



ASTRONOMICAL SOCIETY OF SOUTHERN AFRICA

Durban 'nDaba



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Chairman's Chatter

May 2022

Dear ASSA Members,

I would like to begin by thanking all that were involved in the Monteseel Conservancy Stargazing evening. This would not have been the success it was without everyone coming together.

We have had amazing feedback from people that had come out on the night to view through our telescopes and listen to the presentation and navigating the sky with Ooma and her laser pointer. This truly was an amazing experience for everyone, and I hope that you are able to join us on the next one which I hope to be a little more prepared for on my part.

If you have not had a chance to view the alignment in the early hours of the morning, there is still hope. You can view this as late as 6am on the eastern horizon. Toward the end of May, the moon would join in but Saturn will be much higher in the sky at that point. There is an article on planetary parades featured on page 21

It is with great sadness that I inform you of the passing of one of our members Don Orsmond. He and I had many telephonic discussions shortly before his passing on the making and improvement of dew heaters for our telescopes. He had sent me an email with a spreadsheet that he had created using precise calculations to build your own (as opposed to my guesswork heated dew shield). If anyone would like to attempt to build their own, I can email the spreadsheet to you. I am sure he would be happy knowing that this has helped all of people. There is a little write up on Don Orsmond on page 20, from information received from his wife Ritva after chatting with one of our members Corinne Gill.

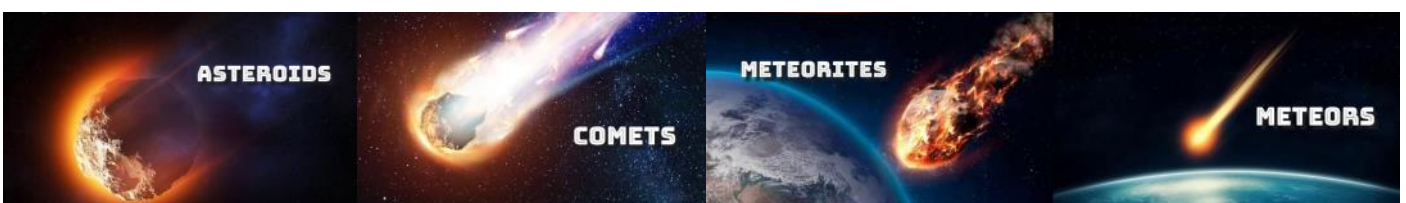
We have our AGM coming around shortly, on Wednesday 13th July. As previously noted, there are a few important portfolios to be filled,:

- Treasurer
- Outreach - Public
- Outreach - Schools
- Vice Chair
- Observatory Assistant

Please put in your nominations to volunteer for the ASSA Durban Committee; or if there is someone you know who would like to be nominated. Please do not hesitate in contacting me.

In light of the above, I would like to welcome Fiona Khan, who was nominated for the position of 'nDaba Editor for the 2022-23 committee, which nomination she has accepted. A woman of many talents, one of which one is writing; who has many great contacts that can provide some interesting articles.

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



Astronomy Delights: Beautiful Carina

By Magda Streicher

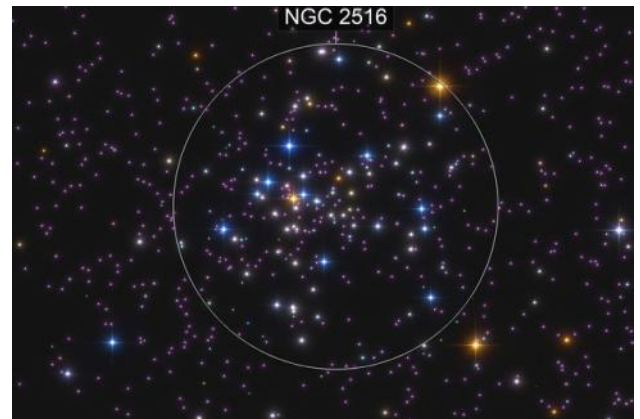
When the constellation of Carina makes her Appearance in the south-east and at the foot of the constellations Vela and Puppis, she brings with her a sense of deep enchantment. Make use of this opportunity to explore this rich part of the Milky Way – it promises to be a wonderful experience



Starting off in the western part of the constellation, the first object to explore is a beautiful planetary nebula. **IC 2220** is situated 3 degrees west of the star epsilon Carinae. The planetary nebula displays a soft, floating haze around the magnitude 12 centre star about 1000 light-years from us. The nebulosity appears slightly brighter towards the western side. IC 2220 was named the Toby Jug Nebula by Paul Murdin, David Allen and David Malin in the Catalogue of the Universe published in 1979.

LEFT: IC 2220 Toby Jug Nebula - Image: ESO

Barely 1.6 degrees south of IC 2220 is one of Carina's most memorable clusters. **NGC 2516** indicates a beautiful, large, widely spaced, slightly extended northwest to south-east grouping, and a good example of closely associated stars. Bright, individual stars stand out in the busier southern area of the cluster. The entire cluster is richly sprinkled with a variety of different coloured and numerous pairs of stars. A lovely orange coloured magnitude 6.6 star is positioned near the southern extreme with a prominent chain of faint stars extending further southwards. It is an easy naked eye object, indicated as a misty spot to observe in ideal dark skies.



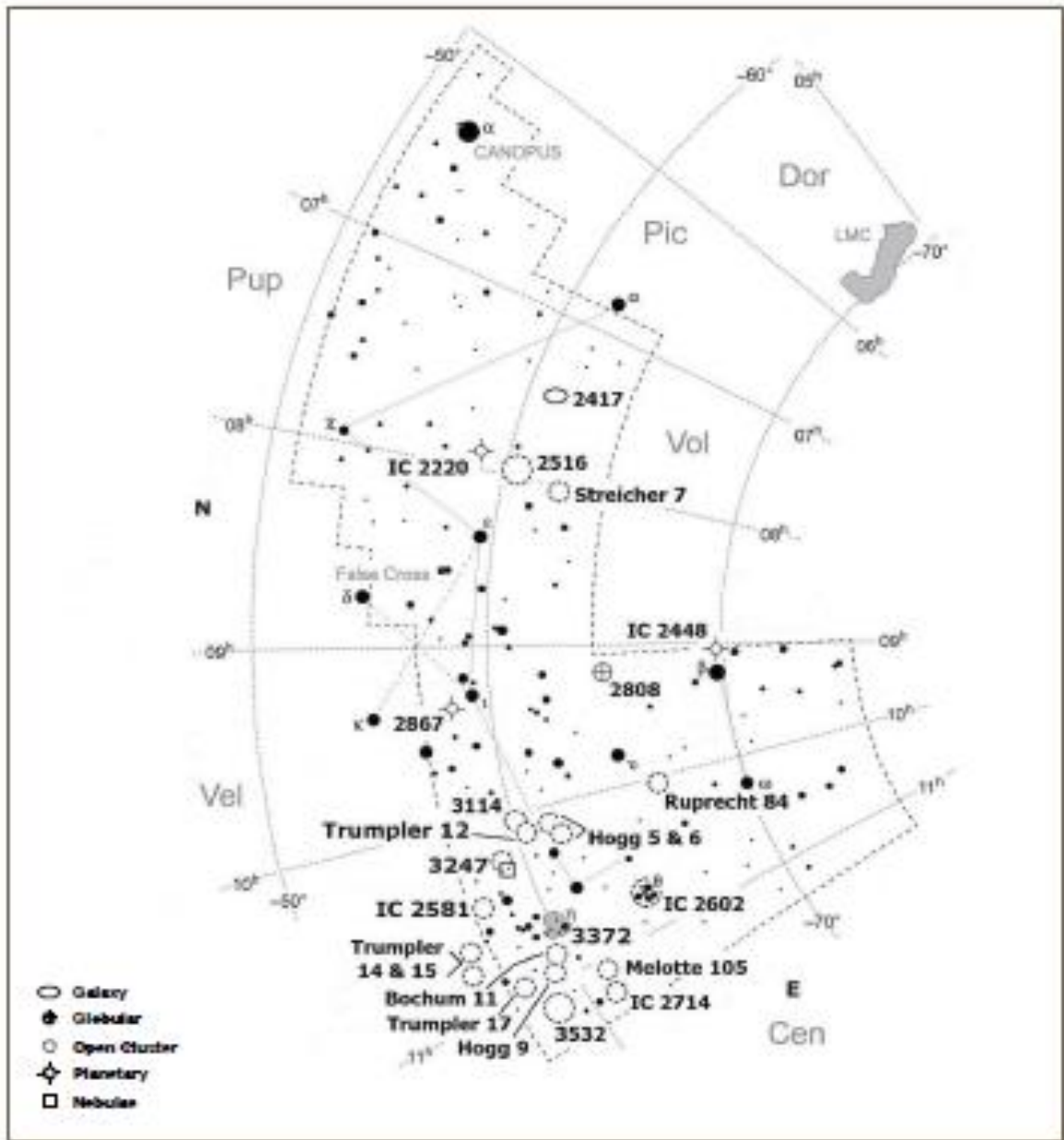
ABOVE: NGC 2516 - Image: Astrobin



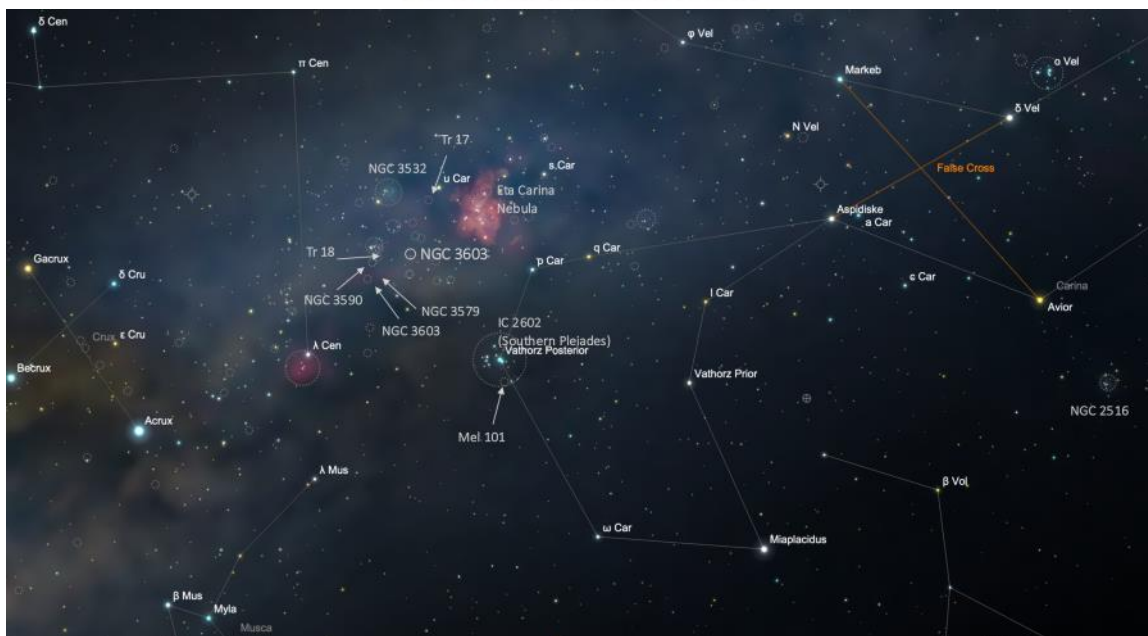
The galaxy **NGC 2417** is situated 3.6 degrees south-west of NGC 2516. This star city displays only a very soft, almost round glow that becomes gradually brighter towards the middle. Using averted vision and high magnification through a telescope, it becomes slightly more defined towards the northern edge.

LEFT: NGC 2417 Galaxy - Image: In-The-Sky

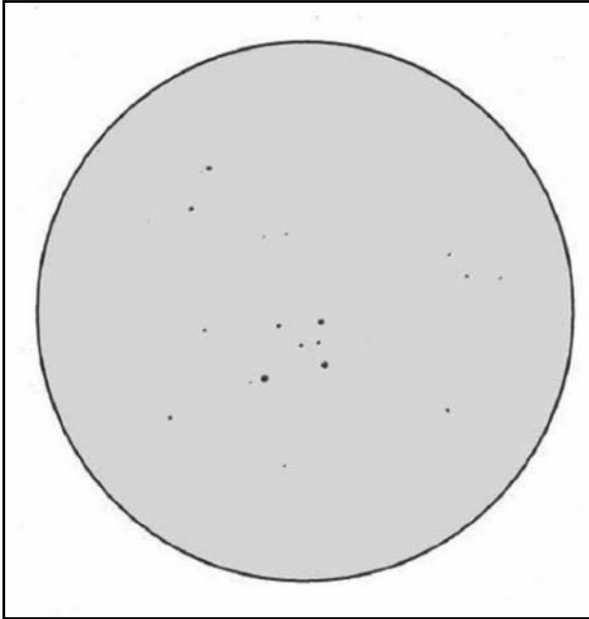
...Carina



The constellation of Carina



...Carina



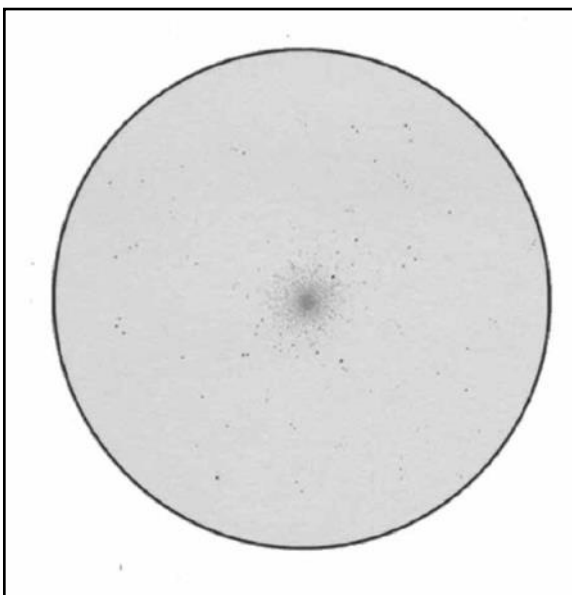
Situated barely 1.6 degrees south of NGC 2516 is asterism **STREICHER 7**. It is a group of stars that represents a small constellation Crux impression, with the long axis pointing towards the south-east. I am dedicating this asterism to a very special person, Carla (le Roux) Graham. She lost her battle with acute myeloid leukaemia in 2010, and my sincere wish is that the stars in this cross may shine brightly in thought of her memory and the legacy she left behind.

