



ASTRONOMICAL SOCIETY OF SOUTHERN AFRICA

# Durban 'nDaba

*2021 Amukh' Raiphal*

Monthly Newsletter of the Durban Centre - July 2021

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## Member Submissions Disclaimer

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# Chairman's Chatter

July 2021

Dear Members and Astronomy Friends,

We are still not able to have meetings in person and will continue to do this via Zoom. Thanks again to Gerald de Beer for hosting us during the lockdown periods.

Our AGM is scheduled for **14 July 2021** via Zoom. You will receive the agenda and supporting documentation shortly.

Prior to the AGM, we request you to assist the Committee by:

1. Please find the attached nomination form sent in the mail containing the 'nDaba newsletter. If you are willing or know someone wanting to become a committee member, please complete the nomination form and send via email to the [secretary@astronomydurban.co.za](mailto:secretary@astronomydurban.co.za) with the required proposer, nominee and seconder's signatures. **ASSA Committee Nomination** in Subject line.



Due to the covid restrictions, and the difficulty in getting the nomination forms signed; email nominations will be accepted with trailing mails from the nominee, seconder and proposer. We need new committee members due to some resignations received and appeal to you to consider joining us in running the society. Kindly note these are to be received by **7 July 2021**.

2. We customarily announce "Astronomer of the Year" at the AGM. During the past unusual year, we have had limited contact but need the help from you, our members. Please nominate any member you feel qualifies for this, or any other person that may be deserving of an award that you may feel needs to be recognized. Please send your nominations with **ASSA Award Nomination** in the subject line, to the email address [secretary@astronomydurban.co.za](mailto:secretary@astronomydurban.co.za) for the committee to considered them. Please send proposed awards and names by **7 July 2021**.

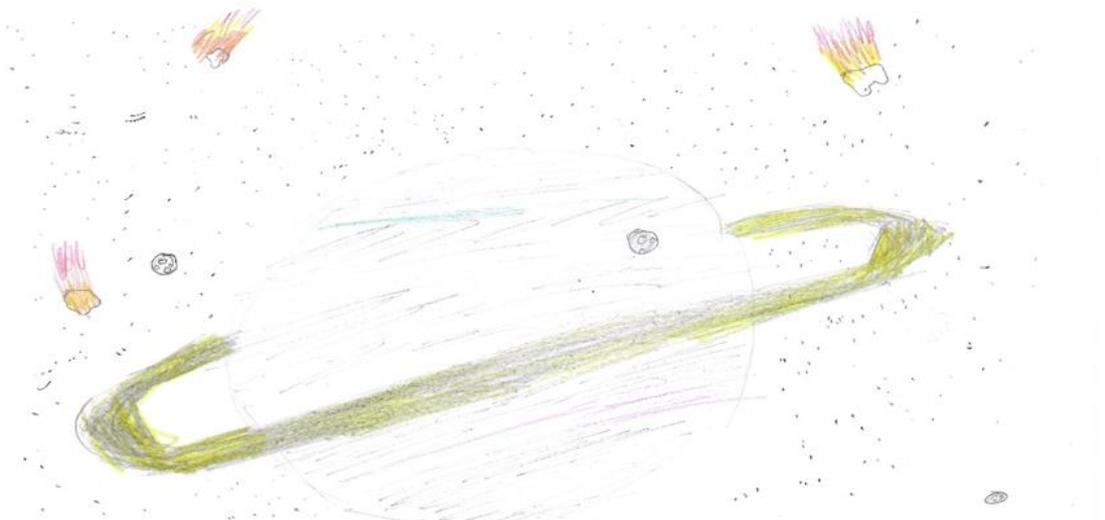
We have had to cancel some of our public events due to the risks during the "third wave" and will advise all later, depending on the developments.

We have scheduled another event, "On The Moon Again" (OTMA) which is held annually as a celebration of the moon landing in 1969. We did this in July 2019 on the 50<sup>th</sup> Anniversary of this event. We are provisionally planning for Friday 16 July; which will be confirmed nearer the time.

Below is a drawing given to me by a Grade three student at the German school. I was asked which is my favourite planet.

Until the AGM.

Piet



PS: See the Astro-photographers competition details on page 28 - Good luck to those submitting.



## ...Astronomy Delights – Hydrus

*The constellation Hydrus first published by Bayer, must not be confounded with the ancient constellation Hydra. Explore this constellation with care known by the Germans as der Kleine Wasserschlange.*

In the northern part of Hydrus, the asterism **STREICHER 27** found a home. The grouping consists of four relatively bright stars in a semicircle with fainter members stringing out to the south-east.



ABOVE: NGC 602

Hugging the border with the constellation Tucana between field-stars I could barely make out **NGC 602**, a two-part cluster. The larger part, reveals a sandpaper impression, positioned more towards the north-east, with a few very faint stars as an extension to the west, giving the cluster an uneven and elongated expression.

There seem to be more hangers in the sky than the Coat Hanger in the constellation Vulpecula and the Mini Coat Hanger in the constellation Ursa Minor. **STREICHER 37**, consist of twelve various magnitude stars in an old-fashioned hanger shape that sported this grouping. The asterism is positioned in a northwest to south-east direction, with the hook pointing south. This small group or stars is situated in a very busy star field and might not be noticed at first. The brightest star in the grouping is the magnitude 9-star, SAO 255920.



The galaxy **NGC 1511** is situated a few arc-minutes south-east of the border with the constellation Reticulum. It appears as a soft spindle in a north-west to south-east direction, with the north-western edge slightly hazy and bulgier. Higher magnification lends the galaxy to show a flatter impression with a relatively bright nucleus.

LEFT: NGC 1511

OBJECT	TYPE	RA	DEC	MAG	SIZE
NGC 602	Open Cluster	01h29m.6	-73°33'.4	10.5	34'
STREICHER 27 DSH J0146.4-6447	Asterism	01h46m.4	-64°47'.8	9	9.5'
STREICHER 37 DSH J0244.3-7821	Asterism	02h44m.3	-78°21'.8	10.5	13'
NGC 1511	Galaxy	03h59m.5	-67°38'.5	11	3.5'×1.3'

# At the Eyepiece

July 2021 by Ray Field



The Moon is Last quarter on the 1<sup>st</sup>, New on the 10<sup>th</sup>, First quarter on the 17<sup>th</sup>, Full on the 24<sup>th</sup> and Last quarter on the 31<sup>st</sup>.

The Moon is near the Crab Nebula (Messier 1) and Aldebaran on the 7<sup>th</sup>, Mercury on the 8<sup>th</sup>, Pollux on the 10<sup>th</sup>, Venus and Mars on the 12, Regulus on the 13<sup>th</sup>, Saturn on the 27<sup>th</sup> and Jupiter on the 26<sup>th</sup>.

Mercury is highest over the East in the morning pre-dawn sky on the 4<sup>th</sup> and near the Moon on the 8<sup>th</sup>. The rest of the month it is not favourable placed.

Venus, on the 3<sup>rd</sup>, is in the middle of the large bright Beehive open cluster (Messier 44), in the early evening sky, low over the West. This should make a fine sight in binoculars. During the month Venus will climb higher in the evening sky after sunset.

Mars, orange-red in colour, is visible to the naked eye at about the same brightness as Saturn is this month. It lies in the constellation of Cancer and passes into Leo later this month. It is visible in the evening sky setting about 19:00 by the month-end over the West.

Jupiter, the largest planet in the Solar System, is a bright object in the sky. It reaches opposition next month when it can be seen all night in Aquarius, near the border of Capricornus. Look for it following Scorpius and Sagittarius across the sky. The Moon is near Jupiter on the 26<sup>th</sup>.

Saturn, in Capricornus this month, is near Jupiter. The Moon is near Saturn on the 24<sup>th</sup> and Jupiter on the 25<sup>th</sup> and 26<sup>th</sup>. The very bright planet, Jupiter, will act as a guide to Saturn. Saturn and Jupiter make interesting objects for even small telescopes. Saturn's brightest and biggest moon, Titan, is about the same size as the planet Mercury.

Uranus is just visible to the naked eye under perfect dark skies. It is in the constellation of Aries all year. Binoculars and a detailed map will aid finding it.

Neptune, in Aquarius, even further from the Sun than Uranus and fainter. A small telescope will only show these planets as a faint dot with no surface detail.

Meteor Showers: (p86 ASSA Sky Guide) Four showers are visible in July, one favourable and three not. All their radiants are South of the Equator.

Name	Max	Date	RA of Radiant	Dec of Radiant	ZHR	Time	Prospect
July Phoenicids	13 July	10 July – 16 July	02:08hr	-48°	< 5	23:00 – 05:00	Favourable
Pices Australids	28 July	19 July – 17 Aug	20:40hr	-30°	5	20:30 – 05:00	Unfavourable
S. δ Aquariids	29 July	21 July – 29 Aug	22:36hr	-16°	25	22:00 – 05:00	Poor
Alpha Capricornids	30 July	15 July – 25 Aug	30:28hr	-10°	5	20:00 – 04:00	Poor

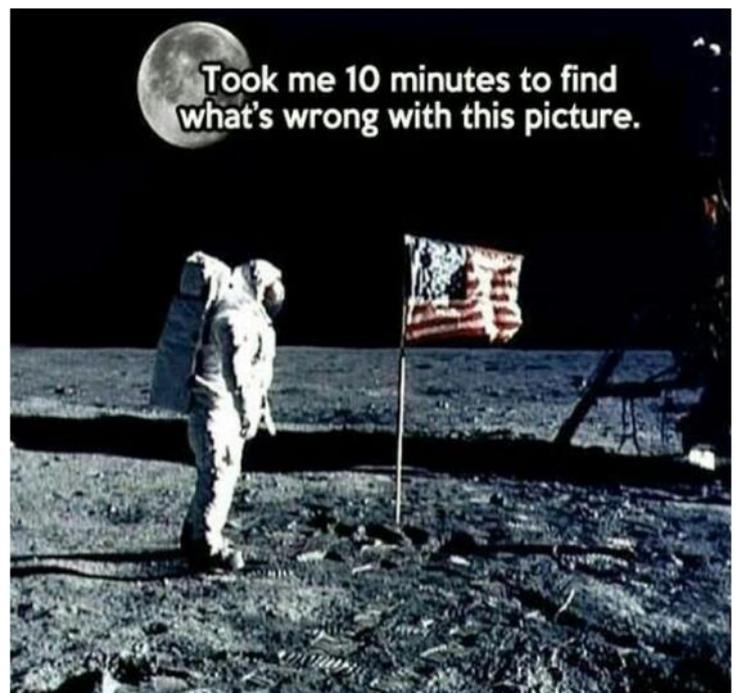
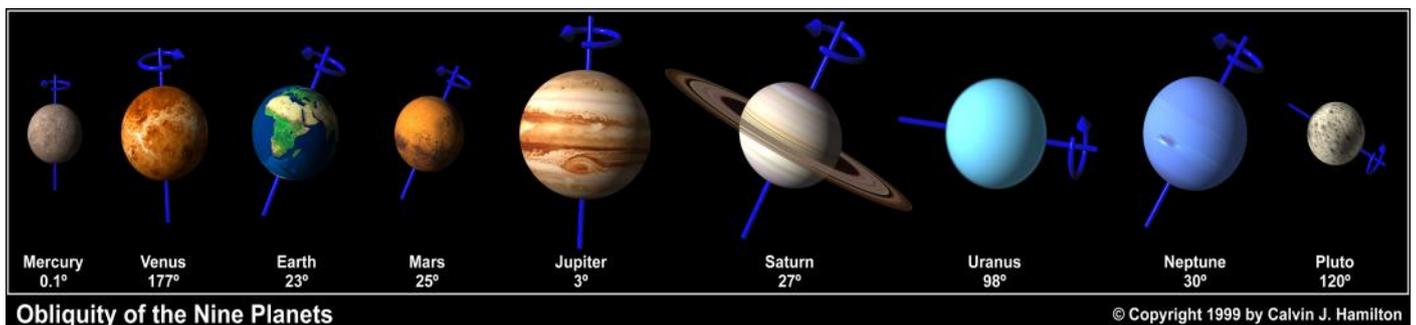
## ... At the Eyepiece

The starry sky from Durban in the early evening. The Southern Cross is just past its highest with the “3 Crosses region” extending down to its right and ending with Canopus, the second brightest star in the sky, (*Sirius is the brightest*) which lies at a distance of 180 light years. Rigel Kentaurus or Toliman, the brightest point of the Southern Cross, is a triple star system, and is the 3<sup>rd</sup> brightest star in the sky at a distance of only 4.37 light years.

