

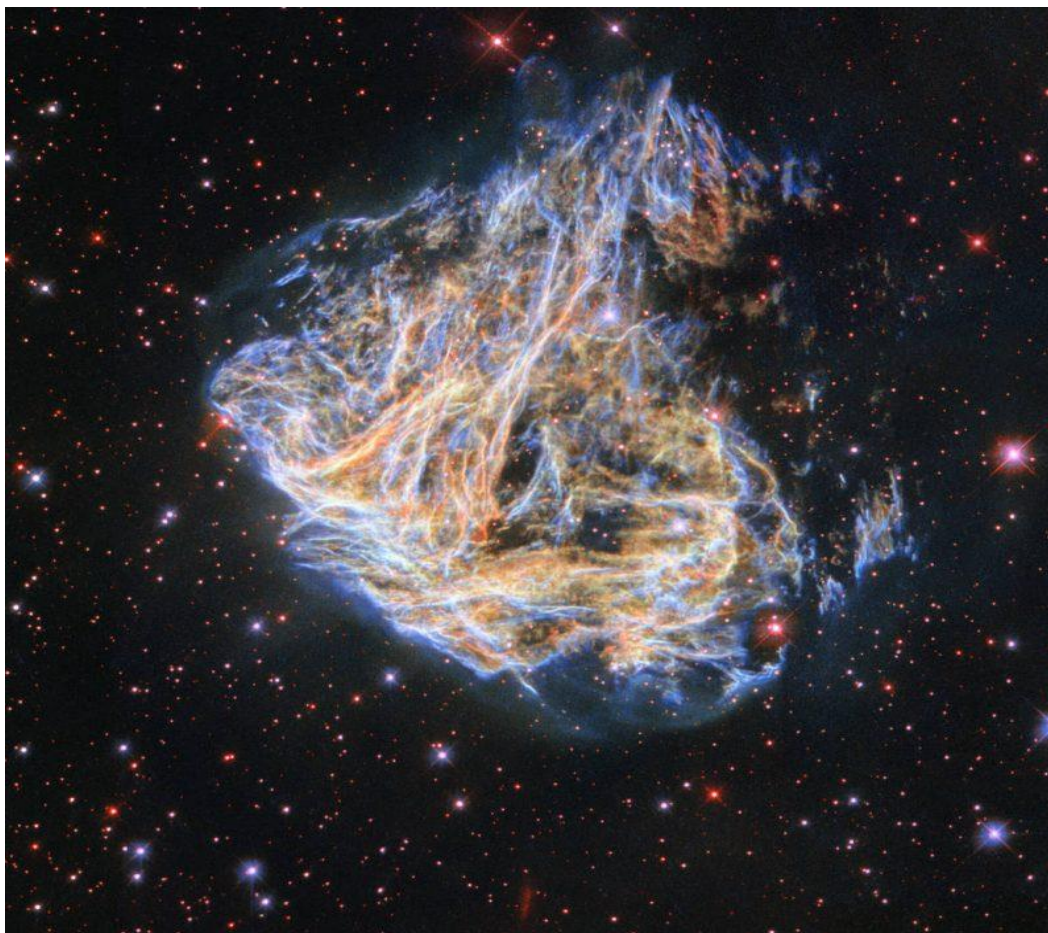


ASTRONOMICAL SOCIETY OF SOUTHERN AFRICA

Durban 'nDaba

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Chairman's Chatter

Greetings ASSA Durban members and welcome to 2023.

This is my first chairman's chatter (I did initially type chairlady but spell check changed it to charlady, so I'll stick with the traditional form). Along with the new year, we have many other changes that have happened recently so this 'chat' may be a bit of an essay.

As Amith mentioned in his last chat, his work commitments do not give him the time he would like to devote to ASSA right now and I was asked to step into the gap (one I thought I had artfully dodged as vice-chair for a few years now). I am far more comfortable at the back of the room but I am counting on the support of committee and members alike to help steer the (space)ship.



It was wonderful to see so many people at our year end dinner; catching up with old friends and meeting some new members too. Claire will be saying a few words elsewhere in the 'nDaba about the dinner.

A major change this year is trying to get back to meeting in person after almost three years of online meetings. On-line certainly has its advantages but it cannot replace seeing friends in person. Please be patient with us as we negotiate our way through the various permutations of in-person, on-line and hybrid. We don't want to lose contact with distance members who have grown accustomed to joining us on line. We also have had the advantage of a far wider range of speakers when we team up with Johannesburg or Cape Town chapters. We will try to get the best of all worlds, so far looking at alternating and/or hybrid meetings; that comes with technical challenges we still have to work out. We know we can't please everyone all the time but hope to please most of the people most of the time - any (constructive) input from members is welcome. For now, January 11th will be hybrid (meeting at the school but with an on-line speaker, Willie Koorts, giving us a virtual tour of Sutherland); February 8th we will join Johannesburg on-line; March 8th we will be back in person at the school (possibly hybrid).

A further challenge to the in-person meetings is the availability of suitable rooms at St Henry's. The pavilion is now a permanent classroom and cannot be used for meetings at all. The hall is regularly hired out for events and so is not always available for our use. We have been offered the use of a science lab but no food or drinks are allowed in that venue so we will have to rethink our usual coffee and biscuits afterwards. Seating about 40 people, the laboratory may not be large enough for the upcoming Intro to Astronomy course we are planning. It is also on the first floor with no lifts so access is a challenge for some of our less mobile members. We are acutely aware that the school does not charge us for use of their facilities and we are grateful for them accommodating us. The meeting room schedule is something the committee is working on with Moya, our liaison with the school. It is a great benefit to us having Moya in our corner.

Something else to look forward to this year is the Intro course I mentioned above. Details will follow but it will likely follow the same 12-module, 6-consecutive-weeks program as before with some on-line and some in-person, depending on availability of the hall if we have more than 40 attendees. Another event is a proposed 'combined' weekend away; sharing space and activities with the geological society, 4x4 club and the backpackers. Such a weekend in 2017 attracted upwards of 60 people from all the groups and was enjoyed by all. A re-run is long overdue. This is earmarked for the long weekend in June (16th – 18th) with Friday being the public holiday and Sunday, New Moon. We are currently looking at venues that can provide both chalets and camping (at the most modest cost possible), dark skies and some interesting rocks nearby. In the meantime, please concrete the weekend in your diary.

