



## Sun, Planets and Transitions

The **Sun** will be in Virgo, the Virgin (*Kanya*) in October. On 1 October, its angular diameter will be 31'57". As the Earth continues to move towards its perihelion point, the angular diameter will increase by 16 seconds of arc to 32'13" by the end of the month.

**Mercury** will be in Virgo on 1 October and move to Libra, the Scale (*Tula*) on 19 October. On this day, it will also be in superior conjunction with the Sun. It will be right behind the Sun as seen from Earth.

**Venus** is now shining brilliantly above the western horizon soon after sunset. It will be a magnitude -4.0 object. It will be in Libra on 1 October, then move to Scorpius, the Scorpion (*Vrushchika*) on 18 October, and then to Ophiuchus, The Serpent Bearer (*Bhujangadhari* or *Sarpdhar* or *Naraturunga*) on 24 October.

	Phase	ang diam	elongation
1 Oct	0.85	12.23"	31.3°
10 Oct	0.83	12.76"	33.5°
20 Oct	0.80	13.37"	35.7°
30 Oct	0.78	14.08"	37.8°

On the night of 5 October at 23:36 hours IST, Venus will pass less than a degree of arc from the star Zubenelgenubi or Alpha Librae. By this time, both the star and the planet would have set below the Indian horizon.

The name 'Zubenelgenubi' comes from the original Arabic name which means 'the southern claw' (of the Scorpius constellation). The name was given before Libra and Scorpius were classified as two separate

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

Dt	Dy	Time	Event
01	Tu	02:29	Mercury superior conjunction
02	We	17:22	Moon descending node
03	Th	00:16	Annular solar eclipse
03	Th	00:19	New Moon
03	Th	01:10	Moon apogee: 406500 km
05	Sa	23:00	Moon 2.8° S of Venus
08	Tu	00:18	Moon 0.2° N of Antares
09	We	12:42	Jupiter stationary in RA
09	We	17:23	Moon south declination: 28.7° S
10	Th	13:23	Mercury 2.4° N of Spica
11	Fr	00:25	First quarter
14	Mo	23:15	The Moon occults Saturn (see below)
15	Tu	20:00	The Moon occults Neptune (see below)
16	We	12:35	Moon ascending node
17	Th	06:16	Moon perigee: 357200 km
17	Th	16:56	Full Moon
19	Sa	05:20	Mars 5.7° S of Pollux
19	Sa	19:15	Uranus 4.2° S of Moon
20	Su	01:29	Moon 0.1° N of Pleiades (see below)
21	Mo	12:39	Moon 5.7° N of Jupiter
21	Mo	11:28	Orionid Shower: ZHR = 20
22	Tu	06:20	Moon north declination: 28.7° N
23	We	22:46	Moon 1.8° S of Pollux
24	Th	01:25	Moon 4.2° N of Mars
24	Th	13:33	Last quarter
24	Th	23:05	Moon 3.3° N of Beehive

constellations.

Zubenelgenubi or  $\alpha 2$  Librae with a +2.7 magnitude has a companion,  $\alpha 1$  Librae of +5.2 magnitude. The close proximity of the stars (less than four arc minutes) and the +2.5 difference in magnitude makes it difficult to



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Track of Venus at 10-day intervals (left) and the phases of Venus

see them separately, but they can be resolved with a pair of binoculars.

**Mars** will be in Gemini, the Twins (*Mithuna*) on 1 October. It moves to Cancer, the Crab (*Karka*) on 30 October. As mentioned in the previous issue, for observers in the northern hemisphere, a planet in Gemini, the northernmost zodiacal constellation, is well placed for observation. Mars rises around local midnight. It is moving eastwards and is seen almost in the same direction of the sky each day at a fixed time.

**Jupiter** remains in Taurus, the Bull (*Vrushabha*). Jupiter, which has been in retrograde motion, will be stationery in RA on 9 October. After that, it will commence its prograde motion.

**Saturn** is in Aquarius, the Water-bearer (*Kumbha*). The Moon will occult Saturn on 14 October.

*(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

The Moon will occult Spica (*Chitra*) on 4 and 31 October, but on both occasions the star and the Moon will be too close to the Sun.

