



# The PRETORIA CENTRE

of the

## Astronomical Society of Southern Africa

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

### NEWSLETTER FEBRUARY 2014

#### Next meeting

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

**Date and time:** Wednesday 26 February at 19h15.

**Programme:**

- **Beginner's Corner:** "A visit to the Radebeul Astronomical Observatory in Dresden, Germany" by Pat Kühn.
- **What's Up?** by Fred Oosthuizen.
- 10 minute break — library will be open.
- **Main talk: "The theory of star formation" by Sheldon Herbst.**
- Socializing over tea/coffee and biscuits.

The chairperson at the meeting will be Bosman Olivier.

#### Next observing evening

Friday 21 February from sunset onwards at the Pretoria Centre Observatory, which is also situated at CBC. Turn left immediately after entering the main gate and follow the road.

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Report of Observing Evening on Friday January 17<sup>th</sup> 2014  
by Michael Poll

About 20 or more people were at this observing evening, with 7 or 8 telescopes. Visitors included Nico & Marie. The sky was clear of cloud, and we got in some good observing, although the 17 day old moon rose at about 7.45 pm, and flooded the scene with extra light.

Jupiter was very well placed in the north east, in Gemini. All four Galilean moons were on view, with Io and Europa close together and close to Jupiter on one side and Ganymede and Callisto well spread out on the other. We could even detect a bit of colour in Io and Europa – a number of us noted that Io could be seen to be “orangey” and Europa, whitish. (See Sky & Telescope January 2014, page 54).

It was too late in the season to spot the Andromeda galaxy in the north but we did point out Aries, and looked at the nice double star Gamma Arietis, which has two components of equal brightness. We checked out the two famous clusters in the northern sky – the Pleiades and the Hyades. Johan had his binocular stand with his big binoculars, which were ideal for looking at these two clusters.

Orion was high in the north, and we looked at the Orion Nebula (M42) through various telescopes, but the view through Michael Mollers 12 ½ inch was superb – as well as the normal central part of the nebula, we could see two extensions which resembled wings. Higher up than Orion, we looked at M41 (NGC 2287) in Canis Major. This open cluster passes overhead in Pretoria, and can be found about one third of the way from Sirius to Delta Canis Majoris, slightly west of the line joining these two stars.

The Moon was up by now. It was only a day past full moon, so not much detail was visible. The crater Grimaldi was well placed – sometimes libration can make this crater almost disappear around the limb. Grimaldi is the darkest feature on the Moon. We also noted Aristarchus, the brightest spot on the Moon, but illumination was not favourable for viewing Schroter’s valley which is near this crater.

In spite of the bright Moon, we had an early season look at some of our favourite southern winter objects. Normally these are easy to find, but the challenge was to locate them in the moonlit sky. We did find IC 2602 (the Southern Pleiades) easily enough, and we picked out NGC 3532 (the Wishing Well Cluster), NGC 2516, and Michael Moller picked out NGC 3114. Later on we had more great views through the 12 ½ inch, including the Tarantula Nebula, in the Large Magellanic cloud, and the globular cluster 47 Tucanae. We spent some time looking for these elusive favourites, but we called it a night at about 10 o’clock.

The next observing evening is on February 21<sup>st</sup>. There is an occultation of Saturn on that night, but it looks as though the event will be over for Pretoria observers by the time Moon rises at about 11.00 p.m. Nevertheless, Saturn will still be very close to the Moon for the rest of that night. Ah, well, we will probably be able to watch Saturn disappear behind the Moon in the early morning of March 21<sup>st</sup>. Ω

**Best space pictures.**

<http://news.nationalgeographic.com/news/2014/01/140124-best-new-space-281-science-chile-mars-stars-lagoon/>

**Partial solar eclipse as seen from the SDO.**

<http://www.nasa.gov/content/solar-dynamics-observatory-sees-lunar-transit/>

**The Cat’s Eye Nebula as seen by the Hubble Space Telescope.**

[http://www.esa.int/Our\\_Activities/Space\\_Science/Highlights/An\\_unblinking\\_eye](http://www.esa.int/Our_Activities/Space_Science/Highlights/An_unblinking_eye)

## Chairman's Report for the monthly meeting of 22 January 2014 by Danie Barnardo

The meeting started at 19:15 and after welcoming the members and visitors present, Bosman Olivier started proceedings with a talk on the life of John Dobson, the famous amateur astronomer that started the San Francisco Sidewalk Astronomy club and also invented the Dobsonian Mount and was one of the first individuals to produce large, home-ground mirrors and designed the simple, but effective Dobsonian mounting to make astronomy affordable for countless amateur astronomers. John Dobson passed away on 15 January 2014 at the ripe age of 99. Bosman's presentation concluded with a short video on the life of John Dobson.

Next up was a "*Beginners Corner*" presentation by Percy Jacobs to introduce the principles of Amateur Spectroscopy during which he showed an example of how to determine the spectrum of Formalhaut. He introduced the equipment needed and the method of analysing the results in the Rspec software. He concluded by briefly explaining what the results can be used for. He also updated us on the status of observations by several members of the club who are engaged in the ASSA Top 100 observation program.

