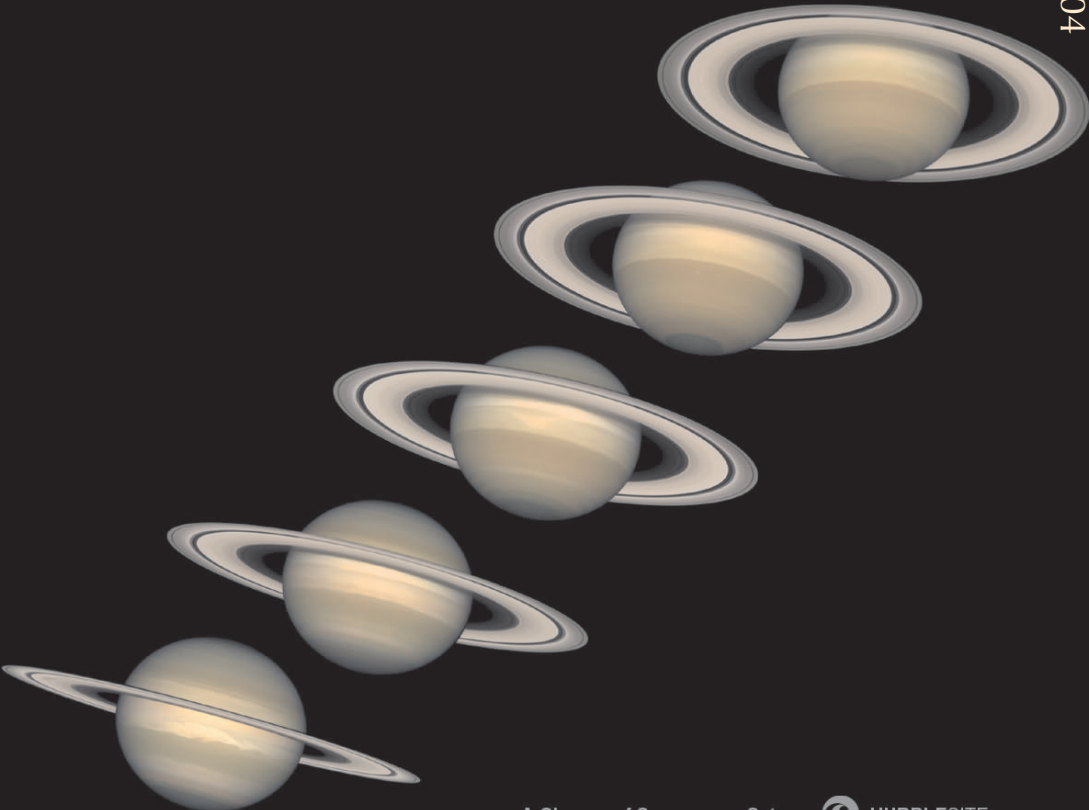


CANOPUS

Monthly Newsletter of the Johannesburg Center of ASSA

September 2004



A Change of Seasons on Saturn  HUBBLESITE.org

Did you know?

... Taking colour pictures with the Hubble Space Telescope is much more complex than taking colour pictures with a traditional camera. For one thing, Hubble doesn't use colour film — in fact, it doesn't use film at all. Rather, its cameras record light from the universe with special electronic detectors. These detectors produce images of the cosmos not in colour, but in shades of black and white.

Finished colour images are actually combinations of two or more black-and-white exposures to which colour has been added during image processing.

The colours in Hubble images, which are assigned for various reasons, aren't always what we'd see if we were able to visit the imaged objects in a spacecraft. We often use colour as a tool, whether it is to enhance an object's detail or to visualise what ordinarily could never be seen by the human eye.

I can see clearly now ...

September Edition of
Canopus

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To take a peek at the
electronic version of
this newsletter, surf
to our website at
www.assajhb.co.za

Dear Canopus Reader,

In 1926, in the opening paragraph of his now classic book 'The Internal Constitution of the Stars', Sir Arthur Eddington lamented:

"What appliance can pierce through the outer layers of a star and test the conditions within?"

Not so long ago, the answer was finally revealed: asteroseismology. With the resounding success of helioseismology, it was just a matter of time before scientists figured out how to look at the inside activities of stars as well. Although this branch of science is still taking baby steps, it will definitely change the way we look at celestial bodies. (More about this in a future edition.)