New Moon is on 3 October. The New Moon phase takes place close to midnight. On 4 October, the crescent Moon can be seen right above the western horizon soon after sunset. The next day on 5 October, the thin lunar crescent with 7% illumination can be seen right below Venus. One will also be able to see the part of the Moon that is illuminated by sunlight reflected off the Earth. This is called 'Old Moon in the arms of the New Moon'.

On 7 October the Moon can be seen right below Antares (*Jyeshtha*). On 9 October it can be seen at the end of the spout of the Teapot asterism in Sagittarius. The next day it will be within the handle of the teapot.

On 14 October the Moon will occult Saturn; and the next day it will occult Uranus. On 19 October the Moon will occult some stars in the Pleiades (*Krutika*) cluster (see below).

On 23 October the Moon will be close to

Pollux ( $\beta$  Geminorum). On the night of 24 October, the Moon, about 50% illuminated, passes less than  $4^\circ$  north of the open cluster M 44, or the Beehive cluster. This cluster is a *nakshatra* of Indian astronomy. The Moon and the cluster rise close to midnight and the duo can be seen well above the eastern horizon at dawn. The Beehive cluster can easily be spotted with a pair of binoculars, south of the Moon. Both will be in the same field of view.

On 29 October the Moon will occult the second brightest star of Virgo,  $\beta$  Virginis or Zavijava.

## Occultations

October offers many interesting occultations. The Moon will occult Saturn on 14 October, Neptune on 15 October, some stars of the Pleiades cluster on 19 October and  $\beta$  Virginis on 29 October.

Some important notes on these events are given below. For more details about these

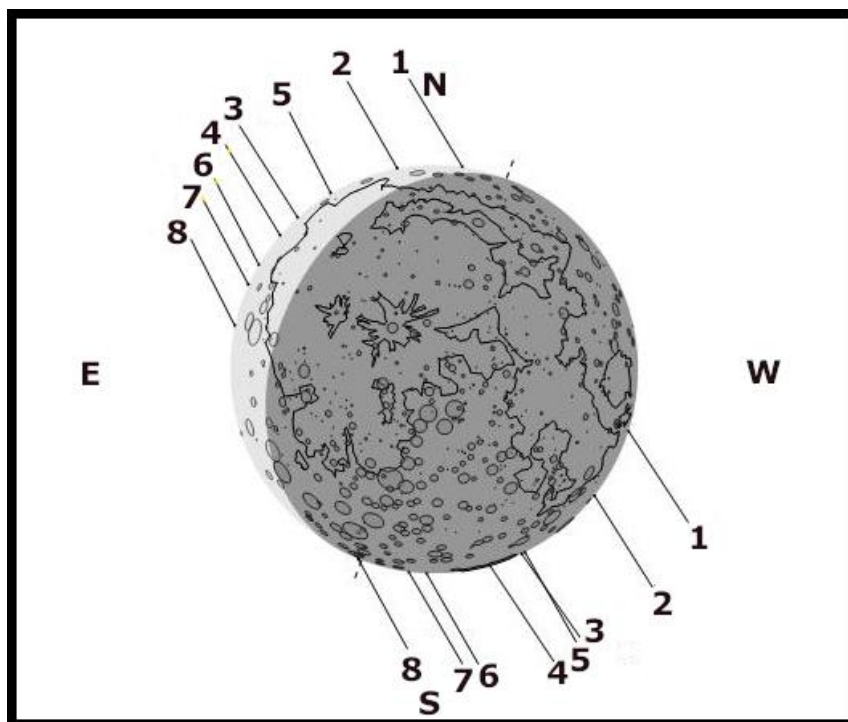
events, please visit <http://skytonight.wordpress.com>

## Occultation of Saturn

On the night of 14 October, Saturn will be occulted by the Moon. This event will be visible from India. Although it can be seen with the naked eye, a pair of binoculars or a small telescope will be very helpful. The event will be most enjoyable through a good telescope in the diameter class range of 100 mm or more.