Percy's talk flowed over into his "*What's Up*" presentation for February 2014. A summary of the months observing highlights is presented elsewhere in this Newsletter. The highlight of the month's observing is certainly the near approach of Venus to the Moon on the early morning of 26 February, just before sunrise. At our latitude, we could even see a grazing occultation, so it is a good sighting to get up early for!

After a legbreak of about 15 minutes, Andre Reitmann was introduced for the Main Talk of the evening. Andre holds an M.Sc. in Physics from the University of Pretoria. He is happily married with 2 children and lives in Kempton Park and works for Cassidian Optronics as a designer of optical systems. Cassidian Optronics originated from the Armscor group of companies, where he started the Eloptro optical component factory. The products of the company are essentially centred around night-vision equipment for defence and security purposes. The different categories of equipment produced are:

- Helmet sights for jet-fighters, helicopters and tanks, where the armament are linked to the direction in which the wearer looks.
- Handheld target locators, with built-in telescopes, night-vision equipment, video cameras and laser rangefinders, that can also locate the exact locality of a target that is being observed.
- Periscopes for submarines. Andre explained how a periscope works and what a modern periscope consists of. He explained the problems of lining up the 10-metre long optical system that is needed for a submarine's periscope.
- Airborne gimbals are pods mounted mainly to the underside of helicopters and contains various night-vision sensors, telescopes and video cameras for observing of clandestine operations of criminals from a distance of up to 3 kilometers, producing clear identification and recording of targets, even in total darkness. The gimbals can be rotated to look in any direction and the greatest problem is to produce a stable environment for this highly-sensitive equipment in the high-vibration environment of a helicopter.
- Sensors that are used in the above mentioned equipment are also a major product.
- The company also produces high-precision optical elements and optical coatings for various applications, from total anti-reflection to 99.5% effective reflecting surfaces.

Andre concluded with the description of a very advanced 300mm telescope that he designed for an envisaged South African satellite during the 1980's. The telescope is an all-spherical Cassegrain design, with an extremely wide field-of-view that left most of the audience drooling!

After a very lively question-and-answer session and discussions, Andre was thanked for a very interesting and much-appreciated talk and the meeting was adjourned at about 21:30, after which discussions continued over a mug of tea/coffee and biscuits.  $\Omega$

### Basics: The Herschelian reflector - by Pierre Lourens

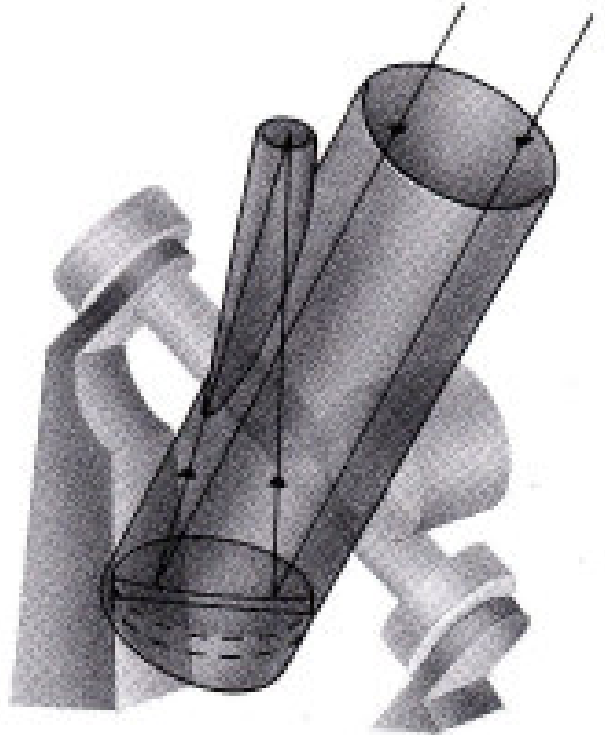
This type of telescope was developed by the famous astronomer Sir William Herschel (1738-1822) in the late 18th century. It uses a paraboloidal primary mirror as in the Newtonian telescope, but the primary mirror is tilted so that the image is formed to the side of the telescope tube, obviating the need for a secondary mirror. The eyepiece looked down the tube at an angle, with the observer facing the primary mirror.

Before the introduction of silver coating for mirrors made out of glass, primary and secondary mirrors were made out of speculum metal. The reflectivity of speculum metal was extremely low (at best 60%) and tarnished quickly, reducing reflectivity. This prompted Herschel to remove all reflecting surfaces other than that of the primary mirror. It had the additional advantage of having no central obstruction like the secondary mirror of a Newtonian telescope.

However, since the parabolic mirror is tilted with respect to the optical axis, the image suffers from geometrical aberrations. But for relatively long focal lengths such as those used by Herschel, the aberrations were negligible and largely offset the drastic fall in luminosity that the introduction of a secondary mirror, made out of speculum metal, would have caused.

