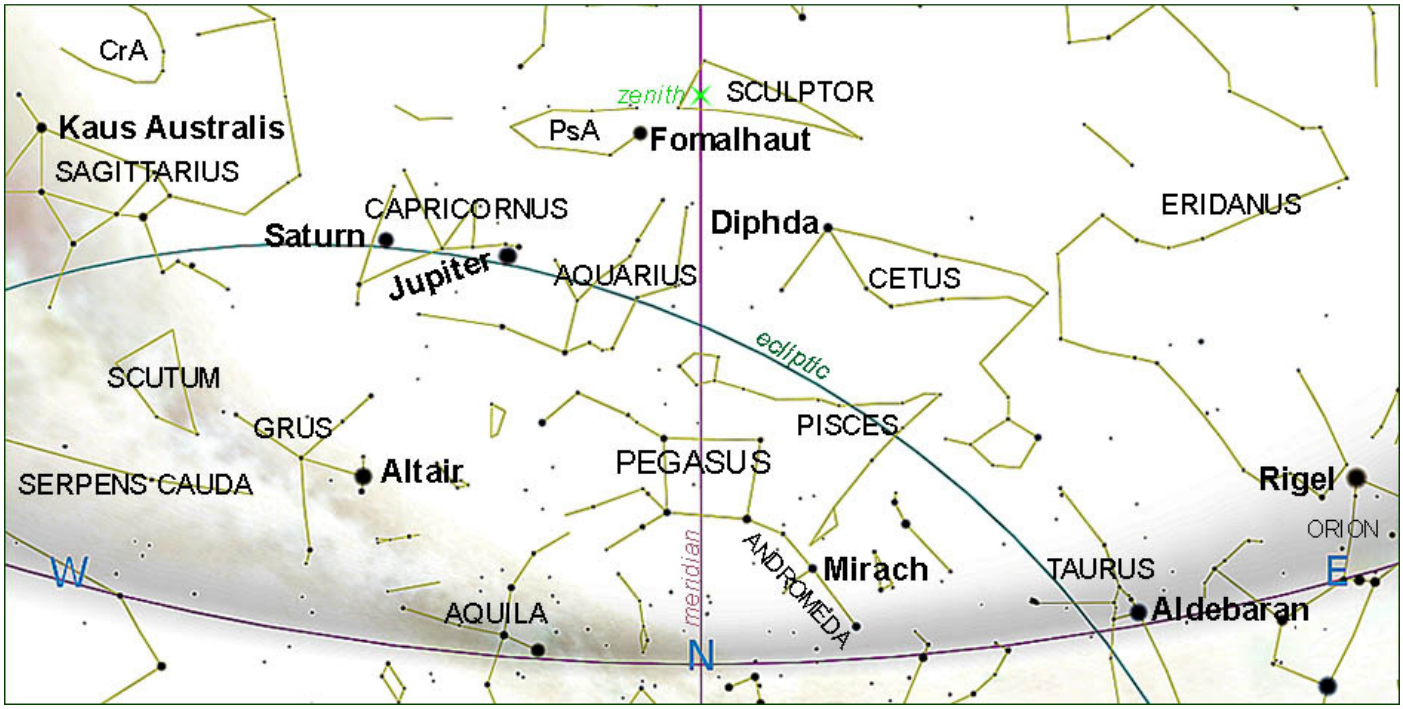
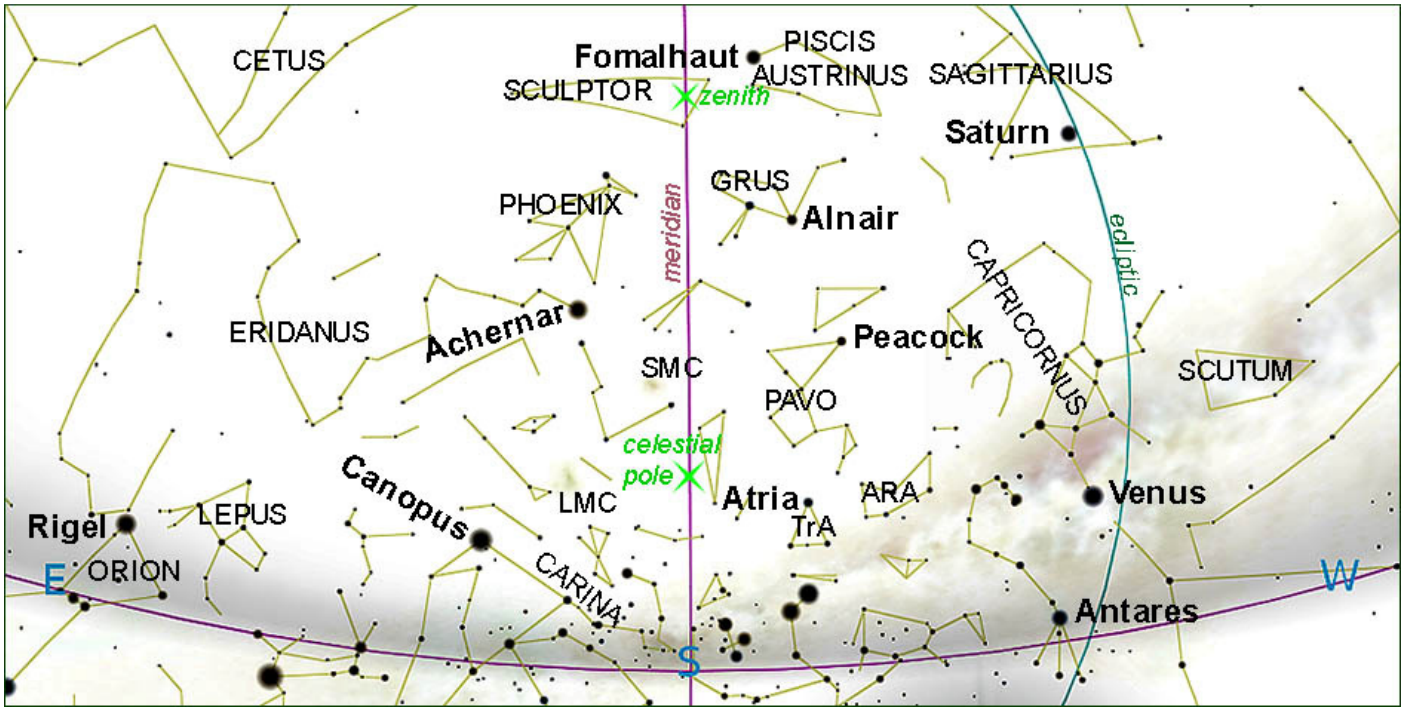
SKYNOTES from Hermanus NOVEMBER 2021

