



## NEWSLETTER OCTOBER 2019

### 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 October at 19h15.

**Programme:**

➤ **Beginner’s Corner:** “Transits of Mercury” by Michael Poll.\*

➤ **What’s Up:** by Michael Poll.

----- 10-minute break. Library will be open. -----

➤ **Main talk:** “1919 curved space experiment” by Neville Young.

➤ Socializing over tea/coffee and biscuits.

The chairperson at the meeting will be Louis Kloke.

\* See page 3 for a summary of his talk.

### NEXT OBSERVING EVENING

Friday 18 October 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
Astronomy-related images and video clips on the Internet	2
Summary of “Beginners Corner” to be presented on October 23 <sup>rd</sup>	3
Astronomy basics: Super massive black hole at the centre of the Galaxy	3
Feature of the month: Deep Field – the impossible magnitude of our Universe	3
Observing: Messier 41, your best friend	4
Chairperson’s report for the meeting on 25 September 2019	5
What's Up in November 2019	7
Photographs with captions	8
Pretoria Centre committee	8
NOTICE BOARD	9

## Astronomy- related articles on the Internet

**Something Is killing the Universe's most extreme galaxies.** In the most extreme regions of the Universe, galaxies are “being killed”, i.e their star formation is being shut down, and astronomers want to know why.

[https://www.livescience.com/whats-killing-universe-extreme-galaxies.html?utm\\_source=ls-newsletter&utm\\_medium=email&utm\\_campaign=20190919-ls](https://www.livescience.com/whats-killing-universe-extreme-galaxies.html?utm_source=ls-newsletter&utm_medium=email&utm_campaign=20190919-ls)

**Universe's most massive neutron star spotted. Should it even exist?** It's near the limit of being able to exist at all.

[https://www.livescience.com/most-massive-neutron-star-discovered.html?utm\\_source=ls-newsletter&utm\\_medium=email&utm\\_campaign=20190918-ls](https://www.livescience.com/most-massive-neutron-star-discovered.html?utm_source=ls-newsletter&utm_medium=email&utm_campaign=20190918-ls)

**Giant volcano on Jupiter moon could erupt any day.**

[https://www.livescience.com/giant-volcano-on-jupiter-moon-could-erupt.html?utm\\_source=ls-newsletter&utm\\_medium=email&utm\\_campaign=20190920-ls](https://www.livescience.com/giant-volcano-on-jupiter-moon-could-erupt.html?utm_source=ls-newsletter&utm_medium=email&utm_campaign=20190920-ls)

**'Alien megastructure' star not alone. More mysteriously dimming objects found.**

[https://www.livescience.com/alien-megastructure-mysteriously-dimming-stars.html?utm\\_source=ls-newsletter&utm\\_medium=email&utm\\_campaign=20190921-ls](https://www.livescience.com/alien-megastructure-mysteriously-dimming-stars.html?utm_source=ls-newsletter&utm_medium=email&utm_campaign=20190921-ls)

**3 monster black holes are about to collide.** They're at the core of a triple galaxy merger 1 billion light-years from Earth.

[https://www.livescience.com/three-supermassive-black-holes-collision.html?utm\\_source=ls-newsletter&utm\\_medium=email&utm\\_campaign=20190927-ls](https://www.livescience.com/three-supermassive-black-holes-collision.html?utm_source=ls-newsletter&utm_medium=email&utm_campaign=20190927-ls)

**The Younger Dryas interval at Wonderkrater (South Africa) in the context of a platinum anomaly – by Francis Thackeray et al.** The observations from South Africa serve to strengthen ongoing assessments of the controversial Younger Dryas Impact Hypothesis. This hypothesis proposes that a meteorite or cometary impact about 12 800 years BP contributed to a decline in temperature, associated inter alia with dispersion of atmospheric dust, mammalian extinctions and cultural changes. The Younger Dryas period lasted from about 12 900 years BP to about 11 700 years BP. During this period there was a return to glacial conditions which temporarily reversed the gradual climatic warming after the Last Glacial Maximum around 20 000 years BP.

