



NEWSLETTER MAY 2018

NEXT MEETING

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

Date and time: Wednesday 23 May at 19h15.

Programme:

- **Beginner’s Corner:** “The celestial sphere” by Bosman Olivier.
- **What’s Up?** by Michael Moller.

----- 10-minute break — library will be open. -----

- **Main talk: TBA by e-mail to members.**
- **Socializing over tea/coffee and biscuits.**

The chairperson at the meeting will be Johan Smit.



NEXT OBSERVING EVENING

Friday 18 May 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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Astronomy- related articles on the Internet

- **'Heartbeat stars' unlocked in new study.** Heartbeat stars are close binary stars that got their name because their combined light curve looks like an electrocardiogram. <https://www.nasa.gov/feature/jpl/heartbeat-stars-unlocked-in-new-study>
- **Tiny galaxy found hiding in orbit around the Milky Way.** Hydrus 1 is a faint, mildly elliptical galaxy that stretches only about 326 light-years across. It is visible from Earth's southern hemisphere and is roughly 90 000 light-years away from the Sun. <https://www.msn.com/en-za/money/technology/a-tiny-galaxy-has-been-found-hiding-in-orbit-around-the-milky-way/ar-AAwH5s9?ocid=spartandhp>
- **Hubble discovers moon orbiting the dwarf planet Makemake.** NASA's HST has spotted a small, dark moon orbiting Makemake, the second brightest icy dwarf planet – after Pluto – in the Kuiper Belt. See  an  image. http://hubblesite.org/news_release/news/2016-18
- **Stars formed only 250 million years after the Big Bang, a step closer to Cosmic Dawn.** <https://www.space.com/40603-stars-formed-soon-after-big-bang.html>
- **'Lost' asteroid 2010 WC9 makes an unusually close flyby of Earth.** A jumbo-jet-size asteroid passed by Earth on May 15 at only half the distance between Earth and the moon. <https://www.space.com/40594-lost-asteroid-2010-wc9-earth-flyby.html>

Astronomy-related images and video clips on the Internet

- **Hubble 28th anniversary image captures roiling heart of vast stellar nursery.** Image of the Lagoon Nebula. http://hubblesite.org/news_release/news/2018-21
- **Hubble sees a star 'inflating' a giant bubble.** The telescope has photographed an enormous, balloon-like bubble being blown into space by a super-hot, massive star. <http://hubblesite.org/images/news/release/2016-13>
- **Hubble unveils a tapestry of dazzling diamond-like stars.** image of the glittering star cluster Trumpler 14, located in the Carina Nebula. http://hubblesite.org/news_release/news/2016-03
- **Hubble sees the Force (of Star Wars) awakening in a newborn star.** http://hubblesite.org/news_release/news/2015-42

Chairman's report for meeting on 25 April 2018 - by Michael Moller

19:15

The attendants were welcomed and the Beginners' Corner speaker was introduced.

19:20

Beginners' Corner: An introduction to SETI, the Search for Extra-Terrestrial Intelligence by Danie Barnardo. He started by mentioning some early reports of ET encounters in Roswell in 1947. He introduced the Drake equation and the thoughts of Frank Drake from 1961 and the Fermi paradox of Enrico Fermi. The SETI program was started in 1984. Next he described the golden record messages which were launched on board the Pioneer 10 and 11, and Voyager 1 and 2 spacecraft. The sole purpose of these being that some ET might one day, in the far future, find and decipher these.

He described the Kepler and Spitzer missions and specifically their search for extra-solar earth-like planets. Possible candidates for habitable worlds included the Trappist-1 system, Proxima Centaurus.

He closed by describing the TESS mission which was recently launched with the primary goal of searching the entire sky for Earth-like planets in our Galactic neighbourhood.

19:40

What's Up for May 2018

Johan Smit started by pointing out the phases of the Moon for May and the viewing opportunities for the planets. These included Mercury reaching its western elongation and passing near Uranus. Mars, Jupiter and Saturn will be visible in the evening, with Jupiter nearing opposition. Venus will also be visible in the early evening in the coming months.

He introduced some prominent winter constellations to watch out for, including Scorpius, Virgo and Libra. Crux is visible high in the south for most of the night and includes a notable red carbon star and a white dwarf to look out for. These were in contrast to a red dwarf star in Eridanus which could also be observed.

20:10

Break

20:25

Main talk: Adventures in Astrophotography by Dawie Venter.

