





# ASTRONOMICAL DIARY

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

## ASTRONOMICAL EVENTS, OCTOBER 2022

DATE	EVENT	TIME
01-04	100 Hours of Astronomy	---
04-10	World Space Week	---
05	Moon at Perigee (Distance = 369,360.149)	12:34 AM
05	Conjunction of Moon and Saturn	11:51 PM
09	Conjunction of Moon and Jupiter	02:11 AM
09	Mercury at greatest elongation west	---
09	Draconids (ZHR=10)	07:00 PM
15	Close approach of Moon and Mars	11:40 AM
17	Moon at Apogee (Distance = 404,255.160)	06:20 PM
21	Orionids (ZHR=14)	02:00 AM
29	Moon at Perigee (Distance = 368,334.580)	10:36 PM

## PHASES OF THE MOON

	<b>First Quarter</b> Oct 03 08:14 AM
	<b>Full Moon</b> Oct 10 04:55 AM
	<b>Last Quarter</b> Oct 18 01:15 AM
	<b>New Moon</b> Oct 25 06:49 PM

## RISE AND SET TIMES OF PLANETS

DATE	MERCURY		VENUS		MARS		JUPITER		SATURN	
	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set
Oct 01	04:52 AM	04:59 PM	05:24 AM	05:30 PM	10:06 PM	*11:01 AM	05:28 PM	*05:34 AM	02:59 PM	*02:31 AM
Oct 11	04:37 AM	04:45 PM	05:36 AM	05:31 PM	09:38 PM	*10:35 AM	04:44 PM	*04:49 AM	02:18 PM	*01:50 AM
Oct 21	04:59 AM	04:56 PM	05:48 AM	05:33 PM	09:06 PM	*10:05 AM	04:01 PM	*04:05 AM	01:39 PM	*01:10 AM
Oct 31	05:29 AM	05:11 PM	06:01 AM	05:37 PM	08:29 PM	*09:29 AM	03:19 PM	*03:22 AM	12:59 PM	*12:31 AM



## 100 HOURS OF ASTRONOMY ASTRONOMY EVENT OF THE MONTH

The 100 Hours of Astronomy, a global project by the International Astronomical Union–Office of the Astronomy Outreach (IAU-OAO) will be celebrated on 01–04 October. PAGASA, in collaboration with the National Outreach Coordinator of the Philippines will host an astronomy outreach activity in selected Grade 1 students, which aims to engage children with the sky as they gain basic understanding of our astronomical surroundings.

More on this: [iau.org/public/oa/100-hours-of-astronomy/](https://iau.org/public/oa/100-hours-of-astronomy/)

Notes:

[1] \* following day

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

“tracking the sky...helping the country”

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# Stars and Constellations

The constellations best observed in October are Taurus, Aries, Perseus, Camelopardalis, Ursa Minor, Draco, Hercules, Lyra, Cygnus, Aquila, Cepheus, Cassiopeia, Triangulum, Andromeda, Pegasus, Lacerta, Sagitta, Delphinus, Equuleus and Pisces in the northern sky, while Aquarius, Capricornus, Sagittarius, Sculptor, Indus, Cetus, Eridanus, Fornax, Scutum, Corona Australis, Piscis Austrinus, Grus, Phoenix and Tucana are located in the southern sky [1]. Figure 1 shows the view of the sky on 15 October at around 09:00 PM when the October constellations are situated overhead.

