



NEWSLETTER APRIL 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 25 April at 19h15.

Programme:

- **Beginner’s Corner:** “Search for Extraterrestrial Intelligence” by Danie Barnardo.
- **What’s Up?** by Johan Smit.

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

- **Main talk:** “Fundamentals of astrophotography ” by Dawie Venter.
- **Socializing over tea/coffee and biscuits.**

The chairperson at the meeting will be Michael Poll.

NEXT OBSERVING EVENING

Friday 20 April 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.

TABLE OF CONTENTS

Astronomy- related articles on the Internet	2
Chairman’s report for meeting 28 March 2018	3
Observing: The Horsehead Hunter	4
NOVA CARINA 2018	5
NOTICE BOARD	6
Feature of the month: Astronomers ponder possible life adrift in Venus’ clouds	6
Astronomy basics: Retrograde motion of planets	6
Astronomy-related images and video clips on the Internet	6
March 23 rd 2018 observing evening report	7
Pretoria Centre committee	8

Astronomy- related articles on the Internet

- **Did Scholz's star invade the Oort Cloud?** Scholz's star is now 20 light-years away. But a study of the orbits of asteroids and Oort Cloud comets verifies a close flyby of this star 70 000 years ago.
<http://earthsky.org/space/scholz-star-disturbed-comets-in-prehistory>
- **Hubble uncovers the farthest star ever seen.** Through a quirk of nature called "gravitational lensing," a natural lens in space amplified a very distant star's light. Astronomers determined its distance (9 billion light-years) and set a new distance record for the farthest individual star ever seen.
http://hubblesite.org/news_release/news/2018-13
- **Astronomers spy runaway star in Small Magellanic Cloud.** Astronomers have discovered a rare runaway yellow giant star in the SMC. Their theory is that it had a companion star. When the companion exploded as a supernova, the tremendous release of energy flung the runaway star into space at its high speed.
<http://earthsky.org/space/runaway-star-j01020100-7122208-small-magellanic-cloud>
- **10 surprises about our solar system.** <http://earthsky.org/space/ten-things-you-may-not-know-about-the-solar-system>
- **TESS.** The Transiting Exoplanet Survey Satellite (TESS) was launched on 18 April into a high Earth orbit. It will continue the work done by the Kepler spacecraft, namely accurate photometry of stars. The light curves for individual stars, plotted using its data, will be searched for signatures of exoplanets.
TESS: <https://tess.gsfc.nasa.gov/index.html>
Kepler: https://en.wikipedia.org/wiki/Kepler_%28spacecraft%29#Mission_status
- **The 10 weirdest stars in the Milky Way.**
https://www.popularmechanics.com/space/deep-space/g19643407/weirdest-stars/?src=nl&mag=pop&list=nl_pnl_news&date=040318
- **Next Mars mission due to launch. Mars InSight** is neither orbiter nor rover. It is a stationary lander and is designed to study what's *inside* Mars.
<http://earthsky.org/space/mars-insight-mission-launch-window-opens-may-5-2018>
- **Does space weather threaten high-tech life?** Coronal mass ejections occur frequently. The last large one that hit Earth occurred in 1859, with disastrous results. If a large one hits Earth now, the microelectronics in Earth-orbiting satellites will be damaged. Inter alia, satellite TV, the GPS system and weather satellites will be put out of action. Large currents will be induced in electric power cables, overloading transformers, which will result in power failures. <http://earthsky.org/space/does-space-weather-threaten-high-tech-life>
- **Nobel Prize in Physics 2017.** A popular article about gravitational waves and their first detection by LIGO.
https://www.nobelprize.org/nobel_prizes/physics/laureates/2017/popular-physicsprize2017.pdf
- **An ultra-powerful flare erupted from our nearest neighbour star.** Proxima Centauri momentarily lit up in the night sky, which could spell doom for its "habitable" planet.
https://www.popularmechanics.com/space/deep-space/a19732532/an-ultra-powerful-flare-erupted-from-our-nearest-neighbor-star/?src=nl&mag=pop&list=nl_pnl_news&date=041118

Chairman's report for meeting 28 March 2018 - by Johan Smit

The March 2018 meeting started a bit confused as the planned chairperson for the evening went on holiday, conveniently forgetting about his duties.

