



ASTRONOMICAL SOCIETY OF SOUTHERN AFRICA

Durban 'nDaba

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Chair's Chat



Greetings and salutations all.

Let me be the first to say it – 177 days to Christmas (as of writing). The year has turned the corner and we are in the latter stretch. With our Basic Astronomy course starting on 4 July, and the AGM on the 12th, this month will be busier than most (which is quite an achievement lately) and this too will soon be a blurred memory for some of us. But the weather has cleared for the most part (just one small flood) and for that we are eternally grateful.

June's viewing was moved a week due to the long weekend but we were able to host a successful public viewing the following Friday (thank you Mike, Alan & team). Dr Mike Watkeys (a 'retired' geologist – the type you have to make an appointment with months ahead because he's off geologising somewhere on the globe) held our attention at the general meeting with his presentation on ancient astronomers. Sadly, many members realised too late what they missed and we have had to ask him to return to repeat the talk. His earliest availability is probably September (13th) so ink in the diary and watch this space (and the what's app group) – last chance. These talks are not be recorded.

As mentioned, the Basic Astronomy course starts on the **4th July**, for 5 evenings over 3 weeks. We have had to condense the course to work with the availability of the hall during the school holidays. In doing that, we have course modules on the second Wednesday which is our general meeting night – being July, it is also our AGM night. In trying to accommodate everything, we have opted to run the first module as usual with the second module shortened to finish by 7pm. That will give us an hour to hold the AGM from 7 to 8pm before the lights go out so **members, please join us at 7pm** (or at 6pm if you wish to hear about telescopes and other equipment). The urn will be hot at 8pm and we can have a mini social and 'coffee by candlelight' after business. **The AGM will be in person at the school hall on the 12 July.** If you would like to help the society get back on its feet and grow after some trying times, please consider standing for committee. This past year has been a bit of a challenge with a reduced team and we need to get back up to full strength as the requests for our outreaches have increased notably of late. The end goal is to get back to in-person meetings on a regular basis and spread the message about our glorious universe to the community at large. Please forward your names to the Secretary@astronomydurban.co.za and experience offered.

We need YOU for this.

It is that time of the year again - \$\$\$\$\$. Annual fees are due at the beginning of July, pretty pretty please. Individual member fees increased nominally from R190 to R210 for the year; family members (living in same house) from R230 to R250. **Please pay by EFT** Into the ASSA Durban account (bank details at the end of the Ndaba) and email proof of payment to Francois at treasurer@astronomydurban.co.za. **Please don't deposit cash or cheques** (if cheques still exist) as it costs us a fortune in bank charges (relative to the fees). Much appreciated.

See you all at the AGM on the 12th @ 7pm.

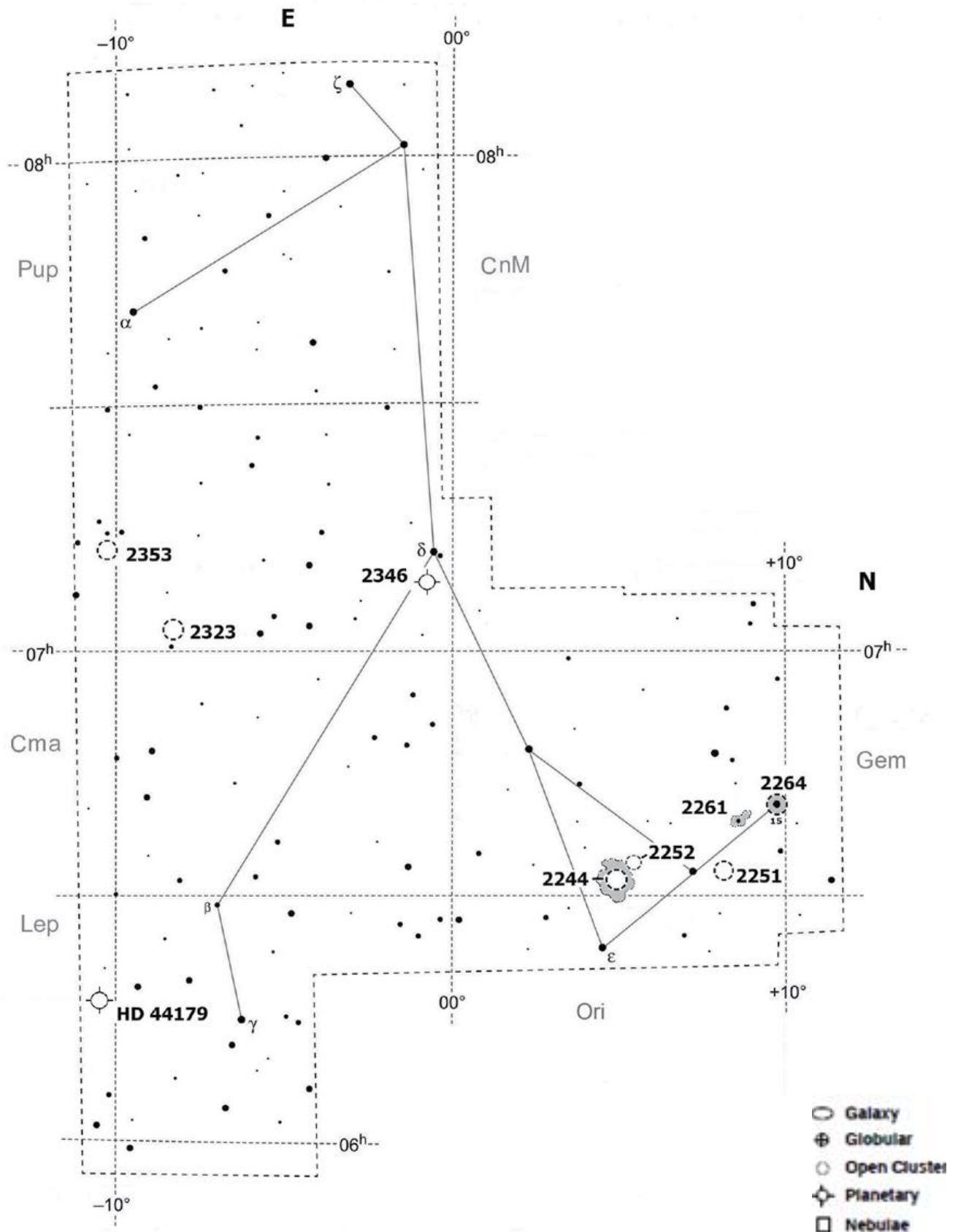
Happy viewing 'till then.

Debbie



Astronomy Delights - Mythical Monoceros

The Unicorn of the Skies

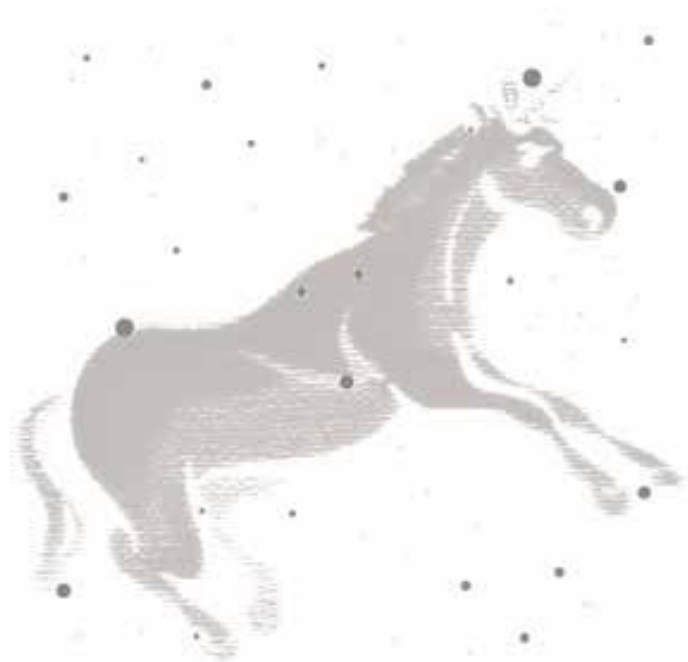


The constellation of Monoceros

...Monoceros

On the north-eastern slopes of the well known Orion constellation the Monoceros Unicorn gallops on in the direction of Gemini the twins. The constellation lacks stars brighter than magnitude 4, but is blessed with beautiful nebulae and star clusters. Various myths surround the reflection of the image, one of which is the misinterpretation of what we know today as the rhinoceros.

Sometimes Monoceros loses out as far as interest is concerned to its famous neighbours. Nonetheless, Monoceros is not insignificant, housing, as it does, few exceptional and interesting, frequently described objects.



ABOVE: NGC 2353 - Photograph: CloudyNights

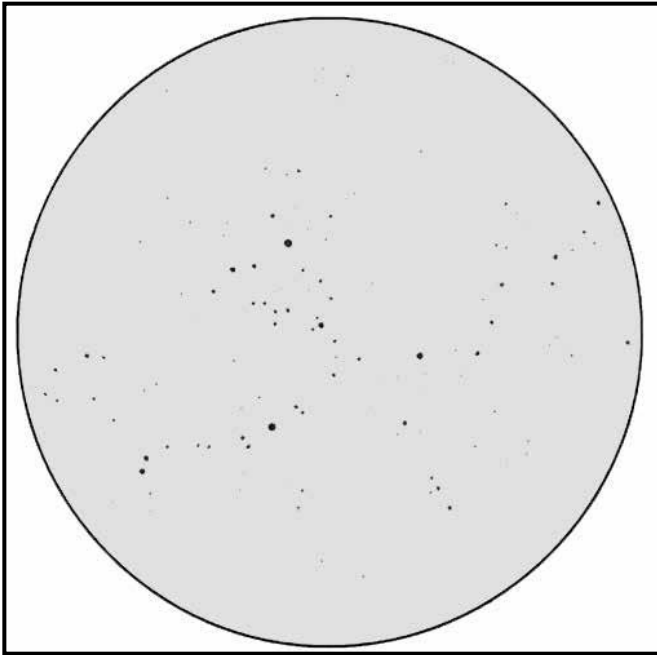


Only a few arc-minutes north of the boundary with Canis Major, approximately 3000 light-years away, hangs the star cluster **NGC 2353** in a haze of nebulosity. What a lovely cluster of approximately two dozen varied-magnitude stars in a slightly elongated north-east to south-west oval. A dark lane appears to divide the group into two parts: the northern section, with slightly brighter stars arranged in an arrow-like shape that brings to mind the typical traffic arrow indicating which way to go. Several fainter stars comprise the southern part; accompanying a magnitude 5.9 shiny white coloured star. A pair of magnitude 10 stars indicate the heart of the Group.

