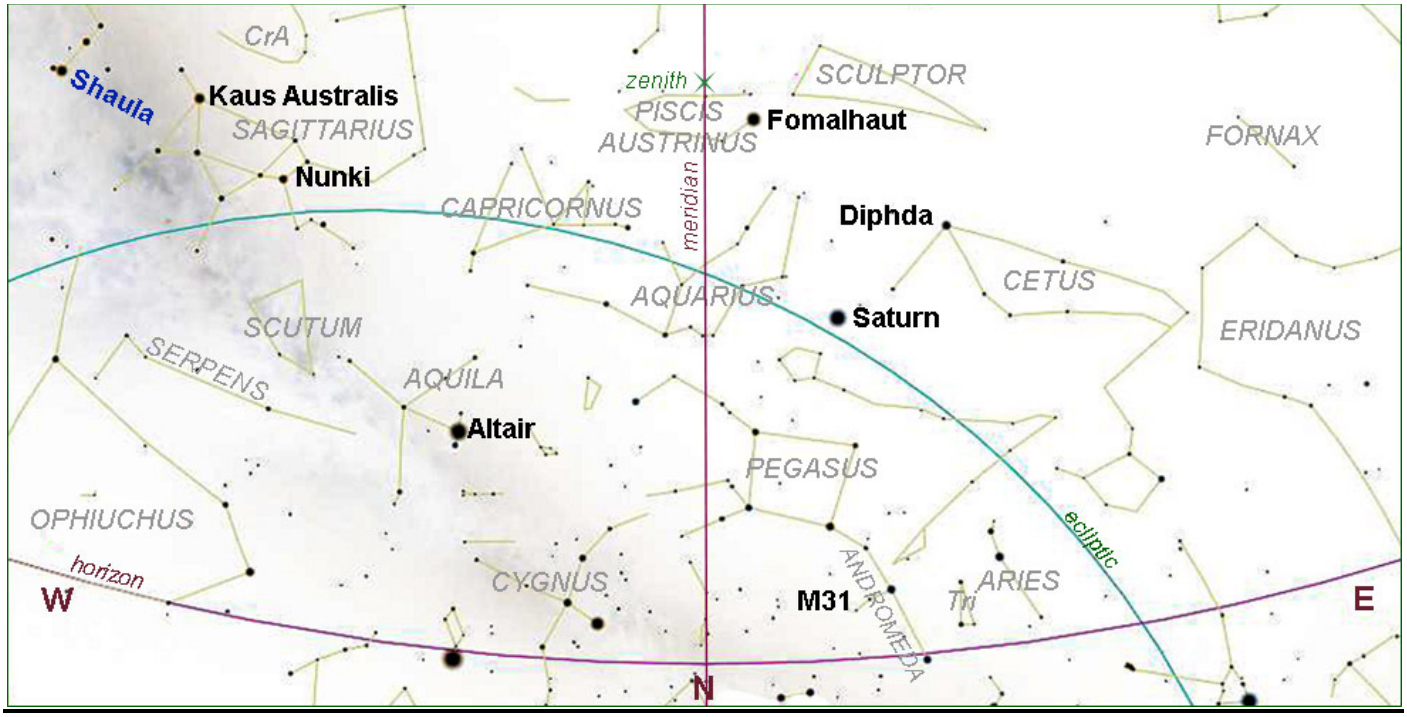
SKYNOTES from Hermanus

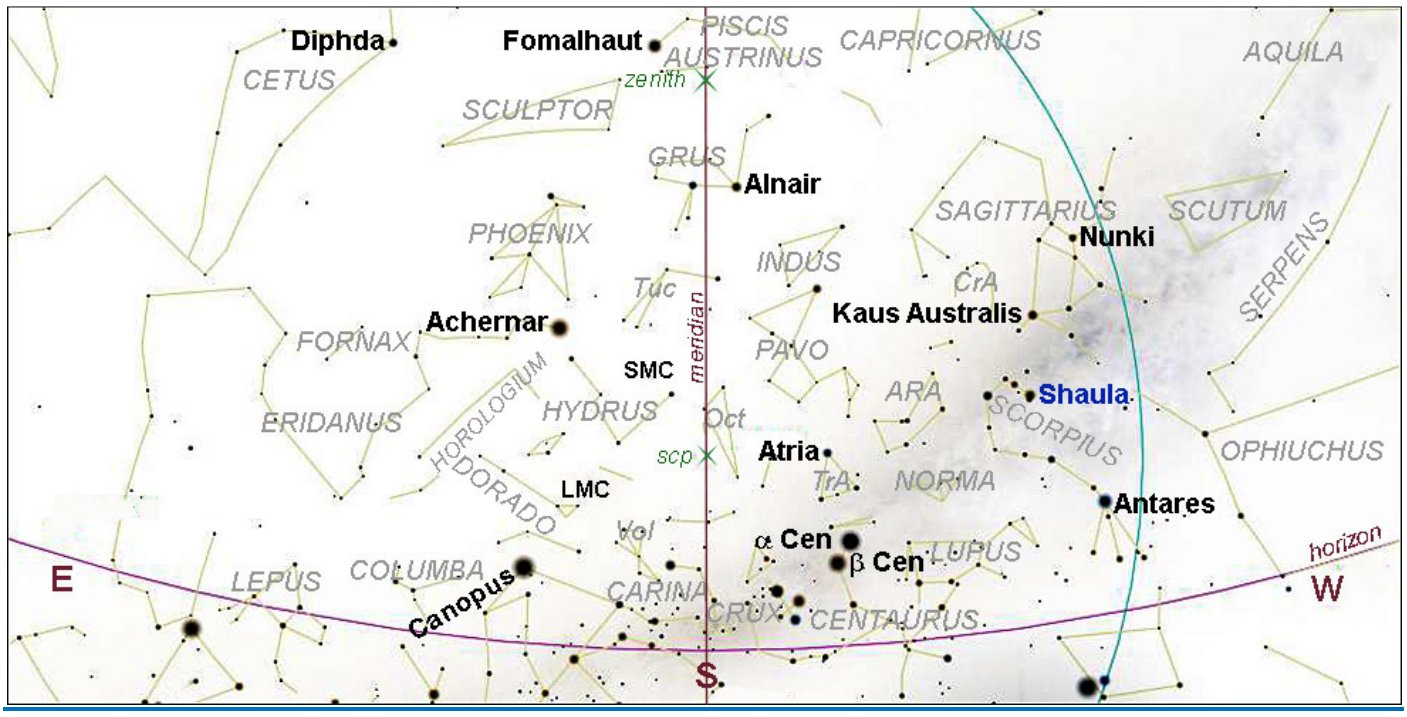
OCTOBER 2025

SKY CHARTS

EVENING SKY – OCTOBER 17th at 21h30 (NORTH DOWN)



EVENING SKY – OCTOBER 17th at 21h30 (SOUTH DOWN)



SUGGESTED EVENING OBSERVATION WINDOW

(Lunar observations notwithstanding)

Date		*Moon*	*Dusk end*
October 11	*Rise*	**23h15 (72%)**	**20h21**
to October 24	*Set*	**22h09 (8%)**	**20h35**

THE SOLAR SYSTEM

OCTOBER HIGHLIGHTS based on the 2025 SKY GUIDE

(PLEASE NOTE: all events are as observed from **HERMANUS**, Western Cape, South Africa)

Date	***Time (SAST)***	***Item***
2		**Venus** at perihelion
	19h50	**Mercury** and **Spica** set together
5	11H20	**Moon** at ascending node
6	03h51	**Moon** (99%) passes 4.2º northwest of **Saturn**
6 - 7		**Jupiter** within the **Twinkling Comet** cluster **NGC 2420** (mag. +8.3)
7		Dwarf planet **Ceres** at opposition
	05h47	**Full Moon**
8	14h36	**Moon** at perigee (359 819 km)
10	05h00	**Moon** (87%) passes 1.5º north of **The Pleiades** (M45)
12		**Moon** northernmost (+28.5º)
13	20h13	**Moon last quarter**
14		**Pluto** stationary
		Callisto at maximum from **Jupiter** (9')
	00h05	**Moon** (39%) passes between **Jupiter** and **Pollux**
16	21h00	**Moon** (13%) passes 1.4º northwest of **Regulus**
18	06h34	**Moon** at descending node
19	20h45	**Mercury** and **Mars** set together
21	14h25	**New Moon**
	20h00	**Mercury** near the **Ghost** globular cluster NGC 5897 (mag. +8.52)
		Orionid meteor shower at maximum
22		Dwarf planet **Eris** at opposition
23	20h40	**Moon** (4%), **Mercury**, **Mars** and **Ghost** globular cluster setting in close formation
24	01h31	**Moon** at apogee (406 445 km)
		Moon (8%) and **Antares** set in close formation
26		**Moon** southernmost (-28.5º)
29	18h21	**Moon first quarter**
30		**Mercury** at eastern elongation (23.9º)
31		**Callisto** at maximum from **Jupiter** (9')