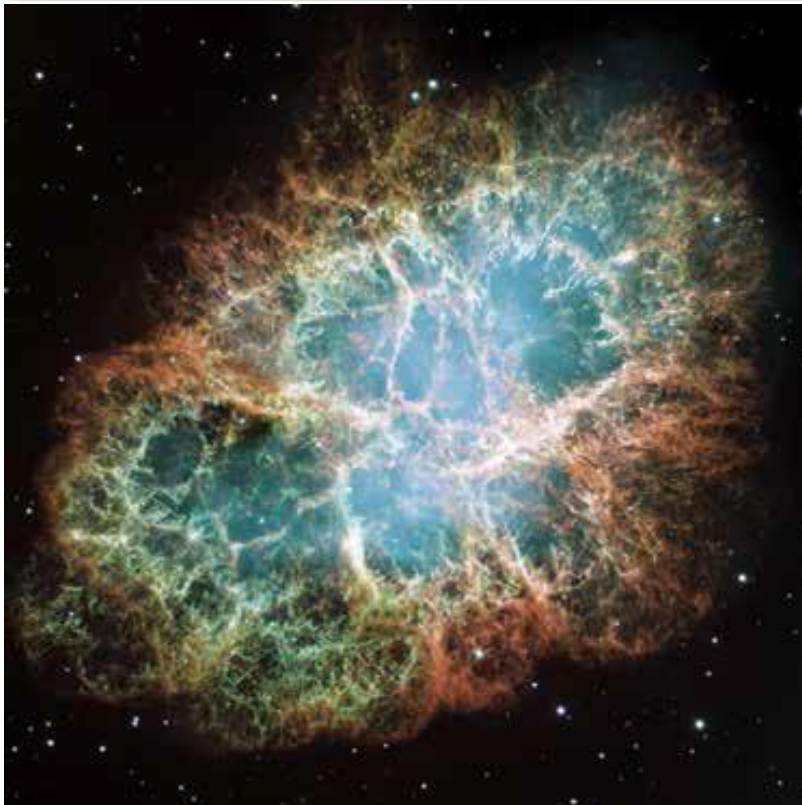
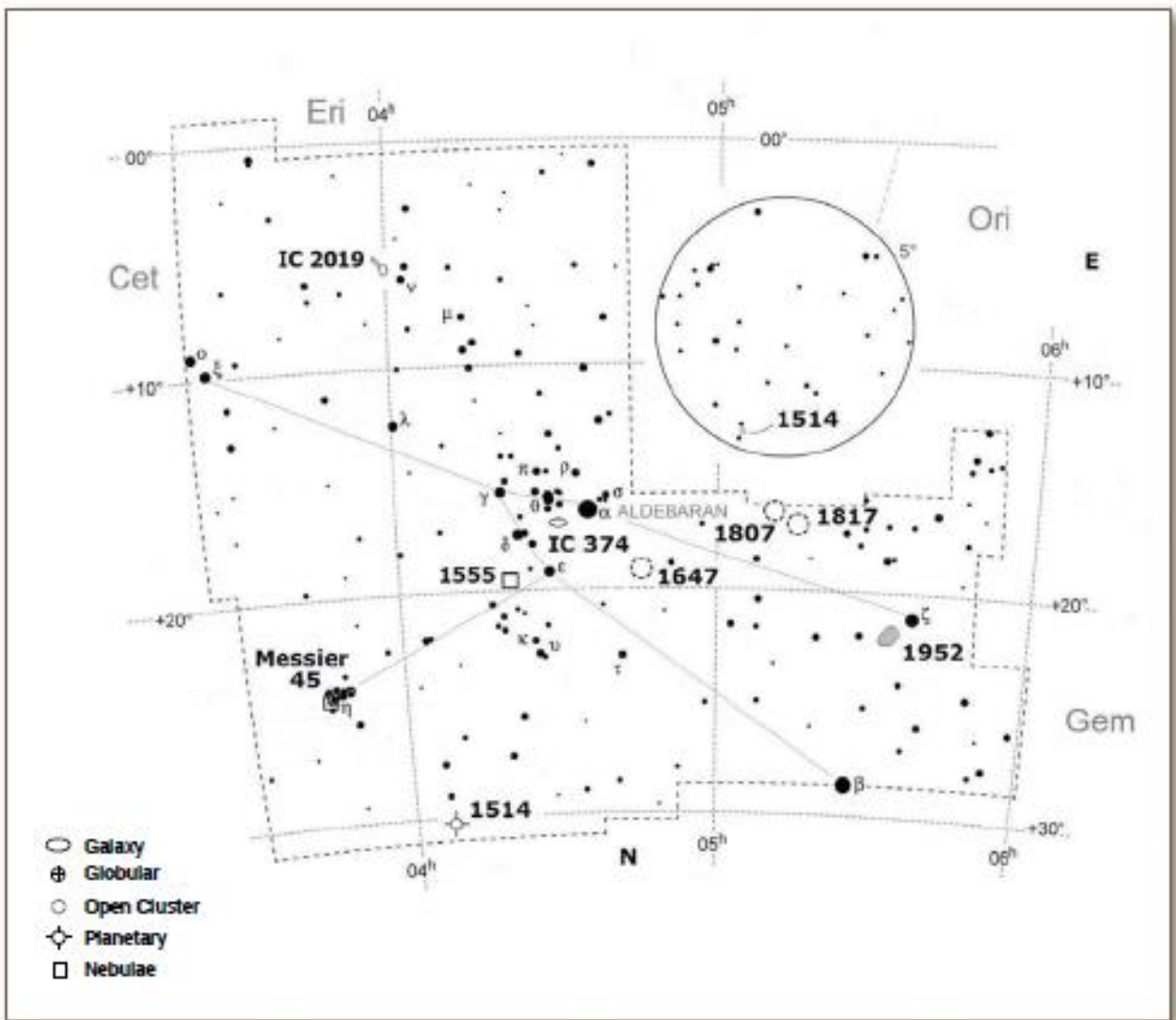
Fiona Khan, who was going to pick up the 'nDaba reins at the end of last financial year, has also succumbed to work pressures and has resigned from the committee. Please give thought to a replacement editor. Corinne and John Gill has helped us out with repeated extensions to their 'nDaba term but I'm sure they would like to finally take the break they was so looking forward to. You can contact one of the committee members at the meeting or by email if you are interested.

Essay complete. Thank you for your attention and hope to see as many of you as possible, in person, on the 11th Jan. For those that cannot make it to the school, this meeting will be hybrid and the zoom link will be distributed before the time.

Regards, Debbie

Astronomy Delights - The Taurus Giants

By Magda Streicher



ABOVE: The Constellation of Taurus

LEFT: NGC 1952 – M1
Photograph: Wikipedia

...The Taurus Giants

The constellation Taurus, the celestial Bull, is one of the oldest to have been designated and is easily recognisable against the northern night sky during the southern hemisphere summer. The Germans call this constellation Stier. It has also been called "rich in maidens", referring to the Hyades and Pleiades clusters. What is clear is that there is an overwhelming number of gigantic and exceptional deepsky objects in this constellation.



The magnitude 1 alpha Tauri conveniently indicates the Bull's red, fiery eye, sometimes referred to as the rival of Mars due to its red-orange colour. The name Aldebaran comes from Al Babaran, the "Follower" of the Pleiades, the best-known open cluster in the night sky. Although Aldebaran appears in the Hyades star cluster, it is actually a foreground star, 68 light-years distant. The naked-eye Hyades group represents the Bull's head and is about 150 light-years away from us.

ABOVE: The glaring [red](#) Aldebaran is the 'eye' of the celestial Bull, Taurus, and is seen at the center here at one tip of the V-shaped Hyades cluster (taken from APOD)

The galaxy **IC 374**, not actually classified as one of this constellation's giants, is situated 50' west from alpha Tauri (Aldebaran), but is something of a challenge to spot as its weak glow competes against the glare of the beautiful star. It is a faint object which becomes slightly brighter towards the middle. While it is faint, it is however quite something for this galaxy to have such a famous and wonderful star as its neighbour.

