



# The PRETORIA CENTRE

of the

**Astronomical Society of Southern Africa**

[www.pretoria-astronomy.co.za](http://www.pretoria-astronomy.co.za)

## NEWSLETTER JULY 2006

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

Date and time                      Wednesday 26 July at 19h15

Chairperson                        Michael Poll

Annual General Meeting (will take less than 20 minutes)

What's Up                          by Johan Smit

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

**MAIN TALK**

**A Direct Measurement of Galaxy Formation on Cosmological Scales with Gamma-Rays: A Unique South African Opportunity**

**by Prof Okkie de Jager of NWU \***

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

The next social/practical evening will be held on Friday 21 July at the Pretoria Centre Observatory, which is also situated at CBC. Arrive anytime from 18h30 onwards.

\* See page 6 for an abstract of his talk. (It promises to be good – Editor.)

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**Observing Evening – June 23<sup>rd</sup> 2006 - by Johan Smit and Karl Crous**

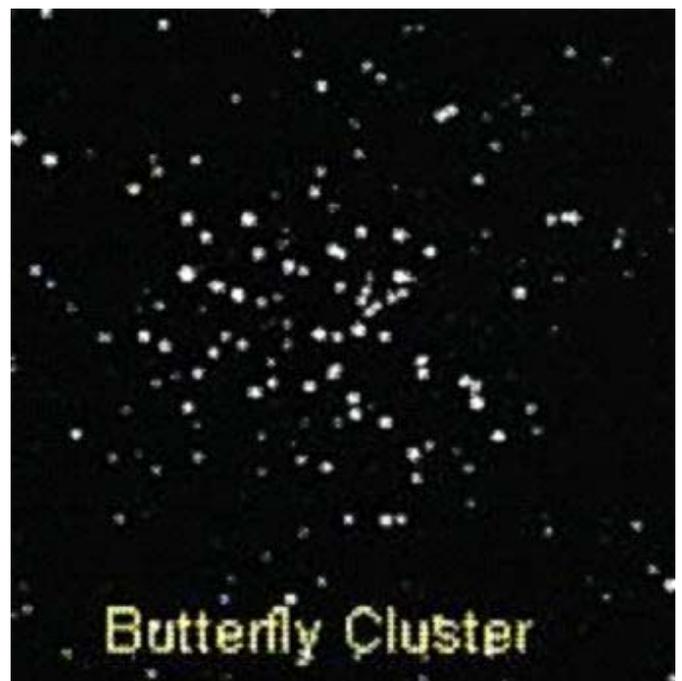
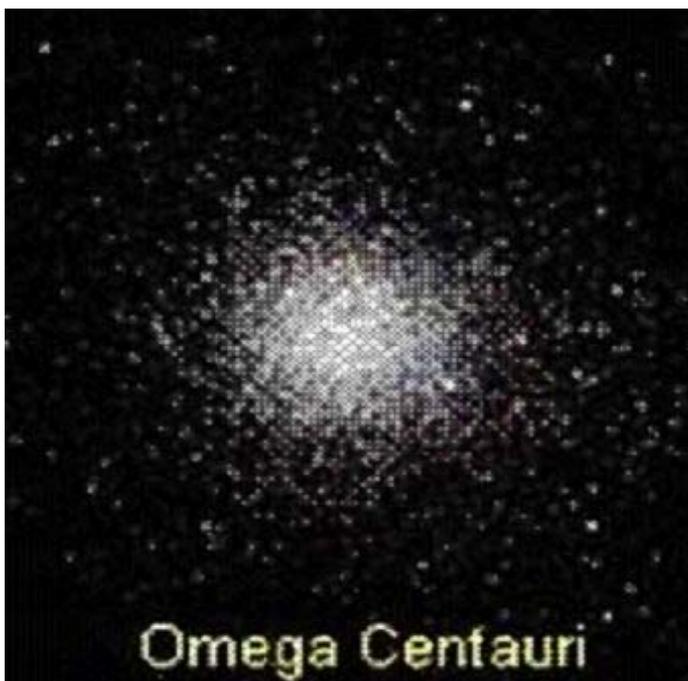
Friday, 23 June 2006 was a fair night for viewing our southern skies. We had a turn out of about 10 telescopes accompanied by their proud owners, and a good number of other attendees. We were pleased to meet some newcomers, including Karl Crous with his 30cm (12 inch telescope) and Elza Buys. Naked eye tours of the sky included views of the Carina Milky way. Other observations produced further interesting sights, with Saturn and Mars close to each other and Jupiter being the centre of attention for most of the night. Two objects, M6 (Butterfly Cluster) and Omega Centauri (NGC 5139) could easily be spotted by just looking up, but through a few millimeters of glass they revealed their entire splendour.

