NEWSLETTER OF THE ASSA PRETORIA CENTRE MARCH 2026

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

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

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

Next Observing Evening : MARCH 20th 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 : MARCH 25th 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

Programme

Johan Smit will be Chairman for the evening and present What's Up for March 2026.

John Lindsay-Smith will do an introductory talk on Solar System astrophotography.
John is the current chairman of the Johannesburg centre and a regular attendee at dark sky events, such as the Free State Star Party and annual ASSA / ESSA Event in the Magaliesburg.

EDITORIAL Michael Poll

I have been doing the Newsletter for a while, starting with the October 2025 issue. Originally I said I would do it for October and November (2025) and see how it went from there, but here I still am, unless someone else would like to take it over! As you may guess, it takes a *lot* of time, and one has to think a long way ahead, and like everyone else, one seems to spend so much time doing 'paper work' on-line: insurance, car tax, income tax, banking, medical aid and other service providers. The most time consuming thing is trying to correct mistakes that these entities make. This editorial which you are now reading was drafted in December last year, because I was going to be away for three weeks in February. At the time I had got the January issue more or less ready, I was working on the February one which had to be ready by the end of January.

The articles I have been using were submitted to the Newsletter by me in times past. They are mostly synopses of articles from Sky and Telescope. I have to use these old articles because I would not now have time to do any new ones, and in any case, some of them would need updating in the light of new information, which would probably mean starting from scratch – it takes a lot of editing to get a satisfactory article. *("Writing makes an exact man"* – Francis Bacon*). Also I do not get Sky and Telescope any more – a few years ago I made a payment via credit card, as I had been doing in the past, but the payment got lost somewhere. The bank say they sent it, Sky and Telescope said they had no record of having received it. Impasse. However until this year I was still able to download the digital PDF copies, but S&T seem to have now blocked that. Inertia has set in and I have done no more.

I do have a couple of years' worth of S&T on my computer which I must admit I have not read. When I get digital magazines, I generally save them to "read later" as one does, and of course, they remain unread, unlike, I hope, this Newsletter! It is not quite the same experience to read a magazine on a screen.

I do have a few newspaper clippings to use in the "From the Archives" section, but the supply is limited. Some of the clippings I will have to use eventually are general historical ones rather than specifically ones about the Centre or ASSA. I have been saving images from the What's App group which I am dipping into for the Gallery, one request is to make sure I know who made the image and the time and date it was made.

For now I will fill space with my old articles, and things I have saved but of course, contributions would be welcome. What would be nice are contributions to the Editorial / Opinion Piece. What I am thinking of is a personal commentary, commentary on the astronomy scene in general or locally, personal experiences good or bad, ideas about the future of astronomy societies, or other similar societies or whatever random commentary or reminiscence comes to mind. I hope that the couple of Editorials I have done may give someone some ideas. Even half a page would be enough.

One caveat about any contributions you may submit is that they need to be sent in on time. I need to send the newsletter to Johan by the weekend before the Observing Evening. The earliest the Observing Evening can be is the 17th of the month (when the 1st is on a Wednesday), so I would like contributions by the 10th of the month. This will include the Meeting Report from the person who was Chairman at the last meeting, and any other contributions. It is not so critical with the Summaries of What's Up and the Main Topic from the presenters – if they miss the deadline the summaries can be sent out with the Notice of the Meeting. Pierre used to frequently nag people to send him their reports and contributions, but I am not going to do that! This is my one and only nag!

* The full aphorism written by Francis Bacon is

Reading maketh a full man,
Writing an exact man and
Conference a ready man.
Francis Bacon (1561 – 1626) "Of Studies"

REPORTS

Observing Evening Report: February 20th 2026 Michael Poll and Johan Smit

We had good turnout in spite of forecast of rain (it came later that night!). Adderus Berg invited a number of people who reside at the same complex as him, including some children, there were also some children from the School, so we were about 15 or so. We only had two telescopes- Johan S and Jaco. The children there were quite taken with using binoculars to look at the Moon, and anything else they could find.

