NEWSLETTER OF ASSA PRETORIA CENTRE APRIL 2026

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

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

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

Next Observing Evening : APRIL 17th 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 : APRIL 22nd 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

Danie Barnardo will be Chairman for the evening and present What's Up for May 2026.

Main Topic: *The Milanković Cycles* by Michael Poll

A century ago, Serbian scientist Milutin Milankovitc hypothesized that the long-term, collective effects of changes in Earth's position relative to the Sun are 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.

The cycles are to do with the ellipticity of the Earth's orbit, which changes over a 100 000 year cycle, precession of the Earth's spin axis, a 27 800 year cycle, precession of the Earth's orbit, a 112 000 year cycle, and change in the obliquity (angle of tilt) of the Earth's spin axis, a 41 000 year cycle. The causes and effects of these cycles will be detailed.

This presentation is Part 1 of 2 and deals with ellipticity, and axial and orbital precession.

Part 1 also shows how precession has affected the Sahara Desert. Between 11 000 and 5 000 years ago the Sahara Desert was green - it supported wooded savannah, numerous rivers, grasslands and large lakes. The way this was discovered and the cause of the humid period will be shown, and how the Sahara has since changed into the desert we know today.

Obliquity will be discussed at a later date in Part 2.

EDITORIAL Michael Poll

It is not long until July when the AGM of the Pretoria Centre is held, and when reports of activities, finances, and section reports are given …. … and a "new" Committee is elected.

Well, for the past few years this item should read "The Old Committee was re-elected", with "old" being in the sense of the long serving previous Committee, not the calendar age of the Committee Members, but dare I say, the latter could apply. The membership of the Committee is

stagnant : all except one of the present committee members have been on the committee since 2013. The current Committee members and their joining dates are

Michael Poll	1985
Neville Young	1985 (with a couple of gaps)
Johan Smit	2006
Danie Barnardo	2008
Michelle Ferriera	2013
Johan Jordaan	2023

Total years served : 136.

I should also mention the long service of the late Pierre Lourens, who died last year and who was a Centre member from 1988. He was on the Committee since at least 2003 and edited the Newsletter without a break for the whole of that time.

Membership of the Centre has dwindled over the years, although there are recently a few new members which is encouraging. For the past three years the paid up membership has averaged 39, unlike in our heyday:- in 2003 the paid up membership was 121. Having such a large membership gave a bigger pool of potential committee members and it showed – in 2003-2004 the Committee numbered 14 members.

Our biggest and perennial problem is finding speakers for our formal Monthly Meetings. Most of the Main Topics and all the "What's Up?" sections are presented by Committee Members, who may run out of steam one day. In fact, a couple of years ago a meeting was nearly cancelled because of the lack of presenters. Come to think of it, when I joined the Centre in 1984, meetings were held only every other month, maybe for the same reason.

The number of times the Newsletter gives the subject for the Main Topic as "To Be Advised" tells you that we are scratching around for speakers because it means that when the Newsletter was circulated, about 10 or so days before the meeting, we had not yet found anyone. We have to thank Johan Smit who does most of the hard yards in finding speakers.

Perhaps members could consider preparing a sort of "Journal Club" talk where they present a digest or summary of an interesting article that they may have seen. It need only be short, we could even have two short papers at one meeting. Meanwhile, offers of talks are always welcome. Do other Centres or Societies have similar problems with finding speakers?

REPORTS

Observing evening report March 20th 2026 Michael Poll

A clear sky at last! Probably as good as it can get at CBC. We were about eight people including some visitors who had attended last month's viewing. It was good to see them. Johan Smit had to leave early, so we only had two telescopes, one of which was Johan Jordaan's 12 inch, which stands so tall that you do not have to bend down to look through it.

Although much of what we looked at and saw might seem like "same-old" for experienced observers, for newcomers they were all "new" – they were generally seeing the objects for the first time, so we do not mind re-visiting them.

Jupiter was the only planet available – all four moons were strung out more or less equidistant from each other with Callisto, Ganymede and Europa to the west of Jupiter and Io to the east.