Johan Smit chaired the meeting and introduced Johan Moolman who presented a talk about the Sun. Johan, one of our established astro-photographers used his excellent images to describe the outer layers of the Sun and what can be seen at different wavelengths.

To a novice this talk looks like a showcase of good photography, but Johan did mention proper science while describing the images.

Johan described activity that happens close to the surface, in the photosphere, and above and how it is "seen" in his photographs. Especially interesting were his time lapses showing the movement and development of features over time.

He included images of transits too, so the presentation was very comprehensive and gave the audience to see just about everything that can be seen on the Sun. He even included some artistic images that rounded off a very interesting presentation.

Considering that Johan is busy recovering after serious open heart surgery this presentation is all the more special. Well done Johan. You set a high standard for us mortals to follow.

Then, Percy Jacobs presented a very comprehensive look ahead to the month of April 2018. He set us a few challenges to do at a planned dark sky weekend in April. Unfortunately that weekend was clouded out, but Percy did motivate activity from our members. A few did produce some images after his talk. That includes images of the newly discovered nova in Carina. An image of this by Barbara Cunow was included in the presentation.

Then Michael Poll topped off the agenda talking about Blue Moons. Michael described the history, folklore and misinterpretations and showed a timeline of events that led up to what is understood today as a blue Moon being the second full Moon in a month.

Considering that the first mention of the term was in 1528, his research was truly comprehensive. Even though I heard a similar presentation previously, this one added so much data that for all purposes this was a new talk.

What became clear is that our current use of the term has no base in science and is actually caused by mistakes in articles in *Sky and Telescope* of 1946 and 1950. In between all this, Michael described 9 uses of the term Blue Moon, most of which is not astronomical at all, but describes rare events.

He even showed that certain atmospheric conditions can actually make the Moon appear blue.

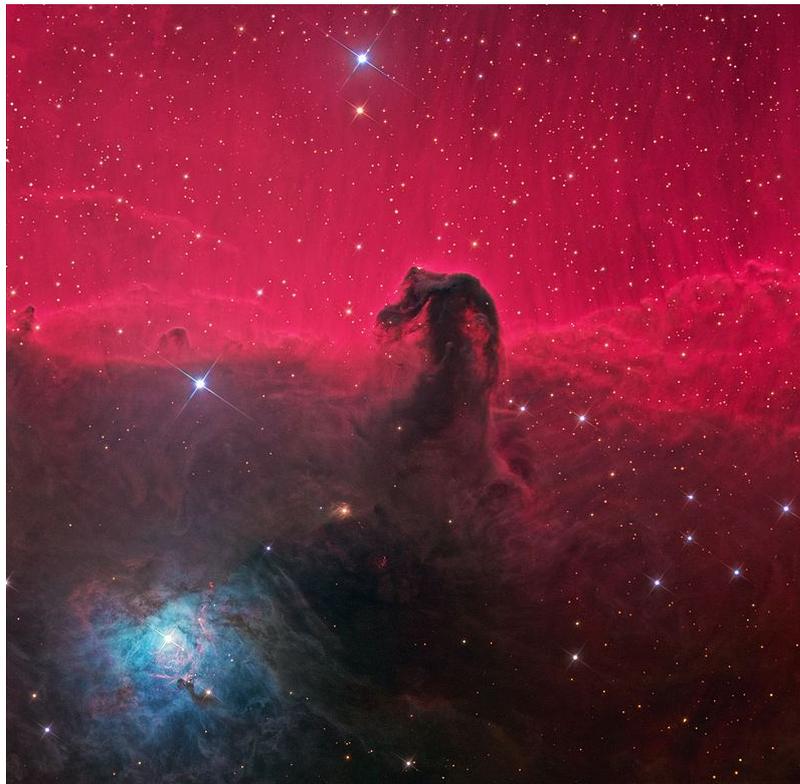
One audience member described the presentation best. He said: "Wow, it is incredible how much research Michael did for this". I can only agree. Michael even included describing the different lunar cycles, Metonic and Saros, so this talk was a most comprehensive work about the Moon whether it is blue or not.

Michael closed the presentation with even more horrid terms about the Moon that is being made popular by social media and even the main stream news media. For the sake of decency I will not repeat them.

If you missed this meeting, you missed one of the best meetings ever.

