SkyNews Astronomical events for Indian observers

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July is a month of rain and cloudy skies; but there are intervals when the clouds give way to clear, pollution-free skies that make night sky observation a pleasure; hence readers are encouraged to look for those brief times when it is possible to enjoy clear, starry skies — Editors.

Sun, Planets and Transitions

The **Sun** transits from Gemini, the Twins (*Mithuna*) to Cancer, the Crab (*Karka*) on 21 July. On 7 July the Earth reaches its maximum distance from the Sun (aphelion) at 01:35 IST. At that time it will be 152 million kilometres or 1.0167 astronomical units away from the Earth. Light from the Sun will take 8 minutes and 27.3 seconds to reach us.

The angular size of the Sun will first decrease from 0°31'27.9" on 1 July to 0°31'27.8"; then as the Earth starts moving closer to the Sun, it will increase to 0°31'30.3" on 31 July.

At the beginning of the month, we have **Venus** and **Mars** well above the western horizon in the post-dusk sky. **Mercury** reappears above the horizon by mid-month.

Mercury is at superior conjunction on 1 July and then by mid-month, it can be spotted low above the western horizon. Mercury transits from Gemini to Cancer on 10 July and then to Leo, the Lion (*Simha*) on 21 July. Between 14 and 15 July it passes close to the Beehive cluster (M44).

Mars continues to travel in Leo. **Jupiter** continues to travel in Aries. Likewise, **Saturn** continues to travel in Aquarius, the Water Bearer.

Venus remains in Leo in July 2023. After reaching its maximum eastern elongation, the Venus-Earth-Sun angle is rapidly diminishing. It was nearly 42° in the beginning of the month and reduces to 22° by the month's end.

The table below gives the magnitude of **Venus**, its phase (phase 1 is fully illuminated), elongation (Sun-Earth-Venus angle), its angular diameter and light time. The latter is the time in minutes taken by light to travel from Venus to the Earth.

List of Events in July 2023

Dt	Dy	Time	Event
02	Tu	04:49	Mercury inferior conjunction
01	Sa	10:16	Mercury superior conjunction
01	Sa	12:18	Venus-Mars: 3.6° N
01	Sa	12:50	Moon-Antares: 1.5° S
03	Mo	06:53	Moon south declination: 27.8° S
03	Mo	17:09	Full Moon
05	We	03:58	Moon perigee: 360200 km
07	Fr	01:35	Earth aphelion: 1.0167 AU
07	Fr	08:35	Moon-Saturn: 2.7° N
08	Sa	05:37	Mercury 4.9° S of Pollux
10	Mo	07:18	Last quarter
10	Mo	10:48	Mars-Regulus: 0.6° N
11	Tu	06:53	Moon ascending node
12	We	02:48	Moon-Jupiter: 2.3° S
13	Th	12:01	Moon-Pleiades: 1.8° N
15	Sa	04:03	Mercury-Beehive: 0.2° N
16	Su	08:10	Moon north declination: 27.8° N
16	Su	13:19	Venus-Regulus: 3.3° S
18	Tu	00:02	New Moon
19	We	17:01	Mercury 3.3° S of Moon
20	Th	12:26	Moon apogee: 406300 km
20	Th	23:21	Regulus 3.8° S of Moon
20	Th	05:55	Venus stationary
21	Fr	09:30	Moon-Mars: 3.6° S
25	Tu	20:35	Moon descending node
25	Tu	11:35	Spica 2.5° S of Moon
26	We	03:37	First quarter
27	Th	16:30	Mercury-Venus: 5.1° N
28	Fr	21:05	Delta Aquarid shower: ZHR = 20
28	Fr	22:41	Moon-Antares: 1.3° S
28	Fr	23:51	Mercury-Regulus: 0.1° S
30	Su	16:43	Moon south declination: 27.9° S

Date	Mag	Phase	Phase angle	Elongation	Diameter	Light time
01	-4.5	0.323	110.7°	41.9°	33.33"	4.16 m
10	-4.5	0.250	120.1°	38.2°	38.36"	3.62 m
20	-4.4	0.160	132.8°	31.7°	45.05"	3.08 m
30	-4.3	0.073	148.7°	21.9°	52.11"	2.66 m

(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

On 1 July the nearly Full Moon and Antares can be seen soon after sunset. The Moon rises about 10 minutes after Antares. It is less than 5° from Antares; as the night progresses one can see the angular distance between them increasing. On 3 July the Moon will be seen inside the handle of the Teapot asterism.

