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

NEWSLETTER MARCH 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 26 March at 19h00.

Programme:

- "What's up in April 2025?" by Johan Jordaan.
- Main talk: "Conjunctions" by Michael Poll. See the summary on page 10.

The web link to join the meeting is: https://meet.jit.si/ASSAPretoriaMonthlyMeeting (See the note at the bottom of page 2.)

The chairperson at the meeting will be Johan Jordaan.

NEXT OBSERVING EVENING

Friday 21 March 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: Colliding galaxies

Galaxies frequently collide. But such a collision is nothing like that between two billiard balls. The long range attractive force of gravity acts between them, and the interaction between them is long and slow. The individual stars in the galaxies very rarely collide, because the stars are very small in comparison with the distance between them, which is light-years. Molecular clouds (dense clouds of gas and dust) in the colliding galaxies merge and become denser, leading to star formation. These regions are termed starburst regions.

Such a collision is awesome and typically lasts billions of years before a final state is reached. It is also complex and the nature of the collision and the end result depends on several factors, such as collision angles, relative velocity, orientation, relative size and composition. They sometimes make many passes through one another before reaching a final state. The most common result of the collision between two or more galaxies is a larger irregular galaxy, but an elliptical galaxy may also result.

Galactic cannibalism is the process where a larger galaxy gravitationally attracts and merges with smaller galaxies, often leading to the destruction or absorption of the latter. It is theorized that galactic cannibalism is currently occurring between the Milky Way and the Large and Small Magellanic Clouds. Streams of gravitationally attracted hydrogen arcing from these two dwarf galaxies to the Milky Way is evidence for the theory.

Galactic collisions are currently a very active area of research. They are simulated on computers. The Great Galaxy in constellation Andromeda is on a collision course with the Milky Way, and the end result will be an elliptical galaxy. See a simulation of this coming collision and of other colliding galaxies at
Supercomputer Simulation of Galaxies Colliding - Search Videos

Images of such collisions can be seen at
Hubble pictures of galaxies colliding – Search. **Ω**

Note about joining our monthly meeting over the Internet

If you wish to attend, please be online before 19h00 SAST (= 17h00 GMT) and mute your microphone until you wish to speak.
Disabling your camera will save bandwidth on your side too.

Astronomy related articles on the Internet

- This solar observatory will orbit Earth, not the Sun. NASA's launching a new sun mission this month: 'PUNCH is going to see a total solar eclipse' | Space
- Black hole jet.
Astronomers watch monster black hole spit out a light-year-long jet | Space
- Some astronomy history.
100 years ago, Edwin Hubble proved our Milky Way galaxy isn't alone | Space
- Something about Japan's space program.
Japan's Resilience lunar lander prepares for 1st swing around the moon | Space
- Something about China's space program. Meet 'Tansuo' and 'Wangyu,' China's next moon rover and astronaut spacesuit (video) | Space
- Exceptional galaxy discovered.
Hubble Space Telescope spots a spectacular Bullseye in deep space (image) | Space
- Building blocks of life found in samples from asteroid Bennu. NASA finds key molecules for life in OSIRIS-REx asteroid samples. Here's what that means | Space
- Another superstructure discovered.
Scientists Just Discovered 'Quipu,' the New Largest Structure in Our Cosmos
- Euclid telescope discovers Einstein ring. Euclid 'dark universe' telescope discovers stunning Einstein ring in warped space-time (image) | Space
- Comets galore around exoplanets.
Trillions of comets discovered orbiting alien planet systems (image) | Space
- The latest calulation of asteroid 2024 YR4's impact probability is only 0.00005. Previously, it was 0.023. (Editor's comment: WHAT A RELIEF!) 'That's impact probability zero folks!' Earth safe from 'city-killer' asteroid 2024 YR4 | Space
- Fossilized ripples in rocks on Mars. NASA's Curiosity Mars rover discovers evidence of ripples from an ancient Red Planet lake (images) | Space
- Why does Mars look reddish?
What makes Mars the 'Red' Planet? Scientists have some new ideas | Space
- Sgr A* is constantly flaring up. James Webb Space Telescope finds our Milky Way galaxy's supermassive black hole blowing bubbles (image, video) | Space
- Another massive SETI project turned up nothing. I want to believe — but yet another massive search for alien technosignatures just turned up nothing | Space

The observing evening in February 2025

This event did not take place due to inclement weather.