*(Alpha Centauri is the closest star system and closest planetary system to Earth's Solar System at 4.37 light-years (1.34 parsecs) from the Sun. The name is Latinized from  $\alpha$  Centauri, and abbreviated Alpha Cen or  $\alpha$  Cen. It is a triple star system, consisting of three stars:  $\alpha$  Centauri A (officially **Rigel Kentaurus**),  $\alpha$  Centauri B (officially **Toliman**), and  $\alpha$  Centauri C (officially **Proxima Centauri**).*

The Southern Milky Way which includes the “3 Crosses” area and Scorpius and Sagittarius, is a magnificent sight in a dark country sky with dark adapted eyes. Pages 42 and 43 of ASSA Sky Guide show the night sky from Durban in winter and some objects of interest such as the Large and Small Magellanic Clouds. Over the North, the bright stars Arcturus, orange in colour, and Spica, a blue-white star, 270 ly away and over the Northeast, Vega and Altair.

References include Handbook of the constellations by Vehrenberg and Blank, Norton's Star Atlas and handbook by Arthur P. Norton, 2021 Sky Guide Africa South by ASSA, Star Watching by Anthony Fairall and Philips' Planisphere for 35° S



# Mars Meditations

by Joe Bergeron

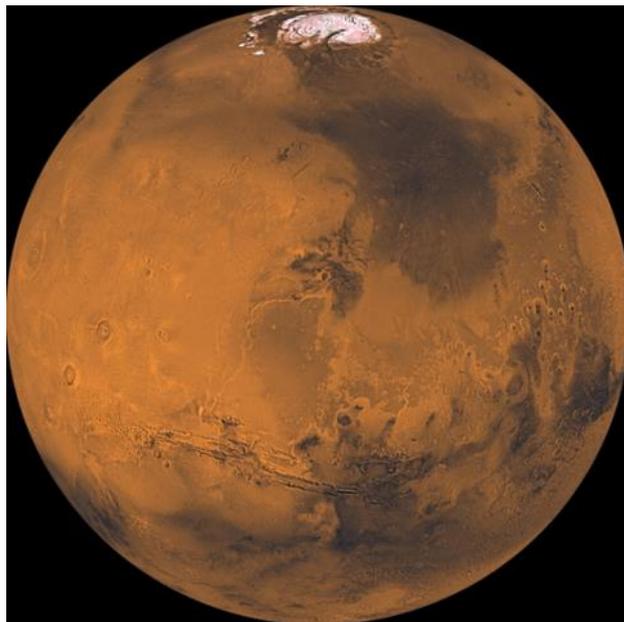
The planet Mars is coy. It spends most of its time as a relatively inconspicuous star-like object, only moderately bright, drifting barely noticed though the sky, little seen, or sometimes hiding behind the Sun.

Once every two years it grows bolder. It decides to put on a show. But even then, it's sneaky about it, gathering its glory in the late hours of the night, seen mainly by dedicated astronomers, those who know what to expect and where to look.

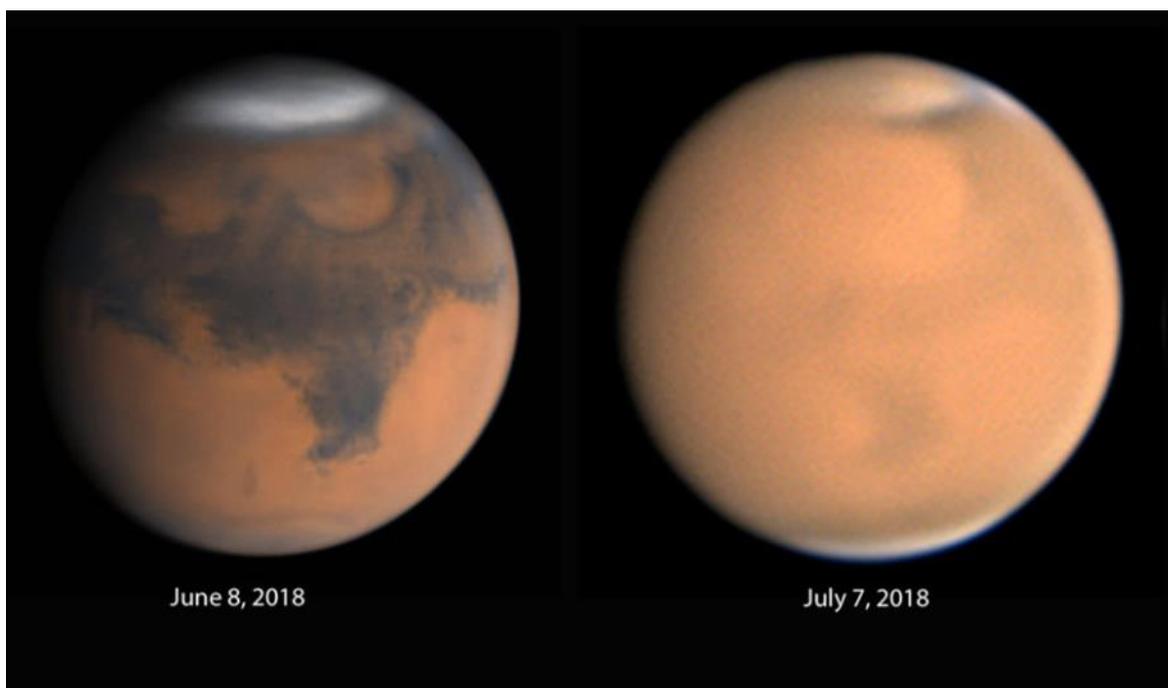
And then, at the apex of its splendor, it rises at sunset, blazing across the sky all night for a few brief weeks, revealing itself in a level of detail far beyond what it will normally display.

Of course, this description of Martian behavior is pure anthropocentric nonsense. As far as Mars is concerned, it's just wheeling around in its orbit as usual, and if that little blue light closer to the Sun cruises by once each (Martian) year or so, it barely notices. Though the planet has noticed that lately, whenever the blue light is a bit ahead relative to itself, a little later one or two tiny metal fleas may descend onto its surface, or perhaps settle into orbit around itself.

This is the situation we are experiencing now. The passage of Earth between the Sun and Mars (or any other outer planet) is called *opposition*. In the case of Mars, it occurs at an average interval of two (Earth) years and fifty days, as the speedier Earth catches up to Mars and passes it in its orbit. The distance between the two planets varies between oppositions, because neither has an orbit that is exactly circular. At a good opposition, like in 2003 and 2018, the planet is less than 36 million miles away, about 150 times the distance to the Moon. At a poor opposition, the planet is 61 million miles away and proportionately smaller.



ABOVE: A composite image of Mars from the Viking Orbiter (image credit: NASA)



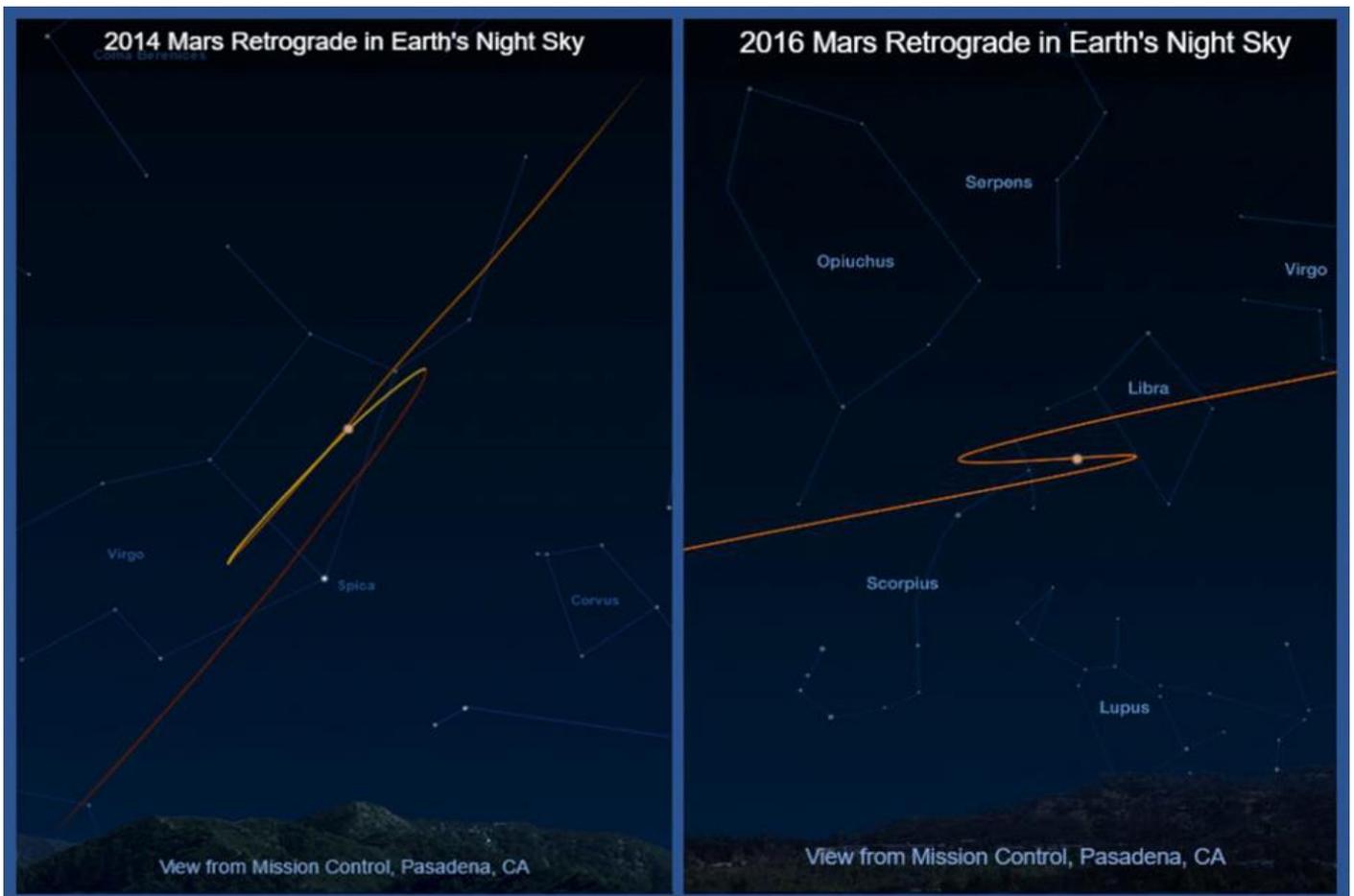
ABOVE: The effects of a dust storm on Mars during the apparition of 2018. The large, India-shaped albedo feature is Syrtis Major, site of an ancient shield volcano. Notice how much dust covers the south polar region. South is up. Image credit: Damian Peach (left), and Christophe Pellier (right).

