



# The PRETORIA CENTRE

of the

## Astronomical Society of Southern Africa

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

### NEWSLETTER JULY 2012

#### Next meeting

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

**Date and time:** Wednesday 25 July at 19h15.

#### Programme:

- **Annual General Meeting:** It will be short and sweet. It will last only about 30 minutes. Come and speak your mind and listen to what others have to say.
- **What's Up?** by Percy Jacobs.
- 10 minute break — library will be open
- **Main talk: The topic will be made known to members by e-mail before 27 July.**
- Socializing over tea/coffee and biscuits.

The chairperson at the meeting will be Johan Smit.

**Next observing evening:** Friday 20 July 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.

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### Chairman's report of meeting held on 27 June 2012 at CBC.

After the usual announcements, the chairman introduced Danie Barnardo to tell us more of the building of Crux II, his new 10" Newtonian.

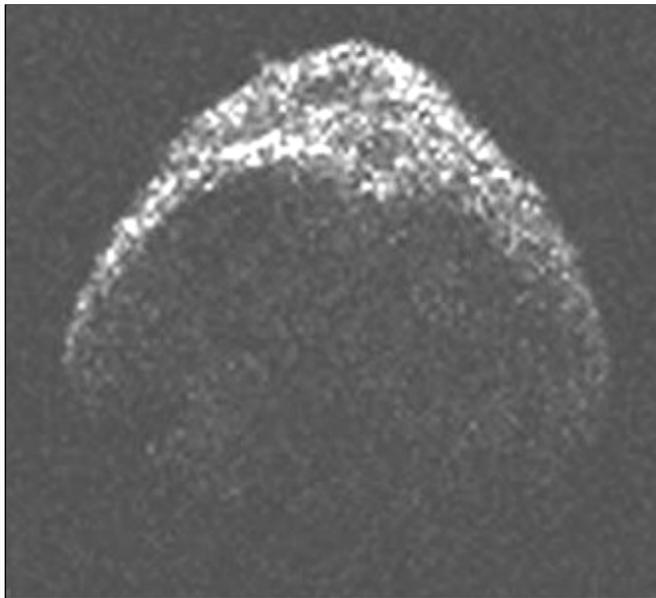
By means of numerous slides he illustrated that the grinding of the mirror took him approximately 100 hours and the end result was a mirror of very high standard passing all the tests with flying colours. Danie once again illustrated the point that one can homebrew excellent optics that puts many commercial telescopes to shame.

When the mirror was aluminized it was apparent that there was no scratches on the surface and the star tests further emphasized the mirror's high tolerances. It is believed that this 'scope will give Danie some excellent viewing and we cannot wait to hear his report from the Northern Star Party on the weekend of 13 to 15 July at Shekinah Camp in the Waterberg.

What's up was presented by Fred Oosthuizen. He was forced to read his presentation due to a power failure in his area, which meant he could not finish his power point presentation for the meeting. He discussed numerous interesting objects which were also targeted during the Northern Star Party.

The main presentation was by Michael Poll on water in the Solar system. A multitude of interesting facts, showing that water is not all that scarce in the solar system, were presented, but the most astonishing was that the earth has only a small percentage of all that water captured in its crust, in its oceans and ice caps and of this, a very small portion is available as fresh water for man's use. Seeing these proportions one realizes that all fresh water is precious and that water, or the lack thereof, could very well become the cause for future wars. Demands on fresh water resources are increasing and it is vital that all fresh water should be conserved in order to ensure man's future existence on this planet.