1. SKY CHARTS

EVENING SKY 1st NOVEMBER at 21h30 (NORTH DOWN)



EVENING SKY 1st NOVEMBER at 21h30 (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 - November 2021

Date	*Time*	*Item*
2		**Callisto** at maximum from **Jupiter** (9.2' E)
3		**Titan** at maximum from **Saturn** (2.9' W)
4	23h15	**New Moon**
5	02h13	**Uranus** at opposition
6	00h24	**Moon** at perigee (358 844 km)
	05h38	**Moon** at descending node
	20h30	**Moon** (5%) 4.1º from **Antares** on the western horizon
8	18h27	**Moon** southernmost (-26.3º)
10		**Moon** near **Saturn**
		Callisto at maximum from **Jupiter** (9.0' W)
		Titan at maximum from **Saturn** (2.7' E)
11	14h46	**First quarter Moon**
	22h45	**Moon** passes 4.6º south-east of **Jupiter**
18		**Titan** at maximum from **Saturn** (2.8' W)
19	10h58	**Full Moon**
	19h59	**Moon** at ascending node
		Callisto at maximum from **Jupiter** (8.7' E)
21	04h15	**Moon** at apogee (406 275 km)
23	00h43	**Moon** at northernmost declination for the year (+26.3º)
24	04h49	**Moon** passes 1.8º south of **Pollux** (β Gem)
26		**Titan** at maximum from **Saturn** (2.7' E)
27	14h28	**Last quarter Moon**
		Callisto at maximum from **Jupiter** (8.5' W)
29	06h35	**Mercury** at superior conjunction

* ASCENDING NODE – in the orbit of a solar system body, the point where the body crosses the ecliptic from south to north. DESCENDING NODE - in the orbit of a solar system body, the point where the body crosses the ecliptic from north to south. *[from the glossary of the Sky Guide Africa South]*

