



# The PRETORIA CENTRE

of the

**Astronomical Society of Southern Africa**

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

## NEWSLETTER APRIL 2010

### Next meeting

**Venue:** The auditorium behind the main building at Christian Brothers College (CBC), Mount Edmund, Pretoria Road, Silverton, Pretoria.

**Date and time:** Wednesday 28 April at 19h15.

**Programme:**

- **Beginner's Corner:** "Celestial objects" by Andrie van der Linde
- **What's Up in the Sky:** by Danie Barnardo
- 10 minute break — library will be open
- **Main talk:** "The Sun: a Matter of Mass and Magnetism" by Michael Poll
- Socializing over tea/coffee and biscuits.

The chairperson at the meeting will be Tony Viljoen.

Next observing evening: Friday 23 April at the Pretoria Centre Observatory, which is also situated at CBC. Turn left immediately after entering the main gate and follow the road. Arrive from sunset onwards.

### CONTENTS OF THIS NEWSLETTER

Observing Evening Report March 19 <sup>th</sup> 2010	2
March 2010 Meeting Report	2
Wayne Mitchell Spots Sirius B! & The Rainbow Sky	4
Dark Sky weekend at Goodlands estate on 12 & 13 March 2010	5
Summary of the coming presentation "What's Up in the Sky"	5
M80	6
The March Equinox	7
Martian moon's secrets to be revealed during fly-bys	7
Discovery of W Ursae Majoris	8
Watching a cannibal galaxy dine & Ninth Biennial Symposium of the ASSA	9
Outreach on 19 February at the observatory in Johannesburg	10
Second Karoo Star Party & Dawn enters asteroid belt - for good	11
First discovery of a building block of life in a comet & MRO finds subsurface ice on Mars	11
Jet from center of M87 & Pretoria Centre committee	12

## Observing Evening Report March 19<sup>th</sup> 2010 by Michael Poll, Johan Smit, Danie Barnardo

The afternoon was not very promising with much cloud. It probably kept some people away, but we still had a good crowd. Astronomers must always be optimistic! When we started arriving it looked just as hopeless as it did in the afternoon, but lo! it cleared in the north and we were able to look at the moon, the Orion Nebula, Castor (double star), Mars (which was still forming a distinct shape with Castor and Pollux), the Beehive Cluster (M44) in Cancer, Gamma Leonis (double star), and Saturn, which will be handily placed for our next few observing evenings. Saturn's rings are still presented at a narrow angle, and will get even narrower between now and May. Not much detail, if any, seen on Mars, but it still clearly shows a reddish disc.

After we had a good look at the northern sky, almost unbelievably, the northern sky clouded over and the southern sky opened up! We looked at the winter favourites including Alpha Centauri and Alpha Crucis; the open clusters Theta Carinae, NGC 3532, NGC 2516, and the globular cluster Omega Centauri (NGC 5139).

Although those "in the know" like to rattle off Messier or NGC Catalogue numbers as if they are old friends, newcomers often follow up with "Yes, but does it have a name?". Many of the names we do use are long established, and generally apply to northern hemisphere objects (Beehive Cluster, Pleiades, Hyades, Helix, Sombrero etc). For many of the familiar southern objects there is not a common name, and to Catalogue Number Enthusiasts, any recent name that is given may sound a little artificial or contrived. Nevertheless, there was a comment in Sky and Telescope some time ago, that newcomers find that a proper name is much more meaningful and interesting than a catalogue number. Some of our southern objects do have familiar names (Jewel Box, Coal Sack), but in the following list there may be some that are new to some people.

IC 2602 – the Southern Pleiades, NGC 3532 - the Wishing Well Cluster, NGC 2516 - Southern Beehive, IC 2944 - the Running Chicken Nebula, or the Lambda Centauri Nebula. Searching for NGC 2547, "the cluster with the heart", has not turned up a common name (yet?).

After a good look at things in the south, it seemed to be clouding over again, but lo! (*and behold!*), the whole sky cleared and we did some more touring. The Orion Nebula (M42) was shown to newcomers, and Pat Kuhn recovered the "Winter Albireo" (designated 145 Canis Majoris), a colourful double similar to its more well known namesake.