However, the star cluster NGC 2353 conceals a slight hitch. The star field is quite busy and the controversy involves the listed NGC 2353 (H V111-34), discovered by William Herschel. William's son, John Herschel, never found NGC 2353 (H V111-34), which he most certainly would have in the same star field sweep. However, he did document NGC 2351 (h437), with a one degree error from his father William. There is strong evidence that the two objects NGC 2353 and NGC 2351 as described are one and the same.

LEFT: NGC 2351 – Credit: Theskylive.com

...Monoceros



One of Monoceros's famous objects is the open cluster **NGC 2323**, perhaps better known as Messier 50, which can be found easily with only the aid of binoculars, and is located 4 degrees west of NGC 2353. However, NGC 2323 is a large, bright cluster which could easily contain 80 stars or more. The north-eastern part is quite compressed, with several chains and stars in pairs that represent the indicated look. Two prominent strings spread out to the south-east and north-west, create the impression of the wings. The grouping, in an elongated north-west to southeast direction might resemble, perhaps, a bird in flight – or a housefly, to use the words of astronomy friend Sue French!

ABOVE: NGC 2323 – M50 Open Cluster



ABOVE: NGC 2323 – M50 – Photograph: Dale Liebenberg

In the far west of the constellation the hind leg of the horse figure may be seen as represented by the star beta Monocerotis, also called Herschel's Wonder Star. What a lovely trio of blue-white stars in a tight, slender formation, which leaves an impression to remember. The three stars, classed with a spectrum of Type-B2, vary in magnitude: 4.7, 5.2 and 6.1 respectively.

...Monoceros

An object discussed among amateurs is the Red Rectangle Nebula indicated as HD 44179, about 4 degrees south and in a triangle with beta and gamma Monocerotis and a degree north of the boundary with Canis Major. The Red Rectangle adjoining the star ranks right up as one of the most difficult objects ever to discern. What is fascinating is all the nicknames given to many of the objects that leaves one with thoughts of nostalgia and amazement, but oh dear, to try and discern this object as a faint little rectangle is nearly impossible. The nebula, so called because of its red colour and unique rectangular shape, is a proto planetary nebula. It was discovered in 1973 during a rocket flight associated with the AFCRL Infrared Sky Survey called Hi-Star. The combine system was first discovered by Robert Grant Aitken in 1915.



ABOVE: Red Rectangle Nebula indicated as HD 44179 Credit: www.Astropage.eu



ABOVE: NGC 2244 Credit: WWW.Walmart.com

Perhaps the best-known object and most certainly a very beautiful object is situated 2 degrees east of epsilon Monocerotis in the far north-western field of the constellation. The nebula is a large, low surface brightness object covered with faint star dust, but can unfortunately be appreciated to its full only with slightly larger power than binoculars. This lovely ring of segmented areas is assigned with different NGC numbers, but it is advisable to use a nebular filter with a medium size telescope to bring out the various parts in full. The brightest part of the nebula is situated mostly in the north-western part. The crown of this beautiful, hazy rosette is the star cluster NGC 2244, which is enveloped within the superfine nebulosity. The tight grouping contains perhaps a few dozen very hot Type -O stars of various magnitudes. The object as a whole is about 90 lightyears distant and more than 25 light-years across. It is an outstanding, rich area in combination with flimsy pieces of nebulosity, faint stars dotted in and around to make this one of the most special objects to have been discovered. The name Rosette had achieved currency only in the early 1950s, but was fairly well known by 1955.

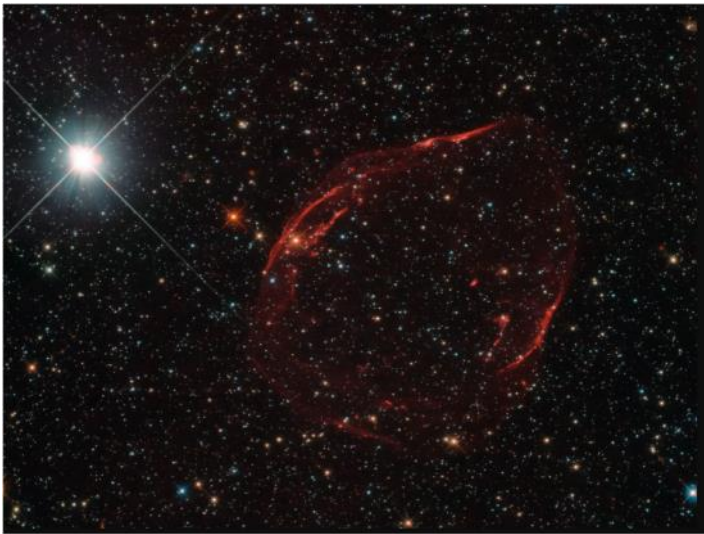
...Monoceros

The north-eastern inner wall of the nebula is much wider but fainter, with the cluster **NGC 2252** situated on the edge. This grouping is one of those rare types which in starlight tell a story without words. The irregular shape can be described as a fish-hook decoration in a north-south direction with the hook on the northern edge.



RIGHT: NGC 2252 - Credit: cseligman.com

BELOW:: NGC 2251 Image Credit Scitechdaily.com



A further 3.5 degrees north is **NGC 2251**, another storybook cluster not to be missed. If you ever see a star formation resembling an eye, complete with eyelashes, then this would be it! A knot of brighter stars represents the focus eye, occupying the spot inside a half-moon eyeball shape looking west. Star points flick out towards the east, just like a nice and curly eyelash. Small open clusters are a joy to observe and most of the time a starry story can be seen in their numerous shapes.

Another degree further north-east the well-known and very special variable star R Monocerotis accompanies a fan-shaped Nebula. Known as Hubble's Variable Nebula, or **NGC 2261**, it displays a reflecting comet-like nebula with the star R Monocerotis at the southern tip. Although faint and not so easy to discern, the western side of the nebula seems slightly brighter. It was named after the young Edwin Hubble in 1916, which discovered that the nebulosity around the young hot star R Monocerotis varied in brightness and shape. It is a classic reflection nebula with powerful stellar winds that produce the comet-like nebula we see today. Hubble's Variable Nebula was the first object photographed by the 200-inch Hale Telescope at Mount Palomar in 1949. I am totally convinced that a number of backyard amateurs excitedly believed they had discovered a new comet, only to be disappointed when they found out what it really was. Note that the magnitudes and sizes of the indicated Emission and Reflecting Nebulae are just estimated.

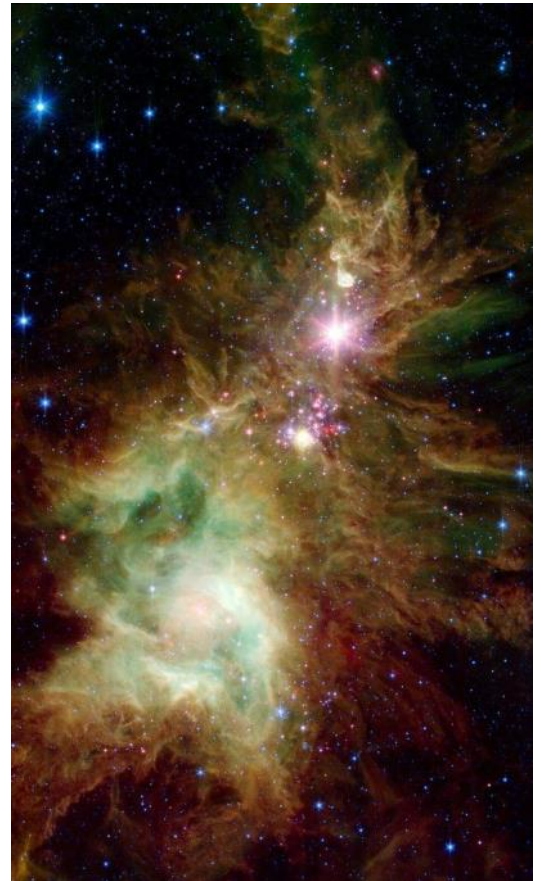


ABOVE: NGC 2261 - Image :Mistsoftware.com

...Monoceros

Less than 2 degrees from the boundary with Gemini, is **NGC 2264**, another splendid object in an outstanding field of view. It is nicknamed the Christmas Tree Cluster because of its triangular shape. To find it, locate 15-Monocerotis in the far northern part of the constellation, and you'll be right in the midst of it. This bright, large cluster, which spans more or less half a degree in a north-south direction, is easily seen through binoculars. Careful observation through a telescope, however, reveals about 20 stars embedded in flimsy nebulosity, which tapers down to the south, ending with the famous Cone Nebula (LBN 912), an obscure dust cloud which is extremely difficult to see. Higher magnification reveals a mist of Christmas decorations shining like sparkling faint stars, covering the starry tree in frosted glitter. NGC 2264 is more or less 20 light-years in diameter and approximately 3000 light-years away.

RIGHT: NGC 2264 - Image: annesastronomynews.com



ABOVE: NGC 2346 Image: www.astronomy.com

The magnitude 4 delta Monocerotis can perhaps be seen as the rounding of the horse's back in the overall shape of the constellation. The planetary nebula **NGC 2346** is only 40' west from the star. The object is not that difficult to observe, despite being somewhat small in size. Averted vision causes a blinking effect, which is a good way to glimpse detail like the central star and the light-grey colour of the nebula. Higher magnification will reveal a hazy edge with a more obvious confirmation of the planetary nebula as a whole.

