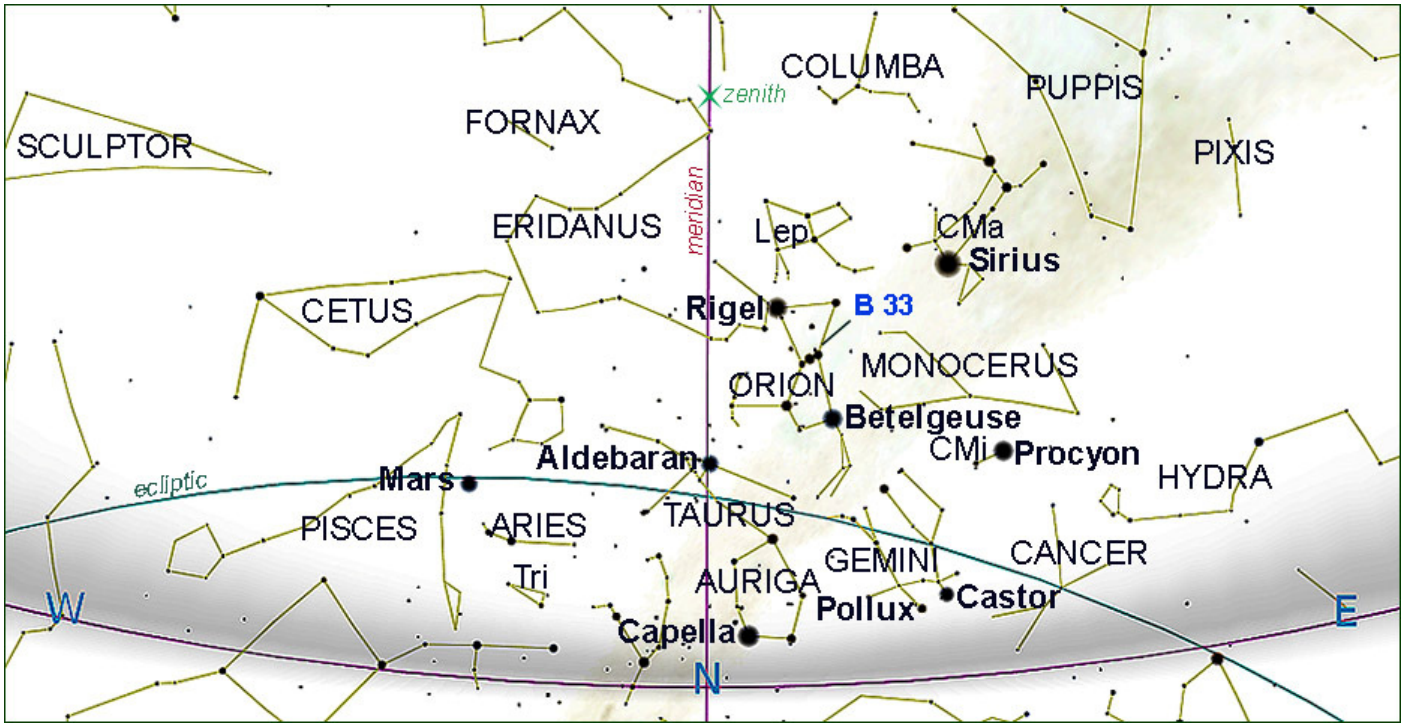
SKYNOTES from Hermanus

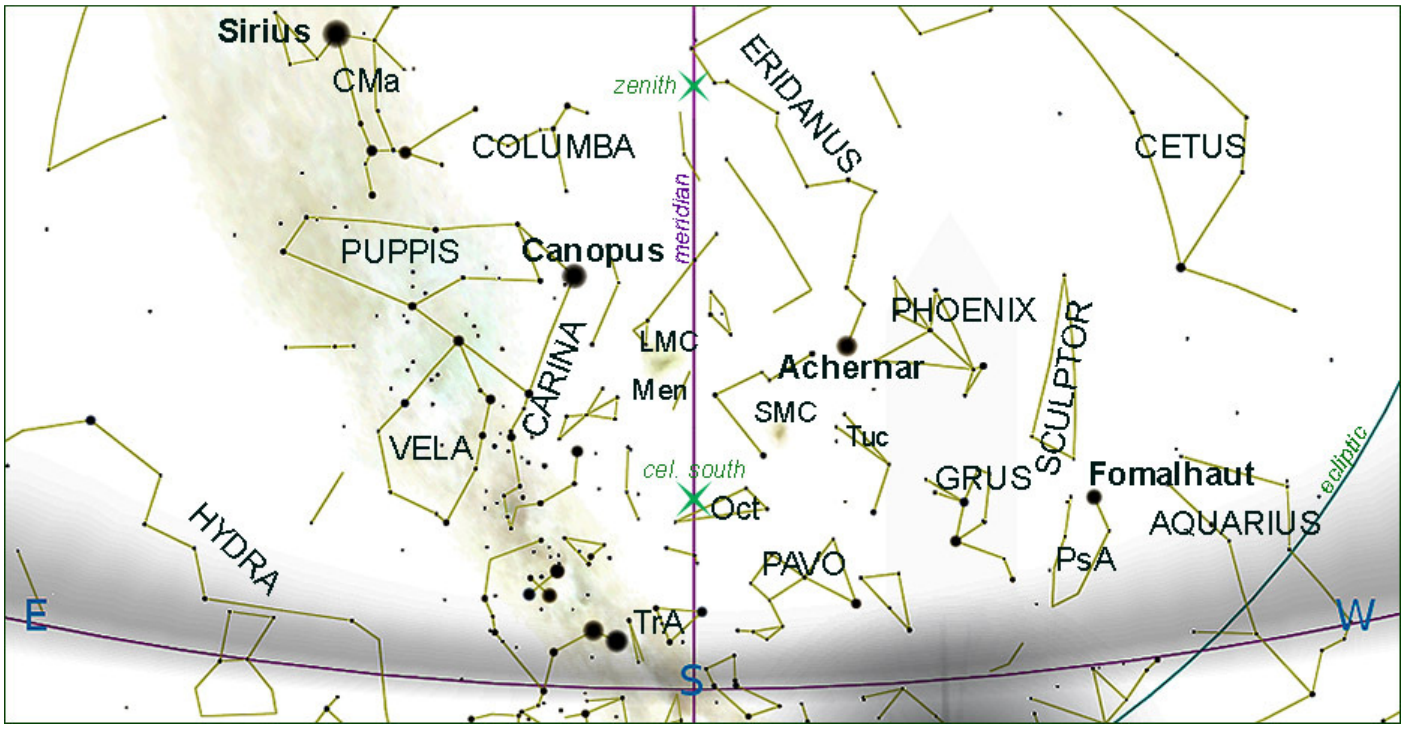
JANUARY 2021

1. SKY CHARTS

EVENING SKY 9th JANUARY at 22h00 (NORTH DOWN)



EVENING SKY 9th JANUARY at 22h00 (SOUTH DOWN)



PLEASE NOTE: All events predicted are as observed from **Hermanus, Western Cape, South Africa. Times are South African Standard Time (UTC +2).** *Also please note*: with the exception of **Pluto** (magnitude +14.4), all events predicted are visible with the naked eye.

2. THE SOLAR SYSTEM

HIGHLIGHTS FROM THE SKY GUIDE

Date	Time	Item
1		**Moon** near the **Beehive** (M44)
2	23h58	**Moon** passes 4.9º north of **Regulus**
	15h59	**Earth** at perihelion (0.9833 AU)
6	11h37	**Last quarter Moon**
8		**Venus** near **Trifid Nebula** (M20)
9	17h40	**Moon** at perigee (367 389 Km)
		Venus near **Lagoon Nebula** (M8)
10	04h08	**Moon** passes 6.2º east of **Antares**
	06h51	**Mercury** passes 1.6º south of **Saturn**
		Venus near **Lagoon Nebula** (M8)
11		**Moon** near **Venus**
	20h08	**Mercury** near **Jupiter**
12	10h18	**Moon** southernmost (-24.9º)
13	07h00	**New Moon**
		Moon near **Saturn**
14		**Moon** near **Mercury** and **Jupiter**
		Uranus stationary
		Pluto at conjunction
19		**α Crucids** at maximum (see Meteor Showers, page 4)
20	23h02	**First quarter Moon**
	20h31	**Lunar-X** visible [1]
		Mars near **Uranus**
21		**Moon** near **Mars**
	15h12	**Moon** at apogee (404 360 Km)
24		**Moon** near **Aldebaran**
	03h59	**Mercury** at maximum eastern elongation (18.6º)
	04h26	**Saturn** at conjunction
26	17h39	**Moon** northernmost **(+24.9º)**
27	17h46	**Moon** near **Pollux**
28	21h16	**Full Moon** (381 530 KM, diameter 31.3')
	16h50	**Moon** near **the Beehive cluster** (M44)
29	02h51	**Jupiter** at conjunction
30	06h55	**Moon** near **Regulus**
		Mercury stationary