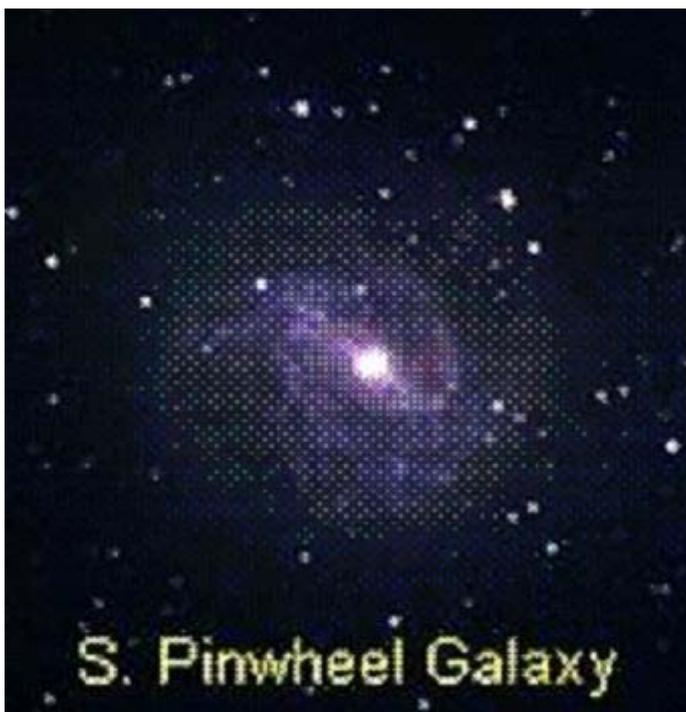
Two of our enthusiasts made quick work of finding the Southern Pinwheel Galaxy (the face-on galaxy M83 in Hydra) – no mean feat in the light polluted sky. However, the galaxy looked nothing like the picture below through their telescopes!. They also chased each other in finding M68. M5, M4, M3, Eta Carinae, the Jewel Box (NGC4755) and the Lagoon Nebula

(M8) were also among the objects studied. All and all it was a good night.

The Centre 12" telescope spent the evening showing old favourites to both the first time visitors and the "old-timers". M4 in Scorpius and the Jewel Box and Omega Centauri provided everyone with the usual breathtaking views.

After nearly everyone left, Johan Smit, Hein Stoltz, Johan Scott and friend stayed behind, talking and taking a binocular tour of the sky. Amongst the objects seen was the Coathanger Cluster and many Messier objects around Sagittarius. Some of the smaller, less prominent constellations like Sagitta and Delphinus were identified and admired. The tour and discussions turned out so interesting that we only left at 03:30 the next morning. This again shows that people should not forget to use binoculars as observing instruments. The low power and wide views are really stunning on objects that are too large to fit into the field of view of a typical telescope.





### Last month's meeting - by Lorna Higgs

Forty-four people wrapped up warmly to attend the meeting and it was worth the effort. Notices included the date of the Tswaing visit (26 August). It was also noted with regret that Trevor Green, a previous committee member, had passed away after bypass surgery.

In Beginner's Corner, Tony Viljoen demonstrated planetarium programs on the computer. He assured us that they can be fairly idiot-proof and he showed us what is available for beginners. He explained that higher levels are available for those with larger telescopes (including professionals).