NOVEMBER 2021			*1st November*	*1st December*	*Visibility*
Sun Length of day	Libra to Ophiuchus 13:30 to 14:17	Rises:	05h42	05h24	***Never look at the sun without SUITABLE EYE PROTECTION!***
		Transit:	12h27	12h32	
		Sets:	19h12	19h41	
Mercury Magnitude Phase Diameter	Virgo to Sagittarius -0.8 to +1.1 80% to 21% 6” to 9”	Rises:	05h05	04h49	**Low in the east before sunrise**
		Transit:	11h28	11h42	
		Sets:	17h51	18h35	
Venus Magnitude Phase Diameter	Ophiuchus to Sagittarius -4.4 to -4.6 48% to 16% 26” to 49”	Rises:	08h17	03h56	**Evening to morning**
		Transit:	15h42	10h44	
		Sets:	23h08	17h32	
Mars Magnitude Phase Diameter	Virgo to Sagittarius +1.6 to +1.4 100% to 96% 4”	Rises:	05h22	03h09	**Morning**
		Transit:	11h56	10h22	
		Sets:	18h31	17h35	
Jupiter Magnitude Diameter	Capricornus to Aquarius -2.5 to 2.0 42” to 34”	Rises:	12h56	08h05	**Early evening**
		Transit:	19h40	14h34	
		Sets:	02h28	21h03	
Saturn Magnitude Diameter	Capricornus +0.6 +0.7 17” to 15”	Rises:	11h41	06h19	**Early evening**
		Transit:	13h38	13h10	
		Sets:	01h39	20h00	
Uranus Magnitude Diameter	Aries +5.6 to +5.8 4”	Rises:	19h21	13h10	**Evening**
		Transit:	00h44	18h30	
		Sets:	06h03	23h51	
Neptune Magnitude Diameter	Aquarius +7.8 to +7.9 2”	Rises:	15h10	09h13	**Evening**
		Transit:	21h35	15h26	
		Sets:	03h44	21h40	
Pluto Magnitude	Sagittarius +14.4	Rises:	10h36	04h46	**Morning**
		Transit:	17h45	11h54	
		Sets:	00h58	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.

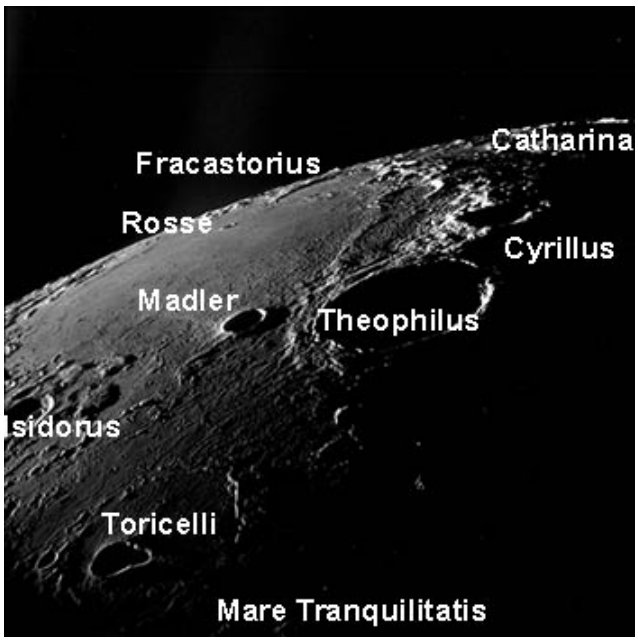
Magnitude: we are accustomed to hearing stars described in terms of ‘magnitude’. For example the planet Jupiter at magnitude -1.8 is considerably brighter than the star Antares (in Scorpius) at +1.05. The scale is ‘inverse’; the brighter the object, the lower the number. A ‘good’ human eye on a clear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

MARE NECTARIS (Sea of Nectar

Mare Nectaris from Apollo11 facing southeast



Location: Lunar south-east sector, south of Mare Tranquilitatis and south-west of Mare Fecunditatis

Type: Dark basaltic plain formed by volcanic eruptions.

Size: diameter 360 Km, area 84 000 km.

Age: about 3.8 billion years

Features: Several large craters are situated at the borders of Mare Nectaris. Montes Pyrenaeus borders the mare to the east and Sinus Asperitatis fuses to its north-western edge. The largest crater is lava-filled **Fracastorius** (dia. 124 km) which fuses with the southern "coast". Located near the north-western "coast" is a prominent trio of 100-km craters **Theophilus**, **Cyrillus** and **Catharina**. Another notable feature is a "ghost crater" Daguerre, almost entirely covered with lava, in the northern part of the mare. Nectaris also contains prominent crater **Rosse**, named after William Parsons, 3rd earl of Rosse.