Dress warmly and get on the back of the starry Unicorn, stop on your way and drink from the ponds of delights it has to offer.

OBJECT	TYPE	RA	DEC	MAG	SIZE
HD 44179	Reflecting Nebula	06h19m.8	-10°38'.4	9	30"
NGC 2244	Open Cluster	06h32m.4	+04°51'.3	4.8	23'
NGC 2251	Open Cluster	06h34m.7	+08°22'.6	7.3	10'
NGC 2252	Open Cluster	06h35m.0	+05°23'.0	7.7	20'
NGC 2261	Reflecting Nebula	06h39m.2	+08°44'.0	3.5	3'x2.5'
NGC 2264	Nebula and Open Cluster	06h41m.1	+09°53'.4	3.9	30'
NGC 2323 Messier 50	Open Cluster	07h03m.2	-08°20'.0	5.9	16'
NGC 2346	Planetary Nebula	07h09m.3	-00°48'.0	11.6	55"
NGC 2353 NGC 2351	Open Cluster	07h14m.6	-10°18'.0	7.1	18'

At the Eyepiece - July 2023

by Ray Field

The Earth is at Aphelion on the 6th July 2023

The Moon is full on the 3rd, last quarter on the 10th, new on the 17th and first quarter on the 26th. The Moon is near Antares on the 1st, Pluto on the 4th, Saturn on the 7th, Neptune on the 8th, Jupiter on the 11th, Uranus on the 12th, the Pleiades (Messier 47) on the 13th, the Beehive cluster (Messier 44) on the 14th, Pollux on the 17th, Mercury on the 19th, Regulus on the 20th, Mars on the 21st, near Spica on the 25th and Antares again on the 28th.

Mercury is at superior conjunction (*A superior conjunction occurs when a Solar System body, such as a planet, asteroid or comet, lies along a straight line joining the Earth and the Sun, but is on the opposite side of the Sun from the Earth. The elongation of a Solar System body at superior conjunction is zero degrees*) and therefore not visible on the 1st, near the Beehive cluster (Messier 44) on the 14th, the Moon on the 19th, near Venus on the 27th and Regulus on the 29th.

Venus is at its greatest brilliancy on the 7th, near the Moon on the 20th and 21st, near Mercury on the 27th and near Regulus on the 29th.

Mars is near the Moon on the 21st. Mars, in Leo, is too near the Sun around the 21st to be seen. It is otherwise an evening object in the twilight during July 2023.

Jupiter, the largest planet in our Solar System, is in Aires this month. Its 4 brightest moons should be able to be seen with binoculars or a small telescope. It rises about 02:00 at the start of the month and rises about midnight by the months end.

Saturn, the ringed planet in Aquarius this month, is in the night sky for nearly the whole night. To the naked eye it looks like a fairly bright "star". Its rings need a telescope to be seen and even a smallish one of say 50mm objective, will do. The brightest moon of Saturn, Titan, is about the size of the planet Mercury, and should be visible in a smallish telescope. Saturn rises about 22:00 at the start of the month and by about 19:30 at the end of the month.

Uranus, in Aires this month, is just visible to the naked eye under "good" seeing conditions. Looking North, Aires is to the left of the Great Square of Pegasus, which is not very bright and is low down as seen from Durban. Refer to pages 36 and 37 of the ASSA Sky Guide 2023 for useful charts on specific dates when interesting alignments of stars and planets occur.

Meteor Showers –

Name	Max	Active	ZHR	Watch	Radiant
Piscis Austrinids	28 July	15 Jul - 10 Aug	5	21:30-05:00	30°
S Delta Aquarids	30 July	12 Jul - 23 Aug	25	22:00-05:00	16°
Alpha Capri-cornids	30 July	03 Jul - 15 Aug	5	20:00-04:00	10°

3 meteor showers are given in the Sky Guide this month, they are as follows:

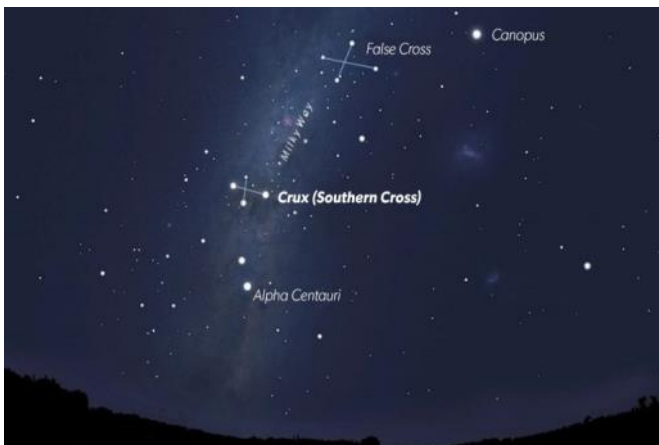
The observing prospects for all three is poor. (See table 13 ASSA Sky Guide, page 86)

The Starry Sky from Durban. Starting as soon as night falls you can locate the Southern Cross, followed by its pointers as it has just passed over its highest point above the southern horizon.

...At The Eyepiece

The rich “3 Crosses” area of Southern Region of the Milky Way is worth scanning in binoculars, and looking at interesting objects with a telescope. A “goto” facility on a telescope would be useful if you have the NGC number for the object. Leo, the Lion followed by Virgo are setting in the West. The brightest star Arcturus, orange in colour and the fourth brightest star in the sky is low over northern horizon. It is 36 light-years away. Scorpius, to the left of the Southern Cross, has risen, followed by Sagittarius. Ara, the Altar, acts as a link between Triangulum Australis and the tail of Scorpius. Over the northern horizon, Hercules starts up with a pretty little Northern Crown to its left.

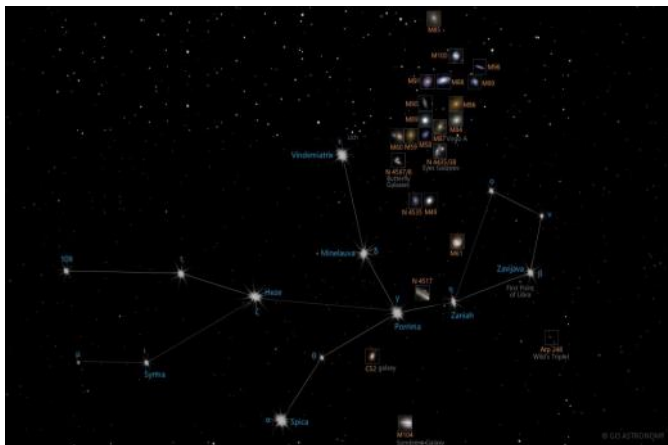
References include ASSA Sky Guide 2023, Norton’s Star Atlas, Stars of the Southern Skies by Sir Patrick Moore, Philip’s Planisphere for 35° S.



ABOVE: NGC 4755 is an open cluster in the constellation Crux, the Southern Cross. It is known as both the Jewel Box and the Kappa Crucis cluster.



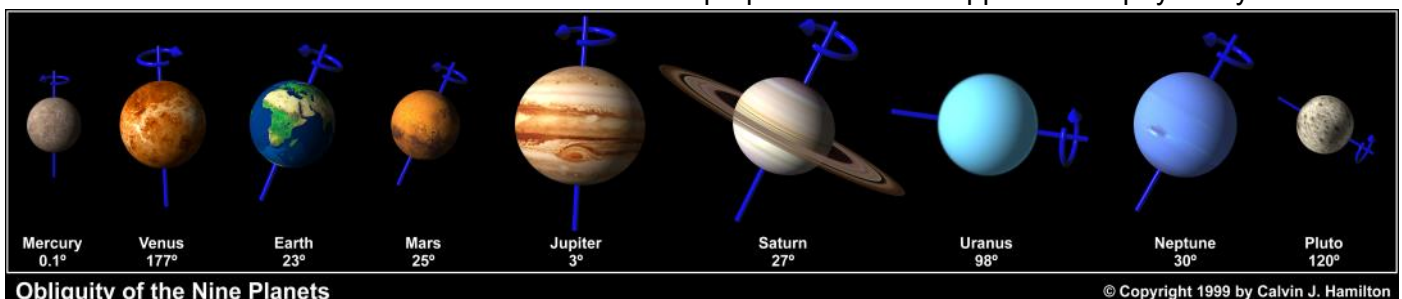
ABOVE: Leo contains many bright galaxies; Messier 65, Messier 66, Messier 95, Messier 96, Messier 105, and NGC 3628 are the most famous, the first two being part of the Leo Triplet



ABOVE: Virgo Cluster-is a galaxy cluster found in the constellations Coma Berenices and Virgo. The center is located approximately 53.8 million light-years away from the solar system, at the center of



ABOVE: The Arcturus stream is a moving group or stellar stream, comprising 53 stars moving at 275,000 miles per hour, which includes the nearby bright star Arcturus. It comprises many stars which share similar proper motion and appear to be physically associated.



Occultation (304) Olga / TYC 0036-01313-1

2023 Jul 20, 02:51 UT Visible from S Africa

Summary:

On 2023 Jul 20 UT, the 68.9 km diameter asteroid (304) Olga will occult a 11.8 mag star in the constellation Pisces for observers along a path across S Africa.

In the case of an occultation, the combined light of the asteroid and the star will drop by 2.13 mag to 13.77 mag (the magnitude of the asteroid) for at most 3.210 seconds.

This update is based on, astrometry for the asteroid kindly provided by the IAU Minor Planet Centre.

This work has made use of data from the European Space Agency (ESA) mission Gaia (<http://www.cosmos.esa.int/gaia>), processed by the Gaia Data Processing and Analysis Consortium (DPAC, <http://www.cosmos.esa.int/web/gaia/dpac/consortium>). Funding for the DPAC has been provided by national institutions, in particular the institutions participating in the Gaia Multilateral Agreement.