It was not a good evening for viewing and it got worse as time went on. The 3½ day old Moon was low in the west, but we did get a look at it. The two features that were most noticeable were Mare Crisium and a prominent crater with a central peak which MP identifies as Langrenus. Notice that Mare Crisium looks oval from our terrestrial viewpoint but viewed from above it would be seen that it is actually circular. Its diameter is 570 km, and it has a surface area of 176 000 sq. km, which is slightly larger than the Eastern Cape (168 000 sq. km). Langrenus is 132 km in diameter and is named after Michel Florent van Langren (1600 – 1675), a Belgian engineer and mathematician who was the first to draw a map of the Moon with names and formations.

Jupiter was high in the north east, Ganymede and Europa were to its west and was Io to its east. By the time we left Jupiter was in the north and therefore could be used to illustrate that the Earth was turning on its axis. Using the positions of the Moon and Jupiter the concept of the ecliptic was explained to the newcomers.

Only the brightest stars were visible with the naked eye, so for the first time visitors we pointed out Orion, Aldebaran, Sirius and Canopus, and in the north, Capella.

We did quite a lot of explaining about naked eye viewing with reference to the Skymaps chart – always a useful tool for discussion. There was also discussion about Messier numbers and NGC (New General Catalogue) numbers. The former is named after French astronomer Charles Messier (1730 – 1817), and the latter was compiled by John Emil Louis Dreyer in 1888, which consolidated the General Catalogue of Nebulae and Clusters of stars which was compiled by William Herschel and his sister Caroline, and John Herschel, William's son, and published by John Herschel in 1864.

Some objects observed in the telescopes included Jupiter (of course) the cloud belts and satellites were noted. We looked at the Orion nebula M42 – the four stars of the Trapezium and the row of three next to it were easily seen, but Oh! the cloud of gas was hardly visible given the sky conditions. Looking south-east and we found NGC 2547, the Heart Cluster. It was difficult, but the shape could be recognised with a little guidance. Another target in that area was the Southern Pleiades (IC 2602) which was compared with the "other" Pleiades in the north. Low in the south east Mimosa (Beta Crucis) was found and the close by carbon star (Ruby Crucis) was just visible.

The sky got worse as the evening went on, in the end we could not even see Castor and Pollux with the naked eye so we ended up by sitting and chatting, so an evening that started off not promising turned into a pleasant experience for all present.

The next Observing Evening is on March 20th 2026

MEETING REPORT: FEBRUARY 25TH 2026

Johan Jordaan presented What's Up. Johan detailed dates of the Moon's phases and indicated which planets were visible in the evening sky for the month - Jupiter, Saturn, and Venus. The summer constellations are moving off to the west and the winter ones with their attendant deep sky objects are rising in the east and south east. The Pencil Nebula (NGC 2736) and the Eight Burst Nebula (NGC 3132 Caldwell 74) were highlighted.

Johan Smit presented the Main Topic which was an in-depth discussion about Telescope Mounts and Their Uses, including strengths and weaknesses of each sort and some practical advice.

ARTICLE THE DATE OF EASTER. Michael Poll

The word Easter comes from the name of the Teutonic goddess of spring, Eostre, whose festival was celebrated at the March Equinox. Other European languages use words for Easter that stem from the Hebrew word "Pesach" after the name of the Jewish Passover feast, which was observed by Jesus the night before the crucifixion. Easter was first celebrated in about AD 68.

To commemorate the Biblical account, Easter Sunday should fall on a Sunday during the Jewish Passover week. Celebration of Passover started on the 14th or 15th day of the Jewish spring month of Nisan. Because Jewish months start when the Moon is new, the 14th or 15th day of the month would have been immediately after a Full Moon, because from New Moon to Full Moon is 14 or 15 days, (taking the day of New Moon as Day 1). The date of the Passover is determined by the first Full Moon of (the northern hemisphere) spring, Nisan being a spring month. The start of spring was the March Equinox (March 21st).

