The PRETORIA CENTRE
of the
Astronomical Society of Southern Africa
www.pretoria-astronomy.co.za

NEWSLETTER JULY 2025

NEXT MEETING

From January 2025 onward, we will have our monthly meetings over the Internet, and not at CBC any more.

Date and time: Wednesday 23 July at 19h00.

Programme:

- "What's up in August 2025?" by Johan Smit.
- Annual General Meeting.

The web link to join the meeting is: https://meet.jit.si/ASSAPretoriaMonthlyMeeting (See the note at the bottom of page .)

The chairperson at the meeting will be Johan Smit.

NEXT OBSERVING EVENING

Friday 18 July from sunset onwards near the Pretoria Centre Observatory, which is also situated at CBC. Turn left immediately after entering the main gate. Carry straight on through the car park and proceed down the tarred road that drifts to the left out of the car park and then swerves to the right. About 50 to 100 metres after the last row of studs there is a cricket sight-screen on the right. Observing will be on the cricket pitch just past the sight-screen.

Please note that we have been instructed that no one is to drive on to the sports fields because of possible damage to the irrigation systems there.

TABLE OF CONTENTS

Editor's chatter: Astronomical data

In the earlier days of astronomy, astronomers spent a lot of time staring through telescopes. Nowadays, they spend a lot of time staring at computer screens, working with masses of astronomical data. Telescopes orbiting Earth and the Sun, as well as ground based telescopes, have been gathering huge masses of data in different regions of the electromagnetic spectrum. This is something the astronomers of the past could not even have dreamed of.

Extracting useful information from masses of data is appropriately termed "data mining". One of the programs the astronomers use for this purpose is Python, with Anaconda as the IDE (**I**ntegrated **D**evelopment **E**nvironment).

And the rate of data collection is expected to grow in the future. For instance, looking at astronomical sky surveys alone, the amount of data collected from them has grown from gigabytes* to terabytes* throughout the past decade and is predicted to grow in the next decade into hundreds of petabytes* with the Large Synoptic Survey Telescope and into the exabytes* with the Square Kilometre Array. **Ω**

***** giga = $1X10^{9}$ = one thousand million = one billion.

tera = $1X10^{12}$ = one million million = one thousand billion

peta = $1X10^{15}$ = one thousand million million = one million billion.

exa = $1X10^{18}$ = one million million million = one billion billion.

A fireball over mountains in the Sonoran desert. A meteor streak is captured as it plunges through Earth's atmosphere over Kitt Peak National Observatory in Tucson, Arizona.

Astronomy related articles on the Internet

- History of astronomy.
The greatest discoveries and advancements in the history of astronomy

- Signs of life?
Scientists question possible signs of life on exoplanet K2-18b in new study: 'We never saw more than insignificant hints' | Space

- The Moon illusion.
The 'Moon illusion' has been baffling scientists for thousands of years

- Most distant galaxy known.
'Previously unimaginable': James Webb telescope breaks its own record again, discovering farthest known galaxy in the universe | Live Science

- Black hole ripping star apart.
Astronomers discover black hole ripping star apart inside galaxy merger | Space

- Development of the JWST.
Go inside the development of NASA's $10 billion James Webb Space Telescope with new 'Cosmic Dawn' documentary | Space

- Supernovas near Earth.
Supernovas may have triggered life-threatening changes in ancient Earth's climate. Scientists say it could happen again | Space

- The physical constants.
Why do the numbers that shape our universe exist at all? | Space

- Asteroids galore. The Rubin Observatory found 2,104 asteroids in just a few days. It could soon find millions more | Space

- This black hole is a glutton. This supermassive black hole is eating way too quickly — and 'burping' at near-light speeds | Space

- Water – a lot of it. The Largest Ocean in the Universe - Big Think

- Monstrous comet is chemically active. Astronomers discover the largest comet from the outskirts of the solar system is exploding with jets of gas | Space

- Star RIK 113 is busy making a new planet. Cosmic rings reveal new planet being born| Space photo of the day for June 11, 2025 | Space

- New giant radio galxies found. Astronomers discover 15 new giant radio galaxies — the largest single objects in the universe | Space

Astronomy basics: Black holes

Black holes: Facts about the darkest objects in the universe | Live Science

NOTICE BOARD

➔ **Help measure how fast asteroids rotate.**
Enigmatic Near-Earth Visitors — Zooniverse

➔ **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.