LEFT: STREICHER 7 - Asterism



The planetary nebula **IC 2448** is situated only 35' to the west of the star beta Carinae, virtually on the border with Volans. This almost round nebula has an icy-blue colour, and brightens considerably towards the center, standing out beautifully against the starry background. The star field toward the north of the planetary nebula contains a nice half circle of stars.

Left: IC 2448 - Image: Wikipedia

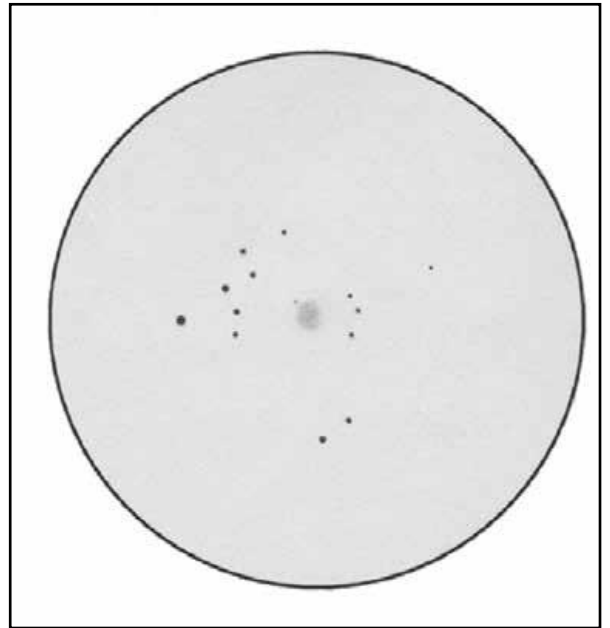


Globular cluster **NGC 2808** is situated relatively in the middle of the constellation Carina and is a must observe for amateurs. Also known as Bennett 41, it is remarkably large and round in shape with a steady brightening towards a dense pin-point core. This uniformly mottled snowball reveals bright individual stars radiating slightly away outwards. Higher magnification through a telescope reveals the nucleus submerged in a bath of faint stars, with an outer ring that appears misty and rough. In the outer region, prominent chains of stars are noticeable, with vacant gaps of starless patches. Brighter stragglers populate the southern side of the star field. The object is easily visible through binoculars.

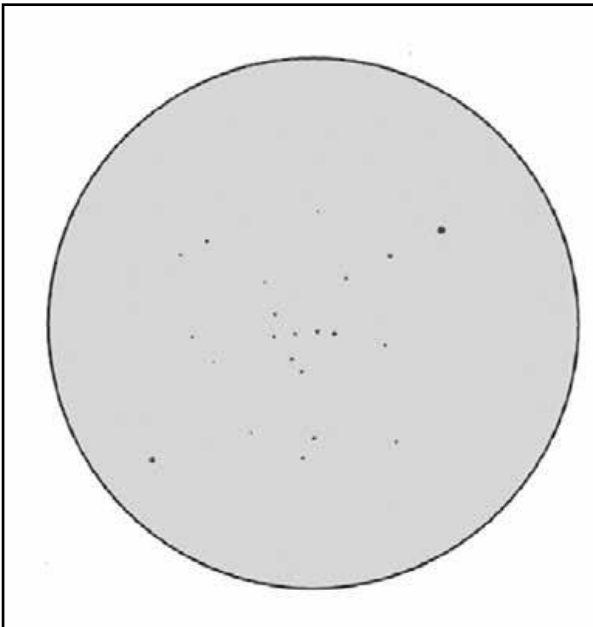
ABOVE: NGC 2808—Globular Cluster

...Carina

A degree north from iota Carinae is the planetary nebula **NGC 2867**, showing a sort of round face with a woollen appearance on its outer edge and a frosted blue colour. To my surprise the extremely faint magnitude 13.7 star on the planetary north-eastern edge is easily visible. The planetary nebula stands out beautifully against the background star field.



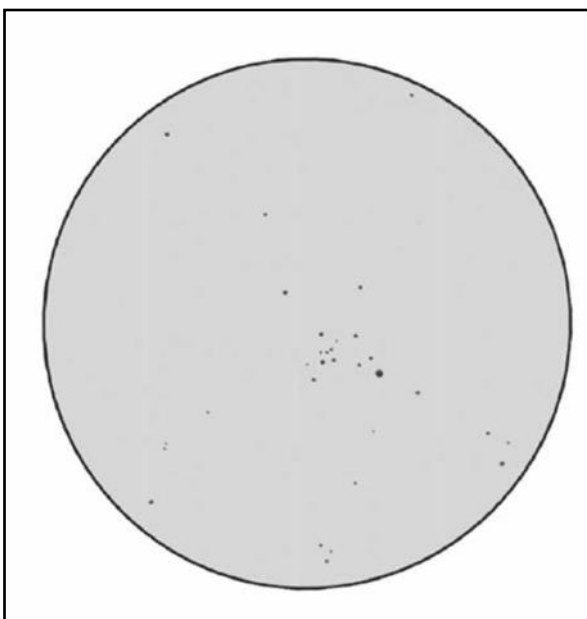
ABOVE: NGC 2867 – Planetary Nebula



RUPRECHT 84 displays a very small stringy grouping situated only 15' south-east of upsilon Carinae in a bare star field.

LEFT: RUPRECHT 84 – Open Cluster

Towards the end of 1963, the Czech astronomer Jaroslav Ruprecht travelled up the slope of Mount Aragats, an extinct volcano in northern Armenia. Ruprecht was carrying out a mission for the International Astronomical Union (IAU) on his way to the Byurakan Astrophysical Observatory, the Soviet Union's greatest observatory. There he studied the detailed list of young hot stars and open clusters compiled more than a decade before at the observatory. Ruprecht was the ideal person to gather the information because he was a leading expert and one of the main compilers of the 1958 Catalogue of Star Clusters and Associations.



TRUMPLER 12 is an attractive open cluster with its 12 splinters of starlight. The stars form a small compact grouping with a magnitude 8 star on its western edge.

HOGG 5 and **HOGG 6**, which may be part of Trumpler 12, can be seen 5' and 10' to the south respectively. Hogg 5 is visible as three prominent stars in the company of a few faint members. Hogg 6 is situated in-between a visible wide double star as a very small grouping.

LEFT: TRUMPLER 12 – Open Cluster

...Carina

HOGG 5 and **HOGG 6**, which may be part of Trumpler 12, can be seen 5' and 10' to the south respectively. Hogg 5 is visible as three prominent stars in the company of a few faint members. Hogg 6 is situated in-between a visible wide double star as a very small grouping.



ABOVE: NGC 3114 – Image: Dale Liebenberg

NGC 3114 was one of the first memorable objects I studied in this fairy tale constellation. To find the cluster is easy enough. Start with the two most eastern stars of the False Cross, magnitude 2.2 iota Carinae and magnitude 2.4 kappa Velorum. From iota Carinae it is situated almost 6 degrees east, halfway to the Carina Nebula (eta Carinae). NGC 3114 is a large, bright cluster, its stars haphazardly dispersed, with a range of magnitudes. The group is believed to be an amazingly ancient 110 million years old. Under ideal dark skies it can be glimpsed with the naked eye.



ABOVE: NGC 3247 – Image: In-The-Sky

The misty open star cluster **NGC 3247** situated further north is known by many other names, like Cr 220, We 2, vdBHa 95 and ESO 127-SC18. What makes the cluster exceptional is the nebulosity permeating and enveloping it. NGC 3247 is not exceptionally bright, but it evokes a feeling of mystery because of its many facets. John Herschel indicated that the cluster displays a knot of around 25 shiny pin-point stars with a nebulous patch to the southeast, and he referred to the cluster as NGC 3247. When Per Collinder (1890-1974), the Swedish astronomer found an object 20' south-east of the indicated NGC 3247 position, he thought he had discovered a new object, which he named Cr 220. Obviously, Herschel had indicated the wrong position for the cluster, but there is no doubt

that he was referring to the correct object. Catalogues now refer to the indicated correct name of the cluster as NGC 3247 along with others. Brian Skiff an astronomer at Lowell Observatory first noted the confusion regarding this cluster. The group of stars are arranged in a slightly elongated north-west to south-east direction. The nebula appears as a kidney shape folding its flimsy arms around the tight cluster. The soft, uneven cloud is situated towards the south-east of the group, much larger, fading out into the star field.

...Carina

Slightly north of the Carina Nebula an exquisite bundle of stars takes up prime residence. The stars in **IC 2581** spiral out in streams from the prominent magnitude 4.6 star, with the bulk of the members situated towards the north.



ABOVE: IC 2581

Make sure to stop at the magnitude 3 upsilon Carinae, which is a lovely double star. The magnitude 3.1 primary is a yellow sun, in comparison with its fainter magnitude 6.1 companion, which displays a yellow-white hue. The two components, with a separation of 5", are currently in a position angle (PA) of 127°.

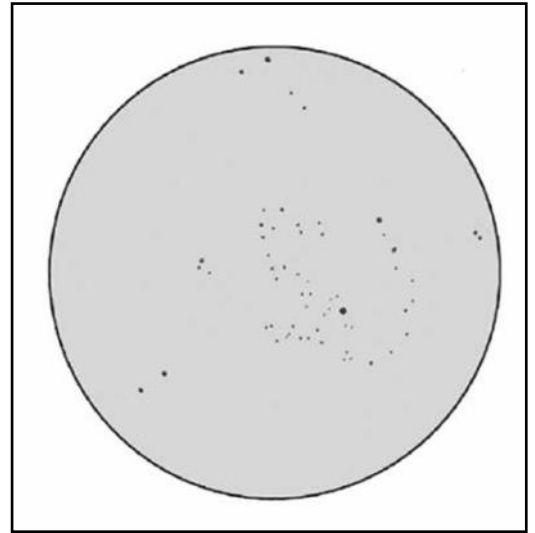
I just love the cluster **TRUMPLER 14** embedded like an embryo in the northwest flimsy arms of the Carina Nebula. Its faint stars appear in curly strings intertwined with one another. The northern part seems to be brighter with a half-moon shape protecting the faint inner group of stars which extends into the southern part of the cluster. Towards the eastern end of the group a double star stakes a prominent place giving this dainty little cluster an elongated east-west impression.



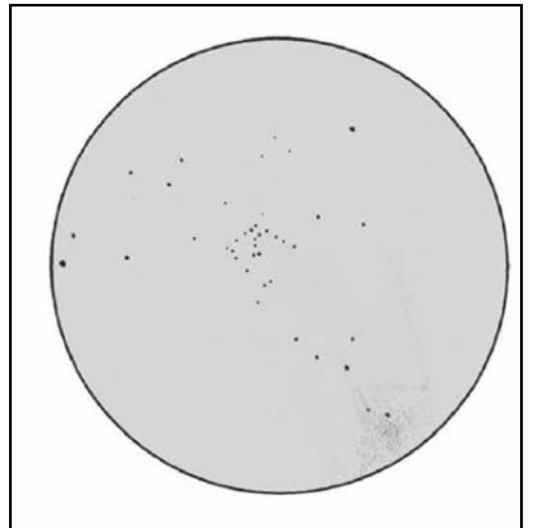
ABOVE: TRUMPLER 14: Image - Hubble

In the northern outskirts of the Carina Nebula, **TRUMPLER 15** displays a stringy group with stars in close formation.

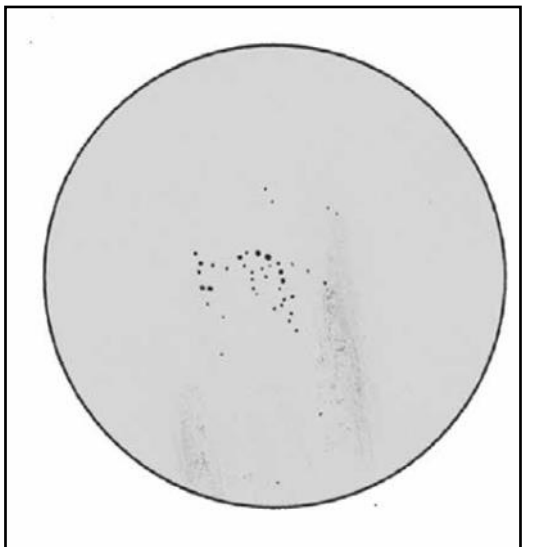
Faint nebulosity can be seen towards the southern field of view. This group is believed to be about 6000 years old.