Naming: Italian astronomer Giovanni Riccioli (1651).

Formation: Mare Nectaris is located in the central part of an 860 km diameter impact basin which was formed 3.8–3.9 billions year ago. This event marks the beginning of the Nectarian period of the lunar geologic timescale. Lava filling of Mare Nectaris is younger than the basin itself. The mare material is approximately 1000m in depth, and mainly of the Nectarian period and the Lower Imbrian epoch, with the mare material of the Upper Imbrian epoch.

Best seen: five days after New Moon and four days after Full Moon.

Lunar and Solar eclipses: none predicted for this month

MOON RISE AND SET TIMES FOR NOVEMBER

Day	*date*	*rise*	*set*	*Day*	*date*	*rise*	*set*	*Day*	*date*	*rise*	*set*
Mon	Nov/01	03h55	15h23	Thu	Nov/11	11h54	01h23	Sun	Nov/21	21h44	06h34
Tue	Nov/02	04h25	16h29	Fri	Nov/12	12h59	02h03	Mon	Nov/22	22h37	07h18
Wed	Nov/03	04h56	17h38	Sat	Nov/13	14h01	02h36	Tue	Nov/23	23h26	08h08
Thu	Nov/04	05h29	18h50	Sun	Nov/14	15h01	03h05	Wed	Nov/24	--	09h02
Fri	Nov/05	06h05	20h04	Mon	Nov/15	15h59	03h32	Thu	Nov/25	00h09	10h00
Sat	Nov/06	06h48	21h20	Tue	Nov/16	16h56	03h58	Fri	Nov/26	00h48	11h01
Sun	Nov/07	07h37	22h33	Wed	Nov/17	17h54	04h24	Sat	Nov/27	01h22	12h02
Mon	Nov/08	08h35	23h39	Thu	Nov/18	18h51	04h52	Sun	Nov/28	01h53	13h05
Tue	Nov/09	09h39	--	Fri	Nov/19	19h49	05h22	Mon	Nov/29	02h23	14h08
Wed	Nov/10	10h46	00h36	Sat	Nov/20	20h47	05h55	Tue	Nov/30	02h52	15h14

METEOR SHOWERS

	Maximum Date/Time	*Observing Prospects*	*Duration*	*Radiant*	*ZHR**	*Velocity Km/sec*
Southern Taurids	5th Nov 21h30 to 03h30	New Moon	1st November – 25th November	15º west of **Aldebaran**	10	29
Northern Taurids	12th Nov 21h30 to 03h30	Moonset 02h03	1st November – 25th November	3º east of **The Pleiades**	5	31
Leonids	17th November 03h00 – 04h00	Poor 96% Moon	12th – 21st November	3º north-west of **Algieba (γ Leo)**	5-10	70

**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 2021, pages 86- 87.

---

3. LOOKING OUT

SUGGESTED EVENING OBSERVATION WINDOWS

(Lunar observations notwithstanding)

Date	*Dusk end*		*Moon*
25th October to	20h36	***Rises***	23h50 (76%)
6th November	20h51	***Sets***	21h20 (5%)
24th November to	21h14	***Rises***	Does not rise
6th December	21h29	***Sets***	22h23 (6%)

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

ANDROMEDA GALAXY
M31, NGC 224

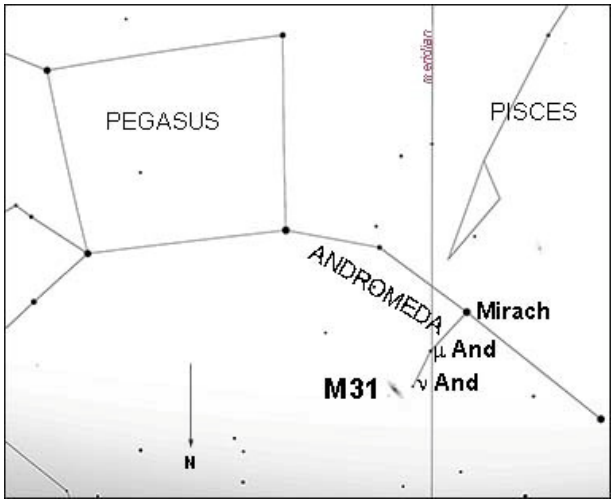
*The following details are applicable to **31st November 2021** at **23h00***

