SkyNews Astronomical events for Indian observers

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Sun, Planets and Transitions

During this month, the **Sun** travels in Virgo, the Virgin (*Kanya*). The angular diameter of the Sun increases from 0°31'59" on 1 October to 0°32'04" on 31 October.

Mercury remains in Virgo. Initially it is in retrograde motion and almost touches the boundary of Leo, the Lion (*Simha*) on 2 October.

Venus too remains in Virgo.

Mars continues to remain in Taurus, the Bull (*Vrushabh*) in October.

Jupiter continues to travel in Pisces, the Fishes (*Meena*) and **Saturn** in Capricornus (*Makara*). Saturn had started its retrograde motion on 4 June. It will continue in retrograde till 23 October when it will be stationary, and then go into prograde motion.

Note that the Sun, Venus and Mercury are all in Virgo, and this makes observation of the two planets difficult. However, two facts make it relatively easy for us to look for Mercury in the first few days of October. As mentioned above, Mercury is in retrograde motion; thus, it is moving in the opposite direction to the Sun. At this time of the year, the ecliptic is nearly perpendicular to the horizon. On 1 October, Mercury rises about an hour before the Sun. It will reach its maximum altitude above the horizon on 8 October. That morning it will be nearly 11° above the eastern horizon at the start of civil twilight.

(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 October 2022

Dt	Dy	Time	Event
01	Sa	01:50	Moon-Antares: 2.4° S
01	Sa	14:36	Mercury stationary
03	Mo	01:02	Moon south declination: 27.4° S
03	Mo	05:44	First quarter
04	Tu	22:31	Moon perigee: 369300 km
05	We	21:21	Moon-Saturn: 4.1° N
08	Sa	10:25	Neptune 2.8° N of Moon
08	Sa	23:36	Moon-Jupiter: 2.1° N
09	Su	02:29	Mercury elongation: 18° W
10	Mo	02:25	Full Moon
12	We	03:19	Moon ascending node
12	We	11:41	Uranus 0.8° S of Moon, occultation
13	Th	09:16	Moon-Pleiades: 2.9° N
15	Sa	09:58	Moon-Mars: 4° S
16	Su	11:42	Moon north declination: 27.5° N
17	Mo	15:51	Moon Apogee: 404300 km
17	Mo	21:11	Moon-Pollux: 2° N
17	Mo	22:45	Last quarter
20	Th	12:28	Regulus 4.6° S of Moon
21	Fr	23:09	Orionid shower: ZHR = 20
23	Su	09:35	Saturn stationary
23	Su	02:17	Venus superior conjunction
25	Tu	16:19	New Moon
25	Tu	16:30	Partial solar eclipse
26	We	12:00	Moon descending node
28	Fr	08:18	Moon-Antares: 2.3° S
29	Sa	20:18	Moon perigee: 368300 km
30	Su	06:34	Moon south declination: 27.5° S
30	Su	18:54	Mars stationary

March of the Moon

The month starts with the approximately 34% illuminated Moon above the western horizon at sunset. It will be about 8°southeast of Antares (*Jyeshta*). On 2 October it will be at the eastern boundary of the Milky Way. On 5 October, it will be just about 4° south of Saturn at 9:20 p.m. The Moon and Saturn will be well above the horizon at sunset and will transit about three hours after sunset. This is an excellent evening to note the changing position of Saturn with respect to the Moon.

A similar but better opportunity comes on 8 October when the Moon passes close to Jupiter. At 23:36 hours IST the Moon will be just about 2° south of Jupiter. Both objects will be above the eastern horizon before sunset. But the Moon will be nearly 98% illuminated, which will make it too bright. On 13 October, the Moon will pass less than 3° south of Pleiades (*Kruttika*). They will rise about 2.5 hours after sunset on 12 October and can be seen well above the western horizon at dawn. On 14 October, the Moon will be less than 8° south of Aldebaran (*Rohini*).

On 15 October, the nearly 75% illuminated Moon can be seen about 4° north of Mars. Then on 20 and 21 October, the Moon will pass north of Regulus (*Magha*). New Moon will be on 25 October. On 26 October, one might just be able to catch the crescent Moon right above the western horizon. But on 27 October, the thin lunar crescent of nearly 7% illumination will be seen above the western horizon at dusk. On 28 October, the Moon will be seen again over Antares. On 29 October, the Moon will be close to the direction of the centre of the Milky Way. On 30 October, there will be an occultation of a 3rd magnitude star τ (tau) Sagittarii by the Moon. See below.

Occultation Watch

A good lunar occultation of a naked eye star — τ (tau) Sagittarii (magnitude 3.3) — is predicted to take place on 30 October. The Moon will be low above the western horizon. It will be a good event to view with a pair of binoculars.