The original article, published in the journal **Palaeontologia Africana**, can be read / downloaded from: <http://wiredspace.wits.ac.za/handle/10539/28129>

A popular version of the article can be read / downloaded from:

<https://theconversation.com/did-a-large-meteorite-hit-the-earth-12-800-years-ago-heres-new-evidence-122426>

## Astronomy-related images and video clips on the Internet

Video clips on Hubblesite:

<https://hubblesite.org/resource-gallery/videos>

### **Summary of “Beginners Corner” to be presented on October 23<sup>rd</sup> 2019, titled “Transits of Mercury” - by Michael Poll**

A transit of Mercury across the face of the Sun takes place on November 11<sup>th</sup> 2019. Transits of Mercury (and Venus) can only occur when the planet is at inferior conjunction, (i.e. when the planet lies between the Earth and the Sun) but transits do not take place at every inferior conjunction. In general transits of Mercury are separated by intervals of 3, 7, 10 or 13 years but not in that order.

Transits of Mercury currently occur in May and November with November transits being more frequent than May ones, in a ratio of about seven November transits to three May ones. May transits can last longest (up to nine hours) because Mercury is near aphelion and is moving more slowly in its orbit.

May transits recur only at intervals of 13 or 33 years, November transits can recur at intervals of 7, 13 or 33 years. Overall there are series of transits reflecting a 46-year cycle. These sequences are analogous to the Saros series for eclipses of the Sun and Moon. A series of May transits can last for 400+ years, and series of November transits can last for 800+ years

For successive May transits, Mercury crosses suns disc further south, and for successive November transits, Mercury crosses suns disc further north.

#### **Observing the transit**

A properly filtered telescope will be required because the disc of Mercury is too small to be seen with the unaided eye. The apparent diameter of Mercury at May transits is 12” of arc, which is 1/158 of the Sun's apparent diameter, and at November transits the apparent diameter is 10” of arc, which is 1/194 of the Sun's apparent diameter.

The current transit starts at 14h 35 SAST on November 11<sup>th</sup> 2019. Greatest transit is at 17h19, sunset in Pretoria is at 18h30, and the transit ends after sunset at 20h00. “ Greatest transit” is when Mercury is at its closest to the centre of the Sun's disc. For this transit the separation at this time is 76” of arc. Note that Mercury travels from east to west across the Sun, because the planet is in retrograde motion at the time of inferior conjunction.

#### **Historical Transits**

After he had formulated his three laws of planetary motion, Johannes Kepler realised that transits were possible, and in 1627 he predicted a transit of Mercury for November 1631 and a transit of Venus for December 1631. Kepler died in 1630 and did not live to see these events, but the transit of Mercury was observed in Paris by Pierre Gassendi. The first person to witness an entire transit of Mercury was Edmond Halley in 1677, when on the island of St Helena.  $\Omega$

### **Astronomy basics: Super massive black hole at the centre of the Galaxy**

Watch a 31-minute documentary on this topic at:

<https://www.youtube.com/watch?v=XwkMCHf516s>

### **Feature of the month:**

#### **Deep Field – the impossible magnitude of our Universe**

<https://hubblesite.org/contents/media/videos/1191-Video.html>

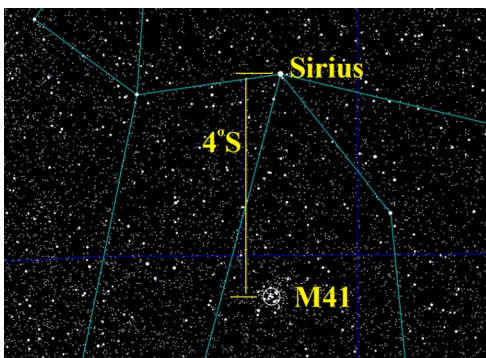
### Observing: Messier 41, your best friend - by Magda Streicher

Canis Major is a special constellation because of its shape and the impression it creates for a star-lover. It houses bright and outstanding objects and, of course, the brightest star, Sirius.

NGC 2287, also known as Messier 41, appears to be hiding itself under the belly of the doglike figure, like a bunch of fleas, about 4 degrees south of Sirius. This beautiful cluster of approximately 100 stars, which can be seen with the naked eye and partly resolved using binoculars, is moving away from us at about 34 kilometers per second and is said to be about 24 light years across and 2 300 light years away.

