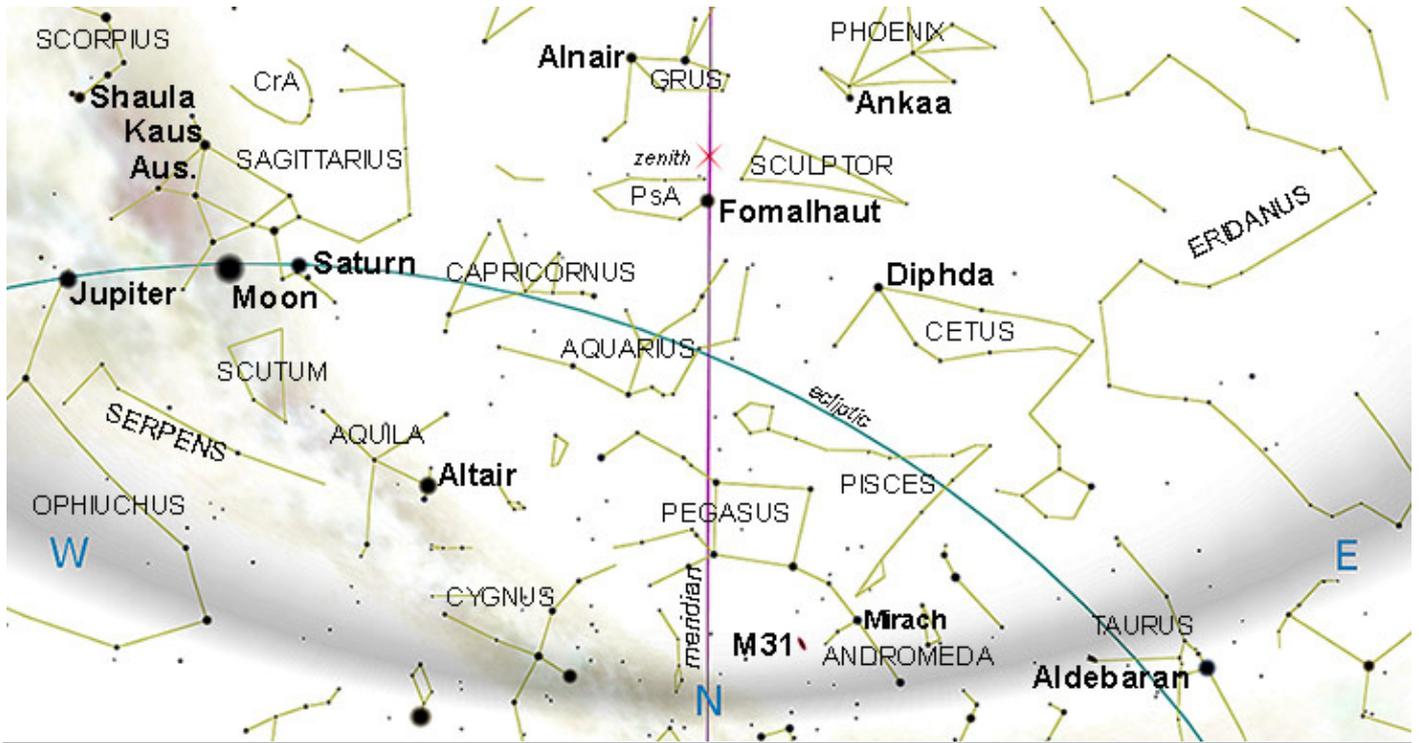


# NOVEMBER 2019

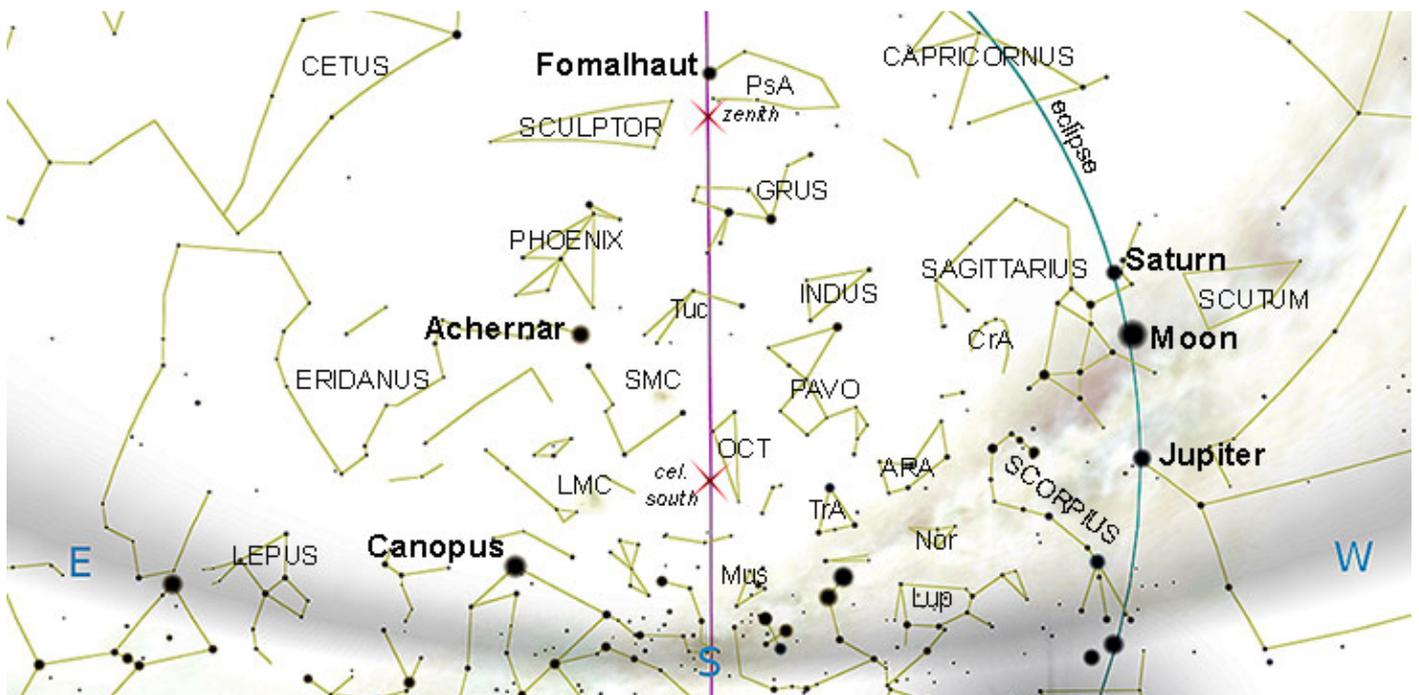


## 1. SKY CHARTS

### EVENING SKY 1<sup>st</sup> NOVEMBER at 21<sup>h</sup>00 (NORTH DOWN)



### EVENING SKY 1<sup>st</sup> NOVEMBER at 21<sup>h</sup>00 (SOUTH DOWN)



## 2. HIGHLIGHTS FROM THE SKY GUIDE

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

<b>Date</b>	<b>Time</b>	<b>Item</b>
2		<b>Moon</b> furthest south (-23.1°)
		<b>Moon</b> near <b>Saturn</b>
		<b>Moon</b> near <b>Pluto</b>
4	12h23	<b>First quarter Moon</b>
	19h18	<b>Luna X</b> visible (sunset 19h11)
5		<b>Southern Taurid</b> meteor show at maximum ( <i>see page 4</i> )
7	10h38	<b>Moon</b> at apogee (405 059 Km)
		<b>Moon</b> near <b>Neptune</b>
9		<b>Jupiter</b> moonless
10		<b>Venus</b> near <b>Antares</b>
		<b>Mars</b> near <b>Spica</b>
11		<b>Moon</b> near <b>Uranus</b>
	14h35	Transit of <b>Mercury</b> <sup>1</sup>
12	15h34	<b>Full Moon</b>
		<b>Vesta</b> at opposition
		<b>Northern Taurid</b> meteor shower at maximum ( <i>see page 4</i> )
14		<b>Moon</b> near <b>Aldebaran</b>
16		<b>Moon</b> furthest north (+23.1°)
		<b>Mercury</b> at perihelion
17		<b>Moon</b> near <b>Pollux</b>
		<b>Leonid</b> meteor shower at maximum ( <i>see page 4</i> )
