PRESS RELEASE SEPTEMBER 2023

# ASTRONOMICAL DIARY

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

## ASTRONOMICAL EVENTS, SEPTEMBER 2023

| DATE | EVENT | TIME |
|---|---|---|
| 02 | Aurigid Meteor Shower (ZHR = 6) | 04:00 a.m. |
| 05 | Close approach of Jupiter and Moon | |
| 10 | September ϵ-Perseid Meteor Shower (ZHR = 5) | 04:00 a.m. |
| 12 | Moon at Apogee (Distance = 406,247.170 km) | 11:43 p.m. |
| 17 | Comet Nishimura at perihelion | |
| 22 | Mercury at Greatest Elongation West | 09:16 p.m. |
| 23 | September Equinox | 02:50 p.m. |
| 28 | Moon at Perigee (Distance = 360,007.215 km) | 08:59 a.m. |

## PHASES OF THE MOON

**Last Quarter**
Sep 07 06:21 a.m.

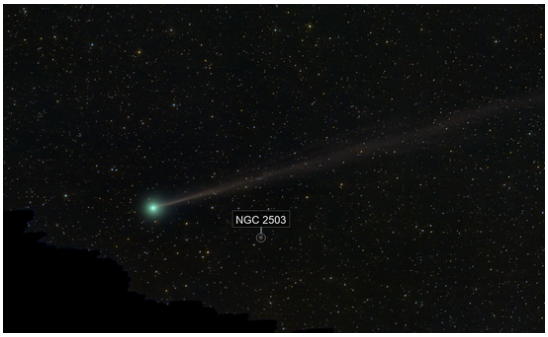
**New Moon**
Sep 15 09:40 a.m.

**First Quarter**
Sep 23 03:32 a.m.

**Full Moon**
Sep 29 05:57 p.m.

## RISE AND SET TIMES OF PLANETS

| DATE | MERCURY | | VENUS | | MARS | | JUPITER | | SATURN | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Rise | Set | Rise | Set | Rise | Set | Rise | Set | Rise | Set |
| Sep 01 | 06:25 am | 06:28 pm | 03:55 am | 04:19 pm | 07:26 am | 07:29 pm | 09:50 pm | 10:29 am* | 05:49 pm | 05:31 am* |
| Sep 11 | 05:11 am | 05:24 pm | 03:19 am | 03:46 pm | 07:13 am | 07:10 pm | 09:10 pm | 09:49 am* | 05:07 pm | 04:49 am* |
| Sep 21 | 04:34 am | 04:56 pm | 02:56 am | 03:25 pm | 07:01 am | 06:52 pm | 08:29 pm | 09:08 am* | 04:26 pm | 04:06 am* |
| Sep 30 | 04:46 am | 05:02 pm | 02:45 am | 03:12 pm | 06:50 am | 06:37 pm | 07:52 pm | 08:30 am* | 03:49 pm | 03:29 am* |




## COMET C/2023 P1 (NISHIMURA)

### ASTRONOMY PICTURE OF THE MONTH

The Minor Planet Center of the International Astronomical Union (IAU) confirmed the discovery of the Comet C/2023 P1 (Nishimura) by a Japanese amateur astronomer named Hideo Nishimura. Looking east-northeast, Comet Nishimura will be passing through a series of zodiacal constellations. Looking east-northeast, on 07 September among the background stars of the constellation Leo, Comet Nishimura should be visible without binoculars for a few hours before dawn. Its closest approach to Earth will be on 12 September with a magnitude of 4.6 and will be moving to the constellation Virgo until it reaches perihelion on 17 September. However, this will make observing the comet trickier due to the brightness of the Sun

Image Credit: Dan Bartlett (https://www.astrobin.com/75erqn/B/)

*Notes:*
*[1] All times displayed are in Philippine Standard Time (PhST)*
*[2] *following day*

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## Stars and Constellations

The constellations best observed in the northern sky for the month of September are Cygnus, Delphinus, Vulpecula, and Equuleus. Whereas, Capricornus, Microscopium, and Indus are best viewed in the southern sky. Figure 1 shows the view of the sky on 15 September 2023 at around 09:00 p.m. [1]

