



<https://www.pretoria-astronomy.co.za>



<https://assa.saao.ac.za/>

**EVENTS:** *All are welcome to join these events.*

### **Next Observing Evening : May 22nd 2026**

From sunset onwards at Christian Brothers College. Turn left immediately after entering the main gate. Carry straight on through the car park and proceed straight down the tarred road. About 50 to 100 metres after the last row of studs there is a cricket sightscreen on the right. Observing will be on the cricket pitch just past the sightscreen.

**Please do not drive onto the grass.**

### **MONTHLY MEETING : May 27th 2026**

The meeting is held on-line. The web link to join the meeting is:

<https://meet.jit.si/ASSAPretoriaMonthlyMeeting>

If you are on our invitation list you will receive an e-mail from Johan Smit on the day of the meeting, which has the link included. If you are not on the Invitation list please and wish to be included, send your mail address to [johanchsmit@gmail.com](mailto:johanchsmit@gmail.com)

**Johan Jordaan will be Chairman for the evening and present What's Up for June 2026.**

### **Main Topic : Nebulae – Catalogues and Classification Michael Poll**

**Summary:** Nebulae (singular Nebula) : is the collective name for objects that appear as hazy spots or clouds to the naked eye or through a small telescope. For various purposes they have been catalogued by many people and institutions. The presentation outlines ten such catalogues including those of Charles Messier, William and John Herschel, Jack Bennett and the ASSA 100.

A diagram of the classification of nebulae is shown, with illustrated examples of each type.

### **EDITORIAL / Point of View: The Earth is Unique Michael Poll**

The way the Solar System formed is probably not unique, but thereafter planets will evolve in an individual way. The meteoritic bombardment alone would have had a major influence on the development of the physical characteristics of the Earth and the development of life here.

For example, there is evidence that the Moon was created when a piece of the Earth was broken away by a glancing blow from a Mars sized impactor causing the Earth's axis to tilt. What if such an impactor had struck at a different angle? The Earth might be tilted at an angle other than  $23\frac{1}{2}^\circ$  and so seasonal variations might have been too hostile for life as we know it to develop.

What if the Mars sized impactor had missed and there was no Moon? There is evidence that life on Earth started in tidal pools. If there was no Moon, the tidal range that the Sun alone would create would not be so great, and life may not have started, or if it had, it would probably have followed a different path.

The Moon's gravity stabilises the obliquity of the Earth's axis. If the obliquity were to change frequently and/or to a great extent, then the long term climatic changes caused may be deadly to life or might have caused it to evolve in a totally different direction to that which it did take.

Mars sized impactors notwithstanding, in the first billion years of its life, the Earth could have been hit by asteroids as big as 250 x 800 km. Such impacts would vapourise the top 300 metres of ocean. The Earth must have been hit by many impactors during its life, (look at the surface of the Moon and compare) but, for example, consider the event that occurred 65 million years ago. It is more or less accepted that an asteroid hit occurred, wiping out about 75% of species and 90% of the biomass of the Earth and causing major chemical and physical changes. What if it this asteroid had missed?... the dinosaurs might still be here and we might not be. This is one illustration of the consequence of an impact.

There must have been countless events in the Earth's history that we do not know about that have led to us being here, but it is not possible to reconstruct the geological and biological history of the Earth without taking impacts into account. However because every planet will have a unique impact history, no other planet will have the same physical characteristics, or have developed life along the same path, and remember, the presence of life will modify the planet. It was life that drew down the carbon dioxide from the atmosphere such that that is now in the rocks as carbonates and photosynthesis replaced the carbon dioxide in the atmosphere with oxygen – a fundamental modification indeed! Planets are as unique as fingerprints, the Earth is unique, so we should also be unique.

## **REPORTS**

### **Observing evening report      April 17<sup>th</sup> 2026      Michael Poll**

This evening did not turn out so well. In spite of the optimism in the invitation, and we are always hopeful that the weather might clear, in the late afternoon it got worse and worse, and just about the time we might have left for CBC, it started raining.

There was an exchange of Whats App messages! Johan was still prepared to go to CBC just in case any visitor turned up, but when he got reports of rain from Michael and Jaco, and it was raining at his house, discretion took the place of valour and it was decided to abandon. It was really a miserable evening to be out in the Friday going-home traffic, so Johan's decision was justifiable.

*However*, it has always been the Centre's policy that *someone* would go whatever the weather, just in case, but unfortunately on this evening for the first time ever, we defaulted to no-one going. Trouble is that one always feels a bit uneasy about not attending in case some members or visitor(s) do arrive, so if any one did come and found no-one at CBC, please accept an apology.

