



ASTRONOMICAL SOCIETY OF SOUTHERN AFRICA

# Durban 'nDaba

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# Chairman's Chatter

March 2022

Dear ASSA members.

We have received the first unaligned images followed shortly by the alignment images from the James Webb Space Telescope. I am sure, like myself, many of you also cannot wait to see what new discoveries arise from this amazing piece of technology. Find JWST images on page 28.



We have started to see a few more clear nights than we did before, so I do hope that many of you are getting the opportunity to go out and enjoy the night sky views.

As of our last general meeting, we are still looking for our young astronomers between the ages of 8 and 16 years old who would like to participate in the Youth Astronomy program that we would like to kick off. If you would like more information or would like your child to participate, please send your child's details to [astronomydurban@gmail.com](mailto:astronomydurban@gmail.com). Information required will be your details and contact number, your child's name, surname, age, date of birth, and email contact details, if different from yours. Please ask your budding astronomers what the name of their group should be called and add this to the mail for consideration.

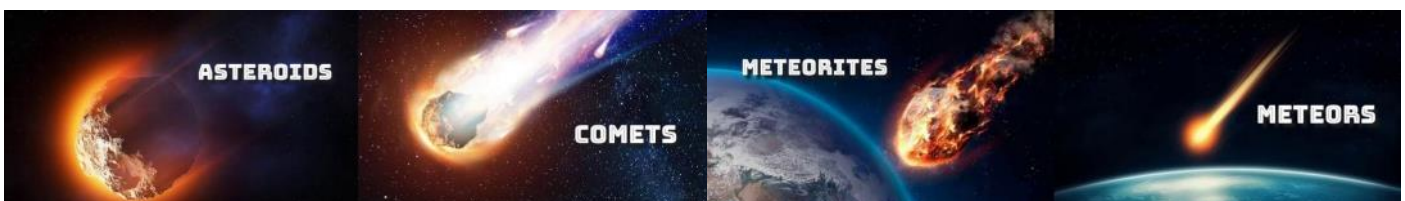


Our children are the future astronomers, so let's give them the opportunity that they so truly deserve.

We are looking for a few new committee members to join us in June 2022. Some positions, such as 'nDaba Editor and Treasurer, have come up for handover; and new members are urgently required for these portfolios. If you would like to consider one of these, or would like to volunteer to become a committee member, please send an email to [amith@astronomydurban.co.za](mailto:amith@astronomydurban.co.za).

As always, stay safe and wishing you all clear skies.

Amith Rajpal.



# Astronomy Delights: Dorado

By Magda Streicher

*Earth is a mere speck in the Milky Way and to try and imagine and represent it in perspective, is all but impossible. The soft band of the Milky Way is a reality that leaves one amazed but understanding little. Gazing southwards in favourable dark skies close to the end of the southern hemisphere summer we are able to see the two satellite Magellanic galaxies that revolve around our Milky Way.*



The explorer Amerigo Vespucci noted the Clouds as early as 1503, but it was Ferdinand Magellan, the Portuguese explorer, who documented the Clouds in the 16th century and named them after himself in his report. Imagine for a moment the amazement and wonder such a sight would have produced in those early seafarers.

The Large Magellanic Cloud (LMC) forms an oval of approximately 6 by 4 degrees and astronomers classify it as a nearly face-on barred spiral galaxy, approximately 160 000 light-years distant. The larger part is situated in the constellation Dorado, with some overflow into the constellation Mensa. Despite the LMC's irregular shape, it displays a bar and one spiral arm, though somewhat distorted.

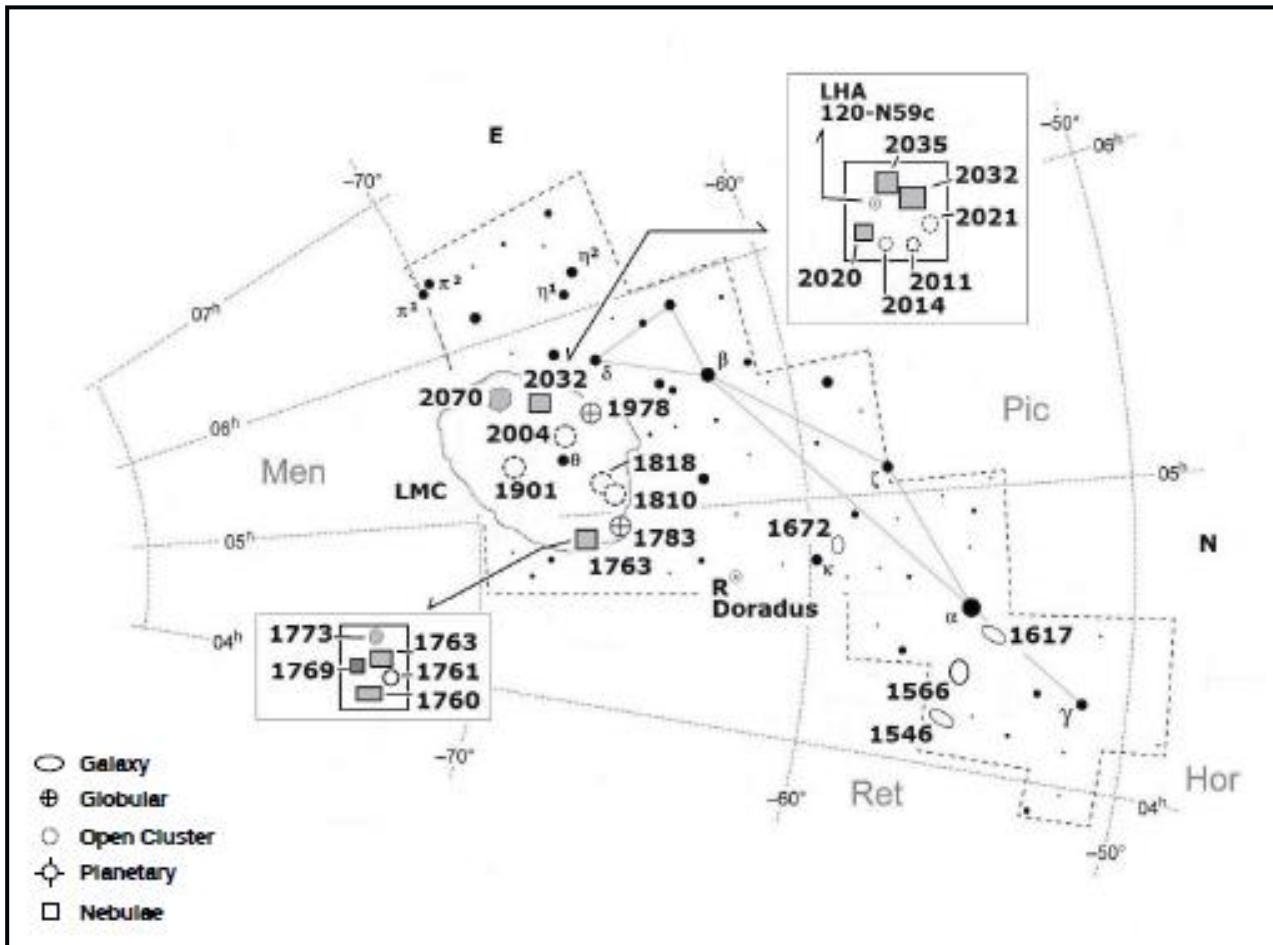
Edmond Halley, who arrived at the island of St Helena off the west coast of Africa in 1677, wrote that the Magellanic Clouds have the look of galaxies, and he observed small pieces of nebulosity and stars through his telescope. Halley noted three nebulae, which were probably the two dusty Magellanic Clouds and the Coal Sack.

Dorado the goldfish is one of the constellations named by Pieter Keyser and Frederick de Houtman during the years 1595-97 and was included in the 1603 catalogue of Johann Bayer. In 1598 the Dutch astronomer Petrus Plancius inscribed the constellation on the very first globe.

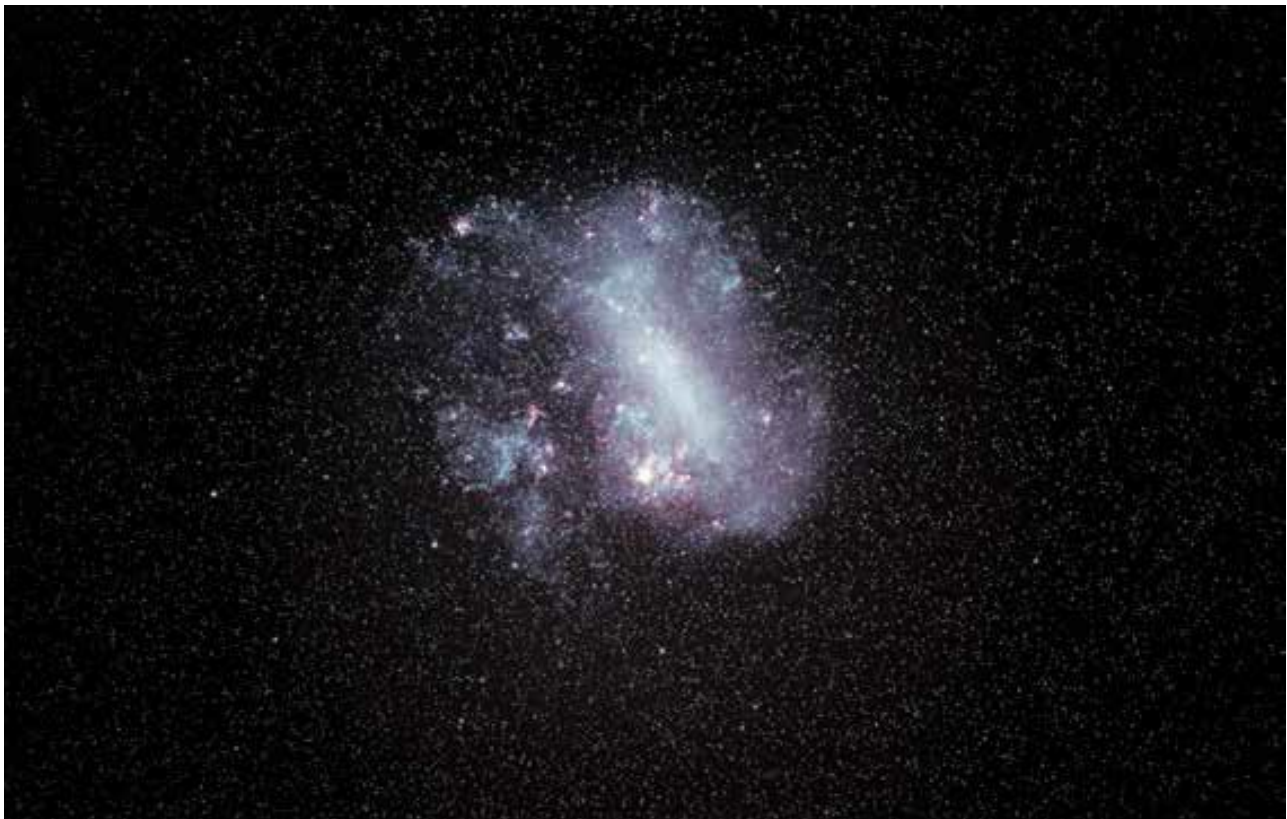
The South ecliptic pole (RA: 04h - DEC: -66°) lies within the constellation between eta and epsilon Doradus. The tail part of this tropical marine fish is projected through the magnitude 4.3 delta Doradus which is located in the far southern part of the constellation. Dorado, a slender figure about 179 square degrees long, is situated just north of the Mensa the Table, named after Table Mountain in South Africa.



# ...Dorado



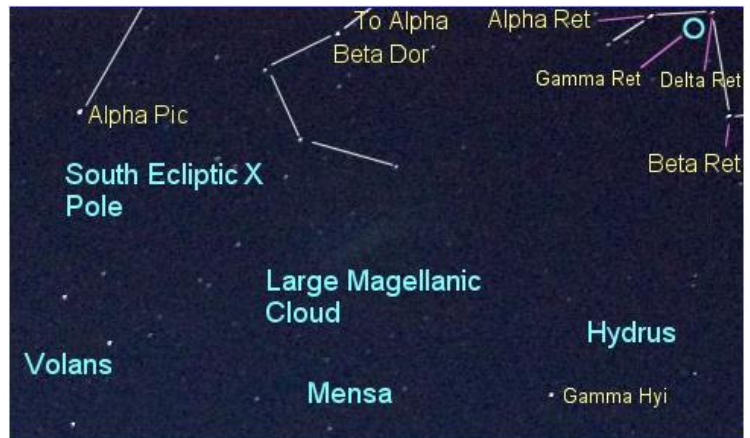
The Constellation of Dorado



Large Magellanic Cloud - Photograph: John Moolman

## ...Dorado

The South ecliptic pole (RA: 04h - DEC: -66°) lies within the constellation between eta and epsilon Doradus. The tail part of this tropical marine fish is projected through the magnitude 4.3 delta Doradus which is located in the far southern part of the constellation. Dorado, a slender figure about 179 square degrees long, is situated just north of the constellation Mensa the Table, named after Table Mountain in South Africa.



