

MAY 2025



SKY CHARTS

LUPUS CENTAURUS PUPPIS zenith ANTLIA SCORFIUS HYDRA Antares VUS LIBRA RATE GANIS Spica . MAJOR Alphard. VIRGO OPHIUCHUS MONOCE Regulus LEO Arcturus Z (D meridian Mars Procyon CANGE •M44 SCrB BO LEO MINOR E W HERCU URSA MAJOR N

EVENING SKY - MAY23rd at 21h00 (NORTH DOWN)

EVENING SKY – MAY23rd at 21h00 (SOUTH DOWN)



SUGGESTED EVENING OBSERVATION WINDOW

(Lunar observations notwithstanding) Date Moon Dusk end

May 18	Rise	22h38 (71%)	19h15
to May 29	Set	19h55 (6%)	19h11

THE SOLAR SYSTEM

MAY HIGHLIGHTS based on the 2025 SKY GUIDE

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

Date	Time (SAST)	Item
1		Moon northernmost (+28.6°)
		(4) Vesta at opposition (mag. +5.7, 1.18 au)
4	03h30	Moon passes 2.1° north of Mars
	15h52	First quarter Moon
5	23h32	Marssets within the M44 cluster
	23h59	Moon (60%) passes 2° north of Regulus (α Leo)
6		eta Aquariid meteor show at maximum (see page 4)
		Pluto stationary
7		Callisto at maximum from Jupiter (7')
8	01h44	Moon at descending node
10		Moon near Spica
11	02h49	Moon at apogee (406 245 km)
12	08h56	Full Moon
13/14		Moon near Antares (a Sco)*
15		Moon southernmost (-28.5°)
16		Callisto at maximum from Jupiter (7')
17	04h00	Moon(79%) passes 0.6° north-east of Namalsadirah II (τ Sgr)
18		Uranus at conjunction and furthest from Earth (20 541 au)
20	01h28	Moon occults Deneb Algedi (δ Cap)
	13h59	Last quarter Moon
22	10h05	Moon at ascending node
	18h27	Moon passes 3.2° south-east of Saturn
23		Saturn, Moon (22%) and Venus rise in a tight formation before sunrise
24		Callisto at maximum from Jupiter (7')
27	05h02	New Moon
28		Moon northernmost (+28.5°)
29		Solstice on Mars
30		Mercury at superior conjunction and furthest from Earth (1.322 au)
31		Mercury at perihelion

* in southern Africa, the **Moon's** occultation of **Antares** occurs during daylight on 14th May.

SOLAR SYSTEM VISIBILITY

2025 MAY 23 th		When visible?		
Sun Length of day	Taurus 10 hours 9 minutes	Rise: Transit: Set:	07h35 12h40 17h44	Never look at the sun without SUITABLE EYE PROTECTION!
Mercury Magnitude Phase Diameter	Taurus -1.5 95% 5"	Rise: Transit: Set:	06h55 12h07 17h18	Too close to the Sun
Venus Magnitude Phase Diameter	Pisces -4.4 45% 26"	Rise: Transit: Set:	03h54 09h43 15h31	Morning
Mars Magnitude Phase Diameter	Cancer +1.2 91% 6"	Rise: Transit: Set:	12h43 17h56 23h09	Evening
Jupiter Magnitude Diameter	Taurus -1.9 33"	Rise: Transit: Set:	09h26 14h21 19h15	Low in the west after sunset
Saturn Magnitude Diameter	Pisces +1.1 17"	Rise: Transit: Set:	02h34 08h41 14h48	Morning
Uranus Magnitude Diameter	Taurus +5.8 3"	Rises: Transit: Set:	07h13 12h20 17h26	Too close to the Sun
Neptune Magnitude Diameter	Pisces +7.9 2"	Rise: Transit: Set:	02h44 08h47 14h50	Morning
Pluto Magnitude	Capricornus +14.4	Rise: Transit: Set:	21h54 05h07 12h16	Morning

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 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 down to a magnitude of about +6.

THE MOON

MARE IMBRIUM

The "Sea of Showers" or "Sea of Rains" is a vast lava plain within the Imbrium Basin on the Moon and is one of the larger craters in the Solar System. The Moon's maria (plural of mare) have fewer features than other areas of the Moon because molten lava pooled in the craters and formed a relatively smooth surface. As a result of later events that have altered its surface, Mare Imbrium is not as flat as it would have originally been when first formed.

Origin

Mare Imbrium formed when a proto-planet from the asteroid belt collided with the Moon during the <u>Late Heavy Bombardment</u>. The impact is dated to approximately 3922 ± 12 million years ago, based on <u>radiometric dating</u> techniques. Ejecta from the impact covers large areas of the near side of the Moon.