**The next Observing Evening is scheduled for May 22<sup>nd</sup> 2026.**

### **Chairman's report: ASSA Pretoria Centre meeting April 22<sup>nd</sup> 2026.      Danie Barnardo**

The meeting started at about 19:05 by welcoming the 22 online members and visitors present. **Danie** started proceedings with a "What's Up in May 2026". His talk is summarised as follows:

In May 2026, the night sky over South Africa features typical autumn-to-winter transition constellations, bright planets in the evening and morning, two Full Moons (including a Blue Moon), and the year's best meteor shower for southern observers—though moonlight will interfere with it.

Southern autumn/winter favourites are gaining prominence: Crux (Southern Cross) high in the south, with the Coal Sack Nebula and Jewel Box cluster nearby; Centaurus (with Alpha and Beta Centauri), Omega Centauri (the best globular cluster visible in the sky) and the Hamburger Galaxy (one of the strongest radio sources known and an easy target); Scorpius and Sagittarius rising in the southeast later in the night, with the conspicuous "Heart of the Scorpion" – Antares, which is a red supergiant star. These two constellations are rich in star clusters and nebulae and lie near to the galactic centre). The summer constellations, Orion and Taurus are setting in the west earlier in the evening. Other notable sights include the Large and Small Magellanic Clouds (visible as fuzzy patches in the southern sky) and various open clusters and the rich Coma Berenices and Leo galaxy clusters. The main targets for deep-sky observation in Scorpius and Sagittarius were also highlighted.

**Michael Poll** was the main speaker and the title of his presentation was: "**The Milanković Cycles**"

In 1941, Serbian scientist Milutin Milankovic introduced his hypothesis which became known as the Milanković Cycles. This hypothesis consists of three concepts, namely Eccentricity, which describes the orbit of Earth around the sun; Obliquity, which describes the axial tilt of earth's axis and Precession, which describes the long-term changes of the above mentioned two in Earth's position relative to the Sun. These are very long-term changes and it was stated that Obliquity happens over a period of 41,000 years and precession of the Earth's orbit happens over an even longer period of 112,000 years. These changes are the result of influences of the gravity effects of the two large gas-planets nearest to earth, Jupiter and Saturn and has the following effect:

Eccentricity of Earth's orbit varies from 0.0034 to 0.06 and the cycle spans about 100 000 years, and currently the eccentricity is very slowly decreasing and is approaching its most circular. Peak Eccentricity of was about 14,000 years ago and minimum Eccentricity will be reached about 25 000 years from now.

Furthermore, the Earth is not completely rigid – when it rotates on its axis, centrifugal force causes the equator to bulge. The Earth feels the gravitational pull of the Sun and the Moon on the bulge. Although the Moon is much less massive than the Sun – it is much closer. Therefore both contribute roughly equally to the precession effect. The pull on the bulge causes the earth to wobble as it spins on its axis - just like a spinning top that is about to fall over. The wobble is known as Axial Precession.

The period of Axial Precession is about 25 800 years, therefore the half cycle is about 13,000 years. Direction of the tilt of the Earth's axis determines when the seasons will occur. The Civil Calendar is synchronised with the seasons – the calendar is based on the Tropical Year – so that in the Southern Hemisphere summer is always in December, therefore, for the Southern Hemisphere in 13 000 years' time Summer will still be in December, winter will still be in June. Precession of the spin axis causes each season to have a different star background, it means that each year stars are in a slightly different position at the same season. If the calendar is synchronised with a sidereal year (which is too long), the season will move backwards through the calendar and in 13,000 years' time the Southern Summer would be in June.(The change over takes place gradually!).

Precession of the Earth's Orbit : the line of the apsides joins the aphelion point with the perihelion point. The period of Apsidal Precession is 112,000 years and happens primarily as a result of interactions with Jupiter and Saturn. Combined with the 25 800-year cycle of axial precession it changes the time of year that the Earth reaches perihelion. At present apsidal precession shortens the period to about 21 000 years.

These processes are the main drivers of long-term changes in the Earth's climate because these changes in Earth's axial tilt and orbital eccentricity have an influence on the amount of solar energy reaching the earth.

Michael continued the presentation by illustrating the effects of these cycles on the northern part of the African continent, which are currently mostly covered by the Sahara desert. Between 11,000 and 5,000 years ago the world's largest arid desert was green and it supported wooded savannah ecosystems, numerous rivers, grasslands, and large lakes. It supported abundant wildlife like hippos, giraffes and elephants. This proves that precession is a strong driver of Earth's long-term climate and are responsible for triggering the beginning and end of African Humid Periods and the Ice Ages.