Johan brought along a "Cute" telescope - a 4 inch reflector from the 1950's that he has restored and mounted on a single arm alt-azimuth mount of his own design. The children who saw it commented "What a cute telescope", which is how it acquired its name. The children, and most adults, loved this little scope and it was used to look at all the targets that the "big" scopes did. This direct comparison convinced many people that even a small scope has its uses, and because of its small size, it can be brought along when the big scopes cannot. Even though it only has 4 inches of aperture it will catch much more light than a large scope that is packed away in the garage! Johan feels that this little telescope will encourage a lot more people to build a similar instrument, and the idea is borne out by the fact that at least three of them are being built in the telescope making class right now. At least we have found a temporary cure for aperture fever!!!.

### March 2010 Meeting Report— by Johan Smit

The meeting was well attended and the audience included a number of visitors who had attended our observing evening on the previous Friday.

Two outreach projects were announced. One was planned for the next evening (March 26<sup>th</sup>) at Midstream College in Centurion. Johan Smit, Bosman Olivier and Fred Oosthuizen attended to this event and many new friends were made while introducing the parents and learners to the sky.

The other event was planned for the 3<sup>rd</sup> of April at the Green Market. Unfortunately this event rained out and will be repeated on the 1<sup>st</sup> of May. Scope-X on the 17<sup>th</sup> of April was also promoted.

Johan Smit then took the audience on a tour back in time, describing the scale of the uni-

verse in terms of the time it would take to travel to visible objects at the speed of light. Because the light we see takes time to arrive at our location we are actually looking back in time when we look at the sky.

The time-frames spanned the whole spectrum from the seconds it takes to the Moon; the minutes it takes to the planets; to the years it takes to the nearby stars; and the millions of years since the extinction of the dinosaurs which is the time taken to reach some clusters of galaxies; and further back to the formation of the solar system, and even back to the edge of our observable universe. Interesting enough some of the “nearby” quasars can actually be seen visually in normal telescopes of a decent aperture—if the observer can find them.

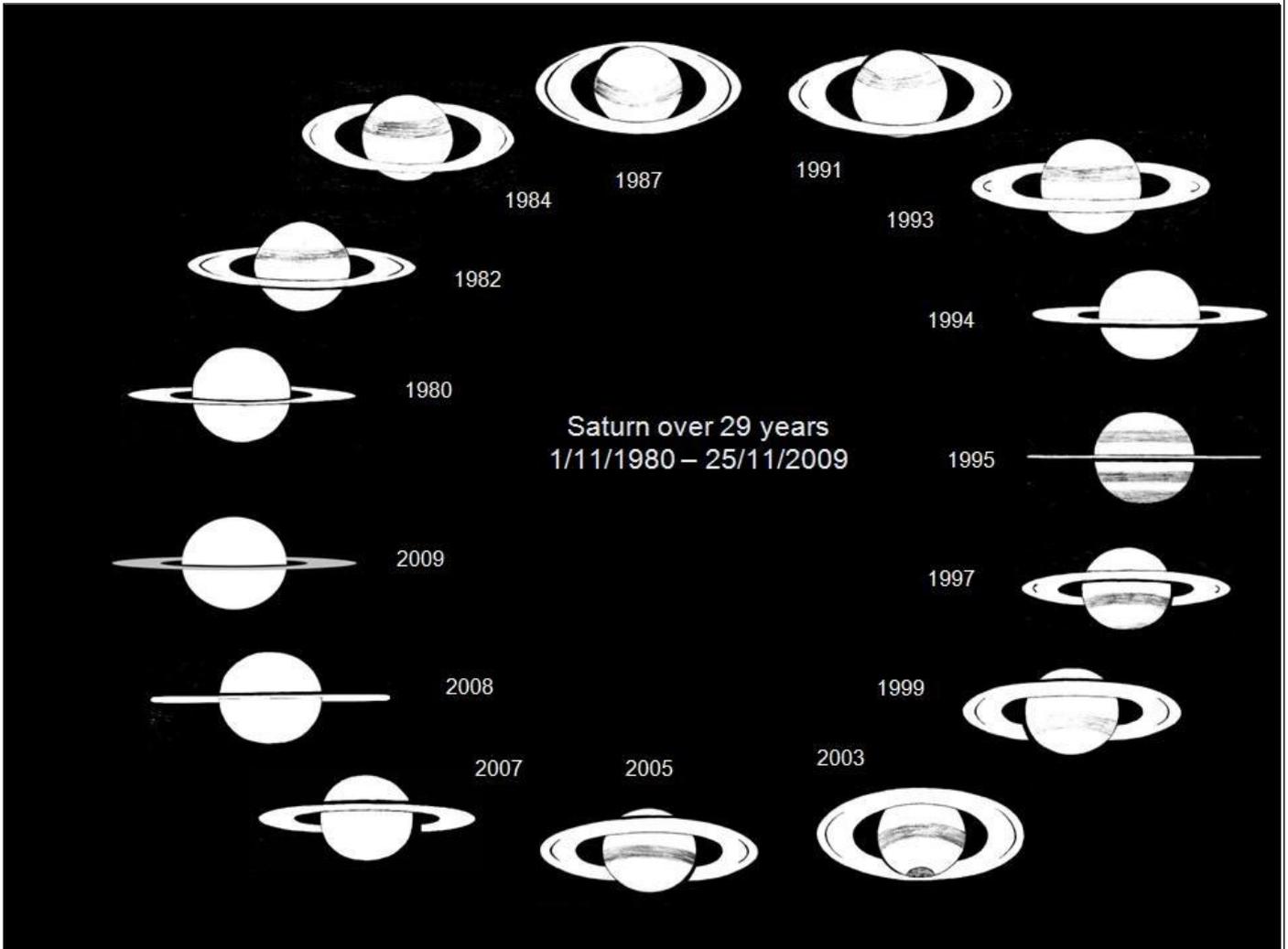
Hein Stoltz presented “What’s Up” and showed us what to look forward to in the winter. Hopefully we will have fewer clouds then. Just after 20:00 we were ready for our main speaker.