Basaltic lava later flooded the giant crater to form the flat volcanic plain seen today. The basin's age has been estimated using <u>uranium-lead dating</u> <u>methods</u> to approximately 3.9 billion years and the diameter of the impactor has been estimated to be 250 ± 25 km.



Image north down

Characteristics

With a diameter of 1145 km, Mare Imbrium is second only to <u>Oceanus Procellarum</u> in size among the maria, and it is the largest mare associated with an impact basin.

The Imbrium Basin is surrounded by three concentric rings of mountains, uplifted by the colossal impact that excavated it. The outermost ring of mountains has a diameter of 1300 km and is divided into several different ranges; the <u>Montes Carpatus</u> to the south, the <u>Montes Apenninus</u> to the southeast, and the <u>Montes Caucasus</u> to the east. At its highest, the outer ring of mountains rises more than 5 km above the surface of Mare Imbrium. The ring mountains are not as well developed to the north and west and it appears they were simply not raised as high in these regions by the impact. The middle ring of mountains forms the <u>Montes Alpes</u> and <u>Montes Archimedes</u>. The innermost ring, with a diameter of 650 km, is defined by <u>Montes Teneriffe</u>, <u>Montes Recti</u>, and possibly <u>Montes Spitzbergen</u>. Much of this ring is submerged under the mare's basalt, resulting in only isolated peaks remaining in some areas such as <u>Mons Pico</u> and <u>Mons La Hire</u>.

Numerous estimates of the depth of the mare material have been made using various methods. These include analyses of gravity, seismic and radar data, studies of craters partially filled with basalt and those that have completely penetrated the mare and comparisons of lunar basins filled with mare deposits to unfilled basins. These studies have yielded depth estimates ranging from 2 km to 5 km in the central part of the mare. It is thought that the original crater left by the Imbrium impact was as much as 100 km deep but that the floor of the basin bounced back upwards immediately afterwards.

Best seen – around last quarter (May 20).

No solar or lunar visible eclipsesare predicted for southern Africa this month.

COMETS, ASTEROIDS AND METEORS

From Tim Cooper

The latest circular of the Comet Asteroid and Meteor Section, CAMNotes 2025 No.2, has been uploaded to the ASSA website and contains details of meteor showers and asteroid observations required for April to June. There are no bright comets visible during this period.

The issue can be downloaded from:<u>https://assa.saao.ac.za/wp-content/uploads/sites/23/2025/03/ASSA-CAMnotes-2025-Number-2.pdf</u>

METEOR ACTIVITY

<u>From</u> SGSA2025	Maximum Date/Time	Observation prospects	Duration	Radiant	ZHR*	Velocity km/sec
η Aquariids	May 6 03h30 – 05h30	Good - Moon sets at 02h28	Apr 19- May 28	See chart below	50	66

* 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. Also, the presence of a bright moon, atmospheric conditions and the shower's proximity to the horizon can seriously diminish the observation of meteor activity.

Chart to right timed May 6 04h30



MEMBERS' IMAGES

Images of the April lunar occultation of Antares (α Sco) by Peter Kogel



Occultation at 23h09 on April 16

Careful planning and staying up

late rewarded Peter with these two excellent images,



Reappearance at 00h20 on April 17

EQUIPMENT AND EXPOSURES:

25mm Plössl eye piece inCelestron Nexstar 6SE SCT. Camera maker: Samsung Camera model: Galaxy A345G F-stop: f/1.8 Exposure time: 1/60 sec ISO speed: ISO-64 Exposure bias: -1.8 step Focal length: 5mm Max aperture: 1.69 35mm focal length: 25

PRAESEPE The Manger, M44, The Beehive Cluster, NGC 2632

Description	Open cluster	Visibi	Visibility on May 18 th 2025			
Constellation	Cancer	Rises	Transits	Sets		
Distance	Up to 610 ly, 190 pc	12h33	17h39	22h45		
Apparent size	70 arcmin					
Actual size	12.4 ly, 3.8 pc	Naked Eye	Binoculars	Telescopes		
Magnitude	+3.09	Yes, In ideal	Yes	Yes		
J2000	+19°40'01"/ 8h40m24s	conditions				
Alt/Az.	22°21'44" / 316°05'06"					

DESCRIPTION AND PROPERTIES

Messier 44is an open cluster in Cancer known since ancient times. The cluster's age and proper motion coincide with those of the Hyades open cluster, suggesting that both share a similar origin. The cluster's distance, as measured by the Hipparcos satellite, is 577 light years - well within the recent consensus of 520 - 610 light years. The cluster's core radius is estimated at 11.4 light years; its half-mass radius is 12.7 light years, and its tidal radius about 39 light years. However, the tidal radius also includes many stars that are merely passing through, and not true cluster members. The cluster's distance, as measured by the Hipparcos satellite, is 577 light years - well within the recent consensus of 520 - 610 light years. The cluster's distance, as measured by the Hipparcos satellite, is 577 light years - well within the recent consensus of 520 - 610 light years. The cluster's core radius is estimated at 11.4 light years, and its tidal radius about 39 light years; its half-mass radius is 12.7 light years. The cluster's core radius is estimated at 11.4 light years; its half-mass radius is 12.7 light years. The cluster's core radius is estimated at 11.4 light years; its half-mass radius is 12.7 light years, and its tidal radius about 39 light years. However, the tidal radius also includes many stars that are merely passing through, and not true cluster members.