Prior to 325 AD, churches in different regions celebrated Easter on different dates, and not always on Sundays. There was a dispute between the Christians of Asia Minor and those of the Western Church as to the date on which Easter should be celebrated. The Christians of Asia Minor kept the Resurrection on the third day after the 14th of Nisan, whatever the day of the week, whereas the Western church kept Easter on the Sunday following the 14th.

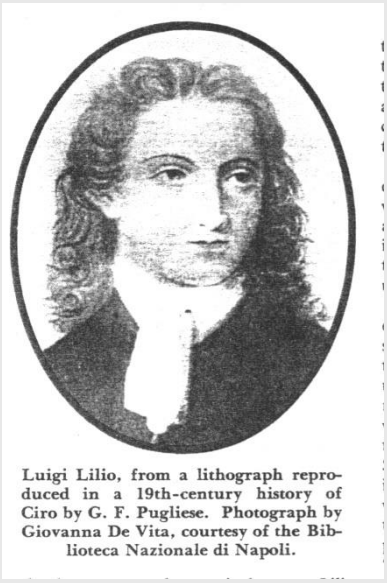
The matter was addressed at the Council of Nicaea in 325 AD. (The Nicene Creed was also instituted at this Council. Nicaea is now Iznik, in Turkey). The Council of Nicaea decided that Easter would be celebrated on Sundays, and to fix the date, **Easter was defined as the first Sunday after the first Full Moon that occurs on or after the March Equinox. If this Full Moon falls on a Sunday, then Easter is the following Sunday.**

Easter was defined with respect to an imaginary Moon, known as "**Paschal**" or "**Ecclesiastical"** Full Moon, and a **fixed equinox** that was always to be on March 21st. The reason for using the imaginary Moon (it can vary slightly from the real one) and the fixed equinox is that the method allows the date of Easter to be calculated in advance without further astronomical knowledge. It also makes the date of Easter independent of longitude on the Earth and is thus independent of Time Zone. For example, at the instant of Full Moon it may be Sunday in Jerusalem but still be Saturday in New York, providing the possibility of differing dates for Easter.

The calendar in use at the time of the Council of Nicaea was the one introduced by Julius Caesar in 46 BC, (the "Julian Calendar") which had a Leap Year every four years, making the length of the (calendar) year 365.25 days. However, the actual time it takes for the Earth to go around the Sun, and thus for the Sun to return to the same equinox is 365.2422 days - this period is called the Tropical Year, and it is the period that matches the seasons. The Tropical Year is 11 minutes and 16 seconds shorter than Caesar's year. This time difference meant that the Sun was returning to the March equinox before one calendar year had passed i.e. the Sun would return to the March Equinox 11 minutes and 16 seconds earlier each year. This amounts to one day earlier in 128 years. By the 1500s Caesar's calendar had been in use for 1600 years, and the error amounted to 10 days.

The Julian Calendar needed reforming, but the reason for the reform was not the fact that the seasons no longer matched the calendar, but that Easter was being celebrated too late. The Jewish Passover was still related to the real equinox, so by the 1500s the Passover was being celebrated on March 11th, while Easter in the Christian church was still defined using the "fixed" equinox of March 21st. Easter was losing its relationship with the Jewish Passover, and was drifting away from its springtime position towards summer, which meant that, at the time, the Christian church would have been celebrating Easter up to six weeks after the Passover.

In 1576 Pope Gregory XIII set up a commission to look for ways of correcting the calendar. The aim of the reform of the calendar was restore the equinoctial date to March 21st, so that the Sun and the calendar would again coincide, and to ensure that they would not drift apart again.



