





# ASTRONOMICAL DIARY

PREPARED BY ASTRONOMICAL PUBLICATION AND PLANETARIUM UNIT, SPACE SCIENCE AND ASTRONOMY SECTION

## ASTRONOMICAL EVENTS, JANUARY 2023

DATE	EVENT	TIME
4	Quadrantids (ZHR = 110)	before dawn
4	Close approach of Moon and Mars	---
5	Earth at Perihelion (Distance = 0.98330 AU)	12:17 AM
7	Mercury at inferior conjunction	---
8	Moon at Apogee (Distance = 406,419.714 )	05:19 PM
22	Moon at Perigee (Distance = 356,681.807 )	04:57 AM
23	Conjunction of Venus and Saturn	---
26	Close approach of Moon and Jupiter	---

## PHASES OF THE MOON

	<b>Full Moon</b> Jan 07 07:08 AM
	<b>Last Quarter</b> Jan 15 10:10 AM
	<b>New Moon</b> Jan 22 04:53 AM
	<b>First Quarter</b> Jan 28 11:19 PM

## RISE AND SET TIMES OF PLANETS

DATE	MERCURY		VENUS		MARS		JUPITER		SATURN	
	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set
Jan 01	07:16 AM	06:34 PM	07:35 AM	06:53 PM	03:11 PM	*04:13 AM	11:19 AM	11:20 PM	09:09 AM	08:40 PM
Jan 11	05:48 AM	07:06 PM	07:45 AM	07:09 PM	02:28 PM	*03:29 AM	10:44 AM	10:47 PM	08:33 AM	08:05 PM
Jan 21	04:52 AM	04:11 PM	07:51 AM	07:23 PM	01:50 PM	*02:52 AM	10:09 AM	10:14 PM	07:58 AM	07:30 PM
Jan 31	04:46 AM	04:04 PM	07:55 AM	07:37 PM	01:18 PM	*02:19 AM	09:36 AM	09:42 PM	07:23 AM	06:56 PM



## NATIONAL TIME CONSCIOUSNESS WEEK "Oras Pinas: Tamang Oras Tungo sa Maunlad na Pilipinas"

The Department of Science and Technology (DOST) is leading the nation to encourage everyone to support the advocacy for the observance of the National Time Consciousness Week (NTCW) on 01-07 January 2023.

"This year's theme is anchored on promoting the culture of punctuality, of being on time, and in giving mutual respect for each other's time. The wise use of time serves as key driver in building a progressive nation that aspires for inclusive growth and development."

The Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) is mandated by law, as the government agency which is tasked to keep and disseminate the Philippine Standard Time (PhST). Section 6 of Batas Pambansa Blg. 8, defining the metric system in the country, states that: "PAGASA shall be responsible in the establishment, maintenance and operation of the National Standard for the second of time".

Reference and more on this at: <https://www.stii.dost.gov.ph/1606-dost-leads-oras-pinas-campaign-in-the-observance-of-the-national-time-consciousness-week>  
Credits: DOST-STII

Notes:

[1] \* following day

[2] All times displayed are in Philippine Standard Time (PhST)

"tracking the sky...helping the country"

PAGASA Science Garden Complex, BIR Road,  
Brgy. Central, Quezon City, Metro Manila, Philippines

Telephone Number: 8-284-0800 loc 116, 107, 106  
Website: <https://bagong.pagasa.dost.gov.ph>

# Stars and Constellations

The constellations best observed in January are Auriga, Camelopardalis, Cassiopeia, Gemini, Leo, and Lynx in the northern sky, while Caelum, Canis Major, Dorado, Eridanus, Lepus are located in the southern sky. Located in between the line of the equator are the constellations Orion, Monoceros, and Cetus. Figure 1 shows the view of the sky on 15 January at around 09:00 PM when the January constellations are situated overhead [1].

