





ASTRONOMICAL DIARY

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

ASTRONOMICAL EVENTS, AUGUST 2024

DATE	EVENT	TIME
09	Moon at Apogee (Distance = 405,237.984 km)	09:31 a.m.
12	Perseid meteor shower (ZHR = 150)	---
14	Close approach of Jupiter and Mars	10:53 p.m.
15	Conjunction of Jupiter and Mars	01:00 a.m.
21	Close approach of Waning Gibbous Moon and Saturn	10:41 a.m.
21	Conjunction of Waning Gibbous Moon and Saturn	11:02 a.m.
21	Moon at Perigee (Distance = 360,288.526 km)	01:02 p.m.
27	Close approach of Waning Crescent Moon and Jupiter	07:32 p.m.
27	Conjunction of Waning Crescent Moon and Jupiter	08:43 p.m.
28	Close approach of Waning Crescent Moon and Mars	07:48 a.m.
28	Conjunction of Waning Crescent Moon and Mars	08:22 a.m.
28	Planetary Alignment of Mercury, Mars, Jupiter, Uranus, Neptune, and Saturn	---
31	Aurigid meteor shower (ZHR = 6)	---

PHASES OF THE MOON

	New Moon Aug 04 07:13 p.m.
	First Quarter Aug 12 11:19 p.m.
	Full Moon Aug 20 02:26 a.m.
	Last Quarter Aug 26 05:26 p.m.

RISE AND SET TIMES OF PLANETS

DATE	MERCURY		VENUS		MARS		JUPITER		SATURN	
	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set
Aug 01	07:22 am	07:41 pm	06:49 am	07:25 pm	01:14 am	02:05 pm	01:43 am	02:34 pm	08:39 pm	08:33 am*
Aug 11	06:39 am	06:54 pm	07:01 am	07:27 pm	01:02 am	01:55 pm	01:10 am	02:02 pm	07:58 pm	07:51 am*
Aug 21	05:29 am	05:50 pm	07:12 am	07:28 pm	12:49 am	01:44 pm	12:37 am	01:29 pm	07:17 pm	07:09 am*
Aug 31	04:36 am	05:07 pm	07:23 am	07:28 pm	12:37 am	01:33 pm	12:03 am	12:56 pm	06:35 pm	06:27 am*



WR 124: A PRELUDE TO SUPERNOVA

A Rarely Seen Wolf-Rayet Star

A Wolf-Rayet star is a unique prelude to the renowned conclusion of an enormous star: the supernova. This extremely unusual and short-lived type of super-hot stars is undergoing a severe transitioning phase that is characterized by a fierce mass ejection. NASA's James Webb Space Telescope captured optical image of a Wolf-Rayet Star, WR 124, gleaming brilliantly at the very center, surrounded by nebula M1-67. This image will enable astronomers to investigate matters that were previously merely theoretical. WR 124 is situated 15,000 light years away in the constellation of Sagitta.

Notes:

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

[2] *following day

"tracking the sky...helping the country"

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Stars and Constellations

August is the best month to observe the northern constellations of **Lyra**, **Sagitta**, and **Aquila** and the southern constellations of **Scutum**, **Sagittarius**, **Corona Australis**, **Telescopium**, and **Pavo**. The prominent constellations are positioned directly overhead at 09:00 p.m. on 15 August 2024 as shown in Figure 1. [1,2]

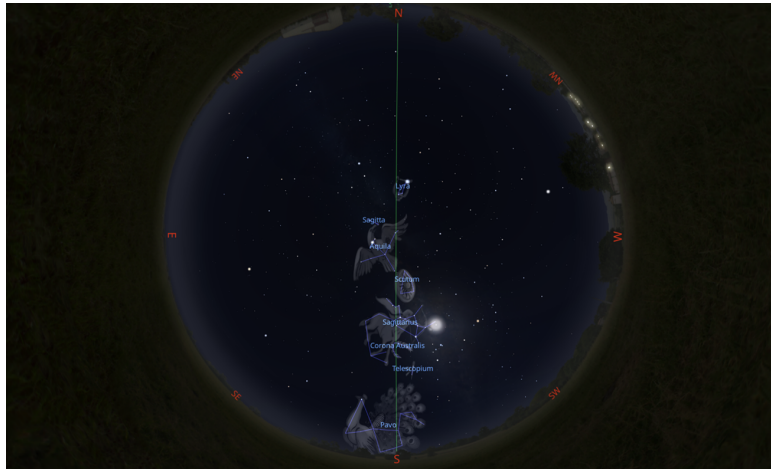


Figure 1: The view of the night sky featuring the prominent August constellations at 09:00 p.m. on 15 August 2024 using the Stellarium software