Dr Barbara Cunow, a professional astronomer, showed us that even professional astronomers also like to do amateur astronomy. By amateur astronomy we mean doing it for the love of the subject.

She started observing Saturn in 1980 and continued this right through to the present. She has thus followed Saturn through a full Saturn year and all 4 seasons on Saturn. The detail captured in her observations showed that this was definitely a labour of love and perseverance. We salute a true professional amateur.

She explained how the viewing angle from Earth changes due to Earth’s rotation around the sun as well as how the angle of illumination from the sun changes during Saturn’s orbit around the sun. The combination of these two factors causes many interesting visual phenomena that will only be noticed by an experienced and conscientious observer like Barbara.

Her well illustrated talk took the audience on a tour of discoveries. It truly felt like ground-breaking work was being done. I will never look at Saturn again without thinking of Barbara and



her observations. I myself will try and notice some of the many features she described.

No words can truly describe the sheer volume of observations she did, and the hours that she must have spent making sketches. She displayed some of her sketches alongside Hubble pictures of Saturn and it was amazing how accurate her sketches were and how they captured the essence of what was to be seen.

The only thing that will sum up her talk is a picture. Here is a collage of her sketches summing up 30 years of observations. ASSA Pretoria can be proud to have someone like Barbara as a member.

The meeting ended just after 21:00 and was concluded with more lively than usual discussions over tea and coffee.

### **Wayne Mitchell Spots Sirius B!**

Although not aware of the insert about Sirius B in the March newsletter, Wayne Mitchell did know about this white dwarf, and on March 27<sup>th</sup> 2010, in the twilight, he found it!