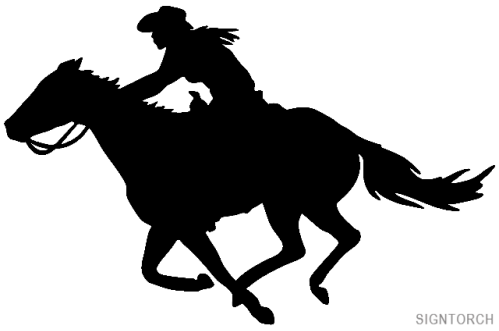
Astronomy related images, video clips and documentaries on the Internet

➢ The Veil Nebula. See a video clip.
Hubble's Inside the Image: The Veil Nebula | Watch

➢ Giant sprite above thunderstorm. ISS astronaut captures a rare phenomenon from orbit — a giant 'sprite' above a thunderstorm | Space

Give your imagination free rein – by Pierre Lourens

● The beginning of our Cosmos.
Did our cosmos begin inside a black hole in another universe? | Space



Chairman's report: ASSA Pretoria Centre meeting of 25 June 2025 – by Michael Poll

The meeting started at about 19:10 by welcoming the 13 online members and visitors present. Danie started proceedings with a "Whats Up in July 2025". A summary of this talk is available in the June 2025 Newsletter of the Pretoria Centre.

Michael Poll was the main speaker and he gave two presentations; the first was the completion of his June 2025 What's Up, which was interrupted by internet difficulties. Following is the content of this talk:

Libra is the only zodiac sign that does not symbolize a living creature. Libra was known in Babylonian astronomy as the Claws of the Scorpion or the "Scales" or "Balance". The Greeks regarded it as part of Scorpius, not as a separate constellation. The Greeks called this area Chelae: literally meaning 'claws'. Ptolemy in the *Almagest*, written around AD 150, continued to refer to this constellation as "The Claws".

The name Libra is due to the Romans. Roman writer Manilius described Libra as "the sign in which the seasons are balanced, and the hours of night and day match each other". She was increasingly offended by the wickedness of her citizens, decided to flee from the corrupt civilization. She returned to the heavens as the constellation of the Virgin Goddess. She abandoned civilization so hurriedly that she left her golden Scales of Justice behind.

Sun was in Libra at the September equinox (when days and nights are of equal length). This is supposed to be the reason for identifying the constellation with scales. The September equinox was in Libra until 729 AD when precession of the equinoxes moved it into Virgo. The September equinox will move into Leo in 2439 AD.

β Librae (Beta Librae)
Zubeneschamali – Arabic : "The Northern Claw."
Brightest star in Libra
Apparent visual magnitude : 2.6
Distance : About 185 l.y.
It has 4.9 times the solar radius.
About 130 times more luminous than the Sun.

α Librae (Alpha Librae)
Zubenelgenubi - Arabic : "The Southern Claw."
Second brightest star in Libra
Apparent visual magnitude : 2.8
Alpha Librae : Double Star
Alpha-1 Librae: Magnitude : 5.2
Distance 74.9 light years
Alpha-2 Librae : Magnitude : 2.8 Distance 75.8 light-years.
Separated by about 5400 AU (0.1 light year) (= 135 x Sun-Pluto)
Share a common proper motion
But is not gravitationally bound to each other
Easily separated in binoculars
Separation 230" = 3.8' (Moon is 30' =1800")
Naked eye: "Difficult"

σ Librae (Sigma Librae) : Brachium
The traditional name means "arm" in Latin.
Also sometimes known as Cornu (Latin for "horn") and Zubenelgubi ("Southern Claw" in Arabic).
Used to have the Bayer designation Gamma Scorpii even though it lies quite far from the border with Scorpius.
Only became Sigma Librae in the 19th century.
Confirmed by the International Astronomical Union: July 31, 1930.
Red giant
Apparent visual magnitude: 3.29
Distance : About 288 light-years (Continued on next page.)