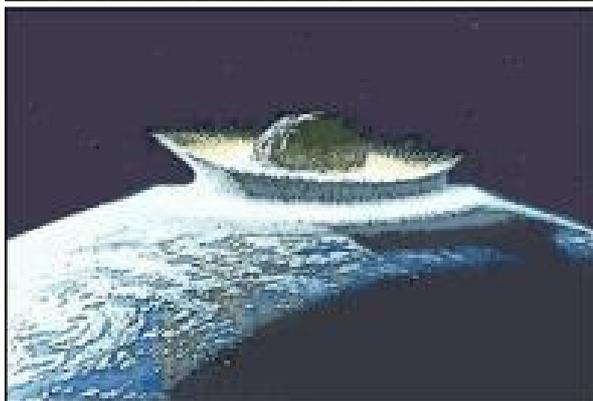
### Feature of the month: Asteroid 2012 LZ1 - by Pierre Lourens



On June 10, 2012, a potentially hazardous asteroid, thought to have been **500 meters wide**, was discovered by Siding Spring Observatory in New South Wales, Australia. Fortunately for us, asteroid 2012 LZ1 (see photograph at left) drifted safely by, coming within 14 lunar distances from Earth on June 14. **Phew!** This particular asteroid may not have been a danger, but much of the concern was rooted in the late warning of its detection. **It was spotted only four days before closest approach.**

And, to make things worse, astronomers later discovered that asteroid 2012 LZ1 is actually bigger than at first thought - in fact, it is **one kilometer wide**. That means it has eight times the volume and eight times the mass of the original estimate. Its surface is really dark, reflecting only 2 - 4 percent of the light incident on it. This contributed to the underestimated initial optical observations.

This incident demonstrates yet again that Earth's asteroid detection program is inadequate, and also that it is high time for the development of asteroid deflection technology that can be deployed at short notice. Or else..... see the artist's depiction at left.



<http://news.discovery.com/space/asteroid-2012-lz1-just-got-supersized-120622.html#mkcpgn=emnws1>

Observing Evening Report : June 22<sup>nd</sup> 2012 - by Michael Poll

Another clear evening, except that a few clouds came and went half way through, but they did not cause any distress! There were perhaps 30 or so people, including a number of children, which was quite pleasing. The telescopes numbered at least half a dozen.

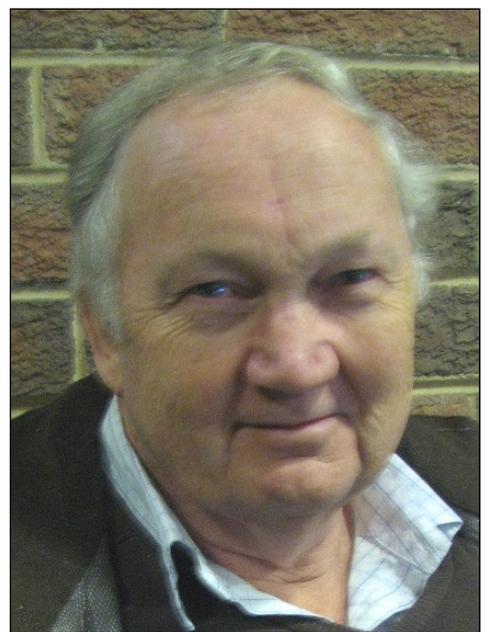
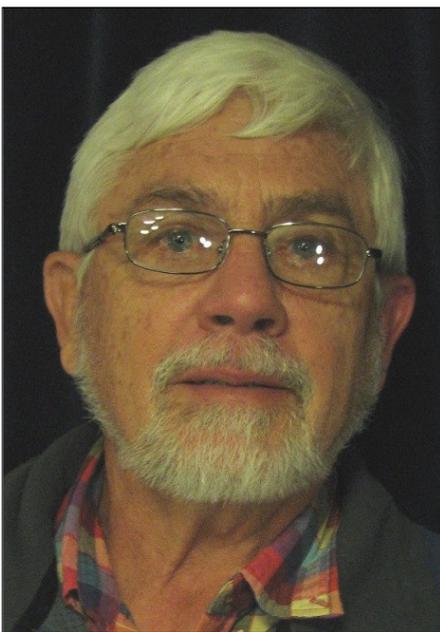
The (three day old) moon crept into our observing evening sky for the first time for some time. We noted Mare Crisium and a large crater with a central peak (probably Langrenus, which has a diameter of 132 km. Langrenus) to the south of Crisium (to the right as viewed in a Newtonian reflector). As usual, we noted the long shadows at the terminator, and the shadows within the craters. Next we looked at Saturn, which is now quite high in the early evening, still forming a striking pair with Spica in Virgo. We also noted Mars, and had look at it with the telescopes, noting that, although Saturn is much further away than Mars, Saturn looks larger than Mars at the same magnification. It was also pointed out that Mars will pass between Spica and Saturn in the middle of August.