Wayne writes:

For Sirius B, I didn't expect to see anything, but thought it was worth a try. I was sitting outside enjoying a cup of coffee just after sunset and staring at the moon, which was partially hidden behind a thin layer of cloud. I looked up and Sirius was the near to the zenith. Only Canopus and one or two other bright stars were beginning to reveal themselves. Then, while looking at Sirius, I remembered the occasion when I observed the faint companion of Antares. Co-incidentally, the observing conditions seemed identical to what they were for Antares – Sirius was near to the zenith like Antares was, and it was not completely dark. There was a very thin layer of cloud passing in front of the star. I thought it may be worth a try to observe Sirius B and wheeled my telescope from the garage. It is a 300 mm F/4.9 Newtonian reflector. The highest magnification I can achieve with the eyepieces I have is only 200x, which is what I used. I pointed the telescope at Sirius, and centered the star in the middle of the eyepiece field. It is important to keep the star in the centre of field-of-view of the eyepiece to minimize lens distortion. I stared at Sirius for a few seconds, [it was] shining brilliantly like a white diamond. I centered star once more and stared again, still nothing. I tried again, looking within and around the glare that I was expecting to envelop the feeble little star. Yes! There it was, actually slightly out of the glare from its parent star. It was so small and faint that for a moment I doubted whether or not I was seeing the star. I rotated the eyepiece to make sure that it was not an aberration. The little star maintained its position, but appearing and disappearing at random. I was quite thrilled! That is when I called Michael Poll to share the excitement. After speaking to Michael I attempted to observe Sirius B again, but it was completely dark now and there was no thin cloud in front of the star. I did not see the star.

If Sirius B lies in line with a diffraction spike you will most definitely not see the star. Sirius B does appear to be separated from its parent star by about as much as the faint companion of Rigel, but Sirius B is a far greater challenge to observe.

I cannot remember the exact time of my observation. It was not yet completely dark, which is really one of the important factors. When it is completely dark, Sirius is too bright when viewed through the eyepiece and therefore envelops Sirius B within its overpowering glare. One would not expect to see the faint Sirius B if it is not yet completely dark, but it is evidently possible. The following evening, when it was completely dark, I tried to observe Sirius B again through some thin cloud. It was visible, but not nearly as obvious as when I observed the star before it was dark the previous evening. I think that the centre's 300 mm telescope would be more suitable since it has a longer focal length and perhaps could be used at a magnification of 300x instead, of the 200x I used.

### **The Rainbow Sky**

This book and many others are free e-book downloads from

<http://www.digita-book.com/category/science/>

## Dark Sky weekend at Goodlands estate on 12 & 13 March 2010 by Antonio de Franca

About 11-12 people attended the dark sky weekend with approximately 6 telescopes on display. Friday evening was ideal for observing with mostly clear skies and a slight breeze.

Fred Oosthuizen brought his impressive Stevick-Paul telescope along and demonstrated how it operated as well as explaining all the technical processes of aligning his four mirrored telescope. Regarding Friday's menu, the starter included the observation of Mars, Saturn, M42 or the Orion Nebula and the low lying Pleiades star cluster in the constellation on Taurus was also observed.

Michael Poll drew our attention to the North East where he pointed out the elegant "three leaps of the gazelle" located in the constellation of Ursa Major, it was indeed a magnificent sight.

A number of spectacular meteors were seen during the night. The visually elusive M83 was rather a challenge to locate, but it was eventually located with the help of Michael Poll. Other observations included the so called "Hamburger galaxy", NGC 4755 or known as the "Jewel box", 2547 open star cluster, M44 or better known as the Beehive star cluster were observed, only to mention a few.

For those of us who stayed on longer in the early hours enjoyed the constellation of Scorpius over the zenith. Saturday night observing session was short lived as an electrical storm took centre stage of the night's observation. Virtually everybody decided to retire early. Although it was a short weekend, it was nevertheless enjoyable. Both Fred and Michael's enthusiasm, knowledge and advice were invaluable to many of the junior amateur astronomers. I'm sure that all who attended will be looking forward to the next outing at this wonderful natural location.

The photo below was taken by Antonio at the occasion.



### Summary of coming presentation "What's Up in the Sky" - by Danie Barnardo

#### Phases of the Moon

Last Quarter – 6 May 2010

New Moon – 14 May 2010

First Quarter – 21 May 2010

Full Moon – 28 May 2010

#### Best viewing

10 to 16 May 2010.

#### Planets

**Mercury** : (mag 5.2) is visible in the early morning all month, brightening to mag 0.2 towards month end. This is a good time to view this elusive planet. On 26 May Mercury is at greatest elongation (25.120 West).