Some basic information about the event:

Moon: Waxing, % illumination  $\approx 94+$   
 Magnitude  $\approx -11.7$   
 Saturn: Magnitude 0.9  
 Equatorial diameter 18.69"  
 Polar diameter 16.68"  
 Ring system major axis 42.4"  
 Ring system minor axis 3.6"  
 Solar elongation at the time of contact  $\approx 142^\circ$



Positions of Saturn with respect to the lunar limb. The numbers correspond to the cities in the table below

City	Disappearance		Reappearance	
	Time (IST)	Alt°	Time (IST)	Alt°
Leh	0:38:46	31	1:27:59	23
Delhi	0:30:24	36	1:31:38	25
Guwahati	0:39:34	25	1:39:01	12
Kolkata	0:36:11	30	1:35:35	17
Mumbai	0:15:25	48	1:24:39	34
Chennai	0:25:10	43	1:19:08	31
Bengaluru	0:19:48	46	1:18:38	33
Kanyakumari	0:21:06	48	1:06:06	38

## Occultation of Neptune

On the night of 15 October, the Moon will occult Neptune. This event will be visible in most of northern India.

Some basic information about the event:

Moon: Waxing, % illumination  $\approx 95+$   
Magnitude  $\approx -11.7$

Saturn: Magnitude 7.8  
Angular diameter 2.31"  
Solar elongation at the time of contact  $\approx 155^\circ$

A note on observing: The event will occur when more than 95% of the lunar surface is illuminated as seen from Earth. Even though Neptune can be spotted using 7 X 50 or 10 X 50 binoculars, the Moon will be nearly 57000 times brighter than Neptune, making it very difficult to spot the latter in the glare of the Moon.

However, since the disappearance occurs on the dark limb of the Moon, locating Neptune

will be relatively easy if the field of view is less than half a degree.

The angular size of Neptune is more than 2 seconds of arc. Hence disappearance and reappearance will be gradual rather than instantaneous.

## Occultation of Pleiades

Occultation of the stars of the Pleiades cluster will take place at about 01:40 hours on the night of 19-20 October. The magnitude of the Moon will be nearly -12 and the events take place at the brighter limb.

## Occultation of $\beta$ Virginis

On the night of 28 October, the Moon will occult a 3.6 magnitude star,  $\beta$  Virginis. The event will take place around 02:45 hours on 29 October.

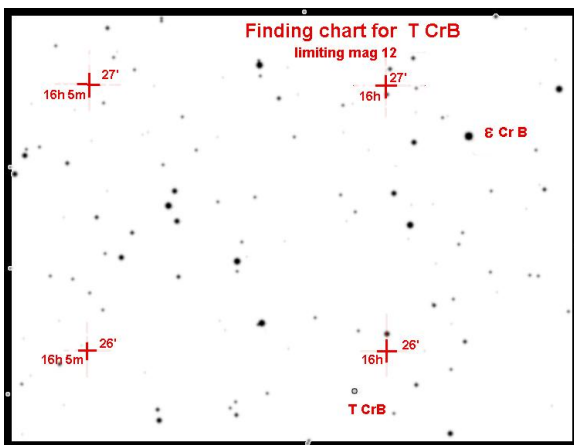
## Recurrent Nova Outbursts

T Coronae Borealis (T CrB) is expected to

flare up soon. The International Nova Community is monitoring it closely. There are several groups monitoring the event, and many have planned observations during the outbursts. Professor G C Anupama appeals to Indian amateur astronomers to "join this watch and be a witness to this exciting event."

The coordinates of T CrB are RA15h59m, Dec +25°55'. The star is usually at magnitude 10 but reaches magnitude 2 during its outbursts.

You may use a finding chart for T CrB, which is given below. All the other stars are 8<sup>th</sup> magnitude or fainter.



## 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.

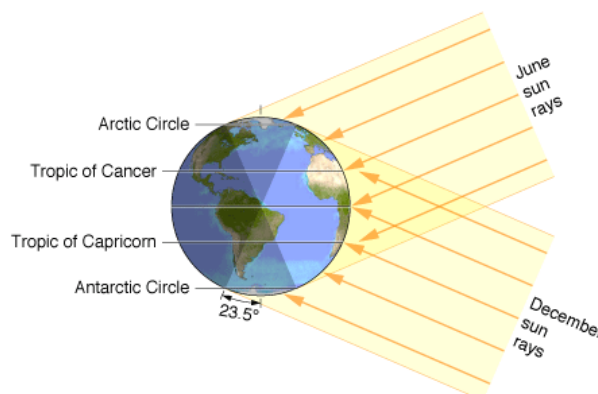
**Phase:** D = disappear; R = reappear; I = ingress; and E = egress.