Herschel made many telescopes that were the best of their day, culminating in one of 6 m focal length and 48 cm aperture, and another of 12 m focal length and 122 cm aperture. The latter was then the world's largest telescope.

The Herschelian reflector was soon superseded by the achromatic refractor telescope and the Newtonian telescope with glass mirrors coated with silver.  $\Omega$



A photo of the moon taken by Johan Moolman. The encircled crater is Anaxagoras.





Summary of "What's Up?" to be presented on 26 February 2014  
 - by Fred Oosthuizen

**MARCH 2014**

The angle from which the Sun illuminates the Moon is constantly changing, so the moon goes through a cycle of phases of shadow every 29.53 days called the Synodic Month. It is possible to have 5 lunar phases in a month whenever a lunar phase occurs on the 1<sup>st</sup> or 2<sup>nd</sup> day of the month, hence two New Moons this month.

**MOON PHASES**

- New Moon: Saturday 1<sup>st</sup>
- First Quarter: Saturday 8<sup>th</sup>
- Full Moon: Sunday 16<sup>th</sup>
- Last Quarter: Monday 24<sup>th</sup>
- New Moon: Sunday 30<sup>th</sup>

**METEOR SHOWERS**

Gamma Normids 25 February – 22 March and delta Pavonids 11 March – 16 April. Viewing of both the showers are not so good.

**PLANETS**

- Mercury: Prominent in the morning sky reaching its greatest elongation on March 14.
- Venus: Is the brilliant "Morning Star" throughout March.
- Mars: Rises early evening and brightens as it approaches opposition on the 8<sup>th</sup> of next month.
- Jupiter: Can be seen from midnight until dawn.
- Saturn: Rises 3 hours after sunset and can be seen till dawn.
- Uranus sets at dusk and Neptune rises early in the morning. They will both be a challenge to see.

**CONSTELLATIONS**

The Southern Circumpolar constellations: Carina, Centaurus and the Southern Cross can be seen throughout the year. The summer constellations: Canis Major, Cetus, Eridanus, Gemini, Orion, Perseus and Taurus will by months end be fairly low in the west and difficult to view. Bootes, Cancer, Crater, Hydra, Leo and Virgo rising out of the east and will be fairly high in the sky by months end

