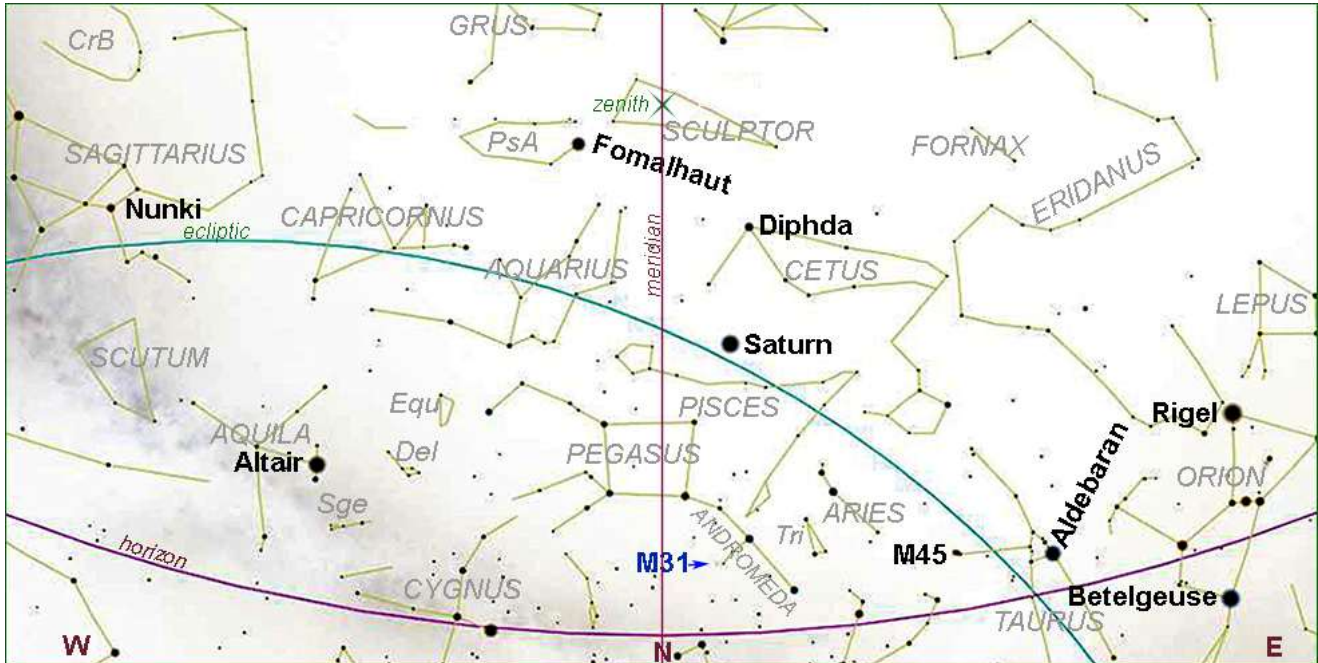
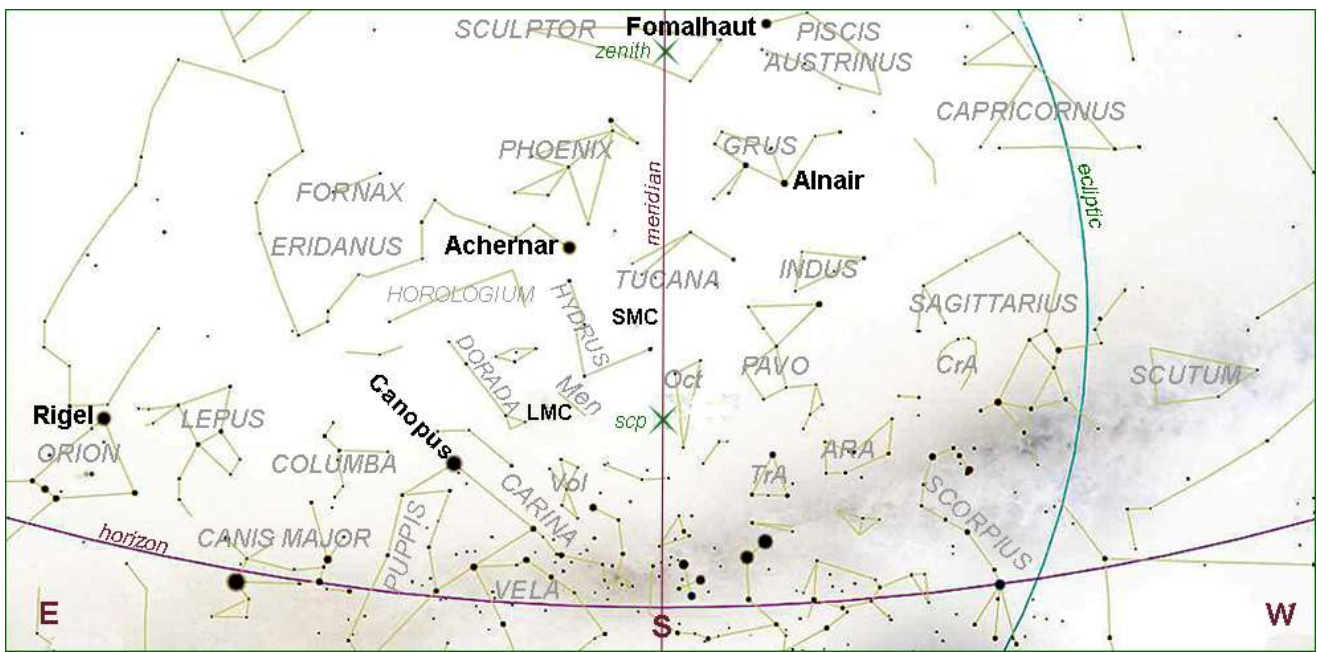