Michael had a long discussion with one visitor about the spin axis of the Earth, which included a discussion about the altitude of the south celestial pole at various latitudes.

Previous to this discussion we did a naked eye tour starting with the zodiacal constellations. With the sun at its furthest north, setting in the north west, on June evenings the ecliptic stretches from the north west to the south east, so its furthest point north (in Gemini) was setting while its furthest point south (in Sagittarius) was rising. This led to the discussion about the change in position of the sunrise points during the year – the sunrise point moves from north east to the south east over a period of six months. These points get further apart the further one goes away from the equator.

We looked at a few pretty double stars in Scorpius – Beta, Nu ( $\nu$ ) and Sigma ( $\sigma$ ). All three have unequal components, Beta and Nu have the brightest secondaries, while the secondary star of Sigma is just a speck.

We looked at some of our favourite clusters, including M7, M6 and NGC6231 in Scorpius. Other deeper sky objects seen included Omega Centauri (NGC 5139) and the Jewel Box (NGC 4755).



**Meet some members of the Pretoria Centre of the ASSA**

Left to right: Martin (aka Fickie) Fick, Dr Paul Mulder, Tony Viljoen (a committee member).

## Summary of "What's Up?" to be presented on 25 July - by Percy Jacobs

### Phases of the Moon

1 <sup>st</sup> Full Moon	– 2 <sup>nd</sup> Aug
2 <sup>nd</sup> Full Moon	- 31 <sup>st</sup> Aug ("Blue Moon" – 2 full moons in a month)
Last Quarter	– 9 <sup>th</sup> Aug
New Moon	– 17 <sup>th</sup> Aug (dark sky)
First Quarter	– 24 <sup>th</sup> Aug
Dark Sky	– from about 8 <sup>th</sup> to 22 <sup>nd</sup> Aug

### Planets

<b>Mercury</b>	- rises in morning twilight – best seen mid month – never rises very high
<b>Venus</b>	- bright morning star entire month
<b>Mars &amp; Saturn</b>	- visible after sunset and both set late evening. Mars overtakes slower Saturn and they are closest on 15 <sup>th</sup> Aug
<b>Jupiter</b>	- rises after midnight & prominent in morning sky
<b>Uranus</b>	- rises in the 1 <sup>st</sup> half of the evening – in Pisces – around 23:00
<b>Neptune</b>	- rises at sunset in Aquarius
Uranus & Neptune well placed for observing in the morning sky	

### Events

#### Blue Moon

2 full moons in 1 month

### Constellations – shall be discussed in more detail at meeting

Grus	- "the crane" - Al Nair
Pavo	- "the peacock" – $\alpha$ Pav – peacock star
Ara	- "the altar" – $\alpha$ Ara
Scorpius	- "the scorpion" – Antares
Sagittarius	- "the archer" – galactic centre
Aquarius	- "water carrier" - Sadal Melik (double star)
Capricornus	- "the goat" - Deneb Algiedi
Cygnus	- "the swan" - Alberio double star
Lyra	- "the harp" - Vega
Sagitta	- "the arrow"
Delphinus	- "the dolphin"
Hercules	- Roman mythological hero

### "ASSA Top 100" observers

1 George Dehlen	73
2 Louis Kloke	56
3 Percy Jacobs	33
4 Craig Kloke	17
5 Grant Thompson	16
6 Pat Kühn	15
7 Michael Poll	13
8 Andre de la Ponte	6
Total	<b>229</b>

## Database

Members are reminded that a database of the books in our library is to be found on our website. The database was created by Danie Barnardo, one of our committee members.

