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

NEWSLETTER APRIL 2023

NEXT MEETING

Venue: Christian Brothers College (CBC), Mount Edmund, Pretoria Road, Silverton, Pretoria.

Date and time: Wednesday 26 April at 19h15.

Programme:

- "What's up in May" by Johan Smit.
- Main talk: "How I built a 150 mm f8.4 Newtonian telescope" by Johan Jordaan.
- Socializing over tea/coffee and biscuits.

The chairperson at the meeting will be Bosman Olivier.

NEXT OBSERVING EVENING

Friday 21 April from sunset onwards at the Pretoria Centre Observatory, which is also situated at CBC. Turn left immediately after entering the main gate and turn left at the first opportunity on the road leading away from the parking lot. **Please note that we have been instructed that no one is to drive on to the sports field because of possible damage to the irrigation system there.**

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Astronomy related articles on the Internet

EarthSky | Dwarf planet Quaoar has a ring!

Mysterious object unlike anything astronomers | EurekAlert!
The strange object sends out a beam of radiation for a minute every twenty minutes. Then it is one of the brightest radio sources in the sky. The observations match a predicted astrophysical object called an 'ultra-long period magnetar'. (A magnetar is a pulsar with an exceptionally strong magnetic field.)

At Jupiter, JUICE and Clipper Will Work Together in Hunt for Life - Scientific American
A soon-to-launch European mission is the first of two spacecraft - with the other coming from NASA - that will hunt for signs of habitability on Jupiter's icy moons.

New Space Radar Will Hunt Planet-Threatening Asteroids - Scientific American

Brian Greene answers 10 mind-bending questions about our Universe - NZ Herald

Does the Universe have an edge? | BBC Sky at Night Magazine

59 new exoplanets discovered around nearby stars (earthsky.org)
Astronomers have found and confirmed 59 new exoplanets. All of them are within 65 light-years of the Sun and orbit red dwarf stars. The total number of known exoplanets is now (26 March 2023) 5312.

From the hottest to the coldest places in the Universe - Big Think

Exploring Mars caves, leaving 'breadcrumbs' (earthsky.org)
Martian lava tube – Wikipedia
These "caves" on Mars are actually lava tubes and are obvious places for colonists to live in to protect them from small meteorites and cosmic rays.

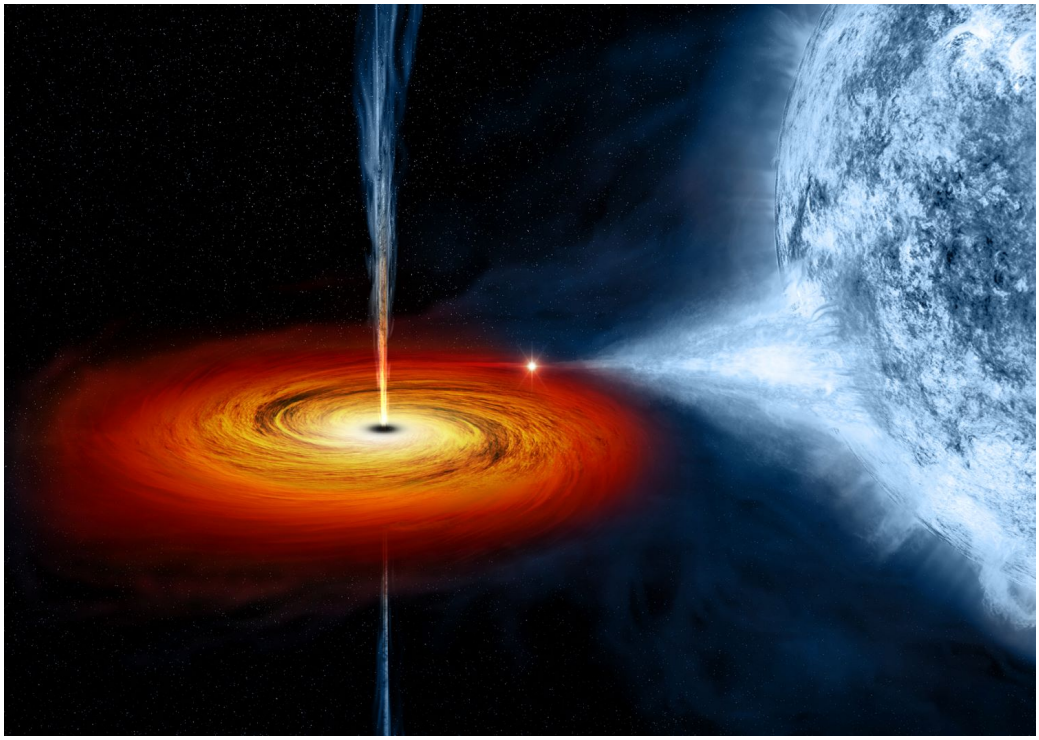
What's the biggest black hole in the universe? | Live Science
There is a theoretical limit to the size of black holes. And the largest directly observed black hole with a confirmed mass is just about at this limit.