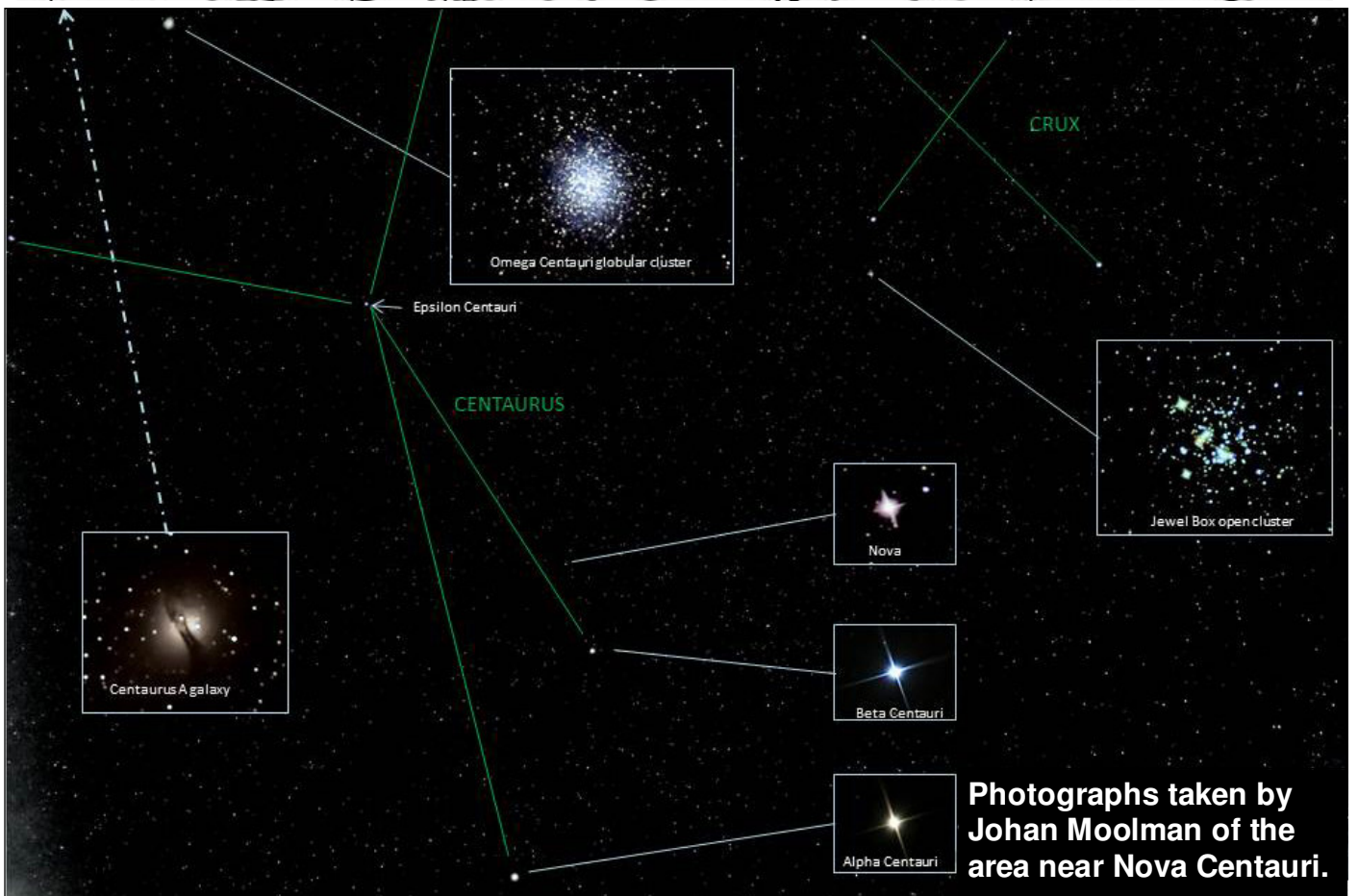
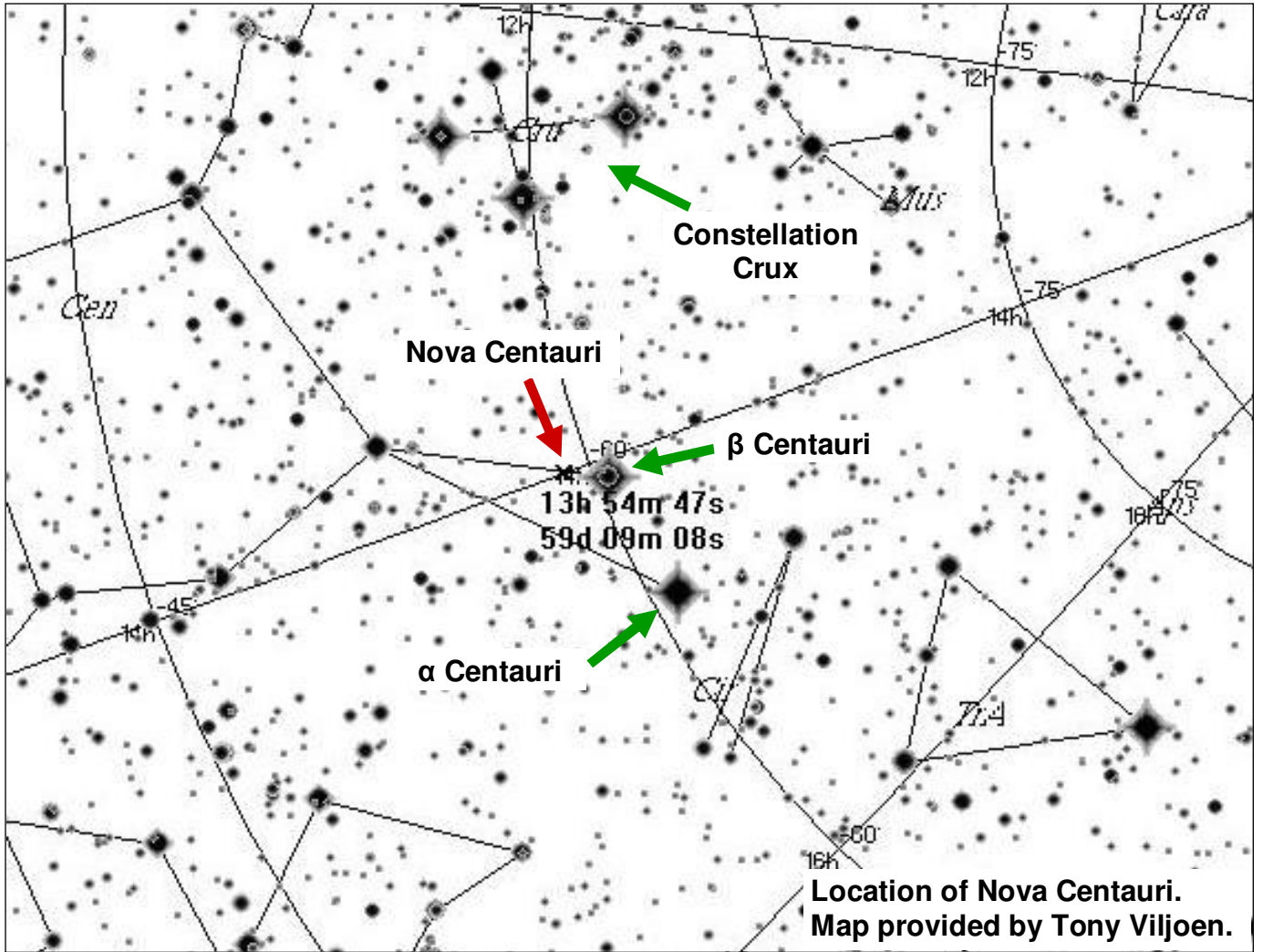
**DEEP SKY**