Lyra is a small but remarkable constellation home to famous brilliant stars and captivating deep-sky objects. Its brightest star, Vega, is the fifth brightest star in the sky and the second brightest in the northern hemisphere. Vega is part of the prominent asterism, Summer Triangle, along with Deneb from Cygnus and Altair from Aquila. Another star of interest in Lyra is the Epsilon Lyrae, also known as the “Double Double” star, an intriguing multiple-star system that appears as a single point of light to the unaided eye. Among the numerous deep-sky objects located in Lyra is the Ring Nebula (M57) [Figure 2a], one of the most well-known planetary nebulas that can be viewed using small telescopes from moderately dark sites. [2,3]

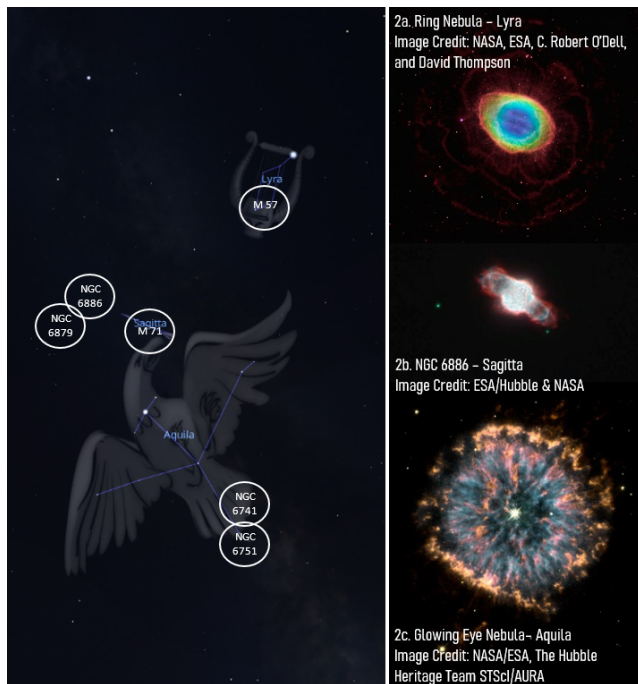


Figure 2: The Northern Constellations

Sagitta, the third-smallest constellation in the sky, is an identifiable constellation due to its distinctive arrow-like shape. Its brightest star, Gamma Sagittae, is a red giant with a magnitude of 3.5, around 274 light-years from Earth that symbolizes the arrow’s head. Notable deep-sky objects in Sagitta include the planetary nebula NGC 6886 [Figure 2b], the unbarred spiral galaxy NGC 6879, and a globular cluster located about 13,000 light-years away, M71. [2,4]

Aquila, the Eagle, is an equatorial constellation visible from most places in the northern and southern hemispheres. Its brightest star, Altair, is the 12th brightest star and among the nearest stars visible to the naked eye. Magnificent deep-sky objects located in Aquila include the Phantom Streak Nebula (NGC 6741), a planetary nebula that appears as a tiny, dim disk through amateur telescopes, and the Glowing Eye Nebula (NGC 6751) [Figure 2c], another planetary nebula renowned for its high-level ionization and intricate shell structure. [2,5]

Known as 'The Archer,' **Sagittarius** is a zodiacal constellation full of astronomical gems. It is a magnificent constellation brimming with galaxies, star clusters, and nebulae because of its location near the Milky Way's center. Eight of the brightest stars of Sagittarius form a distinctive teapot-shaped asterism, "The Teapot", used to recognize the constellation. Its brightest star, Kaus Australis or Epsilon Sagittarii, has an apparent magnitude of 1.79 and serves as the base of the teapot. Fascinating deep-sky objects in Sagittarius include the Messier objects: M20 or the Trifid Nebula [Figure 3a], an emission, reflection, and dark nebula; and the emission nebulae, M17 or the Omega Nebula. [6,7]