## ...Mars Meditations

Even when Mars does decide to show off, it may still become shy at the last minute and throw a veil over itself. When Mars makes an unusually close approach to the Sun, the increased warmth can cause planet-wide dust storms that obscure or even entirely conceal the dark markings that amateur astronomers try to pick out with their telescopes. Such dust storms make the planet appear blander than any observer would wish.

Opposition and closest approach must be the ideal time to send spacecraft, and maybe even astronauts, to Mars, right? Well, no. Chemical rockets are too weak to overcome the velocity difference between the two planets and send much of anything there on a direct path. Instead we must wait for the planets to align in such a way as to permit a low-energy Mars Transfer Orbit. This allows a spacecraft to sweep out a leisurely path to Mars that takes ten months to complete. That time doesn't mean much to a robot spacecraft, but it's a major obstacle to any manned exploration of Mars.

Now, here's your chance to play Junior Ancient Scientist. For two or three months before and after opposition, go out every night, note where Mars is relative to the background stars, and plot the position of the planet on your map. Connect the dots, and you will notice a peculiar thing. Ordinarily, Mars and the other outer planets appear to slide among the stars from west to east as they move in their orbits. But, if you begin recording the position of Mars in the weeks before and after opposition, you will find that it's moving backwards!



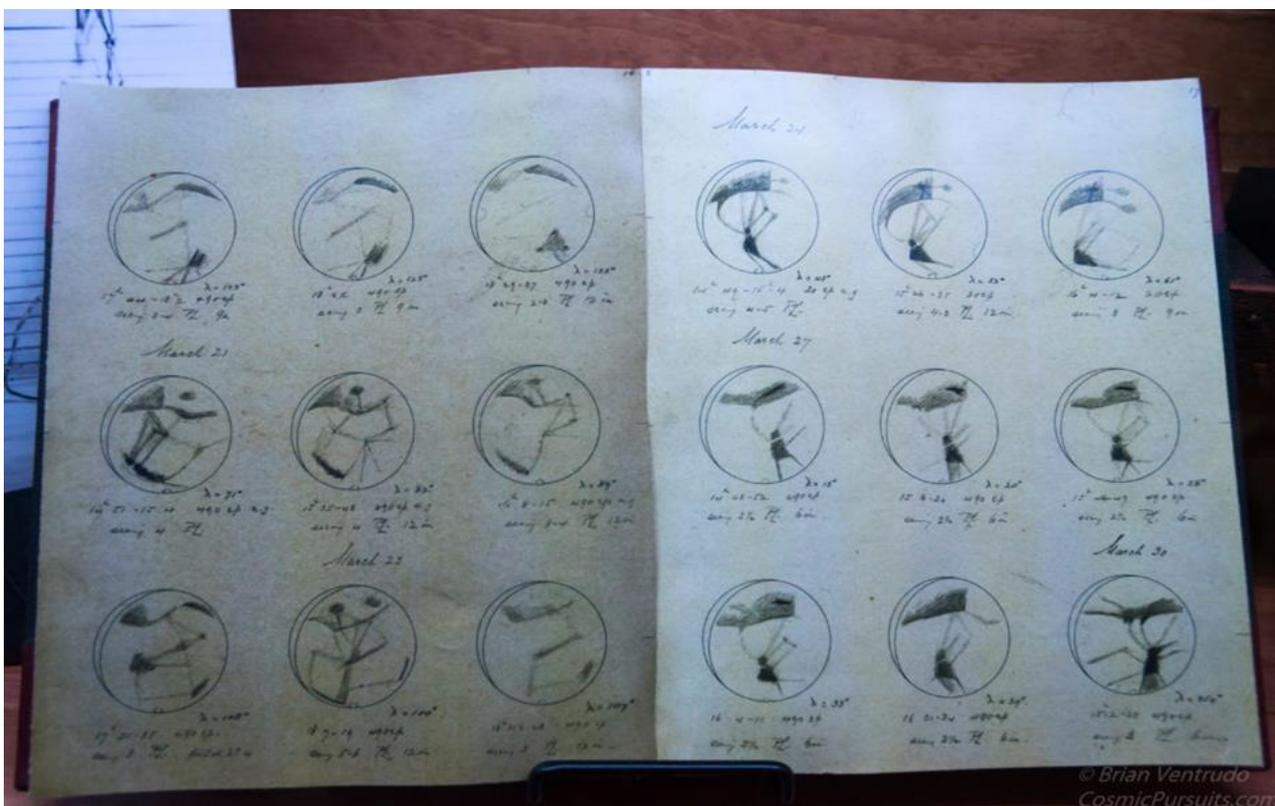
ABOVE: Retrograde motion of Mars during its 2014 and 2016 apparitions. Image credit: NASA/JPL

We call this retrograde motion, and the explanation is simple enough. During opposition, Earth is catching up with, and then passing, Mars (or any of the other outer planets) in its orbit. If you pass anything, such as a car in the slow lane as you're driving, it appears to be moving backwards from your point of view. If you had begun plotting the location of Mars, you would have found that its path described a loop, not a simple back and forth motion, because the two worlds do not orbit the Sun on exactly the same plane.

## ...Mars Meditations

This behavior doesn't seem too puzzling now, but to the ancients it was deeply mysterious. It wasn't enough that the planets were the only "stars" that moved among the other, "fixed" stars, but sometimes they had to stop, back up, and then continue on again. No wonder they seemed supernatural. No wonder they were called "wandering stars".

Opposition, normally, is the best time to observe Mars through a telescope. For many years, all we knew about the physical nature of Mars was learned by peering through telescopes, mostly during those fleeting oppositions. Observers saw white polar caps of ice, and correctly interpreted them as such, though it took a while to realize the planet is so cold they are mostly composed of frozen carbon dioxide. They saw persistent dark markings, convinced themselves they changed color seasonally and were sometimes green, and erroneously concluded they were patches of some primitive vegetation. A few of those observers (Giovanni Schiaparelli most notably) thought they saw fine, narrow lines crisscrossing the planet, and fewer still (Percival Lowell) imagined they represented artificial canals.



ABOVE: Percival Lowell's notebooks showing a selection of his sketches of the planet Mars.

In other words, we knew little about the true nature of Mars until our robot spacecraft began to visit it in the 1960s. Amateur astronomers can still look at the planet, still see those same dark markings and polar caps, and even try to make out non-existent canals, exactly as those 19<sup>th</sup>-century astronomers used to do. Many of today's amateurs have better telescopes in their back yards than most of those old-time professionals had in their domes. Advanced imagers can capture the planet in even greater detail than what the eye can discern.

What is the relevance of Mars to the human race? In my opinion, it's mostly as a repository for the imagination. We can no longer dream of exotic Martian civilizations using their canals to stave off the desiccation of their dying world. Nor can we speculate about mosses and lichens that change color with the change in the Martian seasons, but we can still wonder about whether that cold, dry little world once harbored life that we would recognize. We can send robots to look for whatever clues and remnants such life might have left. We can dream of sending human explorers to that enticing little planet, though I believe that will have to wait for the advent of technology well in advance of anything we now possess, at least if we wish to retrieve our astronauts in good condition.

## ...Mars Meditations

And we can stare at Mars with our telescopes, putting ourselves in the place of those old astronomers who tried to determine the nature of that distant world by peering at a small, wavering image in their eyepieces. Mars may have lost its old mystery and romance, but if gaining knowledge is our goal, we are now much better off.

Or we can look back even farther in time. Even if you don't have a telescope, look for Mars around the time of opposition, when it's highest at midnight, a fiery orangish light. You can't miss it. Try to imagine what an enigma it must have been to ancient peoples, this flare-up of something usually so inconspicuous. What would you have made of it?

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### First Close-up Photos of Mars were Beamed back to Earth 51 Years ago

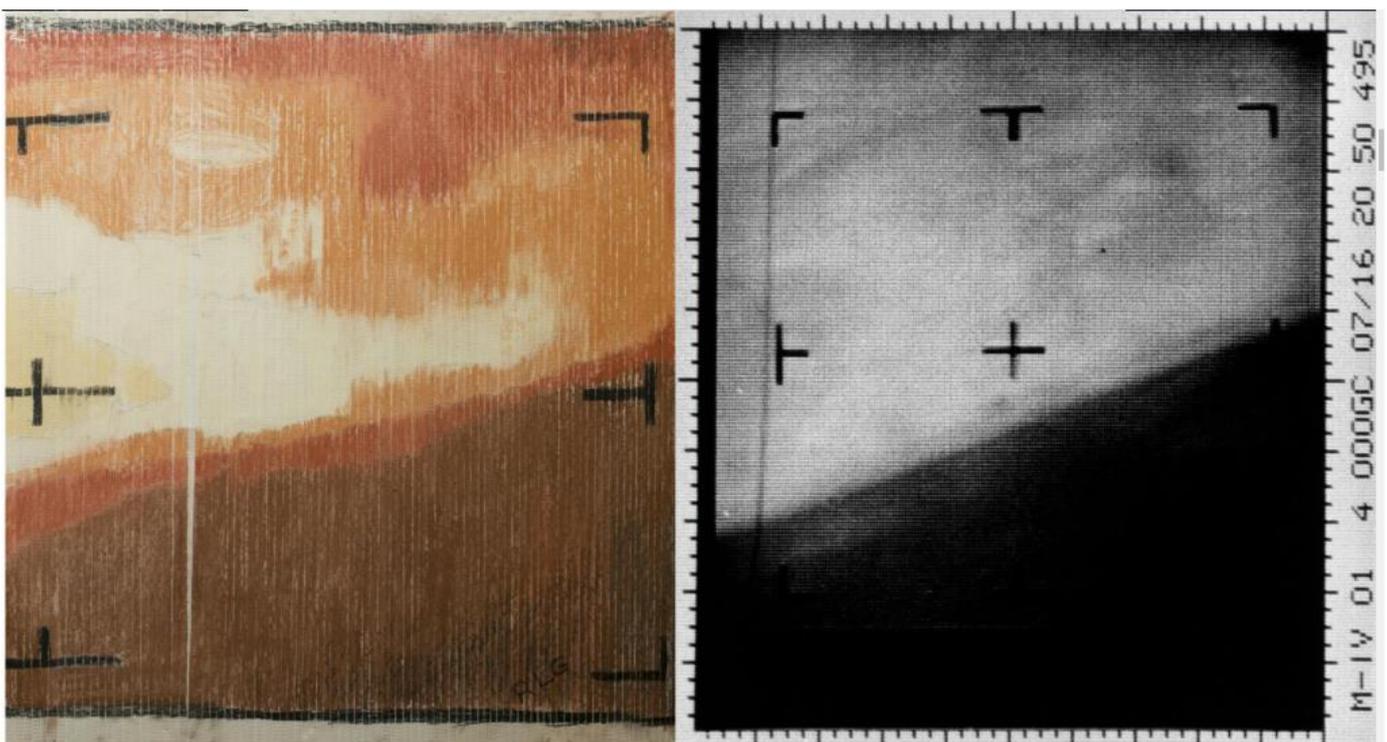
In the summer of 1965, the world finally got some answers to the many questions posed about that mysterious red dot on the horizon. This was the year that Mariner 4 became the first successful flyby mission to Mars, gaining historic ground where other attempts had failed by capturing the first images of the planet .