ABOVE: Image Southern Dorado by Greg Dimijian

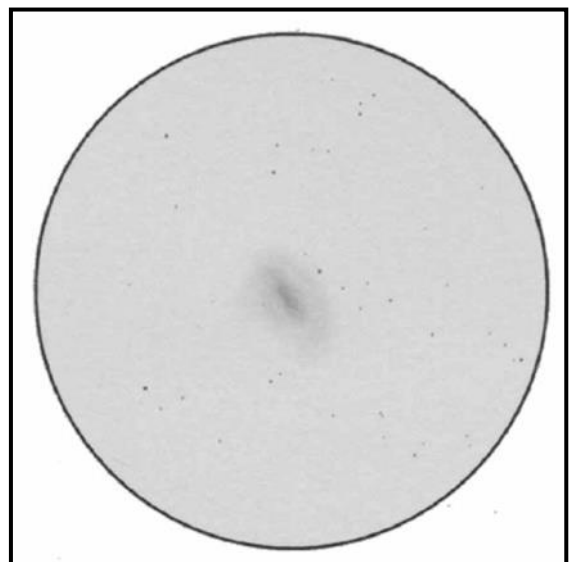


ABOVE: NGC 1617 Barred Spiral Galaxy in Dorado Image: TheSkyLive.com

The star alpha Doradus, which can be seen perhaps as the eye of the goldfish is situated just 33' south of the galaxy **NGC 1617**, also known as Bennett 25a. NGC 1617 is not that difficult to explore – you just need some patience and a few tricks. Move alpha Doradus to just outside your field of vision, use high magnification and concentrate! The galaxy displays a soft, elongated east to west oval which gradually brightens to a star-like nucleus surrounded by an outer envelope. The eastern edge of the galaxy appears very misty and high magnification treated me to some visible surface character in the form of a few knotty areas. IC 2085 with a magnitude of 14 is situated 11' to the north.

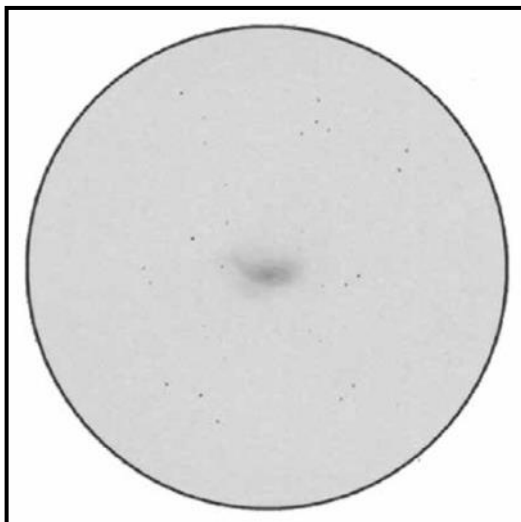
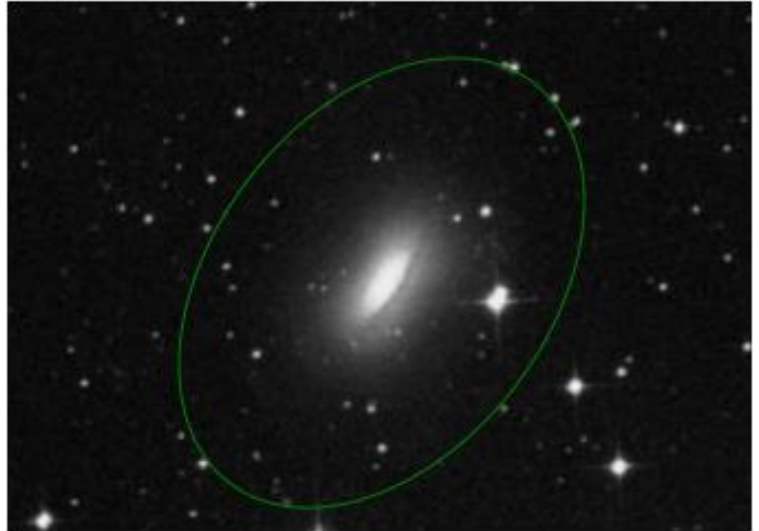
One of the most beautiful open spiral galaxies, **NGC 1566**, also known as Bennett 25, can be found among a number of other galaxies, also known as the Dorado Group, just 2 degrees west of alpha Doradus. The galaxy displays a large oval in a slightly north-east to south-west direction with a hazy fringe. The eastern and western parts are very flimsy and look like extended spiral arms. The large bright core displays a dense nucleus surrounded by a soft envelope. A few faint stars and dusty knots can be seen on the surface.

BELOW & RIGHT: NGC 1566 Galaxy



## ...Dorado

Another galaxy which is also part of the Dorado group is **NGC 1546**, situated barely a degree further south-west, close to the boundary with the constellation Reticulum. The galaxy displays a lovely, large, elongated oval in a north-west to south-east direction. The middle brighter area is large, with a soft outer halo that displays a good amount of nebulosity on the fringes. A magnitude 10 star close to the galaxy's western edge has a very faint magnitude 11 companion.



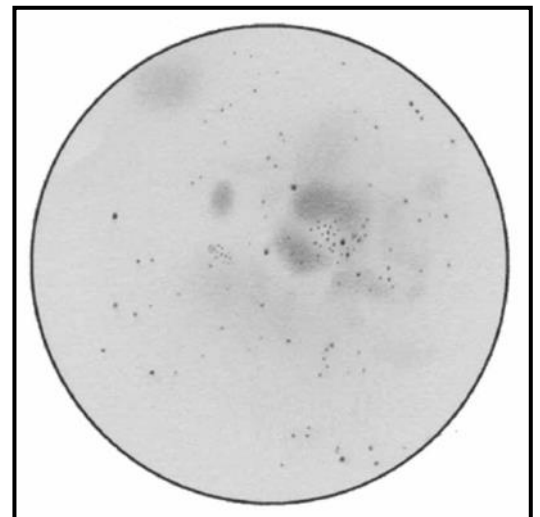
Between the fins of the heavenly fish, the galaxy **NGC 1672** can be spotted just 30' north of magnitude 5.2 kappa Doradus in the middle area of the constellation. The galaxy is an excellent example of a well-defined bar shape in an east to west direction showing off a bright pinpoint nucleus. Towards the eastern end of the bar a faint spiral arm can be glimpsed, extending northwards. This large relatively bright galaxy displays a very misty washed-out outer halo, more so towards the northern and southern ends.

LEFT: NGX 1672 - Galaxy

An outstanding red Carbon Mira star, R Doradus, which I strongly recommend observing, is situated 2.5 degrees south of kappa Doradus.

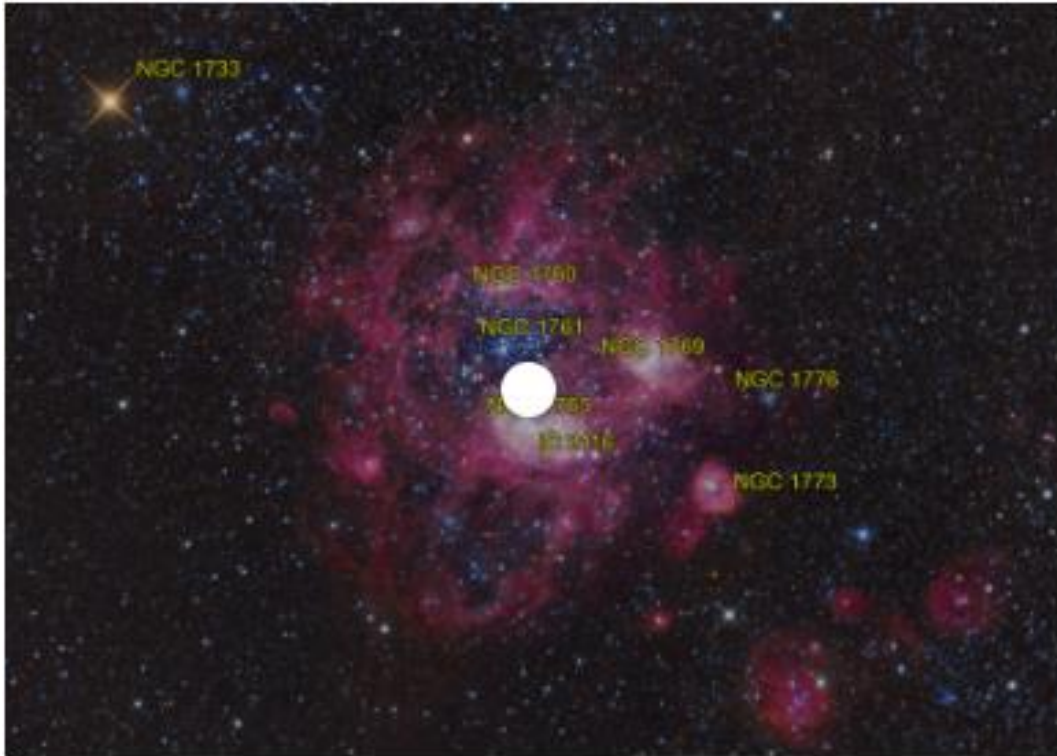
On the far northern edge of the LMC, a globular cluster pokes its nose up into the air out of the stormy sea. **NGC 1783**, also known as Bennett 28, is an outstanding object, slightly oblong in a north to south direction. This globular has all the parameters, becoming denser towards a compact centre with stars resolved over the surface and particularly with short star spikes on the outer edge. A few references classify this object as an open cluster.

A lovely, complex area permeated with clusters and nebulosity is situated just 30' to the south of NGC 1783. A few very bright, irregular pieces of nebulosity fill a field of nearly 20' and contain NGC 1760, 1761, 1763, 1769 and 1773. The focus of the complex area is **NGC 1763** towards the north-west, resembling a cocoon enveloped within a gas cloud, and also the largest and brightest object in the field of view. The cluster **NGC 1761**, situated just south of NGC 1763, displays approximately 20 faint stars, well resolved.



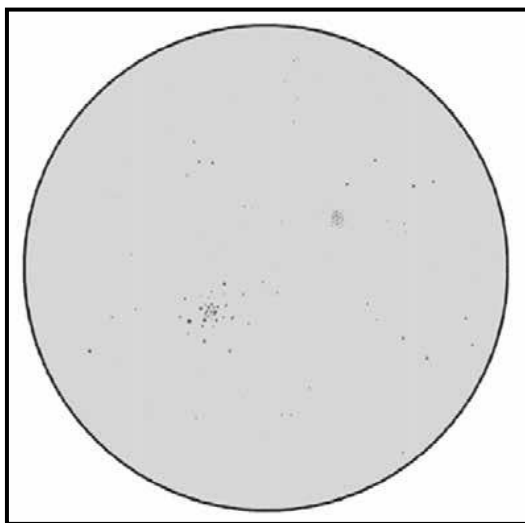
RIGHT: NGC 1763 ext - Nebulae

## ...Dorado



ABOVE: NGC 1760, 1769, 1733

Against the very uneven, flimsy, nebulous complex **NGC 1760**, an emission nebula situated further south, displays a soft, hazy, extension with quite a few faint stars embedded. Situated to the north-eastern side of NGC 1760 and in the middle part of the area, the oblong emission nebula **NGC 1769** is part of the larger complex and impresses with its bright, dense appearance. The much smaller **NGC 1773** displays a round, quite bright patch of nebulosity just further north-west in the field of view, with just a few pinpoint stars in its midst. The quite impressive dusty field can even be observed through binoculars. Bear in mind that the size and magnitude of the emission and diffuse nebulae are very difficult to determine, because most of the index data differs.



The open cluster **NGC 1818** is situated only 50' to the east, also known as Bennett 30. It is rather impressive and resembles a small, bright, round hazy\* patch with a compact middle. With higher magnification stars of varying magnitudes form short strings within the outer regions of the cluster. I could spot the very faint glow of the unresolved smaller cluster **NGC 1810** about 6' to the northwest.

LEFT: NGC 1818 and NGC 1810

One of the easier and larger globular clusters to spot in the LMC can be found in the north-eastern extreme. **NGC 1978** displays a large oval that is quite bright with a very hazy impression. It could easily be mistaken for a galaxy. However, with careful observation, a few extremely faint stars can be detected on its surface. What makes observation a little difficult is that the object is embedded in the flimsy



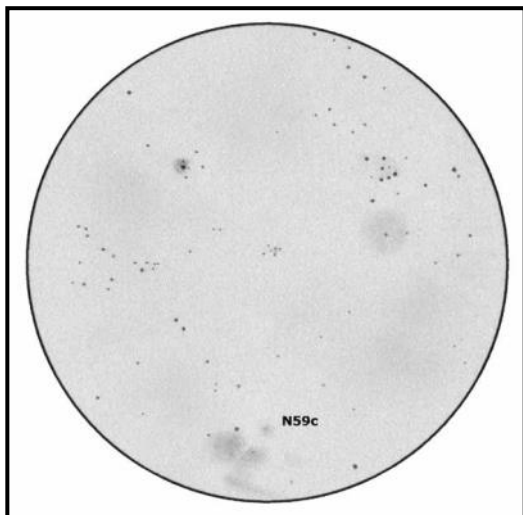
## ...Dorado

Further south and in the mist of the LMC is one of my favourite small open clusters **NGC 2004**. This group is situated 1.5 degrees east of the magnitude 4.8 gold-coloured theta Doradus. This cluster gives the impression of a comet core with faint stars flying away into a misty tail. The group displays short strings of stars with less activity towards the southern part. This is a very good example of where the field of view plays a role in the characterising of an object's impression. Around 8' to the south is a very small knot that could be an unresolved triple star.



ABOVE: NGC2004 image Wikipedia

**NGC 1901**, the very large, loose group of about 50 clearly visible stars and a handful of fainter ones is situated more or less in the middle area of the LMC. The cluster spans an area of more than 30'. It is a very easy noticeable group of stars to study through binoculars.



A rich area under the magnifying glass contains seven objects with **NGC 2032**, the larger and brighter uneven nebula in the field of view. **NGC 2035** is rounder, slightly fainter, with a few very faint stars embedded on the dusty surface. The two objects barely touch each other and form a well-defined figure. I pick up a small round patch of nebulosity just 2.7' south of NGC 2035.

