CANOPUS

The Astronomical Society of Southern Africa

Johannesburg Centre

Monthly Newsletter for September 2001

Contents:

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

Editorial

Spring has sprung **. . .** but where's the rain? I know that rain and clouds are the bane of an astronomer's existence, but then so is the muck and dust that floats around in the atmosphere at the tail end of winter. We enjoy the most magnificent sunsets but at what cost? **. . .** a magnitude or two of visibility and some difficulty in obtaining sharp views. Of course, there are some filters that can help, but it's not quite the same is it. So let's hope we get a couple of days of rain to wash the skies clean and then we'll be OK 'til the rains arrive back at the end of September - then we can complain about the rotten weather!

Our friend from IPAC, **Bill Wheaton,** has sent an article covering some of the current projects of the Jet Propulsion Laboratory giving us an up-to-date status of two in particular - those being the Deep Space 1 and MAP projects. *It's good to hear from you again Bill.*

Wolf Lange starts with the first of a new fun and informative series which he has titled "The A to Zee of Astronomee". His opening description reads "*A selective mixture of interesting terminology, objects, people of interest to all that love and are involved in Astronomy"* and I guess this puts the whole series into perspective. I'm looking forward to reading all 26(?) articles Wolf.

Brian Fraser has supplied us with a general guide to the Heavenly Happenings for the next 2 months; and **Eben van Zyl** has submitted an interesting article on "The Life of a Star". I can recommend this to any of you who want to get a better idea of what goes on under the surface of the Sun. Brian and Eben are our most regular contributors and as editor of our monthly magazine, I am very grateful for their submissions.

As we enter a new ASSA Jo'burg centre year, we have to spare a thought for the members of your newly elected committee who will be doing all the organising of the programmes, meetings and outings for the year ahead. Also, the society has some financial commitments such as rent and the printing and posting of this publication. *Your annual subs are thus a very important part of the running of the society* and our plea to each and every one of you out there is to please pay these as soon as possible so that your committee may make suitable plans for the year ahead. *Our current fee structure (which remains unchanged for the year to come) is very inexpensive for the perks provided - access to a site with some excellent telescopes, a library with a great selection of books and magazines, the "Mars Bar" and of course, last but not least, your own Johannesburg Centre magazine - Canopus.*

The Editor

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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 12th of September, 2001 at 20:00.

Topic

"The Waves that Rule Britannia"

by: Tony Voorvelt.

Future Meetings

October 10th	**T.B.A.**	**An Astro-Historian**
November 14th	**Year-end Star Party**	**at Dave Gordon's**
December 12th	**T.B.A.**	**T.B.A.**

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.*

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 although this will be revisited to determine a more realistic fee at the end of the current ASSA year. 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.

Jo'burg Centre Outings for 2001

Nylsvlei - we have a booking for the weekend of the 14th - 16th September for 30 people.

You may contact Bruce Dickson on 312-1887 if you wish to book a place on this outing.

Boyden - We are busy attempting to negotiate a suitable weekend with Martie Hoffman. There does not seem to be much chance at present, but we vigorously continue our efforts in this regard.

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.

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 an 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 (probably on October) to the Visit to the SAFARI-1 Nuclear Reactor, Pelindaba where we will be able to see the famous Cerenkov radiation. *See more details later in this issue.*

