



The PRETORIA CENTRE

of the

Astronomical Society of Southern Africa

www.pretoria-astronomy.co.za

NEWSLETTER AUGUST 2006

The next meeting of the Pretoria Centre will take place at Christian Brothers College, Pretoria Road, Silverton, Pretoria

Date and time Wednesday 23 August at 19h15
Chairperson Michael Poll
Beginner's Corner "Amateur telescope making: show and tell"- by
 Johan Smit, Fred Oosthuizen and Dirk Wolmarans
What's Up by Lorna Higgs

+++++++ **LEG BREAK - Library open** ++++++

MAIN TALK

"Observing Solar Eclipses"
by Lorna Higgs

The meeting will be followed by tea/coffee and biscuits as usual.

The next social/practical evening will be held on Friday 18 August at the Pretoria Centre Observatory, which is also situated at CBC. Arrive anytime from 18h30 onwards.

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Last month's observing evening – by Johan Smit

The Friday started clear and clouded over quickly as the time for the practical got nearer. We are getting quite used to this. Therefore we had a quick peek at some bright objects between the clouds. I and some of the first time visitors stayed longer and later on the clouds cleared so much that I could take them on a binocular tour of the sky.

One of them is involved with the Voortrekker movement and promptly booked me to give a similar introduction to their commando members on our next

practical evening on 18 August.

Therefore we invite every one interested to come and visit us on the 18th and get a free introduction tour as well as some viewing. Bring along your telescopes and binoculars to help guide our young visitors.

Hein Stoltz and I were again the last to leave at just before 24:00. So, an evening that appeared dead at the start, turned out quite busy and many new friends were made.

Last month's meeting - by Lorna Higgs

51 members and 1 visitor signed the attendance register, which proves that AGM meetings are not too frightening, even in winter.

Michael Poll chaired the meeting and the business of the AGM was soon over. The Chairman's report showed that the Pretoria Centre had a busy, interesting and enjoyable year and the Treasurer's interim report showed that we are solvent and can continue into the next year. 10 members were agreeable to be on the committee. The Jack Bennet telescope floating trophy was awarded to Rynhardt van Rooyen for his hard work in keeping track of our finances and members. The proposal of a special vote of thanks to Michael Poll for stepping in as chairman at short notice and for keeping the Pretoria Centre running smoothly, was unanimously approved.

The details about Astronomy Africa given by Eckhart Piprek are elsewhere in the newsletter.

Johan Smit did his usual interesting What's Up with everything from phases of the moon, through Messier objects, to history and an animated dance of the planets.

The fascinating Main Topic was given by Prof Okkie de Jager from NWU. He told us how the Active Galaxy Nuclei (back to the earliest times) emit gamma rays that we are starting to detect and study. These Multiwavelength Messengers, as they are called, are studied across a range of wavelengths using HESS in Namibia (which will hopefully be upgraded to a 7-square-kilometer array fairly soon), SALT and NASA's GLAST spacecraft to be launched in 2007. Even before these upgrades are available, HESS has made an interesting (although puzzling) discovery that the early universe was darker than predicted. (Theorists will have to rethink their ideas of lots of supergiant stars appearing out of the initial darkness!)

Thanks to Prof de Jager we now know what a valuable contribution Southern Africa can make to cosmological research into the origins of our universe and we look forward to receiving progress reports from him in the future.

Visit to Tswaing Crater – August 26th 2006

The kgotla at Tswaing has been booked for the night of August 26th 2006. Booking by individuals is not essential, but it would be nice to cater for the tea coffee and milk. (People may contribute towards this as they see fit). Could people who are going let Michael know by August 20th. At the moment 20 people from the Pretoria Centre have booked, so there is plenty more space.

- People should provide their own food and drink, and eating utensils.

Tea, coffee and milk will be supplied and there will be an urn for hot water.