Example: Events for 2 October and what they mean:

2	02:00:12	3	Ec	D
	04:03:24	3	Ec	R
	03:25:00	1	Sh	I
	04:40:06	1	Tr	I

Means that

At 02:00:12 hours on 2 October, Europa will be eclipsed by Jupiter. It will reappear at 04:03:24 hours. That same night, at 03:25:00 hours the shadow of Io will transit Jupiter. Io itself will transit Jupiter at 04:40:06 hours.

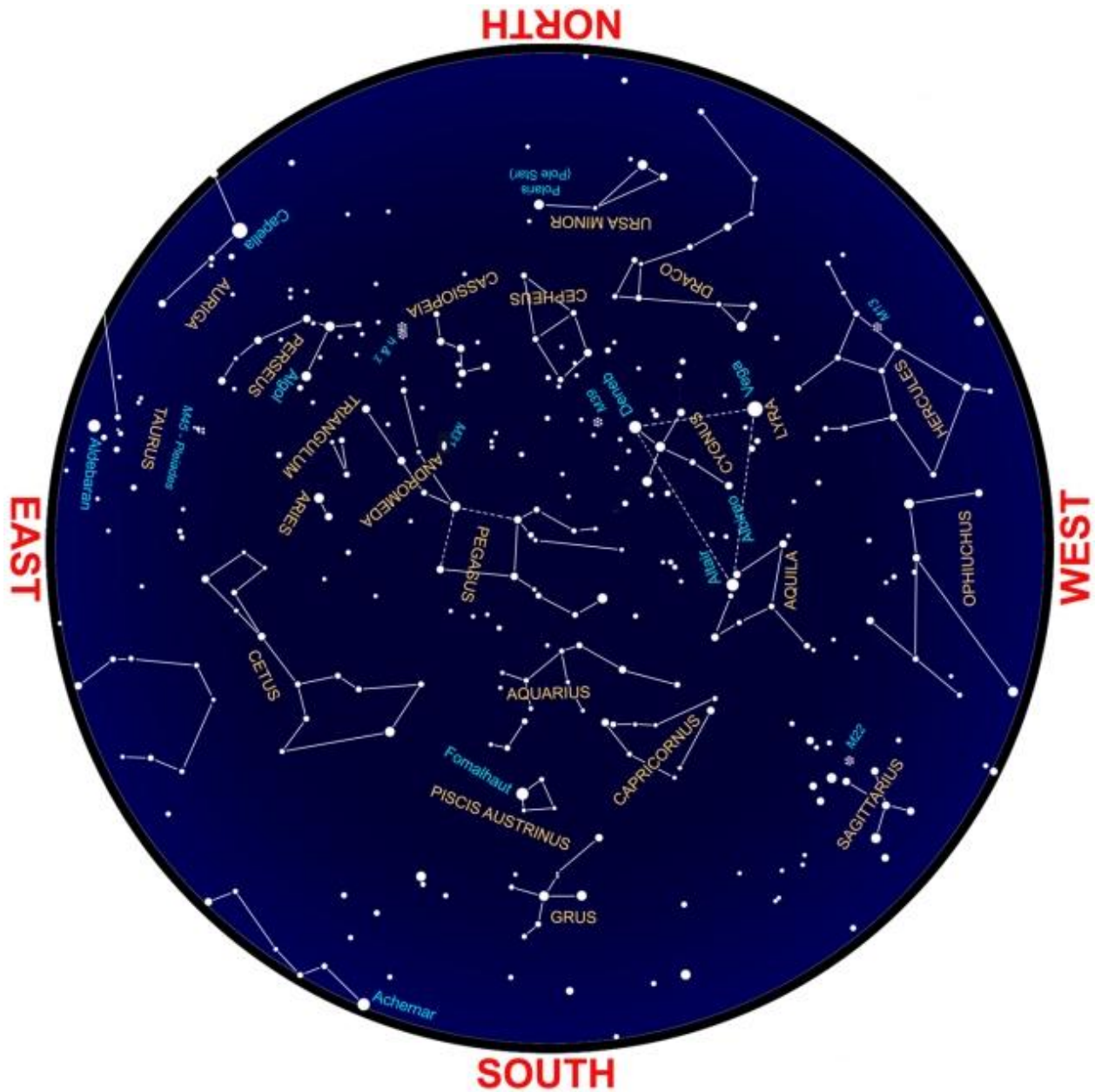


The Arctic and Antarctic Circles mark the maximum reach of the sun's rays at the solstices. The Tropics of Cancer and Capricorn mark the locations where the rays of the noon sun are perpendicular to the ground at the solstices. (Earth image adapted from NASA data using John Walker's Earth and Moon Viewer.) Picture courtesy: <https://physics.weber.edu/schroeder/ua/SunAndSeasons.html>

### Satellites of Jupiter in October 2024

<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>
2	02:00:12	3	Ec	D	18	01:40:18	1	Sh	I
	04:03:24	3	Ec	R		02:45:24	1	Tr	I
	03:25:00	1	Sh	I		03:51:06	1	Sh	E
	04:40:06	1	Tr	I		04:56:06	1	Tr	E
3	05:35:18	1	Sh	E	19	22:59:12	1	Ec	D
	00:42:42	1	Ec	D		00:08:42	3	Sh	I
	04:11:30	1	Oc	R		02:13:06	3	Sh	E
4	21:53:18	1	Sh	I		02:16:54	1	Oc	R
	23:07:36	1	Tr	I		04:34:06	3	Tr	I
5	00:03:42	1	Sh	E	20	21:12:18	1	Tr	I
