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

NEWSLETTER JUNE 2020

NEXT MEETING

This will be a virtual meeting. See page 6 for details on how to join it.

Date and time: Wednesday 24 June at 18h45 for 19h15.

Programme:

- **Beginner's Corner:** "3D designing and printing for astronomy" by Craig Kloke.
- **What's Up:** by Fred Oosthuizen.
- **Main Talk:** "Reminiscing: Pretoria ASSA through the years", a panel presentation on the great times had by ASSA Pretoria members.

NO OBSERVING EVENING THIS MONTH

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Astronomy-related articles on the Internet

Meet M13, the Great Cluster in Hercules. Many stargazers call it the finest globular cluster in the northern half of the heavens. It's M13, also known as the Great Cluster in Hercules. It is now becoming visible in the evening.
https://earthsky.org/clusters-nebulae-galaxies/m13-finest-globular-cluster-in-northern-skies?utm_source=EarthSky+News&utm_campaign=6b6f379b5b-EMAIL_CAMPAIGN_2018_02_02_COPY_01&utm_medium=email&utm_term=0_c643945d79-6b6f379b5b-394671529

First-ever measure of brown dwarf wind speed. Brown dwarfs are too large to be considered planets, but too small to shine as stars do. They have deep atmospheres and strong winds. It turns out that the winds are powerful, clocking in at 2 293 kph. That's faster than any winds known in our solar system.
https://earthsky.org/space/brown-dwarf-wind-infrared-radio-spitzer-vla?utm_source=EarthSky+News&utm_campaign=537d73b318-EMAIL_CAMPAIGN_2018_02_02_COPY_01&utm_medium=email&utm_term=0_c643945d79-537d73b318-394671529

First-ever comprehensive geologic map of the moon.
https://earthsky.org/space/first-ever-comprehensive-geologic-map-moon?utm_source=EarthSky+News&utm_campaign=8b23c7ec8c-EMAIL_CAMPAIGN_2018_02_02_COPY_01&utm_medium=email&utm_term=0_c643945d79-8b23c7ec8c-394671529

An unique (so far) gravitational wave signal. LIGO and Virgo detectors have now captured the first gravitational waves from a binary black hole merger where the black hole masses are unequal.
https://earthsky.org/space/a-gravitational-wave-signal-like-none-before

A mystery solved? Fast Radio Burst detected within Milky Way. **F**ast **R**adio **B**ursts (FRB's) are mysterious, short, intense bursts of radio waves coming from locations all over the sky. All other FRB's have been extragalactic.
https://earthsky.org/space/fast-radio-burst-detected-within-milky-way

New closest known black hole lies in a visible star system. This black hole is only 1 000 light-years from Earth and forms part of a triple system that can be seen with the unaided eye. https://earthsky.org/space/closest-black-hole-hr-6819-eso-telescopium?utm_source=EarthSky+News&utm_campaign=d2db7c252f-EMAIL_CAMPAIGN_2018_02_02_COPY_01&utm_medium=email&utm_term=0_c643945d79-d2db7c252f-394671529

Saturn's bizarre polar hexagon is really hazy. A new study reveals details of a multi-layered, sandwich-like haze that hangs above the famous hexagon at Saturn's north pole.https://earthsky.org/space/haze-saturn-hexagon-cassini-hubble?utm_sourcews&utm_campaign=c711d59fcf-EMAIL_CAMPAIGN_2018_0e=EarthSky+N2_02_COPY_01&utm_medium=email&utm_term=0_c643945d79-c711d59fcf-394671529

How to spot ISS in your sky. Learn to watch ISS moving silently and steadily across your night sky. https://earthsky.org/human-world/how-to-spot-the-international-space-station?utm_source=EarthSky+News&utm_campaign=c37553f1e1-EMAIL_CAMPAIGN_2018_02_02_COPY_01&utm_medium=email&utm_term=0_c643945d79-c37553f1e1-394671529 (Continued on next page.)