Luigi Lilio, from a lithograph reproduced in a 19th-century history of Ciro by G. F. Pugliese. Photograph by Giovanna De Vita, courtesy of the Biblioteca Nazionale di Napoli.

A new Calendar, devised by Aloisius Lilius (aka Luigi Lilio) (1510 - 1576) with modifications by Christoph Clavius (1537 – 1612), was introduced by Pope Gregory XIII in 1582, and so the calendar in use today is called the Gregorian calendar.
The 10 days were taken out of the calendar all at once in 1582 which therefore corrected the date of the March Equinox. (Not every country made the adjustment in 1582 – Britain only did it in 1742, and the then USSR did not do so until 1918 which is why the October Revolution is commemorated in November).

The basic difference between **Caesar's Calendar** and the **Gregorian Calendar** is that the Julian calendar had 100 Leap Days in 400 years, whereas the Gregorian calendar has 97 Leap Days in 400 years. Leap Years generally are those years divisible by 4, but the three Leap Days were removed by ruling that century years had to be divisible by **400** to be a Leap Year, thus the year 1900, although divisible by 4, was not a Leap Year, but 2000 *was* a Leap Year. The Gregorian year of 365.2425 days is 26 seconds longer than the Tropical Year of 365.2422 days, which amounts to an error of less than 1 day in 3300 years.

From this calendar reform, Lilius devised tables that would be used to determine the date of Easter, as based on the Gregorian calendar. The aim of the system is to indicate the date of the first Full Moon after March 21st. It took Lilius 10 years to devise these tables. The tables are based on a cycle of 19 years in which the phases of the Moon repeat themselves (almost) exactly. This period of 19 years or 235 lunar months, is known as the Metonic Cycle, named for Meton, an Athenian astronomer (5th Century BC), who discovered it.

Metonic Cycle: 19 Calendar Years of 365.2425 days = 6939.6 days
235 Lunar Months of 29.5306 days = 6939.7 days
Difference: 2 hours 5 minutes

To calculate the date of Easter the Golden Number and the Dominical Letter are used.
The Golden Number.

Each of the years in the 19 year Metonic cycle is numbered from 1 - 19 (the "Golden Number"). To calculate the Golden Number for any particular year, divide the year by 19, find the remainder, then add 1 to obtain the Golden Number.

The Golden Number for **2026** is 13 (2026 /19 = 106 remainder 12 +1= 13 **)**, and for 2027 it is 14. The phases of the Moon, including Full Moon, **will fall on the same dates in years with the same Golden Number, i.e. the phases of the Moon only repeat on the same day and date every 19 years.**

The Dominical Letter (also known as the Sunday Letter). (Latin: *Dies Domini*, Day of the Lord)

Each calendar year is allocated a Dominical Letter. To determine the Dominical Letter for any particular year, all the days of the year from January 1st to December 31st are marked with a continuous cycle of seven letters: A, B, C, D, E, F, G. The letter A is always set against January 1st, and so on as follows:

January 1st is labelled A
January 2nd is labelled B
January 3rd is labelled C
January 4th is labelled D
January 5th is labelled E
January 6th is labelled F
January 7th is labelled G

So, January 8th will be A again and so on throughout the year, (except that February 29th, when it occurs, is not given a letter)

To find the Dominical Letter for any particular year, first note on which day of the week January 1st falls, (given that January 1st is always 'A' whatever day of the week it falls on). Label the remaining days of the week with the next letter in the cycle, up to Sunday (which will be the first Sunday of the year). The letter that

falls to the first Sunday is the Dominical Letter for that year, and during that year, every date with the Dominical Letter will be a Sunday.

Examples: The Dominical Letter for 2026 is D, because January 1st (A) fell on a Thursday (hence Friday = B, Saturday = C Sunday = D). In 2027, January 1st (A) is a Friday and Sunday will be C, so C is the Dominical Letter for 2027, and all the dates marked C will be Sundays.