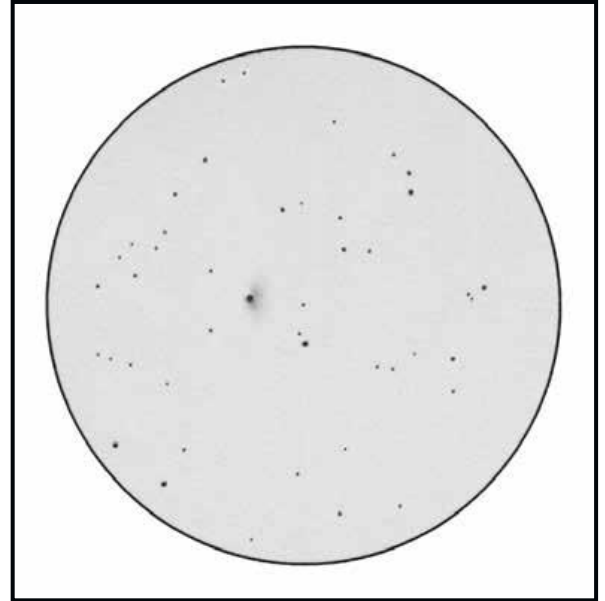


RIGHT: IC 374 Galaxy - Credit Skynet

...The Taurus Giants

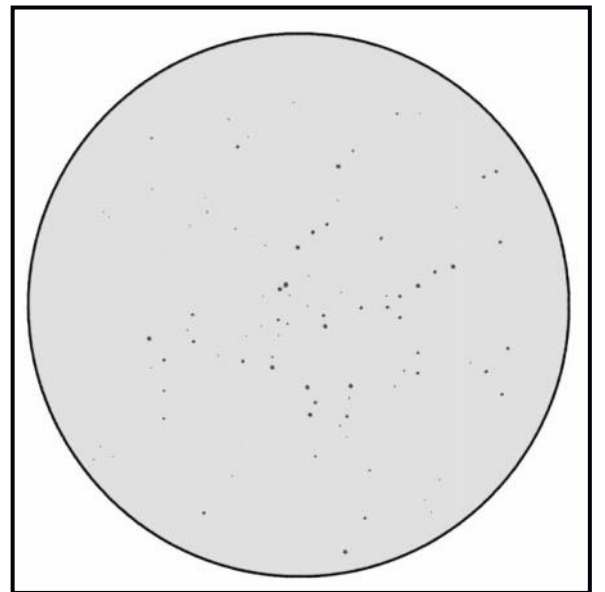
The western eye of the Bull is represented by magnitude 3.5 epsilon Tauri. Continue 1.5 degrees east to locate one of the most famous stars T Tauri and a reflection emission nebula. Variable stars are not uncommon, but here we have one accompanied by a very special object. **NGC 1555**, the variable nebula makes the combination outstanding. The object was also given a separate catalogue number NGC 1554 by Otto Struve in 1868, but has lately been classified as only a close pair of stars 4' to the south-west of T Tauri.

RIGHT: NGC 1555 – Variable Nebula



Russell Hind, who discovered the phenomenon, was an English astronomer employed at the George Bishop's Observatory. On 11 October 1852, during a routine observation, he saw a glow, close to a magnitude 9.8 star in the northern part of the Taurus constellation. It was, in fact, a variable star and variable nebula, now known as Hind's Variable Nebula, or NGC 1555, possibly in the region of 5 million years old. Starlight illuminates the gas and dust surrounding the nebula, which varies between magnitudes 9 to 13.5. Discovered in 1852, it faded from view in 1868 and did not reappear until 1890.

RIGHT: NGC 1647 Open Cluster



The open cluster **NGC 1647** is situated 3.5 degrees north-east from the star Aldeberan. This beautiful cluster is a star grouping with a difference. Also called the Crab Cluster (not to be confused with the Crab Nebula), it displays a loose and widely spaced grouping with long strings of stars with a few pairs in their midst. A collection of approximately 50 stars with various magnitudes. Auke Slotegraaf says the two curving rows of stars towards the west and northwest suggest the pincers of the starry crab. Four shorter outliers mark the tips of the legs and the clump of stars in the middle form its body. NGC 1647 was the first object discovered by William Herschel on 15 February 1784 while testing a new speculum-metal mirror for his 18-inch telescope.

...The Taurus Giants

Approximately 6.5 degrees southeast the twin clusters **NGC 1817** and **NGC 1807** are situated in a field of view with a radius of a mere 30'. The brighter of the two is the western group NGC 1807, which is home to about 30 stars that appear magnificent in composition. The galaxy, PGC 16865 is situated within the southern boundary of NGC 1807. I would certainly not try searching for this extremely faint galaxy, or recommend it as it requires extreme dedication. NGC 1817, situated only 25' north-east of NGC 1807, appears much fainter, but larger and more concentrated. An uneven chain of stars runs through NGC 1817 from north to south.



ABOVE: NGC 1817 and NGC 1807
Photograph: Lucas Ferreira

Most people have admired and marvelled at the outstanding, bright, naked-eye star cluster commonly known as the Seven Sisters, which adorns the night sky at a certain time of the year. Lately, only six members can be seen with the naked eye, due to the slight fading from view of one of the sisters named Celaeno. Of course, this relatively young star cluster, named the **PLEIADES**, or Messier 45, is home to many more stars which cannot easily be seen with the naked eye, as first noted by Galileo in his 1610 book *Sidereus Nuncius*. The fact that it is enveloped in a soft haze has given rise to a general belief that the haze was partly responsible for the development of this young cluster. However, the group is moving through the gas nebula and the two are not at all related. The soft glow enfolding the Pleiades was discovered by Edward Emerson Barnard in 1893. The Pleiades is about 400 light-years away, so in 2010 we saw the starlight of the group around the time Galileo was mapping them with his telescope.



ABOVE: PLEIADES - Photograph: Adam Block

...The Taurus Giants

The Pleiades also offers Barnard's Merope Nebula, or IC 349, discovered by him in 1890 and should not be confused with the cloud of well-known nebulosity around the star 23 Tauri, called the Merope Nebula or NGC 1435. IC 349 is a small, brighter patch within the Merope Nebula. It is only 30" in diameter and situated very close to the star Merope's south-eastern edge. There is also the Maia Nebula, NGC 1432 in the northern part of the cluster which surrounds the star Maia, one of the other sister stars. Search out these faint tendrils in the Pleiades – it is quite a journey.



ABOVE: NGC 1514 – Photograph: Cloudy



ABOVE: IC 2019 – Photograph: In-The-Sky

On the northern edge of the Taurus constellation, catch a glimpse of one of Taurus's hidden jewels. The planetary nebula **NGC 1514** is a favourite of many, and is also known as the Crystal Ball Nebula. The overwhelming centre star, magnitude 9.5, dominates the surrounding nebulosity, but the nebula itself shows up as a halo with faint wisps when viewed through an oxygen (O-III) filter. The north-eastern and south-western edges of the nebula are slightly fainter, which gives it something of a dumbbell shape. A challenge is to spot the magnitude 13 star just off the northern edge of the nebula. This is Herschel's famous "star with an atmosphere", found by him in 1790. It was the key object for his theory that true nebulosity exists to form new stars.

While the Taurus constellation does not contain any bright galaxies, all can be forgiven because there is no shortage of magnificent objects within its boundaries. A pair of interacting galaxies **IC 2019** is situated only a half a degree south-west from nu Tauri. The north-eastern spiral displays a slight elongated shape with the smaller galaxy touching the south-western tip. It is a special pair of galaxies, but so faint it is difficult to observe through amateur telescopes

On the morning of 4 July 1054, Chinese observers sighted a new star close to magnitude 3 zeta Tauri, the Bull's southern-most horn, which remained visible until early in the year 1056. The star, which formed in the wake

of a supernova explosion, could be seen during the daytime for almost 20 days, even rivalling the planet Venus at the time.