ABOVE: IC 2581 – Open Cluster

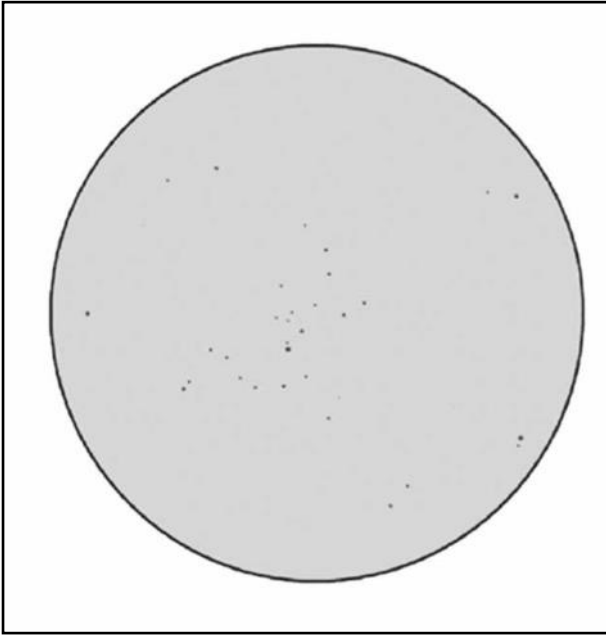


ABOVE: TRUMPLER 14 – Open Cluster



ABOVE: TRUMPLER 15– Open Cluster

...Carina

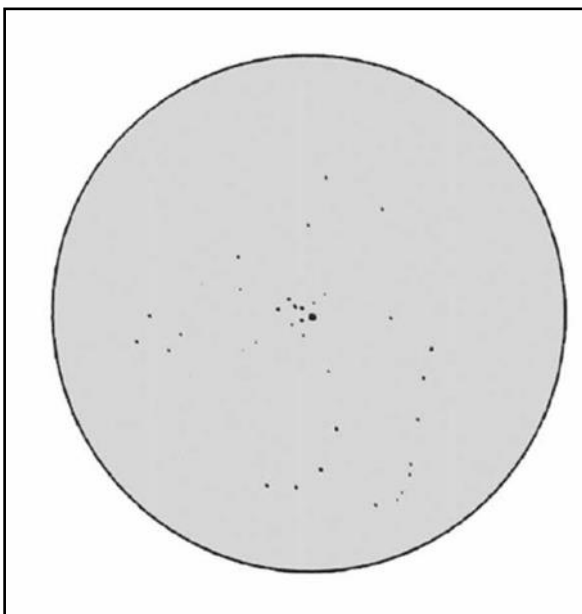
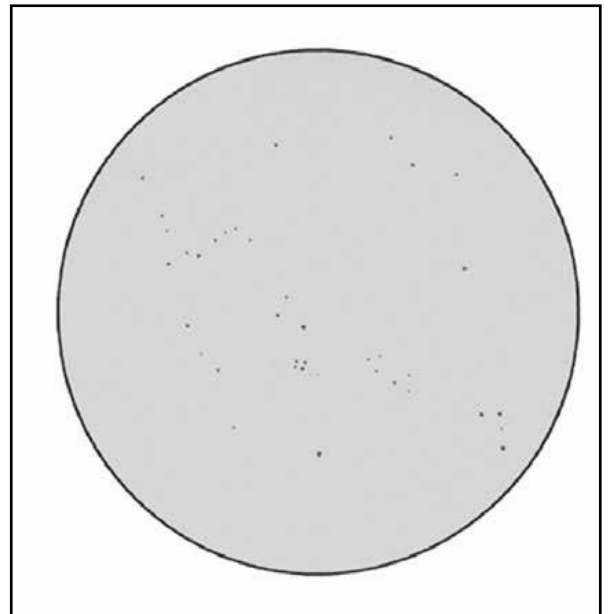


TRUMPLER 17 (TR17) is situated barely a degree east of the Carina Nebula. It is an exquisite grouping of approximately 25 stars that circle out to the south-east from a pair of stars. The bulk of the stars appear in an M-or-W shape.

Closer to the Carina Nebula **HOGG 9** is exceptional in composition, representing a tight square compiled by four faint stars with outstanding beauty that stands out well against the busy star field. The grouping was discovered by Australian born Arthur Robert Hogg.

BELOW: HOGG 9

ABOVE:& BELOW: TRUMPLER 17



Another lovely group, **BOCHUM 11** is situated in the south-eastern membranes of the Carina Nebula, displaying only a few faint stars. It proves to be a delight to the keen eye. Anthony Moffat and Nikolaus Vogt compiled a list in 1970 labelled Bochum Clusters, after the Bochum Ruhr University in Germany.

The constellation Carina is a veritable playground of open star clusters, and it is easy just to lose yourself in the variety on offer in this opulent part of the Milky Way.

LEFT BOCHUM 11 – Open Cluster

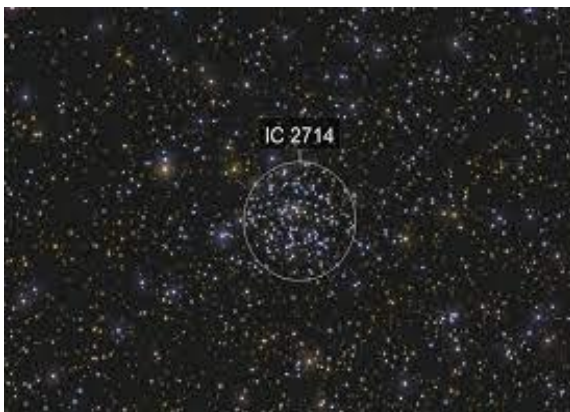
...Carina

NGC 3532 was discovered by Nicolas Louis de Lacaille while he was visiting the Cape of Good Hope. He noted quite a number of faint stars in the cluster; while John Herschel indicated it as a brilliant object. This beautiful star cluster is something really special and boasts a location as a near neighbour to the mighty Carina Nebula around 3 degrees north-east and also situated in the same wide binocular field of view. NGC 3532 is an obvious hazy spot to the naked eye, only 1200 lightyears distant. The cluster is very rich in starlight, and hosts more than 600 true members.

NGC 3532 is obviously elongated in an east-west direction and spans nearly a degree in size. The middle part of the cluster displays a slightly denser area. It's large displays of star strings appear almost like a spiral with open patches in between. This grouping, nicknamed the Arrowhead Cluster, is in one word simply just beautiful.



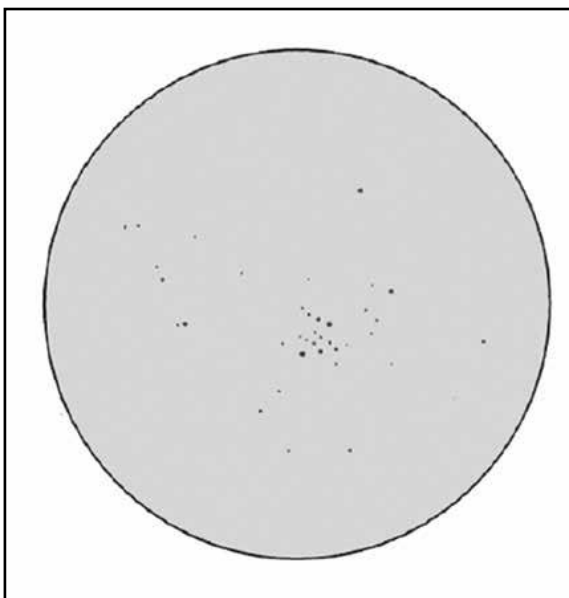
ABOVE: NGC 3532 – Open Cluster
Image: Dale Liebenberg



IC 2714 is a special cluster, and is situated in the far north-east of the constellation. In his charming Dutch-Afrikaans the late Albert Jansen introduced me to this pile of stars. The cluster reminded me of a street-light on a wet, misty evening. The group appears quite roundish in shape with a scattering of faint stars. This was James Dunlop's first discovery in 1826.

LEFT: IC 2714 - Image: Rayastrobin.com

The cluster **MELOTTE 105** is situated just 50' north-west from IC 2714. The brighter stars in this cluster, shaped in a sort of a fancy letter M on a bed of fainter stars could well be indicative of Mr. Melotte who discovered this group. British astronomer Philibert Jacques Melotte (1880–1961) also discovered Jupiter's moon Pasiphaë, 676 Melitta, and the famous cluster Mel 111 in the constellation Coma Berenices. Melotte was awarded the Jackson-Gwilt Medal of the Royal Astronomical Society in 1909.



BELOW: MELOTTE 105 - Image: Astroturf.com



The exceptionally rich great Carina Nebula, also known as **NGC 3372** is a famous landmark of the southern skies and is a treasure trove for the naked eye. Sir John Herschel sketched the eta Carinae Nebula around 1834. He drew the dark inner portion of the nebula, known as the Keyhole, much more definitely than it appears today; an indication that this part of the nebula has changed. The star eta Carinae on the eastern rim of the Keyhole nebula shows two soft lobes embedded in haziness. The little nebula around the star eta Carinae is called the Homunculus, meaning “manikin”, and is expanding at 5000 kilometers per second away from the star. Since 2001 studying it through my telescope, I have been noting the two soft lobes around the star with the south-eastern lobe slightly larger and brighter. Follow-up observations indicate two prominent dark markings imbedded, one a tad bigger than the other. A surprise was the two small dents, or notches in the larger lobe’s north-east peripheral rim. Ideal dark skies and high magnification show a faintly visible flare between the two lobes. Observers with larger telescopes capable of high magnification should explore this star and its nebula, which pumps out as much energy in six seconds as our sun does in an entire year.



ABOVE; NGC 3372 – eta Carinae Nebula

...Carina



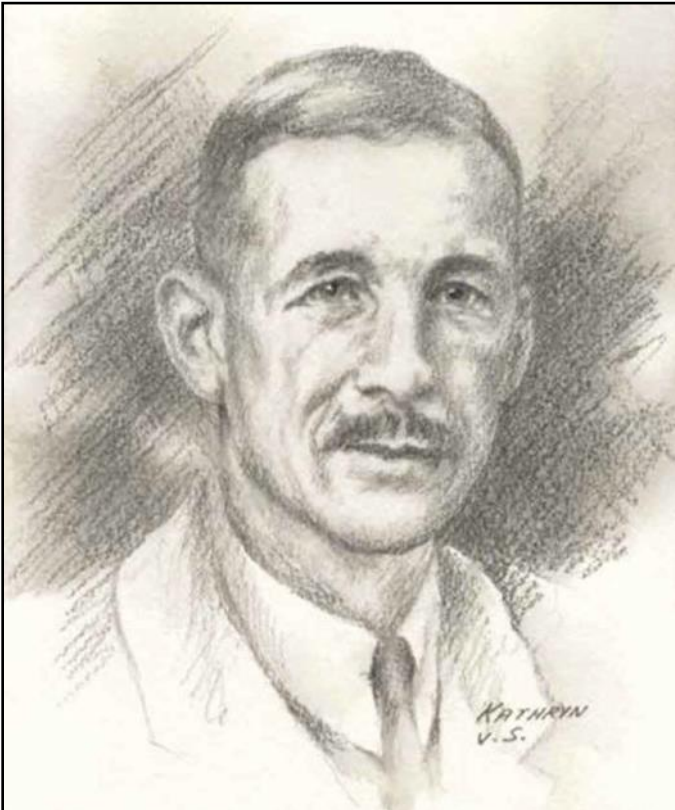
ABOVE: NGC 3372 – eta Carinae Nebula - Image: Doug Shape



Above: IC 2602 – Image: phys.ttu.edu

IC 2602 is arranged around the star theta Carinae, situated in the eastern part of the constellation and also known as the Southern Pleiades. This open cluster is a whopping 100' wide with a total visual magnitude of 1.9. The deep blue colour of the star theta Carinae near the center calls to mind the similarly placed star Alcyone in the well-known bright naked eye group of stars called the Pleiades in the northern constellation Taurus.

...Carina



Robert Julius Trumpler (1886–1956) was a Swiss-American astronomer who discovered that the brightness of individual distant open clusters was lower than expected. He studied and catalogued the dimensions of open clusters in order to determine the size of the Milky Way. He also showed the existence of interstellar dust.

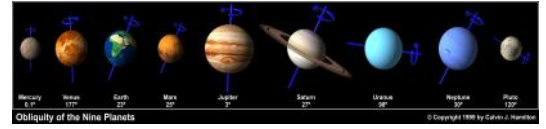
Robert Julius Trumpler
Pencil Sketch: Kathryn van Schalkwyk,
Original photograph: Astronomical Society of the Pacific

To be a star lover is a given; to explore the beautiful Carina constellation is a huge privilege; and in the Southern Hemisphere's dark of night Ee all shine to our full extent.

