



## Sun, Planets and Transitions

The **Sun** transits from Taurus, the Bull (*Vrushabha*) to Gemini, the Twins (*Mithuna*) on 21 June. Its angular diameter will decrease from  $0^{\circ}31'33.09''$  on 1 June to  $0^{\circ}31'27.93''$  on 30 June.

The summer solstice will be on 21 June at 8:28 pm. On this day the Sun will reach its northernmost declination. The Sun's rays will be parallel to the Tropic of Cancer.

The post dusk sky in June has **Venus** and **Mars** above the western horizon; and the pre-dawn sky has **Saturn**, **Jupiter** and **Mercury** over the eastern horizon.

**Mercury** can be spotted in the first half of the month above the eastern horizon at dawn. It transits from Aries, the Ram (*Mesha*) to Taurus on 7 June and then to Gemini on 27 June.

On 15 June **Mercury** will be right between the Pleiades (*Kruttika*) and Aldebaran (*Rohini*). On 17 June it will be at the one end of the V-shaped Hyades cluster with Aldebaran at the other end. After that, it will be too close to the Sun for observation.

**Venus** transits from Gemini to Cancer, the Crab (*Karka*) on 3 June and then to Leo, the Lion (*Simha*) on 27 June. **Venus** reaches its maximum eastern elongation on 4 June at 4:29 pm; at that time the Sun-Venus-Earth angle will be  $45^{\circ}23'57''$ .

The table below gives the magnitude of **Venus**, its phase (phase 1 is fully illuminated), elongation (Sun-Earth-Venus angle), its angular diameter and light time. The latter is the time in minutes taken by light to travel from Venus to the Earth.

### List of Events in June 2023

Dt	Dy	Time	Event
02	Tu	04:49	Mercury inferior conjunction
01	Th	11:52	Moon descending node
02	Fr	09:00	Mars - Beehive: $0.1^{\circ}$ S
04	Su	02:49	Moon - Antares: $1.6^{\circ}$ S
04	Su	09:12	Full Moon
04	Su	16:29	Venus elongation: $45.4^{\circ}$ E
04	Su	05:56	Mercury $2.7^{\circ}$ S of Uranus
05	Mo	21:51	Moon south declination: $27.9^{\circ}$ S
07	We	04:37	Moon perigee: 364900 km
10	Sa	01:49	Moon - Saturn: $3^{\circ}$ N
11	Su	01:01	Last quarter
11	Su	23:20	Mercury - Pleiades: $6.2^{\circ}$ S
13	Tu	16:35	Venus - Beehive: $0.5^{\circ}$ N
14	We	05:35	Moon ascending node
14	We	12:03	Moon - Jupiter: $1.6^{\circ}$ S
15	Th	14:06	Uranus $1.9^{\circ}$ S of Moon
16	Fr	06:17	Moon - Pleiades: $2^{\circ}$ N
17	Sa	01:48	Mercury - Aldebaran: $4.3^{\circ}$ N
17	Sa	22:56	Saturn stationary
18	Su	10:07	New Moon
19	Mo	02:37	Moon north declination: $27.8^{\circ}$ N
20	Tu	14:40	Moon - Pollux: $1.9^{\circ}$ N
21	We	16:08	Moon - Beehive: $4^{\circ}$ S
21	We	20:28	Summer solstice
22	Th	06:17	Moon - Venus: $4.1^{\circ}$ S
22	Th	15:39	Moon - Mars: $4.2^{\circ}$ S
23	Fr	00:01	Moon apogee: 405400 km
23	Fr	16:43	Regulus $4.0^{\circ}$ S of Moon
26	Mo	13:20	First quarter
28	We	03:53	Spica $2.7^{\circ}$ S of Moon
28	We	17:52	Moon descending node

Date	Mag	Phase	Phase angle	Elongation	Diameter	Light time
01	-4.3	0.519	$87.9^{\circ}$	$45.3^{\circ}$	22.56"	6.15
10	-4.3	0.467	$93.8^{\circ}$	$45.3^{\circ}$	25.03"	5.54
20	-4.4	0.403	$101.2^{\circ}$	$44.4^{\circ}$	28.46"	4.87
30	-4.4	0.331	$109.7^{\circ}$	$42.2^{\circ}$	32.83"	4.23

**Mars** moves from Cancer to Leo on 27 June.

**Jupiter** continues to travel in Aries. Saturn continues to travel in Aquarius, the Water Bearer (*Kumbha*).

On 5 June **Mercury** passes close to **Uranus**. At 5:56 am the angular separation between the two will be  $2^{\circ}43'02''$ . On this day the magnitudes of **Mercury** and **Uranus** will be 0.1 and 5.8 respectively.

