DOST PAGASA
The Weather and Climate Authority

PRESS RELEASE SEPTEMBER 2024

ASTRONOMICAL DIARY

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

ASTRONOMICAL EVENTS, SEPTEMBER 2024

DATE	EVENT	TIME
05	Mercury at highest altitude in morning sky	---
05	Mercury at greatest elongation west	10:30 a.m.
05	Moon at Apogee (Distance = 406,165.662 km)	10:54 p.m.
06	Mercury at dichotomy	12:34 p.m.
06	Planetary Alignment of Mercury, Mars, Jupiter, Uranus, Neptune, and Saturn	---
09	September ε-Perseid meteor shower (ZHR = 5)	---
17	Close approach of Waxing Gibbous Moon and Saturn	06:07 p.m.
17	Conjunction of Waxing Gibbous Moon and Saturn	06:22 p.m.
18	Moon at Perigee (Distance = 357,394.069 km)	09:22 p.m.
22	September Equinox	08:44 p.m.
24	Close approach of Moon and Jupiter	06:22 a.m.
24	Conjunction of Moon and Jupiter	07:21 a.m.
25	Conjunction of Waning Crescent Moon and Mars	07:49 p.m.
25	Close approach of Waning Crescent Moon and Mars	08:45 p.m.
27	Daytime Sextantid meteor shower (ZHR = 5)	---

PHASES OF THE MOON

New Moon
Sep 03 09:56 a.m.

First Quarter
Sep 11 02:06 p.m.

Full Moon
Sep 18 10:34 a.m.

Last Quarter
Sep 25 02:50 a.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	04:34 am	05:05 pm	07:24 am	07:28 pm	12:35 am	01:31 pm	00:00 am	12:52 pm	06:31 pm	06:22 am*
Sep 11	04:39 am	05:09 pm	07:34 am	07:28 pm	12:22 am	01:18 pm	23:21 pm	12:18 pm*	05:49 pm	05:40 am*
Sep 21	05:13 am	05:30 pm	07:45 am	07:28 pm	12:08 am	01:04 pm	22:45 pm	11:41 am*	05:07 pm	04:58 am*
Sep 30	05:44 am	05:47 pm	07:56 am	07:30 pm	11:52 pm	12:49 pm*	22:11 pm	11:08 am*	04:30 pm	04:20 am*

"NAME A QUASI-MOON!"

An IAU and Radiolab global contest

The International Astronomical Union (IAU) and WNYC's award-winning science podcast, Radiolab, have collaborated to host a new naming competition for one of Earth's quasi-moons, inviting people all over the world to engage with this area of astronomy. With official recognition from the global body responsible for naming objects in the Solar System and beyond, this would enable people worldwide to infuse their creativity into the universe and make their mark on the sky.

People from anywhere in the world can submit a name and a brief description (referred to as a citation) for consideration until 30 September 2024. To know more about this competition, you may visit this website: https://www.iau.org/news/pressreleases/detail/iau2406/

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

Stars and Constellations

The constellations **Cygnus, Delphinus, Vulpecula,** and **Equuleus** in the northern hemisphere, and the constellations **Capricornus, Microscopium,** and **Indus** in the southern sky are best seen in the month of **September**. The prominent constellations are positioned directly overhead at 09:00 p.m. on 15 September 2024 as shown in Figure 1. [1,2]