EVENING SKY – NOVEMBER 6th at 21h30 (NORTH DOWN)



EVENING SKY – NOVEMBER 6th at 21h30 (SOUTH DOWN)



SUGGESTED EVENING OBSERVATION WINDOW

(Lunar observations notwithstanding)

<u>Date</u>		<u>Moon</u>	<u>Dusk end</u>
October 30 to	Rise	23h21 (72%)	20h51
November 13	Set	23h24 (14%)	

THE SOLAR SYSTEM

NOVEMBER HIGHLIGHTS based on the 2026 SKY GUIDE

All events are as observed from **HERMANUS**, Western Cape, South Africa

ALMANAC

<i>Day</i>	<i>Time</i>	<i>Item</i>
1	22h28	Last Quarter Moon
2	23h38	38% Moon occults Jupiter
4		Callisto 8.0' from Jupiter (8.0')
5		Titan 2.7' from Saturn (2.7')
9	09h02	New Moon
12		Callisto 8.1' from Jupiter
13		Titan 3.0' from Saturn
17	03h00	Lunar X and Lunar V visible
	13h48	First Quarter Moon
		Leonid meteor shower at maximum ¹
20	22h44	Moon passes 6.8° NW of Saturn
21		Callisto 8.4' from Jupiter
		Titan 2.7' from Saturn
24	16h53	Full Moon (Supermoon)
	21h00	Moon , M45 and Uranus ²
26	01h13	Mars near Jupiter and Regulus ³
29		Callisto 8.5' from Jupiter
		Titan 2.7' from Saturn
		Venus at greatest brilliance

EPHEMERIS

<i>Day</i>	<i>Time</i>	<i>Item</i>
3	05h02	Moon at descending node
	15h27	Mercury closest to Earth (0.673 au)
4	16h24	Mercury at inferior conjunction
10		Mercury at perihelion
11	17h11	Venus stationary
12	09h40	Moon southernmost (-27°42')
13	19h50	Moon at apogee (405,619km)
	11h15	Mercury stationary
17	13h49	Moon at ascending node
18		Mercury at dichotomy
21		Mercury at western elongation (19.6°)
25	22h58	Moon at perigee (359 348 km)
26	02h02	Moon northernmost (+27°38')
	00h29	Uranus closest to Earth (18.444 au)
	00h41	Uranus at opposition
30	05h34	Moon at descending node