**Venus** : (mag -3.9) is visible for 1 to 1.5 hours after sunset.

**Mars** : (mag 0.7) is visible all evening and sets just before midnight.

**Jupiter**: (mag -2.1) is visible in the morning sky, from 03:00 on the 3rd and from 01:00 at month end.

**Saturn**: (mag 0.8) is visible for the whole evening, setting at 03:00 in the beginning and 01:15 at month end.

**Uranus** : (mag 5.9) rises just after 03:00 on the 1st and at 01:00 at month end.

**Neptune** : (mag 7.9) rises just before 01:00 and at 23:00 towards month end.

### Specials to watch out for

On **9 May**, at 04:00, Jupiter 4.0° SE of a 23% Moon. On **16 May**, at 18:30, Venus 2.0° W of a 8% Moon. On **18 May**, at 20:00, Mars, Regulus, M44 and Saturn forms an interesting grouping with a 25% Moon. On **20 May** at 19:00, Grouping of Regulus, Mars and a 47% Moon. Throughout the month, in the NW in the early evening sky, M44, or the Beehive cluster, or Praesepe, the Manger, with Asellus Australis and Asellus Borealis, the Southern and Northern Asses eating out of the Manger, forming a very impressive binocular object in Cancer.

### Constellations

**Crux** is prominent in the southern sky, with **Carina**, **Vela** and **Puppis** with numerous clusters and deep-sky objects in this magnificent part of the Southern sky. **Scorpius** is steadily rising in the East, while **Orion** is disappearing in the West, indicating the onset of the Southern winter. Legend has it that the head god, Zeus separated Orion the Hunter and Scorpius the Scorpion as far as possible, because Scorpius stung Orion in the heel. **Cancer**, **Leo** and **Virgo** is visible towards the North.



### M80

A Hubble Space Telescope image of Messier 80 (aka M80), a typical globular cluster. It is an object made up of hundreds of thousands of stars and is located in the direction of the southern constellation Scorpius (The Scorpion). It can be easily seen with binoculars during the winter months. It is about halfway between Antares and Beta Scorpii. There are about 160 similar globular clusters spread throughout the spherical halo of our Galaxy.