NASA's Roman Telescope: How James Webb's successor will map universe with colossal amounts of data | Euronews
It will be able to create infrared images that are 200 times larger than those of the HST while providing the same rich level of detail with its similarly sized 2.4 metre diameter mirror. It is scheduled for launch by May 2027.

Volcanoes on Venus … Wow! New map here (earthsky.org)
There are 85 000 volcanoes on Venus.

Innermost TRAPPIST-1 exoplanet is hot and airless (earthsky.org)
The JWST has been taking its first close look at the TRAPPIST-1 planetary system in recent months. The system contains seven Earth-sized planets.

Immediately below: Artist's depiction of a black hole pulling matter off its companion star (a white dwarf) onto its accretion disk and emitting jets of particles along its spin axis.



Below: An artist's depiction of an imaginary scene from an exoplanet orbiting a double star. The double star consists of a red giant and a white dwarf orbiting one another. The dwarf is pulling matter off the surface of the giant. The matter is attracted to the accretion disk of the dwarf. A moon of the planet is seen on the bottom left.

What's up in May 2023 - by Johan Smit

Planets:
This month there is little planet viewing during the middle of the night.
Venus and Mars are visible after sunset, slowly moving closer together during the month.
Saturn starts rising around 01:30 at the beginning of the month. And at the end of the month around 23:00.
Jupiter is a bright "morning star" the whole month, and Mercury joins it from the middle of the month, low on the horizon below Jupiter. Best seen near the end of the month with its greatest elongation on 29 May.
May 22 to 24: Moon near Venus at noon. Use the chance to spot Venus in daylight.
Venus will be 12 degrees east of the Moon on the 22nd and 2.5 degrees separated on the 23rd. On the 24th the Moon will be 10 degrees east of Venus.
Penumbral lunar eclipse at sunset on May 5. The eclipse is in progress at sunset/moonrise. Ends around 21:31. The Moon never enters the darkest part of the shadow (umbra). Expect to see a very slight darkening of the lunar surface.

Close approaches:
10 May. Moon occults Tau Sagittarii.
23 May Moon occults Iota Geminorum.

Special day:
National Space Day. First Friday in May. 05 May. Celebrate this while enjoying the penumbral eclipse.

Outreach:
Saturday 13 May. Outreach at Craig Kloke's church. We need volunteers with telescopes. Always a very nice event. You will be sorry if you missed this one.
Saturday 20 May. Join the Mountain Club for a dark sky event.
Please contact Johan Smit to volunteer your services.

Some local star lore:
The South African farming community (Afrikaanse Boere), believe that the first frost will appear when the Seven Sisters (Pleiades) set with the Sun. According to my reckoning that will happen around 15 May. Start getting the winter clothes ready and check if this belief holds water (or rather, frost).

Some science fiction lore:
May the 4th, Star Wars day.
And while we play around with science fiction we may as well try and see some special stars, a white and red dwarf. It may be a bit late, but these should be visible early in May (and earlier) for about an hour after sunset. Just "under" Orion you will see the stars of Eridanus, the River.
In Star Trek lore, Vulcan is the home of logic, learning and the deeply beloved first officer Mr. Spock.
While Vulcan is fictional, the star system it belongs to, namely 40 Eridani, is very real.
It's located only 16.5 light-years away from Earth and its primary star can be spotted with the naked eye.
Look for Omicron Eridani, also called 40 Eridani. Also named Keid.

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83” away from it will be seen Omicron 2B. First white dwarf identified in 1910. Magnitude 9.8.
7.5” distance from Omicron 2B: Red dwarf. Mag 10.8. Variable (flare star) DY Eridani.
May the 4th be with you.
Logical greetings from Vulcan.