This month we take a look at the HST. Talking of altering views: the Hubble Space Telescope has contributed tremendously toward the scientific knowledge base. If you are a Hubble-ite, this issue will probably having you nod your head

in agreement. Who will ever forget those first pixels beamed back, slowly materialising into awesome graphics? Read in this edition how important it really is to save Hubble from deterioration.

With apologies to Sir Arthur:

"It is through Hubble that the human race can pierce through the starry skies and see the jewels hidden within..."

Back to Earth. Another kind of jewel box is waiting to be opened at the annual ASSA Symposium to be held in October this year. The programme is choc-a-bloc, covering quite a range of topics - from pure novice to extreme fundi. So, after reading this issue of Canopus from cover to cover, go and fill in that leave form - you know you have to join us from the 14th to the 16th of October!

Clear skies all the way,

Mariëtte

In this issue...

On the coveragepage: Saturn's seasons as captured by the Hubble Space Telescope

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What about some Astro Games?

After two weeks of constant bombardment of Olympic games events, I couldn't but admire these fantastic athletes and the hundreds, perhaps thousands, of hours of training they would have put in to reach the standards they do.

And I started to think: "If there were an Astronomical Olympics, would I make the South African team?" The answer is "probably not", but maybe at some point in my life - if the carrot was dangled - I may have put in the hundreds of hours to attempt to make the team.

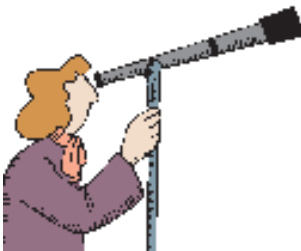
But that is not the point. What I saw was thousands of people performing to the best of their abilities and I realized that most of us make very little effort to perform as well as we can. We prefer to drift along in our little comfort zones, with no attempt to be as good as we possibly can.

Amateur astronomy in South Africa today is very different to what it was 20 years ago. There are far fewer people doing serious observing, and as this is one of my passions in life, I hope in the next year or so to try persuading some of our members to do some serious astronomy - things that you can do in your backyard with a small telescope, or even a pair of binoculars, like observing variable stars and lunar occultations.

So be prepared! You might just be tempted into doing some fun things you didn't know existed...

Till we meet again,

Brian



ASSA logo competition announced

The ASSA Council has agreed that a competition is to be held to design a new logo for the Society. The logo should be distinctive, unique and representative of astronomy in Southern Africa. For more information on the history of astronomy in Southern Africa and the Society's objectives, visit www.sao.ac.za/assa. All members are invited to submit entries which may be e-mailed to maciej@ifr.sun.ac.za or posted to ASSA Logo Competition, PO Box 9, Observatory 7935, South Africa.

Deadline: To be received before November 1, 2004.

The winning entry will be announced before January 1, 2005 and the winner will receive a prize to the value of R250.

Membership Renewal

- A Reminder to All

Please remember to renew your membership for 2004-2005!

Forms are available on the website, or from Chris Penberthy on request.

Normal member: R125.00

Family: R150.00

Minors, Pensioners & Students: R62.50

Joining fee for new members: R50.00

Note that the subscription period corresponds to the Centre's administrative year, i.e. 1 July 2004 to 30 June 2005.

Why We Must Defend Hubble

A few space advocates have recently questioned why those whose primary concern is to further the human exploration and settlement of space should fight to save an astronomy project.

The answer to this is straightforward. Hubble must be defended because the abolition of the Hubble programme would be a crime against science. Furthermore, the grounds given for deserting Hubble are irrational, and constitute a form of moral cowardice, that if accepted as the basis of space policy, would absolutely prevent any human missions to the Moon, Mars, or anywhere else. These points are explained in greater detail below:

1. A Crime Against Science:

The HST is, as explained in more detail in the appended talking points, the most productive scientific programme in human history. It has revolutionised astronomy, and made discoveries that have caused us to radically revise our concept of the nature of the universe.

2. Deserting Hubble is Irrational:

Giving up on Hubble makes no sense. Given the commitment to continue flying the Shuttle programme through 2010, adding the two Shuttle flights required to upgrade Hubble and then reboost it to make it operational through 2015 would only add

about 1% to the Shuttle programme's cost, while increasing its science return by several orders of magnitude.