- NGC 1851 globular cluster in columboM 79 globular cluster in lepusM 42 & M 43 bright nebulae in OrionM 35 open cluster in GeminiM 41 and NGC 2362 open clusters in Canis Major.  $\Omega$

**Asteroids to be watched**

**Watch asteroid Herculina take the Bull by the horns.** In the next few weeks, the asteroid Herculina, the 532nd asteroid to be discovered, will glow in the sky in the constellation Taurus at an apparent magnitude of about 10. That should make it easy to spot with small backyard telescopes, even through the glare from cities. <http://newswatch.nationalgeographic.com/2014/02/05/watch-asteroid-take-the-bull-by-the-horns/#.UvnB24o36B8.email>

**Ceres and Vesta in 2014.** The two brightest asteroids are very close to each other in the sky in 2014, fitting in a single field of view through binoculars and some telescopes. Get a printable map of Ceres and Vesta's paths through Virgo in 2014. <http://www.skyandtelescope.com/observing/objects/asteroids/Ceres-and-Vesta-in-2014-243533241.html>





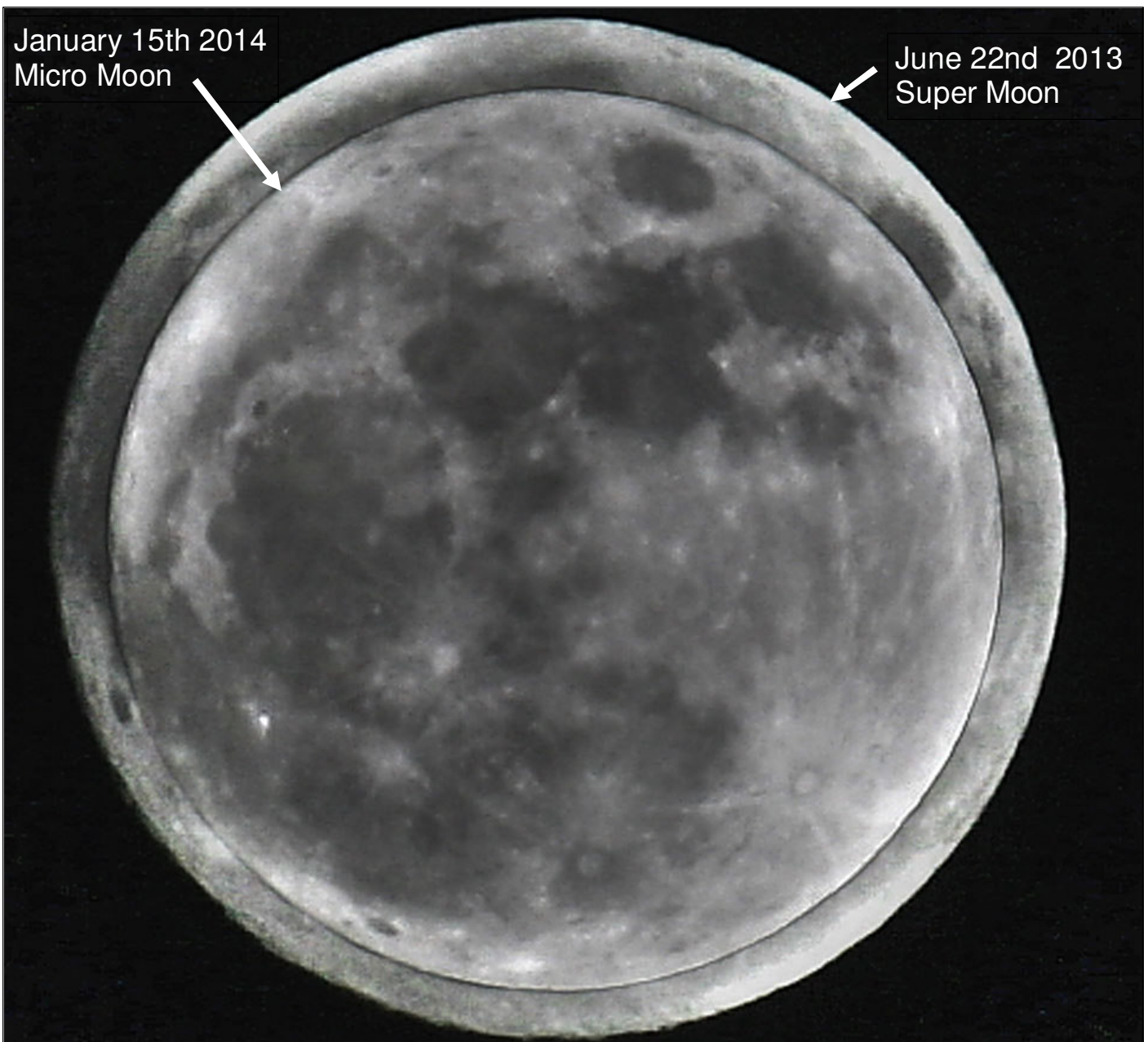
## Micro Moon over Super Moon

Did you see the big, bright, beautiful Full Moon on Wednesday night 15th January 2014? That was actually a Micro Moon! On that night, the smallest Full Moon of 2014 reached its full phase only a few hours from the time of lunar apogee, the most distant point from Earth in the Moon's elliptical orbit.