Naked eye we looked at the familiar current constellations – Orion high in the north later going down lying on its side. We traced the Zodiac – Taurus, Gemini, Cancer and Leo, and later on we saw Spica in Virgo, but being a bit low down, we could not see any other stars of Virgo. We did note that the long axis of the Southern Cross extended northwards meets the quadrilateral of Corvus, which we could see, and noted that Gamma and Delta Corvi pointed to Spica. Last month we could hardly see Castor and Pollux, but on this night we could even see the rectangle formed by Castor, Pollux and Gamma and Mu Geminorum. We could also make out the Sickle of Leo. High up we noted Sirius and Canopus, and the Southern Crosses were well seen – the False Cross, the Diamond Cross and the Southern Cross itself. Although quite low down, the latter was quite plain to see, having been lost in the murk last month.

The same philosophy about "same old" can be used about the nebulae and clusters we looked at – although long-time observers may know them well enough and may want to move on to

more challenging things in darker skies (the ASSA 100 springs to mind), we looked at these "old favourites":

We started with the Southern Pleiades (IC2602), which are anchored on Theta Carinae, the brightest star in the cluster. A horizontal line at this time took us to the Wishing Well cluster (NGC 3532). In the same area lies the Eta Carinae nebula (NGC 3372), after which we went to NGC 2516, the Southern Beehive, which lies just off the long axis of the False Cross. Earlier we did manage to see Omega Centauri (NGC 5139), but it was difficult to tease it out of the background sky. The Jewel Box (NGC 4775) was observed. Having seen the Southern Beehive, we also could see the "original" Beehive Cluster- M44 in Cancer, which was quite a catch in the CBC skies – we would probably not normally have tried for this one. We noted that it is about halfway between Pollux, in Gemini, and Regulus, in Leo. After all these clusters, we had not even got on to double stars, but we did have a look at Alpha Centauri before we left at around 9.30 pm.

The next Observing Evening is on April 17th 2026

Meeting Report: March 25th 2026 Michael Poll

What's Up for April 2026 was presented by Johan Smit. He detailed the dates of the phases of the Moon and was pleased have found a diagram of the phases as seen from the Southern Hemisphere. A morning sky event is around April 20th when Mars, Saturn and Neptune will be in a close group with the Moon joining them on April 16th.

On an evening all sky map, the zodiacal constellations were identified, noting that the Sun also passes through Ophiuchus, as well as the classical zodiacal constellations.

The view to the north for the month includes Castor (double star), and galaxies in Leo (the Leo Triplet) and the star cluster in Coma Berenices. We also see the seven stars of the Plough (a.k.a. the Big Dipper, part of Ursa Major) low in the north this month, and the Three Leaps of the Gazelle south of (above) it.

The view to the west includes Taurus (with the "Yield" asterism near Aldebaran), Orion, and Canis Major setting. The "Summer Albireo" (145 G CMa) is near Delta CMa.

In the east are Virgo and its galaxies, and near Corvus are M104 (The Sombrero Galaxy) and the Stargate asterism. The view to the south includes the objects mentioned in the Observing Evening report, plus Gamma Velorum, NGC 2457 (the Heart Cluster), and Ruby Crucis, a carbon star near Beta Crucis.

For the Main Topic **John Lindsay-Smith** presented **An Introductory Talk on Solar System Astrophotography.** John is the current Chairman of the Johannesburg Centre

In the invitation Johan Smit commented that when we look at the Moon with a telescope, invariably someone wants to take a picture, and people spend a lot of time trying to hold a cell phone up to the eyepiece, and with a bit of luck end up with something resembling a photo of the Moon - or nothing at all. This not astrophotography. "People should come listen to John and learn how it can be done properly".

John *did* open his talk with the advice that if someone wants to take pictures at the telescope with a cell phone then they should buy a special clamp that fits on to the telescope and holds a cell phone.

For "proper" astrophotography, John started with the basic requirements – which include a firm support for the camera, a cable release, a means of taking repeated exposures, the use of an appropriate lens, not using any filters, and the use of a lens hood. Once set up, the first requirement is to achieve sharp focus, which can be done by focusing on a distant object in daytime, or use live view. Using the camera's infinity setting is not recommended. Once focusing is achieved, tape the focus ring in place.

Proper solar filters are a must when photographing the Sun. Alternatively a solar hydrogen alpha telescope can be used. Because the planets are so small in the sky, to get good photographs a lot of magnification is required – large aperture long focal-length telescopes work best, also Barlow lenses may be used. It is better to image planets when they are high in the sky. Jupiter is the easiest target, even Saturn is quite small, and Mars is very difficult. Single shots are not ideal, better to take a video, and stack the best frames using a commercial stacking application. John described the equipment necessary taking images at prime focus and also gave details and types of dedicated planetary cameras.

