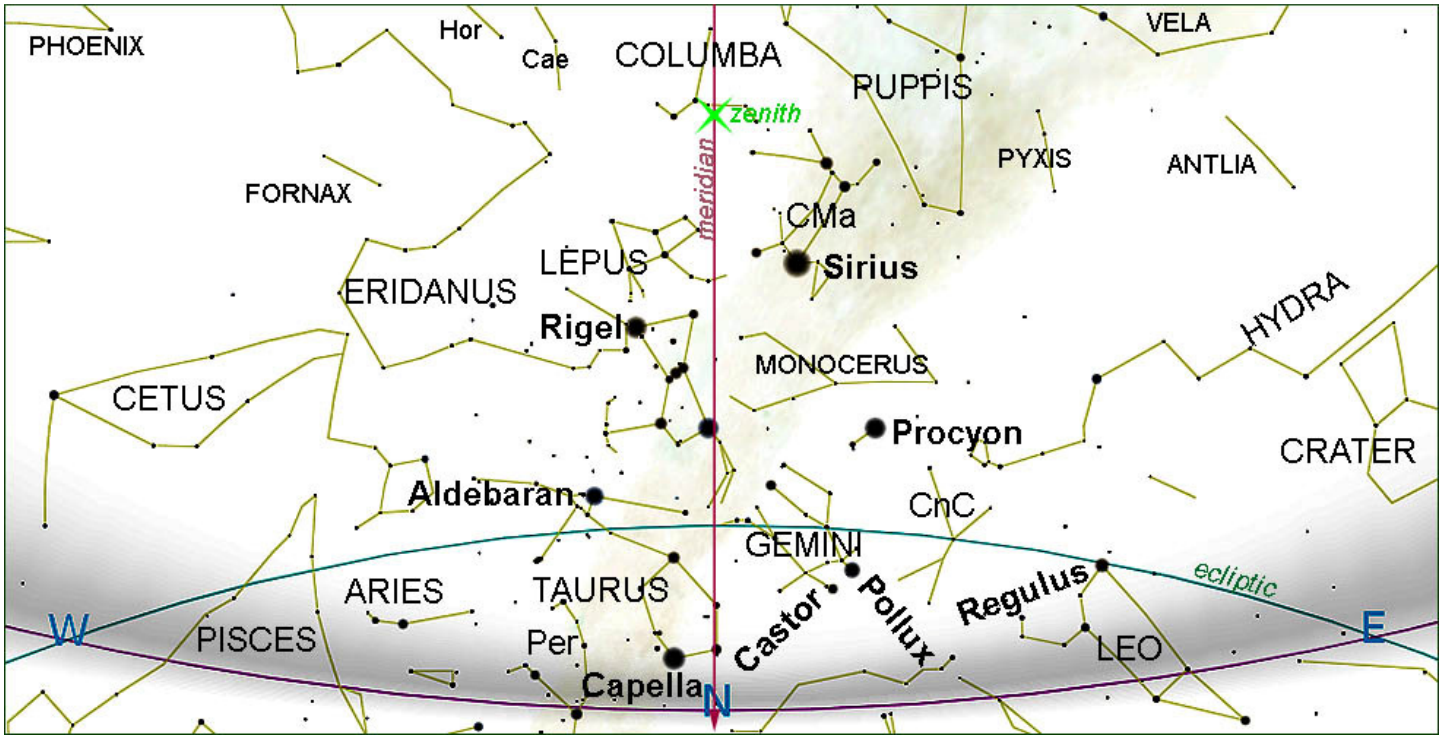
SKYNOTES from Hermanus

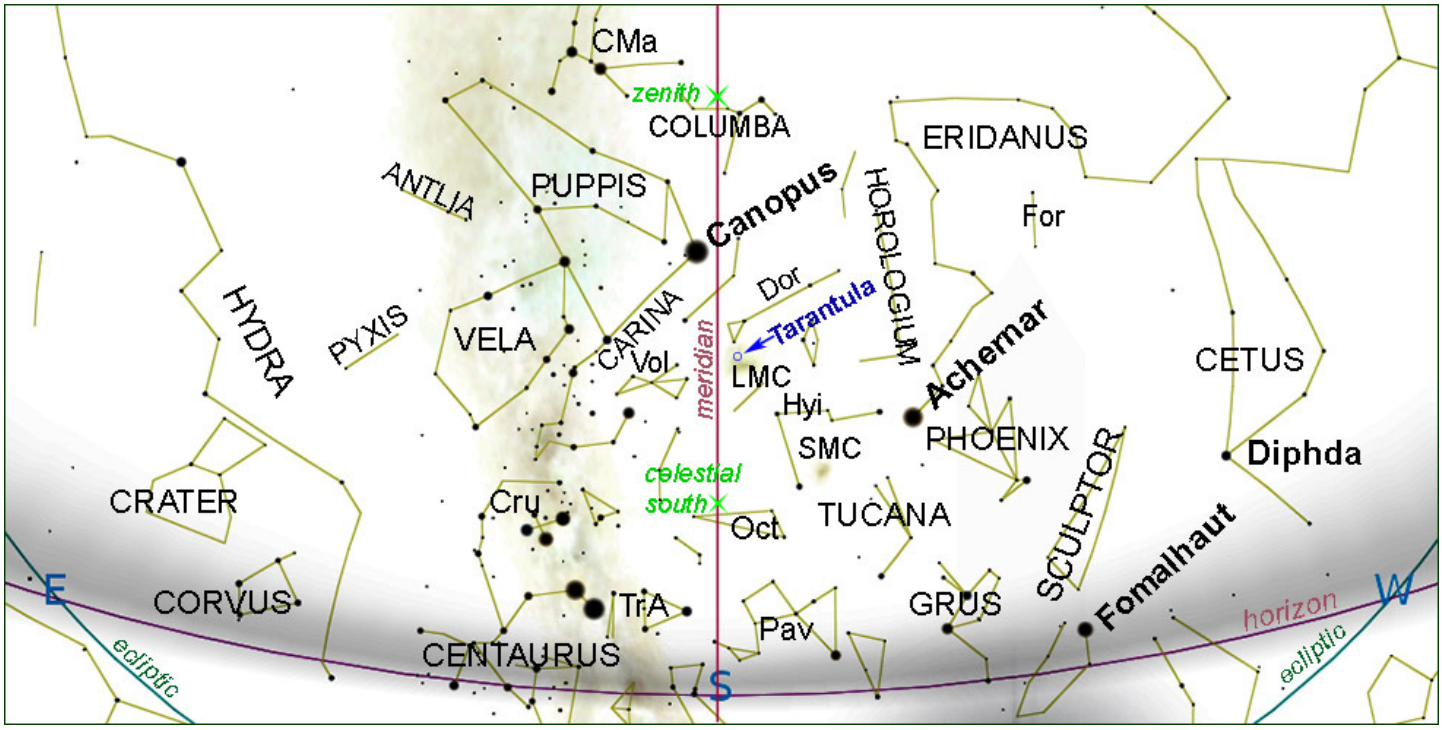
JANUARY 2022

1. SKY CHARTS

EVENING SKY 31st JANUARY at 22h00 (NORTH DOWN)



EVENING SKY 31st JANUARY at 22h00 (SOUTH DOWN)



2. THE SOLAR SYSTEM

PLEASE NOTE: All events predicted are as observed from **Hermanus, Western Cape, South Africa. Times are South African Standard Time (UTC +2).**