Note that the Dominical Letter cycles backwards by one letter each year, but in Leap Years the Dominical letter jumps back for a second time when the Leap Day occurs, so for Leap Years two Dominical Letters are shown (e.g. B/A) to indicate the Dominical Letter before the Leap Day (B), as well as after the Leap Day (A). In this example, before the Leap Day all the dates lettered B will be Sundays, and after the Leap Day all the dates lettered A will be Sundays. For the purpose of determining Easter, the second letter is the applicable one

Thus, the Dominical Letter for the year tells us which dates are Sundays without having to refer to a calendar. One of those Sundays will be Easter Sunday, but to determine which one, the Golden Number for that year needs to be known, because, as noted above, Full Moon will occur on the same day and date in years that have the same Golden Number. By cross-referencing the Dominical Letter with the Golden Number, the date of the Paschal Full Moon, and therefore the date of Easter, can be determined.

Adjustments to the tables have to be made at intervals, because of the difference of about two hours between 19 calendar years and 235 lunar months, and the 26 seconds difference between the Gregorian year and the Tropical year. But, because the differences are so small, the effects accumulate slowly, so the adjustments need only made at long intervals. The next adjustment will be made in the year 2200!

The following table (with acknowledgements to J R Stockton) can be used to determine the dates of Easter in the Gregorian calendar from 1900 – 2199. © J R Stockton, www.merlyn.demon.co.uk

DOMINICAL OR SUNDAY LETTER

Golden Number	**A**	**B**	**C**	**D**	**E**	**F**	**G**
1	Apr 16	Apr 17	Apr 18	Apr 19	Apr 20	Apr 21	Apr 15
2	Apr 9	Apr 10	Apr 4	Apr 5	Apr 6	Apr 7	Apr 8
3	Mar 26	Mar 27	Mar 28	Mar 29	Mar 30	Mar 24	Mar 25
4	Apr 16	Apr 17	Apr 18	Apr 12	Apr 13	Apr 14	Apr 15
5	Apr 2	Apr 3	Apr 4	Apr 5	Apr 6	Apr 7	Apr 1
6	Apr 23	Apr 24	Apr 25	Apr 19	Apr 20	Apr 21	Apr 22
7	Apr 9	Apr 10	Apr 11	Apr 12	Apr 13	Apr 14	Apr 15
8	Apr 2	Apr 3	Apr 4	Mar 29	Mar 30	Mar 31	Apr 1
9	Apr 23	Apr 17	Apr 18	Apr 19	Apr 20	Apr 21	Apr 22
10	Apr 9	Apr 10	Apr 11	Apr 12	Apr 6	Apr 7	Apr 8
11	Mar 26	Mar 27	Mar 28	Mar 29	Mar 30	Mar 31	Apr 1
12	Apr 16	Apr 17	Apr 18	Apr 19	Apr 20	Apr 14	Apr 15
13	Apr 9	Apr 3	Apr 4	Apr 5	Apr 6	Apr 7	Apr 8
14	Mar 26	Mar 27	Mar 28	Mar 29	Mar 23	Mar 24	Mar 25
15	Apr 16	Apr 17	Apr 11	Apr 12	Apr 13	Apr 14	Apr 15
16	Apr 2	Apr 3	Apr 4	Apr 5	Apr 6	Mar 31	Apr 1
17	Apr 23	Apr 24	Apr 18	Apr 19	Apr 20	Apr 21	Apr 22
18	Apr 9	Apr 10	Apr 11	Apr 12	Apr 13	Apr 14	Apr 8
19	Apr 2	Apr 3	Mar 28	Mar 29	Mar 30	Mar 31	Apr 1

Hence for 2026 the Golden Number is 13, the Dominical Letter is D, so Easter Sunday is April 5th.

For 2027 the Golden Number is 14, the Dominical Letter is C so Easter Sunday is March 28th.

Although the Gregorian Calendar repeats itself every 400 years, the pattern of Gregorian *Easter* dates only repeat themselves after a period of 5 700 000 years.