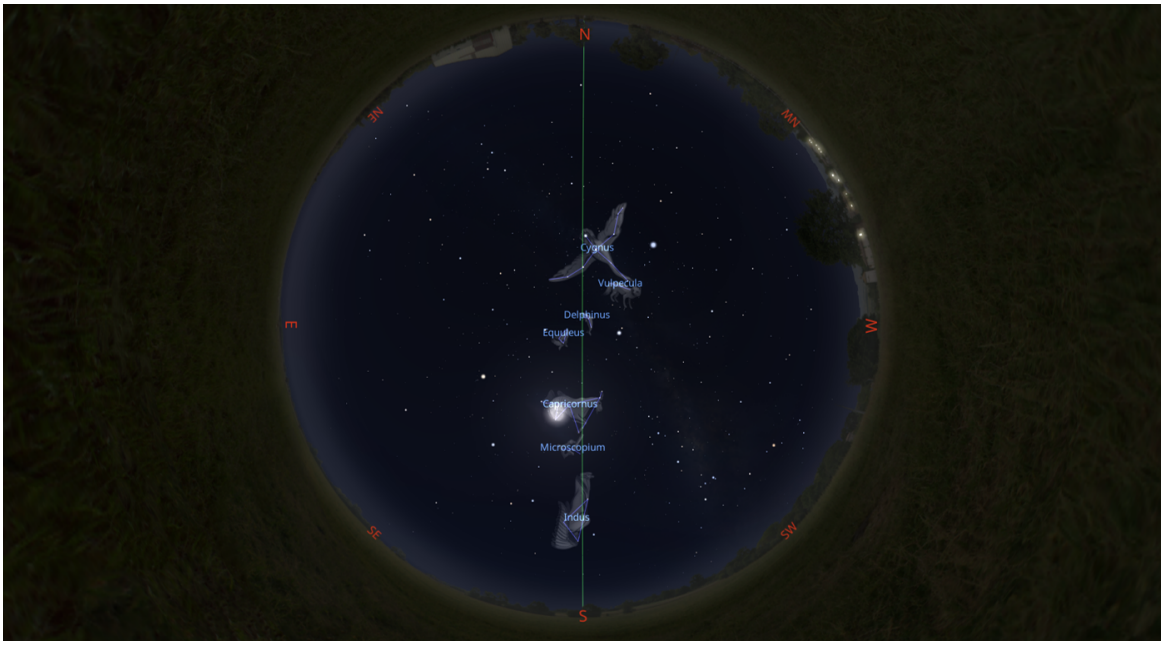

Figure 1: The view of the night sky featuring the prominent September constellations at 09:00 p.m. on 15 September 2024 using the Stellarium software

One of the most identifiable constellations is **Cygnus**, the Swan, due to its distinctive cross shape. Its several brilliant stars form the asterism known as the Northern Cross. Deneb, the constellation's brightest star, denotes the swan's tail while the line of stars that form the beam of the cross represents the swan's body. Aside from its dazzling stars, Cygnus is also a wealth of interesting deep-sky objects. One of these is the emission nebula known as the North America Nebula (NGC 7000) [Figure 2a], named due to its resemblance to the continent of North America. Other well-known nebulae in Cygnus are the Cocoon Nebula (IC 5146) and the Blinking Planetary Nebula (NGC 6826) [Figure 2b]. [2,3]

Vulpecula, the Little Fox, is a small constellation with unique beauty and significance in the night sky. Alpha Vulpeculae, its brightest star, is a red giant of the spectral class M1III, roughly 297 light-years distant from Earth. Another interesting star in the constellation is the 23 Vulpeculae, or HD 188228, known for its changing radial velocity and unusual spectra. The constellation hosts some captivating deep-sky objects including the first planetary nebula discovered, the Dumbbell Nebula (M 27) [Figure 2c], and the Brocchi's Cluster (Cr 399), also known as the Coathanger, a randomly arranged cluster of stars that resembles a coat hanger. [2,4]

One of the twelve (12) zodiac constellations, **Capricornus**, the Sea-Goat, located in the southern hemisphere, is one of the faintest in the night sky. Deneb Algedi, or Delta Capricorni, is its brightest star with an apparent magnitude of 2.81 and represents the sea-goat's tails. Capricornus houses some fascinating deep-sky objects. Messier 30 (M 30), a dense cluster of stars about 27,000 light-years away, and HCG 87 [Figure 3a], a small cluster of galaxies consisting of an elliptical, spiral, and edge-on spiral galaxy, are both in Capricornus. [2,5]

Indus, the Indian, does not contain bright stars in it. Alpha Indi, also known as "The Persian", is the constellation's brightest star with an apparent magnitude of 3.11. The star, situated about 101 light-years away, is an evolved star with a diameter twelve (12) times that of the Sun and has depleted its core hydrogen. Noteworthy deep-sky objects are located in Indus, such as the lenticular galaxy NGC 7049 [Figure 3b] and the spiral galaxy NGC 7090 [Figure 3c]. [2,6]