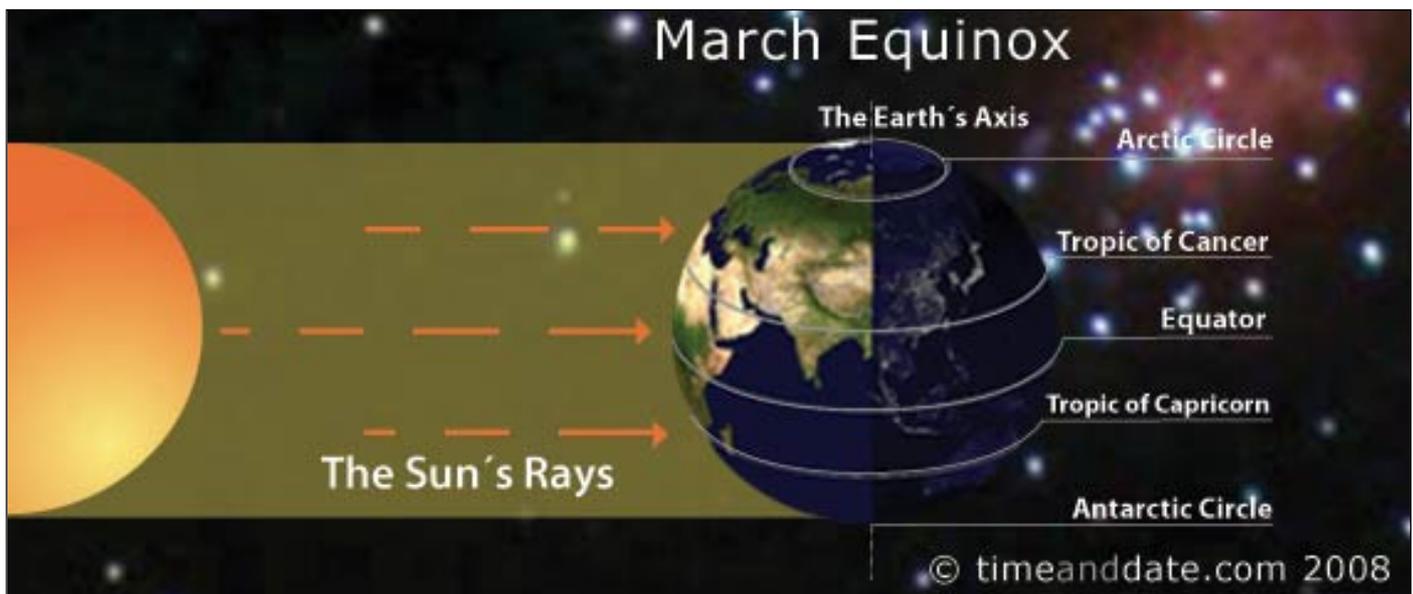
## The March Equinox

The March equinox (the Vernal Equinox for the Northern Hemisphere and the Autumn Equinox for the Southern Hemisphere) occurred on Saturday, 20 March 2010, at 17:32 UT (19:32 SAST).

“Equinox” is Latin for “equal night”. An equinox occurs when the Sun crosses the celestial equator, illuminating the Earth in such a way that the terminator (the line between light and darkness) runs exactly through the north and south poles of the Earth. The length of time of daylight is then = to the length of time of darkness = 12 hours, everywhere on Earth.

At the March Equinox the Sun crosses the celestial equator from south to north. At the other equinox in September, the Sun crosses the celestial equator from north to south.

The illustration below is not to scale.



## Martian moon's secrets to be revealed during fly-bys



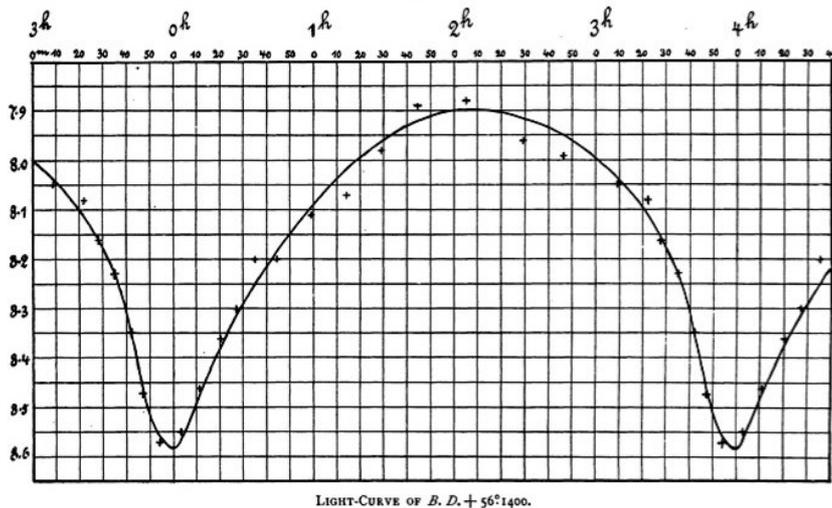
The deepest secrets of Mars' moon Phobos are set to be revealed, following a series of 12 fly-bys by Europe's Mars Express spacecraft. Six had been completed on 8 March 2010, including the closest ever pass of the moon, at 67 km.

The flights will probe the moon's gravity better than ever before, revealing the distribution of material throughout its body. The MARSIS radar will also search for underground structures in the rubble moon, which is probably riddled with caverns.

The gravity data will help Russia's Phobos-Grunt mission, set to launch in 2011 or 2012, maneuver efficiently around the moon before coming in for a landing.

A 9 kilometer diameter crater named Stickney can be seen on the lower right of this false-colour image of Mars' moon Phobos.

<http://www.newscientist.com/article/dn18621-martian-moons-secrets-to-be-revealed-during-flybys.html>



## Discovery of W Ursae Majoris

The variability of W UMa was first noted in the early 1900s by Muller and Kempf (1903) during zone observations for the Potsdam *Photometric Durchmusterung*. The star apparently exhibited an extraordinarily short period of only about four hours -- the shortest known period to that date. (The correct period is now known to be twice that, just over eight hours.) While brightness variations were evident in the light curve, the type, however, could not be placed amongst

the known classes of the time. The discovery light curve is shown above left.