Chairman's report: Pretoria Centre ASSA meeting of 26 February 2025

The meeting started at about 19:10 by welcoming the 26 online members and visitors present. Danie started proceedings with a "Whats Up in March 2025". A summary of this talk is available in the February 2025 Newsletter of the Pretoria Centre.

Johan Smit was the main speaker and he gave two presentations; the first titled: "What can amateur astronomers do?" He urged new members who have just joined a branch, to become involved with activities, firstly by helping with outreach activities of the branch. He empasised that new members do not need any equipment, but that there are always members that bring telescopes to such meetings and any member attending can assist with activities at such events, i.e. monthly viewing evenings, or other outreach activities.

When you reach the stage where you want to acquire equipment, speak to the "old hands", who will be able to point you in the right direction. When you have some equipment, there are many opportunities to become involved in real science. He then outlined some of these activities, starting with activities for which you only need a computer with internet access:

- Citizen science at NASA – see details on their website at https://science.nasa.gov/citizen-science/
- Guide to citizen science efforts – their website is at https://astrobites.org/guides/citizen-science-efforts/

If you have a telescope, there are also activities in which to take part:

- AAVSO (The American Association of Variable Star Observers) activities – see their website at https://www.aavso.org/ for details.
- and AAVSO obseving sections – https://www.aavso.org/observing-sections

Johan also emphasized that, although there are many artificial intelligence activities and that automated surveys are active, observations by amateur astronomers are still very valuable to the science. He mentioned the following examples:

- Data quality inconsistent across surveys.
- Atmospheric effects, Instrument errors etc.
- Cadence, difficult to measure periods.
- Stars in dense populations—too close together, i.e. in the case of stars in the Milky Way.
- Filtering out of non-stellar sources, i.e. asteroids or galaxies.

Johan then followed with a second talk "Basic optics as applied in telescopes" in which he outlined information on:

- Purpose of a telescope.
- Types of telescope.
- Focal points, spherical and chromal abberation and how to fix these.
- Different types of glass; their characteristics and propertiesp
- How to get the most out of your telescope.
- Magnification.
- Focus of a lens or mirror.
- Airy disks.
- Field of view.
- Resolution.
- Contrast and definition.
- What affects seeing.

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- Guidelines to practical magnification.
- The binocular minefield - dwelling on different characteristics and optics of binoculars.

The presentaion slides of this presentaion is available on the Pretoria Centre website at http://www.pretoria-astronomy.co.za/atm.htm.

After a very lively question and answer session and discussions, Johan was thanked for his very interesting and much appreciated talks and the meeting adjourned at about 20:30. **Ω**

Sequence of the total lunar eclipse on 13-14 March 2025 over Castle Stalker, Appin, Scotland. (Image credit:Josh Dury)

Astronomy related images, video clips and documentaries on the Internet

- Images of Comet C/2024 G3 (ATLAS). Comet G3 (ATLAS) looks breathtaking above future home of world's largest telescope (photos) | Space
- The south pole of the Moon. Unraveling the mystery of the lunar South Pole
- Images captured by the JWST. Astounding images captured by the James Webb Space Telescope
- HD 189733b is a hellish planet. Bing Videos
- Video clip of Earth and its Moon. Private Blue Ghost moon lander captures amazing footage of Earth behind and lunar surface below (video) | Space

What's up in April 2025: Highligts in Hydra - by Johan Jordaan

The early evening sky in April 2025.