The meeting ended with the usual refreshments and interesting discussions. **Ω**

Observing: The Horsehead Hunter - by Magda Streicher



The Orion constellation is probably one of the most widely known constellations; add to that the elusive Horsehead Nebula and the constellation increases its worthiness of fame.

This enigmatic dark small notch of nothingness known as Barnard 33 (Horsehead Nebula) is positioned in front of the hazy emission nebula IC 434, which glows with intense radiation from the star Zeta Orionis (Alnitak), the most south-eastern belt star. NGC 2023, a bright quite round nebula situated only 15' to the north-east of the Horsehead Nebula. Williamina Paton Fleming (1857-1911), known for her work in classifying stellar spectra, spotted this small dark cloud on a photographic plate taken at Harvard College Observatory in 1888. The emission nebula was accordingly

included in the first *Index Catalogue* as IC 434, published in 1895.

Edward Emerson Barnard was the first actually to see the Horsehead Nebula, using the great 40-inch Yerkes refractor, on 4 November 1913. Barnard was one of the all-time greatest names in astronomy because of his unceasing passion and love for the starry skies. He discovered the galaxy NGC 6822 in the constellation Sagittarius, which is now popularly known as Barnard's Galaxy, 16 comets, the California and Rosette Nebulae, and more than 300 dark nebulae. In 1892 Barnard, at the young age of only 26, discovered Jupiter's fifth satellite, Amalthea. He was an extraordinary man if you glance at an old picture of him standing proudly at the Lick Observatory's 36-inch refractor.

In every serious amateur's mind, the elusive Horsehead Nebula lingers not only as a thought but as a positive dream. The secret to identifying the Horsehead is to try and observe it when the constellation is high up in the sky, with the best dark skies possible, and eyes well adjusted to the dark. Have a detailed star map handy and use low magnification at the telescope. The use of a hydrogen-beta filter is advisable because it responds well to the emission nebula, and perhaps the only way. Year after year I have spent countless hours searching for this "dark horse" from sunset to sunrise, with various eyepieces and employing a million different techniques. When I finally glimpsed the dark-shaded roundish figure coming into view, receding and reappearing, it was sheer delight. I introduced the Horsehead to Tim Cooper, who was visiting me at the time, a dear friend and working partner since early astronomy days and was waiting anxiously to share in the joy when he acknowledged for the first time the sighting of this wonderful, rare object.

