The PRETORIA CENTRE

of the

Astronomical Society of Southern Africa

www.pretoria-astronomy.co.za

NEWSLETTER JANUARY 2022

NEXT MEETING

Internet meeting. *

Date and time: Wednesday 26 January 2022 at 19h00.

Programme: “A tale of 3 machines and which ones would I use to make telescope parts” by Craig Cloke.

Chairman: Louis Cloke.

*** You will receive /an e-mail invite from Johan Smit around 18:30 to join the meeting. Please join as quickly as possible.**

Virtual observing evening chat Friday 21 January 2022

Like last month, this will start at 18h30. Johan Smit will open the meeting at around 18h15 and anyone who wishes to join the chat is welcome to join in the fun. Be seated in front of your computer at 18h15 with a glass of wine/beer/coffee.

TABLE OF CONTENTS

Astronomy-related articles on the Internet

Astronomers have found the Milky Way's first known 'feather' | Science News

This tiny, sizzling exoplanet could be made of molten iron | Science News

New Deep Learning Method Adds 301 Planets to Kepler's Total Count (nasa.gov)
This brings the total number of known exoplanets to 4870.

EarthSky | Hera mission following after DART's asteroid impact

EarthSky | Double stars: How to find, observe and enjoy
This double star observing guide gives you a range of choices for observing with your eyes alone, or go further using binoculars or a telescope.

EarthSky | Tiny-alien invasion risk: More space biosecurity measures needed?
Space biosecurity concerns itself with both the transfer of organisms from Earth to space (forward contamination) and vice-versa (backward contamination). At present the risk of alien organisms surviving the journey is low, but not impossible. Risks that have low probability of occurrence, but have the potential for extreme consequences, are at the heart of biosecurity management. Because when things go wrong, they go really wrong.

EarthSky | M87's jet has a double-helix structure
M87 is the galaxy whose central supermassive black hole was imaged directly in 2019. It's some 50 million light-years away. The central black hole has a mass of 6.5 **billion** $M_\odot$ and a jet extends from it. The jet has a double-helix shape.

A Key to Life? -Hubble Detects First Exoplanet Magnetic Field - The Daily Galaxy
HAT-P-11 b is a Neptune-like exoplanet. Its mass is 26.69772 Earths, it takes 4.9 days to complete one orbit of its star, and is 0.05254 AU from its star. Its star is a K-type main-sequence star, aka a K dwarf or orange dwarf. Evidence that the exoplanet has a magnetic field and an associated extended magnetosphere was found.

"Nomads of the Galaxy" –Unmoored, Rogue Planets May Outnumber Milky Way's Stars - The Daily Galaxy
Astronomers have just discovered at least 70 new rogue planets in our galaxy.

EarthSky | Top 10 stories of 2021 from EarthSky

EarthSky | 5 weird things that happen in outer space

EarthSky | Juno spacecraft's 4 latest discoveries at Jupiter

EarthSky | Scientists find water in Mars' Grand Canyon
The European-Russian Trace Gas Orbiter has discovered subsurface water ice in Valles Marineris on Mars, the largest canyon system in the solar system.

Fastest-spinning white dwarf ever seen rotates once every 25 seconds | Science News

NOTICE BOARD

Another Zooniverse project. Help explore the surface and weather of Mars' south polar region, using your PC. Planet Four — Zooniverse

Another Zooniverse project. Join the hunt for solar jets, using your PC.
Solar Jet Hunter — Zooniverse

Weekly astronomy and space news. For this, tune in to ***Looking Up*** on FMR (**F**ine **M**usic **R**adio) 101.3 every Friday at 17h10 SAST, brought to you by ***Kechil Kirkham*** (Cape Centre committee member), or listen to the podcast

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.

Astronomy basics: The Magellanic Clouds

Lucky Southern Hemisphere observers get to see something that many northerners never see: the Magellanic Clouds. The Large Magellanic Cloud is only 163 000 light-years away. The Small Magellanic Cloud is only 206 000 light-years away. These dwarf galaxies are satellites of our Milky Way.
EarthSky | The Magellanic Clouds, our galactic neighbors

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

EarthSky | Photos and video: December 4 total solar eclipse
The total solar eclipse of December 4, 2021, took place over Antarctica and the Southern Ocean. Not many people saw it.