He described how anyone could start in astrophotography with some very rudimentary equipment. A tripod and a camera are the only requirements to get started. He talked about the importance of correctly setting up an equatorial mount and getting an accurate polar alignment when taking images.

He described the different frame types, numbers of exposures and camera settings needed to compose good astrophotographs.

He then proceeded to do the actual processing of some raw exposures into the final form. He demonstrated the use of the camera control and image processing software, including Backyard EOS, Deepsky Stacker and Photoshop.

21:45

The meeting concluded and attendants were invited to coffee, tea and biscuits provided by Mr Michael Poll. **Ω**

Observing: The Two-eyed Nebula - by Magda Streicher

Orion is probably one of the best known and most popular of all constellations. Not only is the image outstanding against the starry sky, but it also offers a variety of wonderful objects to discover.

Nebulosity in this constellation is well presented and comes in a variation of sorts. The very elusive Barnard's Loop, formed by ionised wind, cups the area around the bright emission and reflection light of NGC 2068, more popularly known as Messier 78. The nebula is situated a mere 2° north-east of the star zeta Orionis (Alnitak) and reflects a diffuse glow with a strong core. The flimsy south-eastern side breezes away from the core with a well-defined north-western edge. What make this object striking are the two magnitude 10 stars which give the impression of a ghost staring back at you. The nebula seems to be at its brightest and quite mottled to the east of this pair of stars. A magnitude 11 star defines the northern edge, while another faint star lies embedded in the glow 1.5' to its south.

Jay McNeil, a young amateur, observing from his backyard observatory in West Paducah, Kentucky, noticed that some images of the M78 region contained a new nebula at position RA: 05h46.2m DEC: - 00°06'. On the night of 23 January 2004 McNeil took an unfiltered exposure of M78 lasting 90 minutes. He noticed the soft, elongated conspicuous object around 13' south of M78. The object, now called McNeil's Nebula, had been known as the infrared source IRAS 05436-0007 that underwent an outburst and allowed the star's light to reflect the obscuring dust. Star-hopping from NGC 2064, I passed a faint double star on my way to McNeil's Nebula, where on the evening of 17 February 2004 I found the faint small haze, barely visible.

This is what makes the field of astronomy one of the most rewarding playgrounds to enjoy and share with fellow star lovers. Ω

OBJECT	TYPE	RA	DEC	MAGNITUDE	SIZE
NGC 2068 M78	Reflection Nebula	05 h 46.7 m	- 00° 03'	8	8' x 6'

Image of Messier 78 captured using the Wide Field Imager camera on the MPG/ESO 2.2-metre telescope at the La Silla Observatory in Chile.



NOTICE BOARD

- ◆ **Opportunities for citizen science.** Lots of citizen science projects in which citizens can participate. Some of them are astronomical projects. <https://www.scientificamerican.com/citizen-science/?page=1>
- ◆ **More citizen science - searching for strong gravitational lenses.** <https://www.zooniverse.org/projects/aprajita/space-warps-hsc>
- ◆ **Nightfall.** This is the official newsletter of the Deep-Sky Observing Section of the ASSA. It can be downloaded every month from <http://assa.sao.ac.za/sections/deep-sky/nightfall/>
- ◆ **What's Up.** Consult the ASSA website <http://assa.sao.ac.za/>, the Cape Centre Facebook page <http://www.facebook.com/capecentre> or the SAAO *What's Up* page <http://www.sao.ac.za/public/all-whats-up/> for observing highlights every month. The SAAO *Viewing the Sky* page <http://www.sao.ac.za/public/viewing-the-sky/> contains a wealth of general information about observing, including a list of interesting objects in the Southern sky, calendars of solar and lunar information including eclipses and a page of useful websites.

On the New Zealand website Milky-Way Kiwi you can subscribe to free daily emails with Southern Hemisphere star-hopping tips and other practical information <https://milkyway.kiwi/2014/05/27/what-is-a-milky-way-kiwi/>

- ◆ **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.

Feature of the month:

Scientists just found the fastest-growing black hole

Researchers have spotted the fastest-growing black hole ever found. It is 12 billion light-years away.

It consumes a solar mass every two days. Newly released data from the European Space Agency's Gaia satellite confirm that the brightly shining object is a black hole, which has mass of about **20 billion solar masses**. (Strictly speaking, these events took place in the past when its light was released, 12 billion years ago.)