...The Taurus Giants

The comet hunter Charles Messier happened to stumble upon a nebula in Taurus on the evening of 12 September 1758. The object known as **NGC 1952** became Messier 1 in his famous catalogue of nebulous objects, a place of honour well deserved. The nova was discovered in 1731 by John Bevis. The diffuse glow appears as a large north-west to south-east cloud which stands out quite well against a busy star field. Higher magnification through a telescope reveals an uneven edge with irregular patches on an otherwise fairly even surface. At magnitude 9, the now known Crab Nebula, is probably too faint to see with binoculars, but is clearly visible



ABOVE: NGC 1952 - Photograph: Lucas Ferreira

through medium-size telescopes. The nebula is about 6500 light-years distant and 11 light-years across. It is identified as a radio source in 1963 and in X-ray wavelengths during 1964. In 1968 (although this was already clear to Edwin Hubble in 1928) it was confirmed to be one of the Milky Way's supernova remnants, containing a spinning pulsar more or less the mass of the Sun but only 10 kilometers in diameter.

On a few nights in January 2003, mother nature positioned the planet Saturn close to the spot where this exploded star appeared in the year 1054. I can clearly recall glancing towards the constellation Taurus, pretending that Saturn was the naked-eye supernova. Through my 16-inch telescope on the night of 3 January 2003, the contrasting, well-defined planet and nebula Messier 1 glowed in the same field of view. It will always remain one of my precious observing memories.

On 13 March 1781, while working his way through the constellation Taurus, William Herschel noticed an object that did not look like a star. He increased magnification and found that the size of the object also increased, unlike in the case of a star which remains a point of light under high magnification. Though the object stood in Taurus, his reference star was I Geminorum, 3.9 degrees east.



During a sweep Herschel suspected he had discovered a comet in the eastern part of the constellation, not far from the Crab Nebula. However, it turned out not to be a comet at all, but in fact the planet Uranus. It had actually been noticed for the first time on 23 December 1690 by John Flamsteed, who catalogued it as the star 34 Tauri, more than 90 years before Herschel's discovery! Flamsteed was a beloved astronomer at the Greenwich Observatory, where he compiled the positions of more than 3000 stars published posthumously by his wife Margaret in 1725.

...The Taurus Giants



Taurus is indeed a constellation liberally strewn with large, well-known and outstanding deep-sky objects. With this in mind, the word large in whatever dimension struck me once again during one of my visits to the Kruger National Game Park. Respect is commanded when earth's largest land animal, the elephant, suddenly appears right in front of you, as if from nowhere, on the road you have to travel on! I could just stare in amusement and fascination at this unique and massive animal.

I recall sitting at the campfire that evening, the sun setting over the bush with a red heavenly glow and stretching out its hand, as it were, towards the stars to swear loyalty and respect for great giants.

OBJECT	TYPE	RA	DEC	MAG	SIZE
PLEIADES Messier 45	Open Cluster	03h47m.5	+24°07'.3	1.5	110'
IC 2019	Galaxies	04h01m.7	+05°38'.3	14-15	1'×0.8'
NGC 1514	Planetary Nebula	04h09m.2	+30°46'.5	10.9	114"
NGC 1555	Reflection Nebula	04h21m.8	+19°32'.1	9-13.5	30"
IC 374	Galaxy	04h32m.5	+16°38'.1	12.7	0.8'×0.4'
NGC 1647	Open Cluster	04h46m.0	+19°04'.7	6.4	45'
NGC 1807	Open Cluster	05h10m.7	+16°31'.3	7	14'
NGC 1817	Open Cluster	05h12m.1	+16°41'.3	7.7	17'
NGC 1952 Messier 1	Supernova Remnant	05h34m.5	+22°00'.1	8.4	6'×4'



NASA's Astrophoto Challenge for 2023

Once again, NASA is presenting its Astrophoto Challenge. It'll run from **January 2 to February 28, 2023**. If you know your way around a computer and are skilled at image processing, this challenge might be for you. The targets of this year's challenge are the [Eagle Nebula](#) with its iconic [Pillars of Creation](#). NASA is providing participants datasets from the ground-based [MicroObservatory Network](#), plus space-based missions including the [Webb Telescope](#), [Hubble](#), [Chandra](#), [Spitzer](#), and [Herschel](#). Using these data sources, participants create their own version of the Eagle Nebula and Pillars of Creation to share with the world.

Find out how it works by visiting [. NASA's Astrophoto Challenge page.](#)



At the Eyepiece

January 2023 by Ray Field

The Earth is at perihelion on the 4th.

The Moon is full on the 7th, last quarter on the 15th, new on the 21st, near Venus and Saturn on the 23rd, near Neptune on the 25th, near Jupiter on the 26th, first quarter on the 28th and near the Pleiades on the 30th and Mars on the 31st. The Moon occults Mars on the 3rd and from Durban, the times are 20:57 “disappears” and after an hour it “reappears” at 21:57.

Mercury is at inferior conjunction between the Earth and Sun on the 7th and is not well placed for observation this month.

Venus, in the morning sky this month is not well placed for observation this month, being on the far side of the Sun as seen from Earth.

Mars, the “red” planet sets between 3:00 on the 1st and 01:00 on the 31st of this month. It is a bright object and should be easily visible with the naked eye. Mars is occulted by the Moon as seen from Earth on the 3rd. From Durban the times are 20:57 “disappears” at 21:57 “reappears”

Jupiter, in Pisces this month, sets at about 23:00 on the 1st and about 22:00 on the 31st.

Saturn sets at about 21:30 at the beginning of the month and at about 20:00 in the evening twilight by the end of the month.

Uranus, just visible to the naked eye under good observing conditions, is in the constellation of Aires, all month. Binoculars are best for finding Uranus, using detailed star maps. A “goto” type telescope is easier. Under high magnification, Uranus looks like a tiny, greenish disc when seen with at least an 8” objective lense.

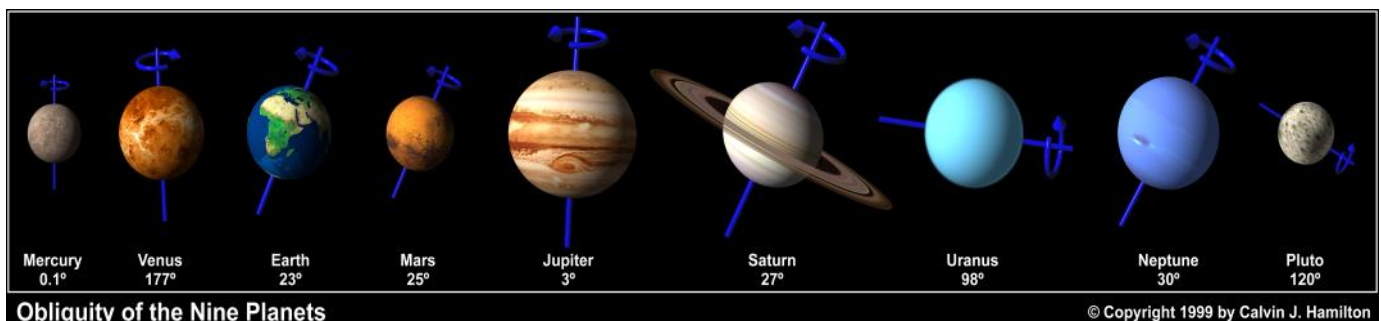
Neptune is fainter and harder to find. It looks “bluish” in colour. Neptune is in Aquarius this month. I have seen it as a tiny disc in my 8” Celestron.