For photographing meteors, as well as the sturdy tripod, a wide angle lens should be used, and the camera should be a DSLR or a mirrorless camera. The images should preferably be taken in the RAW format. Use the widest aperture and apply the 600 rule to avoid star trails (Exposure time in seconds = 600 divided by the focal length being used). The camera should be aimed 40 – 60 degrees away from the radiant. A foreground landscape will make for a more interesting image.

For photos of Starscapes with a terrestrial background a wide angle lens is preferable, and as before, a DSLR or mirrorless camera is the camera of choice. This type of photo is best taken under dark skies, but the foreground photos may be taken beforehand. Take the sky shots after dark without moving the camera. Focusing should be done manually, and photos should be taken in the RAW format. The foreground scene and the sky pictures can be processed with imaged editing software. If it is required to track the sky then an equatorial mount is needed.

We do not often see Aurorae at our latitudes, but John showed some examples of aurora shots taken on a cruise off the coast of Norway, showing that, if you want to take photos of aurorae you will probably have to travel! Use a wide angle lens a high ISO setting and make the exposures as short as possible. A sturdy tripod is essential.

The talk was very useful informative and hopefully will encourage more people to try astrophotography

Image credits : John Lindsay-Smith

Jupiter image taken with

- **Celestron 8SE,**
- **ASI662MC ZWO camera**
- **2x focal extender.**

90 seconds exposure, processed with Autostakkert, Registax and Photoshop

ARTICLE Michael Poll

Star Nomenclature – or – Not "Alpha Crux" it is Alpha *Crucis*!"

The *First Dictionary of the Nomenclature of Celestial Objects* (1983) describes over 1000 different naming systems for celestial objects. It is felt that the list would never be orderly, reasonable or complete. However, there are only a few naming systems used by amateur astronomers, and this essay covers some of the systems used for naming stars.

Since ancient times many stars have had a proper name, such as Rigel or Deneb, but only a few stars have a proper name that is in common use. Many of the star names are in garbled Arabic, and some are quite obscure, and so do not readily spring to mind (e.g Mu Bootis is "Alkalurops" meaning "Shepherd's Crook" and Gamma Ceti is called "Kaffaljidhma", meaning "Part of a Hand"). In the case of the name "Deneb" there are other stars that use the same name word : Alpha Cygni is Deneb, Delta Capricorni is Deneb Algiedi, Beta Ceti is Deneb Kaitos, and Delta Aquilae is Deneb Okab. ("Deneb" means "a tail").

The familiar Greek letter system was introduced in 1603 by Johan Bayer, a German astronomer, in his star atlas *Uranometria*. Bayer labelled many stars with lower case Greek letters, usually the brightest star was Alpha, (α), then he sorted the rest of the stars in the constellation into brightness classes and assigned letters - beta (β) gamma (γ) and delta (δ) and so on.

The Bayer's letter for each star is used with the Latin **genitive** of the constellation name. Latin does not have those pesky little troublesome words : "a", "of" , "to", "with", "from", and "by", but incorporates them by changing the ending of the noun i.e. the ending of the naming word. The genitive case indicates "possession or close association", and the little word the genitive replaces is "of". For example the nominative "Cetus" means "a whale", but the genitive "Ceti" means "of a whale" or "of the whale".

Not every noun has the same set of endings, because, as in many languages, some nouns are masculine, some feminine and some neuter, and in Latin each class has a different set of endings. The plurals of the nouns have another set of endings. (Note Gemini in the table. The word "Gemini" is in the plural form). Needless to say, as well as the "regular" nouns there are plenty of "irregular" nouns, also with a particular set of endings. The variation in the form of the noun is called its "declension", and generations of Latin students spent a good deal of time and homework hours learning the correct set of endings for each class of noun. The verb from "declension" is "decline", so the Latin master would invite a student to "decline" the noun. In this case "decline" meant you had to recite it with all the correct endings and not interpret the instruction in another sense of the word which is "I would rather not".

What this means is that, when using Bayer letters, **when we mention a particular star in a particular constellation we have to change the name of the constellation to its genitive case.** If we want to talk about the Alpha star of Orion we have to say "Alpha Orionis", meaning "Alpha of Orion" – "Orionis" being the genitive of Orion. Likewise, Eta of Carina is "Eta Carinae", **not** "Eta Carina". Vega is "Alpha Lyrae". A list of the genitive cases of the constellations is listed in the table below. (Of course, it also helps to know the Greek alphabet!)