*(Disclaimer: we categorically mention here that we do not believe in astrology and believe that the only influence a planet has on us is to give us the viewing pleasure of its beauty. The sole purpose of giving the transition of planets and the Sun is to acquaint the reader with the Indian nomenclature of planets and constellations and also to show that the actual positions of the Sun and planets, which are based on modern computing, are very different from those given in astrology tables.)*

## March of the Moon

On 4 June the nearly Full Moon can be seen less than  $2^{\circ}$  from Antares. Both of them will set about 10 minutes before sunrise. Then on 6 June, the Moon will be seen inside the 'teapot' asterism of Sagittarius (*Dhanu*). On 9 June it can be seen south of Delta Capricornus (Deneb Algedi). [See below.] Then in the early hours of 10 June the Moon can be seen right below Saturn.

Another glorious sight awaits us on 14 June. Jupiter will be right below the about 18% illuminated lunar crescent. On 17 June, a very thin lunar crescent (about 1.5% illuminated), Mercury, Aldebaran and the Hyades cluster will be in close proximity to each other at the break of dawn.

The Moon reappears above the western horizon as a thin crescent on 19 June. On that day it will be right below the Gateway of Heaven. On 20 June the Moon, Castor and Pollux are on a straight line.

On 21 June the Moon will be right below Venus; the next day on 22 June the Moon,

Mars and Venus form a nice right-angled triangle, with Mars at the  $90^{\circ}$  angle. On 23 June the Moon passes north of Regulus (*Magha*). On 25 June it is south of Denebola ( $\beta$  Leo). The name Denebola comes from its Arabic name, Danab al-asad which means the 'tail of the lion'. Between 27 and 28 June, the Moon passes north of Spica ( $\alpha$  Virginis or *Chitra*).

## Deneb Algedi

Deneb Algedi is a very interesting star. Even though it is the brightest star in the constellation of Capricornus, it is designated as 'delta' in Bayer's designation system. In this system of nomenclature, the brightest star is designated as 'alpha', the second brightest as 'beta' and so on.

The star gets its name from its original Arabic name Deneb al-jady, meaning 'the tail of the goat'. ('Deneb' is derived from 'dhanab' which means 'tail' in Arabic). The star Deneb is at the tail of Cygnus, the Swan; and Denebola in the constellation Leo is the shortened form of Deneb Alased, 'tail of a lion'.

Astronomically Deneb Algedi is 38.7 light-years from the Sun. It is a multiple-star system. Its four visual stars are Delta Capricorni A (a, b), B and C. The magnitude of star B is 15 and it is about one arc-minute from A. Delta Capricornus C is a 13th magnitude star more than 2 arc-minutes away. Delta Capricornus A (a) has twice the mass of the Sun and is 1.91 times bigger. The surface temperature of the star is  $7301^{\circ}$  K, with a luminosity 8.5 times that of the Sun. With just about twice the mass of the Sun, this star will not end its life as a supernova. The star has already exhausted the hydrogen supply within its core. Gravitational collapse will now begin and as its core collapses, the internal temperature will rise, making its outer layers expand. It will shed its outer envelope that will form a planetary nebula, and the star itself will fade away as a white dwarf.