The safety argument given for cancelling Shuttle flights to Hubble while allowing them to ISS is also without rational basis. It is true that when flying to the ISS, the crew has a safe-haven on orbit, which is not available to Hubble flights. However, Hubble missions leave the Cape flying east-southeast, while launches to ISS go northeast. Thus, in the event of a launch abort, Hubble missions can ditch in warm tropical waters while ISS flights must come down in the frigid North Atlantic, where the crew's chances for survival would be much less.

Furthermore, because ISS flights take off with much heavier payloads than Hubble flights, they require full functionality of all three engines for nearly 100 seconds longer than Hubble missions - if they are to perform an abort-to-orbit. This makes landing in the drink on ISS missions considerably more likely.

The Cat's Eye Nebula as taken by Hubble

(<http://hubblesite.org>)





Finally, NASA calculations show that the danger of fatal impacts by micro-meteors and orbital debris to be over 60% greater on ISS missions than Hubble missions. If we put this information together with the fact that only two Shuttle missions are needed to make Hubble operational for another decade, while over 20 are needed to complete the ISS, it is apparent that the risk assessment of the Hubble programme is exaggerated.

3. Hubble Desertion Prevents Human Exploration:

Desertion of Hubble discredits the human spaceflight programme, because Hubble is the one example to-date wherein the human spaceflight programme can show more science return per dollar than robotic spacecraft. For example, Hubble, including its four Shuttle support missions to date, has cost about twice as much as the Galileo probe to Jupiter, but it has produced at least a hundred times the science return.

Fleeing from Hubble is fleeing from the human space flight's programme primary scientific accomplishment. The cost of retreat is much worse than that, because the space agency is now proposing to begin a programme of human exploration to the Moon and Mars. Yet, it is patently obvious that a human mission to the Moon or Mars cannot be done at a lower level of risk than the Shuttle mission to the Hubble.

So, if we don't have the guts to go to Hubble, we are not going to the Moon, Mars, or anywhere else. And if we are not going to engage in human interplanetary travel, then the primary rationale for the Space Station programme - learning about the effects of long-duration spaceflight on human physiology - loses its foundation as well.

Conclusion:

Ultimately, the question of whether we rise to the challenge of the Hubble upgrade mission is not one of the technicalities of Shuttle flight safety, but of societal values. If humans are to explore space, cowardice is not an option. It is not a matter of ignoring risks, but of facing them, and knowing the odds, bravely putting it on the line to do what has to be done. This is the human quality known as courage. It has been the primary requirement for every significant achievement of humanity to date, and it will be the spirit necessary if we are to go to Mars.

Information extracted from the Mars Society

(<http://www.mars.society.org/news/2004/0202.asp>)

You might be an Amateur Astronomer if:

1. You think that not getting enough sleep at night is a good thing.
2. You ask your optometrist about the availability of H-Alpha Sunglasses.
3. You centre your vacation time around the New Moon.
4. You don't buy a house until you've had a chance to see how dark the neighbourhood gets at night.
5. You build your dream home with a roll-off roof (or ideally, a rotating dome roof).
6. Somebody asks you where you live - and you tell him the latitude and longitude of your house.
7. All the night lights in your house are red.
8. You've named your kids and pets after stars or constellations.
9. A pair of binoculars and a small refractor are always in your trunk, just in case.
10. Your neighbourhood seems to always have more than its share of non-functioning streetlights.
11. When you take a new vehicle for a test drive, the first thing you do is run by home to see whether your telescope will fit in the trunk.
12. You spend more money per year at your favourite optics store than you do at Pick&Pay.
13. You have a propensity for buying toys that glow in the dark.



The Hubble Space Telescope is ailing

...Quite unsurprising considering its harsh environment

by Chris Stewart

Fortunately, the HST was designed for in-orbit service. In its 14-year history, this has paid dividends - service missions circumvented the initial problems caused by an improperly figured primary mirror, replaced ageing components with newer better ones and turned it into a spectacularly successful orbiting observatory.

But the last service mission took place in 2002, and since then the shuttle disaster has prompted NASA to cancel planned servicing missions on the basis of safety. This has caused an outcry by the scientific community and the public alike. Apart from the scientifically valuable output, people have become accustomed to receiving ever more impressive and aesthetically pleasing images that pique their curiosity and feed an innate need for beauty.

"Save Hubble" is the rallying cry.