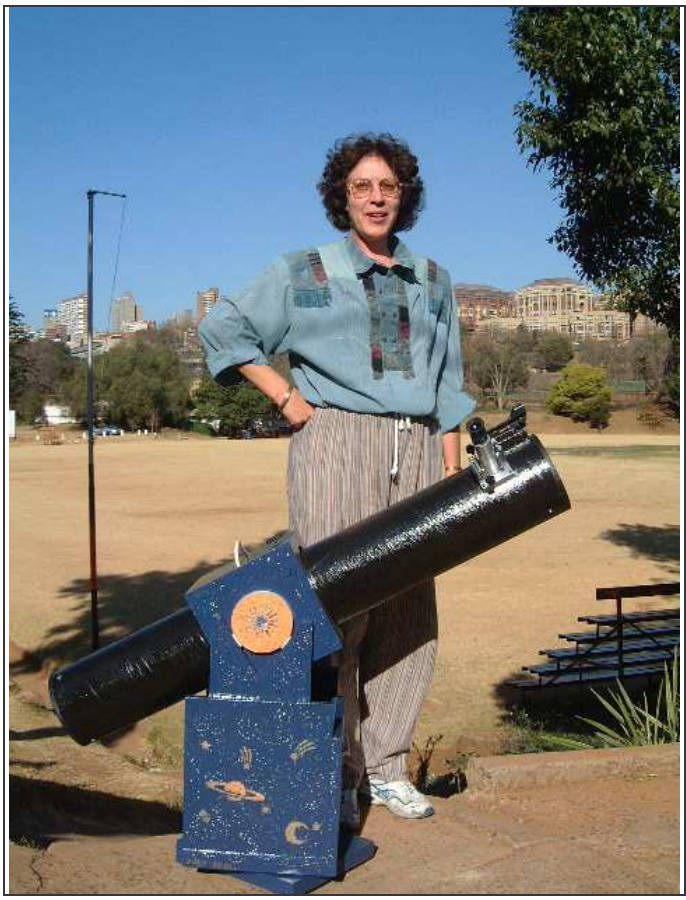
Another visit to the Gamma Ray observatory in Potchefstroom is also in the offing.

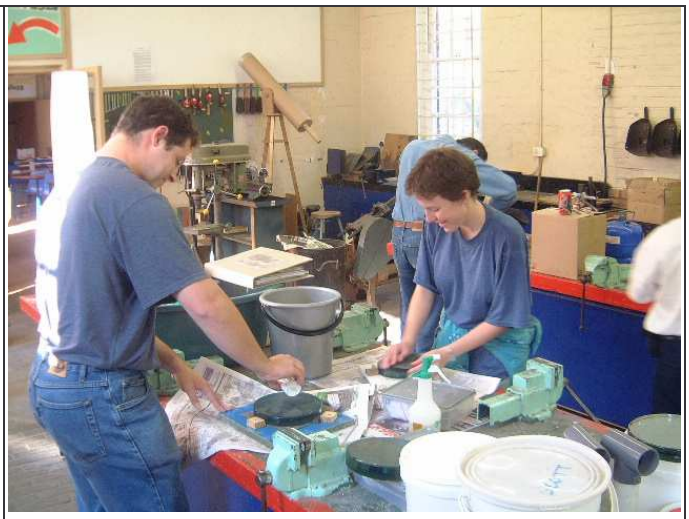
Other ASSA Centres (e.g. the Pretoria Centre) - and try to see if we can organise some joint ventures.

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 803-8291 if you are interested.





In these two pictures, you can see the class in action above, and to the left, you see the fruits of Lerike Cross' labours with her great looking Dobsonian 'scope. With a little effort, a fairly powerful telescope can be built.

6' or 8" telescopes are the norm here, but there is nothing stopping you from grinding a 12" mirror if that is your desire (just takes a little longer).

The "A to Zee" of Astronomee.

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, Burnhams Celestial Handbook Revised and Enlarged Edition, Patterns in the Sky by Julian DW Staal and the Amateur Astronomers Handbook by JB Sedgwick.

Accretion (aggregation) – the increase in mass of a body by addition of smaller bodies that collide and stick to it. *(Not resolved by dieting!)* Accretion is now assumed to have had an important role in the formation of planets from swarms of dust grains.

Achernar – (α Eri) – A conspicuous bluish-white star that is brightest in the constellation Eridanus. Spectral type B3 and at 21pc distant.

