



## Sun, Planets and Transitions

On 1 September The **Sun** will be in Leo, the Lion (*Simha*), with an angular diameter of 31'42". It moves to Virgo, the Virgin (*Kanya*) on 16 September. On 30 September, the angular diameter of the Sun will be 31'56".

**Mercury** will be in Leo on 1 September and will move to Virgo on 23 September. Mercury reaches its maximum western elongation of about 18.1° on 5 September at 07:29 hours. This is an excellent time to look for Mercury, with its -0.2 magnitude, with the naked eye.

For observers close to the 20° N latitude, the plane of the ecliptic is nearly perpendicular to the horizon around sunrise. Mercury rises about an hour before the Sun and will be about 12° above the horizon at the start of civil twilight. Regulus (mag 1.4) can be spotted right below Mercury at sunrise.

**Venus** will remain in Virgo this month. We have a great chance to spot Venus in broad daylight with the help of the crescent Moon on 5 September (see below).

**Mars** will be in Taurus, the Bull (*Vrushabha*). It moves to Gemini, the Twins (*Mithuna*). Note that Gemini is the northernmost zodiacal constellation; therefore a planet in this constellation is well suited for observations for those in the northern hemisphere.

**Jupiter** and **Saturn** continue to remain in Taurus and Aquarius, the Water-bearer (*Kumbha*) respectively.

*(Disclaimer: we categorically mention here*

### List of Events in September 2024 (Time in IST)

Dt	Dy	Time	Event
01	Th	11:29	Moon north declination: 28.5° N
01	Su	18:58	Mercury 4.6° S of Moon
03	Tu	07:25	New Moon
05	Th	07:29	Mercury elongation: 18.1° W
05	Th	11:13	Moon descending node
05	Th	15:43	Moon-Venus: 1.3° N
05	Th	14:28	Venus 1.0° N of Moon (A very good day to spot Venus in broad daylight)
05	Th	20:25	Moon apogee: 406200 km
06	Fr	21:52	Moon-Spica: 0.6° S
08	Su	09:24	Saturn opposition
09	Mo	08:22	Mercury-Regulus: 0.4° N
10	Tu	18:36	Moon-Antares: 0.1° N
11	We	11:36	First quarter
12	Th	10:21	Moon south declination: 28.7° S
17	Tu	15:44	Moon-Saturn: 0.3° S
18	We	08:04	Full Moon, eclipse
18	We	08:15	Partial lunar eclipse
18	We	08:29	Venus-Spica: 2.4° N
18	We	18:56	Moon perigee: 357300 km
19	Th	01:21	Moon ascending node
21	Sa	04:13	Neptune opposition
22	Su	08:32	Uranus 4.3° S of Moon
22	Su	15:46	Moon-Pleiades: 0.2° S
22	Su	18:14	Autumnal equinox
24	Mo	03:52	Jupiter 5.8° S of Moon
24	Tu	22:34	Moon north declination: 28.7° N
25	We	00:20	Last quarter
26	Th	15:55	Moon-Pollux: 1.8° N
27	Fr	16:38	Moon-Beehive: 3.4° S
29	Su	15:55	Regulus 2.7° S of Moon
30	Mo	09:01	Mercury at superior conjunction

*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*



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*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 1 September, a thin lunar crescent can be seen about  $15^\circ$  above the eastern horizon at the beginning of civil twilight. Mercury will be to its southeast. New Moon is on 3 September. The Moon will then appear over the western horizon after sunset.

On 5 September, a thin lunar crescent can be seen south of a brilliantly shining Venus. The next day the Moon will be right below Spica (*Chitra*). The Moon will occult Spica later, but this event will not be seen from India. On 10 September the Moon will be less than 10 arc minutes from Antares (*Jyeshtha*).

On 12 September, the Moon will be in the direction of the centre of the Milky Way. Between 16 and 17 September, it passes south of Saturn. On 23 September, the Moon makes a nice right-angled triangle with Aldebaran (*Rohini*) and Pleiades (*Kruttika*). The trio will be almost overhead at dawn.

## Naked Eye Observation of Venus in Broad Daylight

Venus can be observed in broad daylight, that is, when the Sun is well above the horizon — if you know where to look for it. If you are not experienced in finding Venus in daylight, you can find it with the help of the Moon when it passes close to it.

The post noon period on 5 September affords an excellent time to look for Venus in broad daylight. On this day, the Moon will pass less than  $2^\circ$  south of Venus. The phase of the Moon will be 0.047, about 4.7% illuminated.

First, find the exact north-south line from your point of observation. The point overhead

will be your zenith. 'Declination' of the zenith, or the angle that this point makes with a horizontal plane, will be your latitude. For example, if you are observing from Delhi, your latitude will be  $28^\circ 22.2'$ . All objects having declination of  $28^\circ 22.2'$  will pass through your zenith.