Event at a glimpse:

- * Rank: 100
- * Date and approx. time of event: 2023 Jul 20, 02:47 - 2023 Jul 20, 02:55
- * Geocentric midpoint of event [JD]: 2460145.61891821
- * Magnitude of target star: 11.81 / * Magnitude drop [mag]: 2.13
- * Estimated maximum duration [s]: 3.210
- * Moon: 5 % sunlit, 113° distance / * Sun: 87° distance
- * Rough path description: S Africa

The Occultation Path

- * Approximate projected width [km]: 85
- * 1 sigma uncertainty interval [path widths]: +/- 0.06
- * 1 sigma uncertainty interval [seconds]: +/- 0.5
- * 1 sigma uncertainty interval approx RA,DE ["]: (+/- 0.009, +/- 0.003)
- * 1 sigma uncertainty ellipse (major, minor, PA): (0.010", 0.002", 76°)
- * Approx speed of asteroid's shadow [km/s]: 21.4437
- * Website source for maps: <http://www.asteroidoccultation.com>

Path Coordinates:

Occultation of TYC 0036-01313-1 by 304 Olga on 2023 Jul 20

East Longitude			Centre Latitude			U.T.	Star Alt	Star Az	Sun Alt	Path Limit 1 Latitude		
°	'	“	°	'	“	h m s	°	°	°	°	'	“
28	00	00	-29	41	41	02 49 41.1	49	49	35	-28	-30	4 43
29	00	00	-29	40	33	02 49 45.4	49	49	33	-27	-30	3 34
30	00	00	-29	39	31	02 49 49.7	50	50	32	-26	-30	2 33
31	00	00	-29	38	37	02 49 54.0	50	50	30	-25	-30	1 39
32	00	00	-29	38	51	02 49 59.3	50	50	29	-24	-30	0 53
33	00	00	-29	38	12	02 50 02.7	51	51	28	-24	-30	0 13
34	00	00	-29	36	40	02 50 07.1	51	51	26	-23	-29	59 42

...Occultation - Olga

Uncertainty in time = +/- 1 secs - Prediction of 2023 May 29.0

Data for the Target star

* Name: TYC 0036-01313-1	* Constellation : Pisces
* BCRS position with proper motion to date of event [h,m,s ; °,']	
RA: 01 59 30.5777 DE: +05 53 28.284	
* GCRS Astrometric position with proper motion and parallax to date of event [h,m,s ; °,']	
RA: 01 59 30.5779 DE: +05 53 28.285	
* Position source: Gaia DR3	* Standard error: RA,DE [mas]: (0.100,0.100)
* V mag [mag]: 11.8	* Diameter [mas]: 0.00

Data for the Minor planet

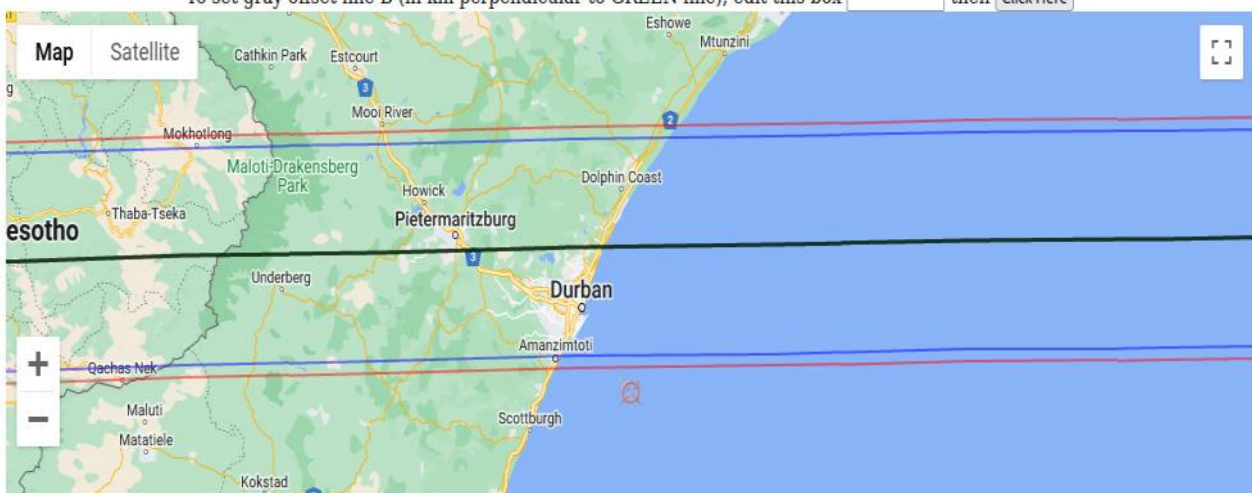
* General information:	
(Number) Name: (304) Olga	Asteroid class:
Approx. diameter [km]: 69	Approx. diameter ["]: 0.057
Distance from Earth [AU]: 1.66800	
Asteroid position offset in RA [mas]: 0	Asteroid position offset in DE [mas]: 0
* Orbital information:	
Orbit source: JPL#69	Date of fit: 2023 Feb 11
Source of used astrometry: MPC, JPL	
Number of used observations: 0	Number of rejected observations: 0
Time covered by the observations: 1800 Jan 01 - 1800 Jan 01	
1 sigma uncertainty ellipse (major, minor, PA): 0.010", 0.002", 76.099°	
* Orbital elements for (304)Olga :	
Mean anomaly = 16.7943611599 deg /	Arg. of pericenter = 172.5609113989 deg
Long. of node = 159.0136520983 deg /	Inclination = 15.8479245482 deg
Eccentricity = 0.2218037687 /	Semimajor axis = 2.4033955239 AU
Perihelion dist = 1.8703133391 AU	Mag: H = 9.90, G = 0.07
Epoch of elements : MJD 60145.11895833 TDT / (2023 Jul 20.1190)	

Occultation of TYC 0036-01313-1 by 304 Olga on 2023 Jul 20

Use + or - in following input boxes to decide which side of the GREEN line to draw line.
 A + value places a line on the True Right Hand Side of the path (in direction of increasing time).
 When this page initially opens, one gray line is set further out from the center (GREEN) path.
 The further displaced gray line (as you zoom in) is the True RIGHT HAND side of the path.

To set gray offset line A (in km perpendicular to GREEN line), edit this box then [Click Here](#)

To set gray offset line B (in km perpendicular to GREEN line), edit this box then [Click Here](#)



...Occultation - Olga

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</Event>

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 Calculator (s): Steve Preston, stevepr@acm.org, 7640 NE 32nd St, Medina, WA 98039
 Date of update: 2023 May 28, 23:38 UT



Above: This image shows view from Gliwce, Poland, several minutes before occultation of Venus behind the Moon. Photograph by Wojciech Piskorz

Information kindly provided by Nigel Wakefield, Received with many thanks.



Occultation (1961) Dufour / TYC 7396-00196-10036-01313-1

2023 Jul 20, 02:51 UT Visible from S Africa

Summary

On 2023 Jul 20 UT, the 50.2 km diameter asteroid (1961) Dufour will occult a 11.8 mag star in the constellation Sagittarius for observers along a path across S Africa, South America.

In the case of an occultation, the combined light of the asteroid and the star will drop by 4.46 mag to 16.26 mag (the magnitude of the asteroid) for at most 4.120 seconds. This update is based on, astrometry for the asteroid kindly provided by the IAU Minor Planet Centre.

This work has made use of data from the European Space Agency (ESA) mission Gaia (<http://www.cosmos.esa.int/gaia>), processed by the Gaia Data Processing and Analysis Consortium (DPAC, <http://www.cosmos.esa.int/web/gaia/dpac/consortium>). Funding for the DPAC has been provided by national institutions, in particular the institutions participating in the Gaia Multilateral Agreement.

The Event at a Glimpse:

- * Rank: 100
- * date and approx. time of event: 2023 Jul 20, 22:24 - 2023 Jul 20, 22:42
- * geocentric midpoint of event [JD]: 2460146.43986833
- * magnitude of target star: 11.82
- * magnitude drop [mag]: 4.46
- * estimated maximum duration [s]: 4.120
- * Moon: 9 % sunlit, 122° distance
- * Sun: 155° distance
- * rough path description: S Africa, South

The Occultation Path

- * Approximate projected width [km]: 50
- * 1 sigma uncertainty interval [path widths]: +/- 0.05
- * 1 sigma uncertainty interval [seconds]: +/- 2.8
- * 1 sigma uncertainty interval approx RA,DE ["]: (+/- 0.018, +/- 0.001)
- * 1 sigma uncertainty ellipse (major, minor, PA): (0.018", 0.001", 91°)
- * Approx speed of asteroid's
- * website for maps: <http://www.asteroidoccultation.com>
- * website for maps: <http://www.asteroidoccultation.com>

East Longitude	Centre Latitude	U.T.	Star Alt	Star Az	Sun Alt	Path Limit 1 Latitude
° ' "	° ' "	h m s	°	°	°	° ' "
-28 00 00	-29 59 37	22 29 42.4	65	258	-80	-29 45 43
29 00 00	-29 48 04	22 29 35.3	64	257	-80	-29 34 08
30 00 00	-29 36 02	22 29 28.2	63	257	-79	-29 22 04
31 00 00	-29 23 31	22 29 21.2	62	256	-79	-29 09 33
32 00 00	-29 10 33	22 29 14.1	61	256	-79	-28 56 32
33 00 00	-28 57 05	22 29 07.1	60	255	-78	-28 43 03

...Occultation - Dufour

Uncertainty in time = +/- 3 secs - Prediction of 2023 May 29.0

Data for the target star

* Name: TYC 7396-00196-1	* Constellation : Sagittarius
* BCRS position with proper motion to date of event [h,m,s ; °,']"	
RA: 18 16 50.4230 DE: -31 56 14.550	
* GCRS Astrometric position with proper motion and parallax to date of event [h,m,s ; °,']"	
RA: 18 16 50.4229 DE: -31 56 14.551	
* Position source: Gaia DR3	* Standard error: RA,DE [mas]: (0.200,0.100)
* V mag [mag]: 11.8	* Diameter [mas]: 0.00