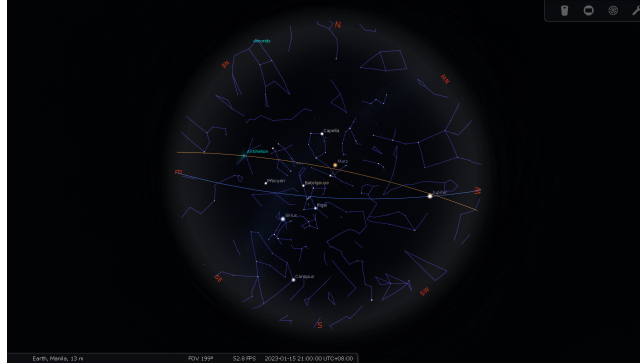


Figure 1: The view of the night sky featuring the prominent January constellations showing the Northern and the Southern Hemisphere on 15 January at 09:00 PM using the Stellarium software

One of the zodiac constellations, **Taurus, the Bull**, is a well-known constellation in the northern sky. The stars Aldebaran, Elnath, and Alcyone are three prominent stars in Taurus, along with the variable star T Tauri. Taurus is home to a prominent deep sky object: the Crab Nebula (M1), a supernova remnant observed in 1054 AD. It also contains the two nearest open clusters, the Pleiades open cluster (M45), often known as the Seven Sisters, and the Hyades cluster [2, 3].

**Orion, the Hunter**, is one of the brightest and most recognizable constellations in the night sky during this month. Orion contains a number of famous nebulae, two of which are the Orion Nebula (M42) and the Horsehead Nebula. Two of the ten brightest stars in the sky are located in the constellation Orion. Rigel, the brightest star in Orion, is the sixth brightest star in the sky, while Betelgeuse, Orion's second brightest star, is the eighth brightest star in the sky [2, 4].



(a) Taurus and Orion constellation (b) Orion Nebula (M42) (c) Crab Nebula (M1) (d) Pleiades (M45)

Figure 2: Some prominent deep sky objects in the constellation Taurus and Orion

The Orion Nebula (M42), the Crab Nebula (M1), the Pleiades (M45), the Hyades cluster, and the Large Magellanic Cloud are the most prominent astronomical targets for the month of January [2]. Figure 2 shows the location of some of the deep-sky objects and bright stars in the constellation Orion and Taurus.

## Planetary Location

On 07 January, **Mercury** will be in inferior solar conjunction, marking the end of Mercury's presence in the night sky. Mercury can be observed as a morning planet in the following days, specifically during the twilight, making it difficult to see during its crescent phase [5]. However, Mercury will be best observed during its gibbous phase once it reaches its highest point in the sky. On 24 January, Mercury will be at its dichotomy. Dichotomy occurs when an inferior planet such as Mercury reaches its half-phase [6].

**Mars** will be readily visible in the evening sky just after sunset. On January 4 at 3:51 PM, the Moon and Mars will approach closely, passing  $0^{\circ}32''$  south of Mars (Figure 3). Mars will be at mag -1.1, while the Moon will be at mag -12.5. Both objects will be located in the constellation Taurus. The duo will be too far apart for a telescope to see them, but they will still be visible to the unaided eye or via a small telescope [7].

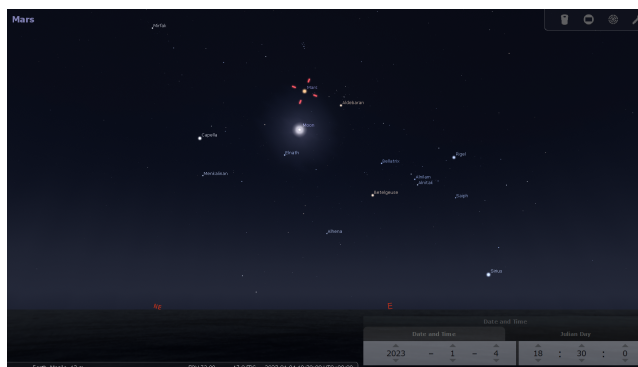


Figure 3: The view of the northeastern sky on 04 January at 06:30 PM during the close approach of Moon and Mars, using Stellarium software

**Jupiter** will be visible in the southwestern night sky after sunset. On 26 January, the Moon and Jupiter will be in close proximity, passing just  $1^{\circ}36'$  apart. But you can see it on the western horizon in the evening after sunset (Figure 4). They won't fit within a telescope's field of vision because they will be too far apart, but they will be visible to the unaided eye or via a pair of binoculars [8].