¹ See Tim Cooper's **Comets, Asteroids** and **Meteors** on page 4

² **Moon**, **M45** and **Uranus** rise in a triangle

³ **Jupiter**, **Regulus** and **Mars** rise in a handsome isosceles triangle

SOLAR SYSTEM VISIBILITY

2026 NOVEMBER 6

Sun	Libra	Rise:	05h37	Never look at the sun without SUITABLE EYE PROTECTION!
Length of day	13 hours 40 mins	Transit:	12h27	
		Set:	19h17	
Mercury	Libra	Rise:	05h29	Too close to the Sun
Magnitude	+3.9	Transit:	12h11	
Phase	2%	Set:	18h52	
Diameter	10"			
Venus	Virgo	Rise:	04h27	Low in the east before sunrise
Magnitude	-4.4	Transit:	11h04	
Phase	6%	Set:	17h41	
Diameter	56"			
Mars	Leo	Rise:	02h01	Morning
Magnitude	+0.8	Transit:	07h18	
Phase	89%	Set:	12h35	
Diameter	7"			
Jupiter	Leo	Rise:	02h08	Morning
Magnitude	-2.0	Transit:	07h31	
Diameter	36"	Set:	12h54	
Saturn	Cetus	Rise:	16h17	All night
Magnitude	+0.5	Transit:	22h16	
Diameter	19"	Set:	04h19	
Uranus	Taurus	Rises:	20h47	All night
Magnitude	+5.6	Transit:	01h52	
Diameter	4"	Set:	06h54	
Neptune	Pisces	Rise:	15h45	All night
Magnitude	+7.8	Transit:	21h48	
Diameter	2"	Set:	03h55	
Pluto	Capricornus	Rise:	10h54	Evening
Magnitude	+14.5	Transit:	18h06	
		Set:	01h21	

Phases: 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 observed **angular diameter** is given in arc seconds.

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* to the horizon directly south.

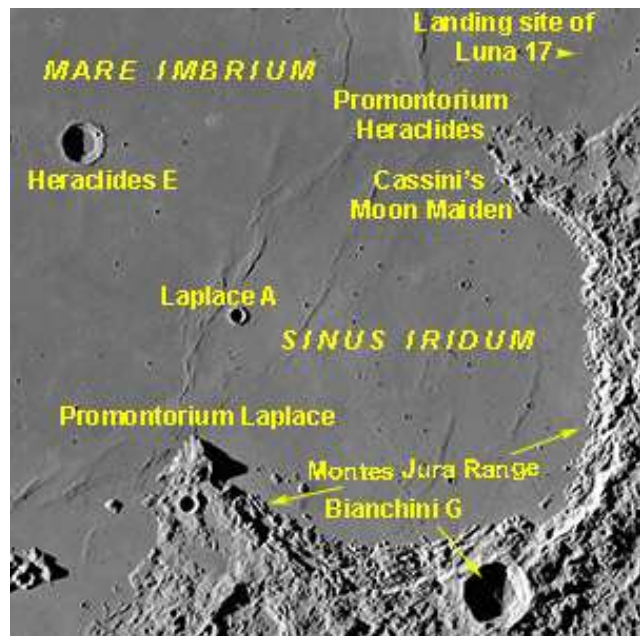
Magnitudes: We are accustomed to hearing the brightness of stars described in terms of 'magnitude'. But, for example, the star Sirius at magnitude -1.4 is considerably brighter than the star Antares (in Scorpius) at +1.05. The scale is 'inverse'; the brighter the object, the lower the value. A 'good' human eye on a clear night can see a star down to a magnitude of about +6.

THE MOON

SINUS IRIDUM

The "*Bay of Rainbows*" is a plain of basaltic lava which forms a north-western extension to the **Mare Imbrium** on the moon. It is surrounded from the north-east to the south-west by the **Montes Jura range**. The protruding part of the range at the southwest end is named **Promontorium Heraclides**, while that at the northeast end is called **Promontorium Laplace**. This bay, with its surrounding mountains, is considered one of the most beautiful features on the Moon and is a favourite among lunar observers.

Promontorium Heraclides is named after [Heraclides Ponticus](#), a Greek philosopher and astronomer. The land form is depicted as the face of a woman looking across Sinus Iridum in a 1679 lunar map by [Giovanni Domenico Cassini](#). This depiction, of disputed origin, is known as the "*Moon Maiden*", a clair-obscur effect.



Sinus Iridum is formed from the remains of a large impact crater which was subsequently flooded with basaltic lava, inundating the "sea" wall. The bay itself does not contain any notable impact craters but does include the satellite crater **Heraclides E** in the south, **Laplace A** along the eastern edge, and **Bianchini G** in the north. The surface is level, but is marked by a number of wrinkle ridges (dorsa).

Sinus Iridum is one of the largest craters of Upper (Late) [Imbrian](#) age.

The Soviet lunar probe [Luna 17](#) landed about 30 km from Promontorium Heraclides on November 17th, 1970.

The selenographic coordinates of the bay's centre are 45.01° N, 31.67° W. The diameter is 249 km. It was the planned landing site of [Chang'e 3](#), China's 2013 lunar exploration mission, which instead landed nearby in Mare Imbrium.