- Crux and the pointers are prominent in the southeast.
- The False Cross can be seen high up in the southern sky.
- Achernar is low in the southwest.
- Canopus shines brightly above Achernar.
- The Milky Way spans from the southeast, then through the sky above Canopus to the
  northwest, where Sirius is positioned.
- In the northwest, below Sirius will be Orion and Aldebaran in Taurus.
- To the north will be Canis Minor with Procyon and Gemini with Pollux.
- To the northeast will be Regulus in Leo.
- Spica in Virgo can be seen low down in the east.

Source: 2025 Sky Guide Southern Africa.

Moon phases.

- **Full moon**: 31 March 2025.
- **First Quarter Moon**: 6 April 2025.
- **Full Moon**: 13 April 2025.
- **Last Quarter Moon**: 25 April 2025.

April 2025

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1 Waxing Crescent	2 Waxing Crescent	3 Waxing Crescent	4 Waxing Crescent	5 First Quarter
6 Waxing Gibbous	7 Waxing Gibbous	8 Waxing Gibbous	9 Waxing Gibbous	10 Waxing Gibbous	11 Waxing Gibbous	12 Waxing Gibbous
13 Full Moon	14 Waning Gibbous	15 Waning Gibbous	16 Waning Gibbous	17 Waning Gibbous	18 Waning Gibbous	19 Waning Gibbous
20 Waning Gibbous	21 Last Quarter	22 Waning Crescent	23 Waning Crescent	24 Waning Crescent	25 Waning Crescent	26 Waning Crescent
27 New Moon	28 Waxing Crescent	29 Waxing Crescent	30 Waxing Crescent			

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Celestial almanac

Note: New Moon will be on 29 March 2025. Therefore dark skies at end of March, beginning of April.
01: Moon near Pleiades.
02: Moon near Jupiter.
05: **First Quarter Moon** (04:15). Moon near Mars and Pollux.
08: Moon near Regulus.
10: Moon occults 6 Vir.
12: Moon near Spica.
13: **Full Moon** (02:22). Occults Spica
16: Moon occults Antares and σ Sco.
17: Mercury near Neptune.
21: **Last Quarter Moon** (03:36).
23: Pi Puppis meteor shower at maximum.
Note: On April 25, Venus will be visible near the Moon at noon, separation 4.3º.
25: Moon near Venus, Saturn, Neptune and Mercury.
26: Moon near Mercury.
27: **New Moon.** Venus at greatest brilliancy (mag. - 4.8).
30: Moon near Jupiter.

Planets visible in April 2025.

April 17, 01h24. Morning sky: Mercury and Neptune 40.8' separation (27° W of Sun).
Evening twilight: Jupiter can be seen in the north-west. Mars is visible in the north.
Around midnight: no planets are visible in the sky.
Before sunrise: throughout April, look towards the east at dawn to observe Venus, Saturn and Mercury grouped together.
On April 11 these three planets are grouped closest together.
On the morning of April 25, the Moon lies within this triangle of planets.
The trio is accompanied by Neptune, which at mag +7.8, will be visible through binoculars.
Mercury puts on its best show for the year during April, rising about two hours before the Sun around midmonth.
Noon: Venus will be visible near the Moon at noon on Apr 25, with Moon and Venus separated by 4.3°.

Deep sky objects in Hydra. (See map on next page.)

Hydra constellation features.

First catalogued by the Greek astronomer Ptolemy (2nd century AD).
It represents the Lernaean Hydra (Water Snake), from the Greek myth of Heracles' Twelve Labours.
Situated close to the celestial equator, Southern Hemisphere.
Largest constellation of 88 constellations in the sky, stretching across 1303 square degrees of the southern sky, and it extends itself for about 123 degrees across the sky.
Position: Hydra's head is located south of the constellation Cancer and its tail lies between Centaurus and Libra.