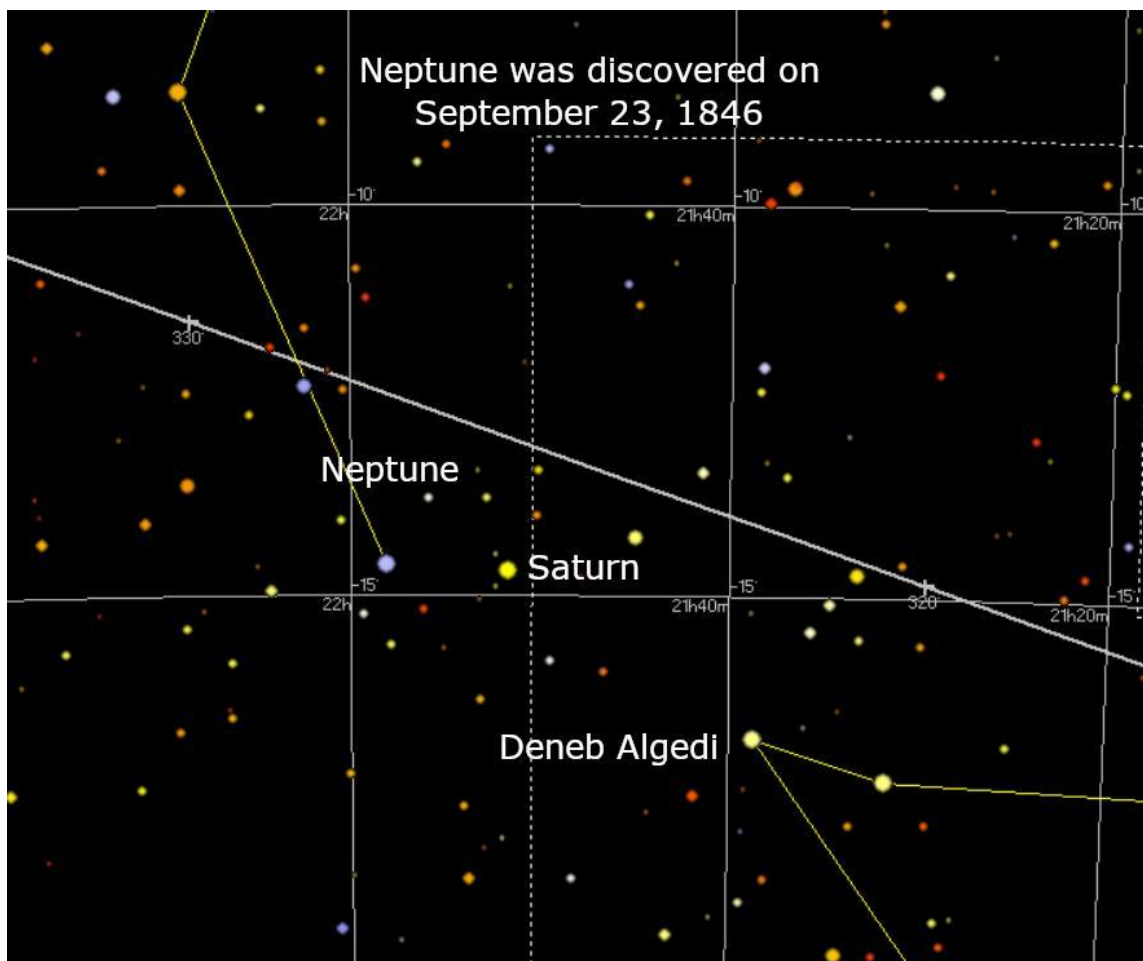
Vesto Slipher, an American astronomer at the Lowell Observatory, discovered in 1906 that

the star was a spectroscopic binary. Fifty years later, Olin J Eggen at the Lick Observatory discovered that the star is also an Algol-type eclipsing binary, with an orbital period of 1 day 32 minutes (or 1.022768 days). The magnitude drop is 0.24.

Delta Capricornus is  $2.6^\circ$  south of the ecliptic and can be occulted by the Moon. This happened on 15 November 2018. This event was visible over some regions in northwest

India.

Neptune was discovered less than  $5^\circ$  away from Delta Capricornus on 23 September 1846, by the German astronomer Johann Galle. The position of Neptune was mathematically predicted by a French mathematician, Urbain Le Verrier. That night Saturn was just  $1.3^\circ$  away from the newly discovered planet.