EarthSky | Pleiades – or 7 Sisters – known around the world
The legendary Pleiades – photographs and more.

EarthSky | EarthSky's top photos from 2021

Five of the most exciting telescope pictures of the universe (phys.org)

EarthSky | 10 best northern lights photos of 2021

Observing: A southern double cluster - by Magda Streicher

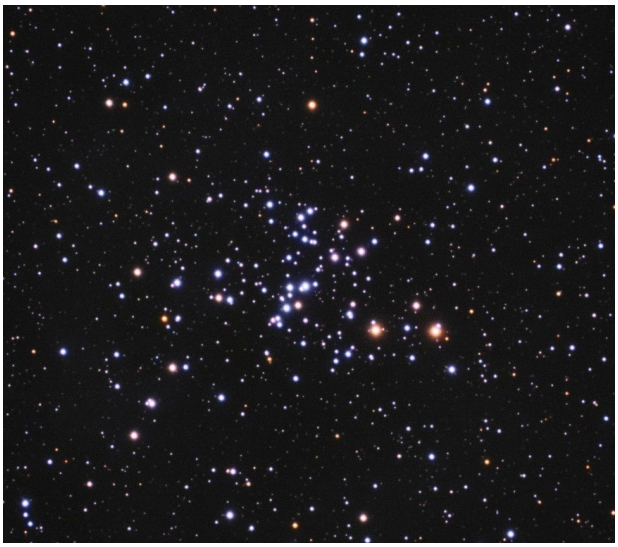
Not only the Northern guys can boast a double cluster, situated in the constellation of Perseus, of which they are very proud, the Southern Hemisphere, too, hosts what could be referred to as double cluster of their own.

The constellation Puppis was once part of a larger constellation called the Argo Navis. Some of the original bright stars belonging to the main constellation have now been divided between four constellations. The brightest star in Puppis is zeta Puppis, also called Noas, and the only star in this constellation with a reasonably easy name. The constellation is, however, a full house of lovely open clusters and nebulae of which some can be admired through binoculars in relatively dark skies.

Two of the clusters, NGC 2477 and NGC 2451, can be seen as our own double cluster; although not similar each has its own identity. NGC 2477 is a naked-eye open cluster just 2.5 degrees west of zeta Puppis (aka Noas). It first appears as a faint mist or what appears, perhaps, to be a globular cluster. The cluster appears as a beautiful dense grouping filled with various magnitude stars easily visible to the naked eye. This striking group contains a few hundred stars crowded into only a few arc-minutes. The close neighbour NGC 2451, which can be described as the double partner, can be found only a degree north-west of NGC 2477, and is visible through binoculars. This is a lovely, wide, loose, bright group and houses around a dozen colourful stars with a magnitude 3.6 orange coloured star claiming the focus. The two clusters appear more or less aligned to our line of sight with the fainter NGC 2477 further away.

So why do we call it the Southern Double Cluster? The simple reason is that both are bright and easy to see and through binoculars and even with the naked eye. **Ω**

NAME	TYPE	RA	DEC	MAG	SIZE
NGC 2447 Messier 93	Open Cluster	07 h 44.5 m	-23° 51.3’	6.2	15’
NGC 2451	Open Cluster	07 h 45.4 m	-37° 58.0’	2.8	45’



NGC 2447 aka Messier 93

NGC 2451

Magda Streicher’s e-mail address: magdalena@mweb.co.za

Feature of the month: The JWST – by Pierre Lourens

The James Webb Space Telescope (JWST) was finally launched on Christmas day 2021. NASA expects it to reach Lagrange point L2 on 23 January 2022.

It is a large, infrared-optimized space telescope. JWST's instruments are designed to work primarily in the infrared range of the electromagnetic spectrum, with some capability in the visible range. JWST has a primary mirror 6.5 meters in diameter and a sunshield the size of a tennis court.

JWST will observe primarily the infrared light from faint and very distant objects. But all objects, including telescopes, also emit infrared light. The lower the temperature, the less infrared light objects emit. To avoid swamping the very faint astronomical signals with radiation from the telescope, the telescope and its instruments must be very cold. Therefore, JWST has a large shield that blocks the light from the Sun, Earth, and Moon, which otherwise would heat up the telescope, and interfere with the observations.