The facilities on site are:-

- Four “chalets” each with 16 beds, with two double bunk beds per alcove. Mattresses are provided, please bring your own bedding.
- Each chalet has its own ablution block.
- There is electricity, power points, a fridge, a freezer, a gas stove, and washing up facilities with hot and cold water.
- It is R15 to go in at the gate.
- The cost at the kgotla is R35 per person per night. Please pay at reception on arrival, and tell them that you are staying at the kgotla with the Astronomy Society. The person who took the booking is Inus Swart.
- People may arrive at any time during the day.

HOW TO REACH TSWAING

From Pretoria Central, Moot and areas north of the Magaliesberg:

- Drive along Paul Kruger Street in northerly direction through Wonderboompoort towards Onderstepoort. Do not turn off to Pretoria North.
- Paul Kruger Street ends with a T-junction at the R 566 between the Old Warmbaths Road (R 101) and Rosslyn/Brits. Turn left towards Rosslyn.
- After a few hundred metres, turn right into M 35 road towards Onderstepoort and Soshanguve. This is known as the Old Soutpan or Tswaing Road.
- Follow this road for about 30 km in a northerly direction past Soshanguve’s informal settlements and various stop-signs until Tswaing is on the left (game fence and Coca-Cola signs)
- Turn left at brown tourism sign into gravel access road that will take you past Soutpan gate to the reception.

Telescopes for sale

- Mrs C Green, widow of the late Trevor Green, offers his telescope for sale. It is an 8” Meade Cassegrain, not computerized, with all accessories, 4 eyepieces and mounted on a sturdy tripod. Price: R15 000. Her contact details are:
Address: Ben Swart Street 582, Gezina, Pretoria.
Telephone : 012 331 0650 (home), 082 552 3332 (cell)
- New Telescopes and accessories now in stock. Visit me and see for yourself.
Sky-Watcher and Celestron.
Contact Wayne Mitchell 072 465 7739 Email: waynemit@webmail.co.za
Fax: 012-6638797

Flood Basalts - by Eugene Geldenhuys

What is the link between major impacts from space and massive lava flows?

Near Mumbai in India there is a topographical phenomenon that has the appearance of a series of natural terraces that are up to two kilometers thick of layer upon layer of black volcanic basalt rock. This is geologically odd, as basalt, which originates in the upper part of the earth's mantle, normally belongs on the deep ocean floor because of its greater density than landmass granite and only on rare occasions appears as lava flows on land.

This area which is known as the Deccan Traps (steps) is 500,000 square kilometers big and is equal to the size of France. Some 65 million years ago this was an unimaginable hell on Earth as molten rock poured through the crust, flooding the landscape with red-hot lava and spewing dust and noxious fumes into the air for many centuries on end.

This was not the only event of its kind. Flood basalts of many different ages are scattered around the world's continents. In the USA states of Washington and Oregon, the Columbia River plateau was formed during a similar event 16 million years ago. The Parana flood basalt of south-east Brazil, 132 million years old, is more extensive than the Deccan and Columbia River basalts put together. Furthermore, plumb in the middle of Russia are the Siberian Basalt Traps that are 3500m thick and 250 million years old, originally covering a vast 4 mil sq km.

The Siberian event's most provocative aspect was that the huge volcanic occurrence coincided precisely with the biggest disaster to befall life on the Earth in the entire era of conspicuous animals and plants. At the end of the Permian period, 250 mil years ago, our planet almost died. About 96 per cent of all species of marine animals suddenly became extinct. Many large land animals, which were then mammal-like reptiles, perished as well.

As recently as 1783 the discharge of a miniature flood in Iceland of just 12 cubic km of basalt lava, killed sheep by fluoride vapour poisoning, and caused 'dry fog' in London 1800 km away. You can well imagine the long-term effect of a similar continuous happening in Siberia stretching over a period of a million years.

In the 1980s, scientists arguing that the dinosaurs were wiped out solely by the impact of a comet or asteroid 65 mil years ago, had to deal with truculent biologists, and also with geologists who said you didn't necessarily need an impact to cause the damage. The issue did not go away when evidence in favour of the impact became overwhelming with the discovery of the main crater in Mexico. Instead, the question became whether the apparent simultaneity of impact and eruption was just a fluke. Or did the impact trigger the eruption?