Back in 1965, the jubilation was similar to that witnessed after the Pluto flyby, but the technology available was very different. And those back at base were so excited when they realised the Mariner 4 camera was working, that they couldn't wait the few hours it would take for the completed image to be processed.

Instead, they took matters into their own hands and tried to interpret the photo's metadata: reams of numbers generated from the real-time data translator machine.

These strips of code were pinned together on the wall, while staff from the Telecommunications Section at Nasa's Jet Propulsion Laboratory rushed out to buy pastels. A colour key was devised and staff filled in the code by hand like a "painting by numbers" exercise until an image gradually emerged from lines of numbers.

When the actual photo eventually emerged, the hand-drawn image was proved correct, with the planet itself at the top left and the sky below, bottom right:



ABOVE: Painting by numbers vs the first ever photo (Nasa/JPL)

# The Cover Image - Eta Carina

Image By Amith Rajpal



*2021 Amith Rajpal*

Eta Carina is a Southern Hemisphere object roughly 8000 light years away spanning a distance across about the same as our Solar system. The Eta Carina Nebula was formed after the star Eta Carinae had an outburst which was as bright as a supernova and released as much energy as one.

The star remained after the outburst which took place roughly 150 years ago.

Seeing as it was first light with this new camera, I felt it appropriate, with us being in the southern hemisphere to image one of our Southern sky gems which is of course the Eta Carina Nebula. It has become sort of a tradition now with new imaging devices to capture this marvelous nebula as the first object given it is rich with Hydrogen Alpha emissions.

This particular set of images were captured on 17 February 2021 from around 21:00; and was taken at home from the front yard on the fixed pier.

The sky conditions were not perfect with a lot of sea spray in the air causing a bit of a haze where the nebula was situated at the time. The wind speed was roughly 6km/h at the time of imaging this object.

## TECH SPECS:

- IMAGES:
  - 4 x Ha (Hydrogen Alpha) @ 60s
  - 4 x Sii (Sulphur 2) @ 60s
  - 4 x Oiii (Oxygen 3) @ 60s
- CAMERA
  - QHY294M-Pro Camera
- FILTERS
  - CFW3 Filter wheel
  - ZWO 36mm filters
- SCOPE:
  - Meade SN10 telescope
- GUIDE:
  - Celestron 80mm guidescope
  - ASI120MC guide camera
- MOUNT - CEM60EC
- GAIN & OFFSET:
  - Gain 1300
  - Offset 30
- EDITING:
  - Processed in PixInsight
  - Touched up with Photoshop

# Georges Lemaître & The True Big Bang Theorist

Compiled by Corinne Gill

## BEGINNINGS



ABOVE: Georges Lemaître 1913

Georges Henri Joseph Édouard Lemaître was born on 17 July 17, 1894 in the city of Charleroi, Belgium. His mother was Marguerite Lannoy. His father was Joseph Lemaître, a lawyer. Georges was the eldest of their four children. His parents were devout Roman Catholics, and at the age of nine, Georges announced that he wanted to become a priest.

The following year, he enrolled at the Jesuit High School of the Sacred Heart in Charleroi, where he excelled in chemistry, physics, and mathematics.

In 1910, Georges' father got a new job, taking the family to Belgium's capital city, Brussels. Georges, now age 16, enrolled at another Jesuit school, the College Saint Michel. His teachers noticed his outstanding abilities in mathematics and the physical sciences.

Although he still liked the idea of becoming a priest, Georges decided to study engineering rather than theology. In July 1913, he started training as a mining engineer as he was awarded a diploma in engineering due to recognition of his abilities by his teachers.

## HORRORS OF WAR

In July 1914, World War 1 began. In early August the German Army invaded Belgium and France. Almost immediately Georges Lemaître, now 20 years old, enlisted alongside his younger brother Jacques into the Belgian Army. By October they were in action on the front line.

The following April, Lemaître was a horrified onlooker when the Germans released over 150 tons of deadly chlorine gas at Ypres in Belgium. The wind carried the terrible gas towards French and Canadian trenches rather than Belgian ones.



Amid the pervasive fear, brutality, and death of trench warfare, Lemaître's comrades were amazed by his ability to disconnect his mind from his surroundings and study physics books whenever he got the chance. This ability was characteristic of Lemaître's orderly approach to life.

Lemaître and his younger brother survived the war, which ended in November 1918. Lemaître attained the rank of master sergeant and won the Croix de guerre medal for bravery. He would have become an artillery officer, but was expelled from training after telling an instructor that his ballistics calculations were wrong!



## LEMAÎTRE PURSUES HIS DREAMS

With the war behind him, Lemaître abandoned engineering to pursue his dreams. Ever since a young boy, he embraced religion and understood the relation it could have with science. Emulating his former teacher, Cardinal Desire Mercier, who held progressive beliefs on philosophy and cosmology; he entered the House of Saint Rombaut in October 1920 and began training for a Roman Catholic priesthood; whilst at the same time enrolling at the Catholic University of Leuven to study for an advanced degree in mathematics.

## ...Georges Lemaître

In 1920, at the age of 26, he was awarded with the highest distinction a Docteur en Sciences in mathematics for his thesis *The Approximation of Real Functions of Several Variables*; written under the direction of Charles de la Vallée-Poussin (this was his license to teach, not a PhD).



ABOVE: Charles de la Vallée-Poussin

His professors, noting his continuing interest in mathematics and physics, suggested he study Albert Einstein's work. Lemaître did this, learning about tensor calculus and general relativity from books written by the famous mathematical astronomer Arthur Eddington.

In 1922, Lemaître submitted a thesis, *The Physics of Einstein*, which ultimately won him a Belgian government scholarship; made possible by Cardinal Mercier's timely visit to thank the US for humanitarian support. Which included the Belgian-American Educational Foundation being established with funds for scholarships for student exchanges between Belgium and the United States. Lemaître was among the first candidates to receive this scholarship.

Lemaître was ordained at 29 as a priest by Cardinal Mercier on 22 September 1923, after which, he left 10 days later, for the University of Cambridge in the UK .

### CAMBRIDGE



"I found Lemaître a very brilliant student, wonderfully quick and clear-sighted, and of great mathematical ability."

**ARTHUR EDDINGTON**

Letter of December 24, 1924

Lemaître used his scholarship to spend a year at the University of Cambridge studying general relativity under the guidance of Sir Arthur Eddington, one of the few experts in relativity at the time. Eddington suggested to Lemaître to begin work on a Ph.D. thesis treating the universe as a sphere containing a gas that is both:

1. isotropic (its properties don't depend on where you're looking from)
2. inhomogeneous (the gas is not evenly distributed)

Eddington asked Lemaître to apply the rules of general relativity to the contents of the sphere and see what the result was.

Lemaître discovered two solutions to Eddington's problem: the first was consistent with a proposal Einstein made in 1917 of a closed, stable, static universe whose energy-mass density is constant; the second was consistent with Willem de Sitter's proposal, also in 1917, of a universe whose large-scale behavior is dominated by the cosmological constant (the energy density of empty space).

Lemaître's period of collaboration resulted in the appearance of an important work in which he generalized the definition of simultaneity in 1924.

### HARVARD - EDDINGTON'S SOLUTIONS AND A PH.D. IN THE USA

September of 1924, Lemaître went to Harvard University in Massachusetts, US, to carry out research in Cepheid Variables, under the guidance of Harlow Shapley. He also registered as a candidate for a physics Ph.D. at the Massachusetts Institute of Technology,



ABOVE: Harlow Shapley

When he arrived at the Harvard University observatory to work, he attended a lecture by his former Cambridge professor, Eddington; who commented on the expanding Universe hypothesis and proclaimed his definitive adherence to it. The attendees turned their eyes to Lemaître and gave him an ovation.

During his time in the USA, he traveled widely, meeting many of the country's top astronomers and physicists, including Forest Ray Moulton, William Duncan MacMillan, Vesto Slipher, Edwin Hubble, and Robert Millikan.

# ...Georges Lemaitre



## CAREER

Lemaitre returned to Belgium in the summer of 1925 and, strongly supported and recommended by Eddington, was appointed associate professor of mathematics at the Catholic University of Leuven.

In 1927, Lemaître returned to MIT to present his doctoral thesis on "*The gravitational field in a fluid sphere of uniform invariant density according to the theory of relativity*". Upon obtaining his PhD, he was named ordinary professor at the Catholic University of Louvain.

On his return to Belgium, he began the report that was published in 1927 in the *Annals of the Scientific Society of Brussels* under the title "A homogeneous Universe of constant mass and growing radius accounting for the radial velocity of extragalactic nebulae", that was later to bring him international fame .

In this report, he presented the new idea that the universe is expanding, which he derived from General Relativity; which says that the speed other galaxies move away from our own is directly proportional to their distance from us. This means that the farther a galaxy is from the Milky Way, the faster it is racing away from the Milky Way. This later became known as Hubble's law.

A Homogeneous universe of Constant Mass & Increasing Radius accounting for the Radial Velocity of Extra – Galactic Nebulae  
Abbe Georges Lemaitre

- Annales de la Société scientifique de Bruxelles, A47, 49, 1927
- English translation in MNRAS, 91, 483-490, 1931

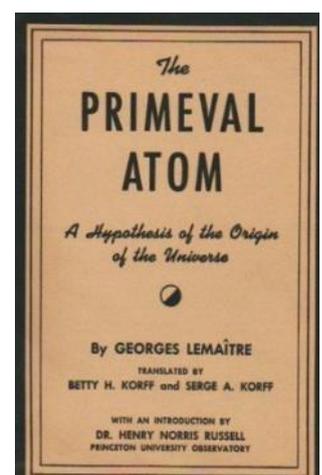
The paper had little impact because the journal in which the paper was published, *Annals of the Scientific Society of Brussels*, was not widely read by astronomers outside of Belgium. Except for Eddington. He wrote a commentary for the Royal Scientific Society and called Lemaître's work a "brilliant solution to the basic problems of cosmology," but in the meantime Hubble came up with the idea independently and is now known as its author.

At this time, Einstein, while not taking exception to the mathematics of Lemaître's theory, refused to accept that the universe was expanding; Lemaître recalled his commenting "Your calculations are correct, but your physics is atrocious".

