



Sun, Planets and Transitions

The **Sun** will move from Virgo, the Virgin (*Kanya*) to Libra, the Scales (*Tula*) on 1 November and then to Scorpio (*Vrushchika*) on 24 November. On 30 November it will move to Ophiuchus.

The Sun's angular size increases from $0^{\circ}32'13''$ on 1 November to $0^{\circ}32'26''$ on 30 November.

Mercury is in Libra on 1 November and moves to Scorpio on 10 November. Then it enters Ophiuchus on 16 November and finally Sagittarius (*Dhanu*) on 29 November.

Venus will move from Leo, the Lion (*Simha*) to Virgo on 2 November. **Mars** is in Libra on 1 November and crosses to Scorpio on 26 November.

Jupiter continues to travel in Aries, the Ram (*Mesha*); **Saturn**, which has been retrograde in Aquarius, the Water Bearer (*Kumbha*), will resume its prograde motion on 4 November.

(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

At dawn on 1 November, the Moon can be seen right above the western horizon, with the

List of Events in November 2023

Dt	Dy	Time	Event
02	Th	10:42	Moon north declination: 28.3° N
03	Fr	09:14	Jupiter opposition
04	Sa	00:01	Moon-Pollux: 1.6° N
04	Sa	22:29	Saturn stationary
05	Su	14:07	Last quarter
07	Tu	01:52	Regulus 3.8° S of Moon
07	Tu	03:19	Moon Apogee: 404600 km
09	Th	14:58	Moon-Venus: 1.1° S
11	Sa	10:39	Moon-Spica: 2.6° S
11	Sa	14:19	Moon descending node
13	Mo	14:57	New Moon
13	Mo	17:25	Mars 2.3° N of Moon
13	Mo	23:02	Uranus opposition
14	Tu	19:19	Mercury 1.6° N of Moon
14	Tu	02:07	Antares 0.9° S of Moon — occultation
16	Th	20:15	Moon south declination: 28.2° S
17	Fr	02:47	Mercury-Antares: 2.5° N
18	Sa	10:18	Mars conjunction
18	Sa	11:21	Leonid Shower: ZHR = 15
20	Mo	16:20	First quarter
20	Mo	19:32	Moon-Saturn: 2.8° N
22	We	02:33	Moon perigee: 369800 km
24	Fr	16:32	Moon ascending node
25	Sa	16:40	Moon-Jupiter: 2.8° S
27	Mo	05:32	Moon-Pleiades: 1.2° N
27	Mo	14:46	Full Moon
29	We	15:59	Venus-Spica: 4.2° N
29	We	19:38	Moon north declination: 28.2° N
29	We	22:55	Venus 4.2° N of Spica

Pleiades and Jupiter right below it. On 5 November, the Moon will be just about 5° north of M44, the Beehive Cluster. In India, this cluster of stars is identified as *Pushya Nakshatra*.

On 7 November, the Moon will be north-east

of Regulus (*Magha*). It will be worth watching the sky on 9, 10 and 11 November: On 9 November, the Moon will be just about 2° north of the 3.6 magnitude star Beta Virginis; Venus will be right below it. The next day, both the Moon and Venus will have moved further east. On 11 November, the Moon will be 2.6° north of the 1st magnitude star Spica (*Chitra*). The pairing up of Spica and the thin lunar crescent will be worth watching.

On 14 November, the Moon will be visible above the western horizon as a thin crescent in the evening. This is a good challenge for skywatchers if the western skies are clear. The Moon will set nearly 40 minutes after the Sun, after the end of civil twilight; Mercury will set 10 minutes later. Mark where the Sun has set, wait for about 15–20 minutes and then look for the Moon and Mercury through a good pair of binoculars. You will have a mere 20–25 minutes to catch them!

But the next evening, on 15 November, it will not be difficult to find the lunar crescent at the end of astronomical twilight. On 16 November the Moon will enter the Teapot asterism in Sagittarius.

On 20 November, soon after Sunset, the Moon can be seen right below Saturn. Five days later, on 25 November, the nearly Full Moon will rise just after Jupiter. On 26 November, the Moon can be seen west (i.e. above) the Pleiades and north-west of Aldebaran (*Rohini*). On 30 November the now waning Moon will enter the Gateway of Heaven about three hours after sunset.