Achromatic lens – a two-element lens (doublet) that greatly reduces Chromatic Aberration in an optical system i.e. reducing the occurrence of different wavelengths e.g. red and blue light to be brought to a focus at different distances from the lens – causing false colour arising in the image.

Airy disk – the bright disklike image of a point of source of light, such as a star, as seen in an optical system with a circular aperture. George Airy calculated in 1834 the disk diameter that limits the angular resolution of the telescope.

Aldebaran (α Tau) – a conspicuous read giant and brightest star in the southern summer constellation of Taurus. Spectral type K5 III and at 19pc distance.

Alpha Centauri (Rigil Kentaurus – a Cen) – A binary star that is the brightest star in the constellation Centaurus . Second nearest star to our sun consisting of Proxima Centauri being nearest to the sun @ 1.33pc distance Spectral type G2 V.

Altazimuth – often used to refer to telescope mountings that allow the telescope to swing about a vertical (azimuth) axis. The other axis with is referred to as altitude.

Aluminizing – a process whereby a very thin but perfectly uniform coating of aluminium is deposited by evaporation on a suitable base (e.g. a glass disk) giving it mirrorlike qualities. Used for primary and secondary telescope mirrors.

Anglo-Australian Telescope (AAT) – the 3.9 m reflecting telescope which began operating in 1975 at Siding Spring Australia at an altitude of 1 150m.

Andromeda galaxy (M31, NGC 224) – the largest of the nearby galaxies, visible to the unaided eye as a faint oval patch of light in the constellation of?…… Yes you guessed right! Andromeda! Distance is estimated at 725kpc or 2,35m light years and total luminosity estimated at about double that of our Milkyway galaxy. Great object to observe through a telescope of 10" or more in dark areas!

Antares (α Sco) – huge remote but conspicuous red super giant star in the southern winter constellation of Scorpius., it has a 5th magnitude B type companion, has a size of 256 solar diameters and is at 160pc distance.

Aperture – clear diameter of the object lens in a refracting telescope or of a primary mirror in a reflector.

Aphelion – the point in the orbit of a planet, comet, or satellite in solar orbit that is furthest from the sun. The earth is e.g. at aphelion on or about July 3rd.

Aquila (Eagle) – an equatorial constellation near Cygnus (swan). Altair is its brightest star at 1st magnitude. Aquila and Cygnus are observable in our southern hemisphere flying in formation above the northern horizon in and around September.

Asteroids (minor planets) – small rocky solar system bodies that orbit our sun of which about 95% orbit in the asteroid belt between the orbits of Mars and Jupiter at a distance of about 1.7 to 4 AU from the sun. Some have different orbits and more than 100 000 are bright enough to photographically observed. 5 500 have received official asteroid numbers. Vesta is bright enough to be seen with the naked eye. Total mass estimated to be 15% of the moon's mass. About 120 are larger than 130km in diameter and 10 with diameters exceeding 250km.

Aurora – a colourful display of diffuse changing coloured light seen high in the earth's atmosphere mainly in the polar regions. Caused by charged particles from the solar wind and solar flares that become trapped in the earth's atmosphere.

Wolf Lange

US Space and Astronomy News

Bill Wheaton, Caltech

2001 September

Greetings once again --

The stately progress of our endeavor continues, and indeed much has happened in space and astronomy since my last column for *Canopus*. Mars Global Surveyor has been quietly revolutionizing our knowledge of the Red Planet, and a follow-up mission, Mars Odyssey 2001, is more than half way to its October arrival. NEAR rests in peaceful bliss, safe on the surface of Eros, the largest near-Earth asteroid. The near-infrared 2 Micron All Sky Survey (2MASS, on which I happen to have been working for the past several years at IPAC, Caltech's Infrared Processing and Analysis Center) has now finished its observing phase and just begun a final uniform processing of the 25 Terabytes of data collected by the two observatories, with the final data release expected in about a year. The Chandra X-Ray Observatory (*nee* AXAF) has been returning marvelous new images and spectra for two years, continuing the trail blazed by HST over the past decade. The Space Infrared Telescope Facility, SIRTF, has been assembled and awaits integration with the spacecraft; launch is officially scheduled for less than a year. JPL's Cassini/Huygens Saturn mission has passed far beyond Jupiter and is now well over half way there, both in distance and in time since launch. Deep Space 1's revolutionary ion drive is still quietly thrusting away towards its planned rendezvous with comet Borrelly in September, two years after the formal mission objectives were accomplished. The MAP and Genesis missions have been launched and are well on their ways, while the construction of the International Space Station continues.