SOLAR SYSTEM VISIBILITY

2025 OCTOBER 17				*When visible?*
Sun Length of day	Virgo 12 hours 00 minutes	Rise: Transit: Set:	05h58 12h28 18h59	**Never look at the sun without *SUITABLE EYE PROTECTION!***
Mercury Magnitude Phase Diameter	Libra -0.2 81% 16”	Rise: Transit: Set:	06h59 13h48 20h34	Low in the west after sunset
Venus Magnitude Phase Diameter	Virgo -3.9 94% 11”	Rise: Transit: Set:	05h13 11h17 17h21	Low in the east before sunrise
Mars Magnitude Phase Diameter	Libra +1.5 98% 4”	Rise: Transit: Set:	07h05 13h57 20h49	Low in the west after sunset
Jupiter Magnitude Diameter	Gemini -2.2 39”	Rise: Transit: Set:	01h43 06h43 11h44	Morning
Saturn Magnitude Diameter	Aquarius +0.8 19”	Rise: Transit: Set:	16h36 22h48 05h04	All night
Uranus Magnitude Diameter	Taurus +5.6 4”	Rises: Transit: Set:	21h47 02h55 07h59	Morning
Neptune Magnitude Diameter	Pisces +7.8 2”	Rise: Transit: Set:	16h54 22h59 05h08	All night
Pluto Magnitude	Capricornus +14.5	Rise: Transit: Set:	12h04 19h15 02h31	Evening

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 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.

Magnitude: we are accustomed to hearing the brightness of 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 value. A ‘good’ human eye on a clear night can see a star down to a magnitude of about +6.

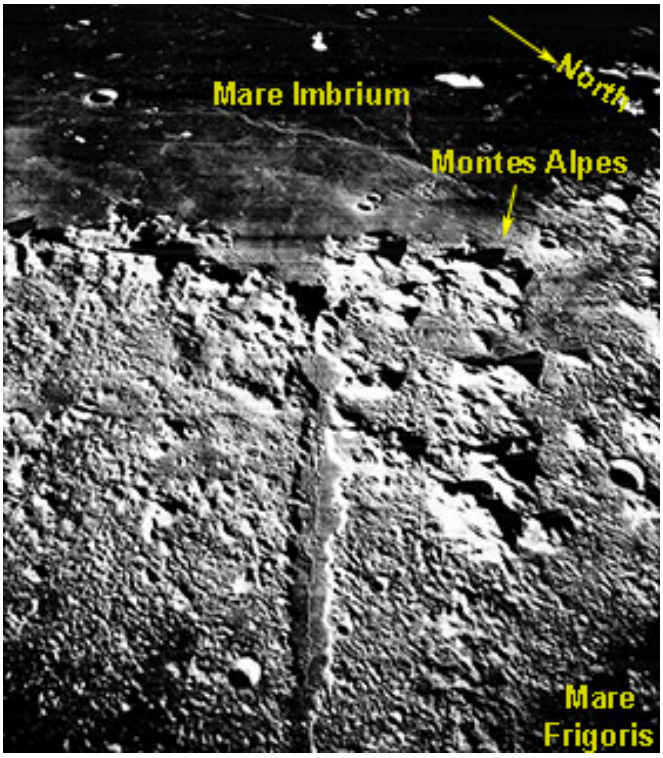
THE MOON

VALLIS ALPES

Description

The Alpine Valley is probably the best example of a rift valley on the Moon.