This is one of the few deep sky objects to have been recorded by the ancients: it was first mentioned by Aristotle in 325 BC. It is one of the delights of the sky, with the grouping reminding me of a lovely flower opening its petals in clear curls and curved lines. Two rust-coloured stars, magnitude 6.8 and 7.3, remind me of pollen threads flowing out of a central crown consisting of a semi-circle of bright members. A swarm of faint stars covers the cluster like powder dust with a few dark patches between chains of faint stars. The magnitude 6 star 12 Canis Majoris shares the field of view towards the south-east.

OBJECT	TYPE	RA	DEC	MAG	SIZE
NGC 2287 Messier 41	Open cluster	06 h 41.2 m	- 20° 44.52'	4.5	38'



## **Chairperson's report for the meeting on 25 September 2019 – by Michelle Ferreira**

The meeting was attended by both members and a few visitors, though the total number of attendees was quite small. Johan Smit presented Beginner's Corner, Michael Poll presented What's Up for October and was standing in for Percy Jacobs who was unable to be present, and the main speaker of the evening was Francis Thackeray.

In Beginner's Corner Johan gave an interesting demonstration on some of the positives of a "go-to" or hand paddle/controller. You can connect your telescope to your laptop instead of using the hand paddle/controller but it is very important to check the voltage of the specialised serial cable BEFORE connecting it to the motor. These cables are available from RS Components. His preference is to use the planetarium program "Cartes du Ciel" herewith. He demonstrated a number of interesting features in the planetarium program. Another important thing to remember is that your mount must initially be "parked". Then "unpark" to start the "go to" process and select a target. He showed how he uses a game controller instead of the hand paddle/controller. A tip he shared was to use a red folder to blur the light glare from your computer screen.

Thereafter What's Up for the month of October was presented by Michael Poll,, a summary of which was prepared by Percy Jacobs and included in the newsletter that was distributed preceding this meeting. Michael discussed the 'popular newspaper' terms Supermoon for the full moon at perigee and Blackmoon for the new moon at perigee. He highlighted the fact that Venus and Mercury travel quite close together during October. Also visible are Jupiter and Saturn which can be seen in the evening sky. ASSA 100 targets he mentioned for this month are [2] NGC 104 in Tucana, [8] NGC 362 and [20] NGC 2070, the Tarantula Nebula. It was mentioned that, on the 22<sup>nd</sup> October the Orionids will be visible and these are bits of Halley's comet on inbound. V3890 in Sagittarius is currently in outburst, being its third recorded outburst. This was previously recorded in 1962 and 1190. A second interstellar object has been observed in the solar system and it is called 2I/Borisov (originally designated C/2019 Q4 (Borisov)). We should certainly be looking out for some of these amazing sights.

This took us through to the main talk on The Radcliffe Observatory, as presented by Prof. Francis Thackeray, with special mention of the 7<sup>th</sup> Radcliffe Observer David Thackeray. He was introduced to the meeting by Neville Young as a professor of Evolutionary Studies at the University of Witwatersrand. He is also the co-author of a book named Kromdraai together with Jose Braga.

He commenced the talk by telling us how Dr John Radcliffe (1652-1714), a medical doctor bequeathed his fortune to science and how the Radcliffe Observatory was named after him. The observatory was built on the suggestion of the astronomer, Thomas Hornsby. The original Radcliffe Observatory was founded in 1772 by the Radcliffe Trustees. This process commenced with designs in 1772 and was completed in 1794. The 74" mirror was installed after the war in the 1950's and was the largest telescope in the Southern Hemisphere for half a century. Due to the size of the telescope a successful mirror was only cast on the third attempt in 1938. Thereafter World War Two completely interrupted the building of the telescope. The telescope was installed in 1948, 13 years after it was ordered.

Until 1839, the Savilian Chair of Astronomy was responsible for the observatory. With the appointment of GHS Johnson as astronomer with no observational experience, the new role of Radcliffe Observer was created. The Radcliffe observers were Hornsby, Johnson, Main, Stone, Rambaut, Knox-Shaw and Thackeray. Over time it became obvious that it was desirable to move the telescope elsewhere (Contd. on next page.)

(Contd. from previous page.)

as optical viewing became more and more impacted by serious limitations of the British climate as well as Oxford rapidly turning into an industrial city. The person who seems to have provided the first impetus in championing the move of the telescope, was the then 6<sup>th</sup> Radcliffe Observer, Harold Knox-Shaw. The Radcliffe Observatory was the astronomical observatory of the University of Oxford from 1773 until 1934, when the Radcliffe Trustees sold it and built a new observatory in Pretoria, South Africa at a site known locally as Fort Klapperkop.