[1] **Lunar-X** commences **20h31** on **20th January**.

(for more details, please see page 4 ...)

JANUARY 2021			1st January	1st February	Visibility
Sun Length of day	Sagittarius to Capricornus 14h24 to 13h45	Rises: Transit: Sets:	08h26 12h14 16h02	06h04 12h57 19h49	***Never look at the sun without SUITABLE EYE PROTECTION!***
Mercury Magnitude Phase Diameter	Sagittarius to Capricornus -0.7 to +1.2 77% to 17% 6" to 9"	Rises: Transit: Sets:	09h39 13h31 17h24	07h15 13h46 20h17	**Low in west after sunset**
Venus Magnitude Phase Diameter	Sagittarius -4.3 to -3.9 2% to 98% 61" to 10"	Rises: Transit: Sets:	0847 13h03 17h19	05h00 12h04 19h08	**The morning star**
Mars Magnitude Phase Diameter	Pisces to Aries -0.2 to +0.5 89% 10" to 8"	Rises: Transit: Sets:	14h08 19h38 01h11	13h20 18h35 23h49	**Evening**
Jupiter Magnitude Diameter	Capricornus -2.0 33" to 32"	Rises: Transit: Sets:	07h19 14h19 21h19	05h52 12h47 19h41	**Low in west after sunset then too close to the Sun**
Saturn Magnitude Diameter	Capricornus +0.6 15"	Rises: Transit: Sets:	07h13 14h14 21h14	05h29 12h27 19h24	**Low in west after sunset then too close to the Sun**
Uranus Magnitude Diameter	Aries +5.7 to +5.8 4"	Rises: Transit: Sets:	14h51 20h15 01h44	12h49 18h13 23h38	**Evening**
Neptune Magnitude Diameter	Aquarius +7.9 2"	Rises: Transit: Sets:	10h59 17h16 23h33	09h01 15h17 21h34	**Evening**
Pluto Magnitude	Sagittarius +14.4	Rises: Transit: Sets:	06h35 13h43 20h51	04h38 11h45 18h53	**Low in west after sunset then low in the east before sunrise**

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.

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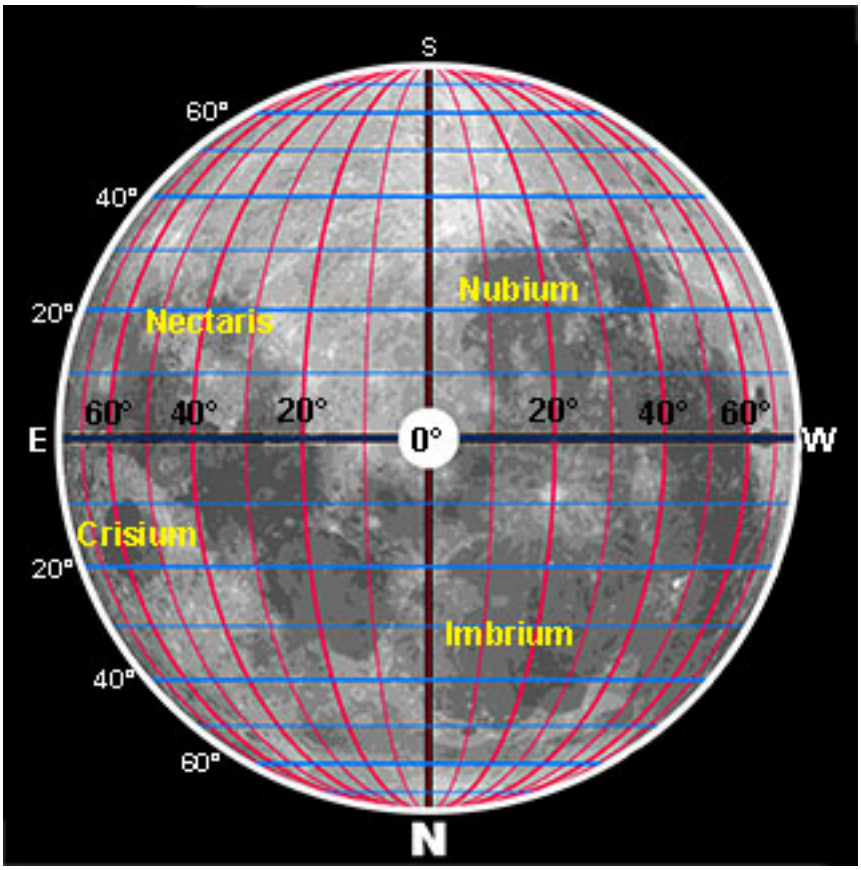
THE MOON