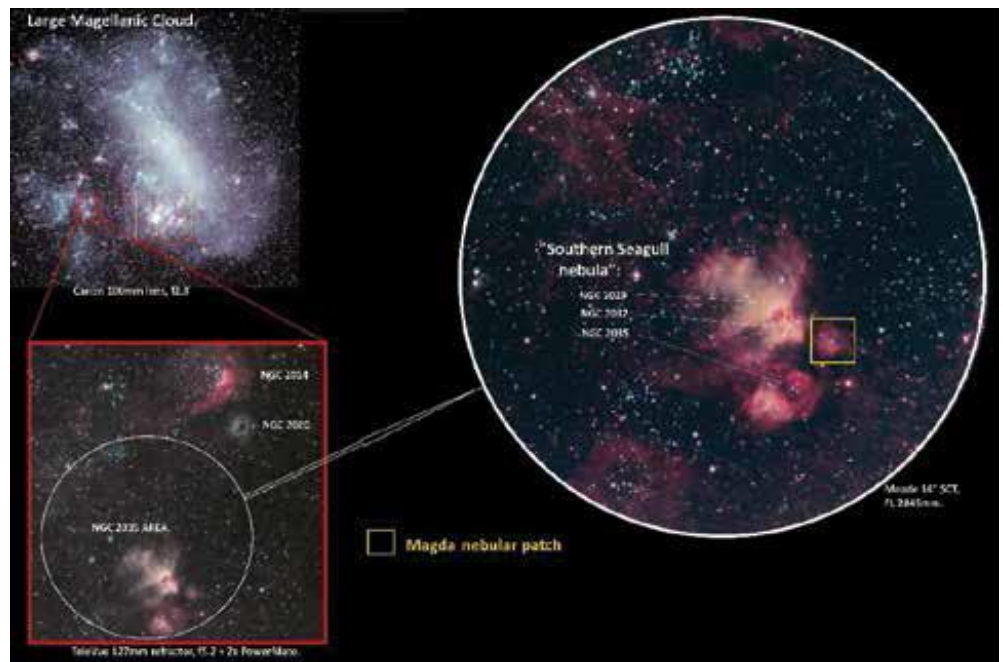
LEFT: NGC 2032 ext - Nederalae

All the nebulae in this area were brilliantly enhanced with an ultra-high contrast (UHC) filter. I was unable to find any data about this nebular patch, and a query was forwarded

to Brian Skiff. He replied that the object was catalogued by Karl Henize in 1956 as LHa 120-N59C. It is centred by a magnitude 14.5 star that is obviously the star that lights up the circular nebula. The position of the star is: RA: 05h35.39.7 and DEC: -67°37'04".8 (J2000). In the same field of view the misty **NGC 2020** is situated towards the south of the above-mentioned objects. The emission nebula displays a soft, even, round glow, very smooth, that fades away into the field. The ignited star that fluorescence the nebula is relatively easy to see, and gives the impression of riding along on top of this glow. The magnitude 12.2 star on the southern end of the nebula is, however, a distracting factor, drawing the eye away. Nebulosity very much interweaves the lovely star grouping **NGC 2014**, about 5' west. And although small, **NGC 2011**, the relatively compact group to the north, is perhaps the brightest object in this field of view. **NGC 2021** displays an elongated scattering of faint stars in the far northern part of the complex, somewhat triangular in shape, with the triangle pointing south.

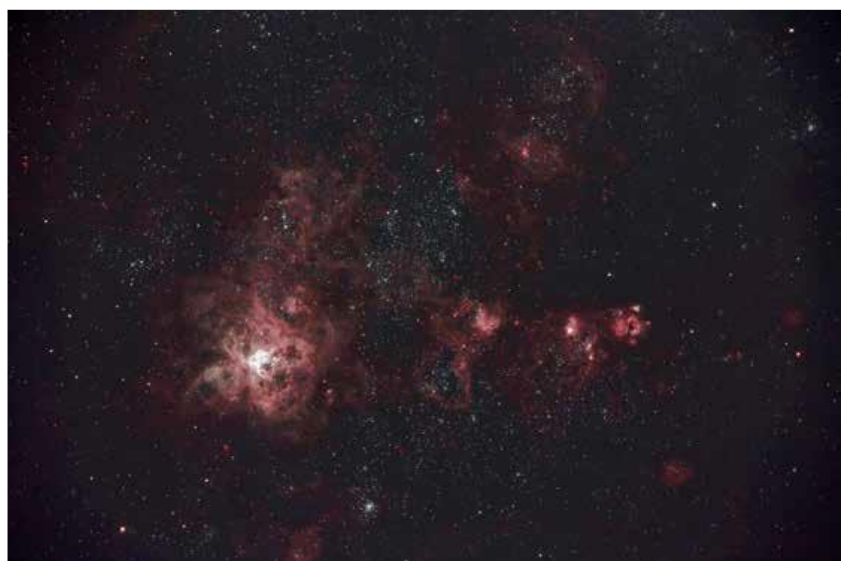
## ...Dorado

My dear friend Johan Moolman took this excellent picture of the nebulous complex, outlived the mysterious nebula clearly.



The Large Magellanic Cloud is home to **NGC 2070**, also known as Bennett 35, the great looped nebula situated in the south-eastern part of the LMC and probably one of the most amazing objects in the southern night sky. It is known as the Tarantula Nebula due to the striking similarity it shows to the tarantula spider, the largest arachnid of its kind in the world. It was discovered by Lacaille in 1751 and is easily spotted with the naked eye. The heart of the tarantula displays a tight and bright overwhelming core. Also known as 30 Doradus, it is situated approximately 190 000 light-years from earth, and is almost 600 to 700 light-years in diameter. Some astronomers believe that 30 Doradus is the nucleus of this neighbourhood galaxy, but it is not very centrally placed. This inner core consists of stars that are very hot and large. Their combined radiation is responsible for its brightness, especially the brilliant cluster R136, home to the recently discovered supermassive stars, several of which have masses well in excess of 200 solar masses. (*MNASSA* – Volume 69 Nos 11&12).

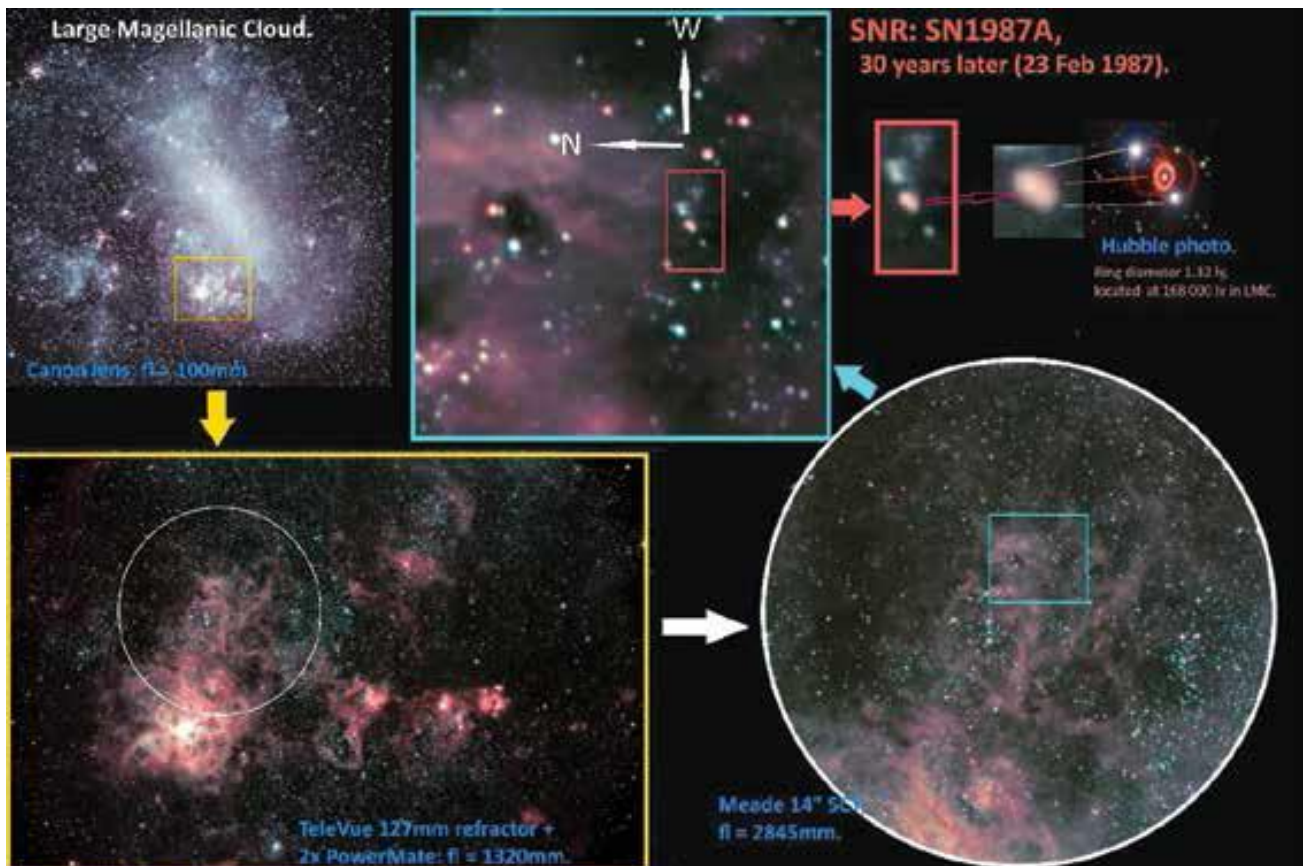
The Tarantula Nebula needs many words to describe it. This very large gas nebula which unfolds in long, soft, cloud-like arms, gently enfolded with dark, stripy inlays from a soft but overwhelming inner part. Nebulous gas trails and filaments extend beautifully in streaks of light that fade away and mingle with the dark of night. The southern part of the nebula is more complex, unfolding in a veil of misty haziness. The northern part appears tighter, and with a bit of imagination a large starry spider can be seen lurking in the nebulousity web. Star splinters dot the surface like dewdrops in the morning sun.



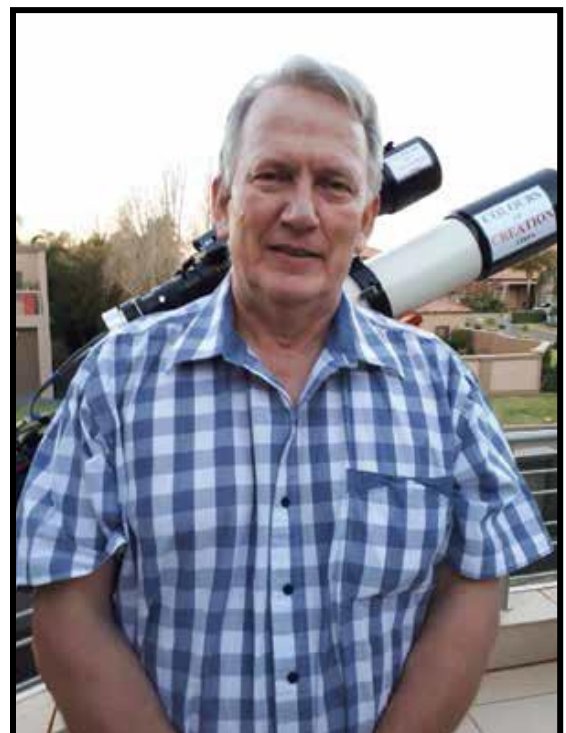
ABOVE: NGC 2070 - Tarantula Nebula  
Photograph: Johan Moolman

## ...Dorado

Supernova 1987A, the titanic supernova explosion, was first observed on 23 February 1987 just to the south of NGC 2070. The star Sanduleak -69°202 was a magnitude 11.7 star before the outburst. It blazed with the power of 100 million suns and brightened up more than 2000 times than it was before. Although the supernova itself is now a million times fainter, light echoes are just beginning to show in the space surrounding it. Supernova 1987A was a blue super giant, with a core collapse that should have left behind a neutron star, but no evidence of that has yet turned up.



Johan Moolman's utter pleasure and joy are to share astronomy with friends, with regular visits to the pure clean Karoo night sky to produce high quality photographs through his telescope. He is an active member of the Pretoria Centre and contribute on various aspects of astronomy in South Africa. Always willing to contribute to various projects I might indulge in, thank you Johan.



## ...Dorado



The name Bennett used in some of the descriptions in this chapter and elsewhere refers to Jack Caister Bennett, an accomplished amateur astronomer born on 6 April 1914 in Estcourt, KwaZulu-Natal, South Africa and who passed away on 30 May 1990. Astronomy friend Louis Piovesan is pleased to note that Jack Bennett was born in his little town and indicates to me that the name Estcourt derives from the Anglo-Saxon name Ecot.


Bennett was a dedicated South African comet-hunter who patrolled the the skies in the late 1960s. He picked up a magnitude 9 supernova in NGC 5236 also known as Messier 83, becoming the first person ever to discover a supernova. He compiled the Bennett Catalogue, a list of 152 objects to help observers eliminate them in comet searches.

The constellation Dorado contains eleven Bennett objects:

- NGC 1549 (Ben 23)
- NGC 1553 (Ben 24)
- NGC 1566 (Ben 25)
- NGC 1617 (Ben 25a)
- NGC 1672 (Ben 26)
- NGC 1763 (Ben 27)
- NGC 1783 (Ben 28)
- NGC 1818 (Ben 30)
- NGC 1866 (Ben 33)
- NGC 2070 (Ben 35)
- NGC 2214 (Ben 36)



## ...Dorado

This is just the start of a journey of exploration through the misty LMC which weaves nebulae and stars into a fine network of art. Swimming around in the waters of the Cloud brings to the fore many knots of faint stars interspersed with nebulosity. Pick up your gear, your friends, your naked eye, and explore this wonderful front-door constellation which has so much to offer. 

