The PRETORIA CENTRE

of the

Astronomical Society of Southern Africa

www.pretoria-astronomy.co.za

NEWSLETTER SEPTEMBER 2022

NEXT MEETING

Internet meeting. *

Date and time: Wednesday 28 September at 19h00.

Programme: “Extra-terrestrial life, the Fermi Paradox and the Great Filter.”
by Danie Barnardo.

Chairperson: Michelle Ferreira.

* 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

Date: Friday 23 September. Time: 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	2
Astronomy related images and video clips on the Internet	2
What’s up in October 2022	3
Feature of the month: Life search in the atmosphere of Venus	4
NOTICE BOARD	4
An imaginary depiction of an Earth-like exoplanet	4
Astronomy basics: Brown dwarfs	4
Notes about the pandemic and our library & photograph	5
Photographs of the removal of books from our library	6
Book review	7
Observing: Marry me	8
Web links for the astronomy enthusiast	9
Pretoria Centre committee	9

Astronomy related articles on the Internet

Over time, Betelgeuse changed color. Now it's also lost its rhythm | Science News

Astronomers spot two neutron stars being swallowed by black holes – Monash Lens

Not one, but two asteroids might have slain the dinosaurs | Science News

The James Webb telescope spotted CO2 in an exoplanet's atmosphere | Science News

EarthSky | How to see and enjoy Jupiter's moons

The Radio Wave Mystery That Changed Astronomy : Short Wave : NPR
The history of the discovery of the first pulsar by Jocelyn Bell in 1968.

EarthSky | DART will impact an asteroid on September 26
DART is the first real test of our ability to defend Earth from an asteroid on a collision course with Earth. DART is targeting Didymos B, a moonlet of the asteroid Didymos. The moonlet is just 160 meters in diameter, and NASA hopes that the nudge from DART will push it slightly from its regular orbit. This test will show if we're ready to take on any threatening asteroids that could be headed our way.

Have the Planets of the Trappist 1 Star System Evolved like Venus? - The Daily Galaxy
TRAPPIST-1 is a small, cool M dwarf star 39 light-years away. All seven of TRAPPIST-1's known planets are about the size of Earth and three of them — planets labelled e, f and g — are believed to be in its habitable zone.

EarthSky | Webb directly images its 1st exoplanet

"We are Only Beginning to Understand Pluto's Life Story" (Weekend Feature) - The Daily Galaxy

EarthSky | Planetary heist: Massive stars steal planets
Astronomers say that massive stars - more than 3 times the size of our Sun - can rip planets out of their stellar nurseries in what they're calling a *planetary heist*.

Could Enigmatic Planet Nine Be a Massive Kuiper-Belt Disk? - The Daily Galaxy
There are now four theories about the cause of the perturbation in the orbits of some Kuiper Belt Objects (KBOs).
1. It is a ring in the Kuiper Belt containing a concentration of KBOs. Click on the link above to read more.
2. It is a concentration of KBOs at one spot in the Kuiper Belt.
3. It is a giant planet.
4. It is a grapefruit-sized black hole - with a mass of 5 to 10 times that of Earth - in the Kuiper Belt.

EarthSky | Our top 10 stargazing tips for beginners

Astronomy related images, video clips and documentaries on the Internet

EarthSky | Webb's largest image of galaxies yet View the image and take a closer look at some of the amazing galaxies that dwell within this image.

EarthSky | Bill Nye explains Webb Space Telescope images

Astronomy Photographer of the Year: 'Once in a lifetime' picture of comet wins award - BBC News See the most beautiful images entered for a competition.

What's up in October 2022 - by Bosman Olivier

Solar system:

Moon: Full 9 October (Whale Moon)
New 25 October

Mercury Greatest Western Elongation 8 October. At its highest point above the horizon in the morning sky just before sunrise.

On 4 October **Saturn** passes at 4 degrees north of the Moon at 15:51 UTC, while on 8 October **Jupiter** passes 2 degrees north of the Moon at 18:11 UTC.

Meteor Showers:

Draconids Meteor Shower – October 7. This is minor meteor shower with about 10 meteors per hour. Produced by dust grains left behind by comet 21P Giacobini-Zinner, discovered in 1900. Best viewed in the early evening instead of early morning like most other meteor showers. Runs annually from 6 to 10 October, peaks on 7 October this year. One might only see the brightest meteors as it is between first quarter and full moon.