19	23h11	<b>Last quarter Moon</b>
20		<b>Moon</b> near <b>Regulus</b>
		<b>Mercury</b> stationary
23	09h56	<b>Moon</b> at perigee (366 720 Km)
24		<b>Moon</b> near <b>Mars</b>
		<b>Venus</b> near <b>Jupiter</b>
25		<b>Moon</b> near <b>Mercury</b>
26	17h05	<b>New Moon</b>
		<b>Mercury</b> greatest latitude north
27		<b>Neptune</b> stationary
28		<b>Moon</b> near <b>Jupiter</b>
	21h59	<b>Moon</b> passes 2.4° north of <b>Venus</b>
		<b>Mercury</b> at greatest western elongation (+20°)
		<b>Venus</b> at aphelion and southernmost annual declination (-24.8°)
29	23h59	<b>Moon</b> occults <b>Saturn</b> ( <i>Stellarium</i> simulation)
		<b>Moon</b> furthest south (-23.2°)
30		<b>Moon</b> near <b>Pluto</b>

<sup>1</sup> **Mercury's** transit of the **Sun** – **Never look at the sun without SUITABLE EYE PROTECTION!**

First contact 14h35    Second contact 14h37    Greatest transit 17h19    Sunset 19h17

For further information: <http://www.eclipsewise.com/oh/tm2019.html> [note that times are UTC]

### 3. THE SOLAR SYSTEM

NOVEMBER 2019			1 <sup>st</sup> November	1 <sup>st</sup> December	Visibility
<b>Sun</b> Length of day	Libra to Ophiuchus 13h29 to 14h16	Rises:	05h42	05h24	<b>Never look at the sun without SUITABLE EYE PROTECTION!</b>
		Transit:	12h27	12h32	