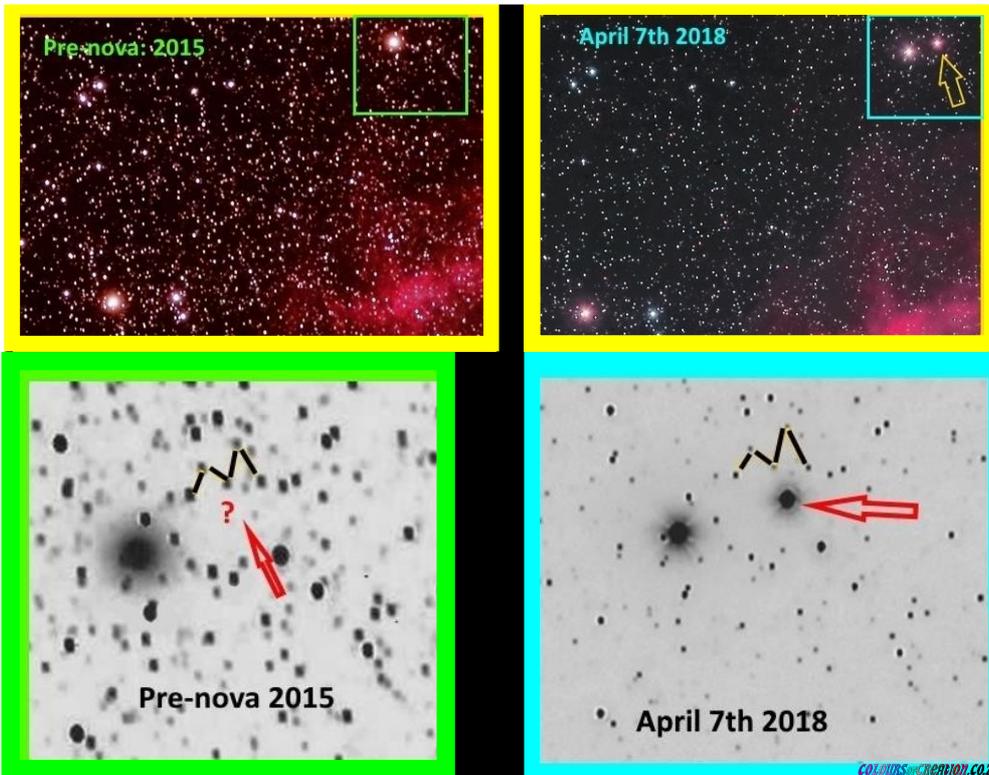
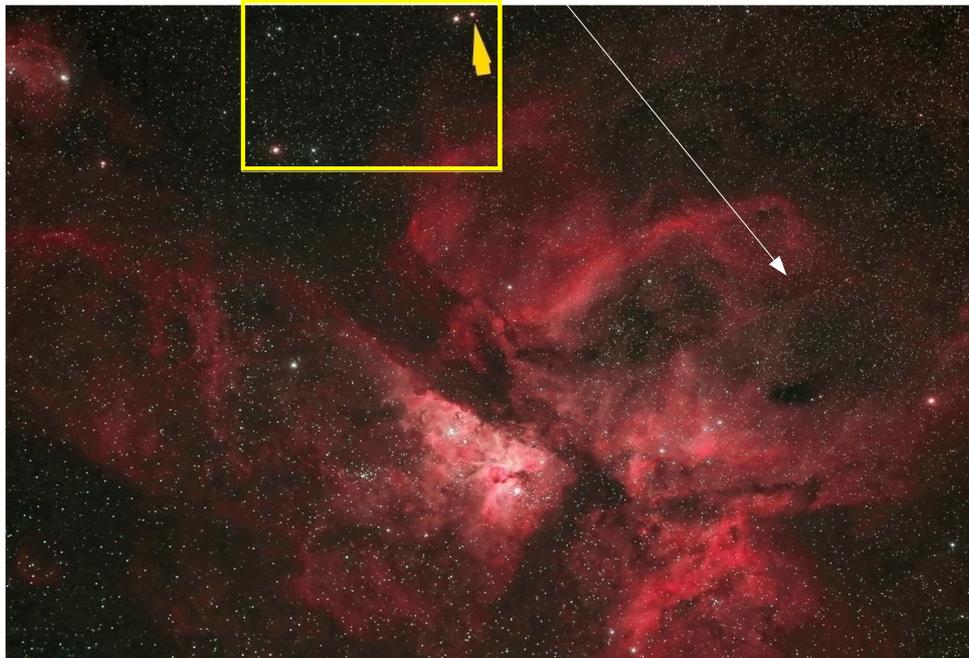
The secret is plenty of determination and a great deal of luck. Ω

Object Name	Type	RA	DEC	Magnitude	Size
B 33 and IC 434	Dark nebula	05h 40.9 m	-02° 28'	14	6'x4'

Source of image:

https://en.wikipedia.org/wiki/Horsehead_Nebula

NOVA CARINA 2018



See caption on next page.

Caption for photograph on previous page.

OTA: TeleVue 127mm refractor, focal length 660mm, focal ratio 5.2. **Filter:** IDAS LPS-V4 Narrowband Nebula Filter. **Camera:** Modified Canon 6D, controlled with BackYardEOS software on laptop.

Mount: Celestron CGX, auto-guided with SBIG SG-4 guide camera on a Canon 400mm f5.6 lens,

Exposures 40 x 30 second exposures, @ ISO 1600.

Stacked in DeepSkyStacker. Imaged processed in Paint.NET and PICASA.

Photographs taken by Johan Moolman.

NOTICE BOARD

- ◆ **Astronomy software for amateurs.**
<http://astronomyonline.org/AstronomySoftware.asp>
- ◆ **The Pan-STARRS1 data archive home page.**
Data from the Pan-STARRS1 Surveys will allow anyone to access millions of images and use the database and catalogues containing precision measurements of 3 billion separate sources, including stars, galaxies, and various other objects.
<http://panstarrs.stsci.edu/>
- ◆ **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:

Astronomers ponder possible life adrift in Venus’ clouds

Scientists have published a new paper, laying out the case for possible microbial life in the clouds of Venus. A concept for sampling the clouds of Venus is on the drawing boards. It’s called the **V**enus **A**tmospheric **M**anoeuvrable **P**latform (VAMP). Maybe extraterrestrial life is closer to home than we suspected..... Ω