Lastly:
With winter approaching and some nice star parties coming up it is time to dust off your equipment and start using / practising with it. Star party season is upon us.
I have seen too many people struggling with untested equipment at star parties. Sort out technical issues before, in the comfort of your home. And plan how you will pack it. I saw too many people arriving at a star party without some critical part of their gear.
The point is, get ready so that when we are ready, so are you and your equipment. The various “experts” in our society will gladly help you. **Ω**

Feature of the month: The Fermi paradox – by Pierre Lourens

The **Fermi paradox** is the discrepancy between the apparently high likelihood of the existence of intelligent extraterrestrial life and the lack of conclusive evidence for its existence. As someone put it, "If life is so easy, someone from somewhere must have come calling by now."

Italian-American physicist Enrico Fermi's name is associated with the paradox because of a casual conversation in the summer of 1950 with fellow physicists. While walking to lunch, the men discussed recent UFO reports and the possibility of faster-than-light travel. The conversation moved on to other topics, until during lunch Fermi blurted out, "But where is everybody?"

There have been many attempts to resolve the Fermi paradox. Some will be discussed in what follows. They are all somewhat speculative.

Life is extremely rare in the Universe.

In this view, life is a very rare phenomenon. The chance that life arises on a planet is extremely small. There are even those who think that Earth is the only planet in the Galaxy - or even in the Universe - on which life arose. Therefore intelligent extraterrestrial life is very rare – or even non-existent.

The lifetime of a technological civilization is short.

There are two ways in which an intelligent species that has created a technological civilization can destroy itself. One is by polluting and damaging its home planet to such an extent that it becomes uninhabitable for that species. Another is by global nuclear war. Natural disasters – like an asteroid impact, a nearby supernova explosion or large scale volcanism – can also destroy such a species.

Given the age of the Universe (13.8 billion years) and the widely different ages of stars (and their accompanying planets), it is unlikely that the lifetime of such a civilization will overlap with ours.

We are too primitive.

In this view, intelligent aliens are simply too intelligent and their technology too advanced for them to be interested in us. To them, we are too stupid and our technology too primitive to bother contacting us.

The great silence theory.

Another argument is that intelligent aliens prefer not to make their presence known. They have a “prime directive” (as in the SF movies “Star Wars”) which states that it is immoral to interfere in any way in a technological civilization. To them, Earth is a “nature reserve” that must be left alone.

Distance and the speed of light.

Lots of technological civilizations exist now, but the immense distances between stars and the upper limit to the speed of travel - which is the speed of light - makes travel between stars impossible.

The kind of intelligence that creates a technological civilization is very rare.

The oldest known fossils on Earth are 3.5 billion years old. These are fossils of stromatolites, which are huge colonies of cyanobacteria. It took 3.5 billion years for humans to evolve from these and was the result of a long chain of unlikely random events. The argument goes that this shows that this kind of intelligence is extremely rare in the Universe.

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Technological civilizations destroy others.

This line of thinking is that a technological civilization destroys others as fast as they appear, motivated by fear that others will become a threat, or simply out of aggression. **Ω**

NOTICE BOARD

Gaia Vari. This is a citizen science project funded by ESA, which supports variable star classification. Astronomers working on the GAIA space mission need your help to classify variable astronomical sources – on your PC.
Gaia Vari — Zooniverse Home | Gaia Vari

Solar active region spotter. You'll help identify long-lived active regions on the Sun using data from the SDO (Solar Dynamics Observatory) – on your PC.
Solar Active Region Spotter — Zooniverse

Alien mother ship near the solar system!!!! This far fetched theory is expounded in a new draft paper that was co-written by maverick astronomer Avi Loeb of Harvard University and the head of the Pentagon's UFO office. According to them, an alien mother ship is hovering around our solar system and sending out "dandelion seeds" in the form of small spacecraft (guided by AI) this way, so as to gather and send back information about humanity to the mother ship.
An Alien Mothership Could Be Sending Tiny Probes to Study Earth! | Weather.com

The Galileo Project. The aim of this project is to do a systematic scientific search for evidence of extraterrestrial technological artefacts and is led by prof Avi Loeb of Harvard University. He has a battery of instruments to observe UAPs in the optical, infrared, radio and audio bands in order to acquire accurate data about them. Good luck to him! He also advocates space missions to rendezvous with interstellar objects and observe them up close in high resolution. (In this context, recall his far fetched theory that Oumuamua is an alien artefact.) See video clips.
The Galileo Project (harvard.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.