Comets. Comet C/2022 E3 (ztf) is closest to the Sun on the 12th at an estimated visual magnitude of 5.

Meteors. The Alpha Centaurids, reach a maximum ZHR activity on the 8th February. The period of activity is from 31st January to 20 February. Their rate per hour is only 5. Time to watch is from 22:00 to 03:30. The observing prospects are unfavourable. See page 86 of the ASSA Sky Guide 2023 for more details. The radiant of this shower is 59° South.

The starry sky from Durban in the evening this January. The Southern Cross is very low over the Southern Horizon. Orion is up over the Northeast and Grus and the “Southern Birds” are sinking over the West. Sirius is well up below Orion, and over the North, Taurus, with Mars in it and the bright red “Aldebaran” star is noticeable.

References include: Nortons Star Atlas, ASSA Sky Guide 2023 and Sir Patrick Moore’s “Stars of the Southern Skies”



Galaxies and Comet C/2017 T2 (PanSTARRS)

by Brian Ventrudo



Above: Comet C/2017 T2 PanSTARRS Passes by Galaxies M81 and M82. Imaged at Grand Mesa Observatory by Terry Hancock and Tom Masterson (Credit and Copyright: Terry Hancock and Tom Masterson).

While a couple of promising comets have fizzled out this spring, the slow and steady Comet C/2017 T2 (PanSTARRS) is keeping astrophotographers happy as it moves through the northern constellation Ursa Major. On May 24, the comet passed the lovely pair spiral galaxies M81 and M82 near the bowl of the Big Dipper. The event was framed spectacularly in the above image by Terry Hancock and Tom Masterson using the Takahashi E-180 Astrograph at Grand Mesa Observatory in Colorado. This image is a testament to a high level of expertise and it shows how astrophotography at the hands of skilled and talented practitioners can approach high art.

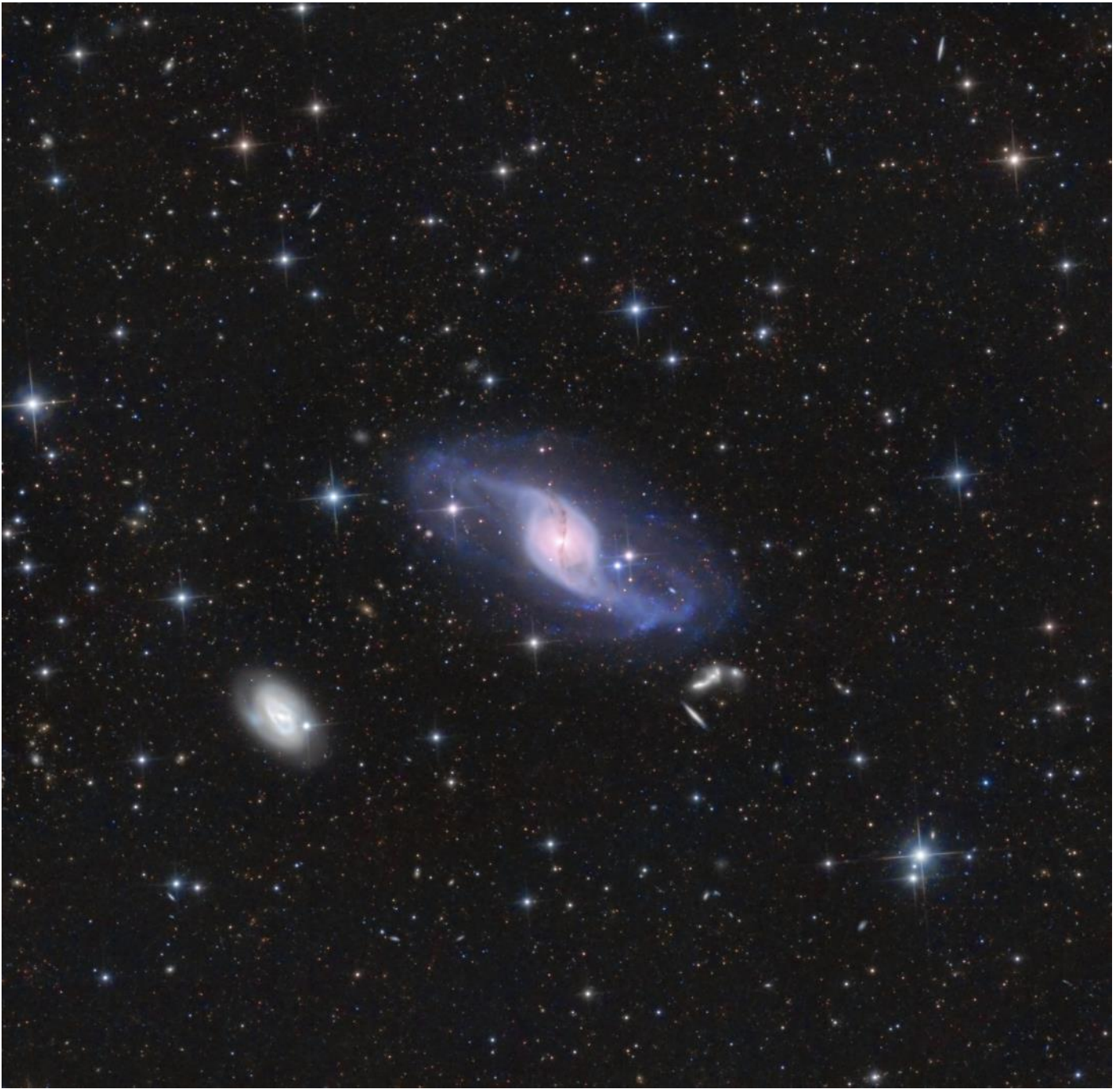
The comet was discovered in October 2017 by the PanSTARRS survey in Maui when it was 8.5 astronomical units away, just inside the orbit of Saturn, and shone at 19th magnitude. It's been making a leisurely approach to the inner solar system ever since. It reached 10th magnitude at the beginning of 2020, passed near the Double Cluster in Perseus on January 22, and reached perihelion on May 7. At the beginning of June the comet shines at a respectable 8th magnitude and is visible in a good pair of binoculars in dark sky. It's a little too far north to be spotted by southern-hemisphere observers.

On its outbound trip this month, PanSTARRS 'photo bombs' a few more well-known and relatively bright stars and galaxies in Ursa Major and Canes Venatici. On, June 4, the comet passes less than a degree from the star Duhbe at the top of the Big Dipper's bowl and spends the next 10 days inside the bowl. On June 15, it passes less than one degree from the star Phecda at the bottom of the bowl, and on June 16 it passes less than one degree from the galaxy Messier 109. On June 23, it enters Canes Venatici and passes less than one degree from the dusty spiral galaxy M106. And on June 30 it passes less than one degree from the star Chara. Mark your calendars for these passes and wander out to see this distant interloper from the Oort cloud. It won't be passing this way again for another 550,000 years.