OBJECT	TYPE	RA	DEC	MAG	SIZE
NGC 2417	Galaxy	07h30m.1	-62°15'.2	12.4	2.6'x2'
STREICHER 7 DSH J0753.6-6220	Asterism	07h53m.6	-62°20'.9	4	6'
IC 2220	Planetary Nebula	07h56m.8	-59°08'.0	7	5'x5'
NGC 2516	Open Cluster	07h58m.3	-60°52'.2	3.8	28'
IC 2448	Planetary Nebula	09h07m.1	-69°56'.5	11.5	8"
NGC 2808	Globular Cluster	09h12m.0	-64°52'.0	6.1	13.8'
NGC 2867	Planetary Nebula	09h21m.4	-58°19'.0	9.7	11"
RUPRECHT 84	Open Cluster	09h49m.2	-65°15'.1	11	3.6'
NGC 3114	Open Cluster	10h02m.7	-60°07'.0	4.2	35'
TRUMPLER 12	Open Cluster	10h06m.4	-60°19'.2	8.8	4'
HOGG 5	Open Cluster	10h06m.5	-60°23'.1	11.2	3'
HOGG 6	Open Cluster	10h06m.7	-60°29'.9	12	3'
NGC 3247	Open Cluster Nebula	10h23m.8	-57°42'.0	8	4.5'
IC 2581	Open Cluster	10h27m.4	-57°37'.5	4.3	7'
IC 2602	Open Cluster	10h43m.2	-64°23'.7	1.6	50'
NGC 3372	Nebula	10h43m.8	-59°52'.0	3	120'
TRUMPLER 14	Open Cluster	10h43m.9	-59°32'.9	5.5	5'
TRUMPLER 15	Open Cluster	10h44m.8	-59°21'.5	7	4'
BOCHUM 11	Open Cluster	10h47m.3	-60°05'.8	7.9	3.6'
TRUMPLER 17	Open Cluster	10h56m.2	-59°12'.3	8.4	5'
HOGG 9	Open Cluster	10h58m.4	-59°03'.5	10.6	1.5'
NGC 3532	Open Cluster	11h06m.4	-58°40'.0	3.4	53'
IC 2714	Open Cluster	11h17m.9	-62°42'.0	8.2	12'
MELOTTE 105	Open Cluster	11h19m.5	-63°29'.1	8.5	5'

At the Eyepiece

May 2022 by Ray Field



The Moon is First Quarter on the 9th, Full on the 16th (eclipse), Last Quarter on the 22nd and New on the 30th. The Moon is near Pollux on the 7th, Regulus on the 10th, Spica on the 14th, Antares on the 17th, Saturn on the 22nd, Mars on the 24th and Jupiter on the 25th. The Moon is near Venus on the 26th and 27th at noon. Take precautions as the Sun is near them on both days. The “Straight Wall” feature on the Moon is 120km long, above and near the middle of the Moon and is best seen in a telescope on the 10th and 23rd. It is quite a surprising thing to see. A photo of the “Straight Wall” feature is given on page 26 of the ASSA Sky Guide. The total eclipse of the Moon starts at 05:29 on the 16th and ends at 06:54 on the same morning.

Mercury is at inferior conjunction on the 21st and will not be well placed for observation this month. (*An inferior conjunction occurs when the planet passes approximately between Earth and Sun; if it passes exactly between them, moving across the Sun's face as seen from Earth, it is said to be in transit.*)

Venus will be near the Moon on the 26th and 27th and could be visible to the naked eye as a “star” near the Moon. Take precautions as the Sun is nearby. On the 25th the Moon is 20° from Venus and on the 26th it is only 8° from the Moon. A diagram of the event is on page 24 of the ASSA Sky Guide.

Mars is visible in the morning sky this month. It looks like a brightish red-orange object to the naked eye and rises shortly after 02:00.

Jupiter, the largest planet in the Solar System is a very bright object. It rises about 03:00 on the 1st and by 02:00 by the 31st. Details of its moons’ positions as can be seen in a telescope are given in a table on page 27 of the ASSA Sky Guide.

Saturn, the ringed planet, is visible to the naked eye, and is near Jupiter in the morning sky. The angular distance of the major planets are given in diagrams on page 27 of the ASSA Sky Guide. Saturn is in Capricornus all year and binoculars will show Titan, the brightest of Saturn’s moons, which is the second largest moon in the Solar System. The largest is Ganymede of Jupiter. The diameters are Ganymede 5000km and Titan 4800km.

Uranus is too close to the Sun to be observed this month. It is in conjunction with the Sun on the 5th May.

Meteor Showers. The eta Aquarids reach a maximum on May 5th with a Zenithal Hourly Rate (ZHR) of 55. They appear to radiate from a point above and to the left of the “Square of Pegasus” looking North. Their duration is from April 21st to May 12th. The time to watch is from 03:30 to 05:30. Their observing prospects are favorable.

The Starry Sky from Durban. Orion is setting in the West and Scorpius is rising in the East. The Southern Cross and its pointers are well up and the second brightest star in the sky, Canopus, is starting to descend to the right of the Cross. Sirius of Canis Major is to the right of Canopus and is the brightest star in the night sky. Looking North, Leo the Lion is well placed above the horizon. To its left are the bright stars of Castor and Pollux in Gemini “The Twins”. To the right of Leo, Arcturus, an orange giant star, the 4th brightest star in the sky is just rising. It is 36 light years away.

NB - Full Lunar Eclipse - 6 May @ 04:30 to 06:00, when Moon will set below the horizon.

References. ASSA Sky Guide 2022, Philips Planisphere for 35° South and Norton’s Star Atlas.



Careening Through Carina

By Joe Bergeron



The star cluster NGC 2516 in the constellation Carina. Image credit: Sergio Equivar.

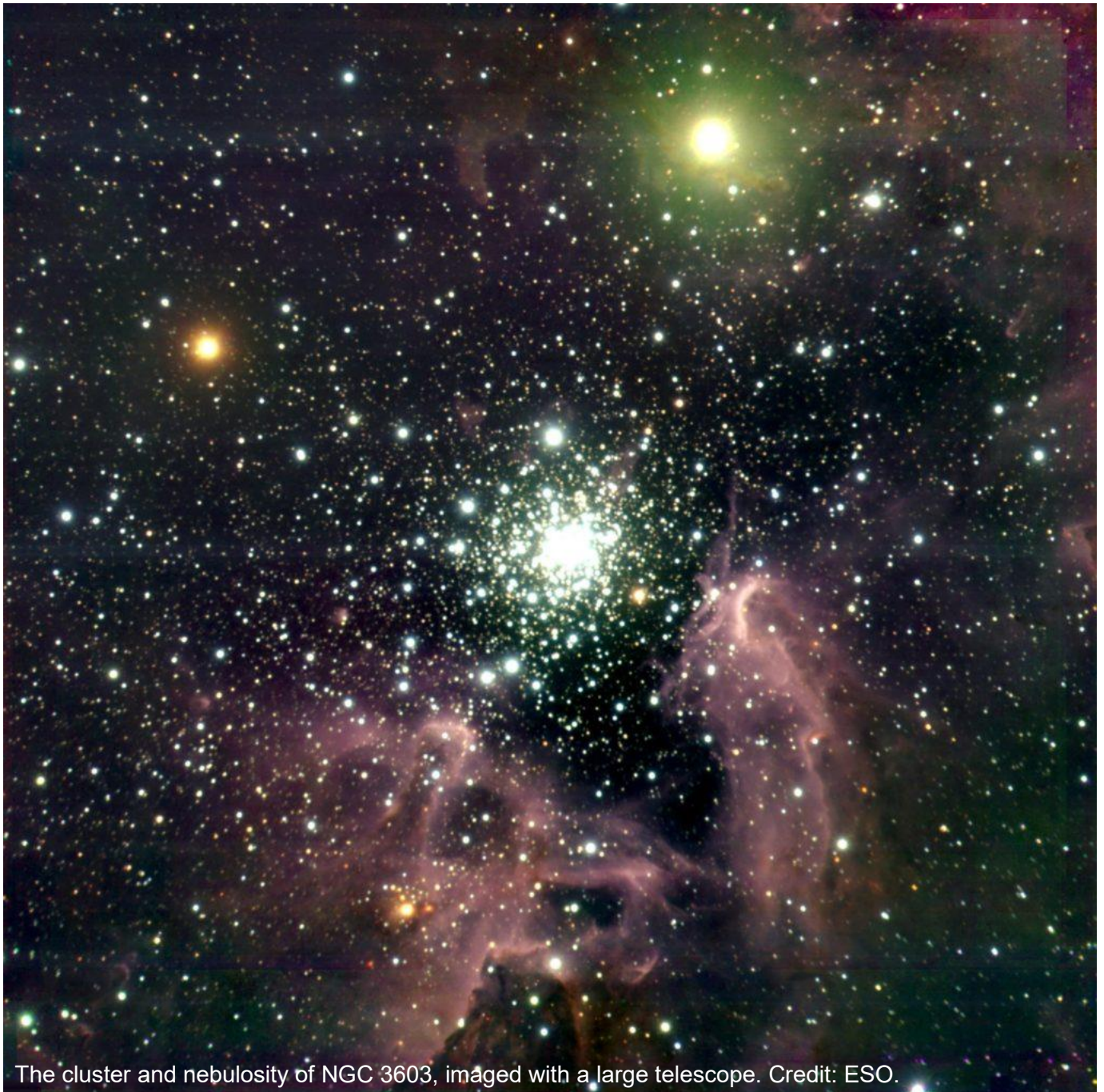
In dark sky, northern-hemisphere observers can see the winter Milky Way as a featureless, inconspicuous band of haze running east of Orion and disappearing below the horizon south of the constellations Canis Major and Puppis. In light-polluted sky, the winter Milky Way is hard to see at all. But further south, into the far southern constellation Carina, the Milky Way suddenly explodes into one of its brightest, most spectacular, and most detailed sections, running through Crux, Centaurus, and beyond.

The Milky Way in the constellation Carina is a playground for anyone with good sky and a decent telescope, and that's where I poked around with my 92mm refractor on a fine, dark New Zealand night. I began my tour of this part of the sky with the mighty open star cluster NGC 3532. A conspicuous fuzzy patch to the naked eye, this cluster is revealed in a low-power telescope as an amazing sight, surely one of the finest clusters in the entire sky. It easily stands out in an already rich background along the southern Milky Way. The cluster is almond-shaped, oriented generally east-west, and consists of a hundred or more fairly bright stars of similar brightness, which I estimated as magnitudes 6 to 8. It's nearly a degree long, with distinct boundaries, and it neither peters out gradually into the background nor shows any concentration toward the center. It reminds me of a broad, glittery, silvery fish, minus the tail. It looks like a snapper, a fish I saw someone pull out of the water here in New Zealand's Bay of Islands. In fact, I'm dubbing it the "Snapper Cluster". Now I'll see if that name catches on. The eye of the cluster is marked by a particularly prominent 6th-magnitude orange star. The cluster's stars are distributed pretty uniformly, though there is a circular empty patch within it. It shares a field with ξ (Xi) Carinae, a much brighter, yellow-orange star of 4th magnitude.

...Careening Through Carina

Next we come to Trumpler 17, a far less conspicuous cluster lying between NGC 3532 and the great Eta Carinae nebula itself. It shares a 50x field with the bright star μ (Mu) Carinae. Using averted vision, I can make out about 15 stars in this small cluster with my 92mm refractor. It features a pair of somewhat brighter stars, with most of the remainder flowing off in the direction of Mu Carinae.

NGC 3603, still in Carina, is an interesting object whose true nature was not apparent in my little telescope. Described by others as a nebulous cluster, to me it appeared as a bright star with a vague fan of nebulosity lying off to one side. At 86X that "star" looked peculiar, slightly fuzzy or nebulous. At the time I thought it might be immersed in a particularly bright patch of nebulosity, but my later investigation revealed that this "star" is actually an extremely compact open cluster known as HD 97950. This cluster turns out to be one of the densest in our galaxy, composed of some of its brightest stars, and lying at a relatively great distance of 20,000 light years. Averted vision makes the general layout of the associated nebula easier to make out. That remote nebula, which looks so inconspicuous, is actually among the biggest and most massive star forming regions in our galaxy.



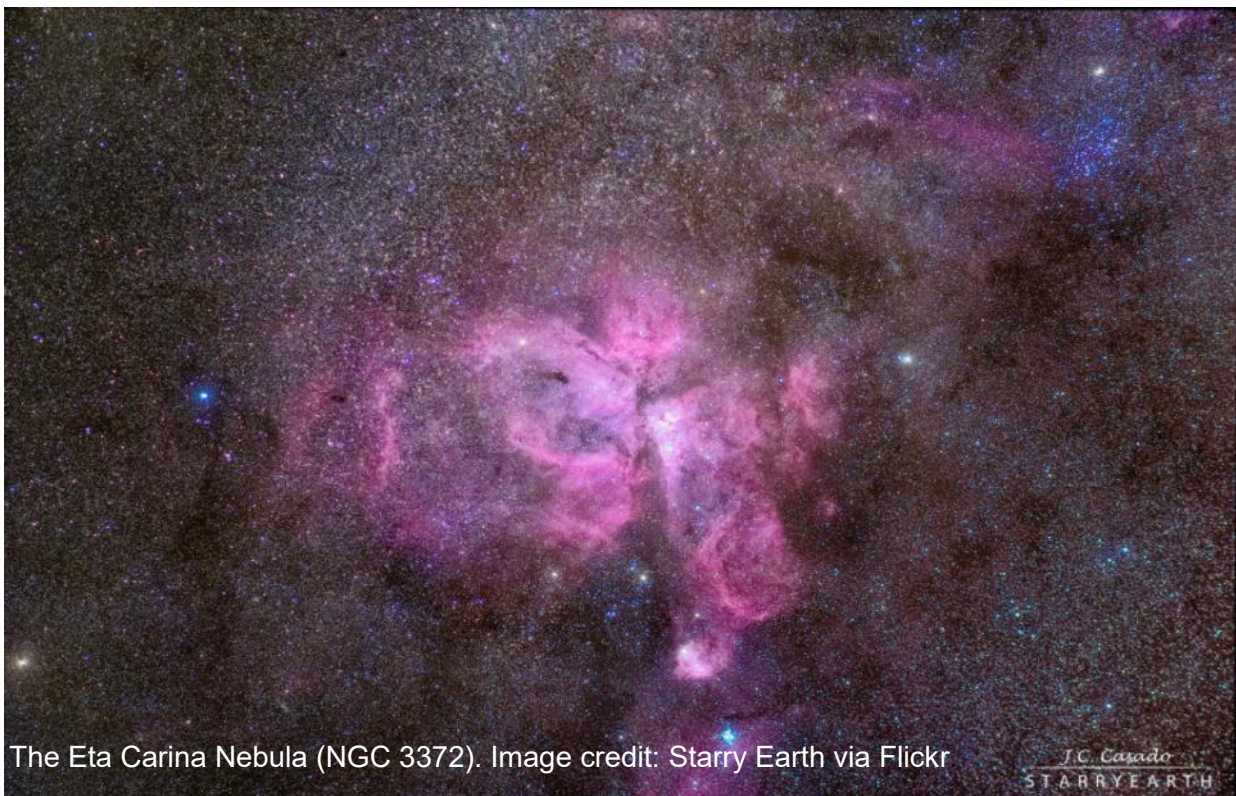
The cluster and nebulosity of NGC 3603, imaged with a large telescope. Credit: ESO.