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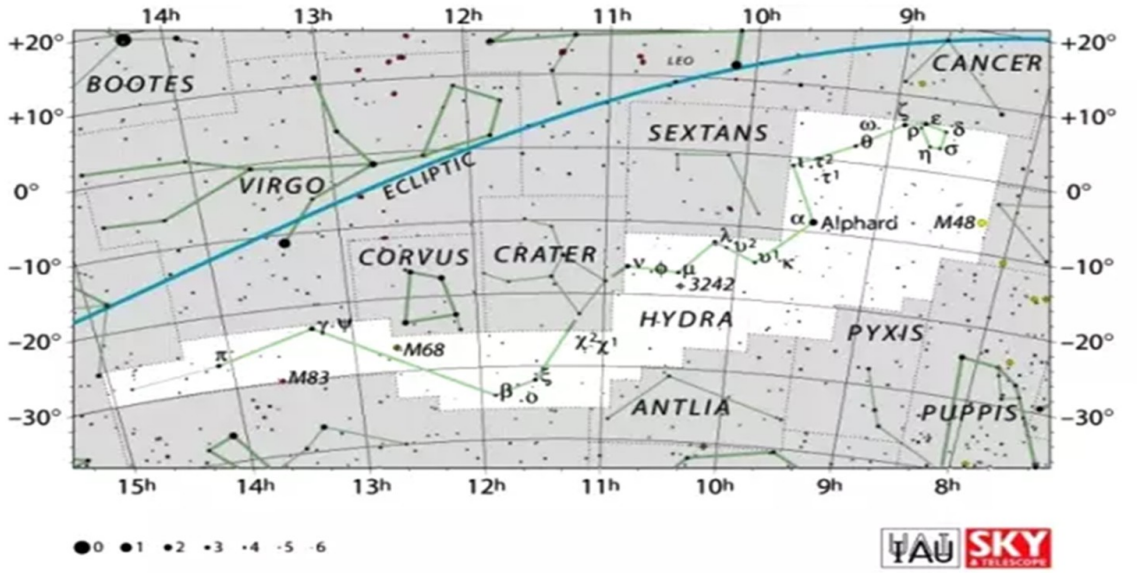

In April, Hydra's deep-sky objects should be visible from about 19:00 to 05:00.

What to look at in Hydra.

Hydra constellation is centrally prominent at night in April, and it has deep sky objects. Therefore: several interesting deep sky objects will be pursued:

Messier 48 – Open cluster	Mag 5.8.
Messier 68 – Globular cluster	Mag 7.96.
Messier 83 – Southern Pinwheel Galaxy	Mag 7.52.
NGC 3242 – Jupiter's Ghost Nebula	Mag 7.7.

A few stars.

Hydra contains only one moderately bright star, **Aphard**, designated Alpha Hydrae. It is an orange giant of magnitude 2.0, 177 light-years from Earth. Its traditional name means "the solitary one".

Beta Hydrae is a blue-white star of magnitude 4.3, 365 light-years from Earth.

Gamma Hydrae is a yellow giant of magnitude 3.0, 132 light-years from Earth.

Deep sky objects

1. Messier 48 or M48, also known as NGC 254.

John Herschel described it as, "a superb cluster which fills the whole field; stars of 9th and 10th to the 13th magnitude – and none below, but the whole ground of the sky on which it stands is singularly dotted over with infinitely minute points".

It sits near Hydra's westernmost limit with Monoceros, about 18° 34′ to the east and slightly south of Hydra's brightest star, Aphard.

M48 is visible to the naked under good atmospheric conditions. The brightest member is the star HIP 40348 at visual magnitude 8.3.

The cluster is located some 2500 light-years from the Sun.

Given its visual magnitude of 5.8, Messier 48 is easily visible with the help of a small binocular.

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2. Messier 68, also known as M68 or NGC 4590.

Messier 68 is a globular cluster found in the east-southeast of Hydra.
William Herschel described it as "a beautiful cluster of stars, extremely rich, and so compressed that most of the stars are blended together".
M68 is about 33 600 light-years distant.
Given its visual magnitude of 7.96, Messier 68 is visible with the help of binoculars with a 40 to 50 mm aperture, or a small telescope.