Most space scientists had no trouble in linking impacts with flood basalts. The large dark patches on the Moon, called maria, are huge areas of basalt floods amidst the global landscape of impact craters, large and small.

In 1974 when NASA's Mariner 10 spacecraft flew past Mercury, it sent home pictures showing the small planet looking at first glance very much like the Moon.

The largest crater on Mercury is the Caloris Basin, 1500 km wide. Diametrically opposite it, at the antipodes of the Caloris Basin, weird terrain caught the attention of the space scientists. It had mountain blocks of a kind not seen elsewhere. The team surmised that the impact's seismic waves reverberating through the planet came to a strong focus at the antipodes, evidently with enough force to create mountains.

If this theory is applied to the Earth, a violent impact in Mexico, 65 mil years ago, could have caused the creation of the Deccan Traps in India, which at the time was a small free-range continent, drifting towards an eventual collision with Asia.

Similarly, on the other hand, a violent impact in Brazil could severely jolt the crust in Indonesia or alternatively, might do the damage locally in Brazil itself, if the impact happened near a pre-existing weak spot in the Earth's crust.

Many geologists and geophysicists initially disliked the idea of a resultant lava eruption at the time when the concept was first introduced, but the crunch came with the precise dating of the

Siberian Traps (although no impact crater has yet been found) which tied the event to the mass extinction 250 mil years ago.

For scientists to draw meaningful conclusions, the accuracy of the dating of the basalt floods was of the greatest importance. The technique used, called argon-argon dating, was accurate to a degree of about 1 mil years. In addition to the theory offered, many argued, an even clearer prototype was the end-Cretaceous event of 65 mil years ago with a global mass extinction, a basalt flood in India, and a crater in Mexico.

In conclusion, as more and more evidence accumulates, it is now generally being accepted that there could be a decisive link between impacts from space, lava flows and catastrophic events such as the mass extinction of life forms on planet Earth.

References: Magic Universe by Nigel Calder
Rocks and Minerals by Larousse

Astronomy Africa (Pty) Ltd

Eckhart Piprek, director of this company, gave us a presentation at the July meeting. The company presents popular lectures on astronomy & viewing through telescopes at holiday camps, conferences, for tourist groups, etc. If you think you can do it, contact him. You get paid and get free transport, accommodation and meals as a bonus.

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How I managed to see Antares' companion star - by Wayne Mitcell

Attempting to observe the tight companion star of Antares, i.e. Alfa Scorpii, is known to be a challenge but occasionally been observed with a 4 inch scope under ideal conditions. I had long thought it impossible, but not under the right conditions, with at least a 6 inch scope at 200X power. Antares is a bright red 1.2 magnitude star and its companion is a 5.4 magnitude deep-blue star with a separation of 3 arc-sec from Antares.

Wait for slight cloud cover in front of the star, enough that Antares is still visible. The cloud acts an excellent filter against the glare from Antares. Antares must also be placed near overhead to minimize effects of atmospheric distortion. Observe into the glare of Antares and the blue star randomly "pops out".

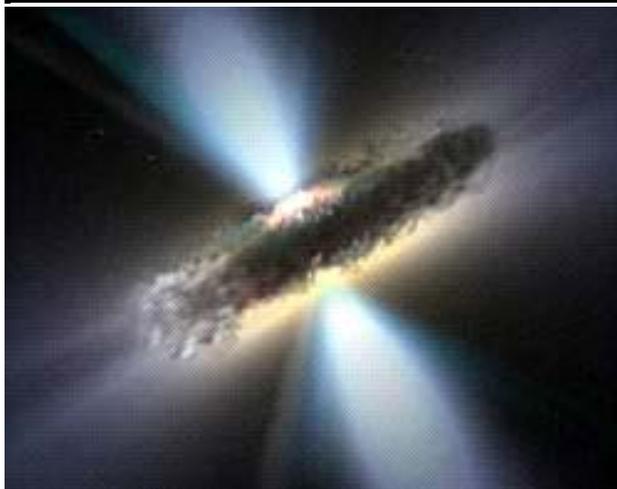
Super massive black holes

Left: An artist's representation of a super massive black hole with its torus of dust around its equator and the two jets of particles along the spin axis.