(Continued from previous page.)

HD 140283
Oldest known star in the Universe, believed to have been created shortly after the Big Bang.
Consists almost entirely of hydrogen and helium –
very metal poor : iron content is less than 1% of the Sun.
Estimated age : 12 billion years
Universe is believed to be 13.77 billion years old.
Apparent visual magnitude : 7.2
Distance : 190.1 light years.
Its name is Methuselah

His second talk talk was entitled “Curcumpolar stars”
Following is the content of this talk.

Circumpolar stars never set from a particular location
Celestial pole – The point in the sky (north and south) where the Earth’s spin axis meets the sky.

Apparent movement of the sky: Looking north, the sky moves anticlockwise
Apparent mmovement of the sky: Looking south, the sky moves clockwise
The altitude of the celestial pole (in degrees) is the same as the observer’s terrestrial latitude.

Circumpolar stars : Are determined by observer’s latitude.

To determine if a star is circumpolar from a particular latitude:
Subtract your latitude from 90° - gives the limit of declination of the objects that never set.

For example: From latitude 40° north, everything north of declination of +50° is circumpolar and everything within 40° of the north celestial pole is circumpolar.
From latitude 26° south, everything south of declination - 64° is circumpolar and everything within 26° of the south celestial pole is circumpolar.

To determine if a star is visible from a particular latitude:
The angular distance of the star from the celestial pole is the furthest terrestrial latitude north or south that the star can be seen.
Polaris: Declination 90° north is 0° away from the NCP. Furthest south visible : Latitude 0°
Sirius: Declination 17° south is 90°-17° = 73° from SCP. Furthest north visible: Latitude 73° north.

Pretoria: latitude 26° south - Furthest north visible 90°- 26° = Declination 64° north

The Plough: Alpha (declination 61° north) ceases to be circumpolar at latitude 39° north, e.g. Denver, Beijing

Lowest latitude all of it is visible 26° south.

Cape Town - Plough visibility 2025 June 2nd :
Cape Town : 34° south. Cannot see any star with declination north of 56° at Cape Town (90° – 34°)
ζ UMa (Zeta) Declination +55° Maximum altitude: 1°
γ UMa (Gamma) Declination +54° Maximum altitude : 2°
η UMa (Eta) Declination +49° Maximum altitude : 7°

Southern Cross: Visibility from northern hemisphere
- Was visible as far north as Britain in the fourth millennium BC.
- Ancient Greeks : 1000 BC: at Athens (38° North) : visible but low in the sky
- Precession lowered it below the European horizon by AD 400.
- Was eventually forgotten by the inhabitants of northern latitudes.
- Rediscovered by Portuguese while rounding Africa (Continued on next page.)

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Is 30° from South Celestial Pole.
Now not visible north of 30° north: Cairo, New Orleans.

Southern Cross : How far north is it visible?
Is 30° from Southern Celestial Pole
Now not visible north of 30° north: Cairo, New Orleans.
Furthest south Cairo & New Orleans can see is 60°
But – a part of the Southern Cross is further than 30° from the Southern Celestial Pole
This part of it *can* be seen from Cairo.