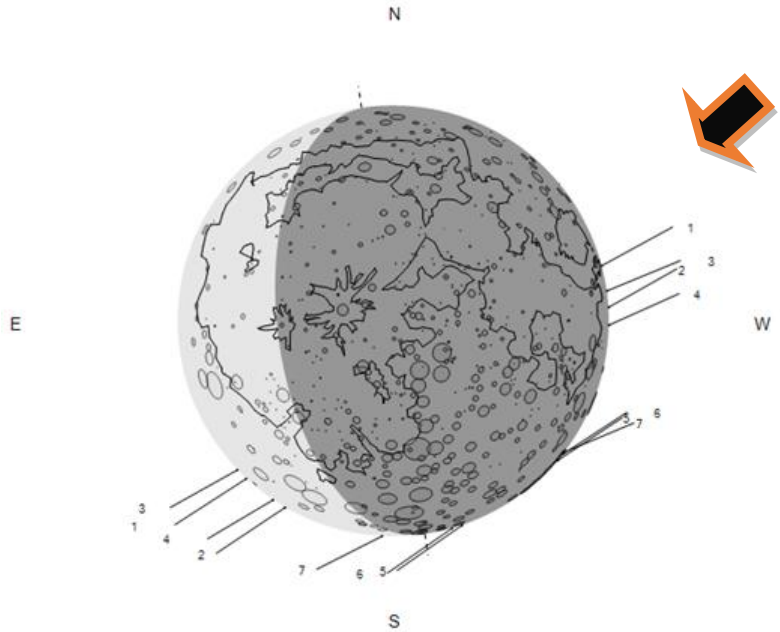
On 7 July, the nearly 83% illuminated Moon can be seen east of Saturn in the pre-dawn sky. On 12 July the Moon can be seen southeast of Jupiter. On 13 July it will be northwest of Pleiades (*Kruttika*). The next day on 14 July, the Moon makes a right-angled triangle with Pleiades and Antares . On 15 July the thin lunar crescent can be seen north of Alnath (Beta Tauri or *Angni*). This star makes a pentagon with four other stars of Auriga.

The Moon then reappears above the western horizon after sunset. From 19 to 21 July it makes exciting configurations with Mercury, Venus, Mars and Regulus. On 19 July the thin lunar crescent will be seen northeast of Mercury. Then the next day on 20 July Venus, Mars, Regulus and the crescent Moon will be within 10 degrees of each other. And on 21 July the Moon will be right above Mars.

On 25 July the Moon can be seen right above (or east of) Spica or *Chitra*. On 28 July the Moon will occult a 2.8 magnitude star, σ (Sigma) Scorpii. On 30 July, two days before Full Moon, the Moon can be seen inside the Teapot asterism of Sagittarius.

Bright Star Occultation by the Moon

▼Occultation Prediction of Al Niyat (σ Scorpii), Magnitude 2.9



Lunar map of disappearance and reappearance of σ Scorpii. The numbers on the map correspond to the following stations:

1	Leh
2	New Delhi
3	Guwahati
4	Kolkata
5	Mumbai
6	Pune
7	Port Blair

This is a multiple star system and observations are highly desired.

In the table below, **a** is the location number; **b** is the location; **c** and **f** are the timings in IST; **d** is the altitude of the sun (a blank cell indicates that the altitude of the Sun is less than 12 degrees or it is after the end of nautical twilight); and **e** and **h** are the altitude of the Moon.

a	b	disappearance				reappearance		
		c	d	e		f	g	h
1	Leh	19:08:46	2	28		20:29:40		30
2	Jammu	19:05:58	4	29		20:23:19	-10	32
3	Amritsar	19:06:48	4	30		20:23:14	-11	33
4	Chandigarh	19:10:01	1	31		20:28:11		34
5	New Delhi	19:12:42		34		20:29:17		36
6	Dibrugarh	19:48:06		36		21:13:48		29
7	Darjeeling	19:33:32		37		20:58:40		34
8	Jaipur	19:13:13		35		20:24:49		38
9	Guwahati	19:42:06		38		21:07:26		32
10	Patna	19:28:58	-11	39		20:51:04		37
11	Shillong	19:43:06		39		21:08:05		33
12	Udaipur	19:15:27		36		20:16:32		40
13	Agartala	19:44:03		40		21:07:23		35
14	Dhanbad	19:33:59		41		20:54:58		38
15	Aizawl	19:47:25		40		21:10:50		34
16	Asansol	19:35:14		41		20:56:29		37
17	Ratlam	19:19:02	-2	38		20:19:58		41
18	Bhuj	19:18:45	3	36		19:58:55	-6	40
19	Bhopal	19:21:14	-4	39		20:27:58		41
20	Gandhinagar	19:18:15		38		20:11:07	-11	41
21	Ujjain	19:19:57	-3	39		20:22:25		41
22	Jabalpur	19:24:19	-7	40		20:36:00		41
23	Ambikapur	19:29:14	-11	41		20:45:53		40
24	Ahmedabad	19:18:48		38		20:10:29	-11	41
25	Indore	19:21:01	-3	39		20:22:10		42
26	Kolkata	19:39:42		42		21:00:16		38
27	Rajkot	19:21:32	1	38		20:01:27	-8	41
28	Bhavnagar	19:22:50	-1	39		20:06:14	-10	42
29	Raipur	19:30:24	-11	43		20:40:25		42
30	Surat	19:24:43	-2	40		20:07:51	-11	43
31	Nagpur	19:27:32	-8	42		20:31:55		43
32	Bhubaneswar	19:39:04		44		20:52:55		41
33	Nashik	19:28:52	-4	42		20:09:10		44
34	Mumbai	19:35:50	-5	43		19:59:46	-10	45
35	Pune	19:36:17	-6	44		20:04:08		45
36	Hyderabad	19:38:51	-11	46		20:23:42		47
37	Port Blair	20:18:03		50		21:01:59		45