...Careening Through Carina

Then there's IC 2602, known as the Southern Pleiades. I'm not sure why a Southern Pleiades is necessary, because the regular Pleiades are also visible from here at this time of year, though they lie fairly low in the north. Here in New Zealand they often go by their Maori name of Matariki.

IC 2602 is easily visible to the naked eye, but is not really a match for the Pleiades. It features a scattered field of thirty or more stars spread across a degree of sky, ranging from magnitude 3 on down. That 3rd magnitude beacon sometimes goes by the fanciful name of Vathorz Posterior, at least according to Sky Safari. The name apparently pertains to the star's position along the waterline of the great mythological ship Argo, of which Carina represents the keel. A more scientific designation is Theta Carinae. This is an extremely luminous star that seems destined to blow up as a supernova one fine day.

Of greater interest to me, at least, is the fainter embedded cluster Melotte 101. This is a small, round cloud of about thirty faint stars that I could make out. It's a much more subtle and, to me, more intriguing sight than the grand splash of stars beyond which it lurks.



The Eta Carina Nebula (NGC 3372). Image credit: Starry Earth via Flickr

We've danced around it long enough, so to conclude, let's take in the overwhelming sight of the Eta Carinae Nebula. Fully describing this fantastic thing and all the stars and clusters it encompasses would take a column of its own, but, in brief...wow! It overflows a one degree field at 100x, and is embedded in a riot of stars. Deep black lanes divide the nebulousity into three major lobes. The most prominent star in the field is the troubled and unstable hypergiant η (Eta) Carinae itself, which appears yellow to me, despite its hot (blue) spectral classification of B0, probably because of filtration by the dense nebula that obscures the star's true brightness. That nebula appears to be dissipating, leading to predictions that the star will steadily brighten from its current 4th magnitude. Eta is part of a cluster called Trumpler 16, which can hardly be distinguished as a cluster because of the dominance of Eta and the general profusion of stars in the area. Another prominent star in the vicinity is the 4th magnitude red star ω Carinae, a foreground object and a variable star. Eta is another likely candidate to blaze up as a supernova, any millennium now.

...Careening Through Carina

It's hard to overstate the visual impact of this spectacular field. Even without the nebula, the density of stars seen here would be memorable. With the nebula, you are privy to an unforgettable view of the depth and richness of our galaxy. Eta Carinae doesn't need my help to find eager observers. Most of the objects I describe in my columns will be more humble, lesser known, more in need of visitation, and sometimes more challenging.

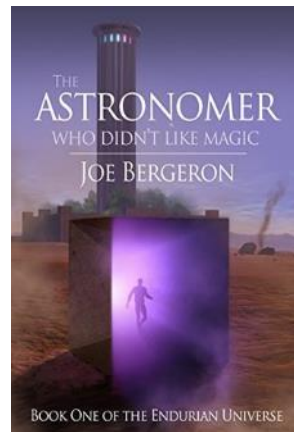
About Joe Bergeron

Joe Bergeron grew up in the twin hamlets of Endicott and Endwell in upstate New York. As a boy he taught himself the constellations using a cardboard star wheel, watching in awe as stars he



had never before identified rose according to prediction. Later he began a more thorough examination of the heavens using various small telescopes.

Joe Bergeron is an amateur astronomer with over 50 years experience; was a director of the local small planetarium, worked for 3 years as a staff artist at the Morehead



Planetarium in North Carolina, is a renown science fiction artist, a space artist winning a window full of awards; and is also the author of the ten novels of the Endurian Universe.

He is a Fellow of the International Association of Astronomical Artists and is considered one of the best space artists in the world.

See more of Joe's work at www.joebergeron.com.



Don Orsmond

It was with deep sadness that we shared the news of Don Orsmond's passing on 2022-02-14, aged 70.

Don, a knowledgeable astronomer, astrophotographer and member of ASSA Durban, was well known for his questions posed to the presenters on their talks given, which were intelligent and thought provoking.

Don was born on 1950-02-14 at Mother's Hospital in Durban, growing up in Mount Edgecombe, attending Northlands Boys High School, then going on to study and become a renowned Technical Engineer.

He, with his 2 siblings, a brother and sister, would lie on the grass on a blanket at their home at night, and wonder at the universe above, debating and considering what was out there. And hence, his love of astronomy was born.

Don and his wife Ritva, were married in 2005, and went on holiday in March 2020 to Finland, his wife's home country. Unfortunately Covid prevented their return home to Durban. Don's main frustration was not having the correct telescope or camera equipment to take the wonderful photos that region had to offer. Here, unfortunately, he fell ill and passed. Our sincere love and condolences go out to Ritva and the extended family.



Planetary Parades



What is a planetary parade?

There has been a lot of talk of the recent lining up of the planets - called Planet Parades. Although there is no official scientific term 'planetary parade', it is widely used in astronomy to denote an astronomical event that takes place when planets of the Solar System line up in a row in the same area of the sky, as seen by observers from Earth; as has been seen in April 2022. There is no single definition of this phenomenon. These are the three most commonly used:

1. An astronomical event that occurs when planets line up in a row on one side of the Sun at the same time, as seen up above the plane of our Solar System.
2. A visual phenomenon that occurs when planets of the Solar System appear in a small sector of the sky at the same time regardless of their visibility conditions, from Earth's point of view (as seen by observers from Earth). A planet parade of this type happened on April 18, 2002, and then on July 4, 2020, when all planets of the Solar System that are visible to the naked eye lined up in a row in the evening sky. According to preliminary forecasts, such planet parades will take place in 2022, 2040, and 2854.
3. On rare occasions, there are very good seeing conditions of all planets of the Solar System in one night. These events are also referred to as planet parades. For inner planets, the best viewing conditions occur near the greatest elongations, and for outer planets – sometime before and after oppositions.



ABOVE: 5 planets and the moon taken from Australia, Image: Denis Crute

...Planetary Parades

Types of planetary parades

Another term for a planet parade is 'appulse'. The following types of planetary parades are distinguished according to the number of participating planets:

- Mini planet parade – 3 planets.
- Small planet parade – 4 planets.
- Large planet parade – 5 or 6 planets.
- Great (full) planet parade – all Solar System's planets (+ Pluto sometimes).

Mini planet parades are not rare events. Three planets can be simultaneously observed in the same part of the sky several times a year.

When do the planets align?

It is important to point out that planetary alignment during a planet parade should not be taken literally. In reality, planets never align in one perfectly straight line, as usually shown in the pictures. Since the Solar System's planets do not all orbit perfectly in the same plane and swing about on different orbits in three-dimensional space, they will never be perfectly lined up.

What happens when the planets align?

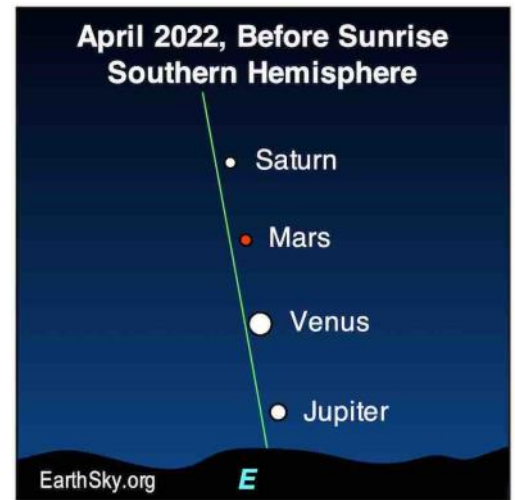
By planets' alignment or parade, astronomers usually mean that planets will appear in the same part of the sky. Sometimes the arrangement of planets in the sky resembles a line, but it's not always the case. Most often, two or three planets form a line in the sky.

Besides, a lot depends on the viewpoint. When planets line up on one side of the Sun, they are not necessarily in the same region of the sky for observers from Earth. Vice versa, when planets are in the same part of the sky from Earth's point of view, they are not necessarily aligned from the point of view of the Sun.

When was the last time all the planets aligned?

On July 4, 2020, a rare and unique planet parade took place. All the planets of the Solar System – Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune plus the dwarf planet Pluto – lined up on one side of the Sun at the same time. This was a planet parade of the first type of the three described above. The near perfect alignment didn't occur, as the deviation angle was quite small.

Before that, the parade of planets of this type happened in 1982, and the next one is only expected in 2161.



ABOVE: 4 Planets, Saturn, Mars, Venus & Jupiter - Image: earth-sky.org



ABOVE: A simulation of the South East horizon in the pre-dawn hours of 4 July 2020 (view from Mumbai). Image courtesy: Stellarium Web

...Planetary Parades

Also, in August 2020, the Large planetary parade of the third type (5 or 6 planets) occurred: observers could witness all the planets in one night. At the beginning of the month, the elusive planet Mercury shone in the morning sky, and brilliant Venus was sitting nearby. The red planet Mars, distant Uranus, and Neptune, all approaching their oppositions, were well placed for observation, as well as the gas giants Jupiter and Saturn. Even the dim dwarf planet Pluto offered sky watchers favorable conditions for viewing it due to its opposition.

The last time the planet parade took place was December 2021. It was less spectacular than the one in August 2020, as this time only six planets lined up in the sky — Mercury, Venus, Saturn, Jupiter, Neptune, and Uranus. The alignment also wasn't close to perfection.

RIGHT: The 5 planets can be seen from around the world. Their orientation to the horizon is different from one part of Earth to another. Denis Crute in Australia caught the 5 planets and the moon from the Southern Hemisphere



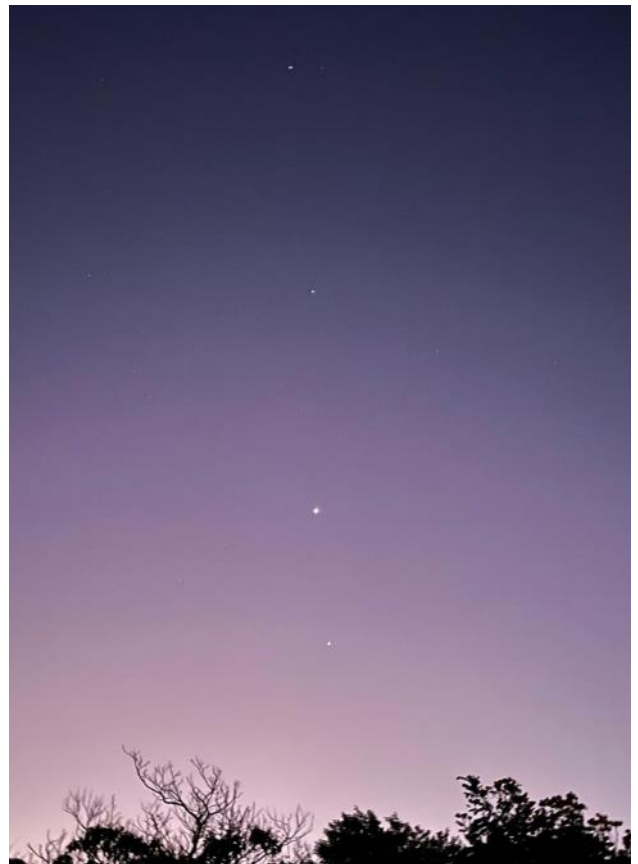
When did the next large planetary alignment occur?

This past Month!!! The stargazers had a chance to enjoy the breathtaking planetary parade of the second type in March / April 2022: five planets of the Solar System – Mercury, Venus, Mars, Jupiter, Saturn – simultaneously appeared in a small sector of the sky. However, the observing conditions will be unfavorable for astronomy lovers from some parts of the globe.

The planet alignment occurred on April 20, when Jupiter, Saturn, Mars, and Venus will create a near-perfect line in the predawn sky. The viewing conditions were more favorable than those in March: all the planets all being within range of naked-eye visibility and rose higher above the horizon before sunrise. However, a clear horizon was required to see Jupiter, which sat lower than the other planets. Also Jupiter in Pisces, Mars and Venus — in Aquarius, and Saturn — in Capricornus, could be found.