		Sets:	19h12	19h40	
<b>Mercury</b> Magnitude Phase Diameter	Libra +0.6 to -0.6 29% to 69% 9" to 6"	Rises:	06h33	04h26	<b>Low in the west after sunset</b>
		Transit:	13h40	11h13	
		Sets:	20h46	18h00	
<b>Venus</b> Magnitude Phase Diameter	Libra to Sagittarius -3.9 94% to 89% 11" to 12"	Rises:	06h48	07h16	<b>Low in the west after sunset</b>
		Transit:	13h50	14h33	
		Sets:	20h53	21h50	
<b>Mars</b> Magnitude Phase Diameter	Virgo +1.8 to +1.7 99% to 98% 4"	Rises:	04h50	03h46	<b>Low in the east before sunrise</b>
		Transit:	11h10	10h27	
		Sets:	17h30	17h07	
<b>Jupiter</b> Magnitude Diameter	Ophiuchus to Sagittarius -1.9 to -1.8 33" to 32"	Rises:	08h22	06h51	<b>Evening</b>
		Transit:	16h32	14h02	
		Sets:	22h43	21h12	
<b>Saturn</b> Magnitude Diameter	Sagittarius +0.6 16" to 15"	Rises:	10h00	08h14	<b>Evening</b>
		Transit:	17h08	15h21	
		Sets:	00h19	22h27	
<b>Uranus</b> Magnitude Diameter	Aries +5.7 4"	Rises:	08h42	16h39	<b>Throughout the night</b>
		Transit:	00h13	22h07	
		Sets:	05h40	03h39	
<b>Neptune</b> Magnitude Diameter	Aquarius +7.8 to +7.9 2"	Rises:	14h51	12h52	<b>Evening</b>
		Transit:	21h10	19h12	
		Sets:	03h34	0135	
<b>Pluto</b> Magnitude	Sagittarius +14.3 to 14.4	Rises:	10h24	08h28	<b>Evening</b>
		Transit:	17h31	15h36	
		Sets:	00h42	22h43	