Yet NASA's safety concerns are valid, and budget constraints a reality. Left to its own devices, the spacecraft's systems will progressively fail until it is unable to point, let alone image. Eventually, it will fall into the Earth's atmosphere and burn up.

Located in a low-Earth orbit (necessary to enable servicing missions by the Shuttle, which has a ceiling of maybe 400km), Hubble is inevitably subjected to atmospheric drag. It has no built-in capability to boost its orbit, and even if it did the fuel would eventually run out. Without intervention, it is doomed. So at the very least, a "controlled de-orbit" is necessary. That's a euphemistic way of stating that the public liability of having the thing fall on a populated area is too horrendous to contemplate, so "something must be done". (Chicken Little was right!)

Hubble was built with the expectation that the Shuttle would be available to look after it. It was even designed to be launched by the Shuttle, sized to maximally utilise the Shuttle's

cargo bay size and lift capability.

With no Shuttle, what to do?

The "obvious" answer is to build on the robotic capabilities that have been building momentum in the decades since Hubble was originally designed. Virtually autonomous machines have recently enjoyed great success as robotic explorers in space, and remote manipulators (exemplified by the robot arms used on the Shuttle and the ISS) have proven their worth.

A few mishaps aside, the Russians have had fair success with unmanned supply craft, docking them by remote control with manned space stations. Yet, there are many challenges - Hubble is large and complicated. Thus far, human ingenuity and adaptability have carried the day, as unforeseen problems and circumstances have been encountered during previous servicing missions.

The question is whether we are far enough advanced for robotics to do the job, and if we are not, whether funding and determination will see us through in time. A year ago, the odds were against it. Now, more experts are gaining confidence and the movement is gaining momentum.

Time will tell.

FAQ Hubble

Why is the Hubble in trouble?

In January 2004, it was unexpectedly announced that a planned shuttle mission to service the Hubble would be cancelled, sentencing it to a premature death in about 2007.

Why was the service mission cancelled?

Safety concerns was cited, but it looks more like a plan to commit all shuttle flights to completing the space station. All shuttles could then be retired, freeing up funds for President Bush's plan to send astronauts to the Moon and Mars.

In 2002, CNN reported on Richard Wade's hypothesis that the mysterious Zimbabwe ruins once served as an astronomical observatory to track eclipses, solstices and an elusive exploding star.

Several of the stone monoliths at the Zim Ruins, for example, line up with certain bright stars in the constellation Orion as they rise on the morning of the shortest day of the year, the winter solstice. Another contains markings that coincide with orbital patterns of Earth and Venus, which could be used to forecast eclipses. Historic records make no mention of it, an omission that is not surprising given the fact that the dying star appeared over the Southern Hemisphere, at a time when virtually no literate cultures were present. But oral legends in the region lend credence to the supernova idea - the Sena people of Zimbabwe hold that their ancestors migrated from the north by following an unusually bright star in the southern skies.

**Talk at the 08 September meeting:
'Archeo-Astronomy of Great Zimbabwe',
presented by Richard Wade.**

Find out more about this fascinating topic at the Monthly Meeting, on Wednesday the 8th of September at 20h00.

August Readers' Poll

What advice did our readers give to novice astronomers? Here are some opinions:

1. Attend a local star party.

The point of going to a star party is to get a realistic view of what is truly visible through an amateur telescope. A lot of people have the misconception that beautiful colour images are visible through the eyepiece and that is simply not true. The other reason is that everyone has questions and there is no place better than a star party to get realistic answers about equipment and the sky.

2. Learn your way around the sky with a good book and a pair of binoculars.

This can be done easily with a well chosen book with star maps and a pair of binoculars. Only then if your interest grows and does not wane, is it wise to buy a telescope. Try it: Go outside every clear night with a set of star charts and learn your way around the sky.

Then, when time comes to start exploring more in depth, you don't have to worry about getting lost trying to match a deep-sky object's location with its position on a star chart.

3. Join Jerome's Beginners Classes.

This class has theoretical as well as observing sessions where the neophyte will have friendly help with questions and hands-on experience with many types of astronomical equipment.

4. Just look at the stars and enjoy it first.

Don't get too caught up in all the different things people want you to buy (although there are a lot of good things to buy). And never forget how beautiful the night sky is.

5. Learn what astronomy is all about.

Learn how to read elementary star charts, what descriptions of telescope types actually entail, basic astronomical terms, types of astronomical objects, and so forth. That knowledge could prove to be a necessary prerequisite to successful and enjoyable stargazing.