The earliest possible date for Easter is Sunday March 22nd, which occurs when the Full Moon is on March 21st, (at the equinox) and that day is a Saturday. Easter is then the next day. This only happens once every 210 years on average, last time was 1818, the next will be 2285.

The latest possible date for Easter is April 25th. This happens when a Full Moon occurs on March 20th, the day *before* the equinox. The first Full Moon after the equinox will occur 29 days later, on April 18th, and if that day is a Sunday, then Easter will be the following Sunday, April 25th. Easter falls on April 25th once every

130 years on average. The last time was in 1943 and the next will be 2038. The commonest date for Easter over the whole cycle is April 19th, occurring in 3.9% of cases.

The 1582 reform of the calendar was not accepted by the Eastern Orthodox churches, which still base their Easter date on the Julian calendar. This causes Easter Sunday for the Orthodox church to fall 1, 4 or 5 weeks later in the year than Easter of the Western Church.

OBSERVERS CORNER by Magda Streicher

NGC 2516 A S*tar Cluster with Class*

In the constellation Carina are many open star clusters providing observational pleasure through binoculars and a telescope. One of the most exceptional star groupings in this part of the sky can be attributed to NGC 2516, only 3 degrees south-west of epsilon Carinae.

Nicolas Louis de Lacaille (1713–1763) discovered the cluster in 1751, while observing from South Africa with a very small telescope. He noted NGC 2516 as a "very close group of stars". Lacaille's residence in Strand Street, Cape Town, where he did many observations, is no longer there. However, a memorial stone was erected against the marble wall entrance, which Auke Slotegraaf and I visited during a brief historical tour in Cape Town. The beautiful antique memorial stone was literally covered with green lichens and moss, which made it almost impossible to read. Auke, who has a great appreciation for history, went to find some water and a cloth and diligently set about cleaning the valuable memorial stone, which disappeared a few years ago!

Auke's comment on NGC 2516: "What a sight!" He said NGC 2516 had it all: multiple stars, curves, chains and coloured stars. He goes on to describe it as a glorious mass of stars in a rich field. The main body of the cluster is a regular-sided diamond shape filled with stars. A broad bridge of stars and stardust runs briefly northwards, and then branches east and west, each branch ending in an orange-coloured star. The bridge has a small but distinct black oval spot towards its centre. On the east and west sides of the bridge are black vacancies, helping to define the bridge. The eastern tip of the diamond shape is capped by a bright off-white star. West of this star, near where the bridge of stars ends, is an almost equal double star. Auke once told me to describe a deep sky object in such a way as to create a clear picture of the object in one's mind and he rightfully mastered it in a brilliant way.

Although Lacaille has long been deceased, his memory will be with us in his sharing of this wonderful cluster, as once seen with his own eyes.

Object	Type	RA	DEC	Mag	Size
NGC 2516	Open Cluster	07h58m.3	-60°52'.3	3.8	29'

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

2026 February 17th. Partial Eclipse of the Sun Barbara Cunow

This eclipse is member of Saros Cycle 121. The first eclipse in the series was on 25 April 944 and the last will be on 7 June 2206. The longest totality was 6 minutes 20 seconds on 21 June 1692.

PS When a solar eclipse occurs near the poles it is either near beginning of a new Saros Cycle or towards the end of an old one.