Orionids Meteor Shower – October 21, 22. The Orionids is an average meteor shower with about 20 meteors per hour at its peak. It is produced by dust particles from the famous comet Halley. It runs annually from 2 October to 7 November and peaks in the evening of 21 October and the morning of 22 October. Best viewed from a dark place after midnight.

Galaxies:

Pegasus – This constellation can be seen to the north with its distinctive big square (The Square of Pegasus) as a prominent feature. To the top and left of the square one can see Enif, a bright red giant, more or less in line with the two top stars of the square (Markab and Algenib) When the line from Markab to Algenib is extended to slightly beyond Enif, one can find M15, a globular cluster a.k.a. the Great Pegasus Cluster.

The star at the bottom tight hand corner of the square is Alpheratz, the brightest star of the galaxy **Andromeda.** This galaxy is home to M31, the Andromeda Galaxy, our closest neighboring spiral galaxy in the Universe.

To the south of Pegasus lies the zodiac constellation **Aquarius**, the 10th largest constellation in the sky. It contains a number of Messier objects, such as M2 (globular cluster), M72 (globular cluster) and M73 (an asterism formed by four stars that are not connected to each other). It also contains several other famous objects. These include planetary nebulae NGC 7239 a.k.a. the Helix Nebula, and NGC 7009 a.k.a. the Saturn Nebula. The peculiar galaxies NGC 7727 and NGC 7252 are also known as the "Atoms for Peace Galaxy".

The brightest star in Aquarius is Sadalsuud (beta Aquarii), with an apparent magnitude of 2.87. It is a yellow supergiant and is approximately 540 light years distant. It is 2200 times as luminous as the Sun and has a mass 5 times that of the Sun.

The constellation **Grus (the Crane)** is one of the constellations known as the "Southern Birds", the other being Phoenix, Pavo and Tucana.

Grus is home to the Grus Quartet, a group of four interacting galaxies. These are the barred spiral galaxy NGC 7424, the lenticular galaxy NGC 7213 and the giant elliptical planetary nebula IC5148, a very faint nebula also known as the "Spare Tyre Nebula".

The southernmost of the October constellations is Octans which contains the southern pole star Sigma Octantis or Polaris Australis. This star is barely visible to the naked eye and is therefore not used for navigation, as opposed to Polaris with a magnitude of 1.98. The bright stars of the Southern Cross is easier to use to determine the position of the south celestial pole. Octans does not include many notable deep sky objects and those available are very faint. **Ω**

Sources:

Constellation Guide - https://www.constellation-guide.com/constellations-by-month/october-constellations/

Photo Pills - https://www.photopills.com/articles/astronomical-events-photography-guide

Feature of the month: Life search in the atmosphere of Venus

In 2023, the aerospace company Rocket Lab will launch a private mission to probe the atmosphere of Venus for signs of life. This follows the discovery of phosphine * in its atmosphere. On Earth, phosphine is only produced by microbes. Other biologically relevant chemicals have also been discovered in the atmosphere of Venus since then. See also "Feature of the month" in the October 2020 and in the April 2021 issues of this newsletter on our website. **Ω**

* Phosphine has chemical formula PH_3.

EarthSky | Launches: Rocket Lab probe to look for life in Venus clouds

NOTICE BOARD

Pioneering radio astronomer Frank Drake dies at age 92. Frank Drake, an eminent radio astronomer known for his pioneering efforts in the search for extraterrestrial intelligence (SETI), died on September 2 at his home in Aptos, California.
Pioneering radio astronomer Frank Drake dies at 92 (ucsc.edu)

Join the search for undiscovered worlds - on your PC.
Planet Hunters TESSting | Zooniverse - People-powered research

The next September equinox will be at 03h04 SAST, September 23, 2022.
EarthSky | 2022 September equinox: All you need to know

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.

An imaginary depiction of an Earth-like exoplanet in the habitable zone of the star around which it orbits. Two imaginary moons of the planet are also visible. The light from the star is reflected off the surface of a liquid water ocean on the planet. There is also a continent on the planet. (Earth-like exoplanets in the habitable zones of their parent stars really exist.)

Astronomy basics: Brown dwarfs

These objects are something between stars and planets, and live almost for ever.