6. Join the ATM Class

The Telescope-Making Class is for those who are more technically minded and appreciate a hands-on experience. See the stars through your own handmade scope, now there's something!

*Topic idea from Astronomy Community:
<http://www.astronomy.com> © 2004 Kalmbach Publishing Co.*

Asteroid danger to vanish in 30 years

One of the greatest threats to the future of the human race - a collision between Earth and a large asteroid - will largely disappear within the next 30 years, an expert in the field predicted on Monday. A new generation of asteroid-hunting telescopes will allow astronomers soon to detect and trace 99 per cent of near-Earth objects that could endanger the planet, according to Benny Peiser, of Liverpool John Moores University.

- The Times

It's teleporting, Jim...

...But not as we know it! It's not quite Star Trek, but Austrian scientists took a step into the future when they 'beamed' the properties of a particle 600 meters underneath the River Danube. The experiment offers the best evidence yet that teleportation is possible - at least at an atomic level.

- Times

Antarctic craters reveal asteroid strike

Scientists from Delft University in the Netherlands have used satellites to discover huge craters under the Antarctic ice sheet that were caused by an asteroid as big as the one believed to have wiped out the dinosaurs 65 million years ago.

- Guardian, Times

Acid rain not all bad

Acid rain can benefit the environment by blocking one of the most powerful greenhouse gases, scientists said yesterday. Research led by Vincent Gauci, from the Open University's department of earth sciences, shows that the sulphur in acid rain dramatically reduces the natural production of methane, responsible for an estimated 22% of the greenhouse effect that is causing global warming.

- The Guardian

NASA launches first mercury mission in three decades

NASA launched its first mission to the planet Mercury in a generation early on Tuesday, one that scientists hope will strip away much of the mystery surrounding the tiny planet closest to the sun. The Messenger spacecraft, riding a Boeing Co Delta 2 rocket, blazed across the night time sky above Florida's Cape Canaveral Air Force Station as the mission got underway with lift off at 2:16 a.m. Eastern Daylight Time.

- Reuters

Snap, crackle, big bang, it's a new universe

Scientists have devised the smallest number in history to express the chances of a repetition of the Big Bang occurring in a bowl of rice crispies. According to the New Scientist magazine, physicists at the University of Chicago have calculated that the chances of such an event as one divided by ten to the power of 1,056 (roughly, one divided by one followed by 100 million trillion trillion trillion trillion trillions).

- Times

4X4s blamed for dust that threatens world

Four-wheel-drive vehicles are contributing to an increase in dust in the atmosphere, with potentially serious consequences for human health and climate change (not to mention amateur astronomy! -Ed), according to research by Andrew Goudie, professor of geography at Oxford University. There has been a tenfold increase over the past 50 years in the quantity of dust being blown across the world from part of the southern Sahara, the single greatest source of the problem, which has been made worse by an effect labelled "Toyotarisisation".

- Daily Telegraph, Guardian

SNIPPETS

Early Cape Observations

by Etienne van Zyl

A group of six Jesuit Fathers, sent on a scientific and religious mission to Siam by French King Louis XIV, visited the Cape for a week at the beginning of June 1685. The notes by one of these, Guy Tachard, give interesting descriptions of the Cape at the time and relates how they made some observations from there. On their arrival, things did not get off to an amicable start, as there was a misunderstanding regarding the customary salute - eventually resolved by the castle firing seven canon shots, the Admiral seven, and the other ships five. This little matter being settled, the French were hospitably treated and a pavilion in the Company Gardens was put at their disposal.

They brought their instruments ashore, their astronomical observations evoking keen interest from the officials of the Dutch East India Company, and several, including Monsieur van der Stel, came to look through their telescope.