Of course, on the night of June 22nd 2013, a Full Super Moon was near perigee, the closest point to Earth in the Moon's orbit. The apparent size of the January 15th 2014 Micro Moon is compared to that of the June 22nd 2013 Super Moon in the composite image, digitally superimposing telescopic images from Perugia, Italy.

The difference in apparent size represents a difference in distance of just under 50 000 kilometers between apogee and perigee, given the Moon's average distance of about 385 000 kilometers.

How long do you have to wait to see another Full Micro Moon? Until March 5th 2015, when the lunar full phase will again occur within a few hours of the time of lunar apogee.  $\Omega$



## Feature of the month: Largest known structure in the Universe by Pierre Lourens



Astronomers have found a mind-bogglingly large structure. It is **10 billion light-years in diameter**. The newly found structure is more than double the size of the previous record-holder, a cluster of 73 quasars referred to as the Huge-LQG, or Large Quasar Group, which spans 4 billion light-years. It is seven times larger than the 1.4-billion-light year diameter Sloan Great Wall.

“This structure is probably a large concentration of galaxy clusters and other normal matter,” said the co-investigator of the structure. He also said that he has no idea how something that big could have evolved. <http://news.discovery.com/space/galaxies/universes-largest-structure-is-a-cosmic-conundrum-131119.htm>

**P.S.:** Don't neglect to view the related gallery of images (made by the HST) and accompanying captions on this website.  $\Omega$

### NOTICE BOARD 1

#### KAROO STAR PARTY 2014

The ASSA Pretoria Centre wants to hold its sixth National Karoo Star Party during the weekend of 1 to 4 May 2014 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 huge success. At the 2013 event, the Karoo lived up to its reputation and provided magnificent views to those lucky enough to be present.

There is no program or fixed schedule. Each person does his own thing. The main aim is to enjoy the Karoo skies and have fun. Come and join us for this relaxing and star-filled weekend!

More information from:

Johan Smit, cellphone: 072 806 2939, e-mail: [JohanS@firsttech.co.za](mailto:JohanS@firsttech.co.za)

Danie Barnardo, cellphone: 084 588 6668, e-mail: [daniebar@webmail.co.za](mailto:daniebar@webmail.co.za)

To book, please book contact Wilma Strauss, the Manager of Kambro, directly at 0833056668 or at e-mail: [kambro@albieswireless.co.za](mailto:kambro@albieswireless.co.za). Kambro's website is at: <http://www.kambroaccom.co.za/>

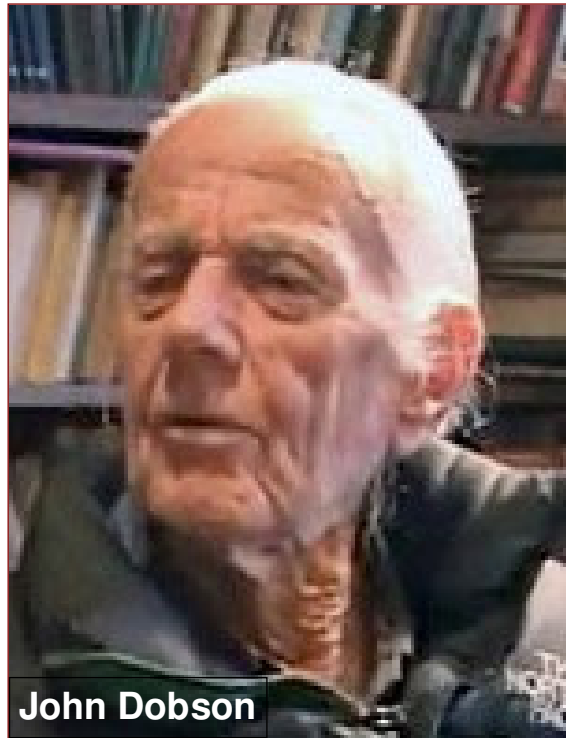


## NOTICE BOARD 2

### **John Dobson 1915 – 2014.**

The long-lived master of sidewalk astronomy, after whom the Dobsonian telescope was named, died peacefully on January 15th 2014. He emerged from obscurity in 1968, when he left his order of Vedantan monks and founded the SFSA (San Francisco Sidewalk Astronomers). John Dobson has been like a natural force in amateur astronomy.

<http://www.skyandtelescope.com/community/skyblog/newsblog/John-Dobson-1915ndash2014-240456881.html>



**John Dobson**

### **Invitation to members - by Pierre Lourens**

Members of the Pretoria Centre of the ASSA are invited to write articles and send them to me by e-mail for placement in the newsletter. This is the way you can share your astronomical knowledge with other members.