Altogether, the Beehive probably contains at least 1000 members, with a total mass of 500 - 600 Suns. Of these, 68% are M dwarfs, 30% are sunlike F, G and K stars and about 2% are bright class A stars. Also present are five giants (four of spectral class K0 III, and a fifth of class G0 III). So far, eleven white dwarfs have been identified. These represent the final evolutionary phase of the cluster's most massive members, which originally belonged to spectral class B. Brown dwarfs, however, are extremely rare in this cluster, probably lost by tidal stripping from its halo.

The age of the Praesepe is estimated at 600 to 730 million years. This is very similar to the age of another famous naked-eye cluster, the Hyades in Taurus (estimated at 625 to 790 million years old). Interestingly, these two clusters also have a very similar direction of proper motion. Although they are now separated by hundreds of light-years, they probably share a common origin in some great diffuse gaseous nebula. This would also explain the similarity of their stellar populations.

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DISCOVERY AND HISTORY

The Praesepe appeared on Johann Bayer's charts as "Nubilum" ("Cloudy") around 1600. But its true nature remained a mystery until Galileo looked at the cluster through his newly-invented telescope, in 1609. He reported: "The nebula called Praesepe is not one star only, but a mass of more than 40 small stars."Charles Messier added the Praesepe as the 44th object in his catalog on March 4, 1769. Messier's inclusion of the

Praesepe is curious, as most of Messier's objects were much more easily confused with comets. Messier may simply have wanted a larger catalog than his scientific rival Lacaille.

The origin of the cluster's other popular name, the Beehive, is uncertain.

OBSERVATION

To locate Praesepe, find Mars (very red) and move westwards along the ecliptic about 7° (conveniently close to the average field of view of binoculars).

One of the nearest open clusters to our Solar System, this cluster is visible to the naked eye in good seeing conditions, looking like a fuzzy spot. M44 cannot be resolved with the unaided eye but with binoculars or a small telescope, one can count at least 75 stars. At 95' across, it fits well into the field of view of such instruments.

The cluster has a visual magnitude of +3.7. Its brightest members are yellow-white stars of magnitude +6 to +6.5; they include 42 Cancri,



The chart above is timed May18 at 20h30

the eclipsing binary TX Cancri, the metal-line star Epsilon Cancri, several Delta Scuti-class variables of magnitudes +7 to +8 and one peculiar blue star.

Larger telescopes reveal that more than 200 of the 350 stars in the region of sky covered by the cluster are actually members, confirmed by their common motion. Others are foreground or background stars or may not yet have had their membership determined.

HISTORY AND MYTHOLOGY

The Greek poet Aratos mentioned this object as "Little Mist" in 260 B.C., and Hipparchus included it in his star catalog as the "Little Cloud" or "Cloudy Star" in 130 B.C. The classical Greek astronomer Ptolemy described it in his Almagest as the "Nebulous Mass in the Breast of Cancer"; to the Greeks, it was known as Phatne.

The Latin translation for Phatne is Praesepe, which means "manger". The ancient Greeks and Romans saw this cluster as a manger from which two donkeys, the adjacent stars Asellus Borealis (γ Cancri, double stars +4.67 & +10.2) and Asellus Australis (δ Cancri, double stars +3.93 & +12.20) are eating. Eratosthenes reported that these two "Aselli" (asses) are the donkeys which the gods Dionysus and Silenus rode into battle against the Titans. Their braying frightened the Titans, enabling the gods to win; as a reward, they were placed in sky, along with their Phatne.

Ancient Chinese skywatchers saw this nebulous object as a ghost or demon riding in a carriage, and likened its appearance to a "cloud of pollen blown from willows." It is the main celestial object in the 23rd lunar mansion (Hsiu Kuei or Xiu Gui) of ancient Chinese astrology.

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, <u>socontact</u> <u>us and let's talk</u>!

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With Grateful thanks to the following:

2025Sky Guide SouthernAfrica Peter Kogel Sky Safari Stellarium The Practical Skywatcher's Handbook Tim Cooper Wikipedia

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