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Touching the asteroid Ryugu. It's a spectacular achievement to rendezvous with an asteroid as it's whizzing around the Sun. It's even more amazing to collect a sample. That's what the Hayabusa2 spacecraft did in February 2019. Here's what researchers learned.https://earthsky.org/space/asteroid-ryugu-hayabusa2-findings?utm_source=EarthSky+News&utm_campaign=e6a91a8b7c-EMAIL_CAMPAIGN_2018_02_02_COPY_01&utm_medium=email&utm_term=0_c643945d79-e6a91a8b7c-394671529

Question: What do you get when you divide the circumference of the Sun by its diameter? See answer below.

Astronomy basics: The large scale structure of the Universe

See a computer simulation of the evolution of the Universe from its beginning until now. In the simulation, galaxies and the dark matter around them finally formed web-like structures that resemble the shapes observed by the most recent cosmic surveys. Also, very importantly: the simulation provided support for our current "standard model" of cosmology.
https://www.youtube.com/watch?v=74IsySs3RGU

Feature of the month: Two planets around Proxima Centauri confirmed

Proxima Centauri is the closest star to the Sun. It is a red dwarf star orbiting a double star at a large distance.

Astronomers have confirmed the existence of an exoplanet with a mass of 1.17 Earth masses orbiting in the habitable zone of this star. It was named Proxima Centauri b.
https://earthsky.org/space/exoplanet-proxima-centauri-b-confirmed?utm_source=EarthSky+News&utm_campaign=c37553f1e1-EMAIL_CAMPAIGN_2018_02_a02_COPY_01&utm_medium=email&utm_term=0_c643945d79-c37553f1e1-394671529

A second exoplanet with a mass of 7 Earth masses orbiting this star was confirmed. It was named Proxima Centauri c.
https://earthsky.org/space/2nd-exoplanet-confirmed-proxima-centauri?utm_source=EarthSky+News&utm_campaign=1418849afb-EMAIL_CAMPAIGN_2018_02_02_COPY_01&utm_medium=email&utm_term=0_c643945d79-1418849afb-394671529

Astronomy-related images, video clips and documentaries on the Internet

The SKA. See a short video clip about it. (And read more if you want to.)
https://www.skatelescope.org/

Alien life, deep time, and our place in cosmic history. A 30-minute documentary. (I rate it as excellent - Editor.)
https://www.youtube.com/watch?v=SUelbSa-OkA

Photos: Solar eclipse 2020. https://www.msn.com/en-za/news/weather/photos-solar-eclipse-2020/ss-BB15Mj9x?ocid=msedgntp

Answer to question: π in the sky!

Observing: A soft cotton ball - by Magda Streicher

The constellation Corvus is renowned not only for its multitude of galaxies, but also boasts the famous M104 on its boundary with Virgo, better known by its nickname, The Sombrero Galaxy.

There is also a beautiful planetary nebula, NGC 4361, that gives the impression of a soft, nearly see-through cotton ball, seen at first as just a relatively large roundish haze. Closer investigation shows it to be slightly elongated in an east to west direction, with a soft grey colour. It is seen easily through a medium size telescope, and higher power brings surface detail and mottling to the fore. Careful study shows a soft outer hazy edge that is not completely round, but displays some broken pieces at the edge.

What makes this planetary nebula special are the knots and hazy patches on its surface and the central star of magnitude 10 that can be seen without any effort. But what I love most about this nebula is the dark void around the central star.

There is a very faint double star close to the north-eastern edge of the nebula. The star field is not busy, and starlight makes this planetary nebula almost appear to be standing alone.

Try to search out these lesser-known objects and bypass some of the brighter, more familiar objects – it brings a different enjoyment. **Ω**

Object	Type	RA	DEC	MAG	SIZE
NGC 4361	Planetary nebula	12 h 24.5 m	-18˚48’	10.3	75”

NGC 4361 imaged through a 24 inch telescope

Chairman's report for the virtual meeting on 27 May 2020 – by Johan Smit

This meeting was the first during the lockdown due to the Covid-19 pandemic. While the whole country has been in lockdown, it also opened new opportunities for all who took on the challenge of being isolated from family, friends and colleagues.