	01:18:00	1	Tr	E		22:19:36	1	Sh	E
	03:31:54	2	Ec	D		23:23:00	1	Tr	E
5	22:39:00	1	Oc	R		03:47:48	2	Sh	I
	23:15:18	3	Tr	E	21	05:56:42	2	Tr	I
6	22:35:30	2	Sh	I		20:43:54	1	Oc	R
7	01:05:12	2	Tr	I	22	21:58:24	2	Ec	D
	01:05:48	2	Sh	E		02:35:06	2	Oc	R
	03:36:30	2	Tr	E	24	21:39:36	2	Tr	E
8	21:46:54	2	Oc	R	25	03:33:54	1	Sh	I
9	05:59:30	3	Ec	D		04:32:36	1	Tr	I
	05:18:30	1	Sh	I		05:45:00	1	Sh	E
10	02:36:42	1	Ec	D		00:53:18	1	Ec	D
11	06:01:18	1	Oc	R		04:04:12	1	Oc	R
	23:46:48	1	Sh	I		04:08:36	3	Sh	I
12	00:57:06	1	Tr	I	27	22:02:18	1	Sh	I
	01:57:24	1	Sh	E		22:59:18	1	Tr	I
	03:07:36	1	Tr	E		00:13:30	1	Sh	E
	06:06:18	2	Ec	D		01:10:12	1	Tr	E
	21:05:12	1	Ec	D	28	22:30:48	1	Oc	R
	22:12:48	3	Sh	E	29	00:33:18	2	Ec	D
13	00:28:30	1	Oc	R		04:55:54	2	Oc	R
	00:57:12	3	Tr	I	30	20:04:48	3	Ec	R
	02:57:00	3	Tr	E		21:41:06	3	Oc	D
	21:34:48	1	Tr	E		23:42:12	3	Oc	R
	01:11:42	2	Sh	I	31	21:29:12	2	Tr	I
	03:32:12	2	Tr	I		22:13:54	2	Sh	E
	03:42:24	2	Sh	E		00:00:30	2	Tr	E
14	06:03:24	2	Tr	E					
16	00:12:06	2	Oc	R					
17	04:30:42	1	Ec	D					

This sky map for October 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://skyonight.wordpress.com/monthly-sky-notes-and-links/>

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