**Basics: zero gravity and artificial gravity - by Pierre Lourens**

**Zero gravity.**

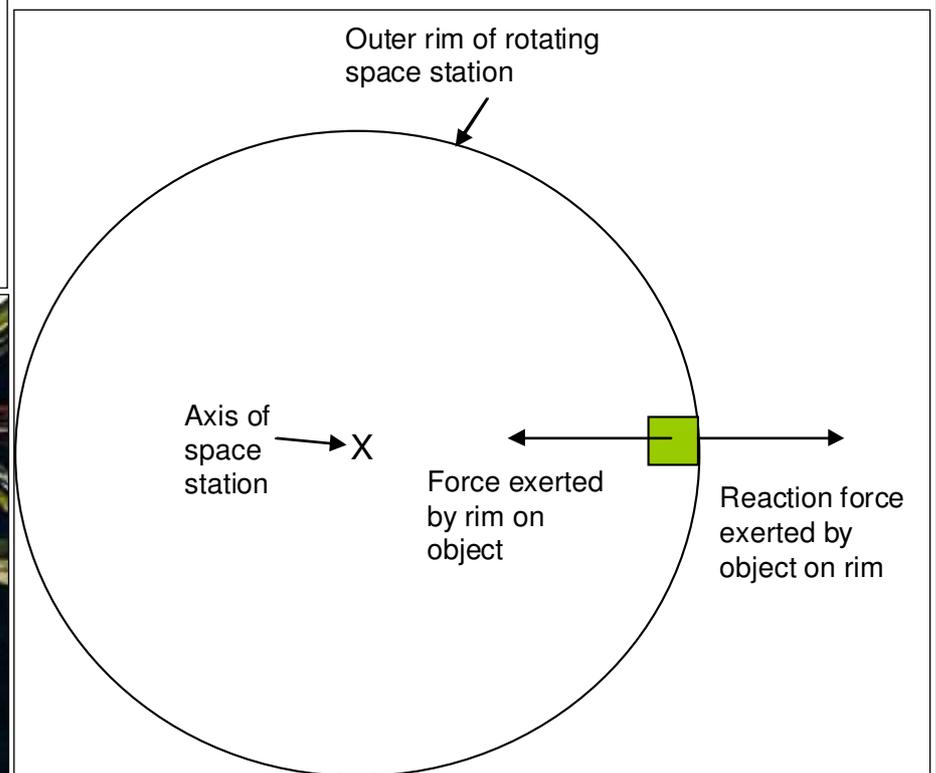
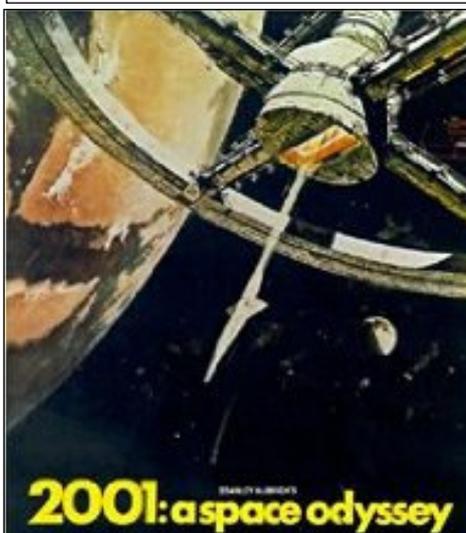
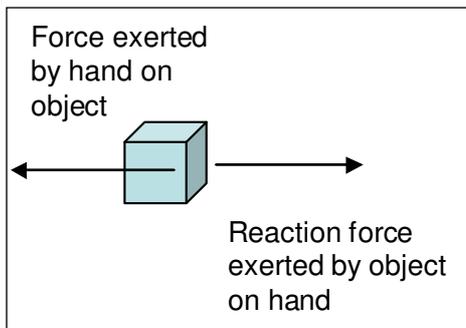
If you could venture in a space ship far away from heavenly bodies, you would approach a state where there is no gravitational force exerted by any of them, i.e., a state of zero gravity. With the engines switched off, the space ship would just drift around in space, and you and all loose objects inside would also drift around. If you stood on a scale, it would register zero weight.