Globular Cluster

47 Tucanae

Imaged by Percy Jacobs

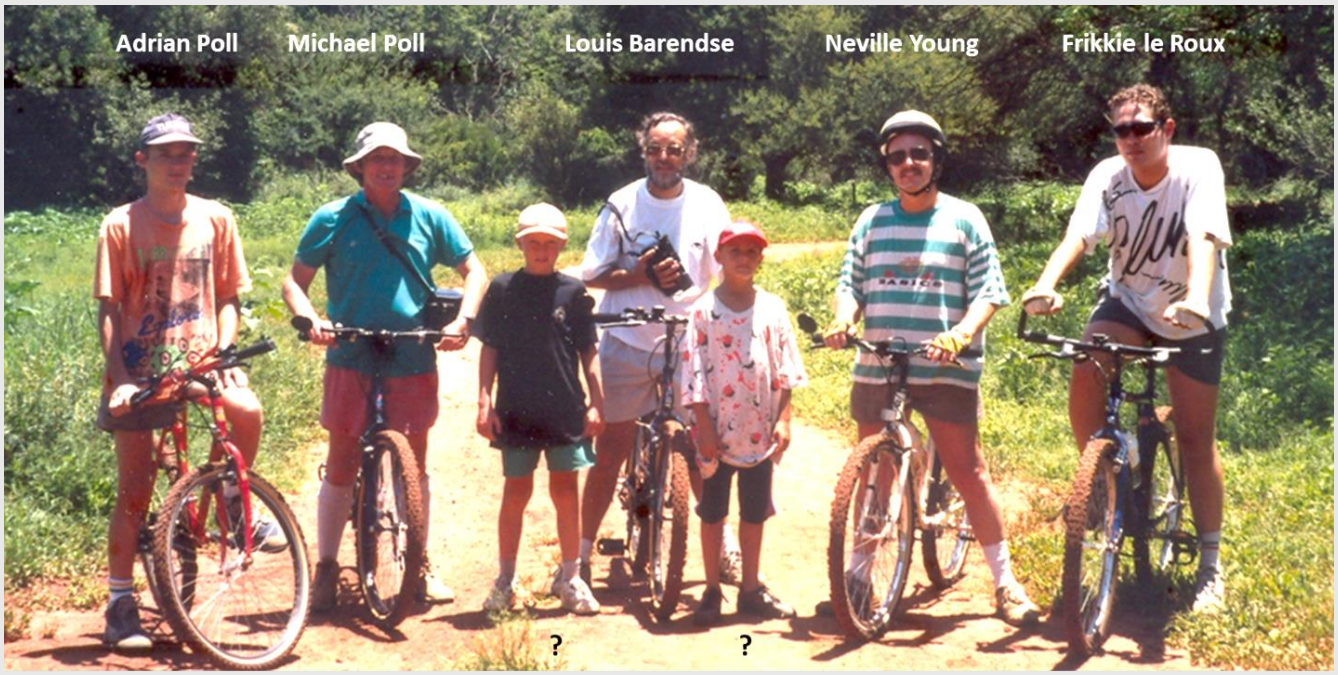
FROM THE ARCHIVES

April 4th 2009.
Irene Oval.

Fred Oosthuizen (on the left)

I have forgotten who the other person is.

Astronomy Weekend at Doornpoort 1995



I don't know who these two lads are, is one of them Noel Young?

SCIENCE RESEARCH COUNCIL

RADCLIFFE OBSERVATORY
PRETORIA
SOUTH AFRICA

P.O. BOX 373 TEL 78-2736

9th April, 1968.

Mr. K. Sterling,
5 Nicklaweg,
Valhalla,
PRETORIA.

Dear Mr. Sterling,

The Science Research Council agrees that the Pretoria Centre of the Astronomical Society of South Africa shall erect and maintain at its own expense a 12 inch telescope and dome in the grounds of the Radcliffe Observatory on a site approved by S.R.C. who will also wish to approve the design of the building. Permission for use of the site is given on the conditions set out in the Memorandum of Agreement drawn up by Lunnon and Tindall.

This Agreement when signed will constitute the understanding between S.R.C. and the Pretoria Centre.

May I remind you that it will be necessary for you to take out an additional Insurance policy, as soon as possible after the signing of the Agreement in accordance with Clause 6 of the Agreement.

Yours sincerely,

A.D. Thackeray

C.C. G.R. Acaster

R.J. Harris, S.R.C.