When 10 to 11 days after [new moon](#) the Sinus Iridum is still in shadow, the Montes Jura is already visible at the [lunar terminator](#). This geometry is also called [Golden Handle](#).

Best seen 1 day after last quarter (2nd) or 3 days after first quarter (20th).

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

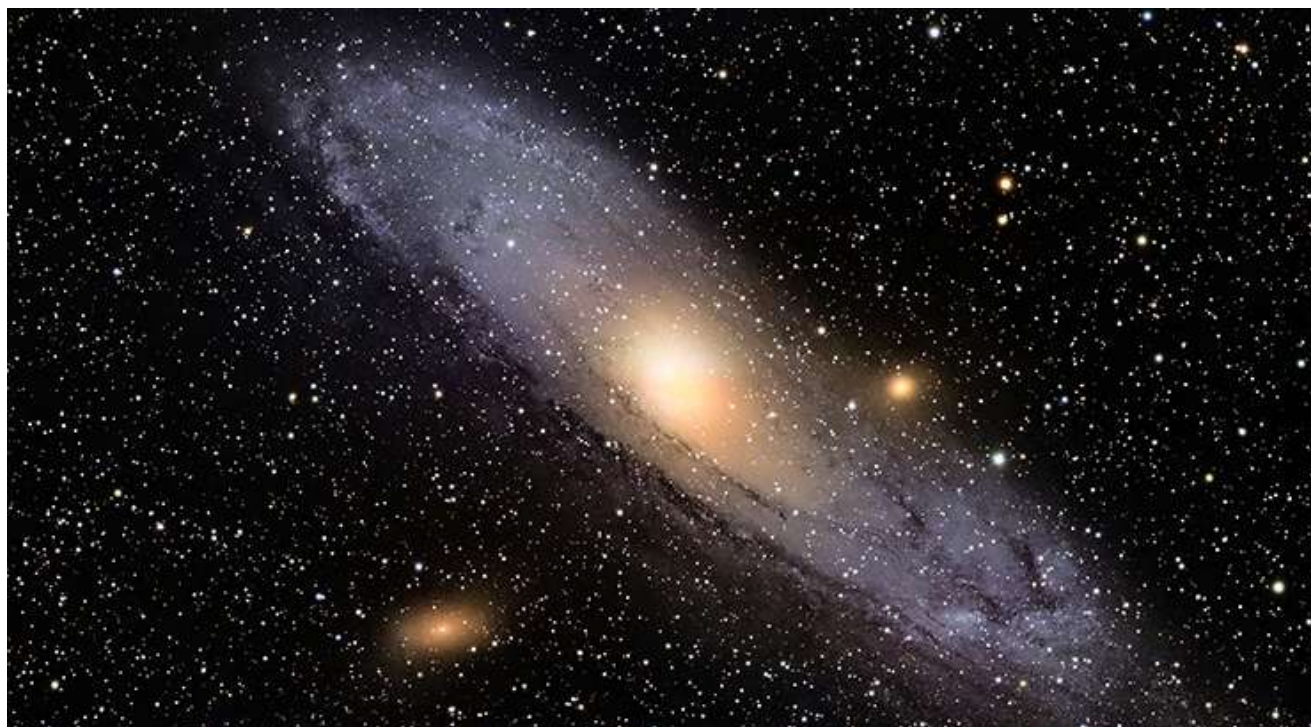
COMETS, ASTEROIDS AND METEORS

The link to the latest Comet, Asteroid and Meteor Section from **Tim Cooper** -

<https://assa.sao.ac.za/wp-content/uploads/sites/23/2026/09/ASSA-CAMnotes-2026-Number-4.pdf>

The latest Deep and Shallow Sky Bulletin by the Director, **Colin Steyn**, is now available to download from the webpage - <https://assa.sao.ac.za/publications/deep-sky/>

MEMBER'S IMAGE



THE ANDROMEDA GALAXY, M31

Image captured by Derek Duckitt

- Camera - *Seestar S50Pro*
- Filter – Internal UV/IR
- 65 x 60” exposures
- Software – *Siril, Photoshop*

THE ANDROMEDA GALAXY M31, NGC 224

<i>Description</i>	Spiral galaxy	<i>Visibility on 12th November</i>		
<i>Constellation</i>	Andromeda			
<i>Distance</i>	2.5 Mly, 765 kpc	<i>Rises</i>	<i>Transits</i>	<i>Sets</i>
<i>Magnitude</i>	+3.4	18h24	22h00	01h39
<i>Apparent size</i>	189 x 62 arcmin			
<i>Diameter</i>	152 000 ly, 47 kpc	<i>Naked Eye</i>	Yes, in excellent conditions	
<i>J2000 Dec/RA</i>	+41°16'20" / 0h42'46"	<i>Binoculars</i>	Yes	
<i>Alt/Az</i>	14°13'29" / +359°53'36"	<i>Telescopes</i>	Yes	