The Selenographic Coordinate System
(from Wikipedia)

Selenographic coordinates are used to refer to locations on the surface of Earth's moon.

Any position on the lunar surface can be referenced by specifying two numerical values, which are comparable to the **latitude** and **longitude** of Earth. The latitude gives the position north or south of the lunar equator. The longitude gives the position east or west of the Moon's prime meridian, which is the line passing from the lunar north pole through the point on the lunar surface directly facing Earth to the lunar south pole. This can be thought of as the midpoint of the visible Moon as seen from the Earth. Both of these coordinates are given in degrees.



Astronomers defined the fundamental location in the selenographic coordinate system by the small, bowl-shaped satellite crater 'Mösting A'. The coordinates of this crater are defined as:

South 3° 12' 43.2"
West 5° 12' 39.6"

The coordinate system has become precisely defined due to the *Lunar Laser Ranging Experiment.*

Anything past 90°E or 90°W would not be seen from Earth, except for **libration**, which makes 59% of the Moon visible.

3. LOOKING UP

Lunar and Solar eclipses : None predicted for this month

METEOR SHOWERS

Name	*Date & Time of Max*	*Duration*	*Radiant*	*Zenithal hourly rate*	*velocity Km/sec*	*Observing Prospect*
α Crucids	19th January 00h00 to 03h30	6th to 28th January	**The Coalsack** in **Crux**	< 5	50	Good moonset 23h54

For more details regarding meteor watching, please see the Sky Guide Africa South (SGAS), pages 86- 87.

SUGGESTED OBSERVATION SCHEDULE for **JANUARY**
(Lunar observations notwithstanding)

Date	***dusk end***		
3th	21h43	***moonrise***	23h21 (81%)
15th	21h39	***moonset***	21h58 (5%)

CLUB STARGAZING – sadly, we have had to reimpose our policy of no gatherings owing to the resurgence of the pandemic.

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

DEEP SKY HIGHLIGHTS

THE HORSEHEAD NEBULA
Barnard 33

Description	Barnard 33 - small dark nebula (silhouetted against IC 434, a bright emission nebula)
Constellation	Orion
Distance	Horsehead 1600 ly, 500 pc
Visual magnitude	Unknown
Apparent size	6 x 4 arcmin
Actual size	2.8 ly, 0.9 pc
Alt/Azimuth	+54º 27' 30" / 029º 37' 45"
J2000 lat/long	-02º 15' 33" / 5h 41' 38"

Visibility on 9th January :

Rise	*Transit*	*Set*
16h58	23h07	05h19

Naked eye: no
Binoculars: difficult
Telescopes: Yes but challenging (see below)

Observing

The Horsehead Nebula, known also as Barnard 33, is a small dark nebula silhouetted against the glow of the emission nebula **IC 434**. Only by chance does the dark nebula resemble a horse's head but its coincidental appearance has led to its becoming a much photographed object.

This narrow patch of nebulosity extends a degree south of the bright star **Alnitak** (ζ Ori), the south-easternmost star in Orion's belt. Amateur astronomers often use this nebula as a test of observing skills as it requires dark skies and excellent transparency. It is best seen in long-exposure photographs as a dark 4' x 6' notch against the 60' strip of faint nebulosity that is IC 434.