Arthur Eddington reportedly helped translate the article into English in 1931, but the part of it pertaining to the estimation of the "Hubble constant" was not included in the translation for reasons that remained unknown for a long time. This issue was clarified in 2011 by Mario Livio. Eddington may have omitted those paragraphs himself when translating the paper for the Royal Astronomical Society, in favour of reports of newer work on the subject.

In 1931, Arthur Eddington published in the *Monthly Notices of the Royal Astronomical Society* a long commentary on Lemaître's 1927 article, which Eddington described as a "brilliant solution" to the outstanding problems of cosmology. The original paper was published in an abbreviated English translation later on in 1931, along with a sequel by Lemaître responding to Eddington's comments.

Lemaitre was then invited to London to participate in a meeting of the British Association on the relation between the physical universe and spirituality. Georges Lemaître argued that if the Universe is expanding, it should have occupied a smaller space. There he proposed that the universe expanded from an initial point, which he called the "Primeval Atom".



# ...Georges Lemaître

## CAREER...

He developed this idea in a report published in *Nature*. Lemaître's theory which appeared for the first time in an article for the general reader on science and technology subjects in the December 1932 issue of *Popular Science*.



Lemaître's theory became better known as the "Big Bang theory," a picturesque term playfully coined during a 1949 BBC radio broadcast by the astronomer Fred Hoyle, who was a proponent of the steady state universe and remained so until his death in 2001.



Lemaître's proposal met with skepticism from his fellow scientists. Eddington found Lemaître's notion unpleasant. Einstein thought it unjustifiable from a physical point of view, although he encouraged Lemaître to look further into the possibility of models of non-isotropic expansion, so it is clear he was not all together dismissive of the concept. Einstein also appreciated Lemaître's argument that Einstein's model of a static universe could not be sustained into the infinite past.

LEFT: Manuel Sandoval Vallarta.

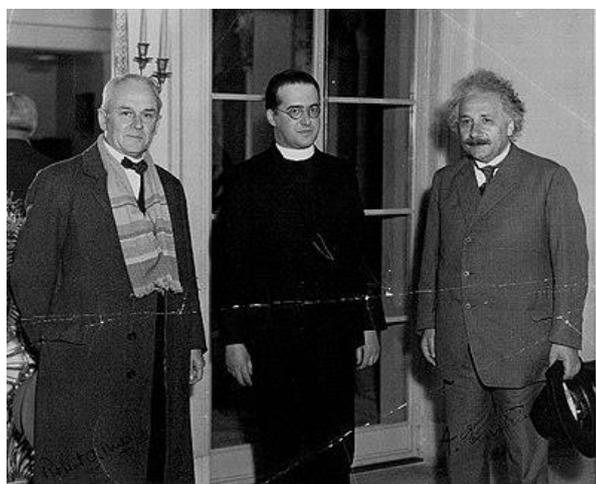
With Manuel Sandoval Vallarta, Lemaître discovered that the intensity of cosmic rays varied with latitude because these charged particles are interacting with the Earth's magnetic field. In their calculations, Lemaître and Vallarta made use of MIT's differential analyzer computer developed by Vannevar Bush. They also worked on a theory of primary cosmic radiation and applied it to their investigations of the sun's magnetic field and the effects of the galaxy's rotation.

Lemaître and Einstein met on four occasions: in 1927 in Brussels, at the time of a Solvay Conference; in 1932 in Belgium, at the time of a cycle of conferences in Brussels; in California in January 1933; and in 1935 at Princeton. At the California Institute of Technology, In 1933 after Lemaître detailed his theory, Einstein stood up, applauded, and is supposed to have said, "This is the most beautiful and satisfactory explanation of creation to which I have ever listened." However, there is disagreement over the reporting of this quote in the newspapers of the time, and it may be that Einstein was not referring to the theory as a whole, but only to Lemaître's proposal that cosmic rays may be the left over artifacts of the initial "explosion".

In 1933, when he resumed his theory of the expanding universe and published a more detailed version in the *Annals of the Scientific Society of Brussels*, Lemaître achieved his greatest public recognition. Newspapers around the world called him a famous Belgian scientist and described him as the leader of the new cosmological physics. Also in 1933, Lemaître served as a visiting professor at The Catholic University of America.

On July 27, 1935, he was named an honorary canon of the Malines cathedral by Cardinal Josef Van Roey. And in 1936 he was elected a member of the Pontifical Academy of Sciences, and took an active role there, serving as its president from March 1960 until his death. In 1941, he was elected a member of the Royal Academy of Sciences and Arts of Belgium.

In 1946, following his article "Primeval Atom" which had been published in the December 1932 issue of *Popular Science*; Lemaître published his book *The Primeval Atom Hypothesis*. It was translated into Spanish in the same year and into English in 1950.



ABOVE: Millikan with Einstein and Lemaître's after his lecture at the Californian institute of Technology in 1933-01 .

# ...Georges Lemaître



## CAREER...

By 1951, Pope Pius XII declared that Lemaître's theory provided a scientific validation for Catholicism. However, Lemaître resented the Pope's proclamation, stating that the theory was neutral and there was neither a connection nor a contradiction between his religion and his theory. Lemaître and Daniel O'Connell, the Pope's scientific advisor, persuaded the Pope not to mention Creationism publicly, and to stop making proclamations about cosmology. Lemaître was a devout Catholic, but opposed mixing science with religion, although he held that the two fields were not in conflict.

During the 1950s, he gradually gave up part of his teaching workload, ending it completely when he took emeritus status ( a retired priest, cardinal retaining the rank of the last office held) in 1964.

In 1962, he strongly opposed to the expulsion of French speakers from the Catholic University of Leuven and created the ACAPSUL movement together with Gérard Garitte , a Belgian historian and scientist, to fight against the split of the university. They unfortunately failed with the Dutch speaking Catholics staying at the University of Leuven, and the French-Language Catholic University moving to Louvain-la-Neuve in Wallonia, 30 km southeast of Brussels in 1968.



RIGHT: Gerard Garitte

During the Second Vatican Council of 1962–65 he was asked by Pope John XXIII to serve on the 4th session of the Pontifical Commission on Birth Control. However, since his health made it impossible for him to travel to Rome – he had suffered a heart attack in December 1964 – Lemaître demurred, expressing surprise that he was chosen. He told a Dominican colleague, Père Henri de Riedmatten, that he thought it was dangerous for a mathematician to venture outside of his area of expertise. He was also named Domestic prelate (*Monsignor*) in 1960 by Pope John XXIII.

Later on in life, he became increasingly devoted to problems of the numerical calculation. He was a remarkable algebracist and showed great interest in the arithmetical calculator. Since 1930, he used the most powerful calculating machines of the time, the Mercedes- Euklid.



In 1958, at the age of 64, he was introduced to the University's Burroughs E 101, its first electronic computer. Lemaître maintained a strong interest in the development of computers and, even more so, in the problems of language and computer programming.



He died shortly after having learned of the discovery of cosmic microwave background radiation, which provided further evidence for his proposal about the birth of the universe.

Monseigneur **Georges** Henri Joseph Édouard Lemaître died at the age of 72 on 20 June 1966 from leukemia, in Leuven , Belgium, and was buried in the family grave at the Marcinelle cemetery in his hometown of Charleroi.



## References:

[https://en.wikipedia.org/wiki/Georges\\_Lemaître](https://en.wikipedia.org/wiki/Georges_Lemaître)

<https://www.europeantimes.info/2021/06/georges-lemaître-who-blew-up-the-universe/>

<http://www.tayabeixo.org/biografias/lemaître.htm>

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<https://docplayer.net/19824854-A-day-without-yesterday-georges-lemaître-the-big-bang.html>

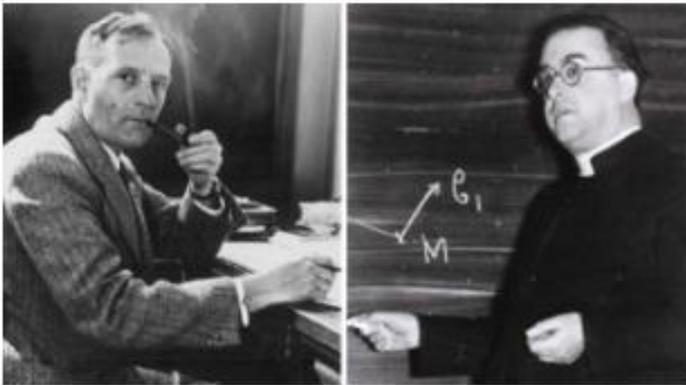
# ...Georges Lemaître

## THE DISCOVERER'S TRUTH....

In the report published in 1925, "*A homogeneous Universe of constant mass and growing radius accounting for the radial velocity of extragalactic nebulae*", Lemaître presented the new idea that the universe is expanding, which he derived from General Relativity. This later became known as Hubble's Law, even though Lemaître was the first to provide an observational estimate of the Hubble constant. The initial state he proposed was taken to be Einstein's own model of a finitely sized static universe. As noted, before, the paper had little impact because the journal in which it was published was not widely read by astronomers outside Belgium.

Arthur Eddington reportedly helped translate the article into English in 1931, but the part of it pertaining to the estimation of the "Hubble constant" was not included in the translation for reasons that remained unknown for a long time. This issue was clarified in 2011 by Mario Livio: Eddington omitted those paragraphs when translating the paper for the Royal Astronomical Society, in favour of reports of newer work on the subject, since by that time Hubble's calculations had already improved on Lemaître's earlier ones.

Lemaître's analysis wasn't available in English until 1931 when, at the invitation of British astronomers, it appeared in the Monthly Notices of the Royal Astronomical Society. But the



ABOVE: During the 1920's, astronomers Edwin Hubble (left) and Georges Lemaître both came to the realization that the universe is expanding.

The sleuthing took a darker turn when Canadian astrophysicist Sidney van den Bergh suggested that the translator of Lemaître's manuscript had intentionally omitted the critical equation and text, so as to preserve Hubble's discovery claim. In June 2011, South African mathematician David Block went so far as to suggest that Hubble himself might have been involved in the censorship. (Hubble was notoriously territorial, as evidenced by his snub of Slipher.)

Now we know the real story, thanks to detective work by Mario Livio (Space Telescope Science Institute). In the November 10th issue of *Nature*, Livio describes how he dug into the Royal Astronomical Society's archives and unearthed a previously unseen letter from the Belgian priest to William Marshall Smart, editor of the *Monthly Notices* at that time. Having translated the treatise to English himself, Lemaître notes, "I did not find advisable to reprint the provisional discussion of radial velocities which is clearly of no actual interest . . . ."

"Lemaître was not at all obsessed with establishing priority for his original discovery," Livio explains. "Given that Hubble's results had been published in 1929, Lemaître saw no point in repeating his own more tentative earlier findings in 1931."

Source: <https://skyandtelescope.org/astronomy-news/a-whodunit-of-cosmic-proportions/>



# Astronomers Survey & Measure the Background Brightness of the Night sky across the World Canary Islands have the Darkest Skies



ABOVE: In the upper part of the image, the Observatory of the Roque de los Muchachos Observatory (Garafía, La Palma, Canary Islands) taken in February 2020. The lower part shows the sky in the southern hemisphere from the La Silla Observatory (ESO, Chile) in April 2016. In this composition, the Milky Way runs almost vertically above and below the horizon. In the upper half, Venus is immersed in the Zodiacal Light, which produces a complete circle through the starry sky. Andromeda and the Magellanic Clouds are also captured. The composition makes the Milky Way appear circular.