HIGHLIGHTS FROM THE SKY GUIDE - January 2022

Date	Time	Item
2	01h01	**Moon** at perigee (358 036 km)
	15h35	**Moon** southernmost (-26.3º)
	20h33	**New Moon**
3		**Moon** near **Pluto**
4	08h55	**Earth** at perihelion (0.983 au, 147 054 707 km)
		Moon (6%) near **Mercury** and **Saturn** after sunset
6		**Moon** (21%) near **Jupiter** after sunset
7		**Moon** (30%) near **Neptune**
		Mercury at eastern elongation (19º)
8	00h51	**Moon** crosses equator northbound
		Callisto at maximum from **Jupiter**
9	20h11	**First quarter Moon**
	02h48	**Venus** at inferior conjunction
11		**Moon** passes 1.2º south of **Uranus**
		Mercury crosses the ecliptic
14	03h03	**Mercury** stationary
	11h29	**Moon** at apogee (405 804 km)
16	01h13	**Mercury** at perihelion (0.308 au, 46 076 144 km)
		Pluto at conjunction
	12h18	**Moon** northernmost (+26.3º)
17		**Moon** (98%) near **Pollux**
18	01h48	**Full Moon** (398 km,, 30.0')
	21h52	**Uranus** stationary
20	21h57	**Moon** rises 25 mins and 6.4º after **Regulus**
23	07h47	**Venus** at perihelion (0.718 au, 107 411 273 km)
	12h28	**Mercury** at inferior conjunction
	16h32	**Moon** crosses equator southbound
	23h25	**Moon** (68%) rises 12.6º north of **Spica**
25	15h41	**Last quarter Moon**
26		**Mercury** northernmost
29	09h59	**Venus** stationary
30	09h10	**Moon** at perigee (362 249 km)
	01h23	**Moon** southernmost (-26.4º)

JANUARY 2022			*1st January*	*1st February*	*Visibility*
Sun Length of day	Sagittarius to Capricornus 14:25 to 13h46	Rises:	05h34	06h04	***Never look at the sun without SUITABLE EYE PROTECTION!***
		Transit:	12h47	12h57	
		Sets:	19h59	19h49	
Mercury Magnitude Phase Diameter	Sagittarius -0.7 to +1.01 77% to 21% 9”	Rises:	06h56	04h49	**Early Jan after sunset. Late Jan before sunrise**
		Transit:	14h04	11h42	
		Sets:	21h12	18h35	
Venus Magnitude Phase Diameter	Sagittarius -4.3 to -4.6 2% to 16% 61” to 49”	Rises:	06h42	03h56	**Early Jan after sunset. Late Jan before sunrise**
		Transit:	13h35	10h22	
		Sets:	20h30	17h35	
Mars Magnitude Phase Diameter	Sagittarius +1.5 to +1.4 98% to 96% 4”	Rises:	03h38	03h09	**Before sunrise**
		Transit:	10h47	10h22	
		Sets:	17h56	17h35	
Jupiter Magnitude Diameter	Aquarius -2.1 to -2.0 35” to 34”	Rises:	09h35	08h05	**Early evening**
		Transit:	16h11	14h34	
		Sets:	22h46	21h03	
Saturn Magnitude Diameter	Capricornus +0.7 15”	Rises:	08h04	06h19	**After sunset**
		Transit:	14h57	13h10	
		Sets:	21h50	20h00	
Uranus Magnitude Diameter	Aries +5.8 4”	Rises:	15h12	13h10	**Evening**
		Transit:	20h32	18h30	
		Sets:	01h57	23h51	
Neptune Magnitude Diameter	Aquarius +7.9 2”	Rises:	11h11	09h13	**Evening**
		Transit:	17h26	15h26	
		Sets:	23h40	21h40	
Pluto Magnitude	Sagittarius +14.4	Rises:	06h43	04h46	**Before sunrise**
		Transit:	13h52	11h54	
		Sets:	21h00	19h02	