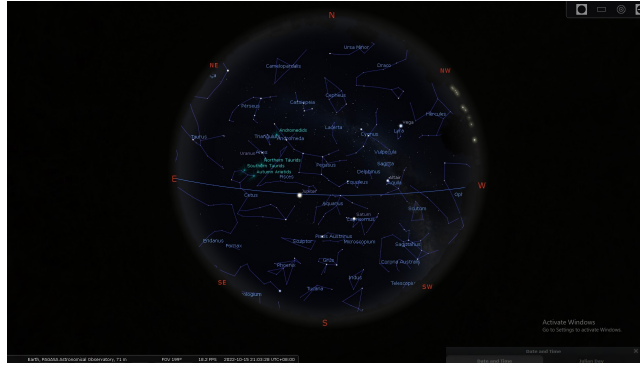


Figure 1: The view of the night sky featuring the prominent October constellations showing the Northern and the Southern Hemisphere on 15 October at 09:00 PM using the Stellarium software

The constellation Lacerta, the Lizard, as shown in Figure 2 is a relatively small and faint constellation that is surrounded by the brighter constellations such as Cassiopeia, Andromeda, Pegasus, Cygnus, and Cepheus. The brightest star in this constellation, Alpha Lacerta is a white main sequence star with apparent magnitude of 3.76, while other stars in the constellation are fainter than magnitude 4.0 [2].

The constellation Cassiopeia, the Seated Queen is easily recognizable by its five brightest stars namely Schedar, Caph, Navi, Ruchbah, and Segin that form a distinctive irregular "W" pattern (Figure 3). Several notable deep sky objects can be found in Cassiopeia, including the Messier open clusters M52 and M103, the Heart Nebula, the Soul Nebula, the Pacman Nebula, the White Rose Cluster, and the supernova remnant Cassiopeia A [2].



Figure 2: The view of the northeastern sky showing the prominent constellations on 15 October at 08:00 PM using Stellarium software

In the northeastern portion of the sky, as shown in Figure 3, are the constellations Triangulum and Andromeda, and their most notable features are the Triangulum Galaxy and the Andromeda Galaxy, respectively. The Triangulum Galaxy or M33 is the second nearest spiral galaxy to the Milky Way, and with perfect dark sky conditions and good eyesight, it can be spotted with the naked eye [3]. Andromeda Galaxy or M31 is the closest large spiral galaxy to the Milky Way and one of the few deep sky objects visible to the naked eye appearing as milky blur [4].

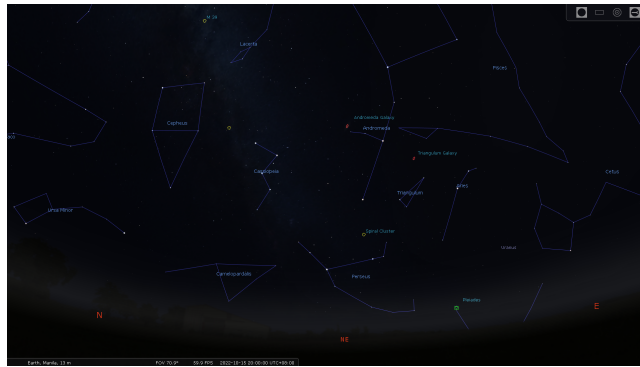


Figure 3: The view of the northeastern sky showing the constellations Cassiopeia, Andromeda, Triangulum on 15 October at 08:00 PM using Stellarium software

## Planetary Location

On 09 October, **Mercury** is at its greatest elongation west. It is when Mercury lies to the west of the Sun that it rises and sets a short time before the Sun and is visible shortly before sunrise [5]. Mercury will be visibly low on the eastern horizon before sunrise for a few weeks until it will eventually be challenging to observe due to its proximity to the Sun (Figure 4). Meanwhile, **Venus** will not be visible for the entire month due to its proximity to the Sun.