Data for the minor planet

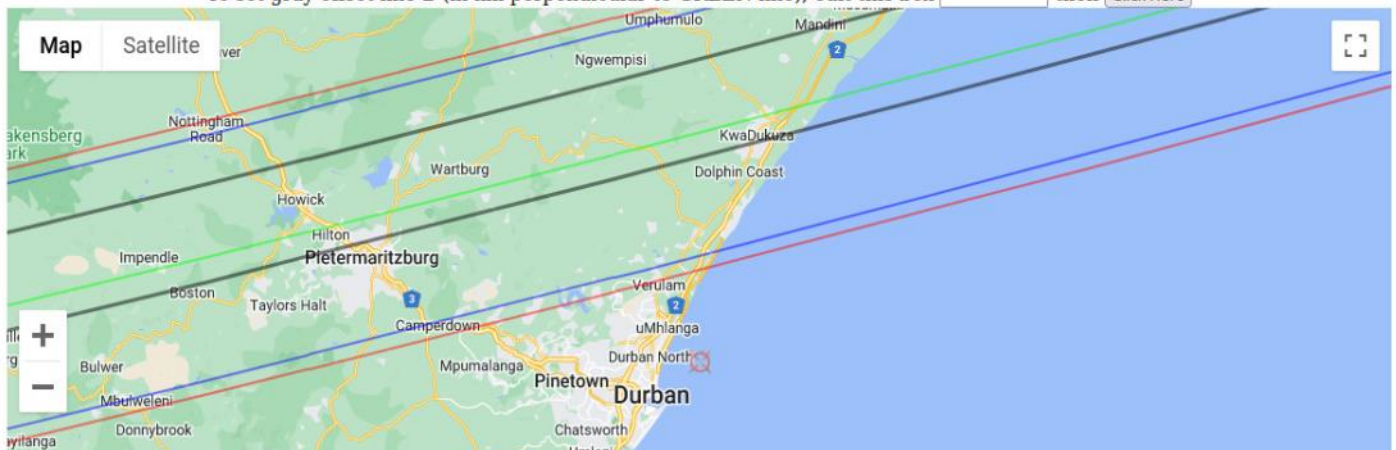
* General Information:	
(number) name: (1961) Dufour	Asteroid class:
Approx. diameter [km]: 50	Approx. diameter ["]: 0.026
Distance from Earth [AU]: 2.63080	
Asteroid position offset in RA [mas]: 0	Asteroid position offset in DE [mas]: 0
* Orbital information:	
Orbit source: JPL#66	Date of fit: 2023 Apr 24
Source of used astrometry: MPC, JPL	
Number of used observations: 0	Number of rejected observations: 0
Time covered by the observations: 1800 Jan 01 - 1800 Jan 01	
1 sigma uncertainty ellipse (major, minor, PA): 0.018", 0.001", 91.489°	
* Orbital elements for (1961)Dufour :	
Mean anomaly = 198.4278227283 deg	Arg. of pericenter = 56.3858886503 deg
Long. of node = 29.5599250285 deg	Inclination = 6.6496676434 deg
Eccentricity = 0.1255815060	Semimajor axis = 3.1908986403 AU
Perihelion dist = 2.7901807836 AU	Mag: H = 10.88, G = 0.15
Epoch of elements : MJD 60145.93979167 TDT (2023 Jul 20.9398)	

Occultation of TYC 7396-00196-1 by 1961 Dufour on 2023 Jul 20

Use + or - in following input boxes to decide which side of the GREEN line to draw line.
 A + value places a line on the True Right Hand Side of the path (in direction of increasing time).
 When this page initially opens, one gray line is set further out from the center (GREEN) path.
 The further displaced gray line (as you zoom in) is the True RIGHT HAND side of the path.

To set gray offset line A (in km perpendicular to GREEN line), edit this box then [Click Here](#)

To set gray offset line B (in km perpendicular to GREEN line), edit this box then [Click Here](#)



...Occultation - Dufour

----- ocelmnt file for Occult BEGIN -----

<Occultations>

<Event>

<Elements>JPL#662023Apr24,4.12,2023,7,20,22.556840,0.000098,-0.002330,-
6.865926,0.316923,0.002320,0.000850,0.000001,0.000000</Elements>

<Earth>-2.2009,-31.9297,-156.74,20.57,False</Earth>

<Star>TYC 7396-00196-1,18.28067305,-31.9373751,0.00,11.82,0.00,0.0,0,,18.30647474,-
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<Object>1961,Dufour,16.26,50.2,2.6308,0,0,-1.802,1.06,,2.8,0</Object>

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</Orbit>

<Errors>1.053,0.0177,0.0014,91,0.0014,Known errors,-1.00,-1,-1,-1</Errors>

<ID>20230720_0196-1,60092.98</ID>

</Event>

</Occultations>

----- ocelmnt file for Occult END -----

=====
Calculator (s): Steve Preston, stevepr@acm.org, 7640 NE 32nd St, Medina, WA 98039
Date of update: 2023 May 28, 23:38 UT

BELOW: Image of the occultation of Mars past the Moon. Credit: <https://www.cieletespace.fr/>

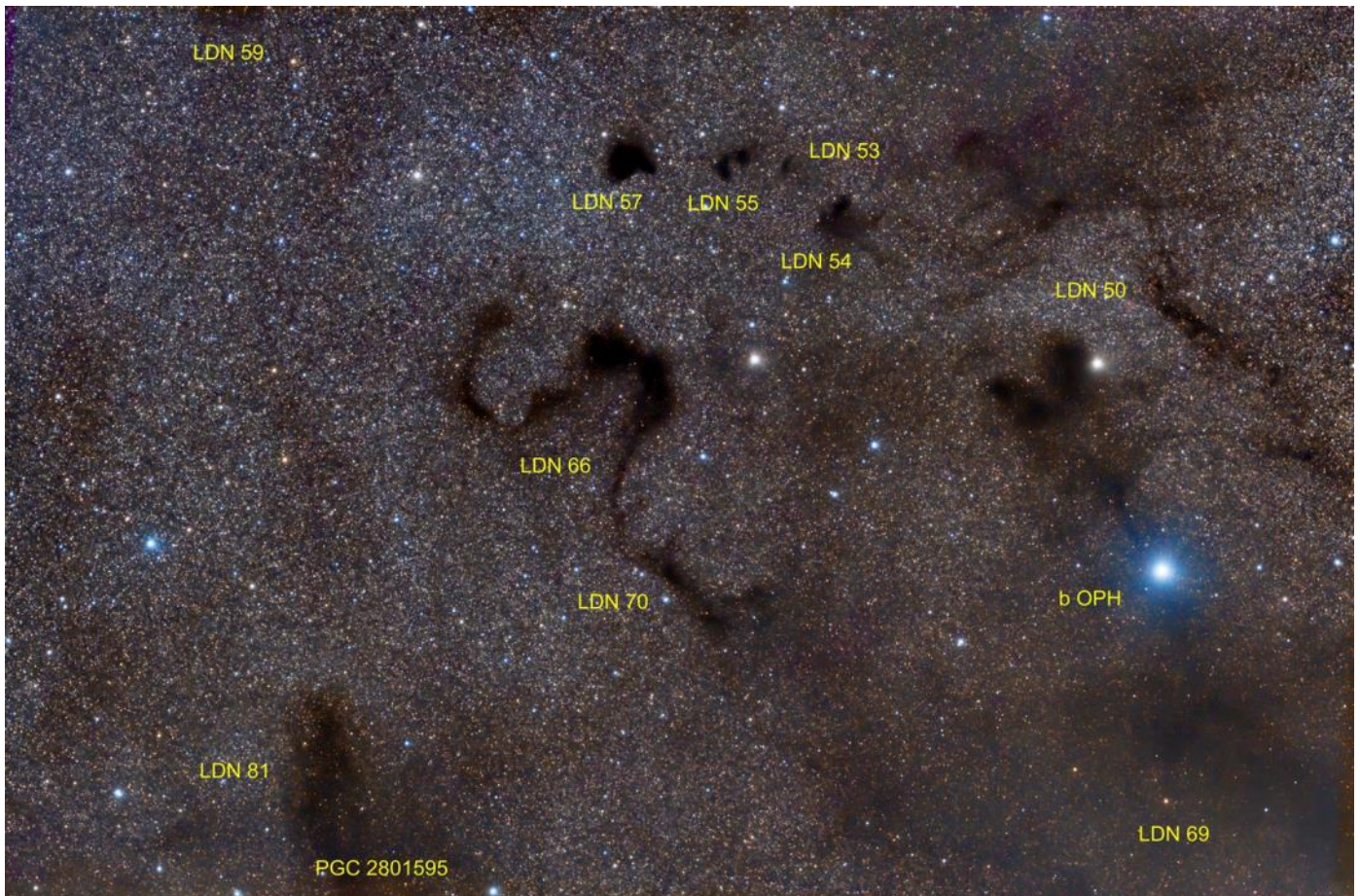


Information kindly provided by Nigel Wakefield, Received with many thanks.