What is circumpolar at Pretoria at 26° south?
Anything within 26° of celestial pole is circumpolar
(Anything with a declination of -64° or more is circumpolar)

Small Magellanic Cloud
2025 06 06 20h 00
Small Magellanic Cloud Dec -72°
Distance from Southern Celestial Pole : 18°
Altitude of Southern Celestial Pole : 26°
Altitude of SMC : 26° - 18 = 8°

Large Magellanic Cloud
2025 06 07 00h25
2025 08 07 20h00
Large Magellanic Cloud: Dec -69°
Distance from South Celestial Pole : 21°
Altitude of South Celestial Pole: 26°
Altitude of LMC: 26° - 21° = 5°

Southern Cross : Not circumpolar from Pretoria
Southern Cross : Is circumpolar only south of 34° south
Southern Cross :is circumpolar from Cape Town: 34° south
Anything within 34° of SCP is circumpolar
Any declination *more* than -90°+ 34° = -56° is circumpolar at Cape Town: 34° S.

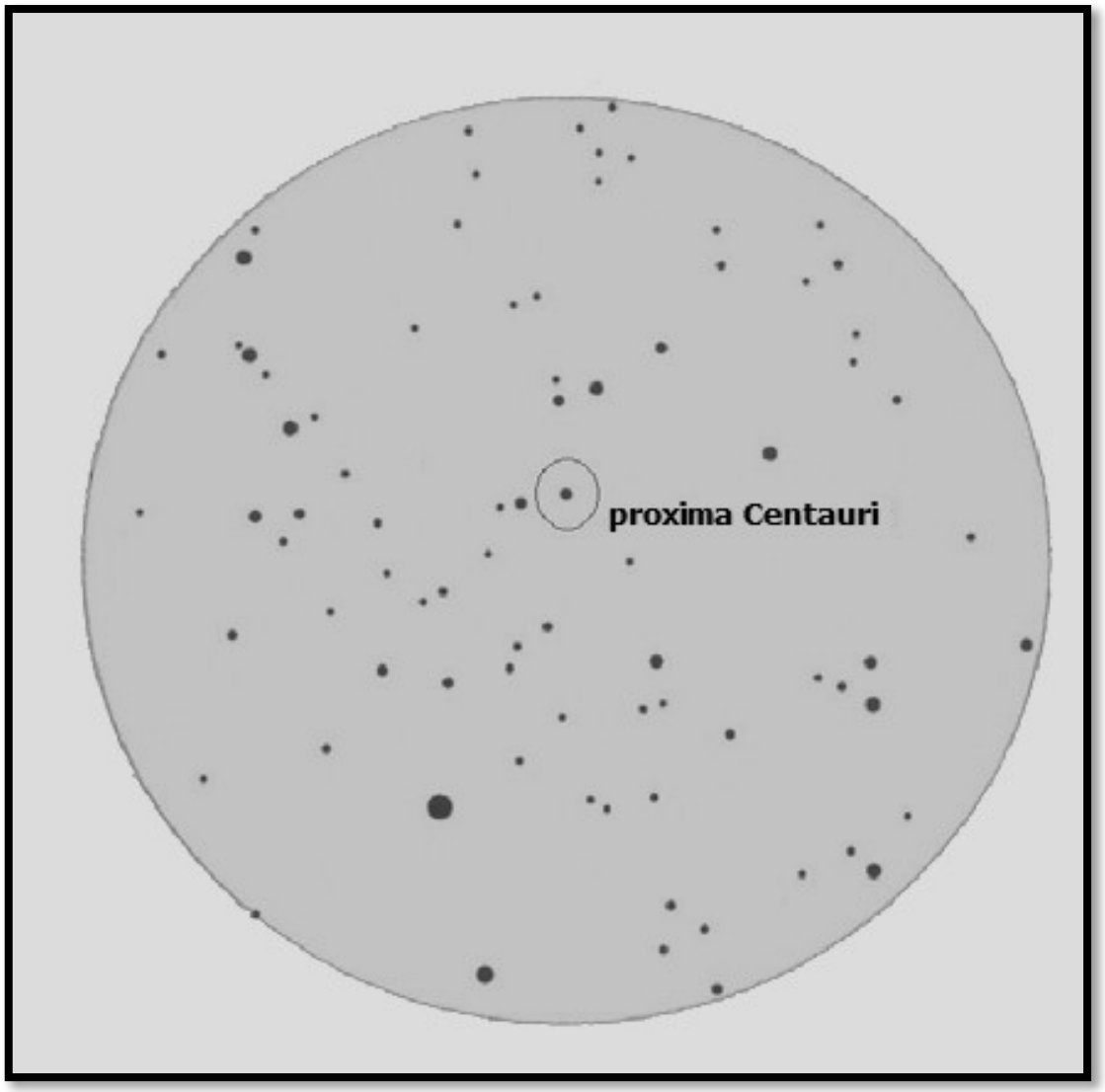
After a short question-and-answer session, Michael was thanked for his very interesting and much-appreciated talks and the meeting adjourned at about 20:30, but was still open for interaction between participants. **Ω**