Scientists trying to find them hiding in nearby galaxies have found surprisingly few. Either they are better hidden than scientists realised or they are lurking only in the more distant universe.

For the full article, go to website

www.esa.int/esaCP/SEMGM6BUQPE_index_0.html



THIS IS YOUR LAST NEWSLETTER, UNLESS YOUR SUBSCRIPTION FEE FOR THE YEAR STRETCHING FROM 1 JULY 2006 TO 30 JUNE 2007, IS PAID BY THE END OF AUGUST.

Missing library item

The bound volume of the issues of Sky & Telescope for 1991 is missing from our library. It will cost us a considerable amount of money to get new copies of these issues and to have them bound. Will the person who removed the volume, please return it to the library.

Astronomers track massive shock waves in stellar jets

Like traffic on a freeway, plasma spewing from the poles of newborn stars moves in clumps that travel at different speeds. When fast-moving particles run into slower material on these cosmic freeways, the resulting "traffic jams" create massive shock waves that travel trillions of kilometres. Thanks to highly resolved images from the Hubble Space Telescope, a team of astronomers have created the first moving pictures of one of these cosmic freeways, which are known as stellar jets. The movies allow scientists to trace these stellar jet shock waves for the first time, glean important clues about a critical, yet poorly understood process of starbirth. The results appeared in the November 2005 issue of *Astronomical Journal*.

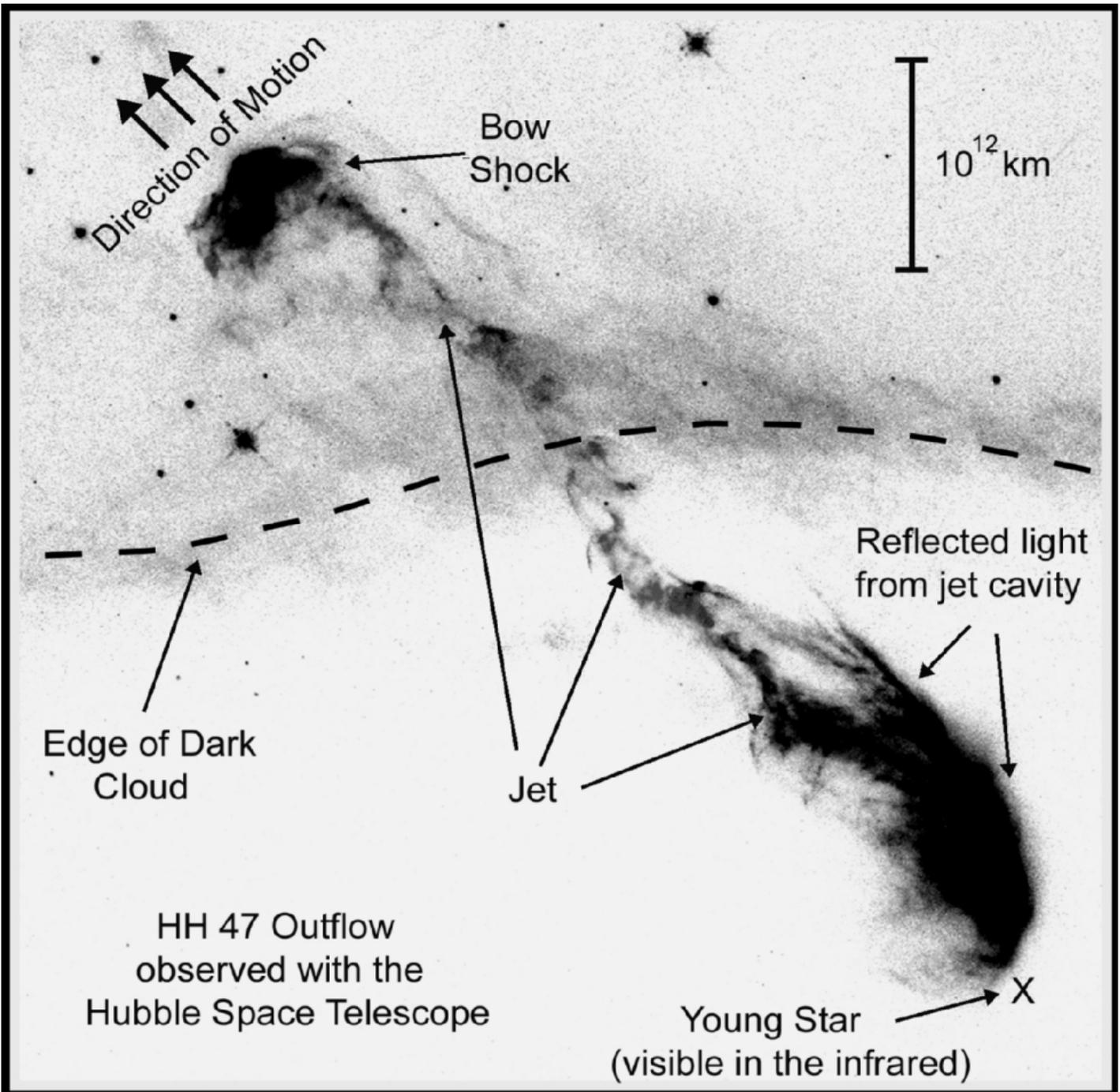
"When it comes to actually showing exactly what's going on, there's just nothing like a movie," said Hartigan, a study co-author. "You can look at a still image and make up all kinds of stories, but they all go out the window when you see a movie."