A lunar valley feature that bisects the **Montes Alpes** range, it extends 160 km from the **Mare Imbrium** basin and trends east-northeast to the edge of the **Mare Frigoris**. The valley is narrow at both ends and widens to a maximum width of about 10 km along the middle stretch. The valley floor is a flat, lava-flooded surface that is bisected by a slender, broken, cleft-like rille. This rille is a challenging target for telescope observation from the Earth and described as "notoriously hard to spot". The rille itself is longer than the valley proper, at about 197 km, with a width of 0.6 km and depth of around 78 m.



Oblique view of Vallis Alpes from Lunar Orbiter 5

Formation History

Most likely this valley is a graben that was subsequently flooded with magma from Mare Imbrium and Mare Frigoris. However, the valley could have been formed by stress fractures due to expansion of the mantle or contraction after solidification of regolith. It is not dissimilar to other linear features radiating from Mare Imbrium and the impact event which created the Imbrium basin may have also led to the stresses creating Vallis Alpes. Lava flooding and thermal or tensional stress fractures are two causes of graben formation.

Discovery

Discovered in 1727 by Francesco Bianchini, the name was confirmed by the International Astronomical Union in 1961.

Best seen around **first quarter** (October 29th)

No eclipses, lunar or solar, will be visible from southern Africa in October 2025

METEORS

From SGSA 2025	*Maximum Date/Time*	*Moon on max Date/Time*	*Duration*	*Radiant*	*ZHR**	*Velocity Km/sec*
Orionids	October 21 00h00 - 04h00	New Moon	Oct 2 – Nov 7	Between Betelgeuse and Alhena (γ Gem)	20	68

COMETS, ASTEROIDS AND METEORS

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

https://assa.saao.ac.za/wp-content/uploads/sites/23/2025/09/ASSA-CAMnotes-2025-Number-4.pdf

MONTHLY IMAGE

The Eagle Nebula (M16) in Serpens Cauda

Image captured and processed by Derek Duckitt

Messier 16, the Eagle Nebula, otherwise known as the Star Queen Nebula, was processed from 58 x 120-second exposure stacked light frames with 15 dark frames, 15 bias frames and 15 flat frames (148 minutes total integration time), under perfect conditions and a Bortle 1 sky.

Telescope: Sky Watcher 120mm refractor

SHAULA
λ Scorpii, 35 Sco

Description	Variable double star
Constellation	Scorpius
Distance	365 ly, 112 pc
Actual size	16.7 sol
Magnitude	+1.62 and +14.90
J2000	-37º06'15" / 17h33m37s
Alt/Az (Hermanus)	+31º09'32" / 243º51'04"

Visibility on 2025 October 17th

Rises	*Transits*	*Sets*
08h25	16h33	00h45

Naked Eye	*Binoculars*	*Telescopes*
Yes	Yes	Yes

OBSERVATION

Despite the Bayer designation, λ Sco is the second brightest star in the constellation Scorpius. Varying between magnitudes of +1.62 to +1.68, it is also the 24th brightest star in the night sky. λ Sco has the traditional name **Shaula**, which comes from the Arabic "al-sawla'" meaning "the raised", or "stinger", as it is found in the tail of the scorpion. The name was originally applied to **Lesath** (upsilon Scorpii) as well.

Shaula is known as the Eighth Star of the Tail in Chinese.

Spectroscopic and interferometric observations have shown that λ Sco is actually a triple system. These observations allow the system's distance to be determined independently of other methods. Its real distance is 365 light years, significantly less than the Hipparchos parallax estimate of 570 light years. Although the "stinger" stars λ and υ Sco appear only half a degree apart in the sky, they are not a real couple, Shaula lying at a distance of 365 light years while Lesath is much further at 520.

Lambda Scorpii is a visual star with three optical components. A 15th-magnitude companion 42" from λ Sco A, while a 12th-magnitude component appears 95" from λ Sco A. It is not known whether these components are physically associated with λ Sco A. If both were, B would be approximately 7500 AU away from A, and C approximately 17 000 AU (0.27 light years) away from A.

COMPONENTS

λ Sco is a Beta Cephei variable, meaning its brightness fluctuates due to atmospheric pulsations, changing in brightness by less than a tenth of a magnitude within at least two periods of 0.2137 and 0.1069 days. λ Sco A is a hot (25 000 K) bluish-white B2 IV subgiant, with more than 10 000 times the luminosity of the Sun, and a radius 6.2 sols. The pulsations are caused by subsurface ionizing metals that act as a heat valve.