OBJECT	TYPE	RA	DEC	MAG	SIZE
NGC 1546	Galaxy	04h14m.6	-56°04'.0	10.9	3.4'×1.7'
NGC 1566 Bennett 25	Galaxy	04h20m.0	-54°56'.0	9.4	7.1'×4.8'
NGC 1617 Bennett 25a	Galaxy	04h31m.7	-54°36'.2	10.5	4.8'×2.2'
R Doradus	Mira Variable Star	04h36m.8	-62°05'.0	4.8 6.6	Period 338 days
NGC 1672 Bennett 26	Galaxy	04h45m.7	-59°15'.0	9.8	6.2'×3.4'
NGC 1763 Bennett 27	Open Cluster Nebula	04h56m.8	-66°24'.8	8	5'×3'
NGC 1783 Bennett 28	Globular Cluster	04h58m.8	-65°59'.2	10.9	3'
NGC 1810	Open Cluster	05h03m.4	-66°22'.5	11.9	1.2'
NGC 1818 Bennett 30	Open Cluster	05h04m.2	-66°24'.9	9.7	3.4'
NGC 1901	Open Cluster	05h17m.8	-68°26'.0	7	40'
NGC 1978	Globular Cluster	05h28m.8	-66°14'.2	10.5	3.9'
NGC 2004	Open Cluster	05h30m.7	-67°17'.0	9.6	2.7'
NGC 2032	Emission Nebula	05h35m.3	-67°34'.0	10	3'
LHa 120-N59C	Reflecting Nebula	05h35m.6	-67°37'.1	14	1'
NGC 2070 Bennett 35	Nebula	05h38m.6	-69°05'.0	5	30'×20'



# At the Eyepiece

March 2022 by Ray Field

The Sun crosses the equator from South to North on the 20<sup>th</sup> March, which is the Autumnal Equinox for the Southern hemisphere.

The Moon is New on the 2<sup>nd</sup>, first quarter on the 10<sup>th</sup>, Full on the 18<sup>th</sup> and Last quarter on the 25<sup>th</sup>. The Moon is near Venus in the daylight on the 27<sup>th</sup> and 28<sup>th</sup>. The Sun is 46° from Venus on these two dates. The Moon is near Pollux on the 13<sup>th</sup>, Regulus on the 16<sup>th</sup>, Spica on the 20<sup>th</sup> and Antares on the 23<sup>rd</sup>.

Mercury is not well placed for observation this month as it is too close to the Sun.

Venus is visible in the pre-sunrise sky this month. It will be highest above the Eastern horizon at 46° on the 20<sup>th</sup> at sunrise.

Mars is visible in the dawn sky this month before sunrise. The Moon is near Mars on the 28<sup>th</sup>.

Jupiter is not well placed for observation this month as it is too close to the Sun. It rises about an hour before the Sun on the 23<sup>rd</sup>.

Saturn can be seen low in the pre-dawn sky over the East. The Moon will be near Saturn on the 28<sup>th</sup>. Mars, Saturn and Venus will all be close to each other around the 28<sup>th</sup>.

Uranus, in Aries, is barely visible to the naked eye under good viewing conditions in the early evening sky this month, after which it gets lost in the solar glare.

Neptune is not well placed for observation this month as it is too close to the Sun in the evening twilight.

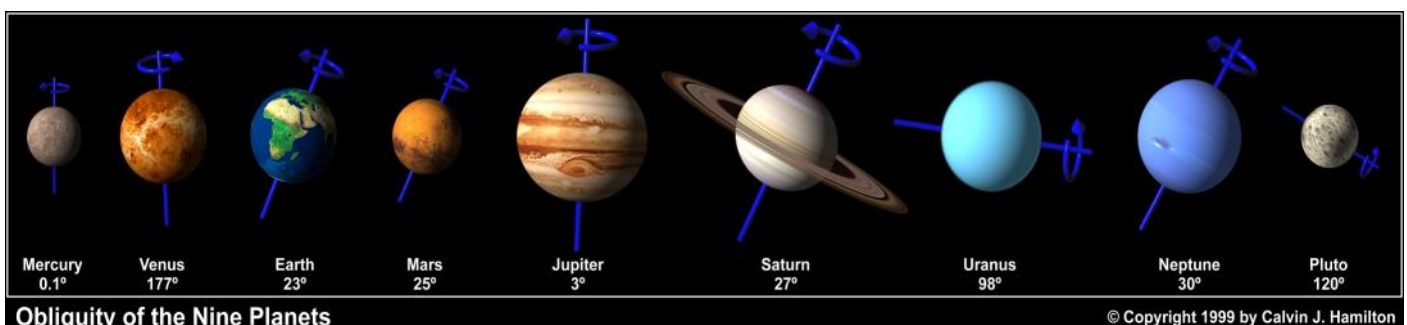
Meteor Showers: The γ Nornids have a maximum on the 13<sup>th</sup> March at a ZHR of 5-10, under good observing prospects this year. It is a southern shower with a declination of the radiant at 51° South.

Comets:

**Comet c/2021 A1 (Leonard)** was predicted to be at its brightest last month which was possible naked eye visibility over the South West soon after sunset.

**Comet 104p/Kowal 2** nearest the Sun on the 11<sup>th</sup> January, in the constellation of Cetus, was predicted to reach magnitude 9, will be below naked eye visibility, on the 11<sup>th</sup> January. It takes about 7 years to orbit the Sun.

**Comet c/2017 K2** maybe visible in binoculars during the second half of the year.



## ...At the Eyepiece

The starry sky for Durban in the evening sky for mid-March 2022. The Southern Cross and it's Pointers are rising over the South East. The bright star Achenar is sinking over the South West. Canopus, the second brightest star in the sky (after Sirius) is above the South, at its highest. Orion is starting to set over the NW. Leo and Virgo are starting to rise above the North East horizon, but low. Sirius, the brightest star in the sky is between Canopus and the Northern horizon.

References include ASSA Sky Guide 2022, Philips Planisphere for 35° South and Stars of the Southern Hemisphere by Sir Patrick Moore. 



360° Image taken by Perseverance showing hills, hills and the horizon around the “Jezero Crater”, a dried-up lake with a diameter of about 45 kilometers on Mars - See Page 24 for a years photos taken on Mars.

## For Sale



Celestron Nexstar 6SE Telescope for sale, includes Carry Case on wheels.  
R 22 000 ONCO - Only used twice. Contact Julie via e-mail at [Julieg9210@gmail.com](mailto:Julieg9210@gmail.com)



# Barnard's Star has a Planet After All

By Brian Ventrudo



An artist's impression of the newly discovered planet round Barnard's star, the nearest single star to the Sun. The newly discovered planet is the second-closest known exoplanet to the Earth and orbits the fastest moving star in the night sky. Image credit: ESO/M. Kornmesser.

It was a discovery nearly a century in the making, but astronomers have finally detected a planet around the speedy little red dwarf known as Barnard's Star. The existence of the planet is not particularly surprising given the vast harvest of exoplanets discovered since 1995 around all manner of stars. Nor is the planet a habitable world, to be sure. But it was welcome news nonetheless to find that the nearest single star to Earth has at least one planet in its relatively feeble gravitational embrace.

In many ways, Barnard's Star was the "white whale" of exoplanet hunters. That's because the star is close, just six light years away, the second-closest star system to Earth, which should make it easier to find an orbiting planet. And the star is prominent because of its speedy apparent motion across the sky. Barnard's Star is also old, more than twice the age of our own solar system, so it's had plenty of time to form a planetary system. But for nearly a hundred years, astronomers have examined the star for evidence of a planetary system using visual observation, photographic imaging, and finally using modern spectroscopic planet-hunting techniques. They came up empty every time.

There was, of course, an exhilarating announcement by the Swarthmore College astronomer Peter van de Kamp in the mid-1960s. He claimed to have detected a wobble in the star's motion across the sky, which he presumed was caused by the gravitational influence of an unseen planet. Van de Kamp refined his results through the 1960s and 1970s and published a series of entirely serious scientific papers on the subject. But other astronomers were unable to reproduce his results, an essential step in the scientific enterprise.



## ...Barnard's Star

After much head scratching, it turned out his results were caused not by a planet around Barnard's Star, but by periodic maintenance of the telescope's objective lens by technical staff at the observatory. Still, the popular imagination was stoked by van de Kamp's work, and Barnard's Star figured prominently in many works of science fiction.



Artist's conception of the surface of the planet Barnard's Star b.

Image credit: ESO/M. Kornmesser.

Despite so many null results, astronomers kept at it. In fact, they've been collecting data on Barnard's Star for some twenty years using seven different telescopes to build up a spectroscopic signal on the star's radial velocity, the slight wobble in the star's motion that a planet might induce. The most recent study, announced in November 2018, compiled this data along with additional measurements and painstaking analyses to finally conclude with 99.2% certainty that Barnard's Star does indeed have a planet.

[Here's a link to the scientific paper](#) published in *Nature* that explains the details of the discovery.

What kind of planet is it? Barnard's Star b, as it's called, is about three times the mass of our own planet. The radius and density are still unknown, but most planets of this mass turn out to be rocky worlds like Earth or Mercury rather than gaseous worlds like Jupiter. The planet is also cold, with an estimated surface temperature of about  $-174^{\circ}\text{C}$ . That puts it in the "snow line", the position around the star at which volatile compounds like water, carbon dioxide, and ammonia condense into ices. It orbits Barnard's Star in about 233 days at a distance equal to the distance between Mercury and our Sun. The planet is much colder than Mercury because Barnard's Star is a small red dwarf, a dim-bulb star with a brightness only 0.04% that of our Sun.

Because of its low mass, the star sips its nuclear fuel frugally and will live to a great age. It's already twice the age of our Sun, about 10 billion years, and has another many tens of billion of years to go before its demise. A planet around such a star would be a great place to build a long-lived civilization.

Barnard's Star, of course, is also an accessible object to us amateur stargazers. Despite its proximity, the intrinsically dim star shines at just 9<sup>th</sup> magnitude. But you can see it with a pair of binoculars or any telescope. It's located just off the horns of a little asterism called Taurus Poniatowski in the constellation Ophiuchus which is prominent in the sky from July through November. The star moves quickly across the sky at a rate of 10.4" per year, a motion plenty fast enough to track with a small telescope against the background stars. It's great fun to see this speedy little star for yourself, especially now that we know it has a planetary companion that, in astronomical terms, is right next door to our own solar system.



## COSMIC PURSUITS

We've put the finishing touches on the updated version of Fundamentals of Stargazing, our online course for those with a keen desire to look up and see the universe for themselves. It's finally ready to go for 2022 for stargazers in the northern AND southern hemispheres.

<https://cosmicpursuits.com/stargazing/>

Fundamentals of Stargazing breaks down the basics of backyard astronomy into easy-to-understand pieces each month. As a member of this course, you receive detailed sky tours throughout the year.

You discover how to choose and use the best binoculars, telescopes, and accessories for your personal situation. And you get little glimpses of the science of stargazing to help you understand how things work in the night sky.

The course also shows you how to find and enjoy hundreds of beautiful and astounding sights beyond the solar system. It even helps you, if you are so inclined, to capture your first 'snapshot astrophotos' of the night sky!

Here's what one recent student said of the course:

“Fundamentals of Stargazing’ is well designed and assembled with heaps of information... and it has enough stimulating challenges to hook you into becoming a more adventurous and informed stargazer. The most valuable aspect was having someone available and prepared to answer any question. This has been a most worthwhile and enriching experience for me.”

Once a year, for a couple of weeks, Fundamentals of Stargazing becomes available at a discounted price, and to a limited number of new students. When it's full, it closes for the year.

If you're at a point in your life where understanding and meaning are paramount, and you're in a position to devote a little time to studying the night sky, then I urge you to learn more about the course at the link below... ✨

<https://cosmicpursuits.com/stargazing/>

Brian Ventrudo, Ph.D.

Publisher

CosmicPursuits.com



47 Tucanae - NGC 104

# The Cover Image - The Witch's Broom

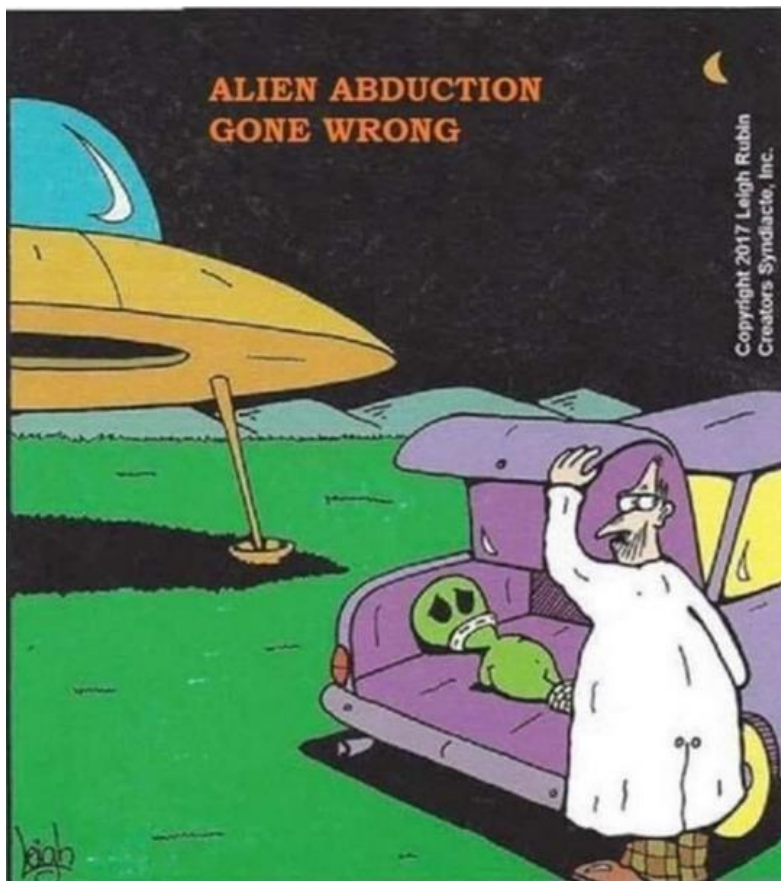
Processed by John Gill



I recently entered a astrophotography processing competition. The data was supplied in Ha, Oiii and RGB. Although I did not win, I did finish in the top 10.