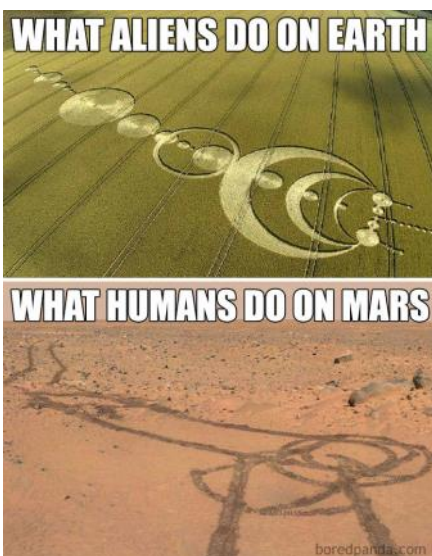
The Cover Image - Snake Nebula LDN 66

By John Gill



The Snake Nebula (also known as Barnard 72) is a dark nebula in the Ophiuchus constellation. It is a small but readily apparent SP-shaped dust lane that snakes out in front of the Milky Way star clouds from the north-north-west edge of the bowl of the Pipe Nebula. Its thickness runs between 2' and 3' and runs around 6' in the north-west / south-east orientation. A good view in a 4" to 6" telescope requires clear dark skies.

This was about 6 hours of mono RGB data captured with an APM 107/700 telescope on a CGX mount and QHY268m camera. Processed in PixInsight.



Upcoming Outreach Events

July 2023

JULY OUTREACH EVENTS



July is one of the few good months for star gazing in Durban. This month's calendar is exceptionally full.

In addition to the Basic Introduction to Astronomy Course, we are holding three Star Parties.

The course starts on the 4 July and goes over 5 evenings in total. Over the years we have recruited many of our members at the course and not only because it includes a year's free membership. The Durban Centre has a very friendly and welcoming vibe. What makes the Durban Centre extra special is the experienced and expert members who generously share their knowledge and experience with newbies.

The first event is on the 15th July as you will have seen in June's nDaba. You will have seen the



flyer on the What's App group. We are going to be with our partners, Monteseel Conservancy, who are as enthusiastic about astronomy as we are. They also have an open field and dark skies. Working members who are bringing their telescopes and the Star Party helpers come in free. Wear your Astronomy T= Shirt or Beanie if you have.



Some of us still may have the old name tags, wear them. Dress warm, bring binos and above all be willing to identify yourself as a true good member of the Durban Centre by helping at events.

The other two July events on 21 and 27 are not open to the members, *other than those who are working on the team*. This is really easy to do when astronomy is your passion. You are doing what you love: identifying celestial objects, learning more and helping others learn.

Contact me, Sheryl Venter, via Whats App 0822022874 to sign up to be a Star Party assistant. It's great fun and you become really integrated into the team.



Astronomy Public Viewing

Friday 23 June 2023

By Sheryl Venter

Alan and Mike Hadlow set up telescopes around the pool. Ooma was there to assist with identifying stars and planets.

Mike managed to align the new dome telescope using a laser beam so that was a good outcome.

As the evening went on, the clouds dispersed. Viewing was reasonably good. The new LED lights put up in the pool area are unresponsive of good viewing conditions yet Alan, Mike and Ooma were unphased.

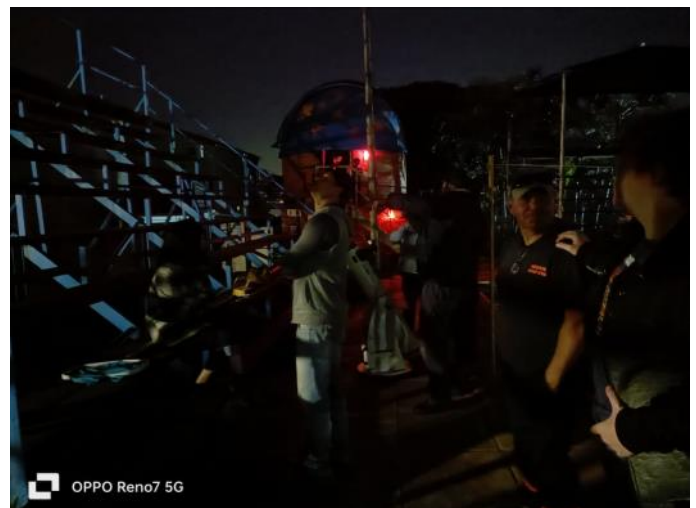
Alan brought his daughter and son in law.



We had six other visiting adults in a group with 3 young children and one of our newest members, Jack, with his father. Always good that parents support their children. That makes 11 in all.

Jack attended Mike's telescope course. He is keen to help at our next few events – July is busy. One of the small children was able to name all the planets in order. I didn't get the names of the group of people who came with the children, the good news is that we could possibly have recruited a new family.

Venus was the most visible planet. We were able to see the stars as they appeared and really missed Ray to tell us what we are seeing without using a phone App. Alan, Mike and Ooma all do a great job of explaining to the guests what they are looking at. Good seamless teamwork.



Education Events & Programs

ASSA Durban will be holding an *Astronomy for Everyone* course in July held at St Henry's Marist College.

Various subjects will be discussed; such as:

- The Solar System
- Our Sun and the Birth of Stars
- The Earth, the Moon, Satellites and Eclipses
- Nearby Stars
- The Milky Way Galaxy
- Near Galactic Neighborhoods
- Telescopes and other Equipment
- Meteors, Asteroids, Comets & Celestial Objects
- Positional Astronomy
- Astrophotography
- Navigating the Southern Sky

This course is designed for all to attend especially those new to astronomy and the use of a Telescope or Binoculars to navigate our galaxy.

Reserve your place urgently as spaces are limited!

2023
Basic Astronomy
5 DAYS | 10 MODULES.
A course by
THE ASTRONOMICAL SOCIETY OF SOUTHERN AFRICA - DURBAN CENTRE.

Dates: 4, 5, 11, 12, 18 July
Time: 18:00-20:00
Venue: Marist Association Hall,
St Henry's Marist College,
Glenwood Drive
(off Mazisi Kunene Road)
Glenwood, Durban

Cost: R300 per person.
Includes a year's membership.

**Bookings essential
as space is limited.**
secretary@astronomydurban.co.za

Your invitation to:
AN EXCLUSIVE VIEWING!

The Durban Astronomical Society welcomes St Henry's students, accompanied by their parents and staff to an exclusive viewing by the members of the society. There will be telescopes set up around the school swimming pool for viewing of the planets, stars etc along with the main feature being access to the large telescope in the dome.

Date: Friday, 21 July
Time: 7:00-9:00
Place: Meet outside the swimming pool gate, nearest the dome.

The viewing will be subject to clear skies. Please dress warm for the evening.

For queries:
Moya O'Donoghue
031-261 7369

St Henry's School are holding an Open Evening on the 21 July – which is only open to the Scholars and their Parents, which is being organised by Moya O'Donoghue.

Piet Strauss, Maryanne Jackson and Mike Hadlow are confirmed as Dome and Star Party Crew.

Additional crew are required to bring telescopes, binoculars, laser pointers, and or to answer questions.

Please kindly come and join then by volunteering your knowledge, as well as your viewing apparatus as described on the left.

Please WhatsApp Sheryl on 0822022874 to join the team.

Volunteers need urgently please!



Librarian's Page

Dear fellow readers,

July is here, and Winter begs us to curl up with a cup of cocoa and an intriguing book!

Here we look at the last 4 titles in our list of epic astronomy books, as listed in astronomy.com

Happy reading, Claire :)

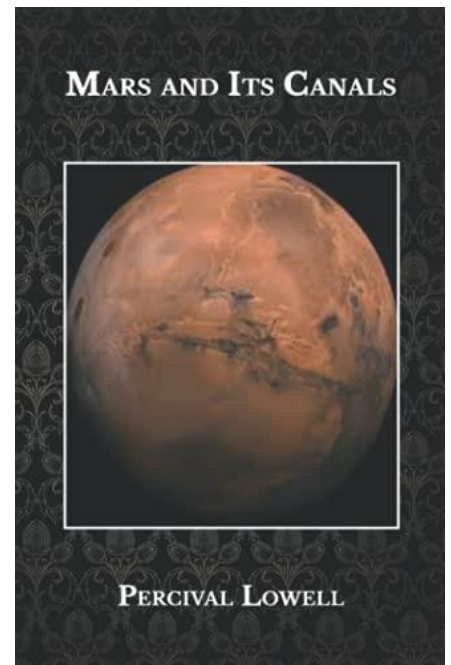
Top 10 astronomy books of all time

By Raymond Shubinski | Published: Monday, January 23, 2023 | astronomy.com

[...] These 10 astronomy books have had a significant impact not only on astronomical science, but also on the way humans think about our place and purpose in the cosmos. And for that, they should certainly be considered some of the most important astronomy books of all time.

7. *Mars and Its Canals*, Percival Lowell (1906)

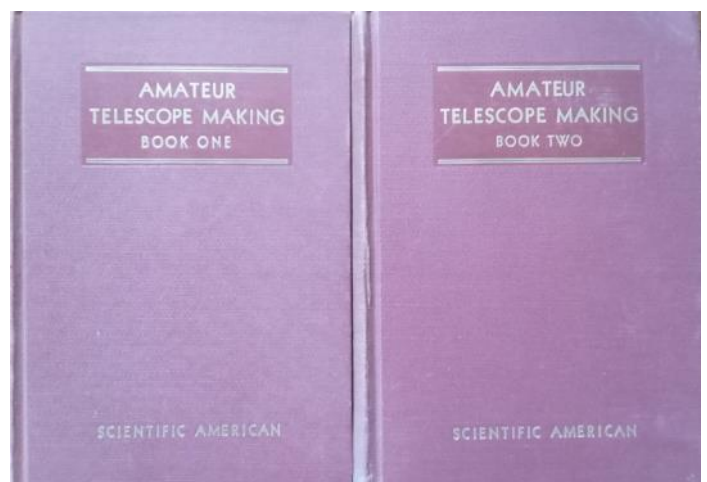
Mars and Its Canals, published in 1906, sparked a martian mania with the public. This was the second of three books about the Red Planet by Percival Lowell. In his first work, *Mars*, published in 1895, Lowell suggested a race of martians to explain the regularity of the canals which he was convinced crisscrossed the globe. The book was not well regarded by many professional astronomers. In *Mars and Its Canals*, Lowell pushed the idea even further, telling of a peaceful race of martian engineers who had devised massive waterworks for their fading civilization. With this book, Lowell became an international celebrity and opened the floodgates to the popular imagination. Within six years of its appearance, Edgar Rice Burroughs had published his first Mars adventure. Songs were penned and movies were made. The idea of martian canals engineered by a race of extraterrestrials has long since vanished, but Lowell's book sparked a desire to search for life on Mars, which still persists to this day.