It is indeed a ponderous process: we wait eagerly, and at times impatiently. Yet one does not need to look back too far to notice the vast distances we have covered, and to realize that we truly are in a Golden Age for both astronomy and space exploration.

Deep Space 1

The first thing you have to understand about DS-1at this point is that the Comet Borrelly encounter due on September 22 is a long shot, way beyond reasonable expectations for what was, after all, a technology development mission, only intended to get some real flight experience with an ion drive and wring out some new instruments and mission operations concepts for the future. Essentially all of the nominal mission objectives were accomplished during the "primary mission" by September 1999, but shortly thereafter the startracker (used to orient the spacecraft accurately) failed, seriously complicating the ability of controllers to point the MICAS camera and near infrared spectrometer. Up until the event, this had been considered a mission-terminating contingency, since it also made it impossible to point the high gain antenna or the ion drive propulsion unit in the way that had been planned. By a fairly heroic software development effort, DS-1's computers have been re-programmed to use the MICAS images to replace the missing startracker data. Since MICAS has less than 0.1 of the angular field-of-view of the star tracker (about 0.7° vs almost 9°) and can only reliably detect 6th mag stars, this was not a simple undertaking. Nevertheless, it was achieved with remarkable success.

A major complication for the comet rendezvous is that the nucleus is small enough that even the HST could not identify it on its last pass through the inner solar system, so its exact position is unknown. (The comet's coma, or outgassing atmosphere, is of course enormous compared to the nucleus -- very roughly ~100,000 km vs ~10 km -- and much brighter.) DS-1 will pass through the coma at a relative speed of 16.5 km per second. So the trick is to use MICAS to locate the nucleus shortly before the flyby and accurately measure its position. To do this it has to try to recognize the faint point-like nucleus in the image against the confusing background of the coma using onboard recognition software, estimate where it will appear a few hours later at closest approach, and then use the gyros to try to point the spacecraft at that critical instant. Clearly a sporting proposition. (How can we resist to try?) A plasma experiment, PEPE, will measure the composition, density, and temperature of ions and electrons in the comet's coma. PEPE is relatively insensitive to precise orientation, and should obtain good results regardless of the success of the imaging endeavor. Because the mission is virtually over, the www pages have

little recent news beyond an entertaining and informative series of reports by mission scientist Marc Raymond at his Mission Log Page,

http://nmp.jpl.nasa.gov/ds1/mrlog.html,

which I recommend for anyone with an adventuresome spirit. For much more funky technical detail, try the mission papers at

http://nmp.jpl.nasa.gov/ds1/papers.html.

Some previous background material about the DS-1 mission can be found in my own Canopus columns from 1999 at

