Sun, Planets and Transitions

The **Sun** will be in Ophiuchus, The Serpent Bearer (*Bhujangadhari* or *Sarpdhar* or *Naraturunga*) on 1 December. It will move to Sagittarius, The Archer (*Dhanu*) on 19 December. The Sun's angular size increases from 0°32'26" on 1 December to 0°32'32" on 31 December.

The December solstice (winter solstice in the northern hemisphere) is at 8:56 pm IST on 22 December.

Mercury is in Sagittarius on 1 December. It is in direct or prograde motion. Mercury will be stationary on 13 December, then will go into retrograde motion, and move to Ophiuchus on 27 December.

Venus will move from Virgo, The Virgin (*Kanya*) to Libra, The Scales (*Tula*) on 11 December.

Mars is in Ophiuchus on 1 December and crosses to Sagittarius on 5 December.

Jupiter, which has been in retrograde motion in Aries, The Ram (*Mesha*), will be stationary on 31 December and will resume its direct or prograde motion. **Saturn** is in Aquarius, The Water Bearer (*Kumbha*).

(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.)

List of Events in December 2023

Dt	Dy	Time	Event
01	Fr	08:53	Moon-Pollux: 1.7° N
02	Sa	09:51	Moon-Beehive: 3.9° S
04	Mo	10:03	Regulus 3.7° S of Moon
04	Mo	19:29	Mercury elongation: 21.3° E
05	Tu	00:12	Moon apogee: 404300 km
05	Tu	11:19	Last quarter
07	Th	05:19	Neptune stationary
08	Fr	19:35	Moon-Spica: 2.5° S
08	Fr	20:54	Moon descending node
09	Sa	22:23	Moon-Venus: 3.9° N
13	We	05:02	New Moon
13	We	10:10	Mercury stationary
14	Th	03:21	Moon south declination: 28.2° S
14	Th	10:58	Mercury 4.4° N of Moon
15	Fr	00:32	Geminid Shower: ZHR = 120
17	Su	00:23	Moon perigee: 367900 km
18	Mo	03:28	Moon-Saturn: 2.5° N
20	We	00:09	First quarter
21	Th	19:24	Moon ascending node
22	Fr	08:58	Winter (December) solstice
22	Fr	19:50	Moon-Jupiter: 2.7° S
23	Sa	00:15	Mercury inferior conjunction
23	Sa	08:30	Ursid Shower: ZHR = 10
24	Su	13:07	Moon-Pleiades: 1.1° N
27	We	03:20	Moon north declination: 28.1° N
27	We	06:03	Full Moon
28	Th	17:21	Moon-Pollux: 1.9° N
29	Fr	18:15	Moon-Beehive: 3.7° S
31	Su	08:56	Regulus 3.4° S of Moon
31	Su	20:39	Jupiter stationary

March of the Moon

On 1 December, the nearly Full Moon is right within the boundaries of the Gateway of Heaven, an asterism formed by two stars of Gemini (Castor and Pollux) and two of Canis

Minor (Procyon and Gomeisa). On 4 December it passes through less than 4° from Regulus (*Magha*). On 9 December, the nearly 17% illuminated lunar disk can be seen half-way between Spica (*Chitra*) and Venus below it; however, the Moon will be rather close to the Sun to be seen comfortably. After New Moon on 13 and 14 December, the thin lunar crescent can be seen above the western horizon just after sunset; but again, it will be challenging.