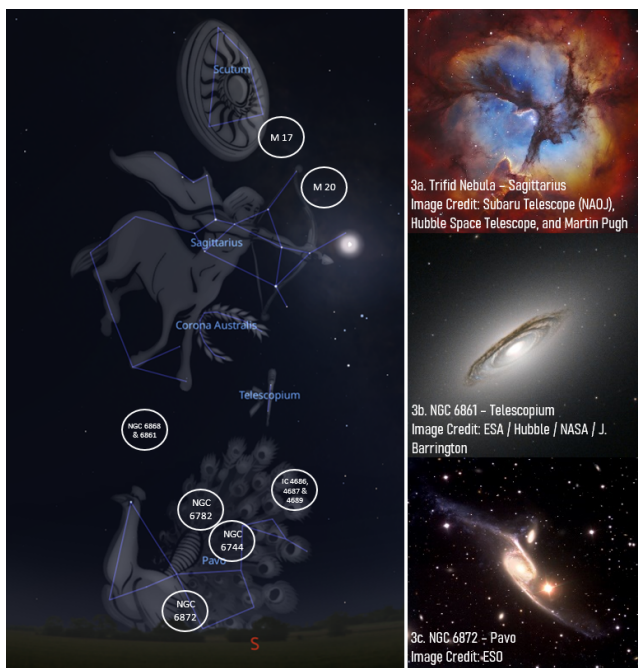


Figure 3: The Southern Constellations

Telescopium is a small and faint constellation in the Southern Hemisphere. Although it may not be as well-known as the other constellations, it stands for the telescope — the very instrument that has enabled us to solve the secrets of the universe. Alpha Telescopii, its brightest star, is a white giant with a magnitude of 3.5, roughly 278 light-years from Earth. The constellation hosts some outstanding deep-sky objects like the Telescopium Group, 12 galaxies in a cluster, 120 million light-years distant from Earth, with NGC 6861 [Figure 3b], a spiral or lenticular galaxy, and NGC 6868, an elliptical galaxy, as its brightest members. [2,8]

One of the constellations referred to as the "Southern Birds", **Pavo**, the Peacock, is a circumpolar constellation that is observable in the southern sky year-round. With an apparent magnitude of 1.94, its brightest star, Alpha Pavonis, also known as Peacock, is a spectroscopic binary star system. Some of the stars in Pavo form "the Saucepan" asterism which serves as a navigational tool pointing towards the southern celestial pole. Among the prominent deep-sky objects found in Pavo are the interacting galaxy NGC 6872 [Figure 3c], the spiral galaxy NGC 6744, and the

triplet of colliding galaxies IC 4686, IC 4687, and IC 4689. [2,9,10]

Planetary Location

For the entire month of August, planets **Jupiter** and **Mars** are readily available in the early morning, rising on the east northeastern horizon, while the evening object **Saturn** rises in the eastern part of the sky. **Venus** and **Mercury** can be seen shortly as it sets after dusk lying low in the west. However, it will be challenging to view Mercury on the second and third weeks of the month as it continues to dive toward the horizon. In the last week, Mercury can be seen rising in the eastern sky but will be lost in the glare of the Sun. [1,11,12]

A close approach of **Jupiter** and **Mars**, lying in the constellation Taurus, will occur on 14 August at 10:53 p.m. passing within 18.4 arcminutes of each other. At about two hours later, the objects will share the same right ascension, with Jupiter passing 18' south of Mars. The two objects are still below the horizon during the occurrence of these two events, thus, the best time to observe their close pairing is at 02:00 am on 15 August [Figure 4]. [13,14]

On 21 August, the **Waning Gibbous Moon** and **Saturn** will have a close pairing at 10:41 a.m., passing within 24.4 arcminutes of each other. The two objects will be in conjunction eleven minutes later, separated by 27'. Both objects are located in the constellation Aquarius. Unfortunately, the exact timing of these events will not be observable since the Moon and Saturn are still below the horizon, hence, the best time to view the pair will be at 05:00 a.m. on 21 August as shown in Figure 5. [11,15,16]

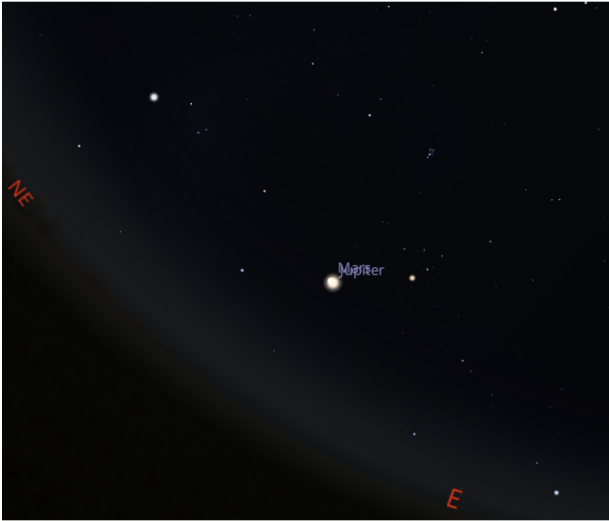


Figure 4: The view of the east northeastern sky showing the close pairing of Jupiter and Mars on 15 August at 02:00 a.m. using Stellarium.



Figure 5: The view of the west southwestern sky showing the Waning Gibbous Moon and Saturn on 21 August at 05:00 a.m. using Stellarium.