**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 Antares (in Scorpius) at +1.05 and the planet Jupiter, at (for example) magnitude -1.9. The latter is considerably brighter than Antares as 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

### **COPPERNICUS**

**Type:** Crater with three central mountains rising 1.2 km above the crater floor.

**Diameter:** 95 km.

**Notes:** Young and isolated formation with a large so-called “starburst” ray system (some of which are up to 800 km long) which can be seen with the naked eye. Due to its relative youth, the crater has remained in a relatively pristine shape since it formed. The circular rim has a discernible hexagonal form, with a terraced inner wall and a 30 km wide, sloping rampart that descends nearly a kilometre to the surrounding mare. There are three distinct terraces visible, and arc-shaped landslides due to slumping of the inner wall as the crater debris subsided.

**Best seen:** Two days after first quarter and one day after last quarter.

**Age:** about 3.6 billion years

**Location:** North-west quadrant, slightly northwest of the centre of the Moon's Earth-facing hemisphere.

**Naming:** Named after the astronomer Nicolaus Copernicus. Like many of the craters on the Moon's near side, it was given its name by Giovanni Riccioli, whose 1651 nomenclature system has become standardized.



**No eclipses, solar or lunar are predicted for November 2019.**

### METEOR SHOWERS

<i>Name</i>	<i>Date &amp; Time of Max</i>	<i>Duration</i>	<i>Radiant</i>	<i>ZHR</i>	<i>velocity</i>	<i>Observing Prospect</i>
<b>Orionids</b>	21 October 00h00 to 04h00	2 October – 7 November	Between <b>Betelgeuse</b> and <b>γ Geminorum</b>	30	68	Poor
<b>Southern Taurids</b>	5 November 21h30 – 03h30	1 October – 25 November	15° west of <b>Aldebaran</b>	10	29	Good
<b>Northern Taurids</b>	12 November 21h30 – 03h30	1 October – 25 November	3° east of <b>Pleiades</b>	5	31	Full Moon
<b>Leonids</b>	17 November 03h00 – 04h00	12 - 21 November	3° north-west of <b>Algieba (γ Leo)</b>	5-10	70	Poor

Guide to the table above:

ZHR – zenithal hourly rate

vel. - velocity in km per second

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

## 4. STARGAZING

### SUGGESTED OBSERVATION DAYS

Unless *specifically* targeting the moon, may I suggest the most convenient dates to plan evening stargazing are from **20<sup>th</sup>** to **31<sup>st</sup>** (moonset at 22h54, 14%) **October**. Then from **16<sup>th</sup>** (moonrise 23h19) to **31<sup>st</sup> November** (moonset 22h33, 10%).



*The next club stargazing evening is yet to be scheduled. Members will receive updated information by e-mail. Please check our website calendar.*

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

*Remember, it's always weather dependant!*

### DEEP SKY HIGHLIGHTS

#### THE ANDROMEDA GALLAXY M31, NGC 224

#### NOTES

<u>Description</u>	Spiral galaxy in Andromeda, the nearest spiral galaxy to our own.	The earliest known record of the Andromeda Galaxy was made in 964 BC by Persian astronomer <b>Abd al-Rahman al-Sufi</b> . He described it as "The Little Cloud" in his book of fixed stars. But 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.
<u>Distance</u>	2 500 Kly, 780 Kpc	
<u>Apparent Size</u>	178 x 70 arcmin	The first telescopic description of M31 was given by <b>Simon Marius</b> in 1612 without claiming its discovery. Unaware of al-Sufi's and Marius' observations, <b>Giovanni Batista Hodierna</b> independently rediscovered this object in 1654. <b>Edmond Halley</b> , in his 1716 treatise, credits the discovery of this 'nebula' to French astronomer <b>Ismail Bouillard</b> , who observed it in 1661.
<u>Size</u>	131.3 Kly, 40.2 Kpc	
<u>Magnitude</u>	+3.4	
<u>Age</u>	The Andromeda Galaxy was formed roughly 10 billion years ago from the collision and subsequent merger of smaller protogalaxies.	In 1764, <b>Charles Messier</b> catalogued the object as number 31. Unaware of al-Sufi's earlier work, Messier incorrectly credited Marius with its discovery.
<u>Location</u>	Constellation Andromeda, from guide star <b>Mirach</b> , 7.7 <sup>o</sup> to north-west	The "Great Andromeda Nebula" was long believed to be one of the nearest gaseous nebulae. In 1785, <b>William Herschel</b> wrote (incorrectly) that, based on its colour and magnitude, its distance "would not exceed 2000 times that of Sirius" – about 17 000 ly.
<u>J2000 coordinates</u>	0h42m42s / +41 <sup>o</sup> 16'00"	<b>William Huggins</b> , 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.
<u>Visibility</u>		
<u>Naked eye</u>	A faint smudge on moonless nights, one of the farthest objects visible to the naked eye.	
<u>Binoculars</u>	Yes (see P. 6)	
<u>Telescopes</u>	Yes (see P. 6)	