On 17 December the Moon can be seen right below Saturn; and the next day it will be above Saturn. On 19 December the Moon will be about one degree from the south of Neptune which will be at about magnitude 8. This will be a good time to check on Neptune. The Moon will then pass north of Jupiter on 22 December. The next day it will be 2.5° north of Uranus (see the maps below). On 24 December, the nearly 95% illuminated Moon can be seen below The Pleiades (*Kruttika*). On New Year's eve, the Moon will be right below Regulus (*Magha*) and the sky will be brilliantly lit by moonlight.
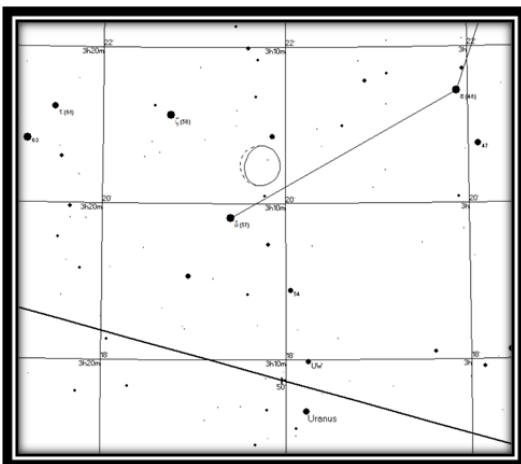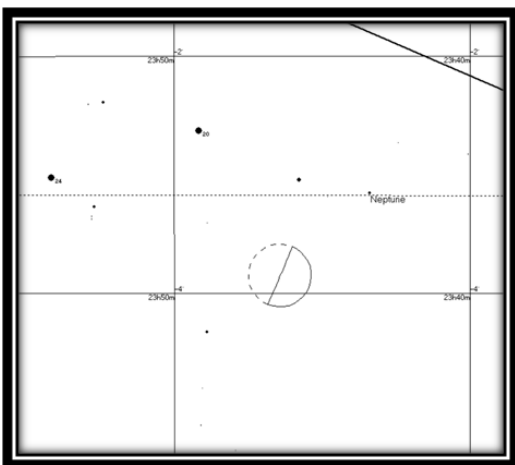
Events involving the moons of Jupiter

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. 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 December and what they mean:

| 1	21:57:06	1	Tr	I
	22:39:42	1	Sh	I
	00:06:54	1	Tr	E
	00:50:18	1	Sh	E

Means that

At 9:57:06 pm, Io (1) will start transiting the disk of Jupiter; then about 45 minutes later we will see Io's shadow on the planet.

After about an hour and a half of transiting Jupiter's disk, Io will egress out of it; and its shadow will follow after about 42 minutes.

Satellites of Jupiter in December 2023

1	2	3	4	5	1	2	3	4	5
1	21:57:06	1	Tr	I	16	19:41:12	3	Sh	I
	22:39:42	1	Sh	I		20:21:36	2	Tr	I
	00:06:54	1	Tr	E		21:23:00	3	Sh	E
	00:50:18	1	Sh	E		22:19:12	2	Sh	I
2	17:59:12	2	Tr	E		22:39:18	2	Tr	E
	19:13:36	1	Oc	D		22:47:24	1	Oc	D
	19:27:36	2	Sh	E		00:38:42	2	Sh	E
	22:07:24	1	Ec	R		01:57:36	1	Ec	R
3	18:33:30	1	Tr	E	17	19:59:06	1	Tr	I
	19:19:06	1	Sh	E		21:00:06	1	Sh	I
5	22:16:42	3	Oc	D		22:09:06	1	Tr	E
	23:51:48	3	Oc	R		23:10:18	1	Sh	E
	01:26:24	3	Ec	D	18	19:13:36	2	Ec	R
	03:11:24	3	Ec	R		20:26:24	1	Ec	R
7	23:11:06	2	Oc	D	22	03:21:12	1	Tr	I
	02:33:12	1	Oc	D	23	19:11:06	3	Tr	I
	03:14:54	2	Ec	R		20:56:06	3	Tr	E
8	23:43:54	1	Tr	I		22:44:30	2	Tr	I
	00:35:24	1	Sh	I		23:43:30	3	Sh	I
	01:53:48	1	Tr	E		00:36:12	1	Oc	D
	02:45:48	1	Sh	E		00:54:54	2	Sh	I
9	18:01:12	2	Tr	I		01:02:54	2	Tr	E
	19:43:24	2	Sh	I		01:24:42	3	Sh	E
	20:18:12	2	Tr	E		03:14:24	2	Sh	E
	20:59:54	1	Oc	D	24	21:48:42	1	Tr	I
	22:03:06	2	Sh	E		22:56:00	1	Sh	I
	00:02:30	1	Ec	R		23:58:48	1	Tr	E
10	18:10:48	1	Tr	I		01:06:00	1	Sh	E
	19:04:12	1	Sh	I	25	19:03:36	1	Oc	D
	20:20:42	1	Tr	E		21:52:30	2	Ec	R
	21:14:42	1	Sh	E		22:21:36	1	Ec	R
11	18:31:18	1	Ec	R	26	18:26:24	1	Tr	E
12	01:42:06	3	Oc	D		19:35:00	1	Sh	E
	03:22:42	3	Oc	R	30	22:50:36	3	Tr	I
14	01:33:00	2	Oc	D		00:39:42	3	Tr	E
15	01:31:54	1	Tr	I		01:09:48	2	Tr	I
	02:31:12	1	Sh	I		02:26:12	1	Oc	D
	03:41:54	1	Tr	E	31	23:39:36	1	Tr	I
						00:51:54	1	Sh	I
						01:49:42	1	Tr	E