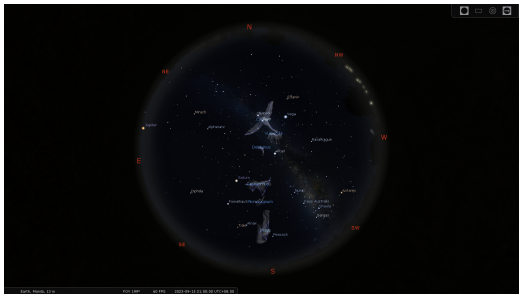

Figure 1: The view of the night sky featuring the prominent September constellations including its artwork at 09:00 p.m. on 15 September 2023 using the Stellarium software

This September, Cygnus the Swan will be the northernmost constellation. Locating Cygnus in the night sky will be a breeze using its largest asterism, the Northern Cross. The Northern Cross is composed of the stars Albireo (Beta Cygni), Fawaris (Delta Cygni), Deneb (Alpha Cygni), Sadr (Gamma Cygni), and Aljanah (Epsilon Cygni) [2] (Figure 2a).

Cygnus also contains two Messier objects, the open clusters Messier 29 and Messier 39. Other significant deep sky objects in the constellation include Cygnus X-1, a well-known X-ray source; the Fireworks Galaxy (NGC 6946), a spiral galaxy close to Cepheus; and the Blinking Planetary Nebula (NGC 6826) [2] (Figure 2b).

(a) Constellation Cygnus and the asterism Northern Cross including its boundary

(b) Some interesting Deep Sky Objects the artwork of Cygnus "the flying Swan"

Figure 2: The formation of the Northern Cross and some prominent deep sky objects in the constellation Cygnus on 15 September at 09:00 p.m. using the Stellarium software

Vulpecula, the fox constellation, is a small, obscure constellation and can be observed lying within the Summer Triangle (Figure 3a). It is the location of the first planetary nebula ever found, the renowned Dumbbell Nebula (M27). The nebula's double-lobed shape appears only in a telescope[2].

(a) Constellations Vulpecula, Delphinus and Equuleus visible in the northern sky including the position of M27 represented by red cicle

(b) Constellation Capricornus, Microscopium, and Indus visible in the southern sky

Figure 3: Some of the constellations best observed in September together with their corresponding artworks, constellation lines, and their boundaries using Stellarium Software.

Lying below Cygnus is the constellation Delphinus. Although it is one of the smaller, fainter constellations, its characteristic diamond shape makes it simple to spot. This constellation does not house any deep-sky

object; however, it has an asterism known as Job's Coffin, formed by the brightest stars of Delphinus (Figure 3a). Another minor constellation in the northern sky is Equuleus, located between Aquila and Pegasus, which symbolizes the tiny horse or foal [2] (Figure 3a).

Situated south of the celestial equator is the constellation Capricornus. Its name means the goat in Latin (Figure 3b). The constellation is a sea-goat, along with Aries, Taurus, Gemini, Cancer, Leo, Virgo, Libra, Scorpius, Sagittarius, Aquarius, and Pisces, Capricornus is a member of the zodiac family of stars [2].

Microscopium, a constellation located between Piscis Austrinus and Sagittarius is the home of two spiral galaxies, NGC 6925 and NGC 6923 (Figure 3b). It is challenging to observe because it is small and elusive. It represents the microscope and is unrelated to any myths. Its brightest star is named Gamma Micoscopii. Further down below south of the equator is the Indus (Figure 3b). However, there are no prominent stars in it. The constellation represents the Indian, referring to a native of either Asia or the Americas at the time the constellation was created [2].

## Planetary Location

Due to its close proximity to the Sun, **Mercury** is not visible at the beginning of the month. However, as days progress, it becomes visible as a morning object lying low in the eastern sky before sunrise [3]. On 22 September at 09:16 p.m., Mercury will be at its Greatest Elongation West [4], with maximum separation from the Sun at 17.9° [8]. On 23 September at 03:26 a.m., Mercury will also reach half phase (dichotomy) and shine brightly at magnitude -0.5 [5]. The best time to view this dichotomy is at 05:00 a.m. when Mercury is already high in the sky (Figure 4).