The other two components are a class B main-sequence star (λ Sco AB) and a pre-main-sequence star (λ Sco Ab). The class B2 V companion has a temperature of 21 000 K, radiates 5000 solar luminosities, and has a radius 5.4 times solar. Its orbit has a period of 1 053 days (2.96 years), and an average separation of 5.7 AU; a modest eccentricity takes it as close as 4.4 AU and as far as 7.0 AU from λ Sco A.

The other close companion, **λ Sco Ab**, is a far lesser star orbiting λ Sco with a period of just 5.9525 days, at a distance of only 0.15 AU. This is less than half Mercury's distance from the Sun. One would expect a small companion this close to have a circular orbit. Instead, λ Sco Ab comes as close as 0.11 AU and as far away as 0.19 AU. This nearby companion is hypothesized to be the origin of Shaula's highly unusual X-ray radiation. Shaula Ab might be a neutron star created in a supernova blast from a much more massive progenitor, a massive white dwarf that is the result of mass transfer, or - most likely - a "T Tauri" star that is

still forming; such stars are vigorous X-ray sources. The three stars lie in the same orbital plane, strongly suggesting that they were formed at the same time.

EVOLUTION

Both λ and υ Sco, and several other stars in southern Scorpius belong to the huge Scorpius OB1 association, a disintegrating group of hot stars that were all born about the same time. The age of the system is estimated to be in the range of 10 - 13 million years. The masses of the primary, pre-main-sequence star, and class B companion are 10.4, 1.8, and 8.1 solar masses, respectively. Shaula Aa will eventually expand into a red supergiant, much like Antares (and probably swallow Shaula Ab in the process), then probably explode as a supernova, though it might survive as a massive neon-oxygen white dwarf. Shaula B, on the other hand, if not absorbed or destroyed, will almost certainly became a white dwarf.

[Adapted from STARS by Jim Kaler, Professor Emeritus of Astronomy, University of Illinois]

Lesath

Lesath (alternative spellings Leschath, Lesuth) is the Scorpion's sting tip with Shaula the fat part of the sting. At magnitude +2.69, Lesath is a magnitude fainter than its apparent companion. Though the two stars were originally both named Shaula, meaning "the Scorpion's stinger," the name "Lesath" really has nothing to do with the frightful Scorpion. It is a vivid lesson in how star names can become corrupted. Lesath comes from the Arabic "las'a", meaning "bite of a poisonous animal"; but this is a miscorrection by Scaliger from the earlier "Alascha", which came from Arabic "al latkha" ("the foggy patch"), originally from a Greek work referring to the nearby open cluster M7. So Lesath's origin is a mismatch of three languages.

Properties

Like many stars in Scorpius, Lesath is a hot class B2 IV star, spectrally identical to Shaula. The two are related in that they both belong to the huge and nearby Scorpius-Centaurus association of O and B stars, an enormous group with several subgroups. Though born roughly at the same time, the association's stars are not gravitationally bound, and the association is rapidly expanding. Though Shaula and Lesath appear very close in the sky (less than a degree apart), they do not constitute a true double: Lesath, 520 light years away, is 180 light years nearer than the other. From Shaula, Lesath would shine at magnitude +0.42, and the Sun as a small nearby dot of 11th magnitude!

Physically, Lesath is a subgiant with 12,300 times the luminosity of the Sun, and a radius 7.5 times solar. It is also a "Be" star, surrounded by a cloud of matter, though it seems to be rotating slower than most Be stars (73 km/sec). This is most likely because its rotational axis is tipped toward us. Lesath may have a companion, but this has never been confirmed. With a mass 10 times solar, Lesath has either just shut down its internal hydrogen fusion or will soon do so; it will then begin its evolution to a red supergiant. The star is most likely under the mass required to explode as supernova, and will instead become a rare massive neon-oxygen white dwarf.

[Adapted from STARS by Jim Kaler, Professor Emeritus of Astronomy, University of Illinois]

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!**

http://www.mnassa.org.za/

With Grateful thanks to the following:

2025 Sky Guide Southern Africa
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