Figure 2: The Northern Constellations

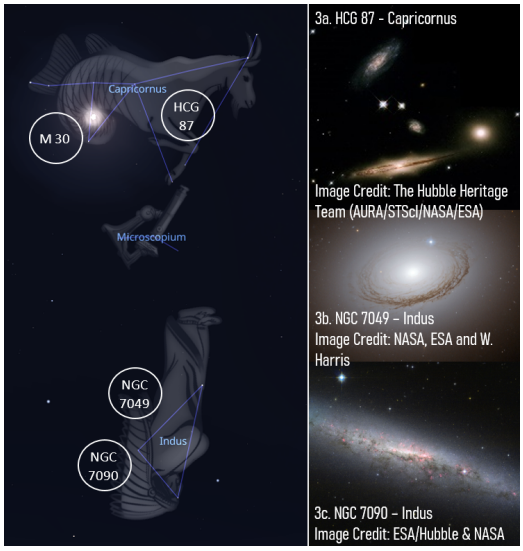

Figure 3: The Southern Constellations

Planetary Location

This September, **Jupiter** and **Mars** are observable in the early morning. On the other hand, **Saturn** will be visible for the majority of the night and will be at its highest point in the sky around midnight, since Saturn will be in opposition on 08 September at 12:27 p.m.. Moreover, **Venus** can be seen briefly in the west after sunset. **Mercury** can be witnessed in the first half of the month sitting low on the eastern horizon and rising before the Sun until it gets lost in the Sun's brightness. [1,7,8]

On 05 September, **Mercury** will shine brightly at magnitude -0.4 as it reaches its highest point in the morning sky. At 10:30 a.m. on the same day, the planet will attain its **Greatest Elongation West**, when it will be separated from the Sun by 18°. The next day at 12:34 p.m., Mercury will undergo **dichotomy**, which happens when a planet appears half-illuminated by the Sun as viewed from Earth. These events will occur during the daytime, thus, the exact timing will not be visible but will appear among the background stars of Leo. [7,9,10,11]

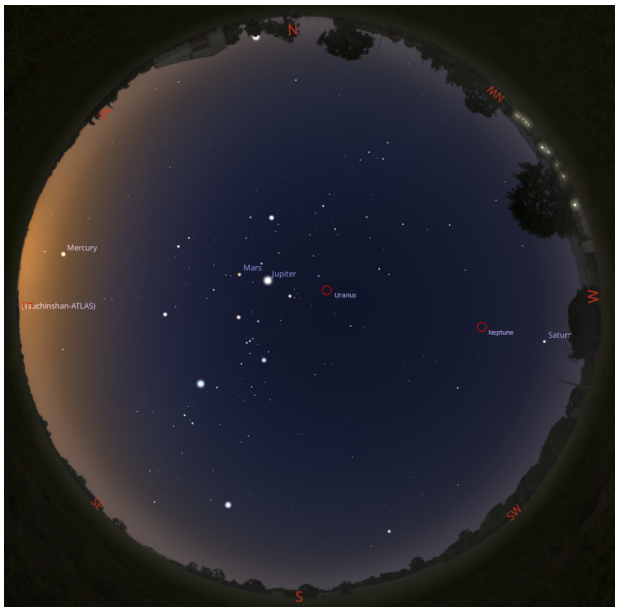

Figure 4: The planetary alignment of planets Mercury, Mars, Jupiter, Uranus, Neptune, and Saturn on 06 September at exactly 05:00 a.m. using Stellarium Software.

A *planetary parade* of six (6) planets – **Mercury, Mars, Jupiter, Uranus, Neptune,** and **Saturn** will occur in the early days of September but will have the best display on the 6th day with four (4) planets visible [Figure 4]. Saturn, Jupiter, and Mars can be easily viewed by the naked eye. Though lying low on the eastern horizon, Mercury can also be seen before sunrise. Meanwhile, Uranus and Neptune require a modest telescope or high-powered binoculars. [2]

On 17 September, the **Waxing Gibbous Moon** and **Saturn** will approach closely with each other at 06:07 p.m., passing within 16.2 arcminutes. It will be followed by their conjunction fifteen minutes later, with the Moon passing 18' to the north of Saturn. The exact events will be visible above the eastern horizon [Figure 5] and the two objects will remain observable until around 04:20 a.m. as they sink on the western horizon. [7,12,13]