The Horsehead is part of a huge region of dark dust and gas made observable by its superimposition against the background of the relatively bright nebula. The red glow of IC 434 originates from ionized hydrogen gas. The bright, bluish reflection nebula near B33 is NGC 2023.

The underside of the “neck” of the Horsehead is especially dark and actually casts a shadow on the field below the “muzzle”. The entire region is illuminated by the bright OB star **σ Orionis** (top left in the image on page 5) which is also responsible for ionizing the emission nebula IC434.

The marked change in star density on the north-eastern side of IC 434 indicates that this strip of glowing hydrogen marks the edge of a substantial dark cloud. As a cloud core emerging from its parent, and as an active site of low-mass star formation, B33 is in an active, complex and fascinating neighbourhood. The ‘streamers’ visible in the brighter region appear to be out-flowing matter funnelled by a strong magnetic field. Small red spots in the Horsehead’s base are protostars in the process of forming.

The bright **Alnitak** (distance 817 ly, magnitude +1.85) is a foreground star and not related.

Discovery and History

Although **William Henry Pickering** was officially credited with its discovery in 1889, the Horsehead Nebula was first recorded on a photographic plate taken by **Williamina Paton Fleming** at the Harvard College Observatory in 1888. The first published description of the nebula was given by **E. E. Barnard** in 1913 and was first catalogued by him in 1919.

... from page 2

The **Lunar X** (also known as the **Werner X**) is a clair-obscur effect in which light and shadow creates the appearance of a letter 'X' on the rims of the craters Blanchinus, La Caille and Purbach.

Luna X is a striking feature and can be viewed even with binoculars.

Luna location: lat. -25.8º, long +1.1º

Lunar X (Werner X) (25º south, 1º east)

The best known clair-obscur effect which produces a well defined letter ‘X’ due to partial lighting of the rims craters **La Caille**, **Purbach** and **Blanchinus.**

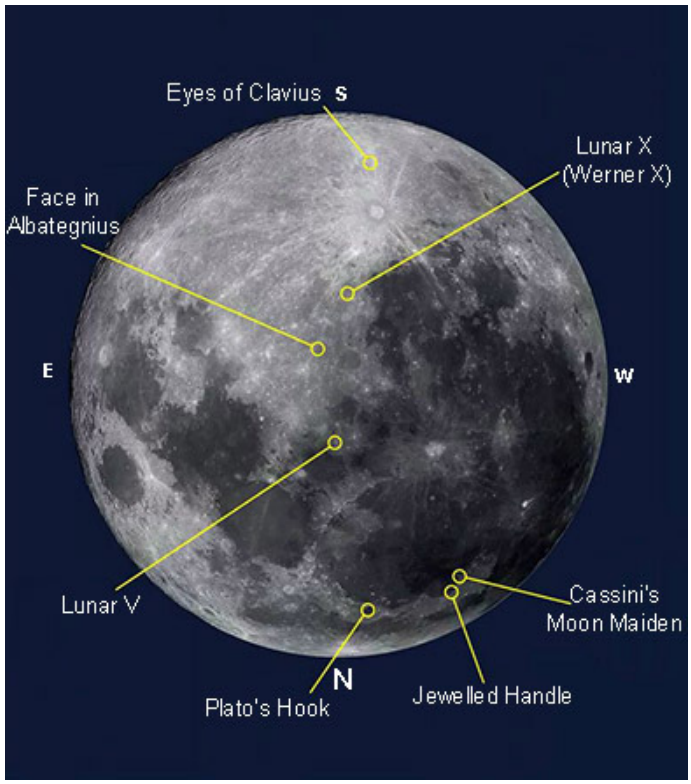
Best seen on the Moon’s Morning Terminator at first quarter:

Wednesday 20th January commencing **20h31**.

Also visible this year during darkness:

21 Mar, 19 May, 17 Jul, 14 Sep and 12 Nov.

Other lunar clair-obscur effects are illustrated to right and will be discussed in the later months of this year.



keep in touch...

Please have a look at our excellent website, edited by Derek Duckitt.
http://www.hermanusastronomy.co.za/

Also...

ASSA website http://assa.saao.ac.za
ASSA Deep-Sky Section
Whatsappchat group: [074 100 7237]
MNASSAhttp://assa.saao.ac.za/about/publications/mnassa/
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