3. The Southern Pinwheel Galaxy (M83).

A bright, face-on barred spiral galaxy.
Its nickname derives from its resemblance to the Pinwheel Galaxy (M101).
It is approximately 15 million light years away (one of the closest galaxies).
It has a diameter of about 36.24 kiloparsecs (118,000 light-years).
It is visible with binoculars.
Note: The Sombrero Galaxy (M104) sits on the northern side of Corvus).

4. Ghost of Jupiter Nebula (Eye Nebula, NGC 3242).

This planetary nebula is most frequently called the *Ghost of Jupiter*, due to its similar shape to the planet.
The nebula measures around two light-years long from end to end.
It contains a central white area with an apparent magnitude of 11.
The inner layers of the nebula were formed some 1 500 years ago.
The two ends of the nebula are marked by lobes of fast moving gas often tinted red.
NGC 3242 can easily be observed with amateur telescopes and appears bluish green to observers.

Challenge for the month.
Find and describe the four interesting object mentioned Hydra:

- Messier 48 – Open Cluster Mag 5.8
- Messier 68 – Globular Cluster Mag 7.96
- Messier 83 – Southern Pinwheel Galaxy Mag 7.52
- NGC 3242 – Jupiter's Ghost Nebula Mag 7.7

You can report your findings to:
Johan Smit JohanS@firsttech.co.za or Johan Jordaan jjordaan121@gmail.com. **Ω**

NOTICE BOARD

➔ **Hunt for galaxies, peculiar stars, asteroids, and more.**
SPLUS: Science Hunters — Zooniverse

➔ **Upgraded planetarium at Wits up and running.** The web link to their website is on the last page of this newsletter under "Planetaria".

➔ **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.

Summary of main topic, namely "Conjunctions" to be presented on March 26th 2025 - by Michael Poll

When two objects appear close together in the sky, they are said to be "in conjunction". Conjunctions can be of the Sun with the Moon; of the Sun with planets; of the Moon with planets and stars; planets with stars and planets with planets. The word "conjunction" is often used loosely, but in astronomy there are two strict definitions of the word, depending on the choice of coordinate grid. There is Conjunction in Right Ascension (RA) and Conjunction in Ecliptic Longitude (EL). To be in conjunction two objects have to have the same RA or EL. Both definitions are valid but generally the use of EL is preferred. Conjunctions usually occur as a single pass of one object past another, but there can also be triple conjunctions. Objects can appear close together even if not strictly "in conjunction". Examples of close approaches are Appulses, Quasi-Conjunctions and Trios.

This presentation explains these definitions and shows illustrations of many past and future conjunctions of the various sorts, including the triple conjunction of Jupiter and Saturn in 1981, the circumstances for triple conjunctions of Venus and Jupiter to occur, and the 2025 triple conjunction of Saturn and Neptune. Selected *future* conjunctions are:
New Moon 2025 March 29th;
Mars & Pollux 2025 March 31st;
Moon & Antares 2025 April 16th;
Jupiter and Venus 2025 August 12th;
Saturn and Neptune 2025 June 29th, August 6th, 2026 February 16th. **Ω**