Figure 4: The view of the eastern sky on 23 September 2023 at 05:00 a.m., showing the position of Mercury, more than 1 hour after the exact event of dichotomy at 03:26 a.m, using the Stellarium application.

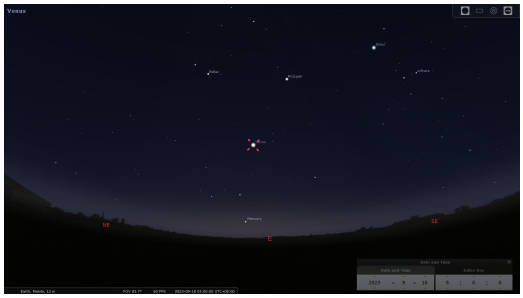

Figure 5: The view of the eastern sky on 18 September 2023 at 05:00 a.m., showing the position of Venus before the exact event of greatest brightness at 08:09 p.m., using the Stellarium application.

Meanwhile, **Mars** is not visible the entire month due to its proximity to the Sun [3]. **Venus**, on the other hand, will be visible throughout the month, rising as an early morning object in the east before disappearing from view before daybreak [3]. On 18 September at 08:09 p.m., Venus will be at its greatest brightness in the constellation Cancer and will be shining at magnitude -4.5 however, Venus will not be visible at the horizon until 03:02 a.m. on 19 September [6]. Figure 5 shows the position of Venus before the exact time of the event since the planet can only be seen in the early morning in the eastern sky before sunrise.

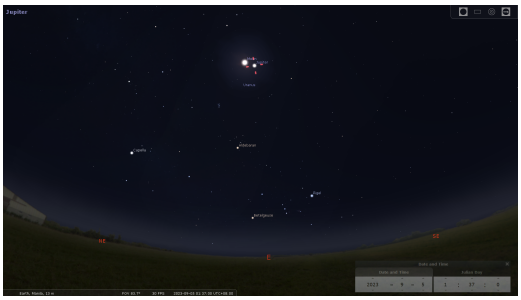

Figure 6: The view of the eastern sky on 05 September 2023 at 01:37 a.m. showing the close approach of waning gibbous Moon and Jupiter using the Stellarium application.

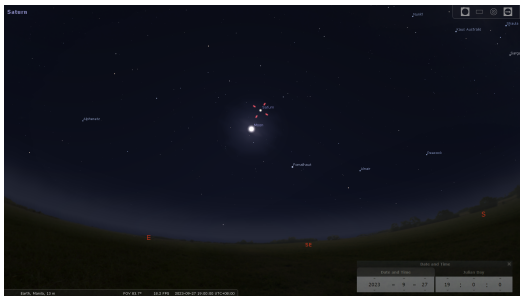

Figure 7: The view of the east southeastern sky on 27 September 2023 at 07:00 p.m. showing the close approach of waxing gibbous Moon and Saturn, less than 8 hours, after the exact event at 11:12 a.m. using the Stellarium application.

Meanwhile, **Jupiter** and **Saturn** will be visible in the late evening sky on the eastern horizon [3]. On 05 September at 01:37 a.m., the waning gibbous Moon and Jupiter will make a close approach, passing within 3°04' of each other [7] (Figure 6). After two hours, at 03:47 a.m. the pair will be in conjunction with the Moon,

where Jupiter will be separated 3°18' to the south of the Moon [8,9]. This close pairing is placed among the background stars of the constellation Aries and can be observed in the east northeastern horizon as soon as it rises at around 09:35 p.m. of 04 September.

The Waxing Gibbous Moon and Saturn will also be in conjunction on 27 September at 09:29 a.m., where Saturn and the Moon will be separated by 2°38' [10]. Subsequently, at approximately 11:12 a.m., they will have a close approach, passing within 2°25' of one another [11]. However, it will be unobservable due to its actual occurrence is during the day. Nevertheless, it will be best seen at around 07:00 p.m. in the east southeastern sky at the constellation Aquarius (Figure 7).