Description	Spiral galaxy	***Visibility on 31st November 2021***		
Constellation	Andromeda			
Distance	2 500 kly, 780 kpc	*Rises*	*Transits*	*Sets*
Magnitude	+3.4	19h10	22h45	02h25
Apparent size	178 x 70 arcmin			
Actual size	131.3 Kly, 40.2 Kpc	Naked Eye	A faint smudge on moonless nights	
Alt/Az	+14º08'01"/ 357º11'11"	Binoculars	Yes	
J2000 lat/long	+41º16'00" / 0º42'42"	Telescopes	Yes, with detail	

The magnificent Andromeda Galaxy is repeated.

Being so low on our horizon from our latitude, our observation windows are annually restricted to between October and early December of each year with further restriction imposed by the moon's phases.

Please be aware that, although the charts on page 1 above are timed for the middle of the first suggested deep sky observation window (2nd November), M31 will be very close to the horizon. The second window, centred on 30th November and waiting until about 23h00 for the galaxy to reach 14º above the horizon, provides a better opportunity.



The chart to above is for 30th November 23h00

Discovery and History

The earliest known record of the Andromeda Galaxy was made in 964 CE by Persian astronomer **Abd al-Rahman al-Sufi**. He described it as "The Little Cloud" in his book of fixed stars. It must have been known to Persian Astronomers at Isfahan as early as 905 AD. It also appeared on a Dutch star map in 1500.

The first telescopic description of M31 was given by **Simon Marius** in 1612 *without* claiming its discovery. Apparently` unaware of al-Sufi's and Marius' observations, **Giovanni Batista Hodierna** independently rediscovered this object in 1654. **Edmond Halley**, in his 1716 treatise, credits the discovery of this 'nebula' to French astronomer **Ismail Bouillard**, who observed it in 1661.

In 1764, **Charles Messier** catalogued the object as number 31. Unaware of al-Sufi's earlier work, Messier incorrectly credited Marius with its discovery.

The "Great Andromeda Nebula" was long believed to be one of the nearest gaseous nebulae. In 1785, **William Herschel** wrote (incorrectly) that, based on its colour and magnitude, its distance "would not exceed 2000 times that of Sirius" – about 17 000 ly. **William Huggins**, the pioneer of spectroscopy, observed the spectrum of M31 in 1864. The "nebula" displayed a star-like continuous spectrum, unlike the line spectra of gaseous nebulae.

continued ...

... **M31** *continued*

Description

The Andromeda Galaxy was formed roughly 10 billion years ago from the collision and subsequent merger of smaller protogalaxies.

With an apparent magnitude of +3.4, the Andromeda Galaxy is one the brightest Messier objects. It is visible to the naked eye from areas of moderate light pollution and can even be seen from urban areas with binoculars.

Although the apparent size of the galaxy is about 3 x 1 degrees – six times the size of the full moon – only the bright central region is visible to the naked eye. M31 harbours a dense and compact nucleus at its centre, giving the visual impression of a star embedded in the more diffuse surrounding bulge.

Astrophotographers can gather fine, faint detail in the spiral arms. M31, classified as an "SA(s)b" spiral galaxy, has arms moderately wound up in a clockwise direction. Andromeda's galactic plane is oriented approximately 13º to our line of sight and is therefore seen nearly edge-on. Like the Milky Way, the Andromeda galaxy has satellite galaxies. Charles Messier found the two brightest, M32 and M110, both visible in binoculars and conspicuous in small telescopes.

The image above shows M31 galaxy with M32 above and M110 below

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!
You can find us on Facebook, Twitter, the ASSAInfo mailing list and the ASSADiscussion mailing list.
ASSA website http://assa.saao.ac.za
ASSA Deep-Sky Section
Whatsappchat group: [074 100 7237]
MNASSAhttp://assa.saao.ac.za/about/publications/mnassa/
Nightfall https://assa.saao.ac.za/?s=Nightfall
Official Big 5 of the African Sky web page
Official Big 5 Facebook group
ASSA Deep-Sky Section mailing list

Grateful thanks to the following:

ASSA
Johan Retief
Pete Scully
Sky Guide Africa South 2021
Sky Safari
Stellarium
Wikipedia

Edited by Peter Harvey - e-mail: petermh@hermanus.co.za -Tel: +27 (0) 81 212 9481