This presentation is Part 1 of 2. Part 2 will be presented in a few months' time.

After a very lively question-and-answer session and discussions, Michael was thanked for his very interesting and much-appreciated talk and the meeting adjourned at about 20:30.

You can see a video about the African Humid Period and the Sahara Desert at [https://youtu.be/CM\\_QS984JKI](https://youtu.be/CM_QS984JKI)

## **ARTICLE THE PRIME MERIDIAN - Michael Poll**

### **Greenwich Observatory from One Tree Hill : 1808 (artist not known to me! Michael)**

One Tree Hill is a high point of land that lies about 300 metres east of Observatory Hill. The current tree is a London plane that replaced its predecessor, probably an oak, which was blown down in a storm on 22 August 1848, a year of dreadful weather. There was scarcely a summer that year, along with devastating crop failures throughout the country.

Reference: <https://www.greenwichparkhistory.org.uk/One-Tree-Hill/>





**The Greenwich Royal Observatory 1972 (left)**

**2016 (right).**

Note the Time Ball at the top of the mast. It is raised at 12h55 and dropped at precisely 1.00 pm.

The original purpose was that when it was dropped the sailing ships on the river could set their chronometers.

(I was there just at the right time! Michael).

(Both Images : Michael Poll)

The Greenwich Meridian is the Prime Meridian defining zero degrees longitude on the Earth's co-ordinate system of latitude and longitude and was adopted as such by international agreement in 1884.

The idea of a prime meridian goes back at least as far as Hipparchus, (2<sup>nd</sup> Century BC), who used a meridian that passed through Rhodes. Ptolemy (2<sup>nd</sup> Century AD) used a meridian that ran through the Canary Islands, which was at the time the western boundary of the known world. Subsequently, cartographers used various islands in the Atlantic Ocean as zero longitude, until, in April 1634, an assembly called by Cardinal Richelieu in France chose the Isle de Fer, the most westerly of the Canary Islands, as the prime meridian. However, there was still no general agreement about this amongst the nations and there were still many prime meridians in use. A French naval chart dated 1753 shows four of the prime meridians in common use - Isle de Fer, Tenerife, London and Paris.

The Greenwich Observatory had been established by King Charles II in 1675 to find a means of determining longitude for navigation - that is for naval and commercial needs rather than astronomical. The British Nautical Almanac was first published using observations from Greenwich in 1767, and from then, other nations started using the Greenwich Meridian as the prime meridian. The United States Government was using the Greenwich Meridian for all nautical purposes by 1810. Various conferences, seven in all, between 1871 and 1883 moved towards the adoption of an internationally acceptable prime meridian, and agreement was reached at a meeting in Washington in October 1884.

The Washington gathering met “for the purpose of discussing, and if possible, fixing upon a meridian proper to be employed on a common zero of longitude and standard of time reckoning throughout the whole world.” The need for a prime meridian was agreed, but the problem was -which one? France wanted a meridian with “absolute neutrality”, such as mountain summit, an island or a building - the Great Pyramid at Giza was one candidate. The Canadian representative, Sandford Fleming, said that a neutral meridian was not practical. The Greenwich meridian was used by 65 % of all the ships in the world, the other 35 % were using more than 10 other meridians. It would be better if the few changed to Greenwich, rather than having everyone adopt a new meridian. Also, a system of time zones for civil use, based on Greenwich, had been established in the United States in 1883. Eventually, by 22 votes to one with two abstentions, “the meridian passing through the centre of the transit instrument at the Observatory of Greenwich” was chosen as the Prime Meridian. San Domingo voted against, and France and Brazil abstained.

Although the Greenwich Meridian had been used as a Prime Meridian for nautical purposes by many countries 1884, for civilian use each country, and even locations within a large country, generally kept local time. However, the keeping of local time started to cause confusion when the speed of travel increased, particularly with the coming of the railways in the USA, where the time difference between the East coast and the West coast is 3½ hours. Because there were more than 80 time standards on American railways, station clocks were “all wildly at variance with [the traveller’s] watch....and timetables to him were but Sphinx’s riddles”. The system of time zones was proposed by Charles Dowd in order to overcome this problem.

The time zone system was based on four standard meridians in the USA, each one 15 degrees (one hour) apart. The one farthest east passed through Washington, specifically, the transit instrument at the US Naval

Observatory. However, a final adjustment moved them 2 degrees Eastwards to make them an exact number of hours different from Greenwich. It was this idea of the time zones that Sandford Fleming took to the 1884 conference, where the Prime Meridian and system of time zones was adopted. Most countries soon adopted the Greenwich based time system, although, for example, Portugal waited until 1912, Ireland until 1916, and Russia until 1924.