NOTE for Southern Cape stargazers – The **Andromeda Galaxy** reaches a maximum elevation of just 14.2° as it transits the meridian on November 12th at 22h00 and will be very difficult to see unless you get away from the mountains to, for example, Fisherhaven. Better yet would be a couple of days in the Karoo. But viewers in, for example, Pretoria, Gaborone or Harare will have fine views.

The following article is more for **observational history** in particular and for general interest.

PHYSICAL DESCRIPTION

The **Andromeda Galaxy** is a barred spiral galaxy and is the nearest major galaxy to the Milky Way. It was originally named the **Andromeda Nebula** and is catalogued as **M31** and **NGC 224**.

The galaxy has a [D25 isophotal diameter](#) of about 47 kpc (152 000 light-years) and is approximately 765 kpc (2.5 million light-years) from Earth. The estimated distance of the Andromeda Galaxy from our own was doubled in 1953 when it was discovered that there is a second, dimmer type of [Cepheid variable star](#). In the 1990s, measurements of both standard [red giants](#) as well as [red clump](#) stars from the [Hipparcos](#) satellite measurements were used to calibrate the Cepheid distances.

The [virial mass](#) of the Andromeda Galaxy is of the same order of magnitude as that of the Milky Way, at 1 trillion solar masses (2.0×10^{42} kg). The mass of either galaxy is difficult to estimate with any accuracy but it was long thought that the Andromeda Galaxy was more massive than the Milky Way by a margin of some 25% to 50%. However, this has been called into question by early-21st-century studies indicating a possibly lower mass for the Andromeda Galaxy and a higher mass for the Milky Way. The Andromeda Galaxy has a diameter of about 46.56 kpc (152 000 ly), making it the largest member of the Local Group of galaxies in terms of extension.

Andromeda–Milky Way collision

Updated Collision Odds

- **50/50 Chance:** Running 100 000 computer simulations using data from Hubble and Gaia shows a roughly 50% probability that the two galaxies will collide or merge within the next 10 billion years.
- **Alternative Outcome:** Instead of crashing, the Milky Way and Andromeda may simply pass by each other and continue orbiting in the Local Group.
- **Low Direct Hit Chance:** There is only about a 2% chance of a direct, head-on collision happening in 4 to 5 billion years.

AMATEUR OBSERVATION

With an apparent magnitude of +3.44, the Andromeda Galaxy is among the brightest of the Messier objects, and is visible to the naked eye from Earth in clear dark skies, even when viewed from areas with moderate light pollution.

OBSERVATION HISTORY

Around the year **964 CE**, the Persian astronomer [Abd al-Rahman al-Sufi](#) described the Andromeda Galaxy in his [Book of Fixed Stars](#) as a "nebulous smear" or "small cloud". This was the first historical reference to the Andromeda Galaxy and the earliest known reference to a galaxy other than the Milky Way. Star charts of that period labelled it as the *Little Cloud*.

1612 - the German astronomer [Simon Marius](#) gave an early description of the Andromeda Galaxy based on telescopic observations. [John Flamsteed](#) catalogued it as 33 Andromedae. [Pierre Louis Maupertuis](#) conjectured in **1745** that the blurry spot was an island universe.

1755 - the German philosopher [Immanuel Kant](#) proposed the hypothesis that the Milky Way is only one of many galaxies in his book [Universal Natural History and Theory of the Heavens](#). Arguing that a structure like the Milky Way would look like a circular nebula viewed from above and like an ellipsoid if viewed from an

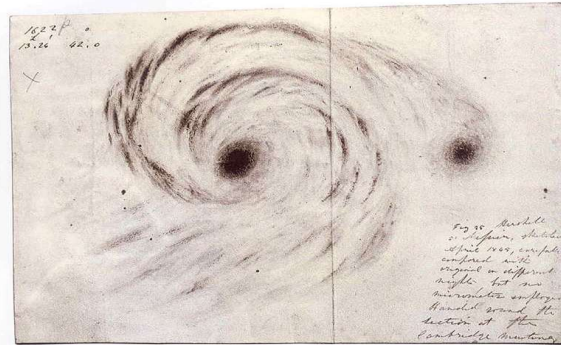
angle, he concluded that observed elliptical nebulae like Andromeda, which could not be explained otherwise at the time, were indeed galaxies similar to the Milky Way, not nebulae as was commonly believed.