"If we had this monster sitting at the centre of our Milky Way galaxy, it would appear 10 times brighter than a full moon. It would appear as an incredibly bright, pinpoint star that would almost wash out all of the stars in the sky," said an astronomer.

<https://www.space.com/40596-fastest-growing-black-hole-found.html> Ω

Astronomy basics: How do you spot an alien planet from Earth?

<https://www.space.com/30240-alien-planets-exoplanet-search-methods-infographic.html>

April 20th 2018 observing evening report

- by Michael Poll, Neville Young and Danie Barnardo

A successful viewing evening at last, although we were apprehensive early on about the clouds ("here we go again"). When we started the heaped-up cumulus were almost completely filling the sky, although we had to admit that they looked very pretty as they caught the rays of the setting sun.

We had about 25 attendees, and at least 5 telescopes. We welcomed a number of members of the public, and we also welcomed the 14 third year medical students from Sefako Makgatho Health Sciences University (SMU) (formerly Medunsa) who are doing a one year astronomy module under the tutelage of Neville Young. The module is known as a 'selective' and allows the students to choose from a range of subjects other than the confines of their narrow medical training. Friday evening was the class's fourth attempt to get out under the stars – the previous three attempts had to be aborted due to rain! The students had been allocated a list of objects that they should observe and describe, noting which sort of telescope they were using. The list comprised the Moon, Venus, Alpha Crucis, Alpha Centauri, the Jewel Box, Omega Centauri, and Jupiter. The students have been learning about what they would be able to see and experience in practice at the evening practical. This dramatically improves their ability to understand and retain what they have learned. A response from a representative of the students at the end of the evening was "Thanks for the great evening at CBC! I think everyone enjoyed it very much!! First time I saw Jupiter through a telescope. So, I'm quite excited!" The students will be attending all the practical evenings until they write their exams in September.

We did see Venus early on, but it was low down and soon disappeared behind the trees. It was shown to the students naked eye, but it was too low for telescope viewing. The feature so far of the current eastern elongation of Venus is that, although it was at superior conjunction on January 9th this year, it is moving northwards along the ecliptic, which is at a shallow angle to the horizon at this time of year. So, in spite of the increasing angular distance from the sun, Venus has not been gaining much in altitude at sunset from day to day. Additionally, Venus is currently slightly north of plane of the ecliptic, so from our view it is below the ecliptic plane, which also makes a few minutes difference to the setting time. Venus will become much higher in the sky at sunset (and therefore set much later than the Sun) over the next few months as the angle of the ecliptic to the horizon at sunset is much steeper later in the year as viewed from the southern hemisphere. Venus will be in the evening sky until mid-October.

The moon was 4 days old, showing a nice crescent. We looked at Mare Crisium in particular and noted that it is 570 km in diameter. It was noted that the craters are the result of meteorite impacts and that the larger ones we can see in the telescopes are up to 200km in diameter and the smallest about 10km. We mentioned that the word "mare" (plural "maria") is the Latin word for "a sea" and the description was used because of their smooth appearance. The shadows near the terminator were also shown.

While still looking in the northern sky, there was a discussion about star colours, and Betelgeuse and Rigel were shown in the telescope. It was explained that the red stars are larger and have a lower surface temperature (about 3,000 degrees C) than the white and blue stars (about 10 000° – 20 000°C). Spica was also shown as a naked eye example of a blue star.

(Continued on next page.)

We pointed out the Southern Cross. Alpha Crucis is the brightest of the stars in Crux. Using this as an example, the nomenclature of stars in a constellation was explained. It is also the southernmost first magnitude star. The star consists of three components. The first split into two unequal components is quite easy and was seen by the observers. The second split (split of the bright component) needed careful scrutiny, but it was seen by most attendees when it was pointed out that there were two.

Alpha Centauri is a slightly easier pair, and people could see this. The pair is still close together after their closest approach in 2015. The presence of a third component (Proxima Centauri), which cannot be seen, was mentioned. They are currently separating but in the 2030s will get even closer than they did in 2015. As an example of a wider and slightly easier double, we looked at Castor, in Gemini.