Talking about the Greek alphabet, there are only 24 letters, and far more stars than that in each constellation. Sometimes one Greek letter is used a number of times to cover stars close together, e.g. Pi^1 (π^1) to Pi^6 (π^6) Orionis, (the row of stars forming the Shield), or Mu^1 (μ^1) and Mu^2 ($\mu^{2)}$, Scorpii, the naked eye pair in Scorpius.

Even so, the Greek letters are not enough. Bayer (and others) used upper and lower case Roman letters, which were originally put all over the sky but have generally fallen into disuse in the case of northern hemisphere stars. They are encountered frequently in southern constellations e.g. G Scorpii (near M7). These were introduced by Benjamin Gould (discussed below).

In 1712, John Flamsteed, the first English Astronomer Royal, used a different method to the Bayer one for naming stars. Flamsteed numbered the stars in each constellation from west to east in order of Right Ascension (RA -the celestial equivalent of longitude) (e.g. 80 Virginis is east of 79 Virginis) but still in the genitive case. He numbered all bright stars, whether they had a Bayer Greek letter or not, so Vega is "3 Lyrae" as well as Alpha Lyrae. In all 2682 stars received Flamsteed numbers, the highest in any particular constellation was 140 Tauri. However, at the time of Flamsteed, there were no formal constellation boundaries, so when "official" boundaries were implemented by the IAU in 1930, many Flamsteed stars were now in the "wrong" constellation – Flamsteed's 30 Monocerotis is in Hydra, and his 49 Serpentis is in Hercules. The stars not visible

from England did not get numbered so who labelled 47 Tucanae? The number comes from a more obscure 1801 catalogue "Allgemeine Beschreibung und Nachweisung der Gestirne nebst Verzeichniss" compiled by Johan Elert Bode.

In 1874, while in Argentina with his assistants, Benjamin Apthrop Gould completed his greatest work, the *Uranometria Argentina*, consisting of an Atlas published in 1877 and catalogue in 1879, for which he received in 1883 the gold medal of the Royal Astronomical Society. The Atlas introduced the system of defining constellation boundaries along lines of right ascension and declination, which was officially adopted by the International Astronomical Union for the whole sky in 1930. The catalogue assigned Gould designations to all bright stars within 100 degrees of the south celestial pole. For example : **"**145 G Canis Majoris", though the designation is often incorrectly listed without the G. The "G" indicates that it is listed in the 1879 Uranometria Argentina by Benjamin Gould.

By the 19th century telescopes had revealed hundreds of thousands of stars, each one needing an identity. In 1859, the German astronomer F W A Argelander, at the observatory in Bonn, began measuring star positions with a 3 inch refractor which resulted in the publication of the *Bonner Durchmusterung* (Bonn Survey - BD) which contained 324 188 stars. The survey was done by dividing the sky into 1 degree bands of declination (the celestial equivalent of latitude) and numbering the stars eastwards around the 24 hours of right ascension. Constellations were ignored. Thus Vega became BD +38° 3238, which means that it was the 3238th star eastwards from 0h right ascension in the zone between declination +38° and +39°. The original BD covered the sky from the north celestial pole to declination -2° deg. Later the southward extension (SBD) covered the sky to Declination -23° with an additional 133 659 stars, and the *Cordoba Durchmusterung* (CBD) added 613 953 stars from Declination -23° to the South Celestial Pole, so that, in total, 1 071 800 stars, down to about magnitude 9.5 were included. The BD remained in use for nearly a century, although the brightness estimates were not very accurate.

Argelander also introduced a system for the naming of variable stars, which is still in use. He labelled the first variable found in any constellation with a capital R followed by the genitive of the constellation name (e.g. R Centauri). He started at R because Q was the highest letter that had been used in labelling stars in Roman upper case. The next variable was S and so on through A to (eg Z Camelopardalis). After Z came RR then RS up to RZ then SS to SZ, TT to TZ all the way to ZZ. If a star already had a Greek letter it was not included. With the discovery of more and more variables the designations then went on to AA, AB and so on to AZ. (J was not included). This system provided for the labelling of 334 variables per constellation, but this was still not enough. It was decided that the next variable would be V335, V336 and so on. By 1990 the highest number for a variable star is in Sagittarius : V4153 Sagittarii.