The Pretoria Centre took up this challenge by arranging this first, albeit a trail, meeting via WebEx, a digital meeting platform developed by Cisco. The platform has been in existence for many years and we used it previously to invite international speakers to present at some of our club meetings.

Since it was a test meeting, the agenda was restricted to two sessions, namely the Beginners Corner and the What's Up for the month of June.

Percy Jacobs presented a talk entitled "A Journey through the observational Universe". His talk was based largely on the book, "A Journey through the Universe" by Ian Morrison.

He discussed the work of astronomers who have contributed to what we know and understand today. These astronomers did actual observations and then applied the "maths", helping their successors to develop their knowledge and that of mankind.

Galileo, by applying logical thinking dispelled the Ptolemaic models of Mercury being closest to the Earth and that Venus was always between the Sun and Earth, by showing that Venus displayed "phases" like the Moon because it moved around the Sun.

Tycho Brahe's observation of a super nova in Cassiopea in 1572 dispelled the idea at the time that the stars in the sky were stationary and the picture never changed. He also charted the paths of the planets and this led to his student, Johannes Kepler's, three laws of planetary movement. These laws can be seen in action in the following three videos:

- http://www.pretoria-astronomy.co.za/images/keplers_1st_law.mp4,
- http://www.pretoria-astronomy.co.za/images/keplers_2nd_law.mp4, and
- http://www.pretoria-astronomy.co.za/images/keplers_3rd_law.mp4

Following on Kepler's work, Isaac Newton worked on gravity and came to the realization that there is an attraction between all bodies. He also discovered the Law of Universal Gravitation, namely:

Every particle attracts every other particle in the Universe with a force that is directly proportional to the product of their masses and inversely proportional to the square of the distance between their centres.

By implementing the Three Planetary Laws of Kepler and Newton's Universal Law of Gravitation it is possible, by using the main formulae to calculate the details of planetary motion.

Percy also discussed the work of Charles Messier who gave us the Messier catalogue of 103 objects which could be eliminated by comet hunters. These objects can all be seen using small telescopes, preferably under good dark skies.

He further spoke about Edmond Halley, best known for the comet named after him. Halley was the person who first measured the distance from the Earth to the Sun, using the principle of parallax.

Percy concluded his presentation with a demonstration of using the gravitational formulae to determine the mass of Phobos, the satellite that orbits Mars.

He also showed some of the work of members of ASSA that utilised the clear skies of the past month or more to observe and photograph various objects in the sky.

The meeting was concluded by Louis Kloke who did an overview of what could be expected in the night sky during the month of June.

On the whole I believe this was a pleasant meeting, with a few teething challenges posed by the digital media. Those will be overcome because they were not major.

The whole lockdown scenario, in my view, has two major advantages for us, amateur astronomers. We are now able to attend many meetings all over the country and the world and be able to interact with top amateurs and professional astronomers through the digital meetings most ASSA centres are presenting, as well as those of other countries world wide.

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The second advantage is that, with all the travel restrictions and the resulting decrease in air pollution, we now have clearer skies, which should lead to an increase in the number of eyes and cameras behind telescopes. It already helped a number of amateurs locally to seriously think about and work on remote controlling their telescopes. **Ω**

The virtual meeting on 24 June 2020

The Pretoria Centre management committee decided at a meeting held on 4 May 2020 to embark on a series of Virtual Meetings via WebEx for the duration of the lockdown period. The second of these meetings will take place on Wednesday 24 June 2020 (i.e. on the normal meeting date) at 18:45 for 19:15.

Johan Smit will be responsible for the technical aspects of the meeting. He will send an email invitation to all members. You, the member must follow the instructions in the email to enter the meeting. Johan will arrange a test meeting with members who are unsure if their equipment is compatible. Please email him at johanchsmit@gmail.com to set up a test meeting.

WebEx is a safer option than other meeting platforms and can be used across most platforms, including Android and iOS. This will allow people to attend the meetings via their smartphones and tablets as well as their computers.