<http://earthsky.org/space/new-study-ponders-possible-life-adrift-in-venus-clouds>

Astronomy basics: Retrograde motion of planets

https://www.youtube.com/watch?v=1nVSzzYCAYk&index=2&list=PL_bGkNDHTZQDtgsb2cNYfoiOHlezy8zcb&t=0s

Astronomy-related images and video clips on the Internet

<https://www.makeuseof.com/tag/watch-space-documentaries-universe/>

March 23rd 2018 observing evening report - by Michael Poll

We had had cloud for weeks, this evening was no exception, and we had 225 mm of rain in the three days ending on this day. A watery half-moon shone through the cloud now and then, but later a rather big sky hole appeared and moved around and so that the whole of the Milky Way was exposed at one time or another, - it was seen stretching from Alpha and Beta Centauri in the south, arching high overhead via Sirius, to the bright star Capella in the north, but that was about it for observing.

Number of attendees: One. The next observing evening is on April 21st 2018.

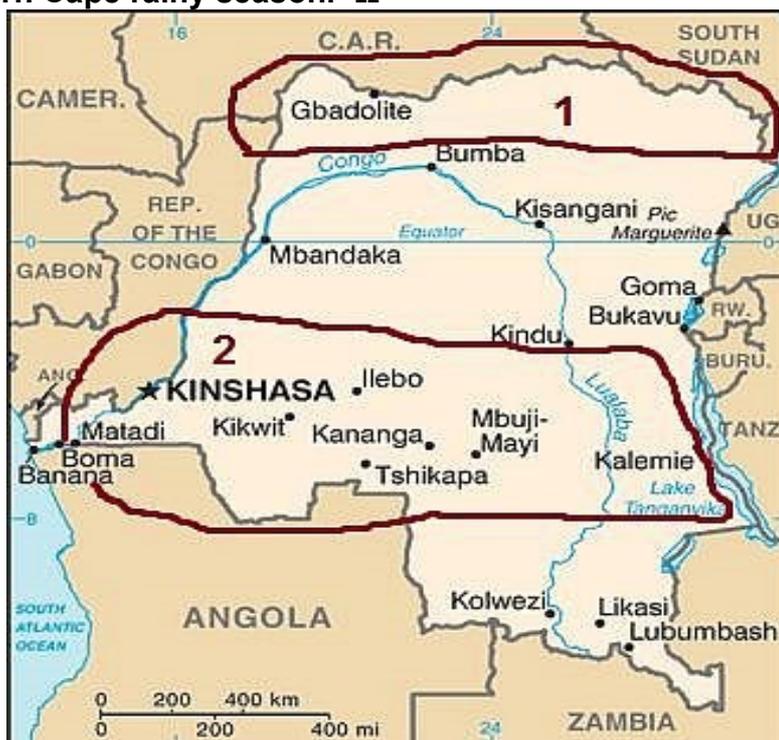
Seeing the Milky Way arching overhead reminded me of a note that I have from the Sky Guide (circa 2008). It says that, in the Democratic Republic of Congo (formerly Zaire) the Milky Way is called “God’s Clock”, because it is oriented east-west during the wet season and north-south in the middle of the dry season. I did a bit of investigation because the DRC straddles the Equator. (See Map)

In the central area of the DRC, where the equator crosses the country, the climate is **equatorial** and so is hot and humid all the year round with no dry season.

Both to the north and south of the equatorial zone (Regions 1 and 2 respectively on the map), there are areas where the climate becomes **tropical** – it is hot all year round, with a rainy season, and a clear dry season, usually of short duration, in the “winter”. In Regions 1 & 2, the dry season occurs at opposite periods. **North** of the equator (Region 1) it lasts from December to February (the “northern winter”). At this time of the year, the Milky Way is orientated north – south in the evening.

South of the equator, the dry season occurs from June to September (the “southern winter”) (Region 2). At this time the Milky way is orientated east-west in the evening. The conclusion is that the folk lore as quoted would apply to the northern region (Region 1), but I suppose the people in the south could also use the term.

In a sense a similar situation applies in South Africa – the Milky Way is orientated north – south in the Highveld rainy season and east-west in June & July in the Western Cape rainy season. Ω



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