The timings and altitude of the star for various cities are given in the table on the next page.

The diagram following the table is a lunar map showing where the disappearance and reappearance will take place. The numbers correspond to the station numbers mentioned in the table.

Note for amateur astronomy associations and those who conduct star parties

The star party season will be starting soon. If you are planning to conduct star parties in the coming months, then please do let us know. We will be happy to include the information in SkyNews. Please send the following information: Name of the organiser, date of event, venue, programme highlights, participation fee and name and contact details (phone, email ID, URL etc) of a contact person. Thank you.

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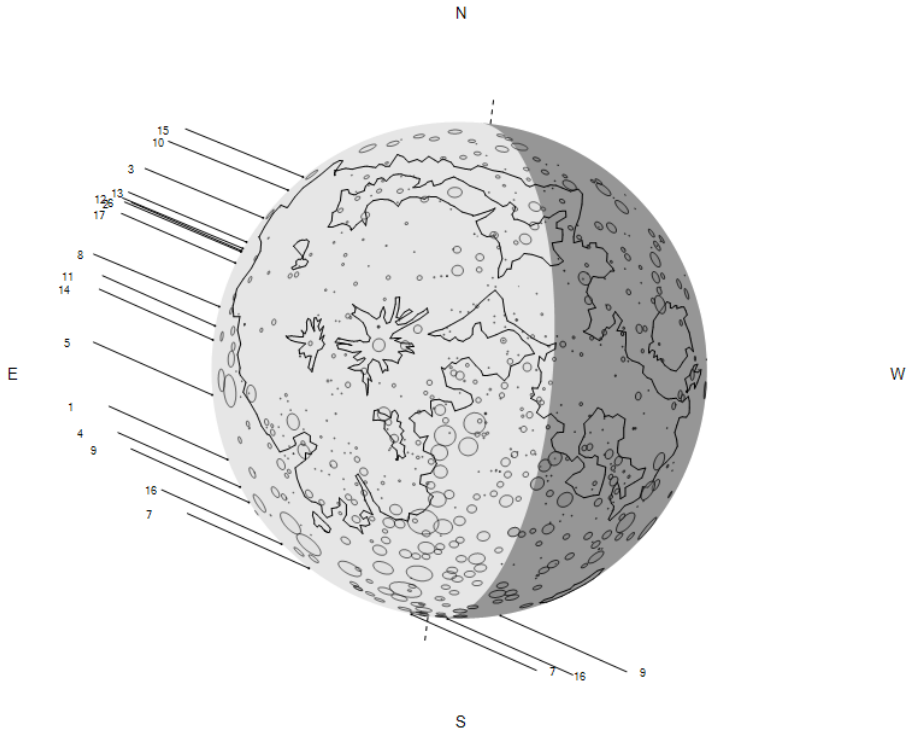
Occultation Prediction of τ Sagittarii, Magnitude 3.3

Date: 30 October 2022

Disappearance			Reappearance		
City	Time (IST)	Moon Alt	City	Time (IST)	Moon Alt
1 Bengaluru	21:26:10	12	1 Bengaluru	Not visible	
2 Bhuj	21:11:03	15	2 Bhuj	Not visible	
3 Chandigarh	21:13:43	5	3 Chandigarh	Not visible	
4 Chennai	21:29:57	9	4 Chennai	Not visible	
5 Hyderabad	21:21:33	10	5 Hyderabad	Not visible	
6 Jaipur	21:14:05	8	6 Jaipur	Not visible	
7 Kanyakumari	21:40:02	12	7 Kanyakumari	21:53:33	9
8 Katmandu	21:17:43	0	8 Katmandu	Not visible	
9 Kochi, India	21:29:48	14	9 Kochi, India	22:03:19	7
10 Leh	21:13:43	3	10 Leh	Not visible	
11 Mumbai	21:15:00	15	11 Mumbai	Not visible	
12 Naini Tal	21:14:51	4	12 Naini Tal	Not visible	
13 NewDelhi	21:14:15	6	13 NewDelhi	Not visible	
14 Pune	21:16:14	14	14 Pune	Not visible	
15 Srinagar	21:13:22	5	15 Srinagar	Not visible	
16 Trivandrum	21:35:39	13	16 Trivandrum	21:57:38	8
17 Udaipur	21:13:30	11	17 Udaipur	Not visible	



The numbers on the map correspond to the location number in the table above

Algol Season

Algol (β Persei) is a famous naked eye eclipsing variable star, and one of the most enjoyable eclipsing variables. It takes about five hours for the star to fade and another five hours for it to regain its normal brightness.