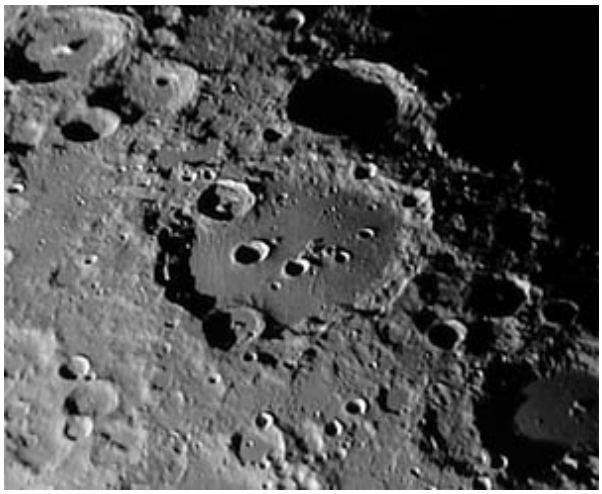
Phase: In a telescope, the inner planets (Mercury, Venus and Mars) appear to us in phases, depending on the angle of the Sun’s illumination, as does the Moon. The **angular diameter** is given in arc seconds (“). This is the apparent size of the object as we see it from Earth.

Magnitude: we are accustomed to hearing stars described in terms of ‘magnitude’. For example the planet Jupiter at magnitude -1.8 is considerably brighter than the star Antares (in Scorpius) at +1.05. The scale is ‘inverse’; the brighter the object, the lower the number. A ‘good’ human eye on a clear night can see down to a magnitude of about +6.

Transit: When an object crosses the **local meridian** it is said to **‘transit’**. The local meridian is an imaginary line from the horizon directly north passing overhead (through *zenith,* see charts on page 1) to the horizon directly south.

THE MOON

Clavius Crater (SGAS Lunar Highlight)



Location: The north down image to right was taken from earth with the moon waxing gibbous and the crater on the terminator.

Coordinates: 58.4ºS 14.4ºW (please see below for the *The Selenographic Coordinate System*)

Diameter: 231 km. **Depth** 3.5 km.

Clavius is one of the largest crater formations on the Moon and the second largest crater on the visible near side (very close in size to Deslandres). It is located in the rugged southern highlands of the Moon, to the south of the prominent ray crater Tycho. It is named for the Jesuit priest Christopher Clavius.

Description

Clavius' location toward the southern limb of the Moon causes it to appear oblong due to foreshortening. Its great size makes it visible to the unaided eye as a prominent notch in the terminator about one to two days after the Moon reaches first quarter.

Clavius is one of the older formations on the lunar surface and was likely formed during the Nectarian period about four billion years ago. Despite its age the crater is relatively well-preserved.

It has a low outer wall in comparison to its size and is heavily worn and pock-marked by craterlets. The rim does not significantly overlook the surrounding terrain making it a "walled depression". The inner surface of the rim is hilly, notched and varies in width with the steepest portion to the south. The rim has been observed to have a somewhat polygonal outline overall.

The floor of Clavius forms a convex plain that is marked by some interesting crater impacts. The most notable of these is a curving chain of craters that begins with Rutherfurd in the south then arcs

across the floor in an anticlockwise direction forming a sequence of ever diminishing diameters. From largest to smallest, these craters are designated Clavius D, C, N, J, and JA. This sequence of diminishing craters has proved a useful tool for amateur astronomers who want to test the resolution of their small telescopes.

The crater floor retains a remnant of a central massif, which lies between Clavius C and N. The relative smoothness of the floor and the low size of the central peaks may indicate that the crater surface was formed some time after the original impact.

Presence of water

In October 2020, NASA confirmed the existence of molecular water near Clavius, at concentrations of up to 412 parts per million. Several ways have been suggested. The water could be trapped into tiny beadlike structures in the soil that form out of the high heat created by micrometeorite impacts.

The water might also be sheltered between lunar soil grains. Another possibility is from very small asteroid strikes, such as a rubble pile from a much more massive "parent" asteroid collision. Pulled apart in its descent to the lunar surface similar to Comet Shoemaker–Levy 9, and hitting the surface in a modest dispersal area with a small mass at low, oblique impact angle and bouncing could allow some water to remain in the lithic matrix. The carbonaceous chondrite class is often water-rich, and th he CI sub group are as much as 22% water. the CI sub group are as much as 22% water.