The Cover Image - NGC 3718

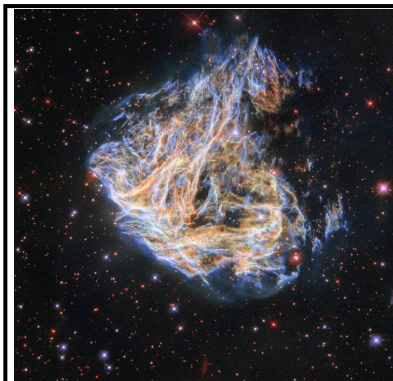
by John Gill



NGC 3718, also called **Arp 214**, is a galaxy located approximately 52 million light years from Earth in the constellation Ursa Major. It is either a lenticular or spiral galaxy.

NGC 3718 has a warped, s-shape. This may be due to gravitational interaction between it and NGC 3729, another spiral galaxy located 150,000 light-years away.

NGC 3718 is a member of the Ursa Major Cluster. The data was kindly supplied by Mark Hanson and processed by myself using PixInsight.



Index Image

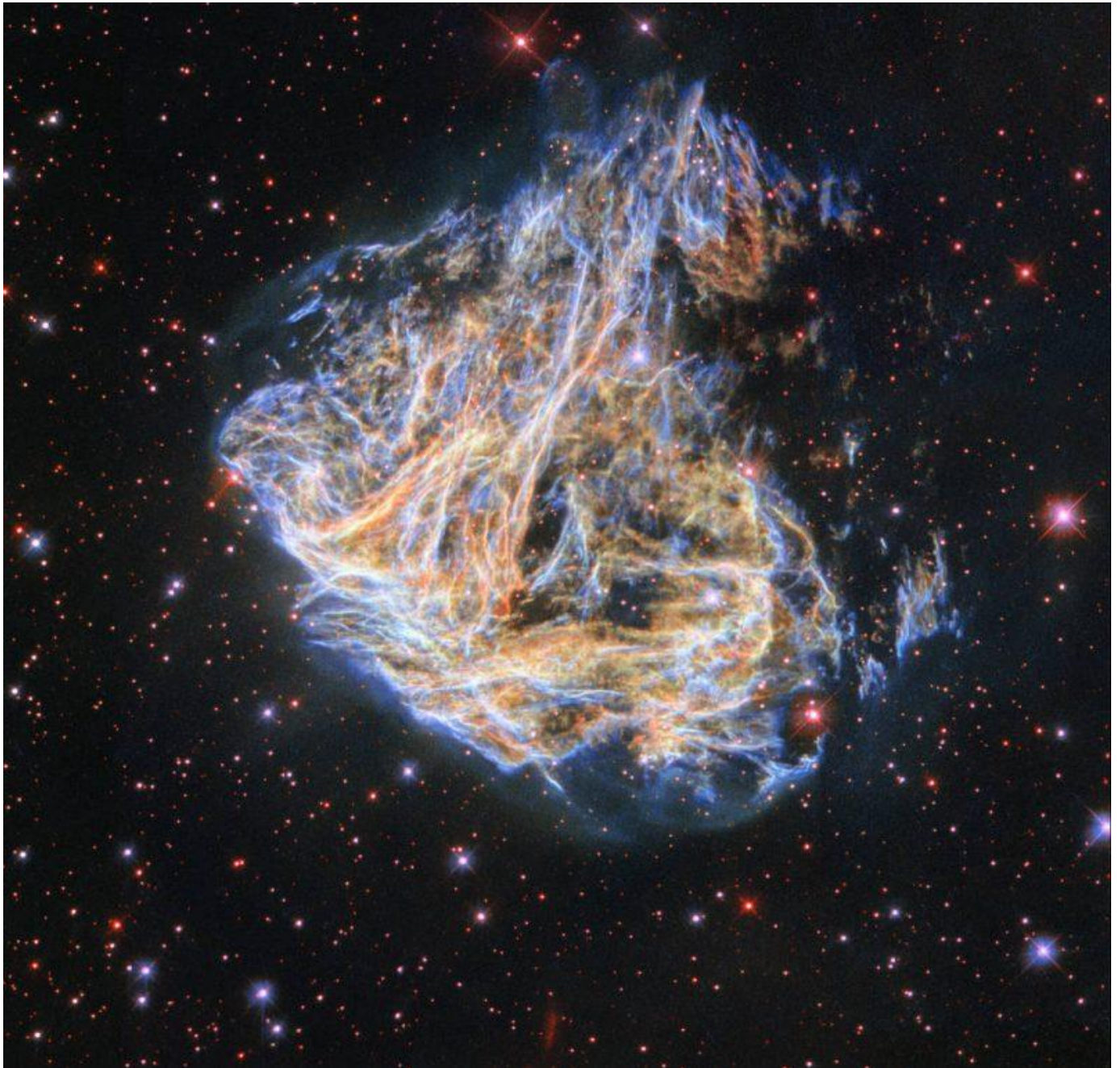
A newly released image from the [Hubble Space Telescope](#) shows celestial fireworks from a supernova remnant known

as DEM L 190, which is the brightest supernova remnant in the [Large Magellanic Cloud](#). Image via [NASA](#)/ ESA/ Hubble/ S. Kulkarni/ Y. Chu.



Celestial fireworks from Supernova explosion

HubbleTelescope / NASA



ABOVE: A newly released image from the Hubble Space Telescope shows celestial fireworks from a supernova remnant known as DEM L 190, which is the brightest supernova remnant in the Large Magellanic Cloud. Image via NASA/ ESA/ Hubble/ S. Kulkarni/ Y. Chu.

Hubble Image of Celestial fireworks

A newly released image from the Hubble Space Telescope shows shreds of the colorful supernova remnant DEM L 190. The delicate sheets and intricate filaments are debris from the cataclysmic death of a massive star that once lived in the Large Magellanic Cloud, a small satellite galaxy of the Milky Way. As a matter of fact, DEM L 190 – also known as LMC N49 – is the brightest supernova remnant in the Large Magellanic Cloud. It shines with an apparent magnitude of +12.7, despite being approximately 160,000 light-years away from Earth in the constellation Dorado.

...Celestial Fireworks

Hubble Image of Celestial fireworks

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Data from 2 instruments

To clarify, this new image combines data from two different Hubble instruments. The first one is the retired Wide Field and Planetary Camera 2 (WFPC2). The second instrument is its replacement, the more powerful Wide Field Camera 3. Nevertheless, during its operational lifetime, WFPC2 produced many memorable images.

First, astronomers used the two WFPC2 investigations of DEM L 190 as a natural laboratory to study the interaction between supernova remnants and the interstellar medium, the tenuous mixture of gas and dust that lies between stars. Then, in the second study, astronomers turned to Hubble to pinpoint the origin of a soft gamma-ray repeater, an enigmatic object lurking in DEM L 190 that repeatedly emits high-energy bursts of gamma rays.

By the way, Hubble also imaged DEM L 190 in 2003. So this newly released image incorporates additional data with improved image-processing techniques, bringing out more detail of the supernova remnant.

Bottom line: A new Hubble image shows celestial fireworks from supernova remnant DEM L 190. The supernova remnant resembles the smoke and streamers of summer fireworks.



Source : <https://earthsky.org/space/celestial-fireworks-from-supernova-explosion/>

Kamargaon Meteorite has Clues to Origin of Life on Earth



The meteorite, which is now called Kamargaon as it crashed in Kamargaon town in the Golaghat district of Assam, India, seven years ago; may hold the secret to origin of life on Earth, as recent research has shown. While researchers are yet to settle on a definitive answer for the origin of this, this meteorite's chemical composition is the biggest hint to this puzzle.