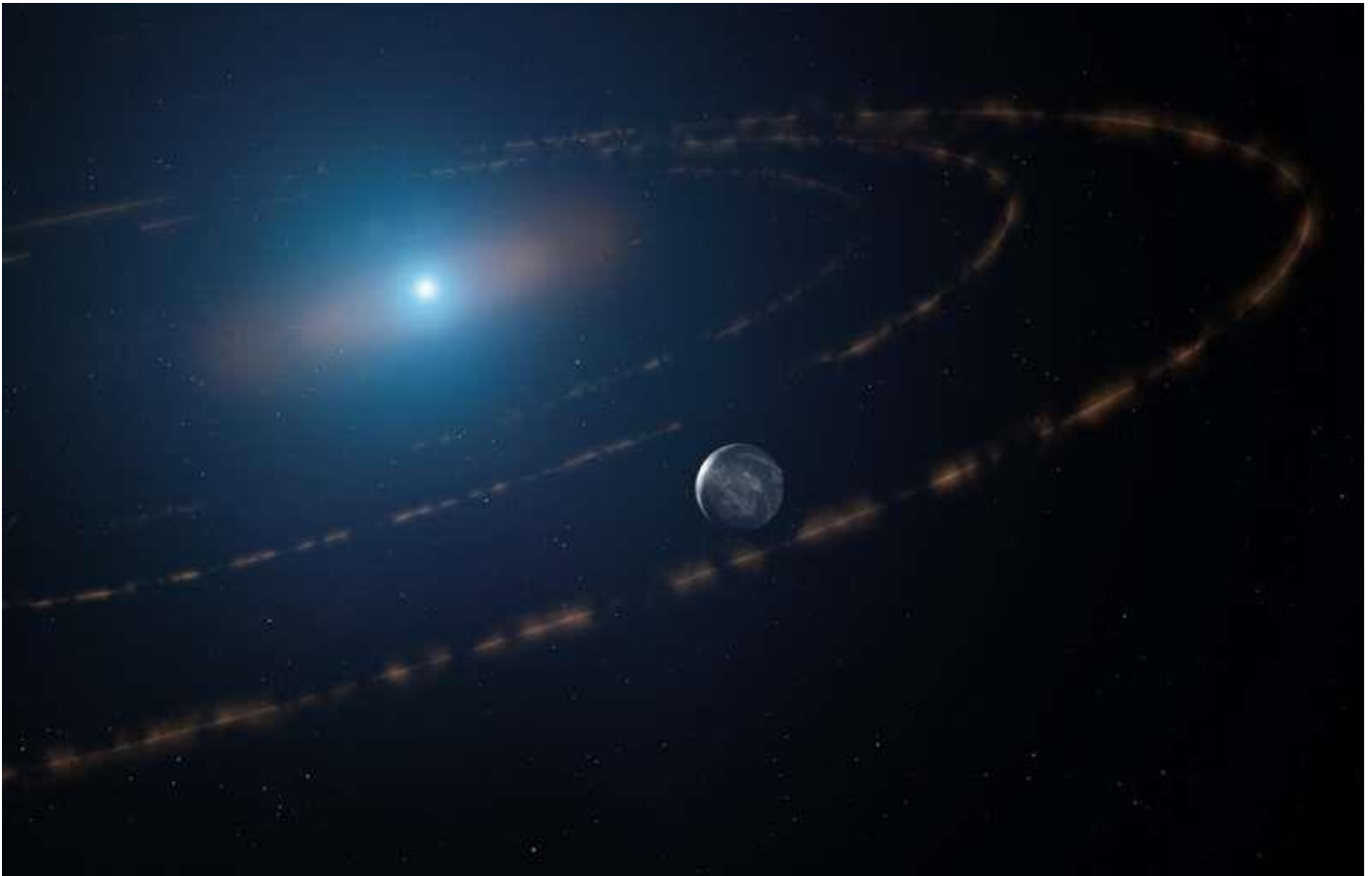
Ten thousand years ago, before the dawn of recorded human history, a new light would have suddenly appeared in the night sky and faded after a few weeks. Today we know this light was from a supernova, or exploding star, and record the expanding debris cloud as the Veil



Nebula, a supernova remnant. This view is centered on a western segment of the Veil Nebula cataloged as NGC 6960 but less formally known as the Witch's Broom Nebula. Blasted out in the cataclysmic explosion, the interstellar shock wave plows through space sweeping up and exciting interstellar material. Imaged with narrow band filters, the glowing filaments are like long ripples in a sheet seen almost edge on, remarkably well separated into atomic hydrogen (red) and oxygen (blue-green) gas. The complete supernova remnant lies about 1400 light-years away towards the constellation Cygnus. This Witch's Broom actually spans about 35 light-years. The bright star in the frame is 52 Cygni, visible with the unaided eye from a dark location but unrelated to the ancient supernova remnant. ✨

# Planetary Bodies Observed for First Time in Habitable Zone of Dead Star

by University College London



An artist's impression of the white dwarf star WD1054-226 orbited by clouds of Planetary debris and a major planet in the habitable zone. Credit: Mark A. Garlick / markgarlick.com

A ring of planetary debris studded with moon-sized structures has been observed orbiting close to a white dwarf star, hinting at a nearby planet in the "habitable zone" where water and life could exist, according to a new study led by UCL researchers.

White dwarfs are glowing embers of stars that have burned through all their hydrogen fuel. Nearly all stars, including the Sun, will eventually become white dwarfs, but very little is known about their planetary systems.

In the study, published in *Monthly Notices of the Royal Astronomical Society*, an international team of researchers measured light from a white dwarf in the Milky Way known as WD1054–226, using data from ground- and space-based telescopes.

To their surprise, they found pronounced dips in light corresponding to 65 evenly spaced clouds of planetary debris orbiting the star every 25 hours. The researchers concluded that the precise regularity of the transiting structures—dimming the star's light every 23 minutes—suggests they are kept in such a precise arrangement by a nearby planet.

Lead author Professor Jay Farihi (UCL Physics & Astronomy) said: "This is the first time astronomers have detected any kind of planetary body in the habitable zone of a white dwarf.

## ...Planetary Bodies

"The moon-sized structures we have observed are irregular and dusty (e.g. comet-like) rather than solid, spherical bodies. Their absolute regularity, one passing in front of the star every 23 minutes, is a mystery we cannot currently explain.

"An exciting possibility is that these bodies are kept in such an evenly-spaced orbital pattern because of the gravitational influence of a nearby planet. Without this influence, friction and collisions would cause the structures to disperse, losing the precise regularity that is observed. A precedent for this 'shepherding' is the way the gravitational pull of moons around Neptune and Saturn help to create stable ring structures orbiting these planets.

"The possibility of a planet in the habitable zone is exciting and also unexpected; we were not looking for this. However, it is important to keep in mind that more evidence is necessary to confirm the presence of a planet. We cannot observe the planet directly so confirmation may come by comparing computer models with further observations of the star and orbiting debris."

It is expected that this orbit around the white dwarf was swept clear during the giant star phase of its life, and thus any planet that can potentially host water and thus life would be a recent development. The area would be habitable for at least two billion years, including at least one billion years into the future.

More than 95% of all stars will eventually become white dwarfs. The exceptions are the largest stars that explode and become either black holes or neutron stars.

Professor Farihi added: "Since our Sun will become a white dwarf in a few billion years, our study provides a glimpse into the future of our own solar system."


When stars begin running out of hydrogen, they expand and cool, becoming red giants. The Sun will enter this phase in four to five billion years, swallowing Mercury, Venus, and possibly Earth. Once the outer material has gently blown away and hydrogen is exhausted, the hot core of the star remains, slowly cooling over billions of years—this is the star's white dwarf phase.

Planets orbiting white dwarfs are challenging for astronomers to detect because the stars are much fainter than main-sequence stars (like the Sun). So far, astronomers have only found tentative evidence of a gas giant (like Jupiter) orbiting a white dwarf.

For the new study, researchers observed WD1054–226, a white dwarf 117 light years away, recording changes in its light over 18 nights using the ULTRACAM high-speed camera fixed on to the ESO 3.5m New Technology Telescope (NTT) at the La Silla Observatory in Chile. In order to better interpret the changes in light, the researchers also looked at data from the NASA Transiting Exoplanet Survey Satellite (TESS), which allowed the researchers to confirm the planetary structures had a 25-hour orbit.

They found that the light from WD1054–226 was always somewhat obscured by enormous clouds of orbiting material passing in front of it, suggesting a ring of planetary debris orbiting the star.

The habitable zone, sometimes called the Goldilocks zone, is the area where the temperature would theoretically allow liquid water to exist on the surface of a planet. Compared to a star like the Sun, the habitable zone of a white dwarf will be smaller and closer to the star as white dwarfs give off less light and thus heat.

The structures observed in the study orbit in an area that would have been enveloped by the star while it was a red giant, so are likely to have formed or arrived relatively recently, rather than survived from the birth of the star and its planetary system. 

# Three Galaxies are Tearing each other Apart in Stunning new Hubble Telescope Image



ABOVE: Three galaxies collide in this stunning new Hubble image. (Image credit: ESA/Hubble and NASA)

Corkscrewing through the cosmos, three distant galaxies collide in a stunning new image captured by NASA's Hubble Space Telescope.

This cosmic crash is known as a triple galaxy merger, when three galaxies slowly draw each other nearer and tear each other apart with their competing gravitational forces. Mergers like these are common throughout the universe, and all large galaxies - including our own, the Milky Way - owe their size to violent mergers like this one.

As chaotic as they seem, mergers like these are more about creation than destruction. As gas from the three neighboring galaxies collides and condenses, a vast sea of material from which new stars will emerge is assembled at the center of the newly unified galaxy.


Existing stars, meanwhile, will survive the crash mostly unscathed; while the gravitational tug-of-war among the three galaxies will warp the orbital paths of many existing stars, so much space exists between those stars that relatively few of them are likely to collide, Live Science previously reported.

The galaxy cluster seen above is called IC 2431, located about 681 million light-years from Earth in the constellation Cancer, according to NASA. Astronomers detected the merger thanks to a citizen science project called Galaxy Zoo, which invited more than 100,000 volunteers to classify images of 900,000 galaxies captured by the Hubble telescope that were never thoroughly examined. The crowdsourced project accomplished in 175 days what would have taken astronomers years to achieve, according to NASA, and the initiative has already resulted in a number of strange and exciting discoveries, like this one.

## ...Three Galaxies

Studying galactic mergers can help astronomers better understand the Milky Way's past and future. The Milky Way is thought to have gobbled up more than a dozen galaxies over the past 12 billion years, including during the exceptionally named Gaia sausage merger, Live Science previously reported.

The 'Kraken merger' may have been the biggest collision in Milky Way's history; which helps fill in the Milky Way's mysterious family tree, but could also help astronomers piece together what our galaxy looked like in its earliest days. With each galactic merger, the shape, size and motion of our galaxy changed forever, ultimately becoming the iconic spiral we recognize today. Now, researchers have attempted to unwind that spiral. Using artificial intelligence (AI) to match distinct clusters of stars by their ages, motions and chemical compositions, the team found evidence of five large-scale galactic mergers (each involving 100 million stars or more) dating back more than 10 billion years — including one ancient collision that has never been described before.

Meanwhile, our galaxy appears on track to combine with the nearby Andromeda galaxy about 4.5 billion years from now. The merger will totally alter the night sky over Earth but will likely leave the solar system unharmed, according to NASA. Watch the collision between our Milky Way galaxy and the Andromeda galaxy in this new animation. <https://youtu.be/4disyKG7XtU> 

<https://www.livescience.com/triple-galaxy-merger-cancer> By Brandon Specktor



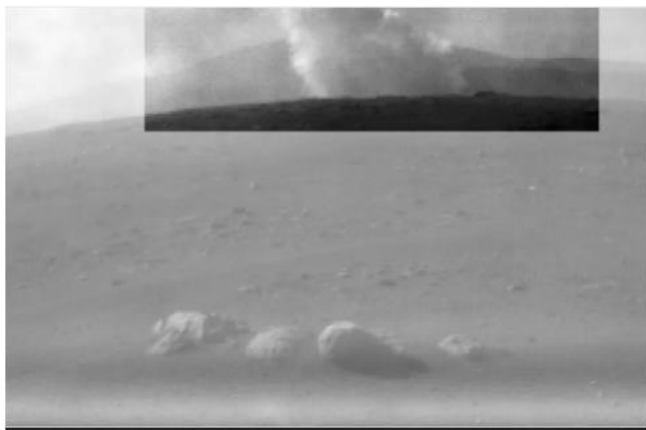
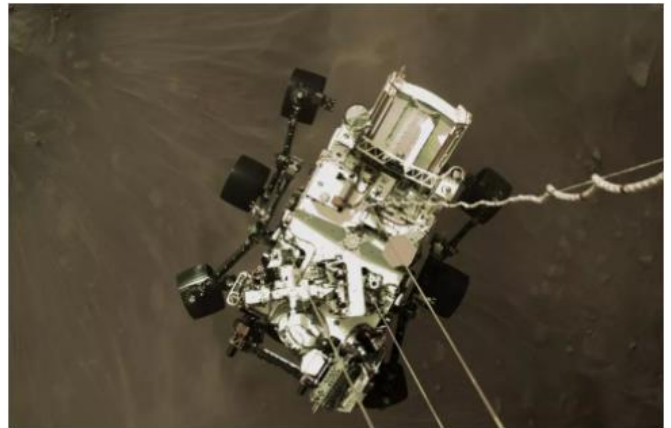
ABOVE: A representation of the Milky Way and Andromeda's merger (Image credit: NASA)

# 12 Amazing Photos from the Perseverance's 1st Year on Mars

NASA's Perseverance rover has now been exploring Mars for a full year, and it has captured some amazing photos during that stretch.