No lunar or solar eclipses will be visible from southern Africa this month.

HERMANUS MOON RISE AND SET TIMES FOR JANUARY 2022

Date	*day*	*rise*	*set*	*Date*	*day*	*rise*	*set*	*Date*	*day*	*rise*	*set*
01-Jan	Sat	03h56	18h51	13-Jan	Thu	16h33	01h57	25-Jan	Tue	--	12h59
02-Jan	Sun	04h54	20h00	14-Jan	Fri	17h31	02h32	26-Jan	Wed	00h24	14h07
03-Jan	Mon	06h02	21h01	15-Jan	Sat	18h26	03h12	27-Jan	Thu	01h01	15h17
04-Jan	Tue	07h14	21h51	16-Jan	Sun	19h19	03h59	28-Jan	Fri	01h44	16h29
05-Jan	Wed	08h26	22h32	17-Jan	Mon	20h06	04h51	29-Jan	Sat	03h36	17h39
06-Jan	Thu	09h36	23h07	18-Jan	Tue	20h48	05h47	30-Jan	Sun	03h38	18h42
07-Jan	Fri	10h41	23h37	19-Jan	Wed	21h25	06h47	31-Jan	Mon	04h46	19h37
08-Jan	Sat	11h43	--	20-Jan	Thu	21h58	07h48	01-Feb	Tue	05h59	20h23
09-Jan	Sun	12h42	00h04	21-Jan	Fri	22h27	08h50	02-Feb	Wed	07h11	21h01
10-Jan	Mon	13h40	00h31	22-Jan	Sat	22h55	09h51	03-Feb	Thu	08h20	21h33
11-Jan	Tue	14h38	00h58	23-Jan	Sun	23h40	10h52	04-Feb	Fri	09h26	22h03
12-Jan	Wed	15h36	01h26	24-Jan	Mon	23h53	11h55	05-Feb	Sat	10h29	22h30

METEOR SHOWERS

	Maximum Date/Time	*Observing Prospects*	*Duration*	*Radiant*	*ZHR**	*Velocity Km/sec*
Crucids	19 January 00h00 to 03h30	19 January poor with 99% Moon	6 – 28 Jan	The Coalsack in Crux	<5	50

**A word of caution on predicted Zenithal Hourly Rate (ZHR)*:

A meteor shower's activity is gauged by its zenithal hourly rate. This value is often quoted in the press and astronomy publications and has sometimes been the source of misunderstanding and disappointment. ZHR is an ideal value; it is by definition the number of meteors a single observer could possibly see during a shower's peak with the radiant directly overhead on a clear, dark night. Most observers, however, will not see as many meteors as the ZHR suggests.

For more details regarding meteor watching, please see SGAS 2022, pages 86- 87.

3. LOOKING OUT

SUGGESTED EVENING OBSERVATION WINDOWS

(Lunar observations notwithstanding)

Date		*Moon*	*Dusk end*
24th December	***Rises***	23h55 (79%)	21h42
5th January	***Sets***	22h32 (12%)	21h42
24rd January	***Rises***	23h47 (61%)	21h32
4th February	***Sets***	22h07 (11%)	21h21

CLUB STARGAZING – Sadly, with the continuance of the pandemic, we still cannot enjoy physical club gatherings. Of course that should not stop our intrepid members digging out a good coat and indulging in stargazing from home or favourite darkest and cloudless spots.

And don't forget the **Moon**, our closest celestial neighbour.

