

The cost has not been finalized but it will be something like R500 – R600 per site per night. There will probably be a discount for people booking 2 or 3 nights.

Deposits on this have to be paid by the end of October, so if you are interested in booking a campsite then please let me know AS SOON AS POSSIBLE.

Brian Fraser

brian.fraser@macsteel.co.za

160,000+ measurements of WZ Sge a record?

Many people have been contributing measurements of WZ Sge to the VSNET effort over the past month. From one of Kato-san's messages (sent Aug 27), I see that over 160,000 data have been reported in a little more than one month.

Is this some sort of record for astronomical measurements of a single object? I can't think of any other object which has been scrutinized so intensely by so many people in such a short time, but I've been working on CVs for only a short time. Are there other examples of such intense observation? I wonder if SN 1987A is a possible contender -- though I doubt that people measured it several times a minute for nights on end.

Perhaps we fall short of one of the campaigns of the Whole Earth Telescope on a white dwarf? Or one of the searches for stellar oscillations by Gilliland and his colleagues? Maybe radio

astronomers studying the rotation of millisecond pulsars leave us in the dust ...

Does anyone know?

When I told one of my colleagues here at RIT about the global effort over the past month, he suggested that it might make a good press release. Now, I really, really dislike the number of press releases in astronomy these days (especially those stupid "hook" sentences at the very beginning), and their endless claims of "first" and "best" and "groundbreaking discovery". But if it turns out that the entire VSNET team has, say, beaten the old record by a factor of 3 or 4, I wonder if a joint press release from all contributing institutions and individuals would make sense?

Michael Richmond

Submitted by **Brian Fraser**

Invitation to ASSA Johannesburg Centre

The Johannesburg Centre will be visiting the SAFARI-1 Nuclear research reactor at Pelindaba on Saturday 13th October 2001.

The visit will take a full day and will include a visit to the industrial isotope unit. An effort is being made to include the medical isotope unit as well, although we have yet to succeed in contacting the relevant manager.

You will have to bring your own refreshments along with you, as their restaurant will be closed.

You are permitted to take photographs as long as they are for private use ONLY.

No publication is permitted in any media without prior written permission.

A highlight of the visit will be to see the reactor overpool area, from which the Cerenkov radiation will be visible.

That should excite any astronomer!

Note that there are a number of conditions to be fulfilled first:

- [1] There is a limit of 10 people to the overpool area at a time. Each group will take 45minutes to an hour to complete that portion of the visit.
- [2] NECSA would arrange for persons to escort the group(s) at SAFARI-1;
- [3] the overpool area (to view the Cerenkov) is accessible, with permission, should the

radiological limits permit - this is normally not a problem but cannot be guaranteed;

[4] no persons under the age of 18 are permitted onto the overpool area;

[5] women within the first 5-6 months of pregnancy are not permitted onto the overpool area;

[6] all persons wishing to access the overpool must provide us with their ID or Passport number and in the case of a classified irradiation worker with their current radiological records, prior to arrival

Therefore: anyone wishing to come must please provide the writer * with the information noted in [6] above by

Monday 8 October 2001 12:00 SAST.

Anyone who has not provided this information in time will be excluded from this field trip.

The writer will also need some contact details such as an e-mail address or telephone number.

* Trevor Gould
083-212-8945 Mobile
011-886-5602 Home / VoiceMail
trevorgo@transtel.co.za

Obituary - Ken Paterson

1919 to 2001

Johannesburg Centre member Ken Paterson, passed away on the 7th of July this year.

He was born in Brechin, Scotland on the 10th of May 1919 and after leaving school, entered St Andrews University where he studied for his BSc Degree. During World War II, he became a pilot in the RAF where he flew Catalina long-range patrol aircraft. After the war, he joined British Airways as a commercial pilot. After leaving the Airline, he worked for African Explosives and Chemicals, first at Umbogintwini in Natal, and later at Modderfontein in the Transvaal.

He had a very keen interest in Astronomy and it was through this interest that he joined the Astronomical Society and became a member of the Johannesburg Centre.

Since 1985, Ken was also very involved as a volunteer of the Alzheimer's Association.

Our sympathies go out to his wife Herna, and children Jean, Andrew, Donald and Maurice.

The Sky this Month

October 2001

dd hh	dd hh
1 16 Mercury stationary	17 16 Neptune stationary
2 14 FULL MOON	22 14 Mercury stationary
7 19 Saturn 0.5 S of Moon Occn.	23 20 Mars 0.1 N of Moon Occn.
10 00 Jupiter 1.6 S of Moon	24 03 FIRST QUARTER
10 04 LAST QUARTER	24 12 Neptune 3.2 N of Moon
11 08 Mercury 0.4 S of Spica	25 17 Uranus 3.3 N of Moon
14 02 Mercury in inferior conjn.	26 21 Moon at apogee
14 23 Moon at perigee	30 06 Mercury greatest elong. W(16)
15 03 Venus 3.8 S of Moon	30 06 Mercury greatest brilliancy
16 08 Mercury 6.1 S of Moon	31 01 Uranus stationary
16 20 NEW MOON	

November 2001

dd hh	dd hh
1 06 FULL MOON	14 08 Mercury 2.7 S of Moon
2 06 Mercury 4.6 N of Spica	15 07 NEW MOON
2 12 Venus 3.9 N of Spica	20 21 Neptune 3.5 N of Moon
2 16 Jupiter stationary	21 19 Mars 2.5 N of Moon
3 23 Saturn 0.6 S of Moon Occn.	22 02 Uranus 3.7 N of Moon
4 17 Mars 2.2 S of Neptune	22 23 FIRST QUARTER
6 07 Jupiter 1.6 S of Moon	23 16 Moon at apogee
8 12 LAST QUARTER	26 10 Mars 0.8 S of Uranus
11 19 Moon at perigee	30 21 FULL MOON
14 02 Venus 2.9 S of Moon	

LOCAL TIMES of RISE and SET for the MAJOR PLANETS, 2001

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
Oct 08	05.42	18.09	06.08	19.07	04.36	16.22	11.20	01.12	00.48	11.21	22.36	09.17
Oct 18	05.32	18.14	05.06	17.38	04.33	16.38	11.12	00.57	00.11	10.44	21.55	08.36
Oct 28	05.23	18.20	04.34	16.57	04.30	16.54	11.05	00.42	23.34	10.06	21.14	07.55
Nov 07	05.16	18.27	04.32	17.13	04.28	17.10	10.58	00.27	22.54	09.27	20.32	07.13
Nov 17	05.11	18.34	04.40	17.46	04.27	17.28	10.52	00.12	22.14	08.46	19.49	06.31
Nov 27	05.09	18.41	04.52	18.21	04.30	17.46	10.46	23.55	21.32	08.04	19.06	05.48