In order for this to work, JWST must be in an orbit where all three of these objects are in about the same direction. The most convenient point is the second Lagrange point (L2) of the Sun-Earth system about 1.5 million km from Earth. At L2, the Sun, Earth and L2 remain aligned in a straight line as Earth orbits the Sun. There the JWST will be permanently in Earth's partial shadow, aka its "penumbra".

An observer moving with L2 would see a permanent annular eclipse of the Sun - eclipsed by Earth. The sunlight that gets to L2 will power the solar cells, but it makes the screening of the telescope more difficult.

But screening from sunlight will not make the telescope cold enough. The JWST's MIRI instrument carries detectors that need to be at a temperature of less than 7 degrees Kelvin (-266 degrees Celsius) to operate properly. Therefore, it also has a sophisticated cooling system.

The James Webb Space Telescope Launch Edition (Holiday-Weekend Feature) - The Daily Galaxy
See an animation of the JWST deployment sequence.

Webb's Launch GSFC/NASA

IAU outreach to amateur astronomers

The IAU (**I**nternational **A**stronomical **U**nion) is reaching out to engage with amateur astronomers. The IAU, as part of its Strategic Plan 2020-30, is reaching out to engage with amateur astronomers around the world. The IAU is the body of professional astronomers, with some 12,000 members in 90 countries and with its headquarters in Paris.

For the first century of its existence, the IAU has had very few formal contacts with the much larger body of amateurs around the world. This changed in 2019 with a successful one-day workshop for amateurs in Brussels, followed by the formation of a new WG (**W**orking **G**roup) in April 2021 for pro-am (**pro**fessional-**am**ateur) relations in astronomy.

At the present time, no one has a clear idea of how many amateurs there are in the world, but it is likely to be of the order of a million individuals, some two orders of magnitude greater than the number of active professionals in the IAU. The new pro-am WG wants to reach out to the amateur community, with the aim of promoting research collaborations with some of the most active amateurs.

Further workshops are also envisaged, following on from Brussels 2019, and the IAU program 'Meet the Astronomer', in which professionals give talks to amateur societies, will be further promoted. As a first step, the IAU has collected a database of the principal amateur societies, associations and groups in different countries, and from mid-December 2021 to February 2022 a survey will be carried out, asking both these societies and their members to respond with their views on how best amateurs can engage with the IAU professional community. The WG wants as many amateurs as possible to complete the survey, so that a statistical analysis of the interests of amateurs can be undertaken, and the level of amateur research being done.

Professional astronomers with an interest in pro-am relations are also encouraged to complete the survey, and some professionals may wish to join the new WG. The survey is a prelude to encouraging future professional-amateur research collaborations.

LINK to Survey: https://www.surveymonkey.com/r/IAU_ProAm
Feedback from the survey will be very helpful as we consider how best to move forward. Any questions should be directed to the IAU Pro-Am Working Group Secretary Yuko Kakazu at IAU.proam@gmail.com.
It is hoped to receive survey replies by the end of January in the first instance.
IAU Pro-Am Working Group **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,* 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
- **More web links can be found on page 118 of "2021 Sky Guide Africa South". Ω**

Pretoria Centre committee

Chairman	Bosman Olivier	082 883 1869	bosman.olivier@gmail.com
Vice Chairman	Johan Smit	072 806 2939	johanchsmit@gmail.com
Secretary	Michael Poll	074 473 4785	pollmnj@icon.co.za
Newsletter Editor	Pierre Lourens	072 207 1403	pierre.lourens@vodamail.co.za
Librarian and Webmaster	Danie Barnardo	084 588 6668	daniebar@webmail.co.za
Public Relations Officer	Bosman Olivier	082 883 1869	bosman.olivier@gmail.com
Observing Coordinator	Louis Kloke	083 393 3594	dawn@mweb.co.za
	(with Craig Kloke)	083 404 2059	info@craigsmodels.co.za
Treasurer and Membership Secretary	Michelle Ferreira	073 173 0168	michellem.ferreira@standardbank.co.za
Curator of Instruments	Louis Kloke	083 393 3594	dawn@mweb.co.za
	(with Johan Smit)	072 806 2939	johanchsmit@gmail.com