But if you were inside a falling container - like a falling elevator - you would experience the same state. You and all loose objects would drift around. If you stood on a scale, it would register zero weight. This is called a weightless condition.

An object (like a space station) moving around Earth in an orbit, is accelerated towards the center of Earth every moment. The magnitude of this acceleration, indicated by  $g$ , is the same as it is for a falling object that does not orbit Earth, but simply falls straight down. This means that the orbiting object is also falling every moment. All objects inside it will also fall with it. If you were inside it, you would experience the same weightless condition as inside a falling elevator. In this way, a state of zero gravity is simulated inside a space station moving around Earth in an orbit.

**Artificial gravity.**

A state of gravity can also be simulated. In order to understand this, consider an object that is accelerated along a straight line by pushing it with your hand. The object pushes back on your hand with an equal but oppositely directed reaction force, according to Newton's third law of motion. Now suppose you have a huge orbiting space station in the shape of a giant wheel and rotating about its axis, like in the 1968 SF film "**2001: A Space Odyssey**". It is not obvious, but an object that is positioned on the inside of the outer rim is accelerated toward the axis every moment by the force the rim exerts on the object. This force is termed the centripetal force. As a result, there is an equal but oppositely directed reaction force that the object exerts on the inside of the rim. This reaction force is termed the centrifugal force. If you were standing there in place of the object, this latter force would feel just like gravity pulling you away from the axis and pressing you against the inside of the outer rim. The greater the rate of rotation and / or the larger the radius of the rim, the greater the centripetal and centrifugal forces. In this way, gravity of the desired strength can be simulated.



### Questions and answers

Q: What did the astronaut cook for lunch?

A: *An unidentified frying object.*

Q: Why didn't the dog star laugh at the joke?

A: *It was too Sirius.*

Q: If a meteorite hits a planet, what do we call the ones that miss?

A: *Meteowrongs.*

Q: What did the boy star say to the girl star?

A: *I really glow for you.*

Q: What kind of songs do the planets like to sing?

A: *Nep-tunes.*

Q: What did Saturn say to Jupiter when he asked if he could call him?

A: *Don't call me, I'll give you a ring.*

Q: How does the man in the moon cut his hair?

A: *Eclipse it.*

### The Higgs boson

A Higgs boson walks into a church. The priest says: "*You are not welcome here.*" The Higgs boson says: "*You can't have mass without me*".

**One-minute physics: Why the Higgs boson is the missing link.** See a video clip.

[http://www.newscientist.com/blogs/nstv/2012/07/one-minute-physics-why-the-higgs-is-the-missing-link.html?cm\\_pid=NLC|NSNS|2012-0907-GLOBAL|oneminutephysics&utm\\_medium=NLC&utm\\_source=NSNS&utm\\_content=oneminutephysics](http://www.newscientist.com/blogs/nstv/2012/07/one-minute-physics-why-the-higgs-is-the-missing-link.html?cm_pid=NLC|NSNS|2012-0907-GLOBAL|oneminutephysics&utm_medium=NLC&utm_source=NSNS&utm_content=oneminutephysics)

### ScopeX 2012

**Where:** National Military History Museum, Johannesburg (aka War Museum, next to the Zoo).

**Date:** Saturday 21 July 2012 .

**Time:** 9 am to 9 pm. (Star Party from 6 pm onward.)

**Museum Entrance Fee:** R22 adults, R11 senior citizens and children up to 18.

**Website:** <http://www.scopex.co.za/>

### Invitation to attend the AGM of ASSA

The following e-mail message was received:

Dear Members of the ASSA,

It is a pleasure to inform you on behalf of the ASSA Council that the invitation to this year's Annual General Meeting of the ASSA is available on the ASSA web site now.