http://www.wwheaton.com/waw/canopus/index.html

MAP

The Microwave Anisotropy Probe, launched on June 30, is on its way to the L2 Sun-Earth Lagrange point, in the antisolar direction about 1.5 million km from the Earth. Most readers of *Canopus* know that the cosmic microwave background (CMB) is the actual light of the Big Bang, the veritable flash of creation, released when the Universe first cooled enough to become transparent, about 300,000 years after the beginning. At that time the temperature was about 3000 K, but the cosmic expansion has since redshifted this primaeval photospheric light by a factor of about 1000, to the 2.73 K we now observe. MAP follows on the enormously successful Cosmic Background Explorer (COBE) mission, launched into Sun-synchronous polar orbit in November 1989, which first clearly revealed tiny ripples in the CMB, by which it deviates from perfect uniformity. These fluctuations, less than 0.1% of the temperature of the CMB itself, reveal a great deal about conditions at those earliest times, and about the present cosmos as well. Recent observations from balloons seem to demonstrate that the large-scale geometry of the Universe is very nearly flat (ie, Euclidean), though at least three distinct kinds of unknown dark matter may be needed to account for the total inventory that appears to be required when all the different kinds of evidence are considered. This will clearly all have to wait for a future column (while I brush up on my cosmology, for one thing), but I at least have space and time here to say that the L2 point from which MAP will observe, being far from the Earth and having all major heat sources (that is, Sun, Earth and Moon) on one side, can be shielded from confusing light and heat much better than any previous mission, and will be able to map the CMB over the entire sky with a sensitivity and angular resolution previously unachievable. In fact, L2 seems destined to become the premier site for space astronomy in the next few decades; keep your eye on this space.

The launch was perfect, and so far, all is well; details can be found at the MAP Homepage at:

http://map.gsfc.nasa.gov/index.html.

Bill Wheaton

Eta Carinae rising

Sebastian Otero
varsao@sinectis.com.ar

Dear Observers:

Eta Carinae is now at its brightest state since the end of 19th century's eruption. Although the current state is not an outburst but a normal S Doradus phase on its way up, this is very interesting to note.

The star is currently at 5.0-5.1 magnitudes and it will probably continue to brighten for several weeks more. As we all know the star is very difficult to measure both photometrically and visually due to the envelope that surrounds it and the emission lines present.

My visual observations have been 0.1 mag. fainter than the PEP(V) values presented in the past by Stan Walker so now that I observe it at 5.1 it's probably at 5.0. Three other observers (Enzo de Bernardini, Cecilia Scalia and Conrado Kurtz) have also been observing the star between 5.0 and 5.2 so the rising trend is confirmed.

Will Eta Carinae finally get closer to 4th magnitude?

Cheers,
Sebastian.

*Submitted by **Brian Fraser***

THE LIFE OF A STAR

During the life of a star the pressure of the overlying layers of gas consisting of hydrogen with an admixture of up to 20% helium, causes the temperature in the nucleus of the star to rise to more than 10 million degrees Kelvin, (10 x 10^6)°. At this temperature and pressure the individual protons of the hydrogen atoms are stripped of their electrons. Normally each proton which carries a positive electric charge is accompanied by an electron which carries a negative electric charge**;** the opposite charges thus producing a neutral atom. The mass of the proton is 1836 times that of the electron and the proton occupies the central point of the atom. One must not think of the electron as if it revolves around the proton in the same way that a planet revolves around the Sun. Rather, one must postulate the space around the Positive proton as being curved by the gravity brought about by the mass of the proton and having a wrinkle or wave in the space-time**;** here at one moment and there at the next moment pulsating all the time. Wave mechanics describes the electron by equations which show that the electron can be fully described by a wave motion. When the atom absorbs energy the electron or wrinkle in space-time jumps further away from the central proton but this jump occupies no time and when the atom radiates energy, it is because the wave of negative electric charge has jumped to a position nearer the central proton. Wave mechanics has shown that the "orbits" of the electrons can only exist at particular distances from the proton, these distances being in the ratios 1^2, 2^2, 3^2 **...**

In the nucleus of a star, therefore we have a plasma consisting of free positive charges, charges (protons) and free negative charges (ELECTRONS). The plasma is considered as being the fourth state of matter, the other three being solids, liquids and gases.