Jupiter was well up in the east and much appreciated. The two dark equatorial belts were pointed out, and all four of the Galilean Moons were visible. Ganymede, Callisto and Europa were on one side, Io on the other. Ganymede and Callisto were furthest out, and quite close together. Omega Centauri was fairly easy to see, it was not quite washed out by the light pollution. It filled about half the field of view in Michael's 150 mm telescope, having seen more or less pinpoints of light previously, it took a while take in such an extended object. Ω

Pretoria Centre committee

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Pretoria ASSA – Northern Star Party – Deelfontein - by Percy Jacobs

Where: Vredefort – Deelfontein - ~1.5hrs to 2hrs drive from Pretoria

When: Friday night the 15th June & Saturday night the 16th June 2018

How much: R125 per person x 2 nights – R250

Number of people in the one location / house – 11 people max

2nd house available if additional people attend which is about 100m's away from viewing house / location

Self catering

The following is supplied:

Bedrooms: Bed linen, towels, hangers

Bathrooms: Soap, toilet paper

Lounge: Lounge furniture

Dining room: tables with table cloths, chairs, 2 serving tables

Kitchen: Gas stove with 4 plates and oven, microwave oven, fridge, freezer, electric kettle, coffee machine. Complete dining service

Scullery: Double sink, dishwashing utensils, washing machine

Barbeque area: Grid and braai utensils. Plastic garden chairs

Payment

Michelle Ferreira (MichelleM.Ferreira@standardbank.co.za), our treasurer, shall make one payment for all that shall attend and who have paid their R250 into the Pretoria ASSA Account – use payment reference “June 18 NSP & your name”

1st come 1st serve – 11 beds available

If we get more than 11 people booking, this is ok and space is available in the 2nd house about 100ms away for everyone after the 1st 11 bookings

Bookings / payment must be made before the 1st June 2018. No late bookings please

When confirming payment with Michelle, please copy Percy Jacobs (percymj@iafrica.com)

Directions

No mobile phone reception, hence no telephonic assistance if you get lost!

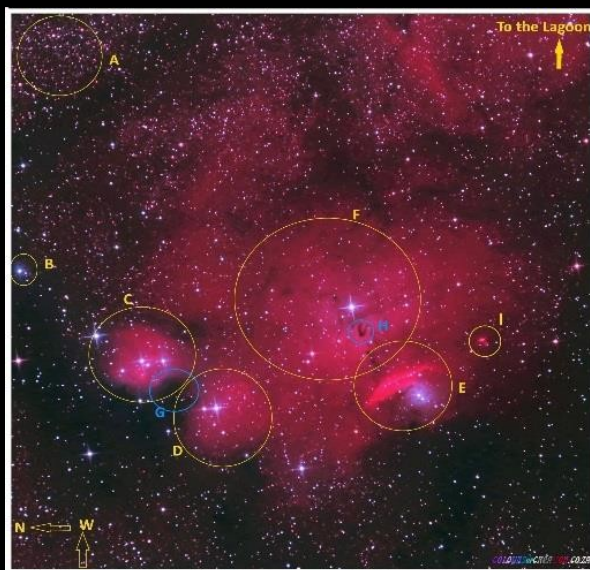
GPS-coordinates of entrance: **26° 56' 37,80" S // 27° 16' 16,48" E**

<http://www.deelfontein.co.za>

From the north (Pretoria, Johannesburg): Take the N1 South to Bloemfontein. Take the Parys offramp and continue to Parys. In Parys, follow the signposts for Vredefort. About 3 km outside Parys, turn right to Schoemansdrif. After a further 3 km, turn left to Reitzburg. If you hit gravel, you have gone too far! There is a crossing after about 4 km, where you continue on straight on a gravel road. After a further 8 km, turn right to Reitzburg. Exactly 2 km further you will find the turnoff marked “Deelfontein, Gerhard Benade” on the right, after passing the turnoff “Deelfontein, Greeff Boerdery”. Turn right, and drive through the gate. After 500 m, there is another gate. Follow the signage. The guest houses and mountain bike trailhead are on the left. The arts retreat, observatory, rondavel and workshop are 400 m further. For the bush camp, continue for 1 km until the road forks. Keep left. The campsite is 200 m further. Please close all gates. **Ω**



"Pandemonium" one degree NE of the Lagoon



Star forming region **SIMEIS 188** is a complex of emission (red) and blue reflection nebulae of dust and dark absorption nebulae. Located 4000 light years away in Sagittarius.

- A. NGC6546: open cluster in same FOV, 3000 ly,
- B. IC 4684,
- C. IC 1274, D. IC 1275
- E. NGC 6559, bright cloud arc, F. IC 4685
- G. Barnard 91, H. Barnard 303
- I. GN 18.06.6.01

**Photographs and text by
Johan Moolman.**