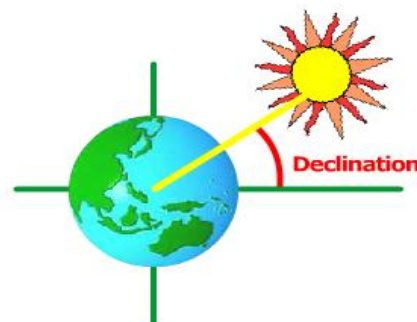
We now need to know the transit times and declinations of the Sun, Moon and Venus. An object is said to 'transit' when it crosses the observer's meridian. The observer's meridian is that circle which passes through the north pole, the observer's zenith (the point right overhead) and the south pole.

Object	Declination	Transit time
Sun	$+6^\circ 35.9'$	See below
Moon	$-3^\circ 40.2'$	1 h 30 m after the Sun
Venus	$-2^\circ 29.7'$	3 min after the Moon

For the transit time of the Sun, check its rising and setting timings in your local newspaper. The half-way time between these two timings is the Sun's transit time for your location. For Delhi, the transit time will be 12.30 pm IST on 5 September. At that time the Sun will be  $(28^\circ 22.2' - 6^\circ 35.9')$  i.e.  $21^\circ 46.3'$  south of the zenith.

- 12:30 pm Sun transits the meridian
- 13:50 pm Moon transits the meridian
- 13:53 pm Venus transits the meridian

Summer solstice in the northern hemisphere. The declination angle ( $\delta$ ) is at its maximum and is  $23.45^\circ$ .



Picture courtesy:

<https://www.pveducation.org/pvcdrom/properties-of-sunlight/declination-angle>

## Events involving the moons of Jupiter

In the table below, we have listed events that can be seen from India. The table gives the timings of eclipses, occultations, transits and shadow transits of the moons of Jupiter, suitable for Indian observers. The timings are given in Indian Standard Time (IST).

The output is given as per the following abbreviations and notations:

**Columns:** 1 = date (given only for the first event listed for that day); 2 = time; 3 = satellite number; 4 = event type; and 5 = phase.

**Satellite numbers:** 1 = Io; 2 = Callisto; 3 = Europa; and 4 = Ganymede.

**Event type:** Ec = eclipse; Oc = occultation; Tr = transit; and Sh = shadow transit.

**Phase:** D = disappear; R = reappear; I = ingress; and E = egress.

Example: Events for 2 September and what they mean:

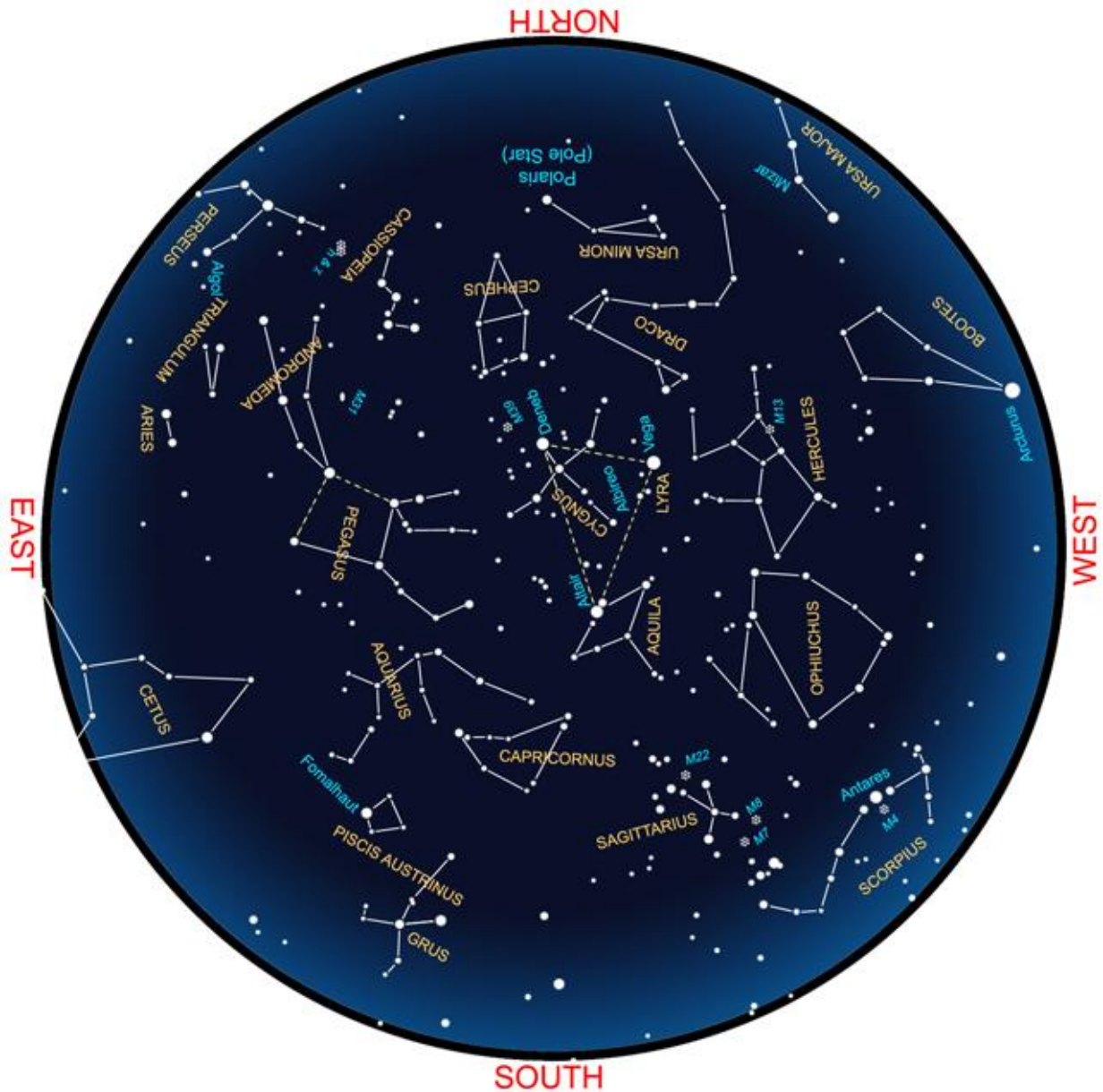
<b>2</b>	<b>01:23:00</b>	<b>1</b>	<b>Sh</b>	<b>I</b>
	<b>02:42:00</b>	<b>1</b>	<b>Tr</b>	<b>I</b>
	<b>03:32:42</b>	<b>1</b>	<b>Sh</b>	<b>E</b>
	<b>03:58:30</b>	<b>2</b>	<b>Ec</b>	<b>D</b>
	<b>04:52:06</b>	<b>1</b>	<b>Tr</b>	<b>E</b>