Immortal Mystery Object-Every Brown Dwarf Ever Created Still Exists - The Daily Galaxy

Notes about the pandemic and our library – by Neville Young

The Pretoria Centre of ASSA had to give up its regular monthly meetings when Covid descended on humanity. We resorted to online monthly meetings, which in some ways have been convenient, allowing an attendee the opportunity to make another cup of coffee or have a bathroom break during a meeting. Travelling time and petrol costs were no longer were not there any more. We did however miss the face-to-face interaction with friends.

An especially unique advantage that online meetings provided was for people being able to attend a meeting from anywhere in the world. A strong consideration of this distant access will have to be made even if we do resume physical monthly meetings.

The Centre library had been located in a room at the back of the auditorium at the CBC school where we have been having our meetings since the late 1980's. The books have been inaccessible during the lockdowns. The school now wishes to use that room for other purposes and so we have had to decide what to do with the library, in addition to whether we continue to hold meetings at the school – which remains the ideal location.

Michelle Ferreira and me were allocated the task of sorting through the library, especially with a view to reducing its size considerably. There were four steel cupboards in that room, not only books but old newsletters, Astrophysical Journals and admin documentation. After five hours of sorting and carrying books to our cars, we reduced the book catalogue to about 10% of its former size. The books that we discarded were donated to Hospice who should get some good value from sales in their bookshop. (Over the years I have found some treasures there.) The newsletters and journals were also donated to Hospice who were only too happy to make them available for recycling. Both our cars were heavily loaded at the end of the sorting session.

Until plans can be made for locating the library elsewhere, the books are at my house and the updated library catalogue will soon be posted on the Centre's website..

I am enjoying having the books at my house, finding that there are many treasures and useful resources amongst the collection. I endeavour to write a review on one of the books for the newsletter each month. (Editor's note: The first of these reviews is to be found on the page after the next.) **Ω**

Michelle Ferreira hard at work removing books from the room at the back of the lecture hall where we had our meetings. It can be seen that the (bloody uncomfortable) fixed benches and seats that were in the hall, are gone.

Immediately below: The boot of a car filled with books from our library.

Below: Books from our library being loaded into the boot of another car.

Book review – by Neville Young

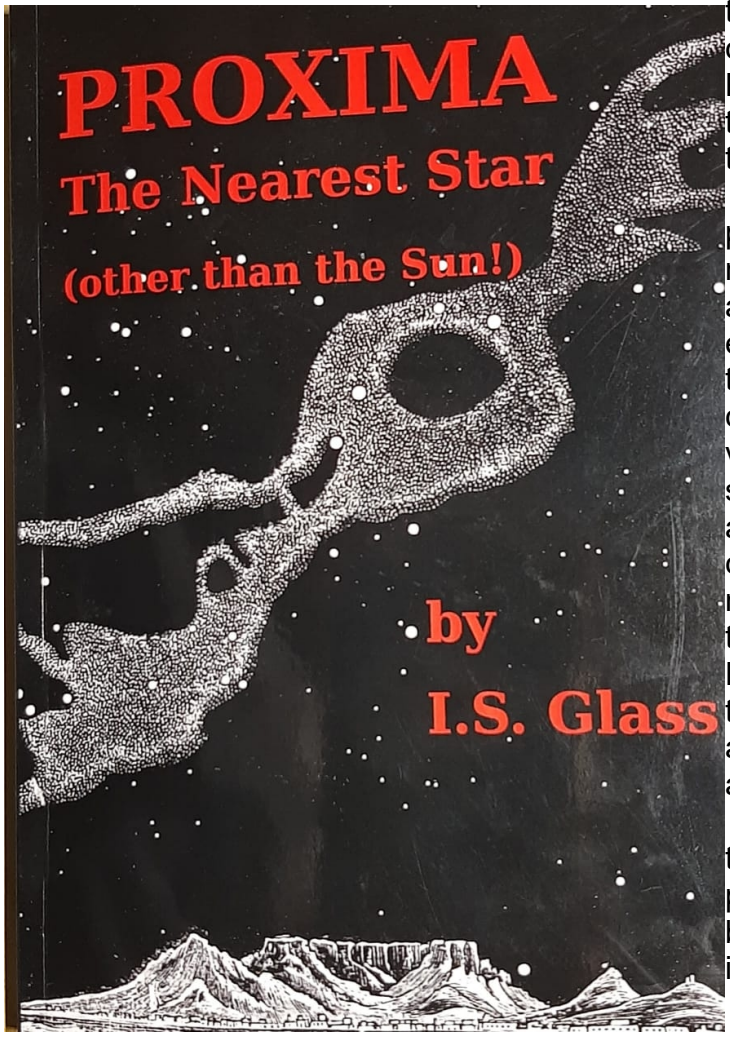
The first book in our library that I review is **PROXIMA – The Nearest Star by I.S. Glass**, i.e. Ian Glass, a professional astronomer and well known member of the Astronomical Society of Southern Africa.