**Happy skywatching!**

**Acknowledgements:**

<http://www.lunar-occultations.com/iota/occult4.htm>

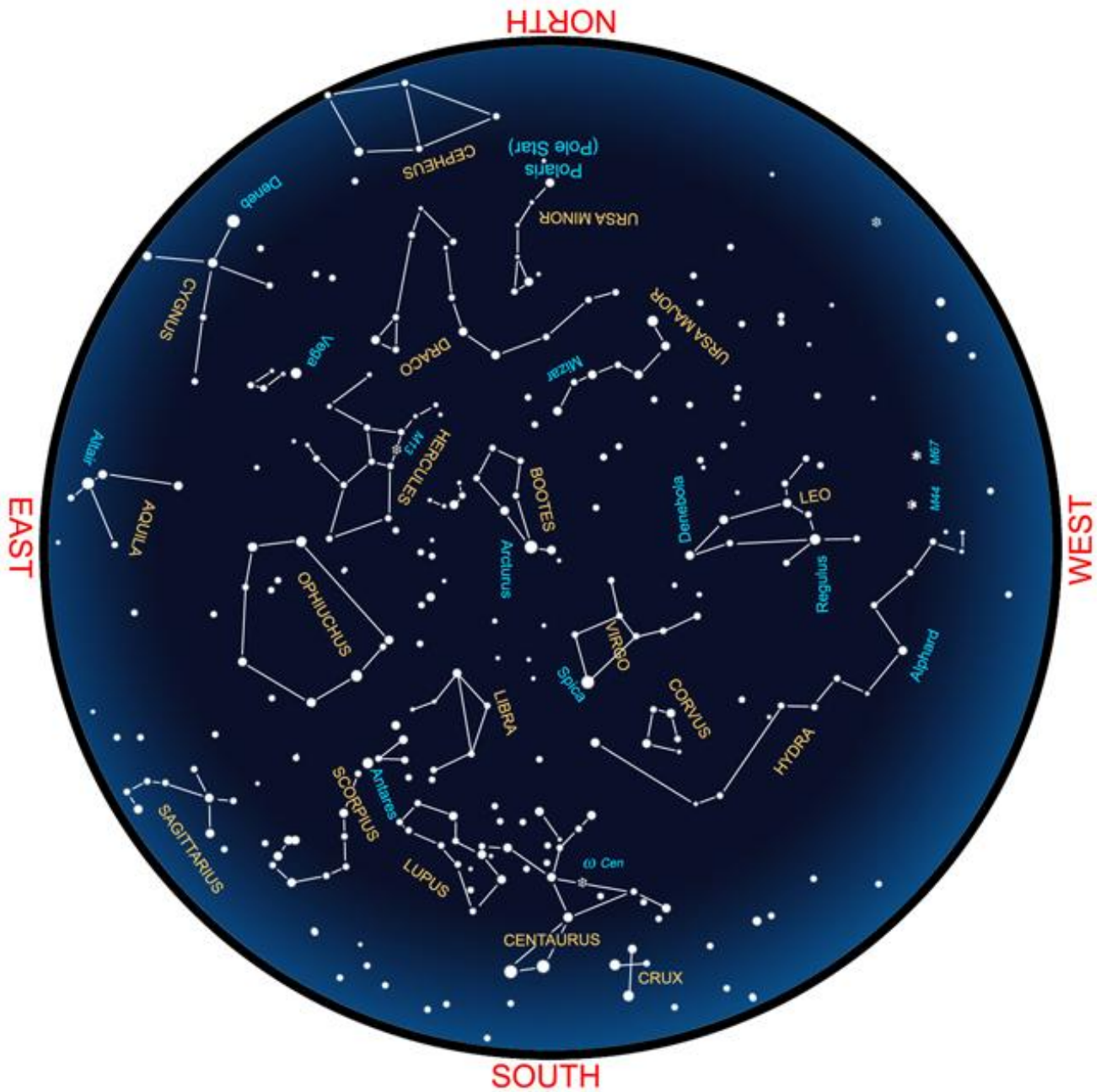
by Dave Herald for International Occultation Timing Association.

<https://eclipse.gsfc.nasa.gov/SKYCAL/SKYCAL.html> by Fred Espenak and Sumit Dutta.

Graphics using GNU Image Manipulation Program (GIMP) a cross-platform image editor.

<https://www.gimp.org/>

This sky map for June is drawn for mid-northern latitudes,  
to be used around 9:30 p.m. local time



For star maps of other months please visit <http://astron-soc.in/outreach/resources/sky-maps/>

For notes on stargazing [click here](#).

Or visit <https://skytonight.wordpress.com/monthly-sky-notes-and-links/>

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