For more information about this star, please visit https://skytonight.wordpress.com/2012/10/12/minima-of-algol/ .

For high northern latitudes, the star is almost circumpolar; it is visible throughout the night. But for observers in the mid- and mid-northern latitudes, the star becomes visible between the end of September and the following March.

We list here the timings of Algol minimum for October 2022, suitable for observers in India and its neighbouring countries.

Date	Time of Minimum (IST)	Notes
11	05:30	Soon after midnight, the star will start fading. It brightens up during the day.
14	02:19	The star will start fading by about 20:50 on 13 October and will return to its normal brightness by daybreak.
16	23:08	The minimum will start at sunset and will be at its brightest by 4 am.
19	19:57	The star will have faded by sunset. It will be good to see it brightening after midnight. This is good for observation in the western part of India.
22	16:46	The star would have started brightening up by sunset. Good for observation in the eastern part of India.

Events Involving the Moons of Jupiter (October 2022)

The table on the next page 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; 2 = time; 3 = satellite number; 4 = event type; and 5 = phase.

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

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

Phase: D = disappear; R = reappear;

I = ingress; and E = egress.

Example 1: An event listed as

11 23:49:00 1 Tr I

means that on 11 October, the satellite Io will transit Jupiter with ingress at 23h 49m 00s IST.

Example 2: An event listed as

12 00:12:12 1 Sh I

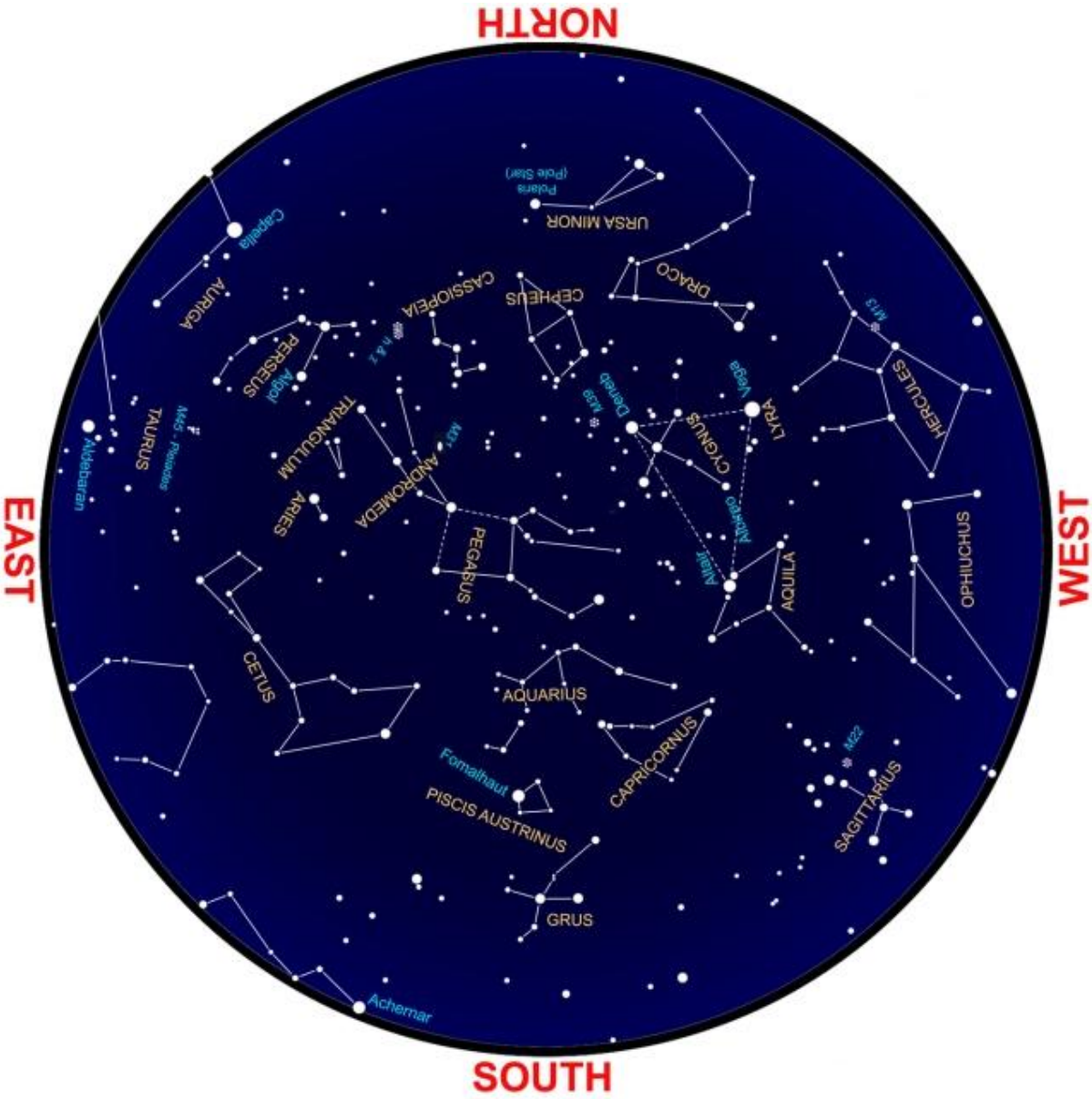
means that this event will take place in the early hours of 12 October (12 minutes past midnight of 11 October); it is an ingress of the satellite Io's shadow on Jupiter's disk at 00h 12m 12s IST. Note that Io would have started transiting Jupiter's disk on 11 October at 23h 49m 00s.