1764 - [Charles Messier](#) catalogued Andromeda as object **M31** in and incorrectly credited Marius as the discoverer despite its being visible to the naked eye.

1785 - the astronomer [William Herschel](#) noted a faint reddish hue in the core region of Andromeda. He believed Andromeda to be the nearest of all the "great nebulae" and, based on the colour and magnitude of the nebula, he incorrectly guessed that it was no more than 2 000 times the distance of Sirius, or roughly 18 000 ly (5.5 kpc).

1850 - [William Parsons, 3rd Earl of Rosse](#), made a drawing of Andromeda's spiral structure.

(Parsons was the builder of the "Leviathan", the largest reflecting telescope of the 19th century, at Birr Castle, County Offaly, Leinster, Ireland)



1864 - [William Huggins](#) noted that the spectrum of Andromeda differed from that of a gaseous nebula. The spectrum of Andromeda displays a continuum of frequencies superimposed with dark absorption lines that help identify the chemical composition of an object. Andromeda's spectrum is very similar to the spectra of individual stars. From this, it was deduced that Andromeda had a stellar nature.

1885 - a supernova (known as [S Andromedae](#)) was seen in Andromeda, the only one ever observed in that galaxy. At the time, it was called "*Nova 1885*"—the difference between "nova" in the modern sense and "supernova" was not yet known. Andromeda was considered to be a nearby object and it was not realized that the "nova" was much brighter than ordinary novae. .

1887 - The spiral structure of the Andromeda Galaxy was first detected on a photograph taken on 10th October



1887 by the Welsh-born astronomer [Isaac Roberts](#) (1829–1904) using a 20-inch reflector at his private observatory near Liverpool. Further photographs confirmed the discovery, culminating on 29th December 1888 with [this four-hour exposure](#). However, he did not realize the significance of what he had photographed, thinking that the spiral shape indicated it to be a forming planetary system. [Roberts wrote](#): 'The central sun is now seen in the midst of nebulous matter which in time will be either absorbed or further separated into rings. The farthest boundaries of the nebula have already separated into rings more or less symmetrical with the nucleus.' It would be another 35 years before Edwin Hubble at Mount Wilson proved that the Andromeda spiral was a separate galaxy.

*Left - "Great Andromeda Nebula" (with **M32** to lower left and **M110** to upper right) by Isaac Roberts in 1888.*

[a remarkable achievement for the day! -ed.]

1912 - [Vesto Slipher](#) used spectroscopy to measure the radial velocity of Andromeda with respect to the Solar System—the largest velocity yet measured at 300 km/s.

1917 - [Heber Curtis](#) observed a “nova” within Andromeda. After searching the photographic record, 11 more novae were discovered. Curtis noticed that these novae were, on average, 10 magnitudes fainter than those that occurred elsewhere in the sky. As a result, he was able to come up with a distance estimate of 500 000 ly. Although this estimate is about fivefold lower than the best estimates available as of the 21st century, it was the first known estimate of the distance to Andromeda that was correct to within an order of magnitude (i.e., to within a factor of ten of the current estimates, which place the distance at around 2.5 million light-years). Curtis became a proponent of the so-called "island universes" hypothesis: that [spiral nebulae](#) were actually independent galaxies.

1920 - the [Great Debate](#) between [Harlow Shapley](#) and Curtis took place concerning the nature of the Milky Way, spiral nebulae and the dimensions of the universe. To support his claim that the Great Andromeda Nebula is, in fact, an external galaxy, Curtis also noted the appearance of dark lanes within Andromeda that resembled the dust clouds in the Milky Way galaxy, as well as historical observations of the Andromeda Galaxy's significant [Doppler shift](#). In 1922, [Ernst Öpik](#) presented a method to estimate the distance of Andromeda using the measured velocities of its stars. His result placed the Andromeda Nebula far outside the Milky Way at a distance of about 450 kpc (1 500 kly). [Edwin Hubble](#) settled the debate in 1925 when he identified extragalactic [Cepheid variable stars](#) for the first time on astronomical photos of Andromeda. These were made using the 100-inch (2.5 m) [Hooker telescope](#) on Mount Wilson, and they enabled the distance of the Great Andromeda Nebula to be determined. His measurement demonstrated conclusively that this feature was not a cluster of stars and gas within the Milky Way galaxy but an entirely separate galaxy located a significant distance from the Milky Way.