Astronomy basics: The life cycle of a neutron star

The life cycle of a neutron star - David Lunney

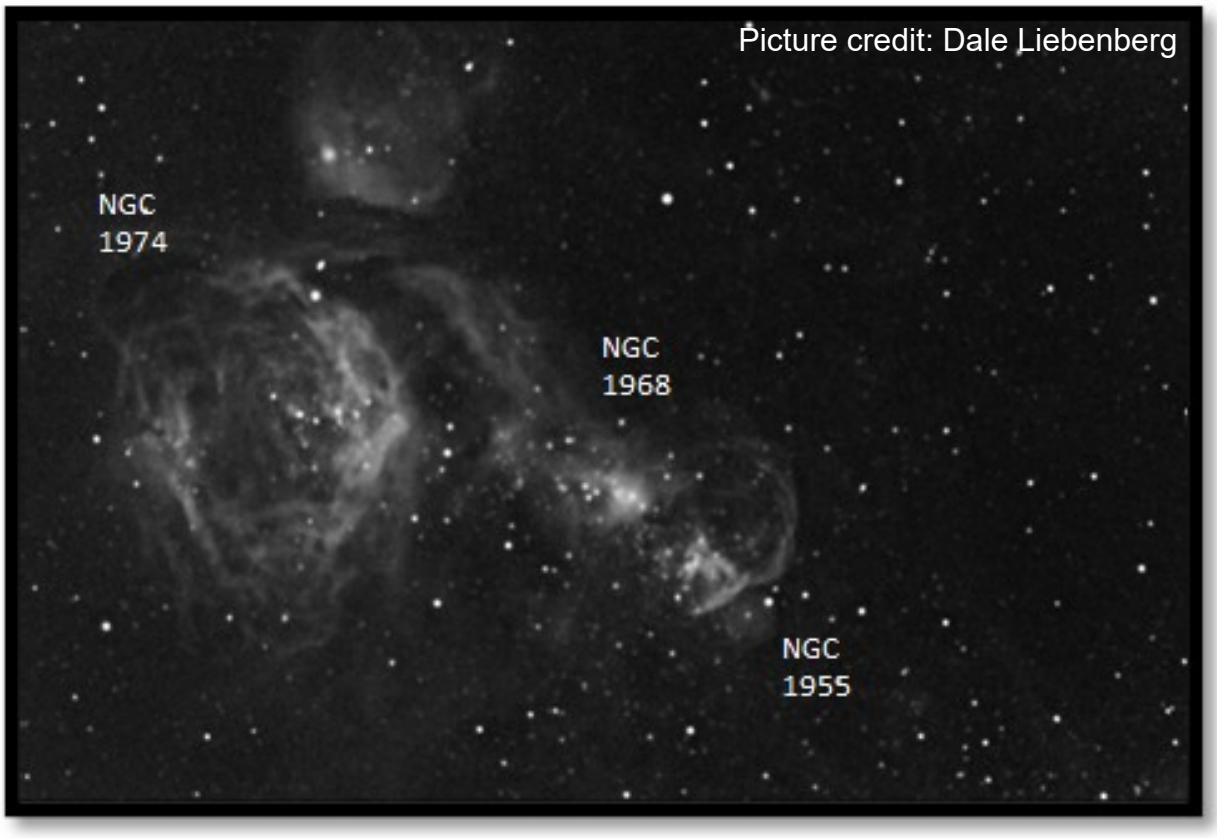
Observing – by Magda Streicher
NGC 1955, NGC 1968, NGC 1974
A Misty Situation

Italian explorer Amerigo Vespucci noted the Clouds as early as 1503, but it was the Portuguese explorer Ferdinand Magellan who documented them later in the 16th century and named them after himself in his report. Imagine for a moment the amazement and wonder such a sight would have evoked in those early seafarers observing from the front veranda, in a manner of speaking.

The Large Magellanic Cloud offers interwoven nebulae and clusters in various degrees of brightness to produce a feast for the eyes – but careful observing is required to sort through this mixed bag of nebulae. The constellation Dorado includes NGC 1955, NGC 1968 and NGC 1974, three splendid objects each with its own character and feel. A first glance reveals three intermingling parts. NGC 1955, the westernmost nebula, is fairly slightly round in shape, brightening towards the eastern side. This part of the object also envelops a few almost invisible stars imbedded in nebulosity. The western part of this beautiful field of view displays a veil of smoke flowing further away west to collects around NGC 1968, also the brightest part in the field of view. The majority of the stars in this grouping are covered in haze, with a neat triangle of faint stars situated on the eastern edge. The haze extends further east to NGC 1974, an uneven glow that houses a handful of stars.

What a lovely, rich area to explore, with its combination of nebulosity and starlight covered in a veil of dust. **Ω**

OBJECT	TYPE	RA	DEC	MAG	SIZE
NGC 1955 & 1968 & 1974	Cluster/Nebula	05h26m.2	-67°28’.5	9 & 9 & 9	1.8’



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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