Reference: Sky and Telescope October 1984 page 300



View from Observatory down to river Thames  
(Both Images : Michael Poll)



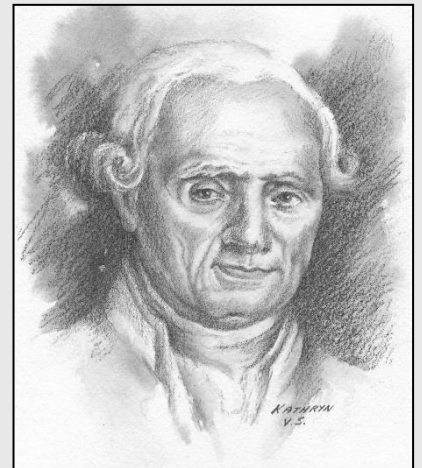
View of the Observatory from River Thames

## **OBSERVERS CORNER by Magda Streicher**      **NGC 5272**

### *Messier's third object : Constellation of Canes Venatici*

Charles Messier was an exceptional astronomer, widely known and evidently very well liked. He combed the skies in search of comets that captured the people's imagination of the time.

Messier decided to compile a list of deep sky objects which might possibly be confused with comets because of their appearance. The first two entries in the well-known *Messier Catalogue* were Messier 1, discovered by John Bevis in 1731, and Messier 2, discovered by Jean-Dominique Maraldi in 1746. The third object was the beautiful globular cluster Messier 3, also known as NGC 5272 in the Canes Venatici constellation, discovered on 3 May 1764 by Messier himself – his very first discovery. The catalogue then grew rapidly, from a mere handful of entries to 110 listed objects.



***Pencil Sketch Credit  
Kathryn van Schalkwyk***

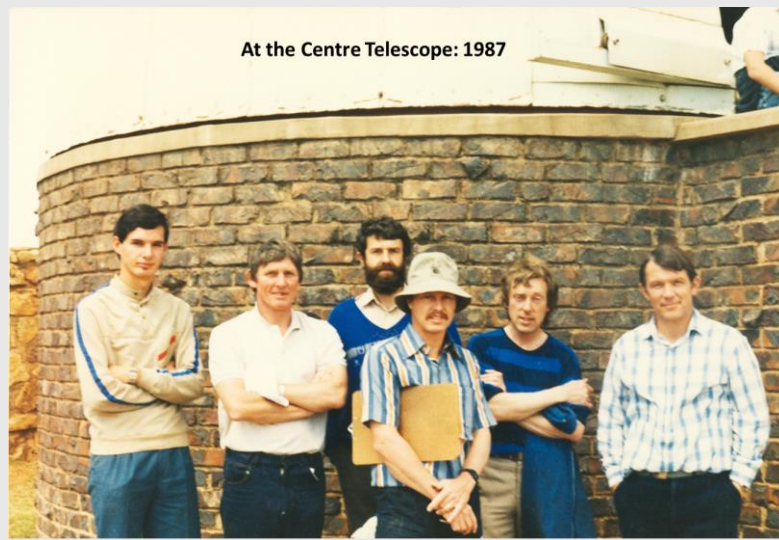
Messier 3 is a dense globular cluster comprising somewhere between 250 000 and 300 000 stars. Viewed more intensively through a telescope, the globular cluster appears as an exceptionally bright object that stands out very strongly against the background star field. It is revealed to be covered in a mass of mixed-magnitude stars running out towards the edge, with faint mingling star strings in all directions that disappear into a busy star field. The outer edge is not shy either in displaying numerous brighter stars to round off this outstanding object. With higher magnification the core grows strongly to appear almost star-like cover in a hazy outer envelope. It compares well with the most dense and exceptional globular clusters, such as Omega Centauri and 47 Tucanae.

OBJECT	TYPE	RA	DEC	MAG	SIZE
NGC 5272	Globular Cluster	13h42m.2	+28°22'.7	5.9	16.2'

**GALLERY** Images taken by members of the Pretoria Centre



**FROM THE ARCHIVES**



Mauritz Geyser   Michael Poll   Mike Haslam & Neville Young   Paul Behrens (?)   Cor Rademeyer



1990 : At UNISA Observatory

Neville Young   Walter Wargau   Mauritz Geyser   Frikkie Le Roux   Louis Barendse   Michael Poll