Because of the pressure under which the protons of the plasma occur two protons are literally squeezed into each other, despite the repelling forces which the positive charges of the two protons exert on each other. This comes about because one of the protons sheds its positive charge which is shot out as a positron - a fuzzy wave of positive electricity having the same mass of the electron:

$$ {}^{1}_{1}\mathrm{H} + {}^{1}_{1}\mathrm{H} \rightarrow {}^{2}_{\uparrow}\mathrm{H} + \mathrm{e}^{+} $$

Here H stands for the proton; the figure at the top indicates the mass which is taken to be one atomic mass unit (1 amu), and the lower figure as indicating 1 positive charge of electricity. e+ stands for the positron. When two protons fuse together a deuteron ${}^{2}_{1}\mathrm{H}$ is formed. It has a mass of 2 amu but still only one positive electric charge; one of the protons having shed its positive charge by shooting it out as a positron. This proton therefore becomes a neutron. The neutron was discovered by J Chadwick of Cambridge University, England in 1932. For this advance he received the Nobel Prize for physics. Whilst the mass of the proton is 1,00758 amu, that of the neutron is 1,00893 amu, thus slightly heavier than the proton. Although this difference in mass is very small, the energy involved when these particles react, can be calculated from Einstein's equation $E = mc^2$. When the mass m is multiplied by the square of the speed of light, we see that the energy involved is enormous.

The nucleus of mass 2 amu $(\oplus \mathrm{O})$ is the deuteron. This nucleus readily attracts another proton, forming $(\oplus \mathrm{O} \oplus)$ which contains 2 protons and 1 neutron. Because the electric charge on this nucleus is 2 instead of 1 it is a nucleus of helium ${}^{3}_{2}\mathrm{He}$ whose mass is 3 and which has two positive electric charges. Another proton gets crushed into this nucleus and another positron is shot out, thus forming a nucleus of helium of mass 4 amu and positive charge 2**:** ${}^{4}_{2}\mathrm{He}$**.** In effect 4 protons have been converted into helium of mass 4 amu and positive charge 2. The amount of mass which is converted into energy in these reactions is 0,02863 amu or 0,7%. When this is multiplied by the square of the speed of light, we find an amount of energy sufficient to boil away almost 10 million kilograms of ice cold water (a dam 1 metre deep and 35 metres in diameter) from 4,03252 grams of protons which are converted into helium; but only 0,7% of the mass of the 4,03252 grams of protons are annihilated. The nucleus ${}^{4}_{2}\mathrm{He}$ is very stable. It is the "ash" left over from the fusing (burning) of hydrogen (protons). In this nucleus the four separate particles have been packed very tightly together. Physicists speak of the packing fraction to indicate the amount of crushing together which the particles have undergone

when 4 separate protons change into one helium nucleus.

All atoms that have masses that are multiples of 4 are very stable. Their nuclei apparently consist of 2 or 3 or 4**. . .** helium nuclei.

During the lifetime of a star in the Main Sequence (10 milliard years in the case of the Sun and other similar stars but only 31 million years in the case of a massive star) nuclei heavier than helium are formed, such as carbon of atomic mass 12**;** oxygen 16**;** neon 20**;**magnesium 24**;** silicon 28**;** sulphur 32**;** calcium 40**;** titanium 48**;** chromium 52 and iron 56**.** Many other atoms of various masses are formed. Atoms having the same charge but different masses are called isotopes. Many of the isotopes are radioactive. Up to the stage when iron is formed, the packing fraction consistently increases so that iron has the highest packing fraction of all atoms. When lighter atoms (up to iron) are fused together, energy is set free. In order to fuse atoms heavier than iron energy has to be supplied.

When a certain amount (about 3/4) of the hydrogen of a main sequence star has been consumed, the outward pressure of the radiation from the centre decreases radically so that the pressure of the overlying layers causes the star to collapse catastrophically on its centre. A star like the Sun will reach this stage after about 10 milliard years. The collapse brings about such a great increase in temperature (up to 100 million degrees) that the helium ash undergoes fusion into carbon 12. This new increase in liberated energy blows the upper layers of the star into space. The star is now on its way to become a red giant -- red because the temperature of the upper layers decreases.