To explain the variability, the authors proposed variations due to a rotating body with a surface of unequal brightness distribution, which could be a result of an advanced age of cooling. Alternatively, the object could be a figure deviating from spherical shape to something more of an ellipsoid. More likely, however, Muller and Kempf suggested that the variable might be two bodies, nearly equal in size and luminosity, with surfaces relatively close in distance that occult each other during the course of revolution.

The image is a painting of sunrise on an imaginary planet with its equally imaginary moon around it. A W UMa type close binary star system, around which the planet orbits, is shown in the background. <http://www.aavso.org/vstar/vsots/>



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<http://science.nationalgeographic.com/science/space/solar-system>

### Watching a cannibal galaxy dine

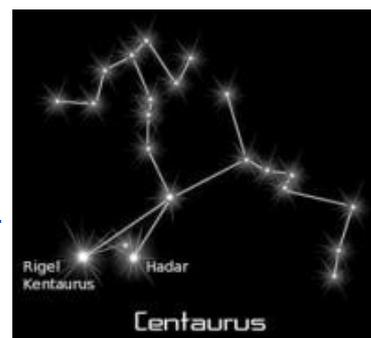


A new technique using near-infrared images, obtained with ESO's 3.58-metre New Technology Telescope (NTT), allows astronomers to see through the opaque dust lanes of the giant cannibal galaxy Centaurus A (aka NGC 5128), unveiling its "last meal" in unprecedented detail — a smaller spiral galaxy, currently twisted and warped. Thousands of star clusters, strewn like glittering gems, are also seen churning inside Centaurus A. (Image at top left.)

Centaurus A is the nearest giant elliptical galaxy, at a distance of about 11 million light-years. The beautiful and spectacular appearance of it is due to an opaque dust lane that covers the central part of the galaxy. (Optical image at top right.) This dust is thought to be the remains of a cosmic merger between a giant elliptical galaxy and a smaller spiral galaxy full of dust.

Centaurus A is located approximately 4° north of Omega Centauri (a globular cluster visible with the naked eye) in the constellation Centaurus. Because the galaxy has a high surface brightness and relatively large angular size, it is an ideal target for amateur astronomy observations. The bright central bulge and dark dust lane are visible even in finder scopes and large binoculars.

- <http://www.eso.org/public/outreach/press-rel/pr-2009/pr-44-09.html>
  - Newsletter for November 2008, page 8.
  - [http://en.wikipedia.org/wiki/Centaurus\\_A](http://en.wikipedia.org/wiki/Centaurus_A)
  - [http://www.scientificblogging.com/news\\_releases/ngc\\_5128\\_centaurus\\_jets\\_and\\_lobes\\_get\\_spectacular\\_new\\_image](http://www.scientificblogging.com/news_releases/ngc_5128_centaurus_jets_and_lobes_get_spectacular_new_image)
- A colour composite image of Centaurus A is to be seen at this web site.



### Ninth Biennial Symposium of the ASSA

The Pretoria Centre of the ASSA has announced the dates for the Ninth Biennial Symposium of the ASSA. The symposium will take place at the Silverton campus of the Council for Geoscience on Thursday 7 October 2010 and Friday 8 October 2010. The program for Saturday 9 October 2010 includes a morning visit to HartRAO and a guided tour through the Tswaing meteorite impact crater during the afternoon.

The symposium will focus on light/spectrum pollution and people interested in delivering papers are invited to send a short synopsis to Andrie van der Linde at [andrie@eridanusoptics.com](mailto:andrie@eridanusoptics.com). You can also make a preliminary booking if you plan to attend. Details on registration fees and suggestions for accommodation, etc., will be available soon.

**Outreach on 19 February at the observatory in Johannesburg  
by Johan Smit**

**Johan Smit** did a presentation to the youngsters of the Linden commando and brought a number of telescopes for viewing. Thanks to **Chris Curry, Rodney Hyman, Alec Jamieson and Bill Reynard** of ASSA Johannesburg for their help. Here are some photos taken at the occasion.