Events involving the moons of Jupiter

Jupiter rises nearly two hours after sunset in the beginning of the month, and then soon after sunset by month-end. We will now bring you predictions of events involving the moons of Jupiter.

These events are very enjoyable to observe. During an eclipse of the Jovian moons, one of them enters or comes out of the planet's shadow. Sometimes a moon or its shadow is seen moving across the disc of Jupiter; or a moon is occulted by it. When a shadow of a satellite is just at the eastern or western limb of Jupiter it looks oval. (Why?) Do enjoy these events.

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 1 November and what they mean:

1	20:29:30	1	Sh	I
	20:32:48	1	Tr	I
	22:40:24	1	Sh	E
	22:42:00	1	Tr	E

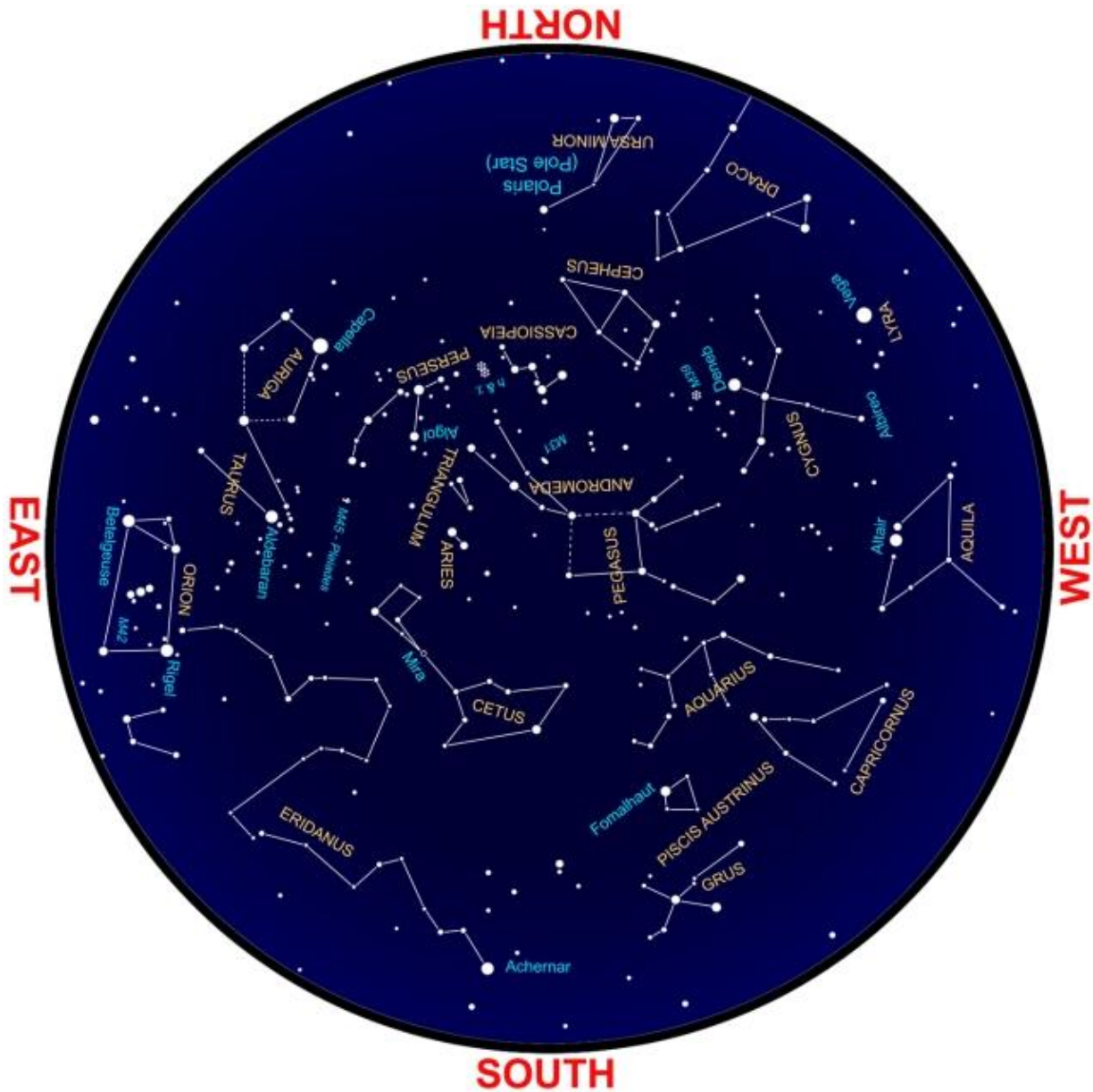
Means that

At 8:29:30 pm, the shadow of Io will be seen entering (ingressing) the disk of Jupiter; then after about two minutes we will see Io touch the limb of Jupiter and then transit its disk. Then about 7.5 minutes later the shadow of Io will leave Jupiter. Two-and-a-half minutes later Io will leave Jupiter.

Satellites of Jupiter in November 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	20:29:30	1	Sh	I	16	19:19:24	2	Ec	R
	20:32:48	1	Tr	I		21:17:54	1	Oc	D
	22:40:24	1	Sh	E		23:48:54	1	Ec	R
	22:42:00	1	Tr	E	17	18:26:30	1	Tr	I
2	19:59:42	1	Oc	R		18:48:42	1	Sh	I
3	19:28:18	3	Sh	I		20:36:06	1	Tr	E
	19:46:36	3	Tr	I		20:59:30	1	Sh	E
	20:50:00	3	Tr	E		02:12:36	3	Tr	I
	21:13:48	3	Sh	E		03:28:48	3	Tr	E