Credit: Juan Carlos Casado & Petr Horálek astro-photographers

Being able to look up at a clear, dark sky is becoming more and rarer in the rich world. Authors, artists, and even scientists have started to express concern about what our lack of daily exposure to a dark night-time sky might mean for our psyche and our sense of place in the universe.

Now a team has collected photometric data at 44 sites around the world in an attempt to quantify how dark the night sky actually is at different places on the globe. So where was the darkest place surveyed? The Canary Islands.

## ...Darkest Skies for Astrophotography

It just so happens that the lead researcher on the project, Dr. Miguel Alarcón is from that set of islands off the west coast of Africa. The paper he and his colleagues wrote, was soon to be published in *The Astronomical Journal*, using a series of photometers, confusingly called TESS; a **T**elescope **E**ncoder and **S**ky **S**ensor (TESS-W) which is the first model of TESS photometers, compact devices to monitor sky brightness every night developed under the Stars4All project; (not to be confused with the Transiting Exoplanet Survey Satellite) to try to get a baseline of how dark the night sky is throughout the world

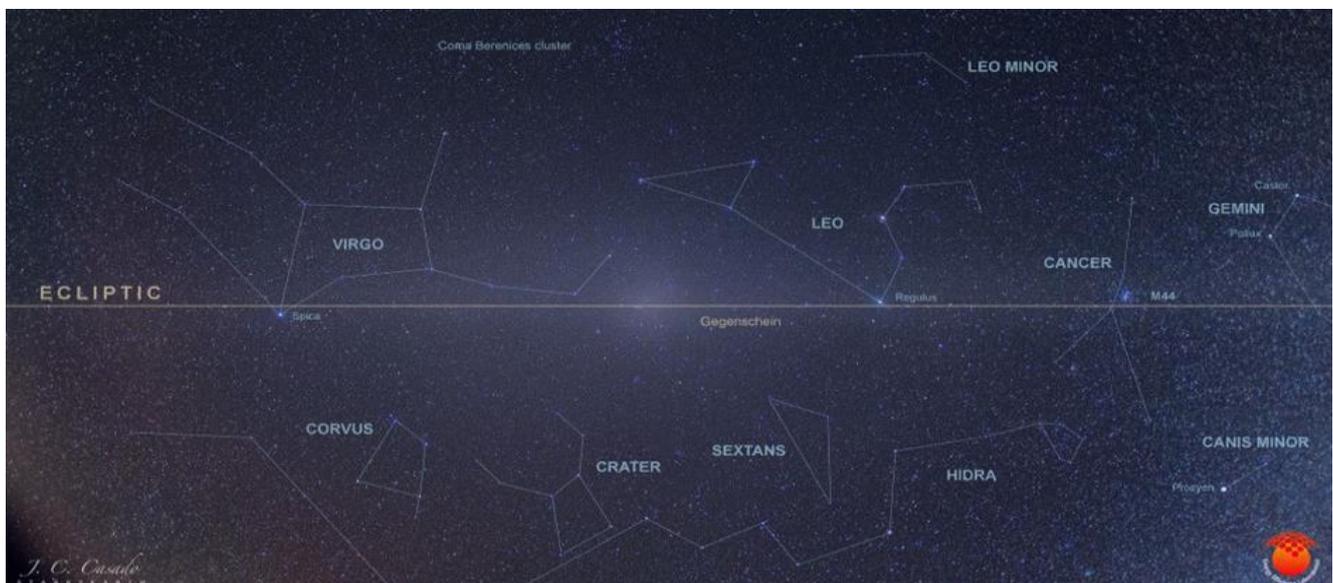
The TESS photometer is mounted on a weatherproof enclosure (83 x 60 x 32 mm). Wherever there is electricity and WI-FI you can install it and get the measures online through the remote observatory. Its temperature and IR sensor will let you know whether the sky is clear or cloudy. The team collected 11 million points of data from places as far apart as Namibia, Australia, and the US. While this did not include some more popular astronomy spots, such as the highlands of Antarctica, it was a good sample of different conditions. As mentioned above, the Canary Islands had the lowest levels of background light of anywhere studied. Only about 2% of the light in the sky at night comes from artificial light at the Roque de los Muchachos Observatory in Garafia.



ABOVE: Example of a standardized TESS photometer.  
Credit: TESS / Stars4all

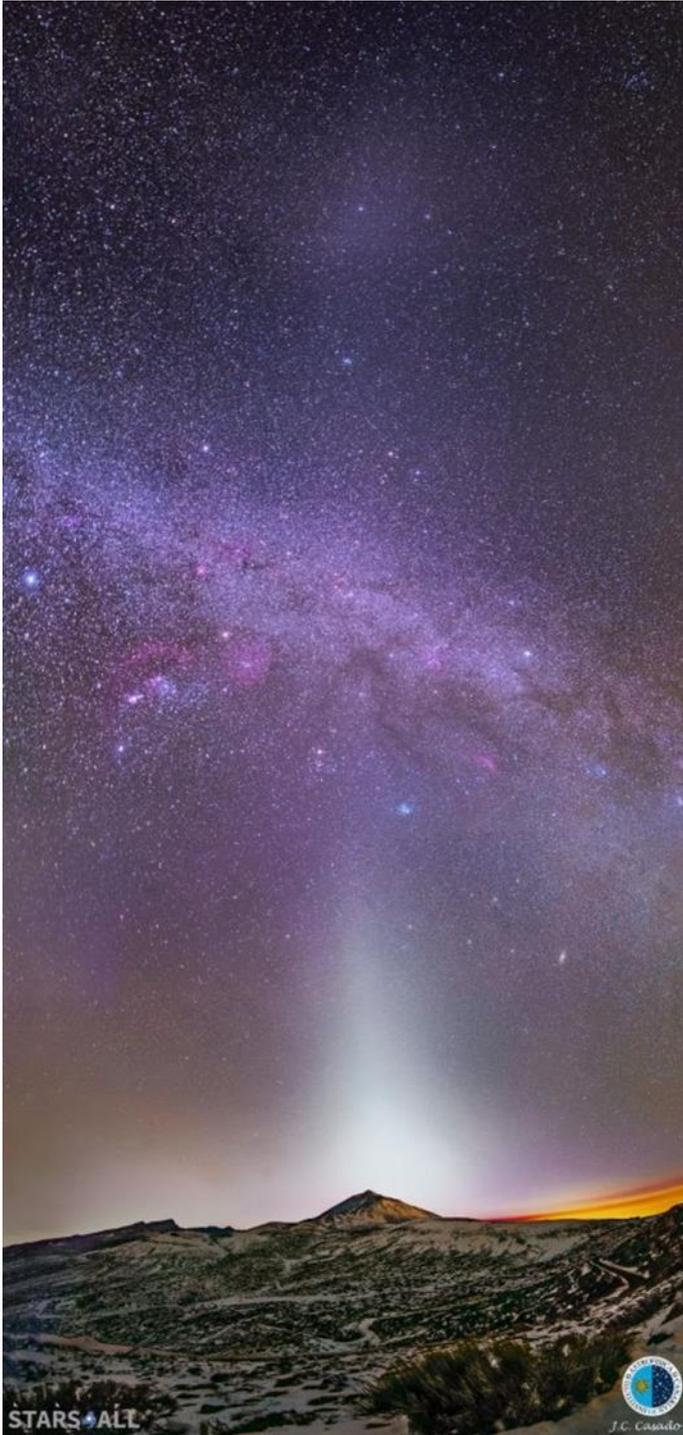
However, there are other, more variable sources that this study monitored. These include a glow in the upper atmosphere that is caused by a combination of factors, such as the solar cycle, geographical location, and the time of year.

Another source is known as the “gegenschein” (is a faintly bright spot in the night sky centered at the antisolar point. The backscatter of sunlight by interplanetary dust causes this optical phenomenon, also called counter glow. Like zodiacal light, gegenschein is sunlight scattered by interplanetary dust. Most of this dust orbits the Sun near the ecliptic plane, with a possible concentration of particles centered at the L<sub>2</sub> point of the Earth–Sun system.

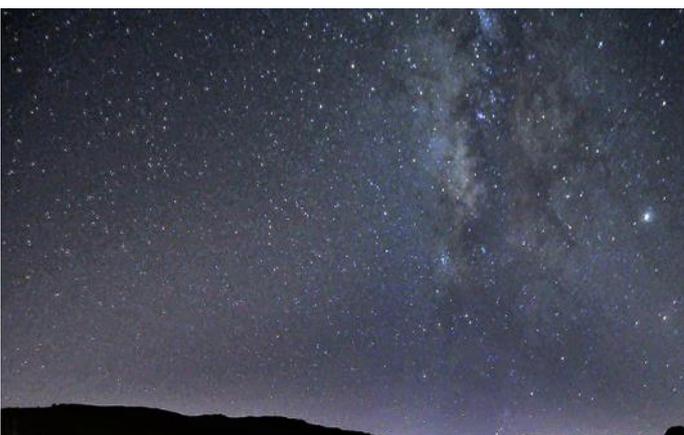


Example of different types of light sources in the night sky, including the gegenschein effect.  
Credit: Juan Carlos Casado

## ...Darkest Skies for Astrophotography



ABOVE: Vertical panorama showing the night sky over the Canary Islands.



Gegenschein is distinguished from zodiacal light by its high angle of reflection of the incident sunlight on the dust particles.

It forms a slightly brighter elliptical spot directly opposite the Sun within the dimmer band of zodiacal light. The intensity of the gegenschein is relatively enhanced because each dust particle is seen at full phase.

This can only be seen in extremely dark places, and the astronomy institute on the Canary Islands (IAC) is one of them.

Just because it has some of the darkest skies does not mean it's the best place for all observations though.

Other factors, such as atmospheric seeing and temperature fluctuations can cause problems with observations. The real take away from this research is that if you truly want to see the night sky as our ancestors did, it might be worth a trip to some islands off the coast of Africa.

On any of the Canary Islands, you can see constellations, planets and shooting stars.

Three of the favorite spots for star gazing on the Canary Islands are:

1. Located in Santiago del Teide, about a thousand meters above sea level, the Mirador de Masca offers an incredible spot for star gazing. During the autumn months, you will be able to locate Pisces, Aquarius and the Capricorn zodiac constellations. Also a star twenty-five light-years away can be seen!
2. In the Teide National Park in Tenerife, at "Las Cañadas del Teide" Parador, is an idyllic place for star gazing. Tours offered explain in detail the different planets and constellations that can be seen, such as the Plough (Ursa Major). In August, the rain of perseids (also known as "the tears of San Lorenzo"), a meteor shower that occurs between August 11th and 13th.
3. Chipude, La Gomera - is easily the most magnificent place to view the Milk Way. Gazing upwards on a cloudless night will guarantee an unobstructed view of the Milky Way to identify the many stars and constellations. A dream location for astro-photographers; as shown in the photograph to the left.

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<https://www.jjoforme.com/>

<https://en.wikipedia.org/wiki/Gegenschein>

# A Ginormous Arc of Galaxies Was just Detected in the Distant Universe

By Michelle Starr

The Universe is a large place, and there are a lot of large things in it. Not just galaxies, but groupings of galaxies, and the cosmic web that connects them all together.