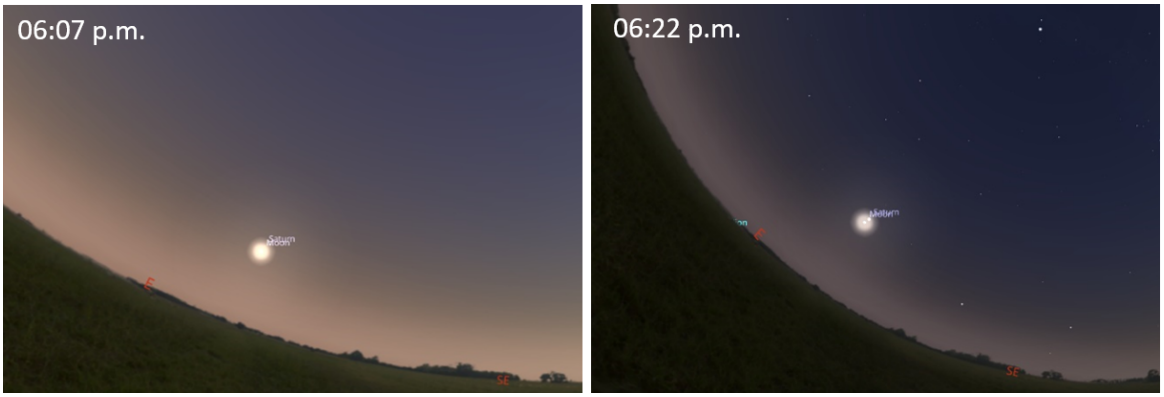

Figure 5: The view of eastern sky showing the a) close approach at 06:07 p.m. and b) conjunction at 06:22 p.m. of the Waxing Gibbous Moon and Saturn on 17 September using Stellarium.

On 24 September at 06:22 a.m., a close approach of the **Moon** and **Jupiter** will take place, passing within 5°48' of each other. At 07:21 a.m., the two objects will share the same right ascension, separated by 5°50'. Due to the Sun's presence, the exact timing of these events will not be observable, but, the best time to view their close pairing is at 05:00 a.m. of the same day [Figure 6]. [7,14,15]

The **Waning Crescent Moon** and **Mars** will be in conjunction at 07:49 p.m. on 25 September, with the Moon passing 4°54' to the north of Mars. They will be in close pairing after about an hour, passing within 4°52' of each other. Both objects are located in the constellation Gemini. Unfortunately, the exact timing of these events will not be viewable since the Moon and Mars are still below the horizon, hence, the best time to witness the pair will be at 05:00 a.m. on 26 September as shown in Figure 7. [7,16,17]

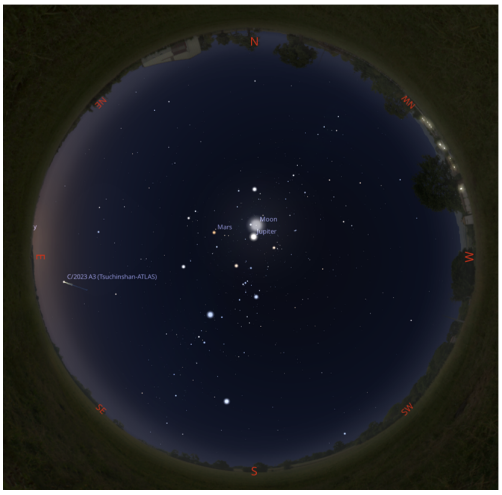

Figure 6: The view of the night sky showing the close pairing of the Moon and Jupiter on 24 September at 05:00 a.m. using Stellarium.

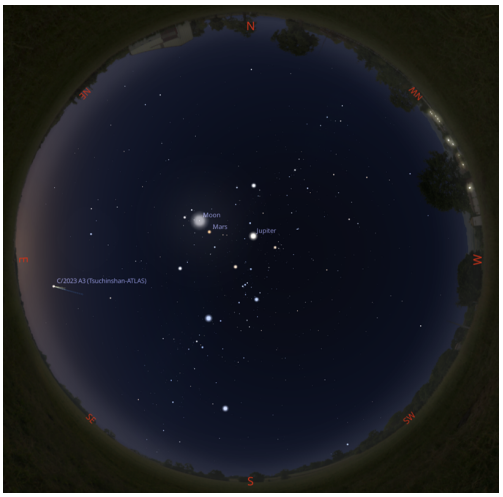

Figure 7: The view of the night sky showing the Waning Crescent Moon and Mars on 26 September at 05:00 a.m. using Stellarium.