1943 - [Walter Baade](#) was the first person to resolve stars in the central region of the Andromeda Galaxy. Baade identified two distinct populations of stars based on their metallicity, naming the young, high-velocity stars in the disc [Type I](#) and the older, red stars in the bulge Type II. This nomenclature was subsequently adopted for stars within the Milky Way and elsewhere. (The existence of two distinct populations had been noted earlier by [Jan Oort](#)). Baade also discovered that there were two types of Cepheid variable stars, which resulted in doubling the distance estimate to Andromeda, as well as the remainder of the universe.

1950 - radio emissions from the Andromeda Galaxy were detected by [Robert Hanbury Brown](#) and [Cyril Hazard](#) at the [Jodrell Bank Observatory](#). The first [radio maps](#) of the galaxy were made in the 1950s by [John Baldwin](#) and collaborators at the [Cambridge Radio Astronomy Group](#). The core of the Andromeda Galaxy is called 2C 56 in the [2C](#) radio astronomy catalogue.

1959 - rapid rotation of the semi-stellar nucleus of M31 was discovered by [Andre Lallemand](#), **M. Duschene** and **Merle Walker** at the [Lick Observatory](#), using the 120-inch telescope, coudé Spectrograph and Lallemand electronographic camera. They estimated the mass of the nucleus to be about 1.3×10^7 solar masses. The second example of this phenomenon was found in **1961** in the nucleus of **M32** by **M.F Walker** at the [Lick Observatory](#), using the same equipment as used for the discovery of the nucleus of M31. He estimated the nuclear mass to be between 8 and 10×10^6 solar masses. Such rotation is now considered to be evidence of the existence of supermassive black holes in the nuclei of these galaxies.

21st century

2009 - an occurrence of [microlensing](#)—a phenomenon caused by the deflection of light by a massive object—may have led to the first discovery of a planet in the Andromeda Galaxy.

2020 - observations of linearly polarized radio emission with the [Westerbork Synthesis Radio Telescope](#), the [Effelsberg 100-m Radio Telescope](#) and the [Very Large Array](#) revealed ordered magnetic fields aligned along the "10-kpc ring" of gas and star formation.

2023 - amateur astronomers Marcel Drechsler, Xavier Strottner and Yann Sainty announced the discovery of a huge, oxygen-rich emission nebula just south of M31, near the bright star 35 And. This nebula, now classified as SDO-1, is exceedingly faint, requiring dozens of hours of exposure time minimum to detect, and appears to only emit in [oxygen-III](#). Deep studies of the surrounding regions showed no signs of similarly bright oxygen nebulae near M31, nor any sign of connecting hydrogen filaments to SDO-1, suggesting a high oxygen-hydrogen ratio. Current research suggests SDO-1 is extragalactic in nature, specifically caused by interaction between the Milky Way's and M31's circumgalactic halos, although more research is needed to fully understand this object. A later study using spectroscopy found the nebula to be in the Milky Way. One study found the nebula to be a [bow shock](#) of a ghost [planetary nebula](#) around the binary [EG Andromedae](#).

2025 - NASA published a huge mosaic made by the Hubble Space Telescope, assembled from approximately 600 separate overlapping fields of view taken over 10 years of Hubble observation. Hubble resolves an estimated 200 million stars that are hotter than the Sun, but still a fraction of the galaxy's total estimated stellar population.



Processed image of the Andromeda Galaxy with enhancement of [H-alpha](#) to highlight its star-forming regions

FORMATION AND HISTORY

A major merger occurred 2 to 3 billion years ago at the Andromeda location, involving two galaxies with a mass ratio of approximately 4.

The discovery of a recent merger in the Andromeda Galaxy was first based on interpreting its anomalous age-velocity dispersion relation, as well as the fact that 2 billion years ago, star formation throughout Andromeda's disc was much more active than today.

Modelling of this violent collision shows that it has formed most of the galaxy's (metal-rich) galactic halo, including the Giant Stream, and also the extended thick disc, the young age thin disc, and the static 10 kpc ring. During this epoch its rate of star formation would have been very high to the point of becoming a luminous infrared galaxy for roughly 100 million years. Modelling also recovers the bulge profile, the large bar and the overall halo density profile.