Acknowledgements:

http://www.lunar-occultations.com/iota/occult4.htm

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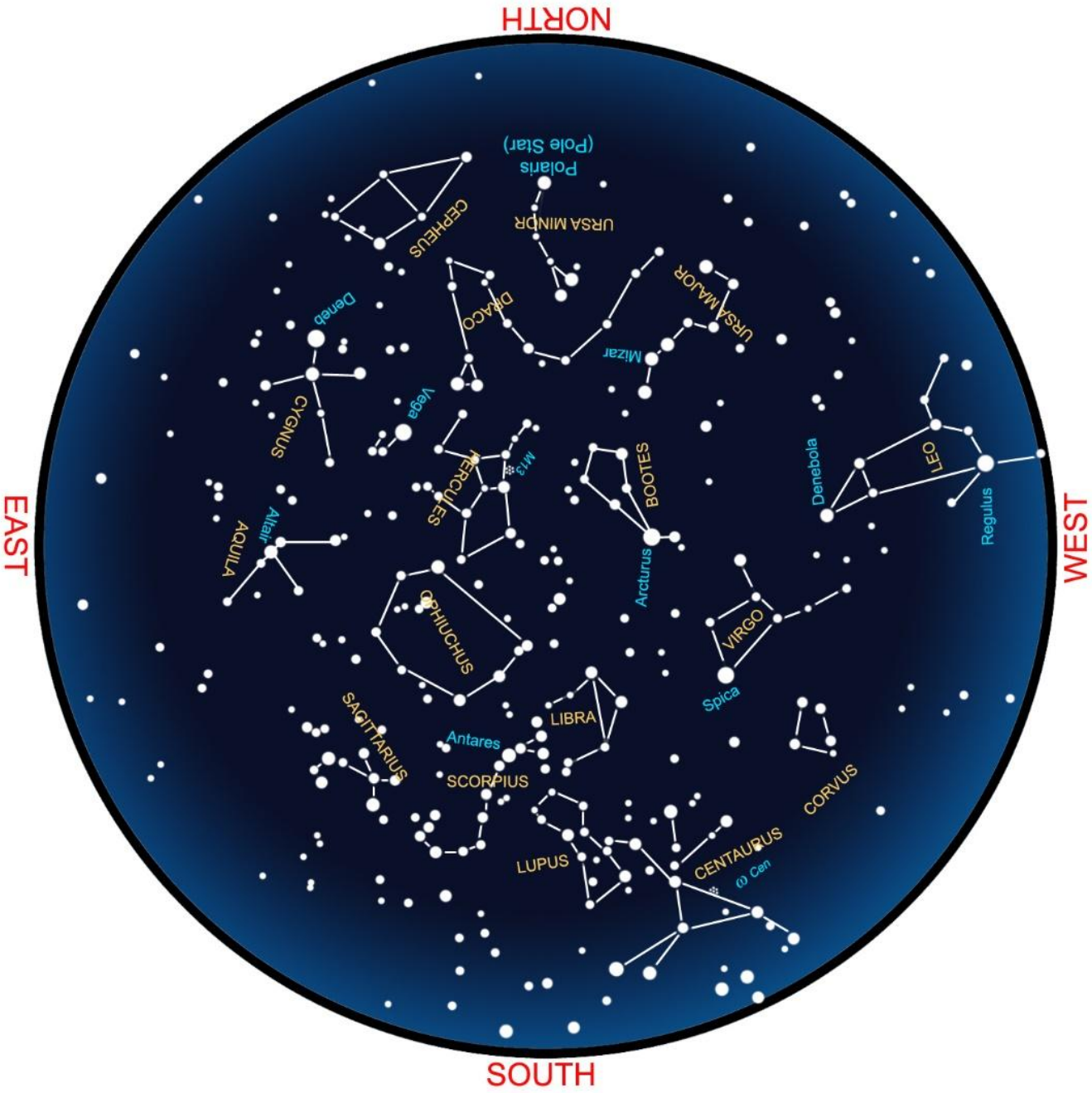
https://eclipse.gsfc.nasa.gov/SKYCAL/SKYCAL.html by Fred Espenak and Sumit Dutta.

Graphics using GNU Image Manipulation Program (GIMP) a cross-platform image editor, https://www.gimp.org/

This sky map for July 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/

These pages are contributed by:
Arvind Paranjpye (paranjpye.arvind@gmail.com) (http://arvindparanjpye.blogspot.com/) and Anjanee Rao (rao.anjanee@gmail.com)