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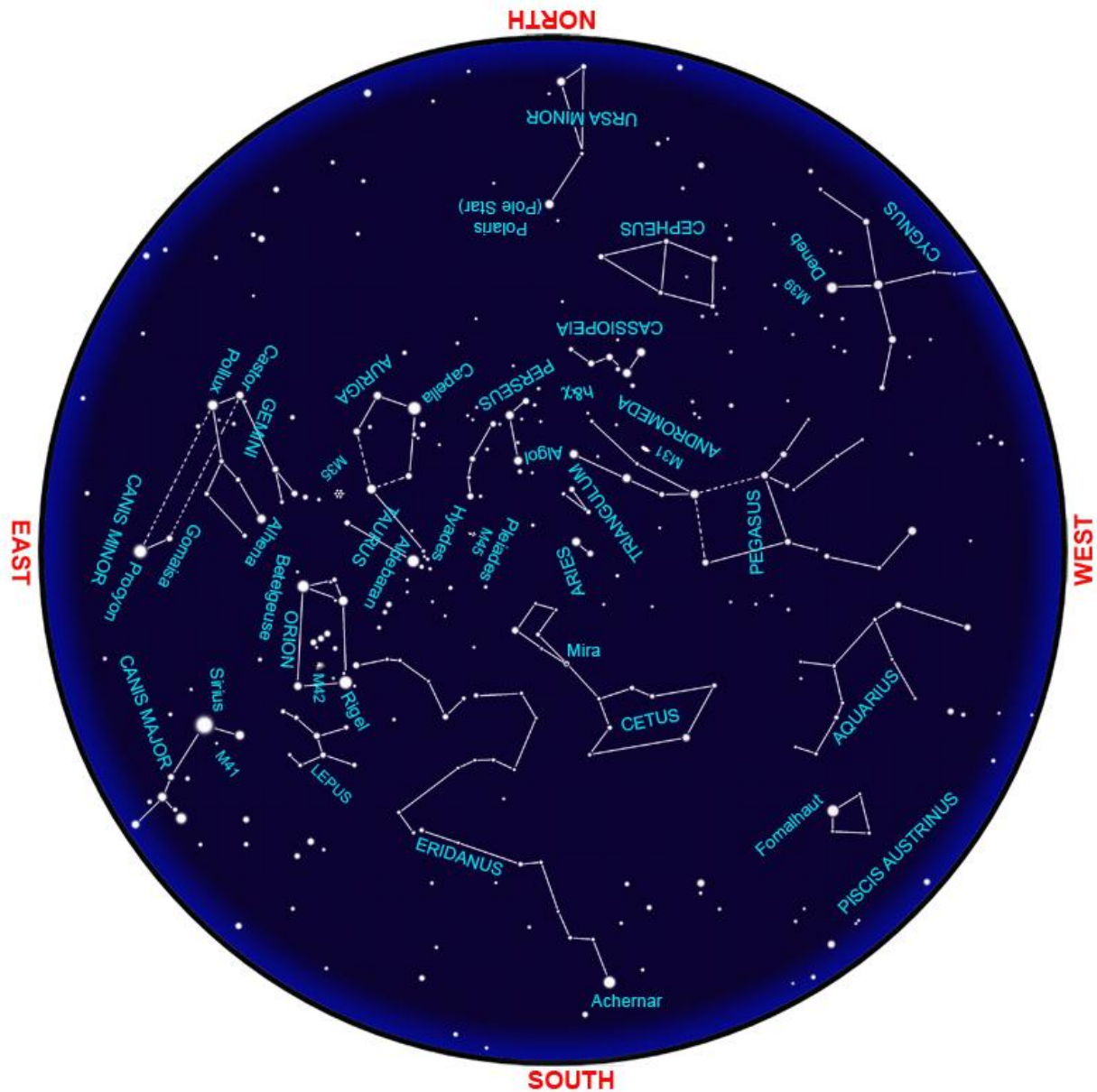
to be used around 9:30 p.m. local time

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

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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/

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