Andromeda and the [Triangulum Galaxy](#) (M33) might have had a very close passage 2–4 billion years ago, but it seems unlikely from the last measurements from the Hubble Space Telescope.

Ian Ridpath's
STAR TALES

Andromeda

Genitive: Andromedae

Abbreviation: And

Size ranking: 19th

Origin: One of the 48 Greek constellations listed by Ptolemy in the [Almagest](#)

Greek name: Ἀνδρομέδα

Perhaps the most enduring of all Greek myths is the story of Perseus and Andromeda, the original version of George and the dragon. Its heroine is beautiful princess Andromeda (Ἀνδρομέδα in Greek). She was the daughter of the weak King Cepheus of Ethiopia and the vain Queen Cassiopeia, whose boastfulness knew no bounds.

Andromeda's misfortunes began one day when her mother claimed that she was more beautiful even than the Nereids, a particularly alluring group of sea nymphs. The affronted Nereids decided that Cassiopeia's vanity had finally gone too far and they asked Poseidon, the sea god, to teach her a lesson. In retribution, Poseidon sent a terrible monster (some say also a flood) to ravage the coast of King Cepheus's territory. Dismayed at the destruction and with his subjects clamouring for action, the beleaguered Cepheus appealed to the Oracle of Ammon for a solution. He was told that he must sacrifice his virgin daughter to appease the monster.

Hence the blameless Andromeda came to be chained to a rock to atone for the sins of her mother, who watched from the shore with bitter remorse. The site of this event is said to have been on the Mediterranean coast at Joppa (Jaffa), the modern Tel-Aviv. As Andromeda stood on the wave-lashed cliffs, pale with terror and weeping pitifully at her impending fate, the hero [Perseus](#) happened by, fresh from his exploit of beheading Medusa the Gorgon. His heart was captivated by the sight of the frail beauty in distress below.

The Roman poet **Ovid** tells us in his book *the Metamorphoses* that Perseus at first almost mistook her for a marble statue. Only the wind ruffling her hair and the warm tears on her cheeks showed that she was human. Perseus asked her name and why she was chained there. Shy Andromeda, totally different in character from her vainglorious mother, did not at first reply; even though awaiting a horrible death in the monster's slaving jaws, she would have hidden her face modestly in her hands, had they not been bound to the rock.

Perseus persisted in his questioning. Eventually, afraid that her silence might be misinterpreted as guilt, she told Perseus her story, but broke off with a scream as she saw the monster breasting through the waves towards her. Pausing politely to ask the permission of her parents for Andromeda's hand in marriage, Perseus swooped down, slew the sea-dragon with his diamond sword, released the swooning girl to the enthusiastic applause of the onlookers and claimed her for his bride. Andromeda later bore Perseus six children including Perses, ancestor of the Persians, and Gorgophonte, father of Tyndareus, king of Sparta.

The Greek goddess Athene is said to have placed Andromeda's image among the stars, where she lies between Perseus and her mother Cassiopeia. Only the constellation Pisces, the fishes, separates her from the sea monster, [Cetus](#).

Stars in Andromeda

Star maps picture Andromeda with her hands in chains. Her head is marked by the second-magnitude star Alpha Andromedae, originally shared with neighbouring [Pegasus](#). In fact, in the *Almagest*, Ptolemy listed this star not under Andromeda but Pegasus, where it marked the horse's navel, although he acknowledged that it was 'common to the head of Andromeda'. The star is now assigned exclusively to Andromeda but echoes of its dual identity live on in its popular name of Alpheratz, which comes from the Arabic al-faras, meaning 'the horse'. A now-obsolete alternative name for it was Sirrah, from the Arabic surrat, meaning 'navel', harking back to Ptolemy's description of it as the navel of the horse.

The girl's waist is marked by the star Beta Andromedae, called Mirach, a name corrupted from the Arabic al-mi'zar meaning 'the girdle' or 'loin cloth'. Ptolemy described it as 'the southernmost of the three stars over the girdle' (the others were Mu and Nu Andromedae). Her left foot is marked by Gamma Andromedae, whose official IAU-approved name is Almach but which in the past has also been variously spelled Almaak, Alamak, or Almak, from the Arabic al-'anāq, referring to the desert lynx or caracal which the old Arabs visualized here. Through small telescopes this is a beautiful twin star of contrasting yellow and blue colours. The star that Ptolemy described as lying in Andromeda's right foot is now just within the modern borders of Perseus, where it is known as Phi Persei.

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Please keep in touch...

Have a look at our excellent website, edited by Derek Duckitt – <https://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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