The chemical composition found in the space rock fragments, says that the origin of life began in the core of stars and stardust.

A study by the Indian Institute of Technology (IIT) Kharagpur have claimed that the researcher have found some rare vesicular and pyroxene in minerals for the first time in any chondrite meteorite from the outer solar system and may find new clues about the origin of life.

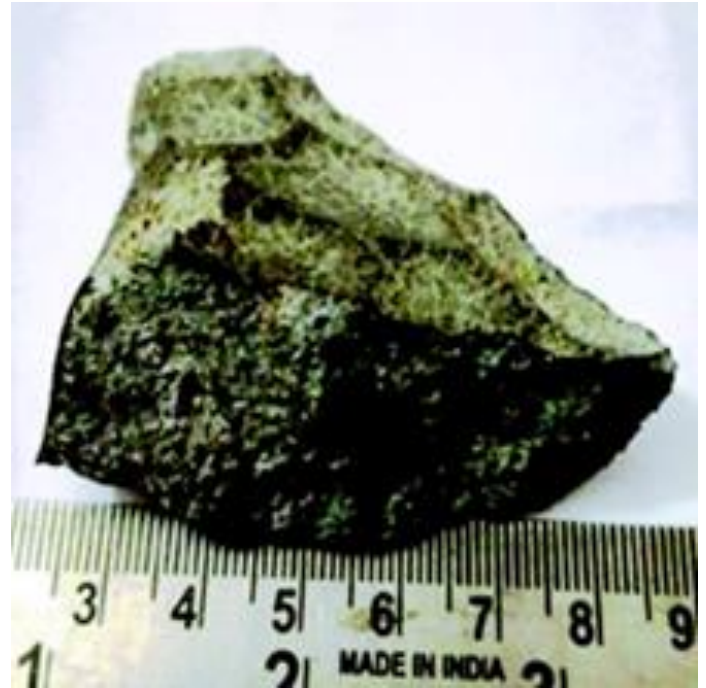
The study of the meteorites is being conducted by researchers in IIT-Kharagpur in collaboration with researchers from Hiroshima University, Japan, and Physical Research Laboratory, Ahmedabad.

Before this study, several other studies have shown that volatile elements such as oxygen, carbon, sodium, manganese, and sulphur are vital elements for life. Hence, tracing the presence of these other elements and other space bodies is important as it can narrate the story of Earthlings.

...Kamargaon Meteorite

The findings of the study have been published in the *Journal of Geophysical Research-Planets*. The study says that for the first time vesicular olivine and pyroxene were found in an ordinary chondrite. "Impact events on the surface of planets and asteroids are one of the most fundamental processes responsible for the formation and evolution of the celestial bodies in the solar system," researchers said in the paper.

The meteorite that crashed in the Assam village, is said to come from the asteroid belt located between Mars and Jupiter, which contains most of the asteroids. As per the study, the space rock was broken down after crashing against another asteroid.



The collision with this asteroid occurred at a high velocity and broke the asteroid into pieces, scattering the smaller pieces of the asteroid, of which some of these mini space rocks fell on the surface of the Earth. In the study, it was discovered that the Kamargaon meteorite came from a massive asteroid over 6.4 kilometers in size.

It is to be noted that shocked meteorites are extra-terrestrial rocks that experience transient high-pressure and high-temperature conditions caused by planetary collisions in outer space and contain abundant fractures subsequently filled with frictional melt known as shock veins.

Previous studies have revealed that volatile elements like oxygen, carbon, sodium, manganese, and sulfur are crucial elements for life and that understanding the occurrence and distribution of these elements in our solar system is important to decipher the story of our own beginning.



Researchers said that the volatile elements present in rocks become mobile at high temperatures and try to escape the rock. Such types of volatile escape from the rock systems create holes on the surface of the rocks known as vesicles. Therefore, these vesicles can be used as a tool to understand the outgassing mechanisms, quantity, and type of volatiles present in the rocks.

...Kamargaon Meteorite

It has been noted that the Kamargaon meteorite contains minerals such as olivine, pyroxene, plagioclase and chromite. Olivine is also found in Earth's upper mantle. It is known to break down into bridgmanite and magnesiowustite in Earth's lower mantle conditions

Table 1: Mineral chemistry of constituent minerals of KomarGaon Meteorite.

Elements (wt %)										Mineral
Fe	Ni	O	S	Si	Mg	Ca	Al	Ti	Cr	
92.00	8.00	-	-	-	-	-	-	-	-	Kamacite
92.30	7.70	-	-	-	-	-	-	-		
92.14	7.86	-	-	-	-	-	-	-		
93.67	6.33	-	-	-	-	-	-	-		
95.49	4.51	-	-	-	-	-	-	-		
93.52	6.48	-	-	-	-	-	-	-		
88.53	-	5.08	-	4.19	2.19	-	-	-	-	Magnetite(?)
73.59	26.41	-	-	-	-	-	-	-	-	Taenite
63.02	14.01	22.97	-	-	-	-	-	-	-	Alloys of Ni-Fe (meteoric iron)
21.54	13.31	65.15	-	-	-	-	-	-	-	
18.98	13.76	67.26	-	-	-	-	-	-	-	
37.40	1.22	61.38	-	-	-	-	-	-	-	
46.92	1.12	51.96	-	-	-	-	-	-	-	
52.27	-	-	47.73	-	-	-	-	-	-	Troilite
10.29	-	-	-	12.50	18.34	-	-	-	-	Olivine
2.80	-	62.70	-	18.50	15.33	0.61	-	-	-	Pyroxene
15.43	-	49.54	-	-	2.33	-	3.63	1.43	27.59	Chromite

Table 2: Bulk chemical composition of Meteorite ((EDXRF)

Compound	Concentration	Unit	Compound	Concentration	Unit
Na ₂ O	1.393	%	Ti	501.72	ppm
MgO	20.25	%	Cr	0.32	%
Al ₂ O ₃	4.02	%	Mn	0.244	%
SiO ₂	35.97	%	Fe ₂ O ₃	21.99	%
P ₂ O ₅	735.72	ppm	Ni	0.32	%
SO ₃	5.51	%	Cu	53.03	ppm
Cl	392.15	ppm	Zn	55.01	ppm
K ₂ O	1366.91	ppm	Se	6.90	ppm
CaO	1.72	%	-	-	-

For a full report on the mineral break down go to the below Reporting Mineralogy And Chemistry of Kamargaon Meteorite, Assam, NE India: <https://www.semanticscholar.org/paper/Reporting-Mineralogy-And-Chemistry-of-Kamargaon-NE-Majumdar-Sunder-Raju/83d6a8c91534bc47b409c11c8ba69a7824dbc298>

Sources:

<https://www.researchgate.net/profile/Dilip-Majumdar/>

https://www.researchgate.net/publication/321242903_Reporting_Mineralogy_And_Chemistry_of_Kamargaon_Meteorite_Assam_NE_India/links/5a168272aca272dfc1ed0715/Reporting-Mineralogy-And-Chemistry-of-Kamargaon-Meteorite-Assam-NE-India.pdf

<https://www.livemint.com/science/news/meteorite-that-crashed-on-assam-has-the-clue-to-origin-of-life-on-earth-11671453857567.html>



ASSA Year End Dinner

After a 3 years of mostly online meetings, our year end meet-up was a wonderful opportunity to catch up with old friends and introduce new members! Close to 40 people attended the dinner which was held at St. Henry's Marist College. It's nice to be back home.