Whereas navigators could estimate latitude with relative ease by measuring the altitude of polar stars, determining longitude was substantially more difficult. The Jesuits' attempt at determining the longitude of Cape Town is therefore very interesting. Extracts of Tachard's notes, quoted from Early French Callers at the Cape by Edward Strangman, give an insight into their findings:

2 June 1685: A seconds-pendulum, made in Paris by Monsieur Thuret, having been set as near to the true time as we could guess, we began the following observations. At three minutes past eleven, by this as yet uncorrected clock, the first satellite appeared distant from Jupiter at little less than the planet's diameter. Through the telescope, on the planet itself, we observed two parallel bands, the wider one towards the southern edge, and the narrower towards the northern. At 11.57'.30" o'clock the first satellite was beginning to touch the rim of Jupiter. At 11.58'.50" o'clock the satellite had disappeared. We took these observations with an excellent twelve-foot telescope made by the late Monsieur Le Bas. The times given are those of the uncorrected clock. We continued observing Jupiter until five minutes past two in the morning, when it disappeared behind the

Lion Mountain, by which our view was bounded on the West. On that night, therefore, we were unable to witness the emersion of the first satellite.

On the night of the 3rd of June, as we had no special observations to take, we examined some of the fixed stars through the twelve-foot telescope. The foot of the Cross shown in Bayer is a double star, that is to say, it is composed of two bright stars, distant one from the other their diameter's width, somewhat like the most northerly of the Twins. A third star, smaller and a little further away, also belongs to the group. Under the cross, in the Milky Way, there are several patches which in the telescope appear to be filled with an infinity of stars. The two Clouds that are near the South Pole do not appear to be a mass of stars like Praesepe in Cancer, nor are they a sombre light like the nebula in Andromeda. Through the big telescope next to nothing can be seen, although to the naked eye they seem quite white, especially the bigger cloud.

Nothing in the sky is so beautiful as the constellations of Centaurus and Argo. Close to the Pole there are no bright stars, but there are quantities of little ones. Bayer and the other books that speak of them omit several, and the majority of those they give are not located in their right positions.

4 June: For this (determining the longitude of Cape Town) we based our calculation on the emersion of the first satellite of Jupiter, which, on the horizon of Paris, was due to occur at 8.25'.40" o'clock in the evening. Having observed that it took place at the Cape at 9.37'.40" o'clock, we found a difference of one hour and twelve minutes between the meridians of the two places. This difference, converted into degrees, gives eighteen. Consequently the maps are defective and place the Cape nearly three degrees more to the East than it is in reality.

Today we are well familiar with the objects described by Tachard above. The actual difference in longitude between Paris and Cape Town is 16 degrees. The result obtained in this observation (18 degrees) is therefore significantly flawed, largely due to the lack of an accurate clock rather than any shortcoming in the procedure.

ASSA Symposium 2004 Programme of Events

Thursday 14 October 2004

09:00	Registration & Welcome
09:30	Dr Kelvin Kemm, Topic to be advised
10:15	Ian Glass - SAAO, 'Recent Studies of Mira and Semi- Regular Variables'
11:00	Tea
11:30	Dr Barbara Cunow - UNISA, 'Stars and Dust in Galaxies'
12:15	Magda Streicher - Amateur JNB, 'Deep Sky Waarnemings' (Afr.)
13:00	Lunch
13:45	Dr Derck Smits - UNISA, 'Determining the Primordial Helium Abundance'
14:30	Prof Raubenheimer - PU for CHE, 'The HESS gamma ray telescope'
15:15	Tea
15:45	Tim Cooper - Amateur PTA, 'Analysis of Comet Brightness Behaviours from ASSA Obs'
16:15	Johan van Delft - Amateur BFN, 'Solar Activity and Climatic Change'

Friday 15 October 2004

09:00	Morning Coffee & Registration
09:30	Phil Charles - Director SAAO, Topic to be advised
10:15	Dr Pieter Kotze - Hermanus Magnetic Observatory,

Join us for an exciting annual ASSA Symposium from 14 to 16 October 2004!

11:00	'Living on a giant magnet' Tea & Group Photo
11:30	Dr Barbara Cunow - UNISA, 'Saturn over the years'
12:15	Brian Fraser & Tim Cooper - Amateurs JNB, 'A W Roberts - The man and his observations'
13:00	Lunch
13:45	Dr Roger Gibson - WITS, 'Deep Impact in SA - the Vredefort Catastrophe and its environmental consequences'
14:30	Magda Streicher - Amateur JNB, 'Cyril Jackson Observatory'
15:15	Tea
15:45	Johan Smit - Amateur PTA, 'History on the Exploration of Mars'
16:15	Emmanuel Petrakakis - Amateur MPT 'Inca Archaeoastronomy'