Observing: Proxima Centauri – by Magda Streicher

The lovely bright star alpha Centauri, also known as Rigel Kentaurus to the Arabian astronomers, meaning the foot of the centaur, consists of three members, the nearest stars to our Solar System. Thomas Henderson's measurements stated the stars alpha 1 and 2 Centauri orbit around a common centre of mass with a period of 79.9 years. Their separation ranges between 1.7" and 22" respectively and the parallax 0.91" ± 0.06" based on measurements carried out from 1839 to 1840 by Thomas Maclear from the Royal Observatory, Cape of Good Hope.

The nearest star and third member of the system, the magnitude 11 Proxima Centauri, is situated 2 degrees south-west of the brighter pair. Proxima Centauri was discovered in 1915 by Robert Thorburn Ayton Innes (1861–1933), and is also referred to as "Innes' Star". Joan George Voute measured the first parallax of Proxima Centauri in 1917 as 0".755 ± 0".028 and stated it to be 4.2465 light-years away from our Sun and our nearest neighbour. John Herschel called alpha 1 and 2 Centauri beyond any comparison, the finest double star in the sky.

What a fine constellation to have on our southern doorstep! Ω



Constellation of Centaurus

Nascent stars expel jets of gas along their spin axes. The jet shown here is being expelled by a star just forming and is catalogued as Herbig-Haro 49 (HH 49). The star expelling this jet is not visible - it is off to the lower right. A distant galaxy is visible near the tip of the jet. Another jet, catalogued as HH 50, is faintly visible behind HH 49.

Web links for the astronomy enthusiast

- **The website for all information about the ASSA and the ASSA Centres:**
  https://assa.saao.ac.za/
- **ASSA Specialist Sections:**
  ASSA has various areas of interest. Join and participate!
  https://assa.saao.ac.za/sections/
- **ASSA Publications to download and enjoy:**
  MNASSA: https://www.mnassa.org.za/
  Nightfall: http://assa.saao.ac.za/sections/deep-sky/nightfall/
  To receive as part of ASSA membership benefits - *Sky Guide Southern Africa,* the astronomical handbook for Southern Africa:
  http://assa.saao.ac.za/about/publications/sky-guide/
- **Mail Groups to join:**
  For general ASSA related information: https://groups.io/g/ASSA-announce
  For posting general items and discussion: https://groups.io/g/ASSA-discussion
- **Social Media to join and share:**
  Facebook: https://www.facebook.com/Astrosocsa/?_rdc=1&_rdr
  Youtube: https://www.youtube.com/channel/UCJ4b1fhmPvYTOsy15YP-_JA
  Twitter: https://twitter.com/AstroSocSA
- **Planetaria:**
  WITS Planetarium (Johannesburg): Welcome to Wits Planetarium
  Naval Hill Planetarium (Bloemfontein): Planetarium Home (ufs.ac.za)
  Iziko Planetarium (Cape Town): Planetarium and Digital Dome - Iziko Museums
  Sutherland Planetarium (Sutherland): Sutherland Planetarium
- **More web links can be found on page 118 of "2025 SKY GUIDE Southern Africa". Ω**

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