Means that

At 01:23:00 hours on 2 September, the shadow of Io will be seen entering (ingressing) the disk of Jupiter; then at 02:42:00 hours we will see Io touch the limb of Jupiter and then transit its disk. Then at 03:32:42 hours the shadow of Io will leave Jupiter. At 04:52:06 hours, Io will leave Jupiter. Moreover, at 03:58:30 hours, Callisto will be eclipsed by Jupiter and will disappear behind it.

Satellites of Jupiter in September 2023									
<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
1	04:09:36	1	Ec	D	18/19	23:38:12	1	Sh	I
2	01:23:00	1	Sh	I		00:57:24	1	Tr	I
	02:42:00	1	Tr	I		01:48:06	1	Sh	E
	03:32:42	1	Sh	E		03:07:36	1	Tr	E
	03:58:30	2	Ec	D		04:04:54	2	Sh	I
	04:52:06	1	Tr	E	20	00:28:18	1	Oc	R
3	02:12:06	1	Oc	R		00:53:12	2	Ec	R
4	01:20:18	2	Sh	E		01:02:30	2	Oc	D
	01:35:00	2	Tr	I		03:34:18	2	Oc	R
	04:06:00	2	Tr	E	22	22:35:12	2	Tr	E
6	00:15:30	3	Sh	I	24	00:02:12	3	Ec	R
	02:12:48	3	Sh	E		03:23:48	3	Oc	D
7	05:43:00	3	Tr	I		04:20:06	1	Ec	D
9	03:16:24	1	Sh	I		05:26:00	3	Oc	R
	04:36:06	1	Tr	I	25	01:31:36	1	Sh	I
	05:26:12	1	Sh	E		02:49:18	1	Tr	I
10	00:32:06	1	Ec	D		03:41:42	1	Sh	E
	04:06:36	1	Oc	R		04:59:36	1	Tr	E
11/12	23:54:36	1	Sh	E	26/27	22:48:42	1	Ec	D
	01:14:36	1	Tr	E		02:20:30	1	Oc	R
	01:28:18	2	Sh	I	27/28	22:10:06	1	Sh	E
	03:57:18	2	Sh	E		23:27:24	1	Tr	E
	04:12:18	2	Tr	I		00:57:36	2	Ec	D
13	01:01:36	2	Oc	R		03:27:48	2	Ec	R
	04:14:36	3	Sh	I		03:33:00	2	Oc	D
16	05:09:48	1	Sh	I	28	06:04:54	2	Oc	R
17	23:30:06	3	Oc	D	29/30	22:29:00	2	Sh	E
	01:32:24	3	Oc	R		22:35:48	2	Tr	I
	02:26:06	1	Ec	D		01:07:00	2	Tr	E
	06:00:06	1	Oc	R					

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



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

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

**These pages are contributed by:**

Arvind Paranjpye (paranjpye.arvind@gmail.com) (<http://arvindparanjpye.blogspot.com/>) and Anjane Rao (rao.anjaneer@gmail.com)