Any of the following items sent, will also be considered for placement: 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, or anything else related to astronomy. **Astrophotographs taken by members will be especially welcome.**

Just check your contribution for accuracy before sending it.

### **Jack Bennett Centenary - by Michael Poll**

John Caister (Jack) Bennett is a founder member of the Pretoria Centre of the Astronomical Society of Southern Africa. Jack was born on April 4<sup>th</sup> 1914, and so this year marks the Centenary of his birth.

The Pretoria Centre will celebrate the occasion with a social braai at the CBC telescope site on Friday 4<sup>th</sup> April 2014. All members, including friends and family, are invited to this informal function.

Also to commemorate this Centenary, there will be a talk about Jack's life at a future monthly meeting. Further details will be given in the March newsletter, but meanwhile members are requested to make a note of the date of the braai.

**NOTICE BOARD 3****Invitation - by Fred Oosthuizen**

Members are invited to visit my private observatory which houses a self-made 8" – f18 unobstructed, off-axis 4-mirror system "STEVIK-PAUL" telescope.

DATE: FRIDAY 25 APRIL 2014

ADDRESS: Fred Oosthuizen. Unit 65, Oostvallei Retirement Village, c/r Serene and Coley Streets, Garsfontein East, Pretoria. Tel: 072 373 2865 / 012 755 4065. E-mail address: [fredo@oostvallei.co.za](mailto:fredo@oostvallei.co.za)

**EDITOR'S NOTE.** Those who want to attend, must book with Fred. He can accommodate only 10 people. First come, first served.



**Fred Oosthuizen's private observatory on top of his house.**

## Noteworthy items on the Internet

### Solar system

- **Join the adventure.** Follow news, updates and real-time reporting on ESA's comet mission via the Rosetta blog. <http://blogs.esa.int/rosetta/>
- **Getting ready for asteroids.** With a mandate from the UN, ESA and other space agencies from around the world are about to establish a high-level group to help coordinate global response should a threatening asteroid ever be found heading towards Earth. [http://www.esa.int/Our\\_Activities/Operations/Space\\_Situational\\_Awareness/Getting\\_ready\\_for\\_asteroids](http://www.esa.int/Our_Activities/Operations/Space_Situational_Awareness/Getting_ready_for_asteroids)

### Our Galaxy

- **NASA missions study 'watershed' cosmic explosion in unparalleled detail.** A gamma-ray burst (GRB), designated GRB 130427A, was studied by three NASA telescopes, namely Fermi (gamma rays), Swift (gamma rays) and NuSTAR (hard X-rays). GRB's result from the most luminous explosions in the cosmos, thought to be triggered when the core of a massive star runs out of nuclear fuel, collapses under its own weight, and forms a black hole. The black hole then drives two jets of particles along its spin axis that drill all the way through the collapsing star and erupt into space at nearly the speed of light. Hot matter surrounding a new black hole and internal shock waves produced by collisions within the jets are thought to emit gamma rays with photon energies in the MeV range. The most energetic emission, as gamma rays with photon energies in the GeV range, is thought to arise when the jets slam into their surroundings. See an animation. <http://www.nasa.gov/press/2013/november/nasa-missions-study-watershed-cosmic-explosion-in-unparalleled-detail/>
- **Hubble reveals first pictures of Milky Way's formative years.** Astronomers studied the evolution of 400 galaxies similar to the Milky Way and noted their appearance at various stages of development over a time span of 11 billion years. Judging from images of these far-flung siblings of the Milky Way, they found that the Milky Way likely began as a faint, blue, low-mass object containing lots of gas, in the shape of a flat disk with a bulge in the middle. <http://www.nasa.gov/press/2013/november/hubble-reveals-first-pictures-of-milky-ways-formative-years/>
- **Gaia comes into focus.** ESA's billion-star surveyor Gaia is slowly being brought into focus. Eventually, the Gaia data archive will exceed a million Gigabytes, equivalent to the data content of about 200 000 DVD's. [http://www.esa.int/Our\\_Activities/Space\\_Science/Gaia/Gaia\\_comes\\_into\\_focus](http://www.esa.int/Our_Activities/Space_Science/Gaia/Gaia_comes_into_focus)

### Space research

- **Automated Transfer Vehicle.** It is an expendable, pressurized, unmanned resupply spacecraft for the International Space Station (ISS) developed by the European Space Agency (ESA). [http://en.wikipedia.org/wiki/Automated\\_Transfer\\_Vehicle](http://en.wikipedia.org/wiki/Automated_Transfer_Vehicle)
- **International Space Station Scrapbook.** From the launch of the first module Zarya in 1998, the International Space Station has grown to the size of a football field, with three laboratories, a gymnasium and an observatory. [http://www.esa.int/Our\\_Activities/Human\\_Spaceflight/International\\_Space\\_Station/Highlights/Space\\_Station\\_scrapbook](http://www.esa.int/Our_Activities/Human_Spaceflight/International_Space_Station/Highlights/Space_Station_scrapbook)
- **School's out for ATV training.** This year sees the fifth and last of ESA's Automated Transfer Vehicles (ATV's) leave for the International Space Station. ATV *Georges Lemaître* will be launched this year from Europe's Spaceport near Kourou in French Guiana. [http://www.esa.int/Our\\_Activities/Human\\_Spaceflight/ATV/School\\_s\\_out\\_for\\_ATV\\_training](http://www.esa.int/Our_Activities/Human_Spaceflight/ATV/School_s_out_for_ATV_training)