Saturday 16 October

10:30	Meet at Broederstroom Observatory
10:45	Brian Fraser, Amateur JNB 'The Franklin Adams telescope and it's contribution to astronomy'
11:15	Tour of the facilities
12:00	Braai
13:30	Travel to HARTRAO
14:00	Dr Mike Gaylard - HARTRAO, 'The HARTRAO facility and what it does'
14:30	Radio astronomy topic to be advised
15:00	Radio astronomy topic to be advised
15:30	Tour of the facilities

Symposium Costs

Prices: all 3 days R300 (Includes tea and lunches on all days, as well as the Planetarium show and the star party at the observatory)
Any single day R140-00, including tea and lunch
Non-delegate fee will be R15-00
The Planetarium show is open to all.

For bookings contact Lerika Cross on lerika@icon.co.za

Pre-payment to ASSA Current account:
Account Number: 1921 013761
Account Name: ASSA Johannesburg Centre
Bank: Nedbank Park Plaza
Branch Code: 192142

TSWAING: Not just another hole in the ground...

An account of the joint ESSA/ASSA venture that turned into a rare gem of a weekend

by Shanta Vadeveer

The joint ESSA/ASSA Tswaing Expedition that took place from 21 to 22 August surpassed most expectations.

Forty kilometres north of Pretoria lies a ring of hills quite unlike any other. These hills are the walls of an impact crater left by an asteroid which hit some 200 000 years ago. The Tswaing crater is similar in size to the well-known Barringer meteor crater in Arizona. The crater walls at Tswaing were originally about twice as high as they are today.

The crater is called Tswaing in seTswana, the local language of the area, or Zoutpan in Cape Dutch both meaning 'Salt pan', as a lake of salty water fills the centre of the crater. A museum was erected adjacent to the crater, with a path leading to the crater, along the rim, and down to the central lake. The crater itself is covered with indigenous trees and bushes, attracting a variety of fauna.

For this specific outing, the turnout was fantastic: about 50 people, including 12 children. Especially the young ones had a wonderful time as the facilities were well suited for children. The 26 adults also had quite informed walks and talks with Vince Nettmann, who definitely lived up to his 'fundit' status. Not only was he well informed about the crater itself, but he also wowed us with his knowledge of the stars. Not a bleary or weary eye was noted in the audience during the presentation as he explained various phenomena in easy-to-understand terms, using peas, golf balls & beach balls to prevent us being boggled with numbers: it will take something like 750 years to get to Jupiter in a Jeep!

The fine weather and fairly quick drive made this trip an easy weekend one. On Saturday, we had a quick mid-morning hike to the fantastic crater's viewpoint on the rim - it is the fourth largest in the world. We wound our way into the hallowed depths, and suddenly we were there. Aside from the purpley-black water having a subtle fishy smell, the surrounding layer of ex-

quisitely crystallised salts made the pan made a perfect spot for breaking out the snack pack. The pump-less borehole set in the pan itself provided some very yucky tasting soda water for the brave to wash their eats down...

Sitting down in the crater, looking up at the rim which is about 1.3km in diameter, we tried to envision the impact of a meteorite equivalent to 1000 atom bombs razing down everything within a radius of 90km. This blew our minds away... Sandton, Johannesburg and Pretoria would vanish completely!

Tswaing... the place where tribal people and Trekkers sought their salt, the place from which mining houses acquired their soda-ash for processing gold, a place where hunters cured their meat after hunting, the place where, in 1912, the last elephant from the Greater Pretoria area was hunted.

Today the wildlife includes lively zebra, red hartebeest, eland, kudu and a multitude of birds (also unfeathered magpies) were abundant in the area - including an African Hawk Eagle.

The wetlands walk on the Sunday morning was wonderful. Being ESSA-ites we obviously detoured from the recommended tracks and extended a 7km hike to round about 11km, with a few minor injuries, sweat and blood we made it back to camp.

By weekend's end new friendships were established, e-mails exchanged and promises made to e-mail photo's of this great weekend out. We parted with hugs and handshakes. To all who joined on this Expedition, I do hope you enjoyed yourself and the company present.

Well done Vince! You definitely did ASSA proud and helped to entrench the ESSA/ASSA affiliation.

[Watch this space for Vince's own account of the weekend's activities in the October Edition.

-Ed.]