Johan Smit will email the link to join the meeting 30 minutes before the start to all members. It will also be placed on our Facebook page, so be at your computers at that time! Ω

Summary of "What's Up?" for July to be presented on 24 June 2020 - by Fred Oosthuizen

MOON PHASES:
The Full Moon is on the 05th The Last QUARTER on the 13th – New Moon on the 20th and the First QUARTER on the 27th
The 85 Kilometre wide Archimedes crater that dominates the plains of the south-eastern Mare Imbrium is best seen on about the 11th of the month and the perfectly circular Plato crater and the neighbouring craters are also well worth investigation.

PLANETS
Shortly before sunrise all five naked-eye planets can be seen in the sky together. At the beginning of the month VENUS, MARS, JUPITER and SATURN are visible. MERCURY and VENUS can be found just east of ALDEBARAN the bright star in the constellation Taurus low in the north-eastern sky. By the end of the month JUPITER and SATURN set before the end of the month, leaving MERCURY, VENUS and MARS visible at dawn. In the early evening twilight only SATURN and JUPITER can be seen.

STARS and CONSTELLATIONS
The magnificent star studded winter Constellation Scorpius and its neighbors, Sagittarius, Corona Australis, Ara , Norma, Lupus, libra , Serpens and Ophiuchus, contain the richest part of the Milky Way and are all very prominent and well positioned for excellent viewing of the myriad of Globular and Open clusters, Nebula, Variable stars, Double stars, Close binary stars and Galaxies. All as follows.
M4, M6, M7, NGC6302, Antares, Shaula Graffias in the Constellation Scorpius:
M8, M17, M18, M20, M21, M22, Kaus Australs, Nunki, Kaus Media and Kaus Borealis in the Constellation Sagittarius:
NGC5643, NGC5822, NGC5224, NGC5882 and NGC5986 in the Constellations Lupus/ Norma.
M9, M10, M12, M14, M19, M62, M107, Rasalhague, Sabik, Yed Prior, Cebairia in the Constellation Ophiuchus.

METEOR SHOWERS
July Phoenicids: July 10 – 16. Maximum July 13 best viewed from 23h00 to 05h00
July Aquariids: July 21 – Aug 29. Maximum July 29 best viewed from 22h00 to 05h00
See also, SKY and TELESCOPE: Interactive Sky Charts: World Wide Telescope:
Toshimi Taki Star Maps and Google Sky. **Ω**

NOTICE BOARD

Discover comets on your computer screen. Almost every day, the SWAN (**S**olar **W**ind **An**isotropies) instrument aboard the Sun-orbiting SOHO (**So**lar and **H**eliospheric **O**bservatory) makes a map of the sky. Anyone with internet access can view the maps and join the search for new comets. To date, 12 comets have been spotted in the SWAN data, all by amateur astronomers. An amateur astronomer spotted the latest one, namely comet SWAN (C2020 F8), while inspecting images from this instrument that had been posted on the Internet. It was the 8th comet he discovered this way. https://earthsky.org/space/discovery-comet-swan-solar-watcher-soho?utm_source=EarthSky+News&utm_campaign=f578ea5b8f-EMAIL_CAMPAIGN_2018_02_02_COPY_01&utm_medium=email&utm_term=0_c643945d79-f578ea5b8f-394671529
To see the images and make a movie out of them for your search, go to
https://sohowww.nascom.nasa.gov/data/summary/swan/swan-images.html
and left click on "SOHO Movie Theater".
In this connection, see also:
https://earthsky.org/space/sohos-4000th-comet?utm_source=EarthSky+News&utm_campaign=a8459c5685-EMAIL_CAMPAIGN_2018_02_02_COPY_01&utm_medium=email&utm_term=0_c643945d79-a8459c5685-394671529

The winter solstice of the southern hemisphere was on Saturday 20 June 2020 at 23:43 SAST. From then on, the path of the Sun through the daytime sky started shifting back south again. It does so slowly at first, and faster later on. See page 4 of the newsletter for September 2010.

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.

Data base: Members are reminded that a data base of the books in our library is to be found on our website.

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