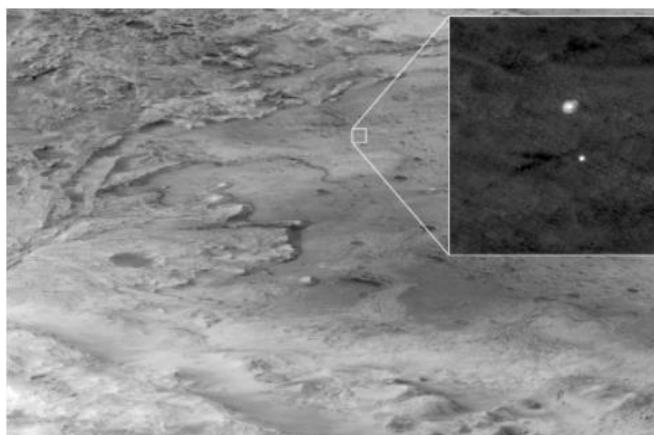
The car-sized Perseverance rover touched down inside the Red Planet's 28-mile-wide (45 kilometers) Jezero Crater on Feb. 18, 2021. The rover is searching for signs of past Mars life in Jezero, which hosted a big lake and a river delta in the ancient past. It's also collecting and caching dozens of samples for future return to Earth.

Perseverance landed with the aid of a rocket-powered sky crane, which lowered the six-wheeled robot onto Jezero's floor on cables and then flew off to a safe distance away. Cameras aboard the sky crane gave us great looks at this dramatic action, as this photo shows. It captures the moment just before touchdown, as Perseverance dangles just 6.5 feet (2 meters) above the red dirt. (Feb 18)



The sky crane's grand sacrifice did not go unnoticed or unmourned: Just after the rover's wheels touched down, the sky crane flew off to crash-land intentionally a safe distance away and Perseverance snapped a photo of the impact's immediate aftermath, from one of the rear Hazard Cameras, or Hazcams, aboard NASA's Perseverance Mars rover. NASA announced Wednesday (Feb. 24).

Perseverance is not alone on Jezero's floor. A 4.4 pound (1.8 kilograms) helicopter named Ingenuity, landed with the rover, tasked with showing that aerial exploration is possible on Mars despite the planet's thin atmosphere. Ingenuity aced its five-flight prime mission and is now serving as a scout for Perseverance, with a total of 19 Martian sorties under its belt to date. Selfie take by Perseverance.



Other robots watched Perseverance's entry, descent and landing (EDL) as well. For example, the HiRISE ("High Resolution Imaging Science Experiment") camera on Mars Reconnaissance Orbiter (MRO) snapped an amazing shot of Perseverance's descent stage cruising toward the Martian surface under parachutes on Feb. 18, 2021. MRO was 435 miles (700 km) from Perseverance and traveling at about 6,750 mph (10,860 kph) when the photo was taken,



## ...Perseverance's Photos

HiRISE has imaged Perseverance repeatedly in the 12 months since touchdown. For instance, the camera captured the rover's parachute, heat shield and other EDL accouterments strewn across Jezero's floor on Feb. 19, 2021. And the camera has kept track of Perseverance's various roving around the crater as well.

It didn't take long for Perseverance to start taking stock of its surroundings. The rover beamed home two hazard-camera images shortly after touching down on Feb. 18, 2021. And on Feb. 22, the rover team released the mission's first Mars panorama, a mosaic constructed using images that Perseverance had taken two days earlier.



ABOVE: The first panorama image snapped by NASA's Perseverance rover. This image was made up of six images.

Ingenuity deployed on April 3, dropping from Perseverance's belly onto Jezero's floor. Three days later, the rover snapped a series of selfies that featured both robots. A stunning mosaic that shows Perseverance watching over its much smaller partner with a seemingly doting eye. A fair imagee was spent by Perseverance in its first few months on Mars supporting and documenting Ingenuity's pioneering sorties. The



rover captured a number of the little chopper in action, including this one, which was taken on Sept. 4, 2021, during Ingenuity's 13th Martian flight.



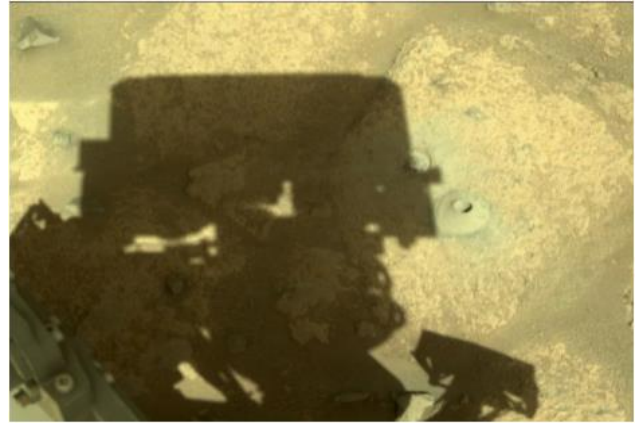
Ingenuity returned the photography favor during its third flight, capturing a shot of its ground-bound buddy from above on April 25. The photo notched another first for the Ingenuity mission; robots had snapped photos of each other on the Red Planet before, but never while one of them was soaring through the air. And this wasn't just a one-time thing; Ingenuity repeated the feat on Aug. 5, during its 11th flight.

Jezero is an interesting place, and many of Perseverance's photos showcase the crater's geological diversity. For example, imagery captured in late April features rocks that may be volcanic in origin — something of a surprise, given that the crater floor is an ancient lakebed and would therefore be expected to be dominated by sedimentary rocks.



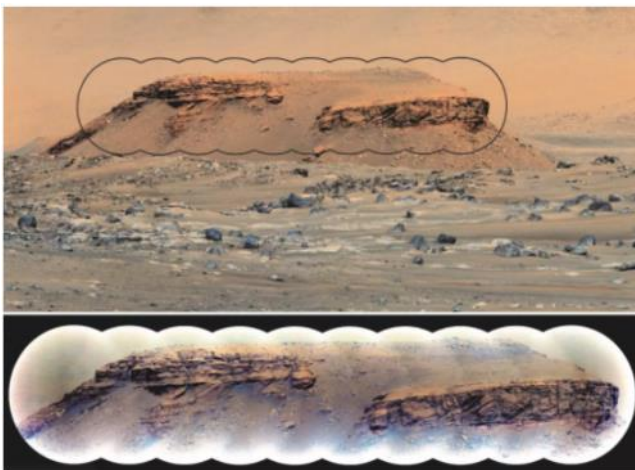
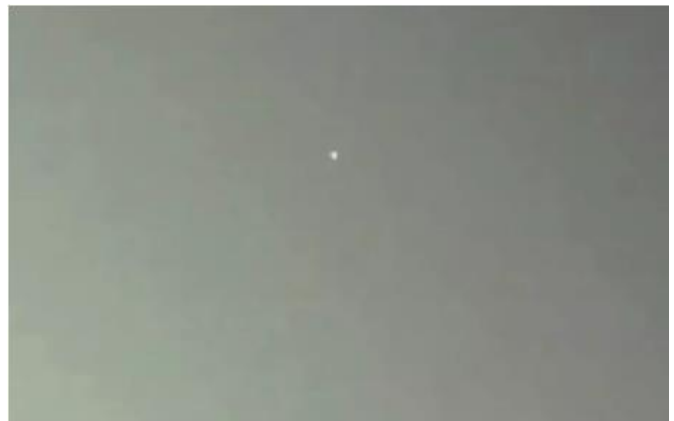
## ...Perseverance's Photos

Perseverance drilled its first sampling hole into a Martian rock in early August, a big milestone for the mission. Things didn't go according to plan, however; NASA announced on Aug. 6 that the rover didn't manage to collect any material during the sampling attempt. Mission team members soon determined that there was no problem with Perseverance's complex sampling gear; rather, this particular rock was just surprisingly crumbly, breaking into bits that didn't make it into the designated titanium tube.



The mission team didn't have to wait long for the first sampling success. That landmark moment came on Sept. 6, when Perseverance sealed up a tube containing a drilled-out core of a rock dubbed "Rochette." The Rochette sample, and the others that Perseverance has collected and will collect during its time on Mars, will be hauled to Earth by a multi-mission NASA-European Space Agency campaign. Those pristine samples could land here as early as 2031, if all goes according to plan.

Perseverance is focused on analyzing Martian rocks and dirt, but the robot also does some skywatching from time to time. On Aug. 20, for example, the mission team posted on Twitter a photo Perseverance had taken of Deimos, the smaller of Mars' two moons. Deimos is but a bright smudge in the image, but that's understandable; the little satellite is just 7.7 miles (12.4 km) wide.

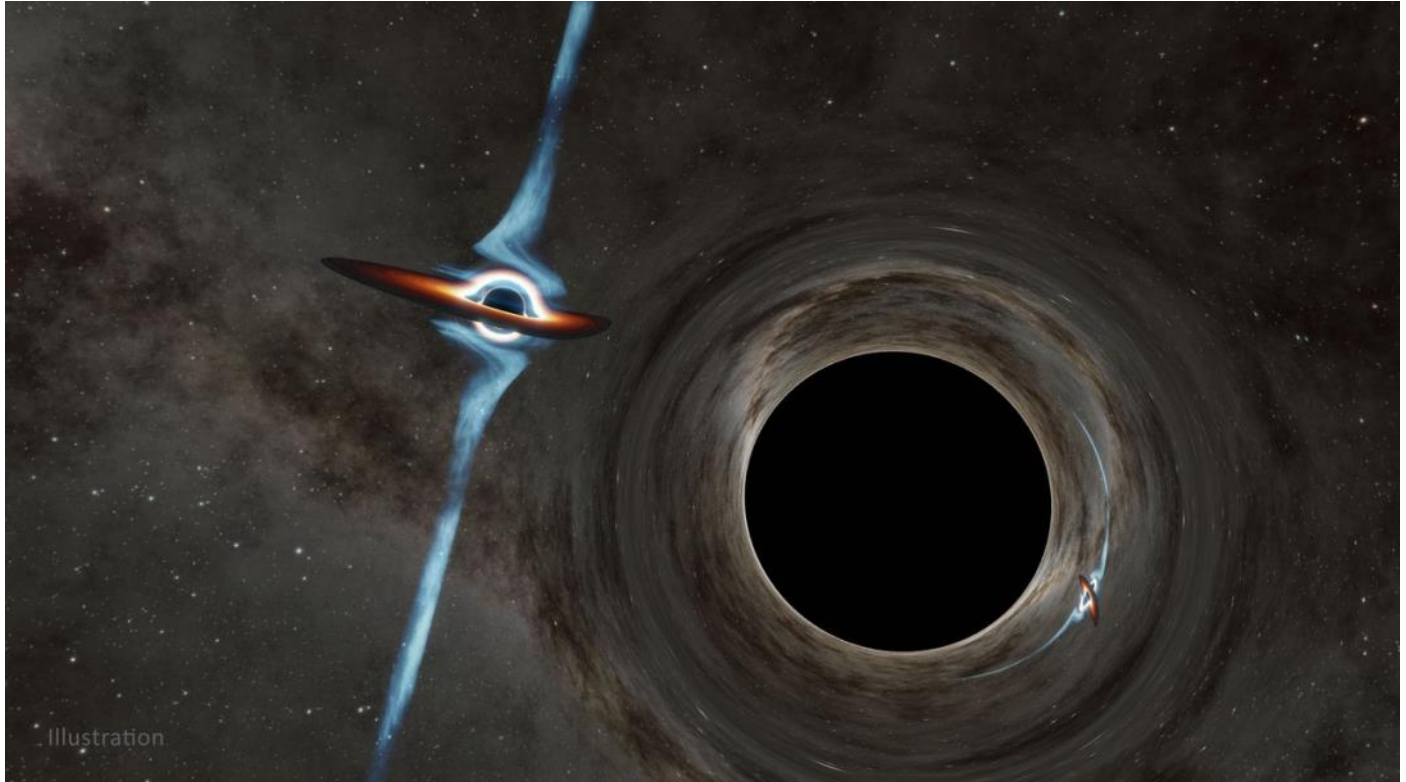


River deltas here on Earth are great at preserving carbon-containing organic molecules and signs of life itself, so Perseverance team members are eager to explore Jezero's ancient delta. Indeed, they've already started doing so from afar, analyzing a hill called Kodiak that's thought to be a delta remnant. The sharp Kodiak imagery, which Perseverance captured with its Mastcam-Z camera system from a distance of 1.39 miles (2.24 km), shows distinct layers of sediment that could only have been deposited by a river flowing into a lake, mission scientists say.