Scientists have just discovered what appears to be one of these groupings, and it could have serious implications for our understanding of the evolution of the Universe. It's an almost-symmetrical arc of galaxies at a distance of 9.2 billion light-years away, and, at 3.3 billion light-years across, it's one of the biggest structures ever identified.



Shown on the left, Astronomers are calling it the Giant Arc, and, if confirmed, it joins a growing number of these giant structures. This number represents a dilly of a cosmological pickle.

"The growing number of large-scale structures over the size limit of what is considered theoretically viable is becoming harder to ignore," said astronomer Alexia Lopez of the University of Central Lancashire, UK.

"According to cosmologists, the current theoretical limit is calculated to be 1.2 billion light years, which makes the Giant Arc almost three times larger. Can the standard model of cosmology account for these huge structures in the Universe as just rare flukes, or is there more to it than that?"

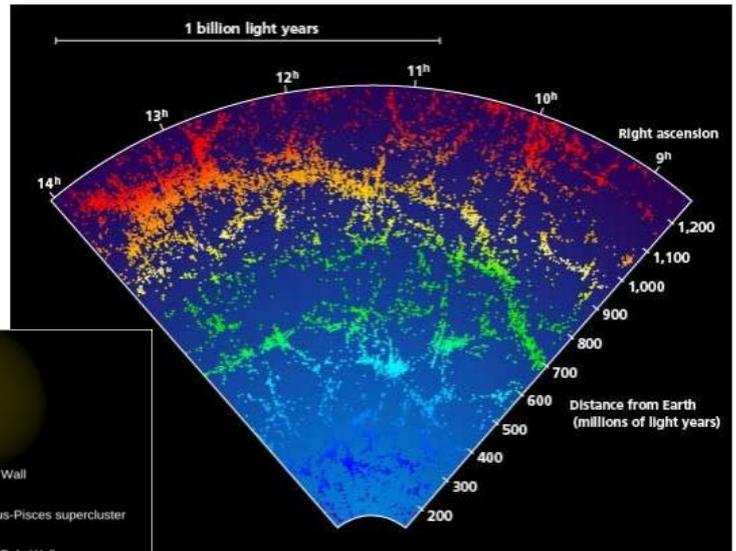
Our standard model of cosmology is founded on something called the Cosmological Principle. This states that, on large enough scales, the Universe is homogeneous, or 'smooth', in all directions. Each section of the Universe should look more or less like every other section of the Universe, with no major inconsistencies or bumps.

## ...A Ginormous Arc of Galaxies

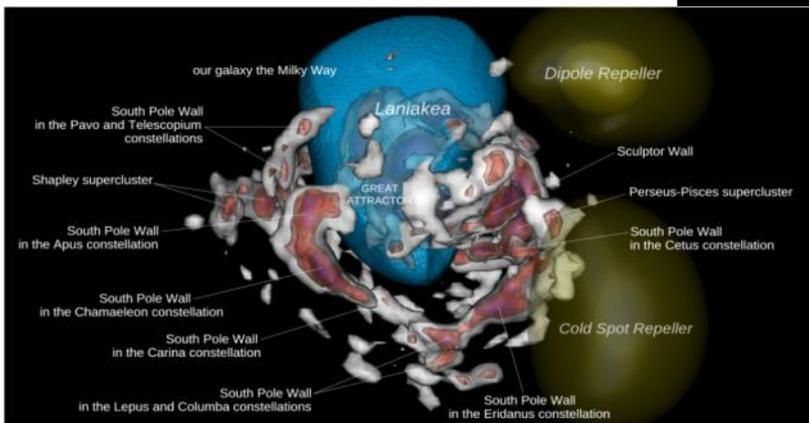
The Standard Model is a set of mathematical formulae and measurements describing elementary particles and their interactions. It's similar to the way the Periodic Table of Elements describes atoms, categorizing them based on their characteristics, but instead the Standard Model categorizes the elementary particles - fermions and bosons.

Large-scale structures, over a size larger than about 1.2 billion light-years, would be considered just such a bump. One or two such bumps might be considered a coincidental arrangement, but more and more keep popping up in the data.

There's the Sloan Great Wall, around 1.5 billion light-years across.; indicated to the right.



The discovery of a similar structure called the South Pole Wall, roughly 1.37 billion light-years across, was announced last year. Shown on the Left.



The Clowes-Campusano LQG group of galaxies is 2 billion light-years across, and the Huge Large Quasar Group is 4 billion. The Hercules-Corona Borealis Great Wall is the biggest, potentially spanning as much as 10 billion light-years

The Giant Arc was discovered in data from the Sloan Digital Sky Survey. Lopez and her colleagues studied the light of quasar galaxies - the brightest galaxies in the Universe, illuminated by the voraciously active supermassive black holes at their centers.

When the light from these galaxies passes through gas in intergalactic space, some wavelengths are absorbed. The spectral absorption lines generated by this process can be used to map the distribution of matter in the Universe. Using this method, the researchers noticed that the Giant Arc galaxies seemed to be clustered together.

Deeper analysis seems to almost confirm it. The team's results have a confidence level of 99.9997 percent, or 4.5 sigma - not quite enough for the 5-sigma gold standard for significance, so there's still the possibility that it's a chance arrangement, but still, the finding is pretty interesting.

If astronomers continue to identify such large structures in the Universe, it may mean we need to have a good think about the Cosmological Principle.

"The night sky, when viewed on a sufficiently large scale, should look the same, regardless of the observers' locations or the directions in which they are looking," Lopez said.

"The Giant Arc we are seeing certainly raises more questions than answers as it may expand the notion of 'sufficiently large'. The key question is, what do we consider to be 'sufficiently large'?"

The team will be looking at other data, chasing that 5-sigma confidence level. Given the preponderance of detections of other giant structures, too, it's looking increasingly like cosmologists will have a significant amount of work to do.

The research was presented at the 238th meeting of the American Astronomical Society.

Source:

<https://www.sciencealert.com/there-appears-to-be-a-giant-arc-of-galaxies-in-the-distant-universe>

# ASSA Durban - School Presentations

Our Durban Centre of ASSA was recently invited to do presentations on Astronomy to Grade Threes at two local schools; as part of their curriculum for the Grade Threes includes “Planets” as a topic.

## The German School Durban



The presentation was held on 10 June at the school, starting at 18:00 sharp when the load shedding ended for the area. It being an evening event, had the Grade threes being accompanied by their parents. A talk by Piet Strauss was held on the planets and moon, was concluded with a follow-up question time. This was quite challenging with questions coming from both the young and their parents.

In the meantime, Maryanne Jackson had set up her telescope on the sports field and all gathered there. Unfortunately, Mars and Venus were below the horizon, but we could see the Jewel box and Coal Sack through the telescope and point out some of the constellations.



## St Henry's Maritz College

Two classes of Grade threes and their teachers gathered at the pavilion for this presentation during the morning of 15 June. Sihle Kunene did his normal entertaining talk, demonstrating with his solar system model. The question time was handled by both Sihle Kunene and Piet Strauss. This was full of intelligent questions and the sharing of facts relating to the solar system.

The St Henry's Marist College hosted our meeting (with covid measures in place) allowing us access to viewing through the telescope and at the dome. It was a real pleasure to do this for the school.

## Summary

Assisting in spreading knowledge and the love for Astronomy is key to what is done by the Durban Centre. Talking to young people is especially rewarding. The knowledge they already have is fantastic. The grade threes could all name the planets in sequence from the sun and had many other facts such as planetary periods and axis of rotation, at their fingertips.

# ASSA Durban Minutes of General Meeting

2021-06-09 Via Zoom  
Joint Meeting with ASSA Johannesburg



## **19:30 Meeting begins**

Guest speaker from ASSA JHB: Chris Stewart

Presentation titled: "A bit about eye pieces."

Chris Stewart is the current President and Director of Instrumentation, for ASSA South Africa. He is well experienced in telescope building.

## **Attending:**

<b>Durban Centre and Guests</b>	<b>JHB Centre and guests</b>	<b>Other, visitors, or unknown.</b>
1. Dr. Chanu Chetty	2. Alison Coulter	1 John
2. Corinne Gill	3. Chris Stewart	2. Mark
3. John Gill	4. Giulia Barr	3. Peter I-Phone
4. Don Orsmond	5. Tessa Collins	
5. Graeme Leslie	6. Andy Overbeek	
6. Michel Benet	7. Hazel Hall	
7. Ooma Rambilass	8. Johan Viljoen	
8. Johnny Visser	9. Malcolm	
9. Piet Strauss	10. Dave Blane	
10. Roger Bond	11. Etsuo Takayanagi	
11. Sheryl Venter	12. Carmel Ives	
12. Amith Rajpal	13. Dee Biobaku	
13. Gerald de Beer	13. Kaveer Dhaniraj	
14. Claire Odhav	14. Phuti Mosomane	

8:40 - Questions and answers

9:15 - First meeting ends.

Alison Coulter wishes everyone farewell.

ASSA Durban leaves meeting to continue with their internal meeting.



# ...Minutes of the Meeting

9:16 - Durban meeting starts

## Apologies:

1. Mike Hadlow	2. Jean Senogles	3. Mike Caine
4. Joy & Graham Alston		

## Attending:

1. Gerald de Beer	5. Piet Strauss	9. Michel Benet
2. Claire Odhav	6. Maryanne Jackson	10. Don Orsmond
3. Corinne Gill	7. Amith Rajpal	11. Johnny Visser
4. John Gill	8. Sheryl Venter	

## General:

- Astrophotography chatter.

## Matters Arising:

- None

## Finances:

- Sky Guides & ASSA masks are available at reduced prices.
- Piet Straus sold another Sky Guide
- Members who sold Sky Guides & Masks to deposit the money into the account ASAP and provide final count of remaining stock.

## **ASSA DURBAN FINANCIALS**

Financials Meeting	Month	Current	Investment	Cash
General Meeting	2021-06-09	R 14071.46	R 59,833.26	R 1,204.00

## **ASSA DURBAN - MEMBERS**

Date	No off	Paid Members	Honoury	Unpaid
2021-06-09	116	113	3	0

## **SKY GUIDES & MASKS**

Date	Date	No Ordered	Purchased	Available
Sky Guides	2021-06-09	70	52	18
Masks	2021-06-09	50	23	27

## On the Moon Again:

- 16-18<sup>th</sup> July
- We are planning for Friday 16th, for a viewing and event.
- Depends on agreement with the school, if we can meet there?



# ...Minutes of the Meeting

## Monteseel:

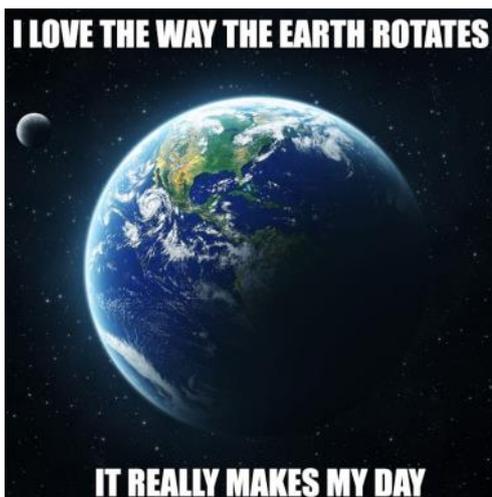
- Saturday 10 July, as soon as it gets dark.
- Dress warm, as it gets quite cold.
- Mike will do a presentation. Screens provided.
- Need volunteers for telescopes and queues please?
- Will send out an email to members with details.
- No dogs allowed are this year, as they knock over the scopes.
- Limit to 200 people
- Arrive at 5pm to setup scopes.
- If it rains, can postpone. Need to discuss.