### Cosmology

- **The idea of parallel Universes: scientific theory or fantasy?** Max Tegmark, a physicist at MIT, thinks it's a scientific theory and defends it in a new book. <http://www.newscientist.com/>



[article/mg22129520.900-when-does-multiverse-speculation-cross-into-fantasy.html#.Ut9eyLiF5cA.email](#)

- **HST's first Frontier Field Program finds thousands of unseen, faraway galaxies.** The first of a set of unprecedented, super-deep views of the Universe contain images of some of the intrinsically faintest and youngest galaxies ever detected. They are seen as they looked over 12 billion years ago. <http://hubblesite.org/newscenter/archive/releases/2014/01/>
- **Astronomers get first glimpse of cosmic web.** Astronomers have for the first time captured a glimpse of the vast, web-like network of diffuse gas that links all of the galaxies in the cosmos. <http://newswatch.nationalgeographic.com/2014/01/19/astronomers-get-first-glimpse-of-cosmic-web/#.Ut5LCsBdU5M.email>

## Exobiology

- **Water found in stardust suggests life is universal.** Water and organic compounds, the basic ingredients needed for life, have now been found in interplanetary dust. <http://www.newscientist.com/article/dn24907-water-found-in-stardust-suggests-life-is-universal.html#.Ut5Hp-FcZwY.email>
- **Europa's choppy ocean looks friendly to life.** Europa has a thick crust of water ice and a (hypothetical) liquid water ocean underneath it. A new mathematical model produces a chaos terrain very similar to the one actually seen on Europa. The model also suggests that the ocean is extremely turbulent, which would be beneficial for any life there because it would help shift nutrients from the sea floor into the rest of the ocean. [http://www.newscientist.com/article/dn24678?cmpid=NLC%7CNSNS%7C2013-1205-GLOBAL&utm\\_medium=NLC&utm\\_source=NSNS&#.UqD6BsOlr50](http://www.newscientist.com/article/dn24678?cmpid=NLC%7CNSNS%7C2013-1205-GLOBAL&utm_medium=NLC&utm_source=NSNS&#.UqD6BsOlr50)

## Sterilization of spacecraft

- **Rare new microbe found in two distant clean rooms.** A rare, recently discovered microbe that survives on very little to eat has been found in two places on Earth: spacecraft clean rooms in Florida and South America. It has also proved to be extraordinarily tough, surviving rigorous sterilization processes. <http://www.jpl.nasa.gov/news/news.php?release=2013-319>

## Exoplanets

- **Kepler finds a very wobbly planet.** It orbits a binary star, so that it has two suns in its sky. The plane of its orbit precesses around the central stars. It also precesses wildly on its spin axis, much like a child's top. In addition, the tilt of its spin axis can vary by as much as 30 degrees over 11 years. It all adds up to very erratic seasons. <http://www.nasa.gov/press/2014/february/kepler-finds-a-very-wobbly-planet/>



**Spooky 'Hand of God' in space reaches for clouds**



It's hard not to see a giant glowing hand in this image. <http://news.discovery.com/space/nasas-nustar-reaches-for-the-secret-behind-the-hand-of-god-140111.htm>

**This is not bedtime reading**

**Stephen Hawking's new theory offers black hole escape.**

[http://www.newscientist.com/article/dn24937?cmpid=NLC%7CNSNS%7C2014-0130-GLOBAL&utm\\_medium=NLC&utm\\_source=NSNS&](http://www.newscientist.com/article/dn24937?cmpid=NLC%7CNSNS%7C2014-0130-GLOBAL&utm_medium=NLC&utm_source=NSNS&)

**Pretoria Centre committee**

Chairman	Bosman Olivier	082 883 1869
Vice Chairman	Pat Kühn	082 895 5686
Secretary	Michelle Ferreira	073 173 0168
Newsletter Editor	Pierre Lourens	072 207 1403
Treasurer and Membership Secretary	Rynhardt van Rooyen	082 325 8745
Assistant Treasurer	Michelle Ferreira	073 173 0168
Librarian	Danie Barnardo	084 588 6668
Assistant Librarian	Pat Kühn	082 895 5686
Curator of Instruments	Johan Smit	072 806 2939
Public Relations Officer	Fred Oosthuizen	072 373 2865
Observing Coordinator	Percy Jacobs	082 498 4680
Webmaster	Danie Barnardo	084 588 6668
Member	Michael Poll	074 473 4785
Member	Tony Viljoen	072 247 6648

**Old newsletters:** All old newsletters from January 2004 onward are on our website. They contain a record of our Centre's activities as well as astronomical information.

**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.