The next major star list after the BD was the *Henry Draper Catalogue of Stellar Spectra* compiled by Annie Jump Cannon at Harvard between 1911 and 1915 and published between 1918 and 1924. This catalogue contained 225 300 stars, labelled "HD", and numbered in order of Right Ascension. (Vega is HD172167). More stars were added later in an extension catalogue (HD Extension – "HDE"). Another catalogue issued at Harvard, in 1908, was the *Revised Harvard Photometry*. This aimed to provide accurate brightness measurements for the brightest 9 110 stars to about magnitude 6.5. Stars have HR numbers (Vega is HR 7001) and this catalogue is the basis of the widely used *Yale Bright Star Catalogue*.

A further common star designation is its SAO number – named from the *Smithsonian Astrophysical Observatory Star Catalogue*, published in 1966. This gives accurate positions for 258 997 stars to about 9th magnitude. The stars are numbered in 10° bands of declination from the North Celestial Pole to the South Celestial Pole. (Vega is SAO 67174). Another catalogue that may be encountered is the Zodiacal Catalogue (ZC). This catalogue lists the stars that the Moon can pass in front of.

However, since the date of the article on which most of this essay is based, bigger and more accurate catalogues based on space based observations have been published. The Hubble Space Telescope Guide Star Catalogue lists 18 819 291 objects, of which about 15 million are stars, and the other 3 point something million are faint galaxies……

References

Alan M MacRobert Backyard Astronomy Sky & Telescope September 1992 p 278

Michael Poll Personal experience of the Latin Master

Constellation Name	Genitive Case	Constellation Name	Genitive Case
Andromeda	Andromedae	Grus	Gruis
Apus	Apodis	Hydra	Hydrae
Aquarius	Aquarii	Hydrus	Hydri
Aquila	Aquilae	Leo	Leonis
Ara	Arae	Libra	Librae
Aries	Arietis	Lyra	Lyrae
Boötes	Boötis	Monoceros	Monocerotis
Cancer	Cancri	Octans	Octantis
Canes Venatici	Canum Venaticorum	Orion	Orionis
Canis Major	Canis Majoris	Pegasus	Pegasi
Capricornus	Capricorni	Pisces	Piscium
Carina	Carinae	Pyxis	Pyxidis
Centaurus	Centauri	Sagittarius	Sagittarii
Corona Australis	Coronae Australis	Scorpius	Scorpii
Crux	Crucis	Taurus	Tauri
Cygnus	Cygni	Tucana	Tucanae
Fornax	Fornacis	Vela	Velorum
Gemini	Geminorum	Virgo	Virginis

OBSERVERS CORNER by Magda Streicher

NGC 3532 ***A Great Cluster***

The constellation Carina was once part of the larger constellation Argo the Ship but is now known only as the broken-down Keel constellation of this once proud vessel.

The open cluster NGC 3532 was discovered by Nicolas-Louis de Lacaille while he was on a visit to South Africa in 1751. The beautiful star cluster is really something special and boasts a location 3 degrees north-east as a near neighbour to the mighty Carina Nebula. The cluster was also one of the first targets observed by the Hubble Space Telescope.

NGC 3532 is an obvious hazy spot to the naked eye, only 1 200 light years distant. The cluster is very rich in starlight, hosts more than 500 true members and spans nearly a degree in size. The middle area of the cluster displays a dense core of starlight.