In the 1960's three of South Africa's Observatories were badly affected by light pollution. They were the Cape Observatory (Cape Town), Radcliffe Observatory (Pretoria) and Republic Observatory (Johannesburg). A new facility was created away from light pollution at Sutherland in the Karoo. Radcliffe Observatory closed down, and its 74-inch telescope was bought and moved to Sutherland. Thus the original Radcliffe Observatory ceased to exist and was incorporated into a new entity, the S.A.A.O.

The 7<sup>th</sup> Radcliffe Observer was David Thackeray, from 1950 to 1972. It was under his leadership that the Observatory enjoyed its most productive years. He was the father of Francis, (the speaker), and had had an interest in astronomy from the time that he was 10 years old and had received a 3" telescope as a gift. Andrew David Thackeray, was born in Chelsea in London, in 1910. He was schooled at Eaton College where he reported meteors to the British Astronomical Association. He was encouraged by his uncle, Jack Evershed, who was a British Astronomer and known for the Evershed Effect, which was named after him. Sir Arthur Eddington was his mentor at Cambridge.

He specialized in stellar spectroscopy. At the conference of the International Astronomical Union in Rome in 1952, he presented results of studies of variable stars in the Magellanic Clouds, indicating that the perceived age and size of the Universe had to be doubled. He was the discoverer of Thackeray's Globules in IC2944 in 1950. He also reported the discovery of Bennett's Comet to the International Astronomical Union, which then verified the discovery thereof. He performed a 23-year study of Eta Carinae, which he monitored during his tenure at the Radcliffe Observatory from 1950-1978. He also obtained the spectrum of the comet Ikeya-Seki which had been discovered in 1965 independently by two Japanese astronomers.

In 1974 David Thackeray moved to Cape Town where he was appointed as Radcliffe Professor. He became an honorary professor of the University of Cape Town and later an Associate of the Royal Astronomical Society in 1978 before he passed away in an accident in February. It is apparent from his son's talk and from his lifetime achievements how important his contributions in life had been, both personal and professional. **Ω**

## What's Up in November 2019 - by Michael Poll

### Moon Phases

**New Moon:** October 28<sup>th</sup> **First Quarter:** November 4<sup>th</sup> **Full Moon** November 12<sup>th</sup> **Last Quarter** November 19<sup>th</sup>.

### Evening Sky

#### **Venus & Mercury :**

October 20<sup>th</sup> Mercury Greatest Elongation East: 25° from the Sun.

October 29<sup>th</sup> Moon, Mercury & Venus grouping

October 30<sup>th</sup> Mercury 2.5° South of Venus

November 11<sup>th</sup> Mercury at Inferior Conjunction : Transit

#### **Moon, Jupiter & Saturn:**

October 31<sup>st</sup> Moon 1.3° North of Jupiter

November 1<sup>st</sup> & 2<sup>nd</sup> Moon near Saturn (Closest approach: Nov 2<sup>nd</sup> 09h 31: Moon 0.6° south of Saturn)

November 24<sup>th</sup> Venus 1°24' S of Jupiter. Conjunction. Elongation from Sun : 26.2°

November 28<sup>th</sup> Moon near Venus & Jupiter

November 29<sup>th</sup> Moon near Saturn.

#### **Venus & Saturn**

December 11<sup>th</sup> Venus 1°8' south of Saturn

**Conjunctions of Venus and Jupiter** will be discussed.

#### **Synodic Period :**

As viewed from the Earth, is the time taken for a planet to return to the same place in the sky relative to the Sun and Earth.

Venus : Synodic period : 1.6 years (19.1 months)

Jupiter: Synodic period : 1.09 years. (13.1 months)

Two synodic periods of Venus and three synodic periods of Jupiter amount to just less than three years and three months. Therefore conjunctions of Venus and Jupiter occur at the same interval – a conjunction of Venus and Jupiter will be followed by another in just less than 3 years and 3 months.