Satellites of Jupiter in October 2022

1	2	3	4	5
1	23:09:36	3	Oc	D
2	02:27:12	3	Ec	R
2	04:05:54	2	Tr	I
2	04:19:42	2	Sh	I
3	03:38:36	1	Tr	I
3	03:47:54	1	Sh	I
3	05:51:54	1	Tr	E
3	06:02:30	1	Sh	E
3	22:28:18	2	Oc	D
4	00:54:06	1	Oc	D
4	01:22:54	2	Ec	R
4	30:18:24	1	Ec	R
4	22:04:42	1	Tr	I
4	22:16:48	1	Sh	I
5	00:18:00	1	Tr	E
5	00:31:18	1	Sh	E
5	19:20:00	1	Oc	D
5	19:39:48	2	Tr	E
5	20:09:24	2	Sh	E
5	21:47:06	1	Ec	R
6	18:44:00	1	Tr	E
5	19:00:06	1	Sh	E
9	02:24:30	3	Oc	D
10	05:22:48	1	Tr	I
11	00:43:42	2	Oc	D
11	02:37:48	1	Oc	D
11	04:01:00	2	Ec	R
11	5:13:06	1	Ec	R
11	23:49:00	1	Tr	I
12	00:12:12	1	Sh	I
12	02:02:24	1	Tr	E
12	02:26:36	1	Sh	E
12	18:48:30	3	Tr	E
12	19:25:54	2	Tr	I
12	20:12:54	2	Sh	I
12	20:33:42	3	Sh	E
12	21:03:48	1	Oc	D
12	21:53:54	2	Tr	E
12	22:44:24	2	Sh	E
12	23:41:48	1	Ec	R
13	18:41:00	1	Sh	I
13	20:28:36	1	Tr	E
13	20:55:18	1	Sh	E

1	2	3	4	5
17	03:00:12	2	Oc	D
17	04:22:06	1	Oc	D
18	01:34:06	1	Tr	I
18	02:07:42	1	Sh	I
18	03:47:30	1	Tr	E
18	04:21:54	1	Sh	E
19	19:27:30	3	Tr	I
19	21:40:36	2	Tr	I
19	21:46:30	3	Sh	I
19	22:10:06	3	Tr	E
19	22:48:24	1	Oc	D
19	22:48:36	2	Sh	I
20	00:09:18	2	Tr	E
20	00:35:42	3	Sh	E
20	01:19:30	2	Sh	E
20	01:36:30	1	Ec	R
20	20:00:24	1	Tr	I
20	20:36:36	1	Sh	I
20	22:13:54	1	Tr	E
20	22:50:42	1	Sh	E
21	19:58:54	2	Ec	R
21	20:05:18	1	Ec	R
25	03:20:00	1	Tr	I
25	04:03:24	1	Sh	I
26	22:49:06	3	Tr	I
26	23:57:00	2	Tr	I
27	00:33:42	1	Oc	D
27	01:24:12	2	Sh	I
27	01:34:00	3	Tr	E
27	01:49:06	3	Sh	I
27	02:26:12	2	Tr	E
27	03:31:24	1	Ec	R
27	03:54:42	2	Sh	E
27	21:46:36	1	Tr	I
27	22:32:18	1	Sh	I
28	00:00:06	1	Tr	E
28	00:46:06	1	Sh	E
28	18:28:30	2	Oc	D
28	19:00:12	1	Oc	D
28	22:00:12	1	Ec	R
28	22:37:24	2	Ec	R
29	18:26:54	1	Tr	E
29	19:15:06	1	Sh	E
30	18:30:00	3	Ec	R

This sky map for October 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:
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https://eclipse.gsfc.nasa.gov/SKYCAL/SKYCAL.html by Fred Espenak and Sumit Dutta.
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https://www.gimp.org/