8. *Amateur Telescope Making*, Albert G. Ingalls (1926–1953)

America entered a golden age of amateur astronomy at the beginning of the 20th century. For the astronomy hobbyist, however, even small “amateur” telescopes were expensive. So, backyard observers started building their own equipment. In 1926, *Amateur Telescope Making*, published by Scientific American, provided an answer to a growing need.

The first edition of *Amateur Telescope Making* was a compilation of articles written by Albert G. Ingalls. The idea grew from a 1921 article by Russell W. Porter titled “The Poor Man’s Telescope.” ...



...Librarian's Page

It was indeed a happy accident that had a profound impact on the hobby. Ingalls eventually met Porter, and they soon joined forces in providing clear instructions for building telescopes. The first book is filled with diagrams, formulas, and delightful sketches by Porter. ...

Four years after its publication, *Scientific American* published an article by the newly famous Clyde Tombaugh titled "My Experience in Amateur Telescope Making." In it, Tombaugh described being "armed now with the book *Amateur Telescope Making*," which provided the information he needed to produce better optics. Not a bad endorsement! Eventually growing to three volumes, *Amateur Telescope Making* continued to inspire and instruct thousands of hobbyists, including myself, for decades. The collection has not lost its value or charm even today.

9. *The Internal Constitution of the Stars*, Arthur S. Eddington (1926)

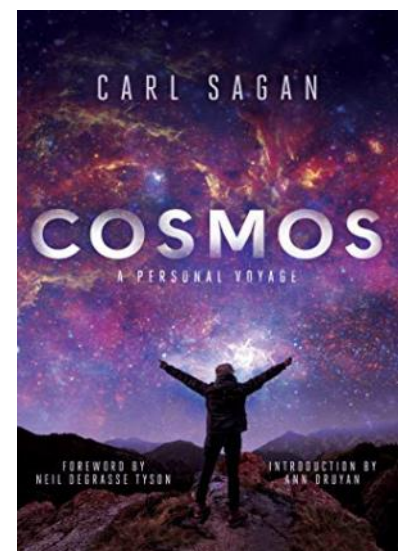
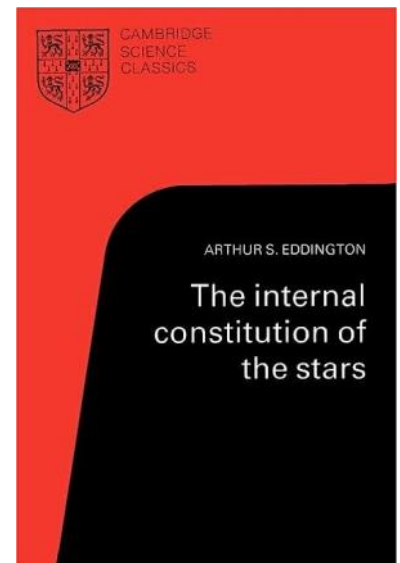
The Internal Constitution of the Stars, written by Sir Arthur S. Eddington and published in 1926, completely changed our understanding of stellar physics and the internal structure of stars. In the early 20th century, astronomers were still struggling with the fundamental questions of why stars shine, where they get their energy, and what mechanisms cause them to evolve. Eddington was particularly interested in Cepheid variable stars. He wanted to understand the physics of their rhythmic variations in brightness. Eddington's book explores how radiation from internal heat and pressure can keep a star stable and affect its luminosity. Eddington also showed that hydrogen and helium are under immense pressure at the cores of stars, where temperatures reach millions of degrees.

The Internal Constitution of the Stars (often called the ICS) was first presented as a paper at a 1920 meeting of the British Association. In the paper, Eddington said, "A star is drawing on some vast reservoir of energy by means unknown to us." In the late 1930s, Austrian-Swedish physicist Lise Meitner, as well as others, supplied the answer: nuclear fusion. Eddington's work on stellar interiors propelled and advanced our understanding of the lives of stars and drove the ultimate discovery of what makes them shine. In many ways, his book was a catalyst that ignited modern astrophysics.

10. *Cosmos*, Carl Sagan (1980)

NASA - "The Cosmos is all that is or ever was or ever will be." With the opening words of his book, *Cosmos*, Carl Sagan inspired, excited, and enthralled a generation of readers. Appearing in 1980, the book was a companion text to the 13-part television series on PBS, PBS, *Cosmos: A Personal Voyage*. *Cosmos* spent 70 weeks on the New York Times' bestseller list. It also received the Hugo Award for Best Non-Fiction Book in 1981. It was used in college astronomy classes, as well as enrichment and literature classes, around the country, inspiring many young readers to pursue careers in science.

With *Cosmos*, Sagan showed that human curiosity, ingenuity, and imagination have provided an understanding of the great universal connections that are woven through the human experience. "The cosmos is within us," he said in the television incarnation. "We are made of star stuff."

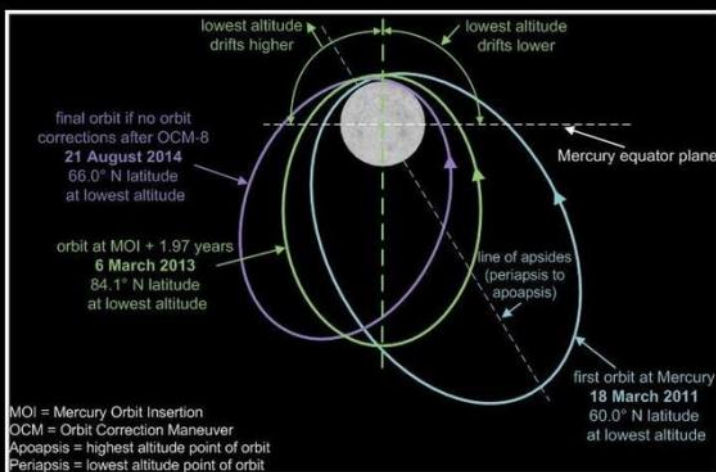
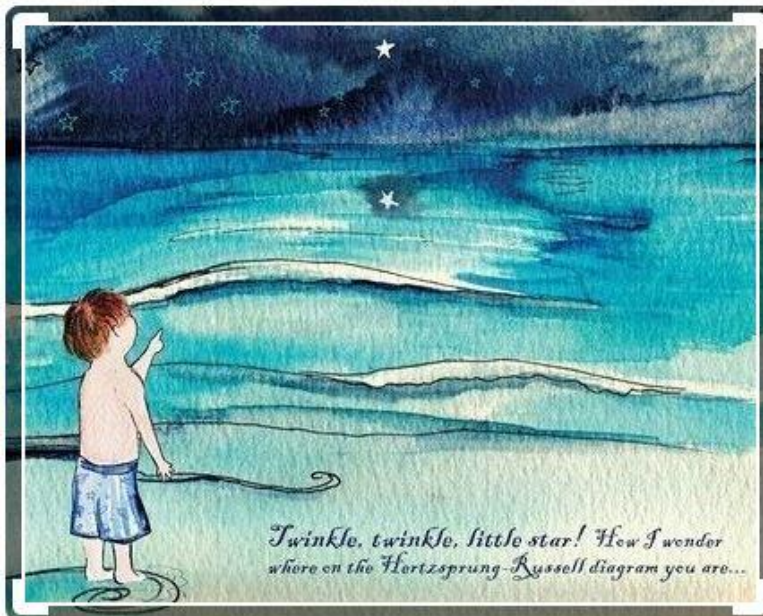


...Librarian's Page

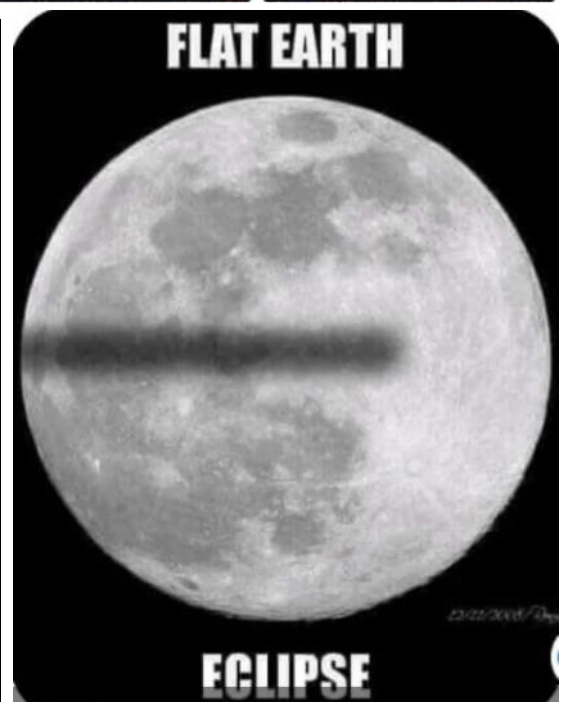
... *Cosmos*, Carl Sagan (1980)

With *Cosmos*, Sagan showed that human curiosity, ingenuity, and imagination have provided an understanding of the great universal connections that are woven through the human experience. "The cosmos is within us," he said in the television incarnation. "We are made of star-stuff."

These are just a few of Sagan's insights and expressions that have entered the lexicon of our vocabulary. Carl Sagan's *Cosmos* not only changed the way we experience the wonder of the universe, but also proved that science literature can be both inspiring and entertaining.



Go home Mercury,
you're drunk.



ASSA Durban Makes the news in Saturday independent 2023-06-23

ASTRONOMY

Learn about the vastness of space

NTUTHUKO MLONDO

ntuthuko.mlondo@inl.co.za

EVER gazed at the night sky, wondering what you are looking at in the great space that is our solar system and beyond?