## General:

- Viewing night this Friday, Mike and Debbie hosting.
- Tomorrow afternoon Piet and Maryanne going to the German school
- Tuesday 15<sup>th</sup> presentation at St. Henry's for the grade 3 pupils
- \* *Need help on both these days please.*
- Gerald and Michel Benet have not received recent emails.
- Gerald last email received was the April N'daba.
- Please check his mail settings
- 16<sup>th</sup> April, Michel Benet's last email
- Please check spam folders.
- Perhaps Gmail blocks too many recipients

## 10:00 Main meeting ends

Discussions on astrophotography continues.





We are very excited to announce that the second annual [Capture the Dark Photography Contest](#) is now open for submissions! It's free to enter and open to entrants of all skill levels worldwide. So, show us what you've got!

This year, there are a total of 8 contest categories, including Connecting to the Dark, International Dark Sky Place, The Impact of Light Pollution, The Bright Side of Lighting, Creatures of the Night, Deep Sky, The Mobile Photographer, and Youth. Please note that we only accept one entry per category per person. Winners of each category will receive a prize package that includes a [Peak Design](#) field pouch and camera strap, a [PhotoPills](#) license, a feature in our Nightscape publication, the IDA blog and social media, an IDA membership, and IDA swag.

Want more details? Head to [www.darksky.org/capturethedark](http://www.darksky.org/capturethedark) for category descriptions, submission instructions, and more.

**The submission window closes on July 23, 2021, at noon PDT** so, be sure to get your entry in before then.

We can't wait to see your amazing photos!

[LEARN MORE & ENTER HERE](#)

 <https://www.facebook.com/IDAdarksky/>

 [https://twitter.com/intent/follow?screen\\_name=idadarksky](https://twitter.com/intent/follow?screen_name=idadarksky)

 <https://www.instagram.com/idadarksky/>

 <https://www.youtube.com/user/IntDarkSkyAssoc>



# Public Viewing Roster ASSA Durban



Dome Master	Phone	Telescope Volunteer	Phone	Assistant	New Moon	Public Viewing
TBC		TBC		TBC	10 July 2021	9 July 2021
TBC		TBC		TBC	8 August 2021	6 August 2021
TBC		TBC		TBC	7 September 2021	10 September 2021
TBC		TBC		TBC	6 October 2021	8 October 2021
TBC		TBC		TBC	4 November 2021	5 November 2021
TBC		TBC		TBC	4 December 2021	3 December 2021

**PUBLIC VIEWING CANCELLED:**

**All Public Viewing has been  
CANCELLED  
under revised lockdown Level 4  
until further notice.**

**Refer to the website  
[www.astronomydurban.co.za](http://www.astronomydurban.co.za)  
for further updates**

Viewing Contacts:	Phone	Email
Mike Hadlow	083 326 4085	<a href="mailto:mike@astronomydurban.co.za">mike@astronomydurban.co.za</a>
Debbie Abel	083 326 4084	<a href="mailto:debbie@astronomydurban.co.za">debbie@astronomydurban.co.za</a>
Maryanne Jackson	082 882 7200	<a href="mailto:maryanne@astronomydurban.co.za">maryanne@astronomydurban.co.za</a>
John Gill	083 378 8797	<a href="mailto:John@astronomydurban.co.za">John@astronomydurban.co.za</a>
Brian Finch	082 924 1222	<a href="mailto:brian@astronomydurban.co.za">brian@astronomydurban.co.za</a>
Ooma Rambilass	083 778 3931	<a href="mailto:ooma@astronomydurban.co.za">ooma@astronomydurban.co.za</a>
Sheryl Venter	082 202 2874	<a href="mailto:sheryl@astronomydurban.co.za">sheryl@astronomydurban.co.za</a>

# Notice Board

## MEETINGS:

- Next Meeting will be the **AGM** held via ZOOM on **Wednesday 14th July 2021 @ 19:30**
- **COMMITTEE MEMBER NOMINATIONS:**
  - \* Attached to the mail with this 'nDaba, is the **ASSA Nomination Form** for members wishing to join the committee for the 2021-2022 year.
  - \* Should you wish to join, please have this form signed by ASSA members and attached to an email, sending it to the **secretary** by **7th July 2021**. Subject matter addressed as **ASSA Committee Nomination** with **your name**.
  - \* Photos of these completed forms can be sent to the secretary as well if no scanning facilities are available.
  - \* **Email Nominations** - Due to the Covid restrictions in place, an email can be sent to the secretary with the subject matter - **ASSA Committee Nomination** with **your name**, confirming your nomination. This mail is to include emails from ASSA members **seconding** and **proposing your nomination** with **their required details** as per the **Nomination form**. Please send your email to the secretary at [secretary@astronomydurban.co.za](mailto:secretary@astronomydurban.co.za) by the **7th July 2021**.
  - \* Its fun and fabulous being a committee member - **JOIN US!**
- **PUBLIC VIEWING MEETINGS - ON HOLD DUE TO COVID LEVEL 4 RESTRICTIONS**. Please refer to website [www.astronomydurban.co.za](http://www.astronomydurban.co.za) or go to this link [https://astronomydurban.co.za/?page\\_id=37](https://astronomydurban.co.za/?page_id=37) for any updates .

## MNASSA:

- Monthly Notes of the Astronomical Society of Southern Africa.
- Available at [www.mnassa.org.za](http://www.mnassa.org.za) to download your free monthly copy.

## NIGHTFALL:

- Fantastic astronomy magazine, go check it out.
- Available from the ASSA website [assa.saao.ac.za/sections/deep-sky/nightfall/](http://assa.saao.ac.za/sections/deep-sky/nightfall/)

## MEMBERSHIP FEES & BANKING:

**NB: Please note - Membership fees will be remaining the same for the new 2021 - 22 financial year. And are now due !!!**

Members in credit will be notified personally of their credit amounts beforehand and balances due will be indicated.

- Single Members: **R 170:00**
- Family Membership: **R 200:00** for parents and children
- Under 18 members: **Free**
- Cash/Cheques: **Please note NO cheques or cash will be accepted - Please pay by EFT**
- Account Name: **ASSA Natal Centre**
- Bank: **Nedbank**
- Account No. **1352 027 674**
- Branch: **Nedbank Durban North**
- Code: **135 226**
- Reference: **SUBS - SURNAME and FIRST NAME**
- Proof of Payment: [treasurer@astronomydurban.co.za](mailto:treasurer@astronomydurban.co.za)



## SKY GUIDE 2021 and ASSA MASKS - Limited number available **at reduced prices!!!**

Sky Guides: **R 50:00** each with payment reference **SG - SURNAME and FIRST NAME**

Masks: **R 50:00** each with payment reference **MK - SURNAME and FIRST NAME**

For Both: **R 100:00** using the payment reference **SM - SURNAME and FIRST NAME**

Please ensure proof of payment is sent to [treasurer@astronomydurban.co.za](mailto:treasurer@astronomydurban.co.za) following your payment.

## RESIGNATIONS from ASSA:

Please send an email immediately notifying the Secretary at [secretary@astronomydurban.co.za](mailto:secretary@astronomydurban.co.za)

## CONTACTS:

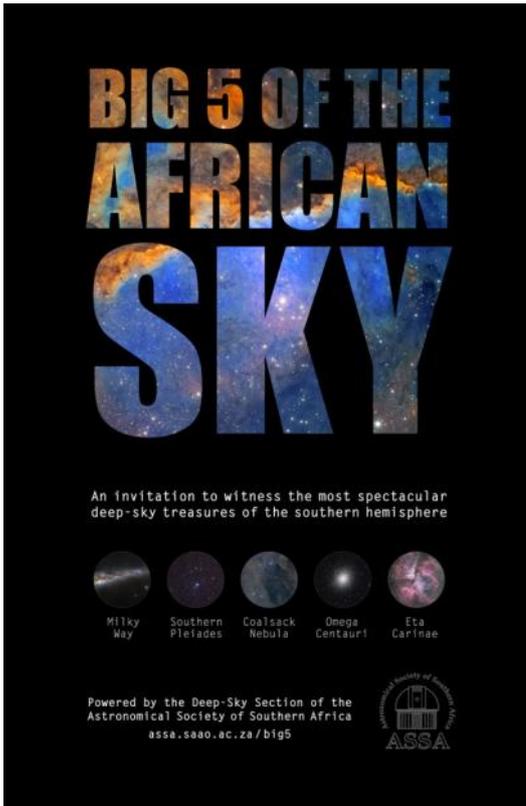
- |                                      |                 |                   |
|--------------------------------------|-----------------|-------------------|
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| • Vice Chair                         | Debbie Abel     | (+27) 83 326 4084 |
| • Secretary                          | Clair Odhav     | (+27) 83 395 5160 |
| • Treasurer                          | Corinne Gill    | (+27) 84 777 0208 |
| • Observatory & Equipment            | Mike Hadlow     | (+27) 83 326 4085 |
| • Publicity & Librarian              | Clair Odhav     | (+27) 83 395 5160 |
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| • Special Projects                   | Corinne Gill    | (+27) 84 777 0208 |
| • St. Henry's Marist College Liaison | Moya O'Donoghue | (+27) 82 678 1103 |
| • 'nDaba Editor, Website & Facebook  | John Gill       | (+27) 83 378 8797 |

## ELECTRONIC DETAILS:

- Website: [www.astronomydurban.co.za](http://www.astronomydurban.co.za)
- Emails : [AstronomyDurban@gmail.com](mailto:AstronomyDurban@gmail.com)
- Instagram: <https://www.instagram.com/astronomydurban/>
- Facebook: <https://www.facebook.com/groups/376497599210326>



# The Big 5 of the African Sky



The magnificent southern sky is a starry realm richly sown with a treasury of deep-sky objects: star clusters, bright and dark gas clouds, and galaxies.

From this (sometimes bewildering) array five specimens of each class of object have been selected by a special Deep-Sky Task Force and are presented here as the celestial Big Five.

The representative of open star clusters is the **Southern Pleiades**. First amongst the globular star clusters is the overwhelming **Omega Centauri**. Bright nebulae are represented by the majestic **Eta Carinae Nebula**. The mysterious dark nebulae are represented by the **Coal Sack**. And the most splendid galaxy of them all is our own **Milky Way Galaxy**.

Your mission is to observe each of these beautiful objects and report back on what you have witnessed.

All submitted observations will be carefully evaluated and feedback will be given.

The names of all participants will be acknowledged on the ASSA website. Observing certificates will be awarded only on merit and issued by the Deep-Sky Section of the Astronomical Society. Have fun, and keep looking up!

<http://assa.saao.ac.za/sections/deep-sky/big5/honour-roll/>

Image and text from ASSA <http://assa.saao.ac.za/sections/deep-sky/big5/>