Please consult our website for updates: http://www.hermanusastronomy.co.za

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Tarantula Nebula
30 Doradus, C103

*The following details are applicable to **31st January 2022** at **22h00***

Description	Bright nebula
Constellation	Dorado
Distance	160kly, 48 kpc
Magnitude	+8.2
Apparent size	40 x 25 arcmin
Actual size	1833 ly, 562 pc
Alt/Az	+55º12'02" / 183º28'52"
J2000 lat/long	-69º05'00" / 5h38'36"

Visibility on 31st January 2022

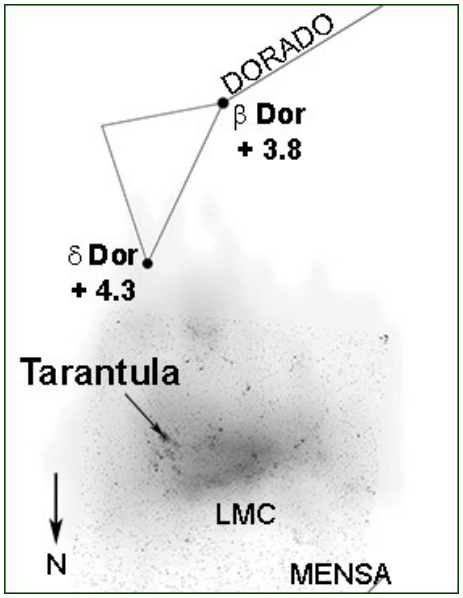
Rises	*Transits*	*Sets*
Does not rise	21h38	Does not set

Naked Eye	no
Binoculars	Yes
Telescopes	Yes

The photo (right) was taken and processed by HAC member Pete Scully:
16th January, 2020; reprocessed 1st April, 2021.
Pre and post processing – Affinity Photo + Macros
15 x 35s lights – 10 darks – 10 bias
EOS 1100d modded – 100 mm refractor HEQ5 – Stellarium - APT

Discovery

The **Tarantula Nebula** was observed by Nicolas-Louis de Lacaille during his expedition to the Cape of Good Hope between 1751 and 1753. Originally thought to be a star, its nebular nature was recognized by Lacaille. The names "Great Looped Nebula" (from John Herschel) and "True Lovers' Knot" are also used. The name "Tarantula" arose in the mid 20th century from its appearance in deep photographic exposures.



Johann Bode included the Tarantula in his 1801 *Uranographia* star atlas and listed it in the accompanying *Allgemeine Beschreibung und Nachweisung der Gestirne* catalogue as number 30 in the constellation "Xiphias or Dorado" (hence 30 Doradus). Instead of being given a stellar magnitude, it was noted to be nebulous.

Description

The Tarantula Nebula, an H II region in the Large Magellanic Cloud, lies at the eastern end of the LMC's stellar bar in our summer months. It is the largest and brightest emission nebula in the LMC galaxy and one of the largest emission nebulae known. Considering its distance of about 160 000 light years, it is so bright that, if it were as close to Earth as the Orion Nebula, the Tarantula Nebula would cast shadows.

Within the nebula is NGC 2070, a large open cluster and candidate super star cluster forming the heart of the bright region. **30 Doradus** has often been treated as the designation of a star or of the central star cluster NGC 2070 but is now generally treated as referring to the whole nebular area of the Tarantula Nebula.

The nebula resides on the leading edge of the Large Magellanic Cloud, where the compression of the interstellar medium likely results in a very active star formation region. In fact, it is the most active starburst region known in the Local Group of galaxies. Although the Tarantula is roughly 100 times larger than the famous Orion Nebula, it is illuminated in the same way: by the ultraviolet radiation from a collection of hot, young, massive stars embedded within it. Several OB associations have been observed inside the Tarantula. At its core lies the extremely compact cluster of stars R136a, which is a hotbed of Wolf-Rayet stars, and produces most of the energy that makes the nebula visible.

Supernova 1987A occurred in the outskirts of the Tarantula Nebula. This was the closest supernova since the invention of the telescope and a harbinger of what lies in store for many of the Nebula's stars.

Please keep in touch...

Have a look at our excellent website, edited by Derek Duckitt.

http://www.hermanusastronomy.co.za/

Contact ASSA - Get in touch with officers of the Society - we're real people with a passion for astronomy, **so contact us and let's talk!**

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Official Big 5 of the African Sky web page
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ASSA Deep-Sky Section mailing list

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ASSA
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