Note that this particular event doesn't really fit the planet parade definitions mentioned above. It could be referred to as the second type, but the distance between the planets will be too far.

ABOVE RIGHT: Photo taken by ASSA Member Maryanne Jackson on April 20 from her garden in the early morning showing Earth, Jupiter, Venus, and Saturn.



...Planetary Parades

The Next Planet Parade

The final and most spectacular planet parade of the year will take place at the end of June. On the morning of June 24, observers saw all planets of the Solar System aligning in the sky. Only five of the planets - Mercury, Venus, Mars, Jupiter, and Saturn - were visible to the unaided eye; observing dim Neptune and Uranus required binoculars.

The planets extended from north to east in the southern latitudes (east to south in the northern hemisphere), across the sky, so you definitely couldn't see all of them together via optics.

Observers from the Southern Hemisphere again had a better view as the the planets here rose earlier and climbed much higher.

An additional bonus, joining the four planets in their neat line in the last week of April was the moon, appearing further south, just right of Saturn

RIGHT: Venus, Mars, Jupiter and Saturn formed a row in the night sky each morning, seen here as a backdrop to the Greenpoint Lighthouse in Scottburgh, KZN, in the early morning just before sunrise. Image: Clinton Wyness.

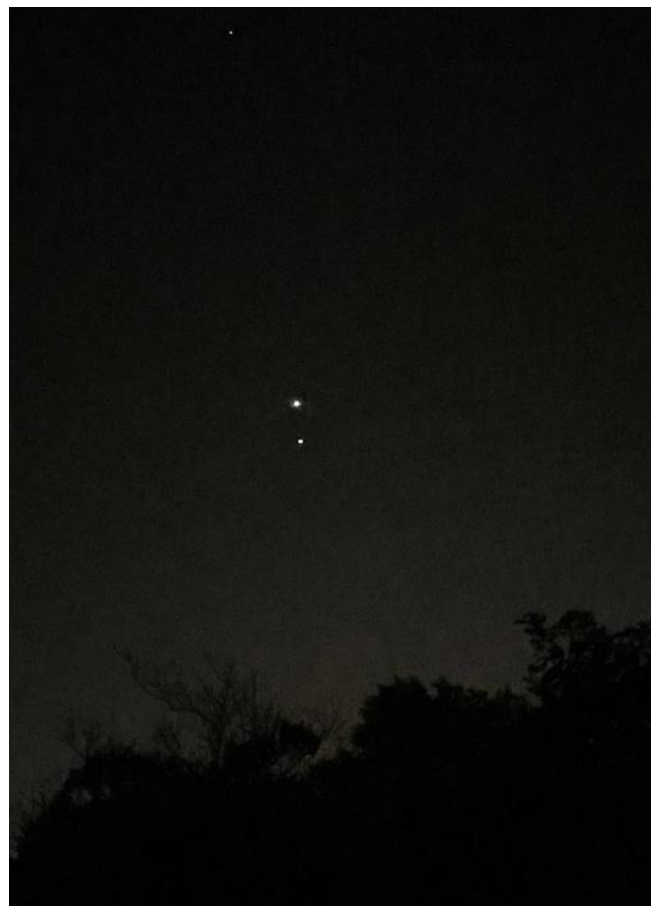


ABOVE: Planetary parade captured in Cape Town - Credit: capetownetc.om

...Planetary Parades - Photos



ABOVE: Submitted by Dylan Evans



ABOVE: Image Maryanne Jackson



ABOVE: Taken in Johannesburg on 23rd April @ 4:45 - Image: reddit.com/r/southafrica/MoonStar757/ Photographer: Unidentified



ABOVE: Taken in Africa Alignment of Earth, Mars, Venus , Saturn and Jupiter. Image source - Lovecraft Photographer: Unidentified



The Cover Image - Eta Carina

Image by John Gill



TECH SPECS 1/2:

IMAGES:

60 x Ha gain for 60 seconds
 80 x Sii gain 85 for 60 seconds
 42 x Sii gain 70 for 60 seconds
 10 x Oiii gain 85 for 60 seconds
 60 x Oiii gain 60 for 60 seconds
 180 x Flats
 300 x Flats
 300 x Dark flats

INTEGRATION TIME

4hr 20 mins

CAMERA

QHY 268m cooled mono camera

TECH SPECS: 2/2

CAMERA

QHY 268m cooled mono camera

FILTERS

Astrodon 5nm narrow band filters

SCOPE

APM 107/700 apo 0.75 focal reducer

MOUNT

Celestron CGX

SOFTWARE

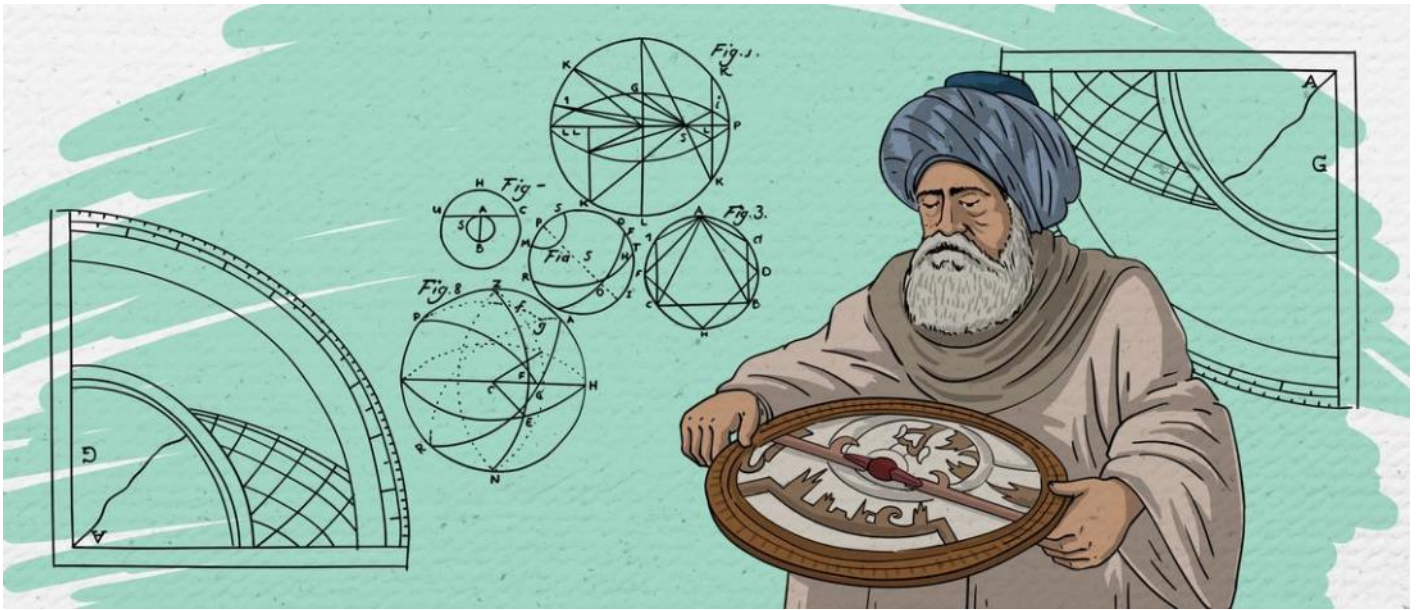
N.I.N.A.

PixInsight

INDEX PHOTO:

Image: Damien Peterson

Al Battani: The 9th century Muslim Star of Astronomy



Inspiring the world of science from the likes of Galileo to Copernicus, this is the story of a Muslim scientist whose groundbreaking discoveries left an indelible mark on astronomy.

Astronomy has always held a special place in Islamic education. The Holy Quran has over 1,160 verses touching upon the creation of the universe, the alignment of the stars and other ideas that were later proven right upon scientific inquiry.

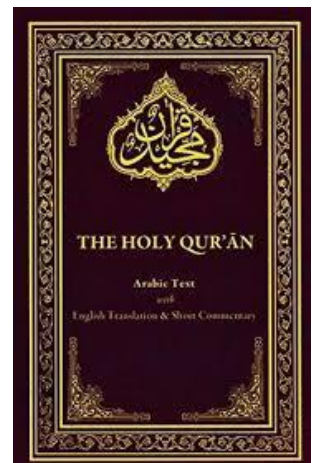
Astronomical observation in the Islamic Golden Age, while largely neglected by the western world, reached far beyond what many scholars throughout history have given it credit for. Since mathematics is an integral part of astronomy, Islamic scholars with a strong understanding of spherical trigonometry and algebra were able to excel in the science of celestial objects

Al Battani was born as an Arab prince in the mid-ninth century 850 in Harran (38 km southeast of Türkiye's Urfa Province), Mesopotamia (now Turkey) known by the Romans as Carrhae. His birth name was Abu Abdallah Mohammad ibn Jabir ibn Sinan al Raqqi al Harrani al Sabi al Battani. He rose to a position of renown among the European astronomers in later centuries and has even been dubbed the "Ptolemy of the Arabs."



Al Battani's family belonged to the Sabian sect - a religious sect of star-worshippers native to his hometown. Although Al Battani was a Muslim and did not follow the Sabian religion, he took advantage of the knowledge of the Sabian sect, which had produced many outstanding astronomers and mathematicians thanks to the desire of its followers to serve their religion. In addition to his access to Sabian wisdom, Al Battani was the student of his father, Jabir ibn Sinan al Harrani, a famous scientific instrument-maker in the Sabian society - paving the way for his astronomical breakthroughs. The name makes the identification certain that al-Battani himself was skilled in making

astronomical instruments and there is a good indication that he learnt these skills from his father. He then moved to Ar-Raqqā, situated on the bank of the Euphrates in Syria, where he received advanced education and began his career as a scholar and where most of Al Battani's observations were made .



...Al Battani

His strikingly accurate estimates of the length of the year and his original innovations in advancing and enlightening the science of astronomy through trigonometric calculations were achieved at a time before modern astronomical equipment, let alone telescopes.

These advances led him to become known as one of the greatest astronomers of all time. Commenting upon the errors he encountered in the work of other astronomers, Al Battani reveals why he was striving to “perfect and confirm” the science of astronomy:

“After having lengthily applied myself to the study of this science, I have noticed that the works on the movements of the planets differed consistently with each other and that many authors made errors in the manner of undertaking their observation, and establishing their rules. I also noticed that with time, the position of the planets changed according to recent and older observations; changes caused by the obliquity of the ecliptic, affecting the calculation of the years and that of eclipses.

Continuous focus on these things drove me to perfect and confirm such a science.”

According to Baron Carra de Vaux, a French orientalist who published memoirs of his travels in the Middle East, the merit of Al Battani was his pioneering use of trigonometry in his calculations. Unlike Ptolemy, who relied on geometrical methods, Al Battani placed more importance on empirical results and employed trigonometrical methods - an important advance that allowed him to calculate 54.5" per year for the precession of the equinoxes. He also obtained 23° 35' for the inclination of the ecliptic. His measurements are said to have been more accurate than those of Copernicus, likely related to the fact that his observations were made from a more southerly latitude.



ABOVE: Pages from Al Battani's book "Kitāb az-Zij"

In addition to introducing several trigonometric relationships, the Muslim master of astronomy also revealed that the farthest distance between the Sun and the Earth varies and that, as a result, annular eclipses of the Sun are possible — as are total eclipses. His groundbreaking book, “Kitāb az-Zij,” (Book of Astronomical tables) which was translated into Latin by Plato of Tivoli in 1116 CE, was used by famous astronomers such as Copernicus and Galileo.

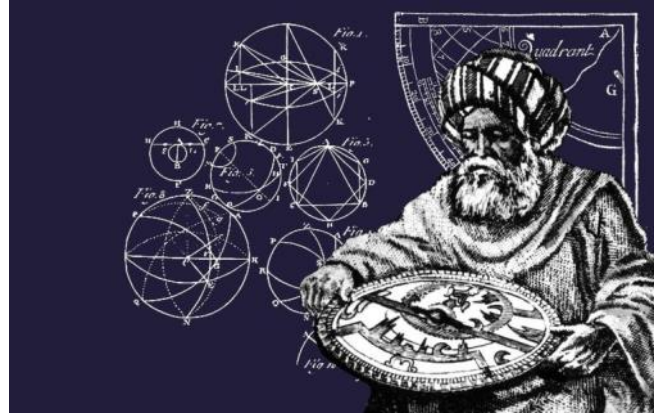
The book, which comprises 57 chapters, first deals with the division of the celestial sphere into the signs of the zodiac and the degrees of celestial bodies. This introduction is followed by a list of necessary mathematical tools, including sexagesimal fractions and trigonometric functions

The rest of the book consists of justifications of his own views based on personal observations, in addition to elucidations of a large number of different astronomical problems and calculations of the motions of the sun, moon and five planets. It also includes instructions on how to read his tables, debates around the construction of a sundial and an evaluation of the construction of a number of astronomical instruments. Finally, the book not only catalogues a total of almost 500 stars, but also refines the existing values for both the seasons and for the length of the year — calculating the latter as 365 days, five hours, 46 minutes and 24 seconds.