The Durban centre of the Astronomical Society of Southern Africa (Assa) is set to provide people with insight and lessons about the universe, and highlight the importance of how astronomy contributes to the way people view it.

Assa head of portfolio in library and publicity Claire Odhav said the astronomy classes were for everyone who has "an eager mind and open ears".

She said Assa would cover a different topic in each module across the five weeks and that participants don't need to bring any equipment besides a notepad and pen.

The course will be held at St. Henry's Marist College. Odhav said they had a special relationship with the school – for more than 30 years – and the school was home to Assa's observatory and telescope.

Topics to be discussed during the five-week course include an overview, history of astronomy, light pollution, the solar system, nearby stars, the Milky Way galaxy, astronomy equipment and navigating and viewing the southern skies.

Odhav said: "We are space enthusiasts and want to share our love of the sky with others. Learning about astronomy helps us to understand the vast wonders of the universe, and how we fit in. Astronomy also offers a wide range of scientific careers.



THE observatory at St Henry's Marist College. The Astronomical Society of Southern Africa Durban Centre will host five courses next month to inform and educate people about astronomy. | SUPPLIED

"We offer talks and viewing evenings to school groups and classes. The interest in astronomy from pupils is high and we believe strongly in investing in the bright and brilliant minds of our youth. After all, they will most likely be our 'Mars Generation' the generation most likely to live on the Red Planet," she said.

She said load shedding had provided them with some help because it allows for enthusiasts to stargaze with ease. She said the course addresses the effects of light pollution as it is now a growing concern, definitely affecting viewing in a negative way.

Assa has 100 members in Durban and the five-week course will be facilitated by 12 of those members.

The course costs R300 and includes a year's membership. Places are limited so booking, at secretary@astronomydurban.co.za, is essential.



Astronomy & Space News

Below please find link to the latest Space News and Astronomical events for your viewing pleasure.

4 full supermoons in a row, starting July 2-3

https://earthsky.org/astronomy-essentials/4-full-supermoons-in-a-row-2023/?mc_cid=5396aa24a1&mc_eid=bdf6fa0ffe

The gravitational wave background of the universe has been heard for the 1st time

<https://www.space.com/gravitational-wave-background-universe-1st-detection>

NASA preparing for 'internet apocalypse' as probe delivers new intelligence

<https://www.express.co.uk/news/science/1784585/nasa-internet-apocalypse-parker-solar-probe-spt>

NASA releases musical "cosmic harmonies" based on telescope images of space

<https://news.sky.com/video/listen-nasa-releases-musical-cosmic-harmonies-based-on-telescope-images-of-space-12907036>

When Will Betelgeuse Explode? A Controversial New Study Says "Soon"

<https://www.inverse.com/science/study-says-betelgeuse-might-explode-soon-but-astronomers-disagree>

The Suspense is Killing Us. The Next Planet in the TRAPPIST System Gets the JWST Treatment

<https://www.universetoday.com/162014/the-suspense-is-killing-us-the-next-planet-in-the-trappist-system-gets-the-jwst-treatment/>

Single supernova looks like 4. Why?

<https://earthsky.org/space/supernova-gravitational-lensing/>

SpaceX launches 56 Starlink satellites, lands rocket at sea (video)

https://www.space.com/spacex-starlink-launch-group-5-12?utm_source=notification

Scientists discover continent that had been missing for 375 years

<https://www.indy100.com/science-tech/scientists-discover-missing-continent-2661543283>

A White Dwarf is Starting to Crystallize into Diamond

<https://www.universetoday.com/161929/a-white-dwarf-is-starting-to-crystallize-into-diamond/>

Lightning on Jupiter! Juno sees a green bolt

<https://earthsky.org/space/lightning-on-jupiter-juno-mission-green-bolt/>

Second 'Tatooine' multiplanetary system discovered

<https://earthsky.org/space/tatooine-circumbinary-planets-exoplanets/>





Public Viewing Roster ASSA Durban



Dome Master	Email	Assistant	Telescope Volunteer	Public Viewing
Debbie Abel	Debbie@astronomydurban.co.za	TBC	TBC	16 July
Debbie Able	Debbie@astronomydurban.co.za	TBC	TBC	18 August
Debbie Able	Debbie@astronomydurban.co.za	TBC	TBC	15 September

PUBLIC VIEWING:

Public viewing is on site at the Marist Brothers St Henry's School in the dome and around the pool area; usually on 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 Mike Hadlow on cell number 083 326 4085, or via email: Mike@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 and 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:

John Gill will organise another 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.

Volunteers to submit names to the Mike Hadlow on Mike@astronomydurban.co.za

Viewing Contact:	Phone	Email
Mike Hadlow	083 326 4085	Mike@astronomydurban.co.za



For Sale

Intes-Micro 152mm F5.9 Mak-Newt



Tripod and extensions

APM or Explore Scientific eyepieces – 20, 13, 9, 5.5 and 3.5 mm

2 x Laser finders and battery rechargers

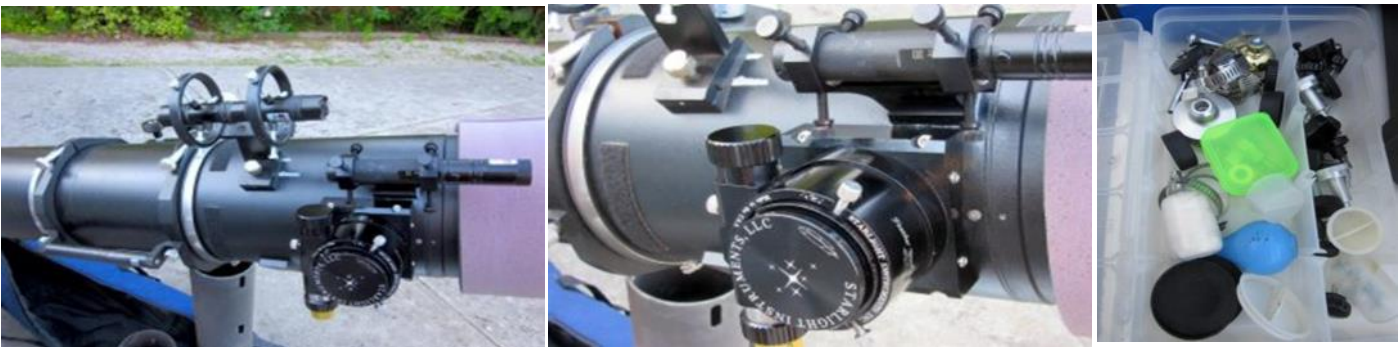
Celestron 2-inch UHC filter

Orion padded telescope case

Orion laser collimator

Cheshite tube

The telescope is nearly perfectly collimated and I haven't had to



recollimate in the last 7 years. The Intes-Micro 152mm scope has its original shipping papers and documentation from Orion (where it was marketed under the "Argonaut" badge.)

It gives a perfect Airy disc and partial first diffraction ring at 257x in the 3.5mm 100° eyepiece — at that power the Trapezium looks like the Pleiades to the naked eye.

The secondary is only 21% of the primary diameter, which makes it a superb lunar and planetary scope with minimal contrast loss due to secondary shadow.

It is a perfect startup system for a newcomer

Price R 24 000

Doug Bullis – 083 347 0856 – douglasbullis@gmail.com



...For Sale

Celestron LCM114 Telescope and Mount



Equipment includes:

- 3 x eyepieces
- Barlow
- External battery,
- Laser pointer
- Travel case

Excellent condition

Equipment location - Durban

Contact John Gill for information:

- **John Gill 083 378 8797**
- John.gill013@gmail.com



Celestron 8" Edge HD Telescope

- Celestron 2" and 1.25" diagonals
- Celestron Luminos 2.5 barlow for 1.25" and 2" eyepieces
- Celestron 1.25" plossl 40mm eyepiece
- Celestron .7 focal reducer
- Televue 2" Panoptic 35mm eyepiece
- T-Ring and T-Adapter for Canon EOS camera
- Extra small and large dovetails
- Finder scope 9x50
- Dew shield
- Bahtinov mask

Excellent condition

Equipment in Durban



Contact John Gill for information:

- **John Gill 083 378 8797**
- John.gill013@gmail.com

Price: R 50 000



Notice Board

MEETINGS:

- ANNUAL GENERAL MEETING to be held on [12 July 2023](#) @ 7 pm in the school hall.
- 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 on the ASSA national website
- assa.saao.ac.za/about/publications/nightfall/

MEMBERSHIP FEES & BANKING:

- Membership Subscriptions are now due on the 2023-07-01 for the 2022-2023 financial year. PLEASE pay your fees ASAP.
- Please pay Subscription fees **via EFT** - Banking details below.

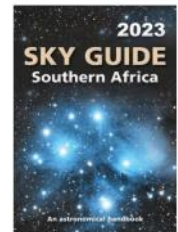
Membership fees indicated below:

- Single Members: **R 210:00**
- Family Membership: **R 250:00** 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 available !!!

- Contact: Mike @ Mike@astronomydurban.co.za
- Price: **R 50.00**
- Reference when paying: **SG 2023 SURNAME and FIRST NAME**



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:

• Chair	Debbie Abel	Debbie@astronomydurban.co.za
• Vice Chair	TBC	
• Secretary	Francois Zinserling	Secretary@astronomydurban.co.za
• Treasurer	Francois Zinserling	Treasurer@astronomydurban.co.za
• Guest Speaker Liaison	Piet Strauss	Piet@astronomydurban.co.za
• Observatory & Equipment	Mike Hadlow	Mike@astronomydurban.co.za
• Observatory Assistant	TBC	
• Publicity & Librarian	Claire Odhav	Claire@astronomydurban.co.za
• Out-Reach - Public	Cheryl Venter	Sheryl@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 Newsletter	Corinne Gill	Corinne@astronomydurban.co.za
• Website & Facebook	John Gill	John@astronomydurban.co.za

ELECTRONIC DETAILS:

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