___Hydrogen 1
___Helium 4
___Carbon 12
___Oxygen 16
___Neon 20
___Magnesium 24
___Silicon 28
___Sulphur 32
___Calcium 40
___Titanium 48
___Chromium 52
___Iron 56
Nickel 56
___Cobalt 56

When the helium flash has consumed most of the helium the carbon 12 in its turn undergoes fusion bringing about a repeated flux of energy**.** Then the carbon gets fused into oxygen, and so on until eventually iron 56 is formed. Silicon 28 also readily fuses into iron 56. By this time the nucleus of the star has taken on a structure like the shells of an onion and the red giant has reached a size large enough to fill the orbit of Jupiter. The core of the star is now a white dwarf which can go on existing almost to infinity eventually becoming a black dwarf. The white dwarf, surrounded by its overlying gas layers is what is called a planetary nebula. The temperature of the white dwarf is about 10 000 degrees**.**

Jan Eben van Zyl

Book and Magazine Binding

Your favourite books showing signs of wear? Astronomical Magazines all over the place? A repair and re-binding service is available to members at preferential rates. Sky & Telescope and Astronomy can be bound into neat books, making them easier to handle and store.

Enquiries to: **Gill Stewart**
(011) 763-3301

LX200 collimation

"Bob's Knobs" make a thumb screw for the LX200 secondary. These let you tweak the collimation without fiddling with Allen keys in the dark. I'll be bringing a set in - if interested drop me a note.

Price is around US$ 16 + pp per set.

Bruce Dickson

Email List

If there are any members out there wanting to be on an email list to receive any messages relating to the ASSA Jo'burg Centre's activities, please send your details to **Bruce Dickson** at:-

bdickson@mweb.co.za

Darwin Award

A 42-year-old man killed himself watching the eclipse while driving near Kaiserslautern, Germany. A witness driving behind him stated that the man was weaving back and forth as he concentrated on the partially secluded sun, when he suddenly accelerated and hit the bridge pier.

He had apparently just donned his solar viewers, which are dark enough to totally obscure everything except the sun.

Submitted by **Chris Stewart**

Visit to the SAFARI-1 Nuclear Reactor, Pelindaba

We are in the process of arranging a visit to NECSA [Nuclear Energy Corporation of SA] for a Saturday in October. At this stage we have not received a firm date, although we do have permission for the visit. The visit includes the overpool area [Cerenkov radiation] subject to the following conditions as outlined by the Reactor Manager:

Regarding a weekend visit to SAFARI-1 - we will be happy to oblige under selective conditions:

- we would arrange for persons to escort the group(s) at SAFARI-1
- your host must preferably arrange access to the NECSA site;
- we cannot easily handle groups of more than 10 persons at a time (it would however be feasible to break a large group into smaller groups);
- 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;
- no persons under the age of 18 are permitted onto the overpool area;
- women within the first 5-6 months of pregnancy are not permitted onto the overpool area;
- 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 (see fax no. below).
- A date after the 8th October is feasible.

We are also attempting to obtain a visit to the medical and industrial isotopes hot cell containment units.

Those who wish to come along should please look at the Centre's web site for clarification on dates, timing and preliminary requirements. If you have an e-mail address, please let me have it:

Trevor Gould - *trevorgo@transtel.co.za*.

Africlipse Website

The Africlipse Website has received a major update.

Full data is provided for Eclipse 2002 and also initial information for Eclipse 2006 (North Africa).

Detailed reports are provided on Eclipse 2001 as well as links to other reports from Africa and Madagascar by expeditions from all over the world.