The AGM will take place at the Auditorium of the South African Astronomical Observatory, Observatory Road, Observatory, Cape Town on 1 August 2012 at 19h15. All ASSA Centre members as well as all country members are invited to attend.

You may find the agenda, the list of council positions (including nominees) and the minutes of last year's AGM at <http://assa.saa.ac.za/html/agm2012.html>

Kind regards,  
Christian Hettlage

### Noteworthy items

- **NASA'S supercomputer Pleiades.** Pleiades is critical for the modeling, simulation and analysis of a diverse set of agency projects in aeronautics research, Earth and space sciences and the design and operation of future space exploration vehicles.  
[http://www.nasa.gov/home/hqnews/2012/jun/HQ\\_12\\_206\\_Pleiades\\_Supercomputer.html](http://www.nasa.gov/home/hqnews/2012/jun/HQ_12_206_Pleiades_Supercomputer.html)
- **NASA'S NuSTAR mission lifts off.** This novel X-ray observatory will explore the previously poorly explored hard X-ray region of the electromagnetic spectrum.  
[http://www.nasa.gov/home/hqnews/2012/jun/HQ\\_12-196\\_NuSTAR\\_Launches.html](http://www.nasa.gov/home/hqnews/2012/jun/HQ_12-196_NuSTAR_Launches.html)
- **Earth-like worlds common?** Earth-sized planets may be widespread in the Milky Way. An analysis based on the Kepler planet candidates indicates that terrestrial planets can form at a wide range of metallicities, including metallicities almost four times lower than that of the Sun.  
<http://news.discovery.com/space/earth-worlds-are-easy-120613.html>
- **The toughest life on Earth.** You can freeze it, thaw it, vacuum dry it and expose it to radiation, but still life survives. [http://www.esa.int/esaCP/SEM5RNBXH3H\\_index\\_0.html](http://www.esa.int/esaCP/SEM5RNBXH3H_index_0.html)
- **NASA offers web and mobile phone links to follow the ISS and Mission Control.** NASA is using the Internet and smart phones to provide the public with a new inside look at what happens aboard the International Space Station (ISS) and in the Mission Control Center at the Johnson Space Center in Houston, Texas.  
[http://www.nasa.gov/home/hqnews/2012/jun/HQ\\_12-210\\_ISS\\_Live\\_Web\\_and\\_App.html](http://www.nasa.gov/home/hqnews/2012/jun/HQ_12-210_ISS_Live_Web_and_App.html)
- **In the shadows of Saturn's rings.** See a recent image of Saturn, the shadows of its rings and Titan, seen from spacecraft Cassini. [http://www.esa.int/esaSC/SEMYIPAXH3H\\_index\\_0.html](http://www.esa.int/esaSC/SEMYIPAXH3H_index_0.html)
- **See simulations of the coming collision of the Milky Way with the Andromeda galaxy and of the evolution of the Milky Way.** [http://www.newscientist.com/blogs/nstv/2012/06/what-milky-ways-deadly-smash-up-will-look-like.html?c\\_m\\_p\\_i\\_d=NLC|NSNS|2012-2506-GLOBAL|milkyway&utm\\_medium=NLC&utm\\_source=NSNS&utm\\_content=milkyway](http://www.newscientist.com/blogs/nstv/2012/06/what-milky-ways-deadly-smash-up-will-look-like.html?c_m_p_i_d=NLC|NSNS|2012-2506-GLOBAL|milkyway&utm_medium=NLC&utm_source=NSNS&utm_content=milkyway)
- **Flyby of spacecraft Rosetta past asteroid Lutetia.**  
[http://www.esa.int/esaSC/SEMXCODXR3H\\_index\\_0.html](http://www.esa.int/esaSC/SEMXCODXR3H_index_0.html)
- **The Universe: no God required?** The debate about the existence of God is centuries old, and still continues.  
<http://news.discovery.com/space/the-universe-no-god-required-120626.html#mkcpgn=emnw1>
- **7 things most often mistaken for UFO's.**  
<http://www.lifeslittlemysteries.com/896-7-ways-to-generate-a-great-space-hoax.html>
- **HST and Swift detect first-ever changes in an exoplanet atmosphere.**  
[http://www.nasa.gov/home/hqnews/2012/jun/HQ\\_12-217\\_Hubble\\_Swift\\_Exoplanet.html](http://www.nasa.gov/home/hqnews/2012/jun/HQ_12-217_Hubble_Swift_Exoplanet.html)
- **The GAIA mission.** Read about its progress.  
[http://www.esa.int/esaSC/SEMWFV1VW3H\\_index\\_0.html](http://www.esa.int/esaSC/SEMWFV1VW3H_index_0.html)
- **X-raying the beating heart of a newborn star.** The violent behaviour of a young Sun-like star spinning at high speed and spewing out super-hot plasma has been revealed thanks to the combined X-ray vision of three space telescopes.  
[http://www.esa.int/esaCP/SEMGB02VW3H\\_index\\_0.html](http://www.esa.int/esaCP/SEMGB02VW3H_index_0.html)
- **Hubble discovers a fifth moon orbiting Pluto.**  
<http://hubblesite.org/newscenter/archive/releases/2012/32/image/a/>