Michael Poll warned us in What's Up that Mercury was disappearing from view fast, but told us how to find the visible planets. He remarked that, as a result of the "equation of time", the sun will only start rising very slightly earlier from 9 July, even though the shortest day is past. The occultation of bright Spica by the moon on 4 July was worth noting. He then mentioned some of the rewards that our southern winter night sky has for those who brave the icy weather.

Johan Smit astounded us all with his Main Topic of "Animals in Space". The few monkeys and dogs that we remember as space pioneers were just a few high-profile cases. Ground-based space research on animals started in 1935 and the Albert rhesus monkey series started in 1948. Hundreds of creatures of all types (from lowly worms to reptiles, rats and rabbits) have taken part in tests and flights. The effects of microgravity, radiation, etc. had to be known before man (and later, woman) could be sent to space. The tests and flights continue today on the space station and shuttle.

Johan did extensive research in an attempt to find the (often unpalatable) truth about the unsung animal heroes that paved the way for Yuri Gagarin and Neil Armstrong to achieve fame, and those of us who heard his talk will never forget their pain, suffering and death for the 'benefit' of man.

## Nylsvley Visit - May 26<sup>th</sup> 2006 – by Michael Poll

The visit to Nylsvlei went well, with 20 plus participants, many telescopes and two wonderfully clear nights of observing. Laser pointers are making their appearance on such occasions more often. Some of us discovered, or re-discovered, the novelty of someone pointing the laser where a particular object might be found, and then pointing the telescope at the end of the laser beam in order to target the object.

On the Saturday we found Venus in daylight at about 9 am and kept it in view both visually and telescopically well into the afternoon. It was a bit more difficult than usual to spot because it is approaching superior conjunction and the increase in distance makes it a magnitude fainter than when approaching inferior conjunction when it is much closer to the Earth.

This was also a family affair with spouses, and children. In these days of bright city lights and shopping malls, one forgets that we are losing the sky, and some children may not have seen a good sky at all. One little girl stood next to me, taking in the Milky Way from Carina to Sagittarius, and said, kind of awestruck, "I've never seen so many stars".

People made the most of visiting the

Nylsvley reserve. Some of the more technical stayed in the camp and made collective list of deep sky objects that were observed. Michael has the list if anyone would like it, but all in all, 56 deep sky objects were logged.

### People

#### Mike and Joy.

Mike Haslam and Joy Miles-Hodgson are moving to a place in the bushveld, near Warmbaths, to establish a retreat and rejuvenation centre called "Paradise Regained". Mike and Joy have been long time members and supporters of the Centre, and we wish them well in their new venture. We hope that they will visit from time to time, and maybe we should visit them as well!

#### Sybil de Clark

Sybil and Michael have left for the USA. They are going to Tucson, in Arizona (near that *other* crater!), for five years, and we also wish them well in their travels.

### Gigantic Cosmic Cataclysm In Stephan's Quintet Of Galaxies

Recent infrared observations made with NASA's Spitzer Space Telescope have revealed the presence of a huge intergalactic shock wave, or "sonic boom" in the middle of Stephan's Quintet, a group of galaxies which is now the scene of a gigantic cosmic cataclysm. This discovery, made by an international research team including scientists from the Max Planck Institute for Nuclear Physics (MPIK) in Heidelberg, provides a local view of what might have been going on in the early universe, when vast mergers and collisions between galaxies were commonplace.

When astronomers using NASA's Spitzer Space Telescope turned their attention to a well-known group of galaxies called Stephan's Quintet, they were, quite simply, shocked at what they saw. There, sweeping through the group, lurks one of the biggest shock waves ever seen.

Website: <http://www.sciencedaily.com/releases/2006/03/060303113802.htm>



The central region of Stephan's Quintet. The intergalactic shock wave, triggered by the 1000 km/s infall velocity of the intruder galaxy NGC 7319b, is delineated by the ridge of Hydrogen emission (shown in green) which runs vertically through this image. (Image: NASA/JPL-Caltech)

### Watcher robotic telescope at Boyden Observatory

The Watcher 16-inch telescope at Boyden Observatory near Bloemfontein became operational in April 2006. It is primarily used for rapid gamma-ray burst (GRB) follow-up observations and soon also extra solar planet searches using the transit technique.