Researchers made the movies using images taken in 1994 and 1999 of a newly formed star called HH 47 in the constellation Vela. Because Hubble flies above the Earth's atmosphere, it can take much clearer images than Earth-based telescopes. As a result, they were able to resolve objects in the Hubble images that were 20 times smaller than objects resolved in similar images taken on Earth. This extra resolution, and the five-year gap between Hubble surveys of HH 47, allowed them to make moving pictures of the stellar jet shock waves moving away from the new star.

"Like the time-lapse images of a football game, our movies give us the ability to track the movement of individual features within the stellar jet, both relative to stationary objects and relative to other objects that are moving within the jet at a different speed," Hartigan said.

New stars form out of giant clouds of gas and dust. Within these clouds, strong gravitational forces pull material together into a tight ball surrounded by a large spinning disk. The new star forms out of the ball, and any planets that might form do so in the disk. Through processes not well-understood, much of the disk material gradually spirals into the star, and the resulting energy from this process drives stellar jets of plasma that erupt from the star at perpendicular angles to the spinning accretion disk. The material thrown away from the star in the jets acts as a brake on disk, slowing its rotation and allowing more material to fall into the growing star. Scientists know stellar jets play an integral role in star formation, but they have yet to determine the specifics of their role, or how it is carried out.

Website:<http://www.rice.edu/media/hartigan.html>



An interstellar jet coming from the pole of a young star. (10^{12} km = 0.1 light-year)

Invitation to members

Members are invited to send short articles for placement in the newsletter to me by email. This is the way you can share your astronomical knowledge with other members of the club.

Astronomical website addresses, information about astronomical computer packages, relevant news, views, experiences, book reviews, references to interesting articles, notices of astronomy lectures, details about astronomy courses, etc., which are sent to me, will also be considered for placement.

Just check your contribution for accuracy before sending it.

We would like to have as much local content as possible in the newsletter.

“Local is lekker” – Leon Schuster.

Editor.

M104: The Sombrero galaxy in the constellation Virgo.

Photo taken by Francois du Toit of Port Elizabeth in a polluted city sky. Photo taken off Mauritz Geyser's website at www.etacarina.co.za



PRETORIA CENTRE COMMITTEE

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