Venus returns to same relative position in the sky every 3.20 years. (2x Venus synodic periods = 38,2 months)

Jupiter returns to same relative position in the sky every 3.27 years. (3x Jupiter synodic periods = 39,3 months)

The 3.27 year cycle of Jupiter is slightly longer than that of Venus. Jupiter is a bit late, and therefore further west each time.

A series of conjunctions starts with a conjunction in the morning sky with successive conjunctions gradually moving westwards, getting closer to the Sun, then going past the Sun and moving into the evening sky. The conjunctions gradually move away from the Sun until the series ends. Such a series of conjunctions lasts about 70 years. The end of one series and the beginning of the next one is marked by a triple conjunction.

#### **Constellations for November**

- In the northern sky : Cygnus, Square of Pegasus, Triangulum and Andromeda.
- In the east the bright stars Aldebaran, Rigel and Canopus lie along the horizon at about 20h 00 in mid-November
- At this time of year the South Pole of the Milky Way passes overhead at our latitude, so the Milky Way runs around the horizon. Ω

**Photographs with captions - by Johan Moolman**



**Pretoria Centre committee**

Chairman	Bosman Olivier	082 883 1869	<a href="mailto:bosman@compendia.co.za">bosman@compendia.co.za</a>
Vice Chairman	Johan Smit	072 806 2939	<a href="mailto:johanchsmit@gmail.com">johanchsmit@gmail.com</a>
Secretary	Michael Poll	074 473 4785	<a href="mailto:pollmnj@icon.co.za">pollmnj@icon.co.za</a>
Newsletter Editor	Pierre Lourens	072 207 1403	<a href="mailto:pierre.lourens@vodamail.co.za">pierre.lourens@vodamail.co.za</a>
Librarian and			
Webmaster	Danie Barnardo	084 588 6668	<a href="mailto:daniebar@webmail.co.za">daniebar@webmail.co.za</a>
Assistant webmaster	Craig Kloke	083 404 2059	<a href="mailto:info@craigsmoels.co.za">info@craigsmoels.co.za</a>
Public Relations Officer	Fred Oosthuizen	072 373 2865	<a href="mailto:fredo@oostvallei.co.za">fredo@oostvallei.co.za</a>
Observing Coordinator	Michael Moller	082 789 8968	<a href="mailto:mmoller2k@gmail.com">mmoller2k@gmail.com</a>
Asistant Observing			
Coordinator	Percy Jacobs	060 883 8106	<a href="mailto:percymj@iafrica.com">percymj@iafrica.com</a>
Treasurer and			
Membership Secretary	Michelle Ferreira	073 173 0168	<a href="mailto:michellem.ferreira@standardbank.co.za">michellem.ferreira@standardbank.co.za</a>
Curator of Instruments	Louis Kloke	083 393 3594	<a href="mailto:dawn@mweb.co.za">dawn@mweb.co.za</a>
Assistant Curator of			
Instruments	Johan Smit	072 806 2939	<a href="mailto:johanchsmit@gmail.com">johanchsmit@gmail.com</a>

## NOTICE BOARD

- ◆ **Astronomical data mining.** Help to find regions where stars are being born!  
[https://www.zooniverse.org/projects/hughdickinson/galaxy-zoo-clump-scout?utm\\_source=Newsletter&utm\\_medium=Email&utm\\_campaign=announce18sep2019](https://www.zooniverse.org/projects/hughdickinson/galaxy-zoo-clump-scout?utm_source=Newsletter&utm_medium=Email&utm_campaign=announce18sep2019)
- ◆ **Beanies.** Beanies will be offered for sale @ R40.00 each at every monthly meeting, until they are sold out.
- ◆ **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 data base of the books in our library is to be found on our website.
- ◆ **Transit of Mercury:** The Cape Centre of the ASSA received an invitation to do a joint observation of the transit of Mercury on 11 November with the Hertford Astronomy Group. The Cape Centre is planning a public observation of this event but will not have the resources to do the collaboration that they suggest, apart, perhaps, from a livestream on Facebook. Any active observer is invited to contact Jerry Stone at [jerry.stone2001@gmail.com](mailto:jerry.stone2001@gmail.com) if you'd like to be involved and also to inform other Centres, groups or individuals who might be interested in this venture. Jerry Stone is the Publicity and Outreach Officer for the Hertford Astronomy Group (HAG), an astronomical society based in Welwyn Garden City, which is 40 kilometres from the centre of London.