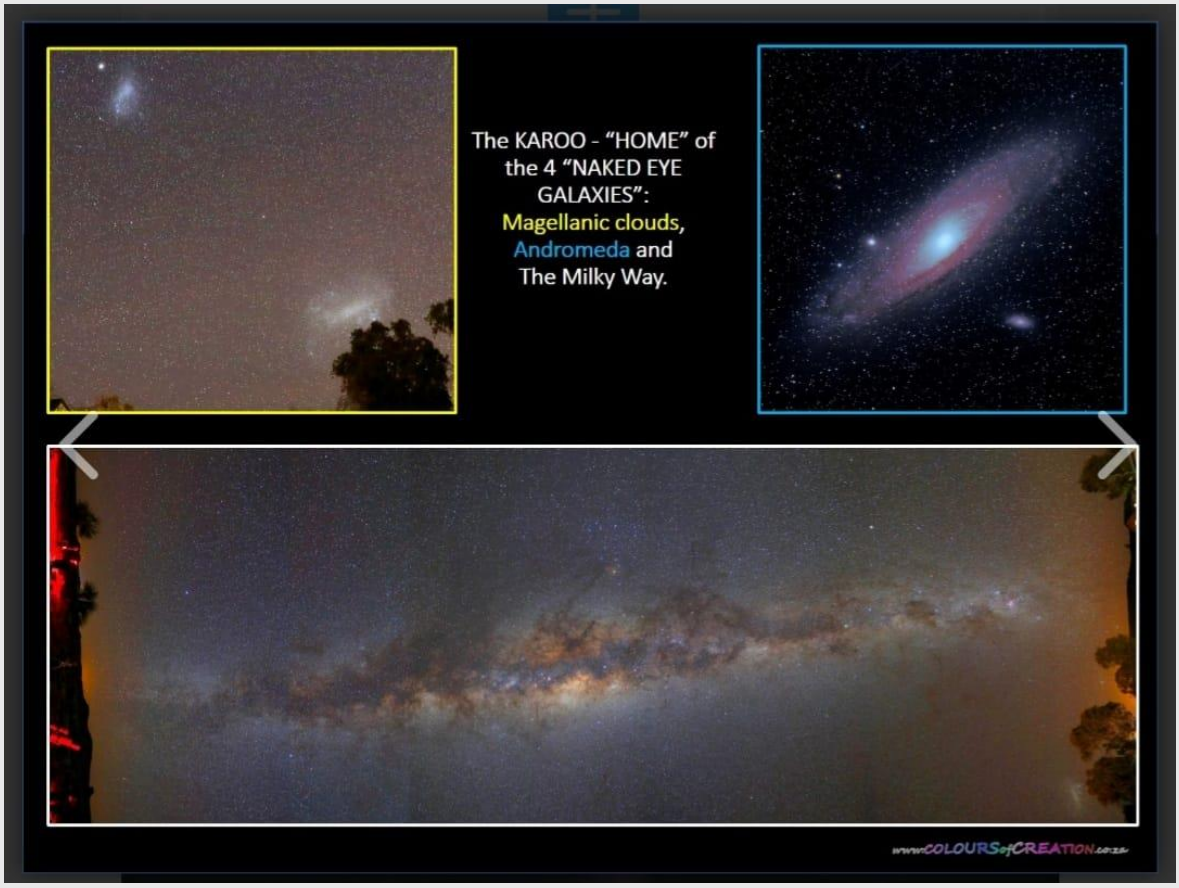
Also known as the Wishing Well Cluster, it displays many star strings extending and appearing to flow over the edge of the core. Fainter stars display spiral strings in various directions with open patches in between. A lovely outstanding yellow magnitude 6 star completely dominates the inner northern edge of the cluster situated just west of the core next to a dark lane. A bright yellow coloured magnitude 3.9 star is situated towards the outer south-east edge of the cluster.

Star clusters are so special, and full of surprises, reflecting much character and seldom disappointing, and the constellation Carina is well placed now towards our night skies.

OBJECT	TYPE	RA	DEC	MAG	SIZE
NGC 3532	Open Cluster	11h06m.4	-58°41’.2	3	50’