See:

www.eclipse.za.net

www.eclipse.za.net/html/2001_report.html

www.eclipse.za.net/html/2001_links.html

www.eclipse.za.net/html/2002.html

www.eclipse.za.net/html/2006.html

Peter Tiedt
rigel@stars.co.za
Visit my website at *http://www.eclipse.za.net*

Signs of Comets Spotted Around Another Star

space.com
15 August 2001

Researchers think they have spotted evidence for the recent birth of millions of comets around a relatively nearby star. If true, it would be one of only a handful of observations that hint at possible solar system formation similar to our own.

The star, called Beta Pictoris, is about 60 light-years away. Previous observations had shown a huge disk of dust and gas surrounding the star, a situation similar to the early years of our solar system. Beta Pictoris is thought to be just 20 million years old, whereas our Sun is now some 4.6 billion years old.

A paper discussing the work appears in the Aug. 16 issue of the journal Nature.

To read the full story, use the internet to go to:

http://www.space.com/scienceastronomy/astronomy/fuse_comets_010816.html

Southern African Meteorite Recovery Program

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Deo Gloria
2001.08.05

Spring 2001 Expedition

The Spring 2001 Expedition will be conducted in an area of sand dunes North of Upington, but South of the Kalahari Gemsbok National Park during the period Saturday 8 September 2001 to Sunday 16 September 2001.

The specific area to be searched will be desert pavement in the inter-dune areas.

Call for Volunteers

Volunteers who are prepared to assist with the search for meteorites are requested to contact the writer.

Note: while it may be possible to stay at or near a Bed 'n Breakfast establishment, it may prove necessary to camp in remote area with no access to ablution facilities.

Volunteers need to be fit to walk the expected distances. No medical facilities will be available, although it may be possible to obtain a snake bite kit.

The timing is intended to fall between the cold of winter, the heat of summer and prior to the first regional rains of the season, however, the week away could well see heat, cold, wind and rain.

Nights are usually cold, but clear, and telescopes for star viewing will be brought along.

If you watched "Survivor" on television and thought this may be for you, please volunteer.

Roads are supposed to be suitable for ordinary sedan vehicles and bakkies or 4X4's while useful, should not be necessary.

Planned Itinerary

Saturday 8 September	Depart for Upington. This expedition will not use a convoy format. We will meet at a point to be determined in or near Upington. From the meeting point, we will proceed to an overnight destination in the search area.
Sunday 9	Meteorite searches
Mon day10	Meteorite searches
Tuesday 11	Meteorite searches
Wednesday 12	Meteorite searches
Thursday 13	Meteorite searches
Friday 14	Meteorite searches
Saturday 15	Meteorite searches
Sunday 16	Return home

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The Sky this Month

September 2001

dd hh	dd hh
1 07 Uranus 3.0 N of Moon	20 20 Venus 0.5 N of Regulus
2 02 Moon at apogee	21 00 Mercury 1.0 S of Spica
2 22 FULL MOON	22 23 **Equinox**
10 13 Saturn 0.2 S of Moon Occn.	24 10 FIRST QUARTER
10 20 LAST QUARTER	25 01 Mars 2.5 S of Moon
12 13 Jupiter 0.0 S of Moon Occn.	26 16 Mercury greatest brilliancy
15 07 Venus 3.3 S of Moon	27 02 Saturn stationary
16 16 Moon at perigee	27 05 Neptune 2.9 N of Moon
17 11 NEW MOON	28 11 Uranus 3.1 N of Moon
18 16 Mercury greatest elong. E(26)	29 08 Moon at apogee
19 03 Mercury 8.1 S of Moon	

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	

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
Sep 08	06.14	17.57	07.21	19.46	04.38	15.35	11.57	01.58	02.32	13.03	00.34	11.14
Sep 18	06.03	18.01	07.12	20.00	04.39	15.51	11.43	01.41	01.58	12.30	23.55	10.35
Sep 28	05.52	18.05	06.51	19.54	04.39	16.06	11.30	01.26	01.24	11.56	23.16	09.56
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