The evening was filled with chatter, load-shedding, melodious tunes, a raffle, the occasional game and a delicious dinner! The dinner and desert was provided by Kreative Hands Catering with some festive mince pies! Tasty and well worth the wait.

Super special thanks once again to one of our members Graham Alston for serenading us with live music from yester-year, and his lovely voice.

Jenny Dunn was the lucky winner of the raffle and hamper which included a laser pointer, a 1000 piece puzzle of the Earth, an ASSA shirt autographed by American astronaut Don Thomas,. She donated back the puzzle for a redraw, which was won by Debbie Able.

It was really nice to see everyone again, and hopefully this year will bring us together many more times under very wonderful circumstances!



2023 Moon Phases and Dates

Lunation	New Moon		First Quarter		Full Moon		Third Quarter		Duration
1237					7 Jan 01:07		15 Jan 04:10		29d 10h 36m
1238	21 Jan 22:53		28 Jan 17:18		5 Feb 20:28		13 Feb 18:00		29d 10h 13m
1239	20 Feb 09:05		27 Feb 10:05		7 Mar 14:40		15 Mar 04:08		29d 10h 17m
1240	21 Mar 19:23		29 Mar 04:32		6 Apr 06:34		13 Apr 11:11		29d 10h 49m
1241	20 Apr 06:12		27 Apr 23:19		5 May 19:34		12 May 16:28		29d 11h 41m
1242	19 May 17:53		27 May 17:22		4 Jun 05:41		10 Jun 21:31		29d 12h 44m
1243	18 Jun 06:37		26 Jun 09:49		3 Jul 13:38		10 Jul 03:47		29d 13h 55m
1244	17 Jul 20:31		26 Jul 00:06		1 Aug 20:31		8 Aug 12:28		29d 15h 06m
1245	16 Aug 11:38		24 Aug 11:57		31 Aug 03:35		7 Sep 00:21		29d 16h 02m
1246	15 Sep 03:39		22 Sep 21:31		29 Sep 11:57		6 Oct 15:47		29d 16h 15m
1247	14 Oct 19:55		22 Oct 05:29		28 Oct 22:24		5 Nov 10:36		29d 15h 32m
1248	13 Nov 11:27		20 Nov 12:49		27 Nov 11:16		5 Dec 07:49		29d 14h 05m
1249	13 Dec 01:32		19 Dec 20:39		27 Dec 02:33				29d 12h 25m

Special Moon Events in 2023

- **Micro Full Moon:** 7 Jan
- **Super New Moon:** 21 Jan
- **Micro Full Moon:** 5 Feb
- **Super New Moon:** 20 Feb
- **Penumbral Lunar Eclipse visible in Johannesburg on 5 May**
- **Black Moon:** 19 May (third New Moon in a season with four New Moons)
- **Super Full Moon:** 1 Aug
- **Micro New Moon:** 16 Aug
- **Blue Moon:** 31 Aug (second Full Moon in single calendar month)
- **Super Full Moon:** 31 Aug
- **Partial Lunar Eclipse visible in Johannesburg on 28 Oct – 29 Oct**

2023 Moon Phases Calendar

Jan	7:☉	15:☉	21:☾	28:☾
Feb	5:☉	13:☉	20:☾	27:☾
Mar	7:☉	15:☉	21:☾	29:☾
Apr	6:☉	13:☉	20:☾	27:☾
May	5:☉	12:☉	19:☾	27:☾
Jun	4:☉	10:☉	18:☾	26:☾
Jul	3:☉	10:☉	17:☾	26:☾
Aug	1:☉	8:☉	16:☾	24:☾, 31:☉
Sep	7:☾	15:☾	22:☉	29:☉
Oct	6:☾	14:☾	22:☉	28:☉
Nov	5:☾	13:☾	20:☉	27:☉
Dec	5:☾	13:☾	19:☉	27:☉



Refer to <https://www.timeanddate.com/moon/phases/south-africa/cape-town> to gain more insight into the type of moons and the description thereof.

Happy Viewing !!!



Public Viewing Roster ASSA Durban



Dome Master	Email	Assistant	Telescope Volunteer	Public Viewing
Alan Marnitz	alan@astronomydurban.co.za	TBC	TBC	20th January

PUBLIC VIEWING:

Public viewing is on site at the Marist Brothers St Henry's School in the dome and around the pool area; usually the first Friday evening closest to the New Moon.

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!!!

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 Alan Marnitz on cell number 082 305 9600, or via email: alan@astronomydurban.co.za

VOLUNTEERS REQUIRED:

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.

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 TUTORIAL:

Mike Hadlow to organise an afternoon / evening to train volunteers as Dome Masters and the use of the large telescope. Date to be confirmed and viewing dates will be announced ASAP.

Viewing Contact:	Phone	Email
Alan Marnitz	082 305 9600	alan@astronomydurban.co.za

Notice Board

MEETINGS:

- GENERAL MEETING to be held on **9th November 2022** via Zoom <https://us02web.zoom.us/j/88037701479?pwd=UU5xMUJFjbWlVWUtd1Y1I2ZDNQdz09> @ **7:30pm**.
- PUBLIC VIEWING MEETINGS - please refer to website under the tab "Viewing and Events" for any updates with regards dates & public viewing, please click here: <https://astronomydurban.co.za/events-viewing/>

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.sao.ac.za/about/publications/nightfall/

MEMBERSHIP FEES & BANKING:

- **Membership Subscriptions were due on the 2022-07-01 for the 2022-2023 financial year. PLEASE pay outstanding subscriptions.**
- **Please pay Subscription fees via EFT.**



Membership fees indicated below:

- Single Members: **R 190:00**
- Family Membership: **R 230:00** for family membership.
- Under 18 members: **Free to join meetings**
- Cash/Cheques: **Please note: NO cheques or cash will be accepted - Cash deposits incur bank charges**
- Account Name: **ASSA Natal Centre**
- Bank: **Nedbank**
- Account No. **1352 027 674**
- Branch: **Nedbank Durban North**
- Code: **135 226**
- Reference: **SUBS 22-23 SURNAME and FIRST NAME**
- Proof of Payment: treasurer@astronomydurban.co.za

SKY GUIDE 2023 - Limited number will be available !!!

- SKY GUIDES

RESIGNATIONS from ASSA:

Please send an email immediately notifying the Secretary at secretary@astronomydurban.co.za stating your wish to resign from the society.

COMMITTEE POSITIONS & CONTACTS:

• Chairman	Debbie Abel	Debbie@astronomydurban.co.za
• Vice Chair	TBC	
• 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	Alan Marnitz	Alan@astronomydurban.co.za
• Observatory Assistant	TBC	
• Publicity & Librarian	Claire Odhav	Claire@astronomydurban.co.za
• Out-Reach - Public	Rowena Baldew	Rowena@astronomydurban.co.za
• Out-Reach - Schools	Sihle Kunene	Sihle@astronomydurban.co.za
• St. Henry's Marist College Liaison	Moya O'Donoghue	Moya@astronomydurban.co.za
• 'nDaba Editor	John & Corinne Gill	John@astronomydurban.co.za
• Website & Facebook	John Gill	John@astronomydurban.co.za

ELECTRONIC DETAILS:

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- Emails : AstronomyDurban@gmail.com
- Instagram: <https://www.instagram.com/astronomydurban/>
- Facebook: <https://www.facebook.com/groups/376497599210326>