The original manuscript of the *Kitāb az-Zij* is, of late, maintained at the Vatican in Rome. Another valuable manuscript on astronomical chronology – also written by al-Battani – is known to be in

...Al Battani

During his scientific journey, Al Battani used an incredibly wide variety of instruments, from astrolabes, tubes, a gnomon divided into twelve parts, and a celestial globe with five armillaries (which he was believed to have created), to angle rulers, a mural quadrant, parallax rules and sundials, both vertical and horizontal. And, understandably, he opted for the largest instruments; the measures taken by the parallax rules relate to a circle of no less than five meters in diameter; and the quadrant was no less than one meter.



Al Battani made many of his major astronomical observations in the ancient city of Raqqa, in northern Syria, where he lived from the 870s until 919. After resolving a dispute on behalf of the people of Raqqa in Baghdad, he died during his return to Raqqa in Qas al-Jiss, near Iraq's Samarra, in 929 CE.

Known by Latinised versions of his name — Albatenius, Albategnius or Albategni - among his mediaeval European admirers, Al Battani continues to be revered for his astonishing scientific breakthroughs, which not only enlightened the science of astronomy for his posthumous students, but also left an invaluable legacy of knowledge that greatly contributed to the field of astronomy as we know it.

Al-Battani's greatest fame came in Mathematics with the use of trigonometric ratios that are also used today. He used trigonometrical methods instead of geometrical methods, which was used by Ptolemy, and so was the first to replace the use of Greek chords by Sines. The concept of Cotangent was also introduced by him and he furnished their tables in degrees.

The main achievements of al-Battani's are:

- He cataloged 489 stars.
- He refined the existing values for the length of the year, which he gave as 365 days 5 hours 46 minutes 24 seconds, and of the seasons.
- He calculated 54.5" per year for the precession of the equinoxes and obtained the value of 23° 35' for the inclination of the ecliptic.
- Rather than using geometrical methods, as other scientists had done, al-Battani used trigonometric methods which were an important advancement. Al-Battani showed that the farthest distance of the Sun from the Earth varies and, as a result, annular eclipses of the Sun are possible as well as total eclipses.
- Al-Battani is important in the development of science for a number of reasons, but one of these must be the large influence his work had on scientists such as Tycho Brahe, Kepler, Galileo and Copernicus.

So great was al-Battani's impact, De Vaux observes, that subsequent observation bore his mantle. Thus, Jewish scientists, Ibn Ezra, Maimonides, Levi Ben Gerson, and others, who through the centuries scattered Islamic learning in all regions of Europe, made al-Battani's calculations the foundations of theirs. Amongst the Christians, Robertus Cestrensis (Retinensis) devised tables of the celestial movements for the meridian of London for the year 1150 after him. Albertus Magnus, Alphonso X, Regiomontanus, Nicolas Cusanus, Copernicus, and Tycho Brahe are amongst others, on whom, al-Battani, in one way or another impacted. It was left to Nallino, who most recently edited al-Battani's work in Arabic with a Latin translation.

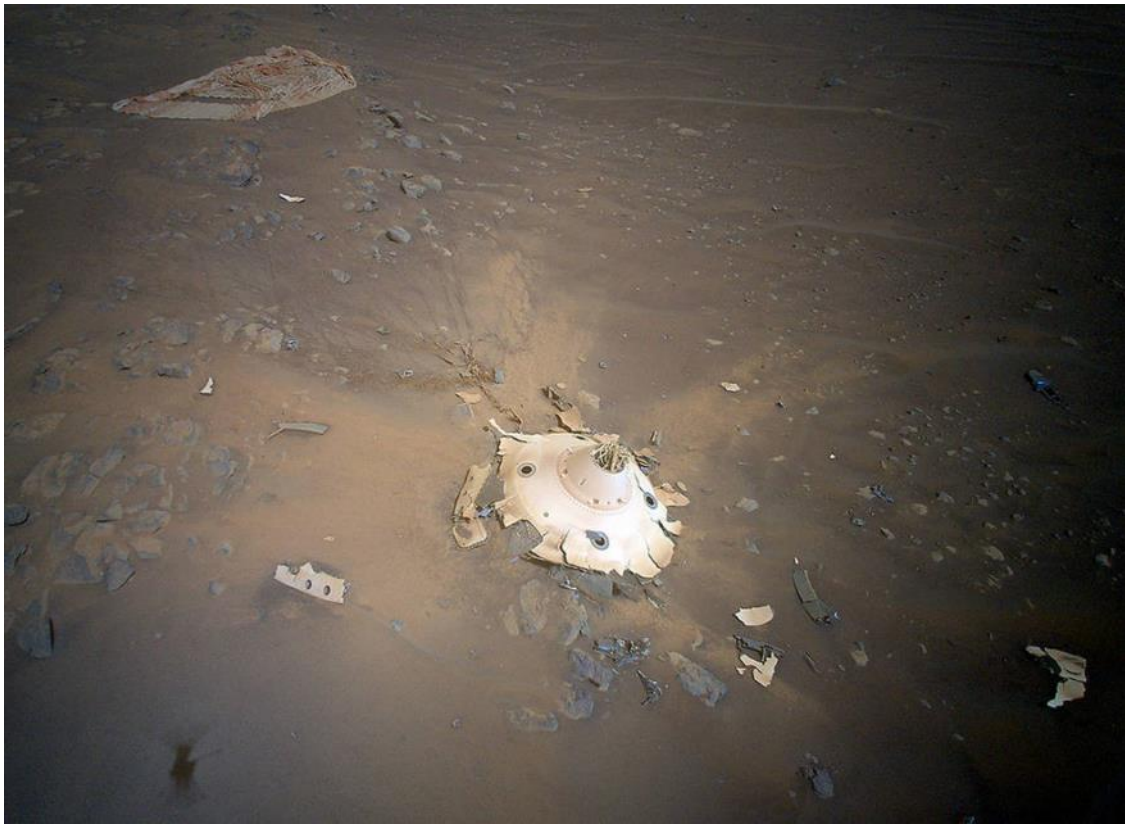
Al-Battani passed away in 929 A.D., near the city of Qasr al-Jiss, Moussul in Iraq. He was regarded as one of the most famous Arab astronomers. He dedicated all his life until his death to the observation of planets and stars.

References: <http://mvslim.com/this-muslim-astronomer-calculated-the-length-of-the-solar-year-long-before-the-use-of-telescopes/> , <https://www.famousscientists.org/al-battani/> , <https://muslimheritage.com/the-impact-of-al-battani-on-european-astronomy/> , www.google.com/search?q=al+battani+inventions , www.youngmuslimdigest.com/science/07/2015/al-battani-pioneering-muslim-mathematician-astronomer-extraordinaire-part-2/ www.google.com/search?q=al+battani+inventions&biw=673&bih=497



NASA Update

NASA's Mars Helicopter Spots Gear That Helped Perseverance Rover Land



ABOVE: This image of Perseverance's backshell and parachute was collected by NASA's Ingenuity Mars Helicopter during its 26th flight on April 19, 2022. Images obtained during the flight may provide insight into the components' performance during the rover's entry, descent, and landing on Feb. 18, 2021. Credits: NASA/JPL-Caltech

Eyeing some of the components that enabled the rover to get safely to the Martian surface could provide valuable insights for future missions.

NASA's Ingenuity Mars Helicopter recently surveyed both the parachute that helped the agency's Perseverance rover land on Mars and the cone-shaped backshell that protected the rover in deep space and during its fiery descent toward the Martian surface on Feb. 18, 2021. Engineers with the Mars Sample Return program asked whether Ingenuity could provide this perspective. What resulted were 10 aerial color images taken April 19 during Ingenuity's Flight 26.

"NASA extended Ingenuity flight operations to perform pioneering flights such as this," said Teddy Tzanetos, Ingenuity's team lead at NASA's Jet Propulsion Laboratory in Southern California. "Every time we're airborne, Ingenuity covers new ground and offers a perspective no previous planetary mission could achieve. Mars Sample Return's reconnaissance request is a perfect example of the utility of aerial platforms on Mars."

Entry, descent, and landing on Mars is fast-paced and stressful, not only for the engineers back on Earth, but also for the vehicle enduring the gravitational forces, high temperatures, and other extremes that come with entering Mars' atmosphere at nearly 12,500 mph (20,000 kph). The parachute and backshell were previously imaged from a distance by the Perseverance rover.

But those collected by the rotorcraft (from an aerial perspective and closer) provide more detail. The images have the potential to help ensure safer landings for future spacecraft such as the Mars Sample Return Lander, which is part of a multimission campaign that would bring Perseverance's samples of Martian rocks, atmosphere, and sediment back to Earth for detailed analysis.



...NASA Update



ABOVE: This image of Perseverance's backshell and parachute was collected by NASA's Ingenuity Mars Helicopter during its 26th flight on April 19, 2022. Images obtained during the flight may provide insight into the components' performance during the rover's entry, descent, and landing on Feb. 18, 2021.

In the images of the upright backshell and the debris field that resulted from it impacting the surface at about 78 mph (126 kph), the backshell's protective coating appears to have remained intact during Mars atmospheric entry. Many of the 80 high-strength suspension lines connecting the backshell to the parachute are visible and also appear intact. Spread out and covered in dust, only about a third of the orange-and-white parachute – at 70.5 feet (21.5 meters) wide, it was the biggest ever deployed on Mars – can be seen, but the canopy shows no signs of damage from the supersonic airflow during inflation. Several weeks of analysis will be needed for a more final verdict.

Flight 26 Maneuvers

Ingenuity's 159-second flight began at 11:37 a.m. local Mars time April 19, on the one-year anniversary of its first flight. Flying 26 feet (8 meters) above ground level, Ingenuity traveled 630 feet (192 meters) to the southeast and took its first picture. The rotorcraft next headed southwest and then northwest, taking images at pre-planned locations along the route. Once it collected 10 images in its flash memory, Ingenuity headed west 246 feet (75 meters) and landed. Total distance covered: 1,181 feet (360 meters). With the completion of Flight 26, the rotorcraft has logged over 49 minutes aloft and traveled 3.9 miles (6.2 kilometers).

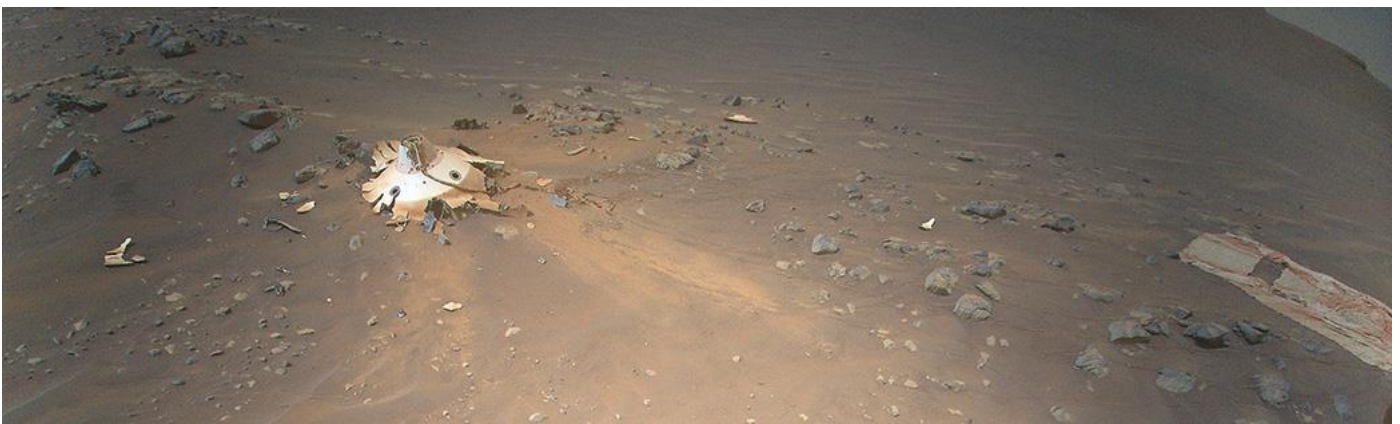
"To get the shots we needed, Ingenuity did a lot of maneuvering, but we were confident because there was complicated maneuvering on flights 10, 12, and 13," said Håvard Grip, chief pilot of Ingenuity at JPL. "Our landing spot set us up nicely to image an area of interest for the Perseverance science team on Flight 27, near 'Séítah' ridge."



...NASA Update

“The new area of operations in Jezero Crater’s dry river delta marks a dramatic departure from the modest, relatively flat terrain Ingenuity had been flying over since its first flight. Several miles wide, the fan-shaped delta formed where an ancient river spilled into the lake that once filled Jezero Crater. Rising more than 130 feet (40 meters) above the crater floor and filled with jagged cliffs, angled surfaces, projecting boulders, and sand-filled pockets, the delta promises to hold numerous geologic revelations – perhaps even proof that microscopic life existed on Mars billions of years ago.

Upon reaching the delta, Ingenuity’s first orders may be to help determine which of two dry river channels Perseverance should climb to reach the top of the delta. Along with route-planning assistance, data provided by the helicopter will help the Perseverance team assess potential science targets. Ingenuity may even be called upon to image geologic features too far afield for the rover to reach or to scout landing zones and sites on the surface where sample caches could be deposited for the Mars Sample Return program.