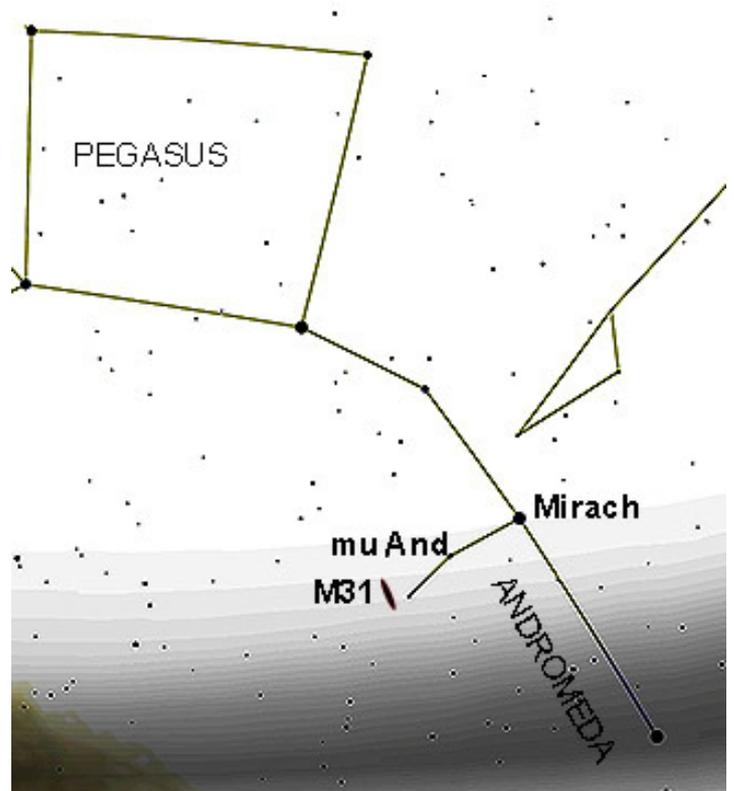
## Visibility (continued)

With an apparent magnitude of +3.4, the Andromeda Galaxy is one of 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  $3 \times 1$  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 the fine, faint detail in the spiral arms. M31 is classified as an “SA(s)b” spiral galaxy, with arms moderately wound up in a clockwise direction. Andromeda’s galactic plane is oriented approximately  $13^\circ$  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.



## **Please keep in touch...**

Don't forget to have a look at our excellent website, edited by Derek Duckitt.  
<http://www.hermanusastronomy.co.za/>

*Also...*

ASSA website <http://assa.saa.ac.za>

[ASSA Deep-Sky Section](#)

Whatsappchat group: [ 074 100 7237 ]

[MNASSA](http://assa.saa.ac.za/about/publications/mnassa/)<http://assa.saa.ac.za/about/publications/mnassa/>

[Nightfall](https://assa.saa.ac.za/?s=Nightfall) <https://assa.saa.ac.za/?s=Nightfall>

[Official Big 5 of the African Sky web page](#)

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[ASSA Deep-Sky Section mailing list](#)

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