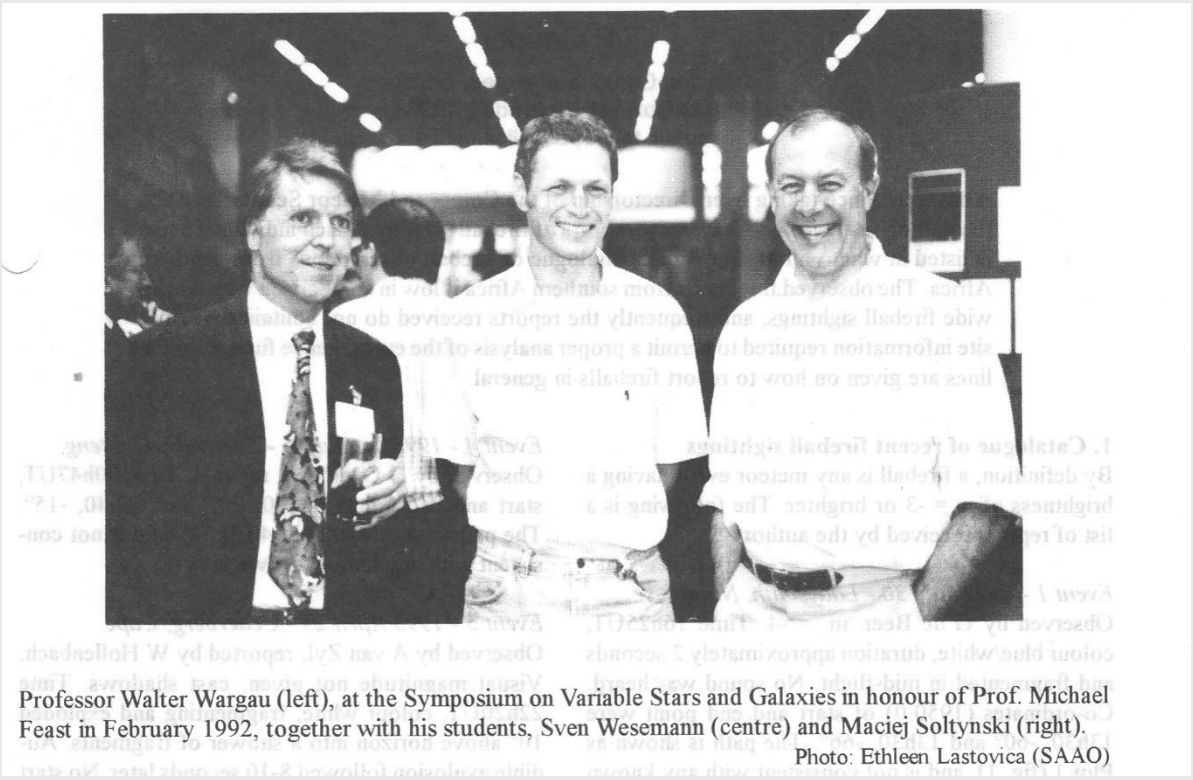
<u>GALLERY</u> Images taken by members of the Pretoria Centre

Image taken: April 8th 2023 The Pleiades and Venus.
My wife Jennifer grew up in the then Rhodesia and called this group the Baby Giraffe. (Michael). (I am not able to credit this image).



May 22nd 2023 Johan Moolman

FROM THE ARCHIVES



Professor Walter Wargau (left), at the Symposium on Variable Stars and Galaxies in honour of Prof. Michael Feast in February 1992, together with his students, Sven Wesemann (centre) and Maciej Soltynski (right).
Photo: Ethleen Lastovica (SAAO)

Prof Wargau (1948 – 1996) was very active in the Pretoria Centre of ASSA. He served on its Committee in various capacities from 1984 to 1996, including that of Chairman from 1987 to 1990.

Picture: GERHARD POTGIETER

The intrigue of the unknown is explained here by Professor Walter Wargau, chairman of the Astronomical Society of Pretoria, to Jakka van der Berg (left) and Marja Kuiper at the society's astronomical exhibition held at Sunnypark Centre at the weekend. 27/1/88

Pretoria News January 27th 1988

THE ASTRONOMICAL SOCIETY OF SOUTHERN AFRICA

The Royal Observatory,
Observatory,
Cape.

March 18 1966

Mr. K. Sterling,
5 Hekla Road,
Valhalla,
Pretoria, Tvl.

Dear Mr. Sterling,

Today I received your letter of the 14th March in connection with the formation of a Pretoria Centre of the Society. I am on the point of proceeding on three weeks leave, and am unable therefore to get the immediate approval of the Council, as required under the Constitution.

However I am convinced that the proposal to form this new Centre will be received with enthusiasm by Council, and you may therefore safely carry on with your plans, keeping me informed as to the outcome; and in due course formal covering approval, will, without any doubt, be given at our next Meeting.

By the way I presume the Transvaal Centre is being informed, as a potential loss of some 30 members is not inconsiderable.

I personally feel that with the establishment of a Centre at Pretoria, membership of the Society will grow quickly in that area, and interest in astronomical matters increase considerably.

Yours sincerely,

T. W. Russo

Hon. Secretary.

T. W. RUSSO

ASTRONOMICAL SOCIETY OF SOUTHERN AFRICA

PRETORIA CENTRE

An important meeting is to be held to discuss the future of the Pretoria Centre of the Astronomical Society with special reference to its financial position. If insufficient interest is shown in this meeting there is a distinct possibility that the centre will have to be dissolved. If members are unable to attend this meeting they should contact either Mr Karl Sterling or Mr Roy Smith at 71-3272 or 8-8528 respectively.

VENUE: Radcliffe Observatory
DATE: 5th March 1971
TIME: 8.00 p.m.