All the conjunctions and near approaches mentioned between the planet and the moon, or planet to planet, will be visible enough to fit within the field of view of a telescope and can also be viewed with the naked eye or using a pair of binoculars.

September Equinox

The **September Equinox**, also known as the Autumnal Equinox, will occur on **22 September** at **08:44 p.m.** This marks the first day of autumn in the northern hemisphere and the first day of spring in the southern hemisphere. During equinoxes, equal day and night will be experienced due to the Sun directly pointing over the Earth's equator, that is, the day and the night are each approximately 12 hours long. Also, on this day, the Sun exactly rises due east and sets due west. [7,18]

Meteor Shower

The **September ϵ-Perseid** meteor shower is active from **05 − 21 September**, producing its peak rate of 5 meteors per hour around **09 September**. The shower can be viewed from 09:00 p.m. and remains active around 05:20 a.m., when its radiant point, the constellation Perseus, is above the northwestern horizon. The radiant point is highest in the sky at around 04:00 a.m., thus, the best display of the meteor is likely produced just before sunrise [Figure 8]. Favorably, the Waxing Crescent Moon will present minimal interference in the meteor shower viewing. [19]

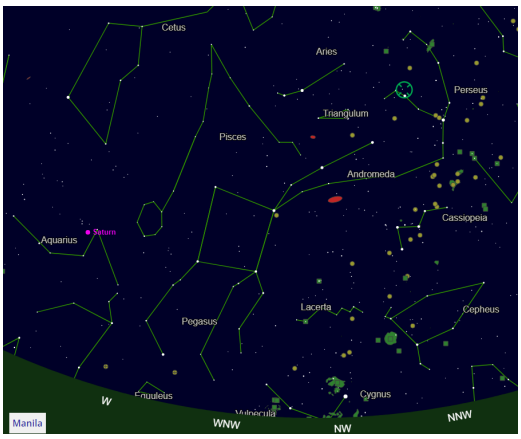

Figure 8: The view of the northwestern sky during the peak of September ϵ-Perseids on 09 September 2024 at 04:00 a.m. when the shower's radiant is represented by the green solid circle.

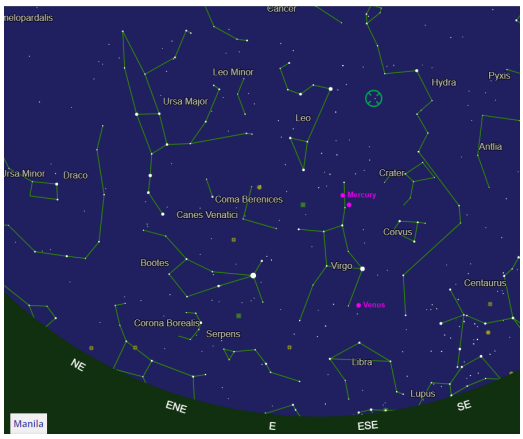

Figure 9: The view of the southeastern sky during the peak of Daytime Sextantids on 27 September 2024 at 10:00 a.m. when the shower's radiant is represented by the green solid circle.

The **Daytime Sextantids** is another meteor shower that can be observed this September. The shower is active from **09 September to 09 October**, with peak activity on **27 September**. In Manila, the shower will be visible from 03:36 a.m. until dawn breaks around 05:21 a.m., when the constellation Sextans, its radiant point, is above the eastern horizon. The radiant point culminates around 10:00 a.m. producing its best view shortly before dawn as shown in Figure 9. Moonlight will provide minimal impact in the meteor shower viewing as it will peak near the new moon. [20]

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 September 2024

Table 1 shows a summary of the astronomical events for September 2024. All times displayed are in Philippines Standard Time (PhST).

Table 1: The summary of astronomical events for September 2024

Date	Event	Time
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05	Mercury at greatest elongation west	10:30 a.m.
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15 August 2024

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