September Skies

dd hh			
1 00	Venus 2.0 S of Saturn	15 09	Mercury greatest brilliancy
1 17	Mercury stationary	15 13	Mars in conj. with Sun
2 01	Venus 8.9 S of Pollux	21 16	FIRST QUARTER
6 16	LAST QUARTER	22 00	Jupiter in conj. with Sun
8 03	Moon at apogee	22 16	Equinox
9 19	Mercury greatest elong. W(18)	22 22	Moon at perigee
9 22	Saturn 5.3 S of Moon	24 16	Neptune 5.1 N of Moon
9 23	Mercury 0.1 S of Regulus	26 03	Uranus 3.9 N of Moon
10 17	Venus 6.6 S of Moon	27 05	Mars 0.2 S of Jupiter
12 05	Saturn 7.0 S of Pollux	28 14	FULL MOON
13 02	Mercury 3.8 S of Moon	28 22	Mercury 0.7 N of Jupiter
14 14	Mars 2.7 S of Moon	29 13	Mercury 0.9 N of Mars
14 15	NEW MOON		
15 00	Jupiter 2.2 S of Moon		

October Skies

dd hh			
3 16	Venus 0.2 S of Regulus	13 09	Mars 1.4 S of Moon
5 19	Mercury in superior conjn.	14 03	NEW MOON & Eclipse
5 21	Moon at apogee	14 15	Mercury 0.4 S of Moon & Occn.
6 11	LAST QUARTER	17 23	Moon at perigee
7 11	Saturn 5.4 S of Moon	20 22	FIRST QUARTER
10 20	Venus 3.9 S of Moon	21 21	Neptune 5.3 N of Moon
11 15	Mercury 2.9 N of Spica	23 08	Uranus 4.0 N of Moon
12 20	Jupiter 1.7 S of Moon	24 05	Neptune stationary
		28 04	FULL MOON & Eclipse

Lunar Eclipse: On 28 October 2004, the Moon enters the umbra at 03:14, totality starts at 04:23, mid-eclipse is at 05:04 and totality ends at 05:44. The Moon sets at 05:53 before leaving the umbral shadow. A challenging watch for all the night owls!

Local Times of Rise and Set for the Major Planets September & October 2004

Date	Sun		Mercury		Venus		Mars		Jupiter		Saturn	
	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set
Sep 07	6.15	17.57	5.20	16.38	3.45	14.35	6.27	18.09	6.52	18.47	3.26	14.05
Sep 17	6.04	18.01	5.25	16.52	3.47	14.45	6.06	17.58	6.19	18.17	2.50	13.30
Sep 27	5.53	18.05	5.38	17.33	3.47	14.56	5.45	17.47	5.46	17.47	2.14	12.54
Oct 07	5.42	18.09	5.49	18.13	3.46	15.09	5.24	17.37	5.12	17.18	1.37	12.18
Oct 17	5.32	18.14	5.56	18.49	3.44	15.23	5.04	17.26	4.39	16.48	1.00	11.41
Oct 27	5.24	18.20	6.04	19.22	3.40	15.36	4.43	17.16	4.06	16.17	0.21	11.03

Site Location: Long +28 deg. Lat -26 deg. Local Time UT +2 h

Last minute notes

Corporate Sponsorship for the 2004 ASSA Symposium.

ASSA Johannesburg Centre is hosting the ASSA Symposium from 14 to 16 October 2004. We are looking for corporate sponsorship for various small items required at the Symposium. Examples of these include notepads, pens, and various other sundry items. Any member who is able to suggest some form of sponsorship or contribution should kindly contact Brian Fraser on 082-568-1391.

Beginners' Classes

The beginners classes are given on the evening of the monthly meeting and then two weeks later at the observatory in the Library building. There may be a gap of three

weeks between the second lecture of the month and the next monthly meeting. In such a case the lecture will still happen at the next monthly meeting. Dates and topics will be published regularly on the website. In special cases where the talk cannot happen on a Wednesday, alternate dates will also be available on the website.

Starting times are 19h00 and the lecture lasts about 45min to an hour.

The beginners class is cyclical and for those who would like to attend the classes, but missed the first topics, please remember you are not at a disadvantage. You can catch up on the first topics next time round. Weather permitting, the Jacobs will be opened for beginners until 21h30. This will help illustrate in a practical way what was learned in the class.

Please phone Jerome Jooste on (011) 465 3402 for enquiries or to book your seat (he needs to know how many people are interested beforehand, please).