The **Waning Crescent Moon** and **Jupiter** will make a close approach on 27 August at 07:32 p.m. passing within $5^{\circ}38'$ of each other. At 08:43 p.m. of the same day, the two objects will share the same right ascension, with the Moon passing $5^{\circ}40'$ north of Jupiter. The next day, 28 August at 07:48 a.m., the **Moon** and **Mars** will approach closely with each other, passing within $5^{\circ}15'$. Their conjunction follows at 08:22 a.m., separated by $5^{\circ}16'$. The exact occurrence of these events will not be visible as the Moon and Jupiter are still below the horizon and the Moon and Mars will get lost in the glare of the Sun. However, the trio is best observed at 04:00 a.m. on 28 August forming a triangular shape above the northeastern horizon [Figure 6]. [11,17,1819,20]



Figure 6: The view of the eastern sky shows the trio: the Moon, Mars, and Jupiter forming a triangular shape on 28 August at 04:00 a.m. using Stellarium.

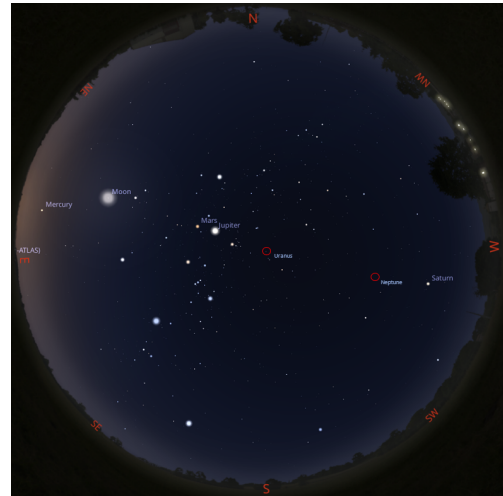


Figure 7: The planetary alignment of planets Mercury, Mars, Jupiter, Uranus, Neptune, and Saturn on 28 August at exactly 5:00 a.m. using Stellarium Software.

A *planetary alignment* of six (6) planets – **Mercury, Mars, Jupiter, Uranus, Neptune, and Saturn** will occur in the early morning on 28 August [Figure 7]. Saturn, Jupiter, and Mars can be viewed by the naked eye. Mercury will be challenging to observe due to its proximity to the Sun, while, Uranus and Neptune require a modest telescope or high-powered binoculars. [1,21]

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.

Meteor Shower

The **Perseid** meteor shower, created by the comet 109P/Swift-Tuttle, can be witnessed annually from **17 July to 24 August**, with peak activity on **12 August**. During its peak, the meteor shower is expected to produce about 150 meteors per hour. In Manila, the shower will be active from 10:05 p.m. until dawn breaks around 05:16 a.m., when the constellation Perseus, its radiant point, is above the horizon. The radiant point is highest in the sky at around 06:00 a.m., thus, the best view of the meteor is likely produced shortly before sunrise [Figure 8]. The Moon in its first quarter phase will present minimal interference on the meteor shower viewing. [22]

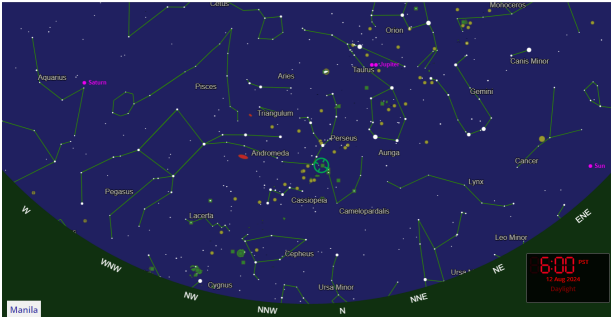


Figure 8: The view of the northern sky during the peak of Perseids on 12 August 2024 at 06:00 a.m. when the shower's radiant is represented by the green solid circle.

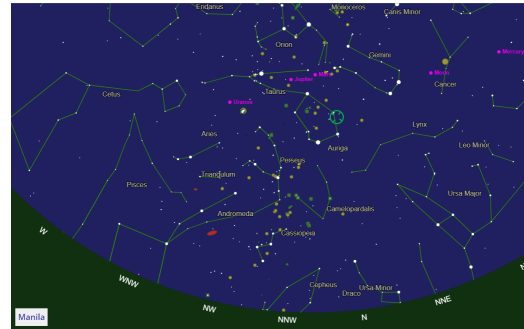


Figure 9: The view of the northern sky during the peak of Aurigids on 31 August 2024 at 07:00 a.m. when the shower's radiant is represented by the green solid circle.

Another meteor shower that can be observed this August is **Aurigids**. The shower is active from **28 August to 05 September**, peaking on **31 August**. It will be visible from 12:29 a.m. until around 05:19 a.m., when its radiant point, the constellation Auriga, is above the eastern horizon, with an expected estimate of 6 meteors per hour. The radiant point is highest in the sky around 07:00 a.m. producing its best display shortly before dawn as shown in Figure 9. Moonlight will present minimal interference in the meteor observation as the shower peaks near the new moon phase. [23,24]

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 August 2024

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

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26 July 2024

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