5	00:55:54	2	Oc	D		03:33:00	3	Sh	I
	03:22:42	2	Ec	R		05:17:06	3	Sh	E
6	03:50:30	1	Tr	I	19	05:25:54	2	Oc	D
	03:55:48	1	Sh	I	21	19:08:18	3	Ec	R
7	05:59:48	1	Tr	E		00:19:00	2	Tr	I
	06:06:42	1	Sh	E		01:14:06	2	Sh	I
	19:51:48	2	Tr	I		02:34:12	2	Tr	E
	20:02:42	2	Sh	I		03:34:12	2	Sh	E
	22:05:42	2	Tr	E		04:36:00	1	Oc	D
	22:23:00	2	Sh	E	22	01:45:06	1	Tr	I
	01:08:24	1	Oc	D		02:15:12	1	Sh	I
	03:25:30	1	Ec	R		03:54:42	1	Tr	E
8	22:16:24	1	Tr	I		04:26:00	1	Sh	E
	22:24:36	1	Sh	I	23	18:33:48	2	Oc	D
	00:25:48	1	Tr	E		21:57:42	2	Ec	R
	00:35:30	1	Sh	E		23:02:06	1	Oc	D
9	19:34:12	1	Oc	D		01:43:42	1	Ec	R
	21:54:12	1	Ec	R	24	20:11:24	1	Tr	I
10	18:51:48	1	Tr	E		20:44:06	1	Sh	I
	19:04:18	1	Sh	E		22:21:00	1	Tr	E
	22:59:18	3	Tr	I		22:54:54	1	Sh	E
	23:30:54	3	Sh	I		05:28:36	3	Tr	I
	00:08:54	3	Tr	E	25	20:12:30	1	Ec	R
	01:15:42	3	Sh	E	28	18:55:12	3	Oc	D
12	03:10:30	2	Oc	D		20:24:24	3	Oc	R
13	06:00:42	2	Ec	R		21:23:54	3	Ec	D
14	05:34:24	1	Tr	I		23:09:24	3	Ec	R
	05:51:00	1	Sh	I		02:34:30	2	Tr	I
	22:05:00	2	Tr	I		03:49:48	2	Sh	I
	22:38:24	2	Sh	I		04:50:24	2	Tr	E
	00:19:24	2	Tr	E	29	03:30:36	1	Tr	I
	00:58:36	2	Sh	E		04:10:42	1	Sh	I
	02:51:54	1	Oc	D	30	20:51:24	2	Oc	D
	05:20:12	1	Ec	R		00:36:12	2	Ec	R
15	00:00:24	1	Tr	I		00:47:12	1	Oc	D
	00:19:48	1	Sh	I		03:38:42	1	Ec	R
	02:09:54	1	Tr	E					
	02:30:42	1	Sh	E					

**This sky map for November 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/>

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/>

These pages are contributed by:

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