The Perseverance team plans to get an up-close look at the fossilized delta — perhaps at Kodiak, perhaps in a different patch of ground — in the not-too-distant future. Exciting discoveries could flow shortly thereafter, as Perseverance will be able to put its full suite of scientific instruments to work at close range. ✨

# Astronomers find Two Giant Black Holes Spiraling Towards a Collision

Astronomers find evidence for the tightest-knit supermassive black hole duo observed to date. The two colossal black holes orbiting each other that are set to collide in the future - an event so energetic it will shake the fabric of space and time.



ABOVE: In this illustration, light from a smaller black hole (left) curves around a larger black hole and forms an almost-mirror image on the other side. The gravity of a black hole can warp the fabric of space itself, such that light passing close to the black hole will follow a curved path around it. Credit: Caltech-IPAC

Locked in an epic cosmic waltz 9 billion light years away, two supermassive black holes appear to be orbiting around each other every two years. The two giant bodies each have masses that are hundreds of millions of times larger than that of our sun, and the objects are separated by a distance roughly 50 times that which separates our sun and Pluto. As the orbit shrinks, the pair gets closer to merging. When the pair merge in roughly 10,000 years, the titanic collision is expected to shake space and time itself, sending gravitational waves across the universe.

A Caltech-led team of astronomers has discovered evidence for this scenario taking place within a fiercely energetic object known as a quasar. Quasars are active cores of galaxies in which a supermassive black hole is siphoning material from a disk encircling it. In some quasars, the supermassive black hole creates a jet that shoots out at near the speed of light. The quasar observed in the new study, PKS 2131-021, belongs to a subclass of quasars called blazars in which the jet is pointing toward the Earth. Astronomers already knew quasars could possess two orbiting supermassive black holes, but finding direct evidence for this has proved difficult.

Reporting in *The Astrophysical Journal Letters*, the researchers argue that PKS 2131-021 is now the second known candidate for a pair of supermassive black holes caught in the act of merging. The first candidate pair, within a quasar called OJ 287, orbit each other at greater distances, circling every nine years versus the two years it takes for the PKS 2131-021 pair to complete an orbit. ✨

<https://www.caltech.edu/about/news/colossal-black-holes-locked-in-dance-at-heart-of-galaxy>

# James Webb Space Telescope - Images

The team behind NASA's [James Webb Space Telescope](#) released some of the first images on 11 February, from the much-anticipated observatory. The main photo, which doesn't even hint at the power Webb will bring to the universe once it's fully operational, shows a star called [HD 84406](#) and is only a portion of the mosaic taken over 25 hours beginning on Feb. 2, during the ongoing process to align the observatory's segmented mirror.



ABOVE: The first published image taken by the James Webb Space Telescope shows part of a mosaic created over 25 hours beginning on Feb. 2, 2022, (Image credit: NASA)

The starlight was seen through each of Webb's 18 mirror segments in its primary mirror, so the resulting image shows a mosaic of 18 scattered bright dots. This is an initial phase where each segment is acting as a separate telescope in combination with a shared secondary mirror.

Scientists were focusing on waking and calibrating the observatory's instruments and making the minute adjustments to the telescope's 18 golden mirror segments that are necessary for crisp, clear images of the deep universe.

To make this image happen, the team had to factor in how misaligned the mirror segments, which were slowly and carefully aligning, were at the time. Since not all the segments were facing the same direction, the 18 spots of light could potentially be very spread out in the sky.

And the photograph does indeed show multiple views of HD 84406, the star that JWST scientists announced they had chosen to look at first.



LEFT: An annotated view of the James Webb Space Telescope's first image marks which mirror segments captured which views of the star HD 84406. (Image credit: NASA)

The HD 84406, is a sun-like star and is about 260 light-years away, and is in the constellation Ursa

Major, or Big Bear, is not visible from Earth without a telescope. But was a perfect early target for the Webb Telescope because its brightness was steady and the observatory could always spot it, so launch or deployment delays wouldn't affect the plan; as it is easily identifiable and not crowded by other stars of similar brightness, which helps to reduce background confusion .

During the image capturing process that began Feb. 2, Webb was repointed to 156 different positions around the predicted location of the star and generated 1,560 images using NIRCam's 10 detectors, amounting to 54 gigabytes of raw data.

## ...JWST - Images

The entire process lasted nearly 25 hours, but notably the observatory was able to locate the target star in each of its mirror segments within the first six hours and 16 exposures. These images were then stitched together to produce a single, large mosaic that captures the signature of each primary mirror segment in one frame. The images shown here are only a center portion of that larger mosaic, a huge image with over 2 billion pixels.

The James Webb Space Telescope has reached another major milestone in its mirror alignment process as the team has successfully worked through the second and third phases of the process and completed Segment Alignment and Image stacking.

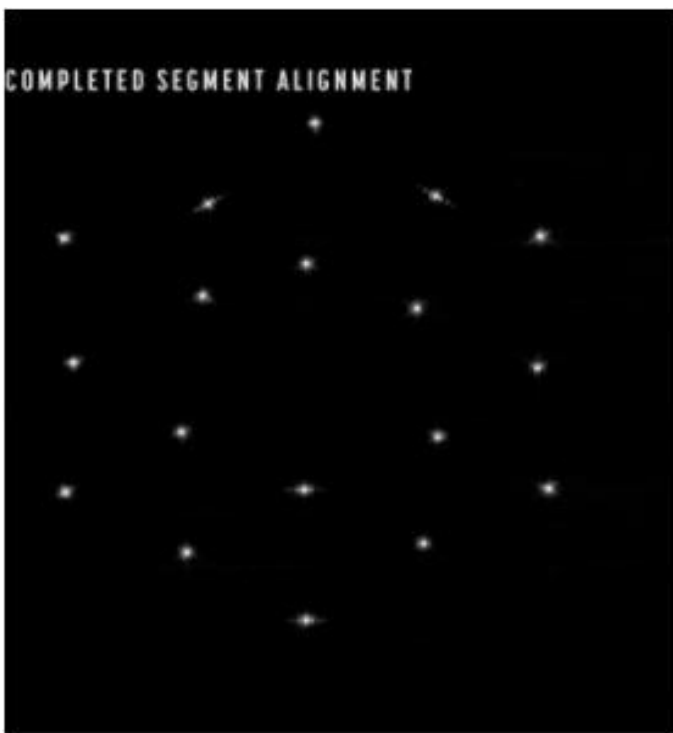


LEFT: Before images from Segment Alignment, when the team corrected large positioning errors of its primary mirror segments and updated the alignment of the secondary mirror.

BOTTOM LEFT: Shows the progress made during the Segment Alignment phase, further aligning Webb's 18 primary mirror segments and secondary mirror using precise movements.

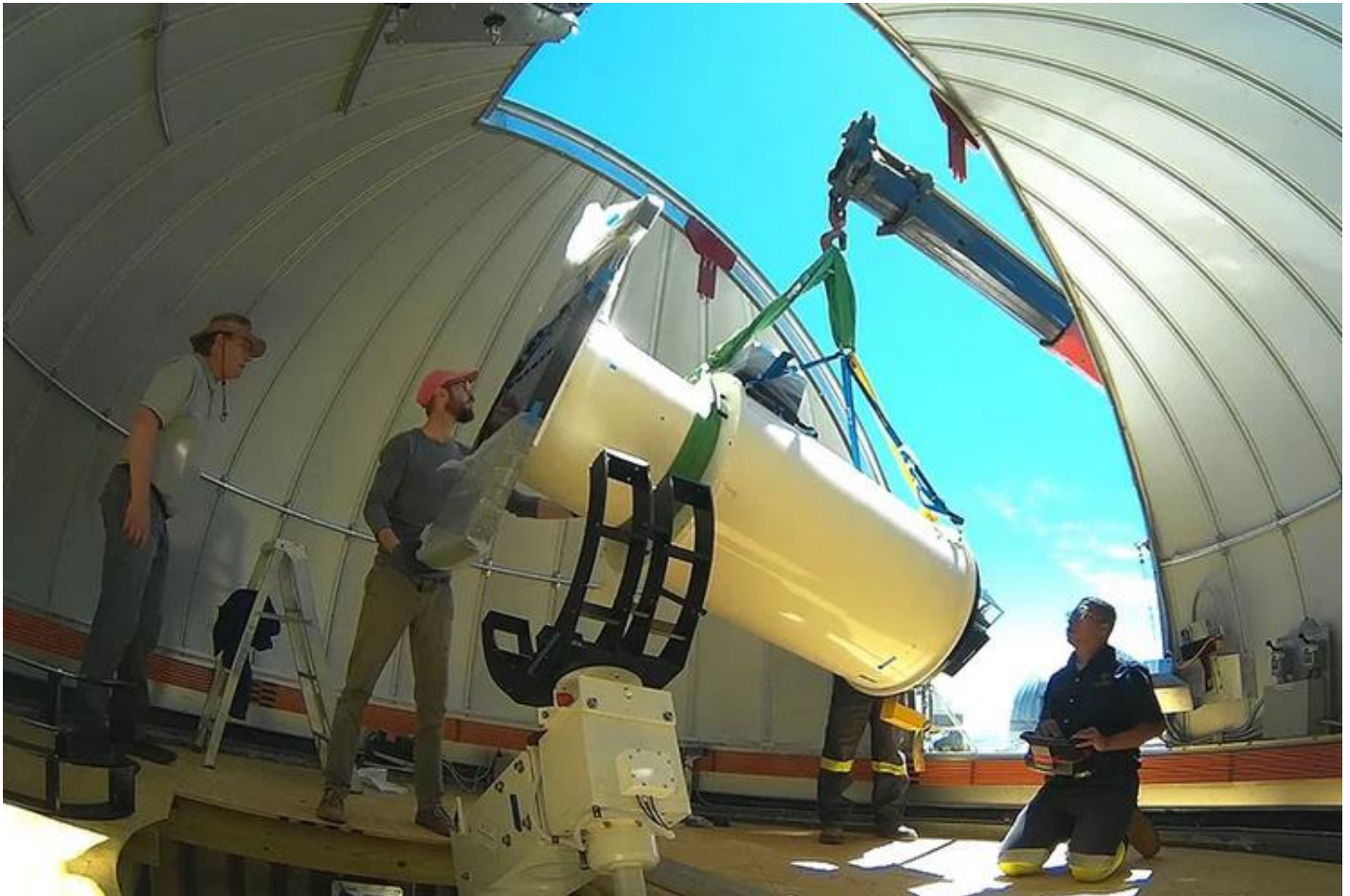
BOTTOM RIGHT: With the second and third stages of the Segment Alignment achieved, the focused dots reflected by each mirror segment were stacked on top of each other and combined on the same location on the Webb's NIRCams sensor. Six sets of mirrors were activated at a

time to repoint their light to overlap until all the starlight overlapped with each other. The result is the image below right, which shows significant progress from the state of the images coming out of Webb less than a month ago. Image Credits: NASA/STScI



# South Africa's Powerful New Telescope can Detect "City Killer" Asteroids

Hanno Labuschagne



The National Research Foundation's South African Astronomical Observatory (SAAO) in Sutherland in the Northern Cape **now hosts** one of four telescopes that form part of the Nasa-funded Atlas asteroid alert system.

Atlas, or Asteroid Terrestrial Impact Last Alert System, is specially designed to detect objects that approach very close to Earth — closer than the distance to the Moon, up to about 240,000 km away.

A \$5-million grant to the University of Hawaii from Nasa's Near-Earth Objects Observations programme, now called the Planetary Defense Coordination Office, kicked off the system's development back in 2013.

The first two telescopes on the islands of Haleakalā and Maunaloa, which are about 160km apart, became fully operational in 2017.

The South Africa-based telescope, Atlas 3, and another installation at El Sauce Observatory in Chile resulted from a further \$3.8 million in funding granted in August 2018.

"The two locations were selected for their access to the southern part of the sky as well as their time zones, which allow for night observation when it is daytime in Hawaii," the Department of Science and Innovation explained.

Combined, the four telescopes will now be able to scan the entire night sky around the clock for objects that could collide with the Earth.

## ...City Killer Asteroids

Atlas 3 was installed in November 2021 by an SAAO team that included Electronic Technician Willie Koorts. Koorts published a [detailed video of the process on YouTube](#).



The Atlas 3 telescope before installation

After arriving in two large crates, the mount and telescope had to be lifted into a dome at the Sutherland facility and fitted precisely.

He explained the system combined a relatively simple telescope with a powerful 110MP CCD camera capable of detecting a match flame in New York when viewed from San Francisco.

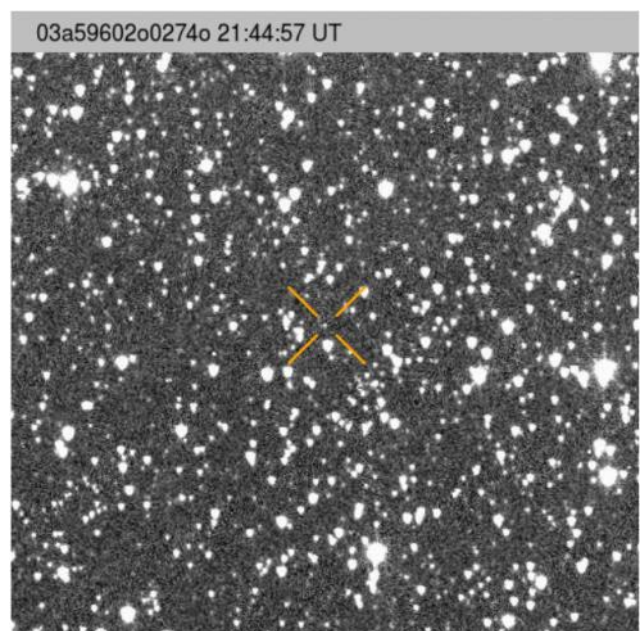
The telescope's field of view is also 15 times the diameter of the full Moon.