GRB's are quick outbursts of high energy radiation and can occur anywhere in the sky. To advance understanding of the mechanisms behind these explosions, it is also vital to detect the outbursts in optical wavelengths.

Watcher can robotically react to GRB alerts from orbital satellites such as SWIFT, the Chandra X-ray Observatory and HETE2. It is designed to start collecting observations in the optical range within 20 seconds of receiving the alert.

### Green laser pointers

A green laser pointer has several uses:

1. To point out celestial objects in the night sky.
2. To do polar alignment of a telescope.
3. To use in place of a finder scope attached to a telescope.
4. To "paint" the field of view to determine a camera's aim when doing astrophotography.
5. To use as a pointer when giving a presentation.

They are commercially available at reasonable prices.

For more information, see MNASSA, vol 65 nos 5 & 8, June 2006, page 80.

### Visit to Tswaing Crater – August 26<sup>th</sup> 2006

The kgotla at Tswaing has been booked for the night of August 26<sup>th</sup> 2006. The original plan to have caterers doing the meals has fallen away.

- People are requested to 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. (Contd. on p 6.)

The facilities on site are:

- Four "chalets" each with 16 beds. The chalets are in the form of a + , each arm ends in an alcove in which there are 4 beds (two double bunk beds). Mattresses are provided, please bring your own bedding.
- Each chalet has its own separate 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. A map of how to get there will be printed in the August newsletter.

Booking by individuals is not essential, but it would be nice to have an idea of numbers because Michael is going to get the tea, coffee and milk. (People may contribute towards this as they see fit). Could people who are going let Michael know by August 12<sup>th</sup>.

### Interstellar orphans found

Astronomers have found planetary disks emerging independently of new stars or brown dwarfs. The disks have formed around planetary-mass objects, called planemos, and seem to be floating freely in space, after springing out of star-forming regions within the Milky Way.

Astronomers used the European Southern Observatory's telescopes in Chile to obtain temperature profiles of two planemos with masses between five and 10 times Jupiter's, and two others 10 to 15 times Jupiter's mass.

All four objects are hot, meaning they are just a few million years old, and all are located within about 450 light-years from Earth. "Now that we've discovered these planetary-mass objects with their own little infant planetary systems, the definition of the word 'planet' has blurred even more," said one of the discoverers.

"It is amazing to think of what other kinds of (lower-mass) rogue planets could be out there, and if life could exist on such forsaken bodies," said an astrophysicist.

Website: [http://www.skynightly.com/reports/Astronomers\\_Find\\_Planets\\_With\\_No\\_Stars.html](http://www.skynightly.com/reports/Astronomers_Find_Planets_With_No_Stars.html)

### Abstract of talk by Prof OC de Jager

Sources of gamma-rays placed at various cosmological distances act as Multiwavelength Messengers which probe the intergalactic medium up to the earliest epochs when the first stars were formed after the Big Bang.

A direct measurement of the cosmological galactic formation rate since these earliest epochs will help solving some of the most fundamental questions about the origins of our Universe.

Using the currently operational HESS in Namibia we can already set crude limits on this formation rate. NASA's GLAST gamma-ray spacecraft to be launched in 2007 will complement HESS. It is expected that a 1,000 new Multiwavelength Messengers (better known as Active Galactic Nuclei) will be discovered by GLAST. The NASA's Multiwavelength Coordinator for GLAST stressed that this project can only be successful if the auto scheduling facility of SALT can be used to measure the cosmological redshifts of all the newly discovered AGN Messengers. This task can only be achieved if driven on a national level.

Background of these projects will be given in this talk.

## Earth has more than one moon!

Asteroid 2003 YN107 is looping around our planet once a year. Measuring only 20 meters across, the asteroid is too small to see with the unaided eye - but it is there. This news, believe it or not, is seven years old. "2003 YN107 arrived in 1999," said Paul Chodas of NASA's Near Earth Object Program at Jet Propulsion Laboratory in Pasadena, California, "and it's been corkscrewing around Earth ever since." Because the asteroid is so small and poses no threat, it has attracted little public attention, but he and other experts have been monitoring it. "It's a very curious object," Chodas said.