In an A5 format and only 80 something pages, it is packed full of the very interesting history of the discovery of Proxima Centauri from photographic observations made by David Gill in South Africa. Credit for the discovery was given to Robert Innes who became director of the Union Observatory in Johannesburg.

Determining whether Proxima was gravitationally linked to the Alpha Centauri binary pair was very difficult to do in the 19th and early 20th centuries, and in fact even though that is considered to be the case nowadays, it is still not 100% sure that it is part of the Alpha Centauri system.

A side issue, but a heavily contested one, was whether Proxima was closer to our solar system than Alpha Centauri is – the latter having been previously accepted as the closest star. The quest to positively discover the closest star was hotly contested, even though it was very difficult to make the fine measurements required to perform the calculations.

Measurements of the difference in position of Alpha Centauri across the baseline of the Earth's orbit – called parallax - were of sub-arcsecond values. And Proxima being closely associated with Alpha, also exhibited a sub-second parallax. The problem was to measure the parallax of the binary Alpha and that of Proxima to a sufficient accuracy that the larger parallax would identify the closer of the two. The parallax of Proxima has been determined since then to be 0.03 arcseconds larger than Alpha's parallax.



Parallax measurements were performed by several astronomers – not all measurements being in agreement. Robert Innes was eventually credited with having made the best determination of Proxima's closest proximity even though the values in his measurements have subsequently been shown to be less accurate than those of his contesting colleagues. Recent unchallengeable measurements around the turn of this century were made by the Hipparchus satellite which was able to measure positions with an accuracy of 1 or 2 thousandths of an arcsecond!

Innes rejected the proposal that the star be named after him, preferring the name Proxima. This book was an enlightening and interesting read. **Ω**

Observing: Marry me - by Magda Streicher

To study and observe a deep sky object in full could also bring another aspect to the complete impression. The planetary nebula Abell 33 situated in the constellation Hydra is located about 2700 light-years away and glows with a magnitude of only 13. Deep photographs of this planetary nebula show a nice round bubble of pale blue hanging against the faint background stars. The remnant progenitor star inside the nebula is on its way to becoming a white dwarf star. By changing the foreground, magnitude 7.2-star HD 83535 is positioned in such a way as to dramatically resemble a diamond ring effect out of our line of sight. The extremely faint glow exists on the north-eastern side of the overwhelming bright star, but very difficult to spot. In amateur circles this is now formally known as the Diamond Ring Nebula and rightfully so. Dr George Abell compiled a list of 86 objects of this nature in 1966. It is known as *The Catalogue of Planetary Nebulae*. There may be a gem against the starry night sky that holds a real attraction to warm the heart. **Ω**

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

OBJECT	TYPE	RA	DEC	MAG	SIZE
Abell 33	Planetary nebula	09 h 39.4 m	- 02° 50.2'	13	270"

Abell 33 aka the Diamond Ring Nebula

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 "2022 Sky Guide Africa South". Ω**

Pretoria Centre committee

Chairman	Johan Smit	072 806 2939	johanchsmit@gmail.com
Vice Chairman	Bosman Olivier	082 883 1869	bosman.olivier@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	daniebar403@gmail.com
Public Relations Officer	Bosman Olivier	082 883 1869	bosman.olivier@gmail.com
Observing Coordinator	Neville Young	083 303 2840	nevyoung@gmail.com
Treasurer and Membership Secretary	Michelle Ferreira	073 173 0168	michellem.ferreira@standardbank.co.za
Curator of Instruments	Johan Jordaan	082 373 3395	jjordaan121@gmail.com
Additional member:	Neville Young	083 303 2840	nevyoung@gmail.com