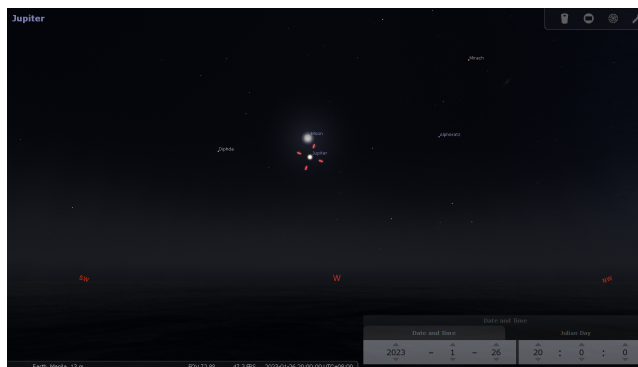


Figure 4: The view of the southwestern sky on 20 January at 08:00 PM during the close approach of Moon and Jupiter, using Stellarium software

**Venus** and **Saturn** will lie in the constellation Capricornus and can be observed in the southwestern night sky. On January 23, three (3) conjunctions will take place (Figure 5); these are the conjunction between Saturn and Venus [9], the conjunction of Saturn and Moon [10], and the conjunction of Venus and Moon [11].





Figure 5: The view of the southwestern sky on 23 January at 07:00 PM during the conjunction of Venus and Saturn, using Stellarium software

## Meteor Shower

The **Quadrantid meteor shower**, produced by asteroid 2003 EH1 is active from 28 December to 12 January, with peak activity occurring on 04 January. At its peak, Quadrantids is estimated to produce a nominal rate of 110 meteors per hour [12]. The meteor shower is anticipated to be active from the time the constellation Bootes radiant rises in the northeastern sky around 01:00 AM. The presence of a waxing gibbous Moon, which is nearly three (3) days away from its full phase at the shower's peak, presents significant interference with the meteor shower observation (Figure 6) [13].

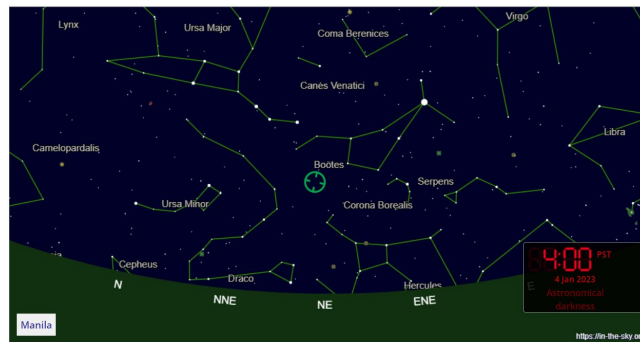


Figure 6: The view of the southeastern sky during the peak of Quadrantids on 04 January at 04:00 AM when the shower's radiant is represented by the green solid circle.

The finest display of meteor shower is visible whenever the shower's radiant point is above the horizon, with the number of visible meteors increasing as the radiant point ascends higher in the sky. Meteor showers are observable through the naked eye, and no special equipment such as telescopes or binoculars is needed. Maximize the viewing experience by choosing a dark observation site away from the city lights under clear and moonless sky conditions.



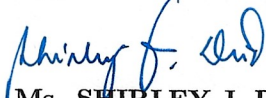
# Calendar of Astronomical Events for January 2023

Table 1 shows a summary of the astronomical events for the month of January 2023. All times displayed are in Philippines Standard Time (PhST).

Table 1: The summary of astronomical events for the month of January 2023

Date	Event	Time
04	Quadrantids (ZHR = 110)	before dawn
04	Close approach of Moon and Mars	—
05	Earth at Perihelion (Distance = 0.98330 AU)	12:17 AM
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23	Conjunction of Venus and Saturn	—
26	Close approach of Moon and Jupiter	—

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27 December 2022

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