Oom Johan sets up the 14" scope with help from a visitor (below, left).

Some youngsters and the 26 inch refractor (below, right).

The business end of the 26 inch refractor (bottom).

Photos by **Chris Curry**, ASSA Johannesburg.





## Second Karoo Star Party

The ASSA Pretoria Centre wants to hold its second National Karoo Star Party during the long weekend of 6 to 9 August 2010 about 20 km north of Britstown in the Karoo, right next to the N12 at the Kambro Padstal. The reason for this locality, apart from the fabulous Karoo skies, is that it is almost exactly halfway between Gauteng and the Cape Town area, so we can all drive the same distance to the site. The first event of this type was held during April 2009 and proved to be a big success. The Karoo lived up to its reputation and provided magnificent views to those lucky enough to be present.

More information from:

- Johan Smit, cellphone: 0728062939, e-mail: [JohanS@firsttech.co.za](mailto:JohanS@firsttech.co.za)
- Danie Barnardo, cellphone: 0845886668, e-mail: [daniebar@telkomsa.net](mailto:daniebar@telkomsa.net)

To book, please contact Wilma Strauss, the Manager of Kambro directly at 0833056668 or at e-mail: [kambro@worldonline.co.za](mailto:kambro@worldonline.co.za). You can also view their website (with a report on the star party that took place last year) at: <http://www.kambroacom.co.za/>

## Dawn enters asteroid belt - for good

NASA's spacecraft Dawn (utilizing solar-powered ion propulsion engines) first entered our solar system's asteroid belt (whose lower boundary may be defined as the greatest distance Mars gets from the Sun = 249 230 000 kilometers) in June 2008. It remained within the belt for 40 days before its carefully planned orbital path brought it below the belt's lower boundary again. Dawn re-entered the belt on 13 November 2009.

This time around, Dawn's flight path will remain above this lower boundary of the belt for the rest of the mission and in the foreseeable future. Dawn will become the first man-made object to take up permanent residence in the asteroid belt.

- November 2007 newsletter, page 9.
- <http://dawn.jpl.nasa.gov/>
- [http://en.wikipedia.org/wiki/Dawn\\_\(spacecraft\)](http://en.wikipedia.org/wiki/Dawn_(spacecraft))

## First discovery of a building block of life in a comet

NASA scientists have discovered glycine, a fundamental building block of life, in samples of comet Wild 2 returned by NASA's Stardust spacecraft. Glycine is an amino acid used by living organisms to make proteins, and this is the first time an amino acid has been found in a comet. The discovery supports the theory that some of life's ingredients formed in space and were delivered to Earth long ago by meteorite and comet impacts. The discovery of glycine in a comet supports the idea that the fundamental building blocks of life are prevalent in space.

<http://www.sciencecentric.com/news/article.php?q=09081843-nasa-researchers-make-first-discovery-life-building-block-comet>

## Mars Reconnaissance Orbiter finds subsurface ice on Mars

Sure, it's big news: the Moon has water ice at both poles, but Mars is loaded! A new extensive radar mapping of the middle-latitude region of northern Mars shows that thick masses of buried ice are quite common beneath the surface. The Mars Reconnaissance Orbiter's Shallow Radar instrument has detected subsurface ice deposits that extend for hundreds of kilometers in the rugged region called Deuteronilus Mensae, about halfway from the equator to the Martian north pole.

<http://www.universetoday.com/2010/03/02/mro-radar-maps-extensive-subsurface-martian-ice/>

### Jet from center of M87

Streaming out from the center of the galaxy M87 like a cosmic searchlight is one of nature's most amazing phenomena, a black-hole-powered jet of electrons and other sub-atomic particles traveling at nearly the speed of light. In this Hubble Space Telescope image, the blue of the jet contrasts with the yellow glow from the combined light of billions of unseen stars and the yellow, point-like globular clusters that make up this galaxy.

<http://hubblesite.org/newscenter/archive/releases/2000/20/image/a/>



### Pretoria Centre committee

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Centre Representative	Michael Poll	012 331 1615 [ H ]	
Librarian	Danie Barnardo	084 588 6668 [ Mobile ]	
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