Most near-Earth asteroids, when they approach Earth, simply fly by. They come and they go, occasionally making news around the date of closest approach. 2003 YN107 is different: It came and it stayed. These asteroids are called Earth Co orbital Asteroids or "co-orbitals" for short. Essentially, they share Earth's orbit, going around the Sun in almost exactly one year. Occasionally a co-orbital catches up to Earth from behind, or vice versa, and the dance begins: The asteroid, while still orbiting the sun, slowly corkscrews around our planet. "These asteroids are not truly captured by Earth's gravity," Chodas said, "but from our point of view, it looks like we have a new moon."

Astronomers know of at least four small asteroids that can do this trick: 2003 YN107, 2002 AA29, 2004 GU9 and 2001 GO2. "There may be more," Chodas said. He said he thinks the list will grow as asteroid surveys improve in sky coverage and sensitivity. At the moment, only two co-orbitals are actually nearby: 2003 YN107 and 2004 GU9. The others are scattered around Earth's orbit.

2004 GU9 is perhaps the most interesting. It measures about 200 meters across, relatively large. And according to calculations just published in the Monthly Notices of the Royal Astronomical Society (S. Mikkola et al., 2006) it has been looping around Earth for 500 years - and may continue looping for another 500. It's in a remarkably stable "orbit." Right now, however, researchers are paying more attention to 2003 YN107 for one simple reason: it's about to depart. The asteroid's corkscrew path is lopsided and on June 10th it will dip within 3.4 million kilometres from Earth, slightly closer than usual. Earth's gravity will then give the asteroid the nudge it needs to leave.

"This is a chance to observe one of these asteroids (on the way out)," Chodas explained. It won't be gone forever, however. In about 60 years, 2003 YN107 will lap Earth again, resuming its role as a temporary, corkscrewing moonlet. In due course, other co-orbitals will do the same. Each encounter is an opportunity for study - and possibly profit. Even the most powerful telescopes cannot see much of these tiny asteroids; they're just specks in the eyepiece. But one day, when the space program is more advanced, it might be possible to visit, explore the moonlets and tap their resources. "For now, they're just a curiosity," Chodas said.

## Agenda of Annual General Meeting

The meeting will be short and sweet. Be there to voice your opinion. On the agenda:

- Opening
- Apologies for Absence
- Approval of Minutes of AGM :2005 July
- Chairman's Report
- Treasurer's Report
- Librarian's Report
- Schanskop Sub-Committee Report
- Election of Committee for 2006 – 2007
- Jack Bennett Award
- Any Other Business

## Mpumalanga - Land of the Rising Sun



Sunrise in July viewed from the top of Long Tom Pass in Mpumalanga.  
Photo copied from Dries van Zyl's website at [www.weatherscenes.co.za](http://www.weatherscenes.co.za)  
(Since the Sun is a star, this is an astrophotograph — Editor)

### PRETORIA CENTRE COMMITTEE

|                          |                     |                               |
|--------------------------|---------------------|-------------------------------|
| Chairman (acting):       | Michael Poll        | 012 331 1615 (h)              |
| Vice Chairman :          | Vacant              |                               |
| Secretary :              | Tony Viljoen        | 012 654 5783 (h) 072 247 6648 |
| Newsletter Editor :      | Pierre Lourens      | 012 654 6366 (h) 072 207 1403 |
| Treasurer and            |                     |                               |
| Membership Secretary :   | Rynhardt van Rooyen | 011 441 3458 (w) 083 654 1862 |
| Centre Representative :  | Michael Poll        | 012 331 1615 (h)              |
| Public Relations Officer |                     |                               |
| and Deputy Treasurer :   | Lorna Higgs         | 012 333 9366 (h)              |
| Librarian :              | Wayne Mitchell      | 012 719 9065 (w) 072 465 7739 |
| Curator of Instruments : | Johan Smit          | 083 306 1199                  |
| Member :                 | Peet van der Walt   | 0829203978                    |
| Member :                 | Fred Oosthuizen     | 072 373 2865                  |