Astronomy related images, video clips and documentaries on the Internet

Bright planets Venus-Jupiter 2023: Great photos here (earthsky.org)
EarthSky Community Photos | EarthSky
See photos of the Venus-Jupiter conjunction in early March 2023.

When space breaks records: some amazing facts about our Universe (msn.com)

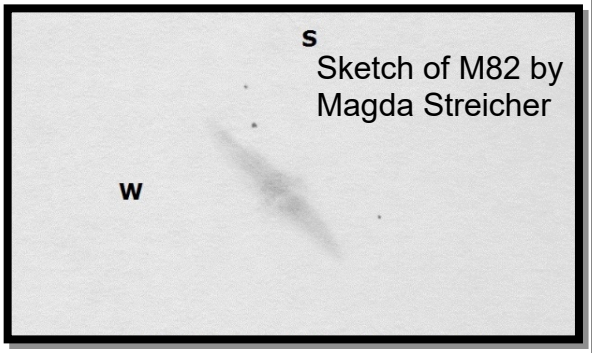
Shanghai Astronomy Museum / Ennead Architects | ArchDaily

See 13 volcanoes from space in this video (earthsky.org)
See 13 volcanoes on the third planet from the Sun.

Astronomy basics: What is a galaxy?

What is a galaxy? All you need to know (earthsky.org)

Observing: The best known galaxies - by Magda Streicher



Sketch of M82 by Magda Streicher

Perhaps the best known galaxies in the northern hemisphere are the close pair NGC 3031 (Messier 81) and NGC 3034 (Messier 82), almost at declination +70˚. What an absolute delight for this southern observer to be able to study these famous galaxies!M81 and M82 were discovered by Johann Bode on a cold New Year's Eve in 1774 and were added to Messier's list in February 1781. They are part of the second nearest galaxy group, 10 million light-years distant after the Sculptor Group of Galaxies which is about 8 million light-years away and includes our own Milky Way.

M81 appears as a hazy, large oval cloud in a north to south direction, which grows slowly brighter towards a non-stellar nucleus with a well-defined large halo. The flimsy exterior had me catching my breath with its beauty and resembled almost lacy streaks misting away from the core. M82 is located only 38' further north and is very different in shape.

The outstanding brightness of this cigar-shaped galaxy took me by surprise. The high surface brightness is remarkable, with a nucleus that appears slightly off-centre towards the south-east. Clear in my mind to this day is the striking broken middle part which cuts the central area into two parts. The south-western part is considerably brighter and thinner than the mottled eastern part, which gradually disappears into nothingness. On my last night at the Astro camp in Portugal I repeatedly went back to observe these two galaxies over and over again! **Ω**

(Magda Streicher's e-mail address: magdalena@mweb.co.za)

OBJECT	TYPE	RA	DEC	MAG	SIZE
NGC 3031 Messier 81	Galaxy	09 h 55.6 m	+ 69° 04.0'	6.9	24' x1 3'
NGC 3034 Messier 82	Galaxy	09 h 55.8 m	+ 69°41.0'	8.4	11.2' x 4.6'

M 81, imaged by the HST.

M 82, imaged by the HST.