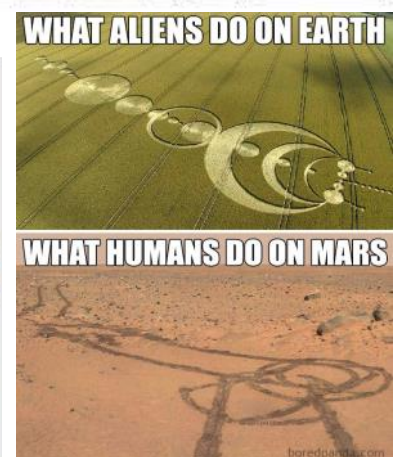
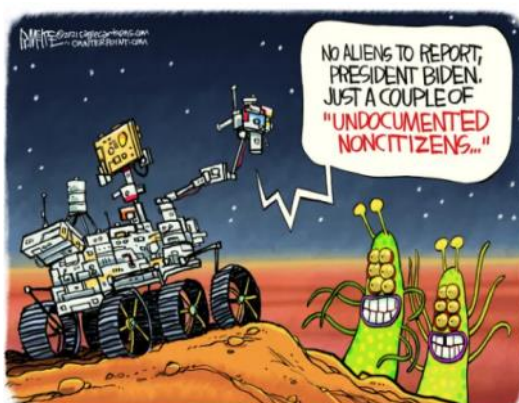


ABOVE: Perseverance’s backshell, supersonic parachute, and associated debris field is seen strewn across the Martian surface in this image captured by NASA’s Ingenuity Mars Helicopter during its 26th flight on April Credits:

<https://www.nasa.gov/feature/jpl/nasa-s-mars-helicopter-spots-gear-that-helped-perseverance-rover-land>



The picture NASA doesn't want you to see



NASA reveals the moment Powerful Solar Flare Erupted from the Sun

The awe-inspiring moment that a powerful solar flare erupted from the sun earlier this week has been captured by NASA. The space agency's Solar Dynamics Observatory spotted the super hot stream of radiation as it was belched from our star on Wednesday; 30 March 2022.

According to a NASA blog post, the explosion burst in the most powerful class of flare of which our sun is capable, an X-class clocking in at X1.3. It poses no threat to Earth as it was fired in a different direction, but had it struck our planet, it could have knocked out power grids and satellites.

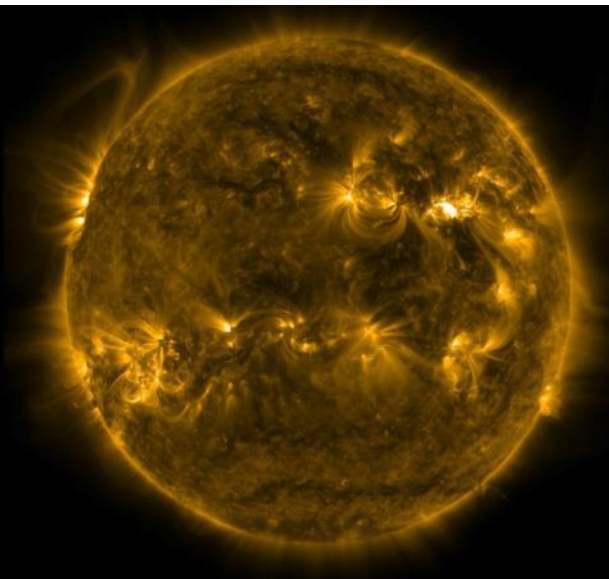
"Solar flares are powerful bursts of energy," NASA wrote. "Flares and solar eruptions can impact radio communications, electric power grids, navigation signals, and pose risks to spacecraft and astronauts."

The stream of hot material is the result of a frenzy of solar storms that have erupted from the sun throughout that week. A total of 17 were captured by NASA observatories exploding from the star on Monday and at least two were fired in Earth's direction.

When CMEs reach Earth, they trigger what is known as a geomagnetic storm — a largely harmless disturbance of the magnetic field. Thankfully, those launched in our direction were low-intensity flares that posed no threat to technology on Earth.

The March 30 flare imaged by NASA, on the other hand, could have caused chaos had it come this way. "This flare is classified as an X-Class flare," NASA wrote. This was an X1.3. NASA continued: "X-class denotes the most intense flares, while the number provides more information about its strength. "An X2 is twice as intense as an X1, an X3 is three times as intense, etc."

Data on that week's CMEs had been captured by NASA's Solar Dynamics Observatory and Solar and Heliospheric Observatory.



LEFT: A powerful X-class solar flare as it erupted from the sun on March 30. NASA Solar Dynamics Observatory

They're the result of an unusually active sunspot, dark and violent regions that appear due to a tangle of powerful magnetic forces.

The storms have led to showings of the northern lights at unusually low latitudes in Europe and North America.

Solar storms are caused by CMEs and solar flares, which are huge expulsions of hot material called plasma from the sun's outer layer. They can lead to the appearance of colorful auroras by energizing particles in our planet's atmosphere.

Each solar storm is graded by severity on a scale of 1 to 5, with a G1 described as "minor" and a G5 as "extreme." Storms at the upper end of the scale wreak havoc on our planet's magnetic field, which can disrupt power grids and communications networks. "Harmful radiation from a flare cannot pass through Earth's atmosphere to physically affect humans on the ground," NASA says. "However — when intense enough — they can disturb the atmosphere in the layer where GPS and communications signals travel."

In the past, larger solar flares have wreaked havoc on our planet. In 1989, a strong solar eruption shot so many electrically charged particles at Earth that the Canadian province of Quebec lost power for nine hours. As well as causing issues for our tech, they can cause harm to astronauts working on the International Space Station, either through radiation exposure or by interfering with mission control communications. The Earth's magnetic field helps to protect us from the more extreme consequences of solar flares



ASSA Durban Minutes of General Meeting

13 April 2022 - 19:30 via Jitsi (JHB) and Zoom (DBN)



Attendees:

Speaker:	Dr Daniel Cunnama	
Present	ASSA – DBN members	ASSA – JHB members
Apologies:	Multiple apologies received due to load shedding	

1. Welcome (Durban meeting)

- x Amith Rajpal, the Durban Chairperson, welcomed all attendees and visitors.

2. Guest Speaker

- x Piet Strauss introduced the speaker Dr Daniel Cunnama, the Science Engagement Astronomer at South African Astronomical Observatory (SAAO), the national centre for optical and infrared astronomy in South Africa. It's prime function is to conduct fundamental research in astronomy and astrophysics. In his current role, Daniel is tasked with the promotion and communication of the world-class research happening at the SAAO and other Astronomical Institutions in the country and has extensive experience in science engagement performing regular television and radio interviews as well as public talks at venues around the country.
- x Dr Daniel Cunnama, presented a talk on "Inspiration and Engagement through Astronomy".

3. Durban Meeting

- x Alison Coulter thanked speaker on behalf of JHB members
- x Amith Rajpal welcomed the members into the Durban meeting.

4. Present and Apologies

- x See above

5. Previous meeting minutes

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

6. Finance:

ASSA DURBAN FINANCIALS

2022/04/13

Financials Meeting	Month	Current	Investment	Petty Cash
General Meeting	2022-04-13	R 22 637,22	R 61 539,10	R 1 000,00

ASSA DURBAN - MEMBERS

Date	No off	Paid Members	Honoury	Removed
2022-04-13	130	130	4	0

...Minutes of the Meeting

6.2 Sky Guides:

- x All Sky Guides delivered, except some remaining to be collected from Mike

7. Youth Project

- x Amith noted that not much interest has been shown by members
- x Now opening to schools, and children between ages 8 and 15 are encouraged to join
- x Max no = 10 to begin with

8. Events

8.1 Monteseel

- x Monteseel 30 April.
- x A big event is expected. Help with telescopes and public needed
- x Sheryl Venter is coordinator for Monteseel but might not attend for the evening
- x We have bookmarks to hand out as freebies, but can also enquire about setting up a stall
- x Mike Hadlow has masks to try and sell or hand out. Soon masks will not be required
- x Old Sky Guides can be handed out even if the calendar is out of date.

8.2 Viewing evenings

- x If people enquire about public viewing they will be invited to Monteseel
- x Further dates end of May.

8.3 Sutherland Trip

- x 6 responses, of which 5 say 'keep deposit'
- x Piet will find out which deposits can be refunded.
- x Not all money was paid over to vendors, so some monies are still secure with ASSA.
- x Not enough time in this year to try and arrange another trip

9. General

- x Subcommittee will decide feasibility of having Astronomy course still this year.
- x Astronomy course could add more interested people to join a trip to Sutherland
- x The next General Meeting will be held on **11th May 2022**
- x Times and venue details will be sent via email and WhatsApp

10. Meeting closed

- x The Chairman closed the meeting at 20:50

ASSA DURBAN ZOOM MEETING DETAILS

Meeting ID: **88037701479**

Passcode: **297674**





Public Viewing Roster ASSA Durban



Dome Master	Phone	Assistant	Telescope Volunteer	New Moon	Public Viewing
Mike Hadlow	083 326 4085	Alan Marnitz	082 305 9600	29 June 2022	3 June 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

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. **VOLUNTEERS REQUIRED:**

Viewing Contacts:	Phone	Email
Mike Hadlow	083 326 4085	mike@astronomydurban.co.za
Alan Marnitz		alan@astronomydurban.co.za
John Gill		john@astronomydurban.co.za

Notice Board

MEETINGS:

- GENERAL MEETING: to be held on **11th May 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/>
- ANNUAL GENERAL MEETING to be held on **13 July 2022**

MNASSA:

- Monthly Notes of the Astronomical Society of Southern Africa.
- Available at www.mnassa.org.za to download your free monthly copy.

NIGHTFALL:

- Fantastic astronomy magazine. Check it out.
- Available from the ASSA website assa.saa.ac.za/about/publications/nightfall/

MEMBERSHIP FEES & BANKING:

- Remember Membership fees for the 2022-07-01 to 2023-06-30 financial year will be due after the Annual General Meeting (2022-07-5) at which the cost of the new financial year will be confirmed.
- **Please note all that have paid later in the financial year will be advised of their adjusted fees once the new fees have been verified. Please all only pay your new year's membership subscription via EFT after 2022-07-15.**



Membership fees 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



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

RESIGNATIONS from ASSA:

Please send an email immediately notifying the Secretary of your wish to resign from the society to : 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

Librarian's Book Review / For Sale:

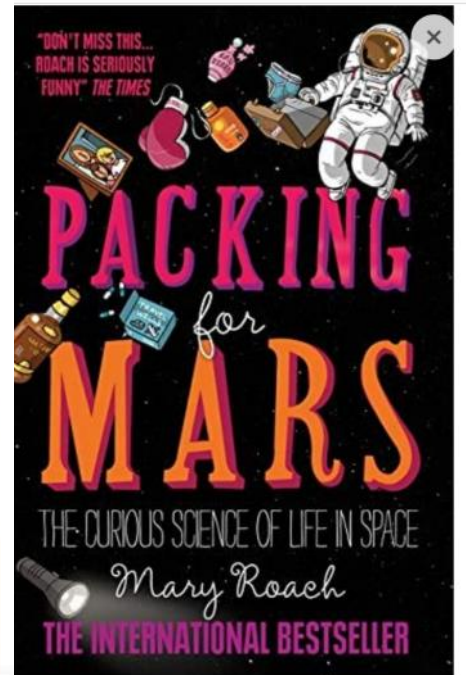
PACKING FOR MARS

By Mary Roach

Space is a world devoid of the things we need to live and thrive: air, gravity, hot showers, fresh produce, privacy, beer. Space exploration is in some ways an exploration of what it means to be human. How much can a person give up? How much weirdness can they take? What happens to you when you can't walk for a year? Have sex? Smell flowers? What happens if you vomit in your helmet during a space walk? Is it possible for the human body to survive a bailout at 17,000 miles per hour?

To answer these questions, space agencies set up all manner of quizzical and startlingly bizarre space simulations. As Mary Roach discovers, it's possible to preview space without ever leaving Earth. From the space shuttle training toilet to a crash test of NASA's new space capsule (cadaver filling in for astronaut), Roach takes us on a surreally entertaining trip into the science of life in space and space on Earth!

(Amazon book review)

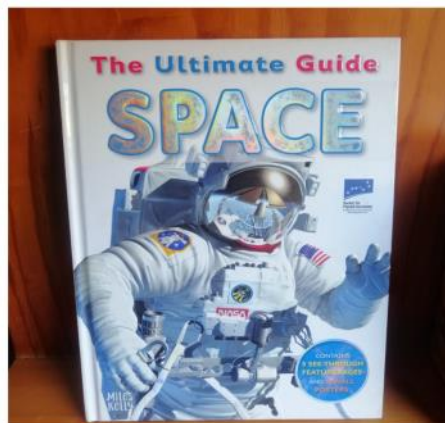


BOOKS For Sale:

The Ultimate Guide to Space
A Miles Kelly book.

R 185:00

Large, Hardcover. Beautifully illustrated.



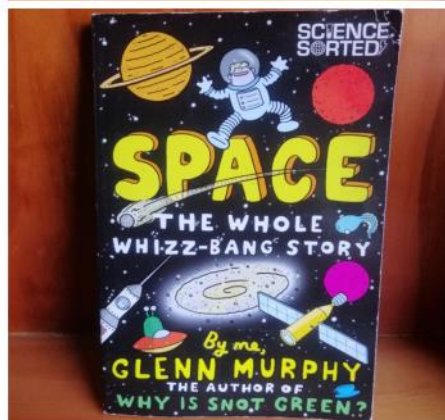
Space.

By Glen Murphy

R 75:00

Paperback, pre-loved.

Packed full of fun information for kids and curious grownups.



Contact Claire:

Claire@astronomydurban.co.za