(continued)

## Titan.

- **Saturn moon has tropical "Great Salt Lake," methane marshes.** Saturn's hazy moon Titan has a huge tropical lake and marshes of liquid methane near its equator. This is what is suggested by surprising new images from spacecraft Cassini. <http://news.nationalgeographic.com/news/2012/06/120613-nasa-saturn-titan-tropical-lakes-methane-cassini-space-science/>
- **Tropical lakes on Saturn moon could expand options for life.** Researchers argue that these lakes are being replenished by subsurface oases of liquid methane. That would expand the number of places on the moon where life could potentially originate. <http://www.nature.com/news/tropical-lakes-on-saturn-moon-could-expand-options-for-life-1.10824>
- **Titan's tides point to hidden ocean.**  
[http://www.esa.int/esaSC/SEM00G1VW3H\\_index\\_0.html](http://www.esa.int/esaSC/SEM00G1VW3H_index_0.html)



2012 © Yuri Beletsky

## Line-up

Visible from left to right near the centre of the image, are the Pleiades open star cluster, Jupiter, Venus, and the "Follower" star Aldebaran, all seen before a starry background. The image was taken from the Atacama desert in western South America early this month. The glow of the rising Sun can be seen over the eastern horizon. Jupiter and Venus will continue to dazzle pre-dawn strollers all over planet Earth for the rest of the month.

**Largest moon of 2012 over Cape Town**

This photograph was sent in by Michelle Ferreira, a member of the Pretoria Centre. The photographer is unknown.



**MNASSA**

The June 2012 issue of MNASSA has just been published on the MNASSA Download Page at <http://www.mnassa.org.za/>

**Pretoria Centre committee**

Chairman	Johan Smit	072 806 2939 [ Mobile ]	
Vice Chairman	Danie Barnardo	084 588 6668 [ Mobile ]	
Secretary	Tony Viljoen	072 247 6648 [ Mobile ]	012 654 5783 [ H ]
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Treasurer and Membership Secretary	Rynhardt van Rooyen	082 325 8745 [ Mobile ]	
Member	Michael Poll	074 473 4785 [ Mobile ]	
Librarian	Danie Barnardo	084 588 6668 [ Mobile ]	
Curator of Instruments	Johan Smit	072 806 2939 [ Mobile ]	
Public Relations Officer	Fred Oosthuizen	072 373 2865 [ Mobile ]	
Observing Director	Percy Jacobs	082 498 4680 [ Mobile ]	
Member	Bosman Olivier	082 883 1869 [ Mobile ]	
Member	Pat Kühn	082 895 5686 [ Mobile ]	
Member	Johan Hartmann	083 276 1323 [ Mobile ]	
Member	Hubrecht Ribbens	082 448 0633 [ Mobile ]	