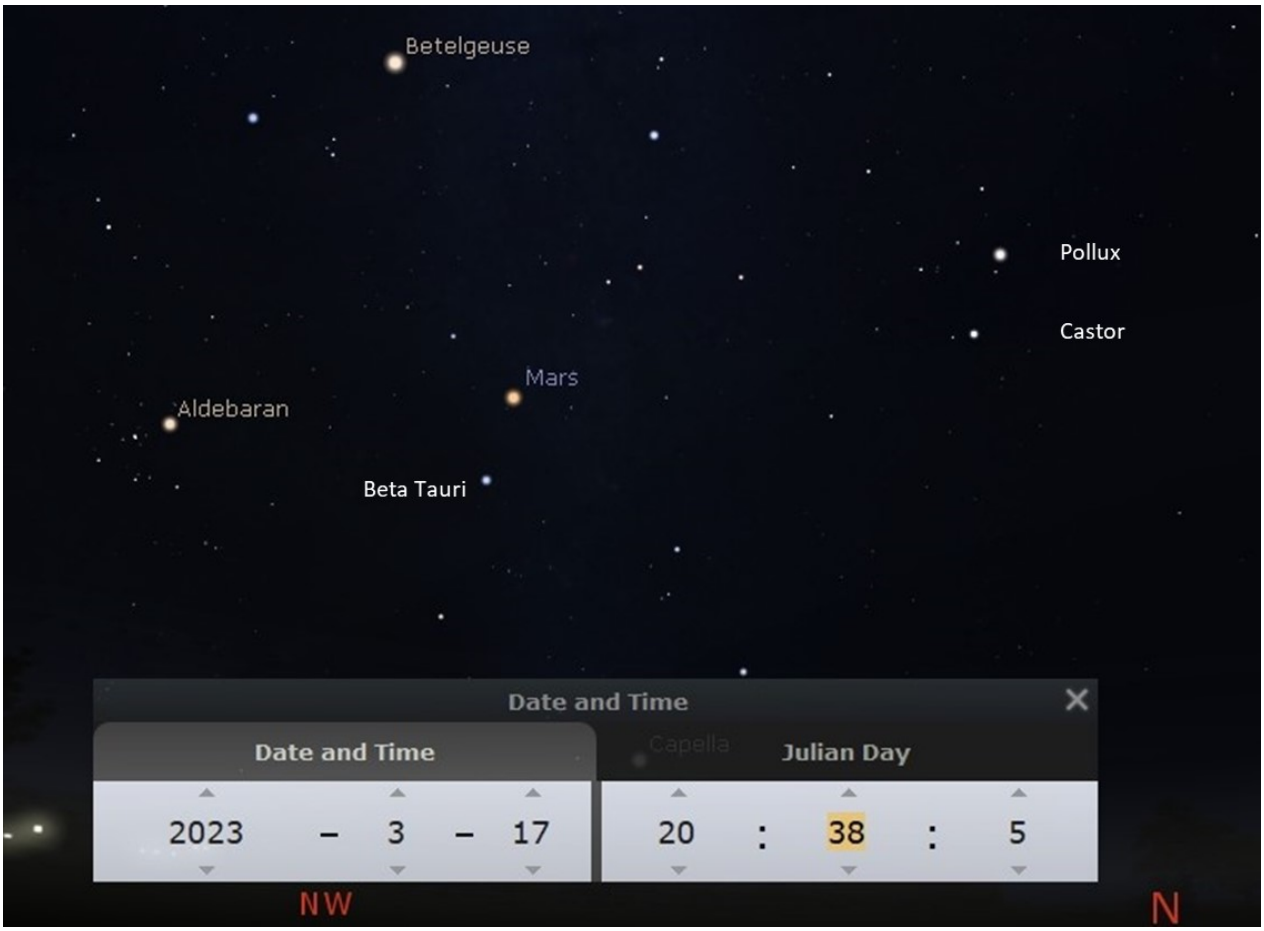
Report of the observing evening on March 17th 2023 - by Michael Poll

Quite a good crowd – more than 20? – and at least half a dozen telescopes, and no cloud. This was the first cloud free observing evening since August 2019.

Venus was in the northwest showing a large gibbous phase. It soon set behind the trees, leaving Mars as the only planet in the sky. Mars is fairly bright, but if not known could easily be mistaken for a star. On this particular evening Mars and Beta Tauri showed a very similar configuration to Castor and Pollux – each pair was the same distance apart and lay at the same angle to the horizon. They also showed similar comparative brightnesses – Mars was magnitude 0.7 compared with Pollux at 1.2, and Beta Tauri at magnitude 1.7 compared with Castor at 1.9. (see image from Stellarium).

There were a number of visitors, and the Skyguide was used as an introduction to the sky. The zodiac signs could be seen in the north (Taurus, Gemini, Cancer and Leo), and Orion's Belt was used as a signpost for Sirius and Aldebaran. The introduction to the southern Milky Way were the crosses: Southern Cross, Diamond Cross and False Cross.

The light pollution is awful, even the bright clusters were compromised – years ago we even used to look for galaxies, but no longer. The clusters shown included the Jewel Box, IC2602 (Southern Pleiades), and the Pleaides. We also looked at M42 in Orion. **Ω**



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 "2023 SKY GUIDE Southern Africa". Ω**

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