Koorts said the system could provide a one-day warning for a 30-kilotonne "town killer", a week's notice for a 5-megatonne "city killer", or three weeks' forewarning for a 100-megatonne "county or province killer".

Atlas can also search for dwarf planets, supernova explosions, and flashes of light when a star is consumed by a supermassive black hole in a distant galaxy.

As of November 2021, Atlas had discovered around 700 near-earth asteroids, 70 potentially hazardous asteroids, 65 comets, and nearly 10,000 supernovae.

Science and innovation minister Blade Nzimande said the South African installation had already discovered its first near-Earth object, as shown in the image on the right. 🌟



Credit: ATLAS

# INCREASING STUDENT INTEREST AND ENGAGEMENT IN SPACE EXPLORATION CONFERENCE 27-29 APRIL 2022

**Protea Hotel Midrand, Johannesburg South Africa In-Person and Virtual**

With a core goal to bridge the gap between space exploration and access to resources and technology of African students, FASESA is proud to present the inaugural **Increasing Student Interest and Engagement in Space Exploration Conference** scheduled for 27-29 April 2022 at Protea Hotel Midrand, Johannesburg South Africa.

**We are officially inviting you and your colleagues to attend this 3 day informative and networking Conference.**

## About The Conference

Space exploration is an emerging global megatrend, and recent developments in space travel may be setting the stage for a striking new era of Space Exploration. As evidenced by the recent leaps and strides in space exploration by the likes of Sir. Richard Branson, Elon Musk, and Jeff Bezos, space exploration is an expanding vocation that will provide vast socio-economic benefits to a nation.

The conference will bring together multiple African governments, space agencies, international corporate entities as well as policy makers and educators, the conference will focus on the current aerospace and space exploration landscape in Africa and the opportunities to bring them to every classroom in Africa.

FASESA understands that cultivating an interest in space exploration begins at a young age. Introducing the vocation to children, then guiding and equipping them with the resources and skills to explore the subject further, will greatly increase a nation's ability to produce thought leaders in the field, who will form the basis of future space programs

## Conference Aim

Our teachers and students need to know and understand what the Space Science Sector is and the career opportunities it offers. "Space" does not mean they have to be an Astronaut. The impressive development of Space Applications gives immense opportunities to those who study IT, Agronomy, Biology, Chemistry, Nutrition, Geography, Medicine, Law, Management, Communications, Electronics, Physics, and so on.





# ...SPACE EXPLORATION CONFERENCE

## Who should attend?

Teachers | Principals | students | career guidance counselors | Ministry of Education, Science & technology officials| Space Agency representatives |Aerospace professionals | Policymakers| Corporate stakeholders|

## Attendance Options

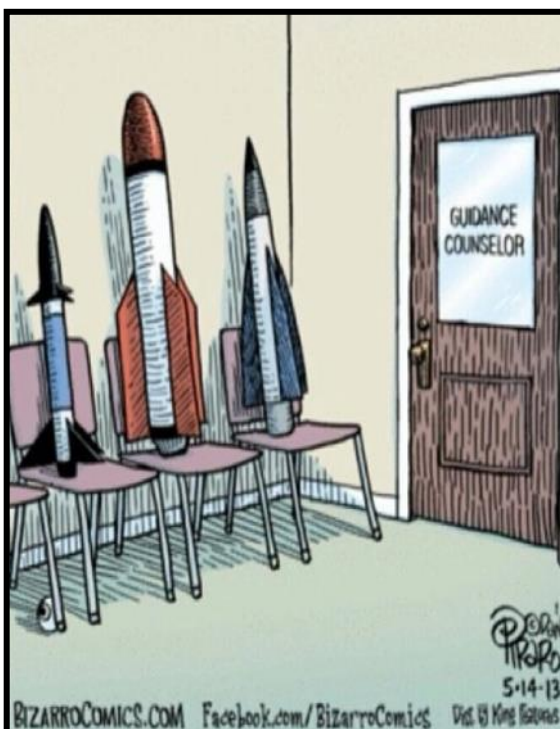
we will have In-Person and Virtual participation and presentation.

Due to COVID-19, we will be limiting the number of in-person attendees to ensure social distancing.

Virtual attendance, the conference will be conducted Online via zoom in the comfort of any location of your choice.

Should you wish to book at this prestigious event, contact us on the numbers below in case of any queries.

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# ASSA Durban Minutes of General Meeting

9 February 2022 - 19:30 via Zoom



## Attendees:

<b>Speaker:</b>	Paige Smith		
<b>Present</b>	ASSA – DBN members	ASSA – JHB members	
<b>Apologies:</b>			

## 1. Welcome (Johannesburg meeting)

- x The JHB Chairperson welcomed all attendees and visitors.

## 2. Guest Speaker

- x The guest speaker, Paige Smith, spoke about the history of South African astronomy, in specific, chapter 5 of her work is about the history of ASSA.
- x “The topic of my thesis is “Captured by Curiosity: the historical development of astronomy in South Africa, from the pre-colonial past to c.1970.” So, essentially, what I researched was the development of astronomy from a cultural and professional perspective, looking at specific case studies during this time period. And of course the Astronomical Society of Southern Africa played a big role in that process of development 🗎”

## 3. Durban Meeting

- x Durban members adjourned from JHB meeting at 20:20
- x Amith Rajpal welcomed the members into the Durban meeting at 20:30.

## 4. Present and Apologies

- x see above

## 5. Previous meeting minutes

- x Minutes proposed by Piet Strauss and seconded by Corinne Gill
- x There were no matters arising from previous minutes

## 6. Finance:

- x Corinne Gill presented finance report.

Financials Meeting	Month	Current	Investment	Petty Cash
General Meeting	2022-02-09	R 21 757,22	R 61 174,03	R 1 000,00

## ASSA DURBAN - MEMBERS

Date	No off	Paid Members	Honoury	Removed
2022-02-09	128	128	4	0

# ...Minutes of the Meeting

## 6.1 Sky Guides:

- x 44 sold, 7 still to be delivered, 6 remaining to be sold.
- x 20 oversupplied to be returned to Cape Town awaiting AJ Nel's feedback

## 7. Dark Sky Initiative

- x Amith discussed
- x Create an awareness of light pollution in built-up areas, and even in rural areas.
- x Future generations may be robbed of a night-sky
- x Piet will try to arrange a talk on this.
- x Mike Hadlow will share a copy of the ASSA Dark Sky presentation of a few years ago

## 8. Youth Project (Brainchild of Corinne Gill)

- x Amith outlined plans to form a group specifically to involve and educate our youth
- x Corinne says we should reach out to parents to motivate their children's involvement
- x Youth are welcome to pose questions or suggestions via WhatsApp
- x Fiona will share a write-up on her page

## 9. Events

### 9.1 Viewing evenings

- x 4<sup>th</sup> March next viewing evening

### 9.2 Sutherland Trip

- x Mango has a potential buyer but still no update on flights
- x Accommodation venues are being contacted to get updates on availability

## 10. General

- x School meetings can be considered again, depending on group sizes.
- x Moya will check up on rules at school
- x The next General Meeting will be held on **9th March 2022**
- x Times and venue details will be sent via email and WhatsApp

## 11. Meeting closed

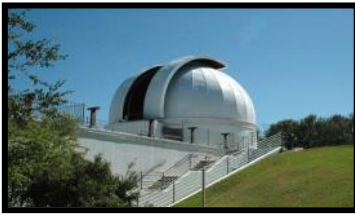
- x The Chairman closed the meeting at 20:56

## **DURBAN MEMBERS ZOOM MEETING @ 19:30**

Meeting ID: 88037701479

Passcode: 297674

Link: <https://us02web.zoom.us/j/88037701479?pwd=UU5xMUJFjbWlVWUitMWTd1Y1I2ZDNQdz09>



# Public Viewing Roster ASSA Durban



Dome Master	Phone	Assistant	Telescope Volunteer	New Moon	Public Viewing
Debbie Abel	083 326 4084	Alan Marnitz	Ooma Rambilass	2 March 2022	4 March 2022
Maryanne Jackson	082 882 7200	Brian Finch	Sheryl Venter	1 April 2022	1 April 2022
				30 April 2022	29 April 2022

## PUBLIC VIEWING RESUMED:

Public viewing is allowed back on site at the school in the dome and around the pool; due to revised lockdown level. This may change according to any revised lockdown conditions.

Please note there is a roster with a booking system. Once the number of telescopes are confirmed, Individuals will be contacted to confirm dates and times. Please book your place !

Kindly note, everyone will be required to adhere to the Covid & social distancing regulations of 1.5m and all will need to sign the attached mandatory questionnaire. Temperatures will also be taken on site.

## NOTIFY OBSERVATORY MANAGER:

Members interested in attending the above viewing evenings and/or becoming involved in assisting with the viewing evenings, please send your names to Mike Hadlow at the following address:  
[mike@astronomydurban.co.za](mailto:mike@astronomydurban.co.za)

Volunteers to please identify which role you are willing to assist with, Dome Master, Viewing Assistant or a Telescope Volunteer.

After which, attendance will be confirmed and viewing dates will be announced.

## VOLUNTEERS REQUIRED:

**Dome Master** - Taking responsibility for the viewing evenings and learning how to set up, manage and use the new telescope.

**Viewing Assistant** - Learning about the new telescope, assisting with the viewing evenings, assisting viewing members as required.

**Telescope Volunteers** - Members willing to bring their telescopes to the viewing evenings to set up around the pool for public viewing.

Viewing Contacts:	Phone	Email
Mike Hadlow	083 326 4085	<a href="mailto:mike@astronomydurban.co.za">mike@astronomydurban.co.za</a>
Alan Marnitz		<a href="mailto:alan@astronomydurban.co.za">alan@astronomydurban.co.za</a>
John Gill	083 3788 797	<a href="mailto:john@astronomydurban.co.za">john@astronomydurban.co.za</a>

# Notice Board

## MEETINGS:

- **GENERAL MEETING:** to be held on **9th March 2022**
- **PUBLIC VIEWING MEETINGS** - please refer to website under the tab "Viewing and Events" for any updates with regards dates & public viewing under the current Covid restrictions; or click here: <https://astronomydurban.co.za/events-viewing/>

## 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. Check it out.
- Available from the ASSA website [assa.sao.ac.za/about/publications/nightfall/](http://assa.sao.ac.za/about/publications/nightfall/)

## MEMBERSHIP FEES & BANKING:

- Many thanks to all the members who have paid their Membership fees for the 2021-07-01 to 2022-06-30 financial year.

Membership fees are indicated below:

- Single Members: **R 170:00**
- Family Membership: **R 200:00** for parents
- Under 18 members: **Free**
- Cash/Cheques: **Please note: NO cheques or cash will be accepted**
- 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 2022 and ASSA MASKS - Limited number available !!!

- SKY GUIDES **SOLD OUT**
- MASKS: **R 50:00** each with payment reference: MK - SURNAME and FIRST NAME

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



## RESIGNATIONS from ASSA:

Please send an email immediately notifying the Secretary of your wish to resign from the society to : [secretary@astronomydurban.co.za](mailto:secretary@astronomydurban.co.za)

## NEW COMMITTEE POSITIONS & CONTACTS:

• Chairman	Amith Rajpal	Amith@astronomydurban.co.za	
• Vice Chair	Debbie Abel	Debbie@astronomydurban.co.za	
• Secretary	Francois Zinserling	Secretary@astronomydurban.co.za	
• Treasurer	Corinne Gill	Treasurer@astronomydurban.co.za	
• Guest Speaker Liaison	Piet Strauss	Piet@astronomydurban.co.za	
• Observatory & Equipment	Mike Hadlow	Mike@astronomydurban.co.za	083 326 4085
• Observatory Assistant	Alan Marnitz	Alan@astronomydurban.co.za	
• Publicity & Librarian	Claire Odhav	Claire@astronomydurban.co.za	083 395 5160
• Out-Reach - Public	Sheryl Venter	Sheryl@astronomydurban.co.za	082 202 2874
• Out-Reach - Schools	Sihle Kunene	Sihle@astronomydurban.co.za	
• St. Henry's Marist College Liaison	Moya O'Donoghue	Moya@astronomydurban.co.za	
• 'nDaba Editor, Website & Facebook	John Gill	John@astronomydurban.co.za	083 378 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>

# For Sale - Telescope Stuff

## Celestron CGEM Computerised Equatorial Go-To Mount



Mount, tripod and counterweight.  
Includes an extra upgraded USB port Nexstar Hand Controller.  
All original boxes

Price: R 20 000

Contact: **Gerald de Beer**

Cell: **082 781 3888**

[gerald@edpharm.co.za](mailto:gerald@edpharm.co.za)

## Astrophotography Filters



Baader 1.25 inch / 32 mm filters

Luminance (clear), Red, Green, Blue, and a UV/IR – Cut/L filters.

Narrowband Ha 7nm, Oiii 8.5nm and Sii 8.0nm.

Still in the original packaging. Have never been opened.

Originally Paid: R 12 000

Asking Price: **R 10 000**

CONTACT: **Johnny Visser**

Cell Number: **082 357 3091**

## 3 x Explore Scientific Eyepieces

All in Immaculate (as new) condition, hardly used and in original packaging. All either nitrogen or argon filled. Quality engineering at its best.



82 Degree Series, 18mm focal length, 2" barrel

92 Degree Series, 12mm focal length, 2" barrel

82 Degree Series, 11mm focal length, 1.25" barrel

barrel

Purchased from B&H Photo for \$ 800, \$ 320 & \$ 230

All three for sale for combined price of **R 14 000**

Jason de Beer – 083 257 1786

[Jason.deBeer@cennergi.com](mailto:Jason.deBeer@cennergi.com)