## Meteor Shower

The **Aurigid Meteor Showers**, produced by the Comet C/1911 N1 (Kiess), is a meteor shower active from 28 August to 05 September. Its peak activity will occur before midnight on 01 September, with its brightest displays visible when the radiant rises in the late morning on 02 September. At its peak, the Aurigids will estimately produce six (6) meteors per hour. The radiant of Aurigids is in the constellation Auriga the Charioteer, which rises past midnight on the northeastern horizon and will remain visible until before sunrise (Figure 8). At the shower peaks, the Moon in Pisces will have only just passed full phase which will cause a lot of interference [12].


Figure 8: The view of the northeastern sky during the peak of Aurigid on 02 September 2023 at 04:00 a.m. when the shower's radiant is represented by the green solid circle.

The **September $\epsilon$-Perseids** is a meteor shower active from 05 September to 21 September. The September $\epsilon$-Perseids is expected to produce 5 meteors per hour during its peak. The radiant of the shower, the constellation Perseus, rises in the eastern sky at around 09:03 p.m. and then will remain active until dawn breaks at around 05:20 a.m. The shower is likely to produce its best displays at around 04:00 a.m. on 10 September. The shower will peak close to the new moon, and so moonlight will present minimal interference. Figure 9 shows the position of the radiant in the eastern sky at 04:00 a.m. on 10 September [13].

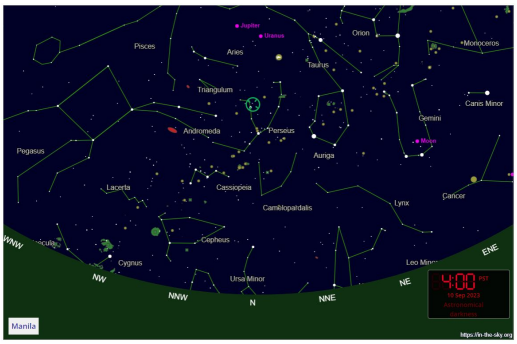


Figure 9: The view of the northeastern sky during the peak of $\epsilon$-Perseids on 10 September 2023 at 04:00 a.m. when the shower's radiant is represented by the green solid circle.

No special tools, such as binoculars or telescopes, are needed to view meteor showers; they can be observed without them. To maximize the viewing experience, choose a dark location away from city lights and make sure that the sky is clear and moonless sky conditions [12, 13].

## September Equinox

The **Autumnal Equinox**, sometimes referred to as the **September Equinox**, occurs on 23 September at 02:50 p.m. [13]. The September Equinox marks the first day of autumn in the northern hemisphere and the first day of spring in the southern hemisphere. During equinoxes, day and night are roughly equal since the Sun is directly overhead the equator of the planet. Additionally, the Sun rises due east and sets exactly due west [15].

## Comet C/2023 P1(Nishimura)

Recently, the Minor Planet Center of the International Astronomical Union (IAU) confirmed the discovery of the **Comet C/2023 P1 (Nishimura)** by a Japanese amateur astronomer named Hideo Nishimura. The existence of the Comet in space was proven through the photos of H. Nishimura taken last 11 August 2023 at Gomyo, Kakegawa, Japan [16]. Looking east-northeast, on 07 September among the background stars of the constellation Leo, Comet Nishimura should be visible without binoculars for a few hours before dawn. Its closest approach to Earth will be on 12 September with a magnitude of 4.6 and will be moving to the constellation Virgo until it reaches perihelion on 17 September. However, this will make observing the comet trickier due to the brightness of the Sun [17, 18].

## Calendar of Astronomical Events for September 2023

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

Table 1: The summary of astronomical events for September 2023

| Date | Event | Time |
|---|---|---|
| 02 | Aurigid Meteor Shower (ZHR = 6) | 04:00 a.m. |
| 05 | Close approach of Jupiter and Moon | |
| 10 | September $\epsilon$-Perseid Meteor Shower (ZHR = 5) | 04:00 a.m. |
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| 22 | Mercury at Greatest Elongation West | 09:16 p.m. |
| 23 | September Equinox | 02:50 p.m. |
| 28 | Moon at Perigee (Distance = 360,007.215 km) | 08:59 a.m. |

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