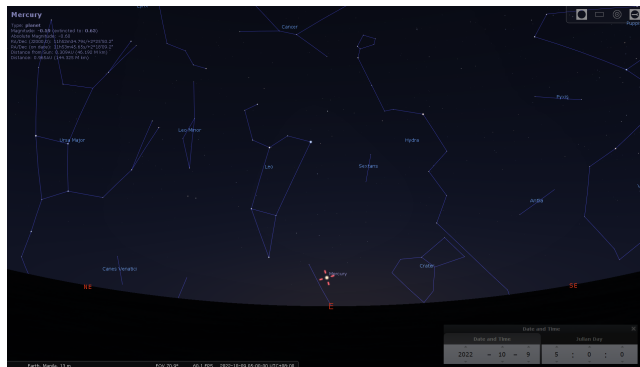


Figure 4: The view of the eastern sky showing Mercury on 09 October at 05:00 AM using Stellarium software

Throughout the month, located within the constellation Taurus, the Bull, **Mars** is first spotted during the late evening hour as it rises on the northeastern horizon. On 15 October at 11:40 AM, the Waning Gibbous Moon and Mars will make a close approach, passing  $3^{\circ}35'$  to each other [6], however, this exact event will not be visible, but they can still be seen paired closely as they rise in the northeastern night sky around 10:00 PM (Figure 5).

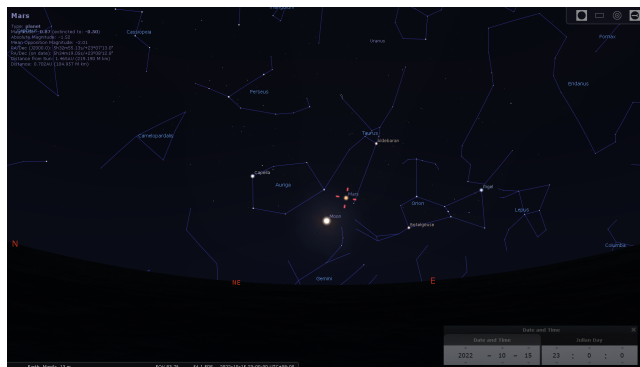


Figure 5: The view of the northeastern sky showing the close approach of Moon and Mars on 15 October at 11:00 PM using Stellarium software

**Jupiter** and **Saturn** are first seen in the east-southeastern horizon a few minutes after sunset among the background stars of the constellations Pisces and Capricornus, respectively. On 05 October at 11:51 PM in the southwestern horizon (Figure 6), the Moon will pass  $4^{\circ}04'$  to the south of Saturn as they share the same right ascension, or conjunction. [7] Also, on 09 October at 02:11 AM (Figure 7), the Moon will pass  $2^{\circ}03'$  to the south of Jupiter as they share the same right ascension, and they will continue to be observable until they sink below  $7^{\circ}$  above the western horizon at around 04:25 AM [8].

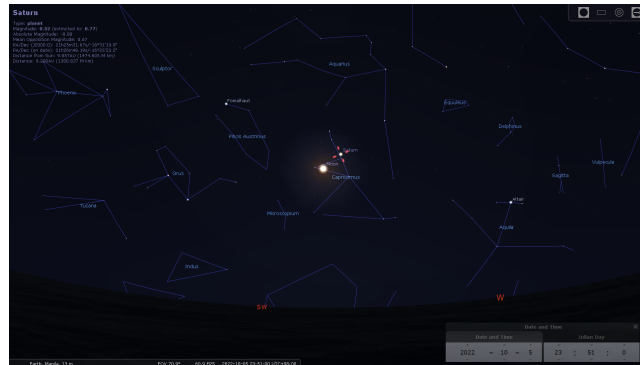


Figure 6: . The view of the southwestern sky showing the conjunction of Moon and Saturn on 05 October at 11:51 PM using Stellarium software

## Meteor Showers

The **Draconid Meteor Shower** is active from 06 October to 10 October, with peak activity occurring on 09 October. At its peak, Draconids is estimated to produce 10 meteors per hour [9]. The value mentioned assumes that the observer is in a clear, dark, moonless sky condition, and the radiant is highest in the sky. The Draconids' best display might be seen before its radiant constellation Draco, the Dragon sets on 08 October and after dusk on 09 October (Figure 8). The presence of the nearly full Moon in Pisces presents a significant interference with the meteor shower observation throughout the night. [10]

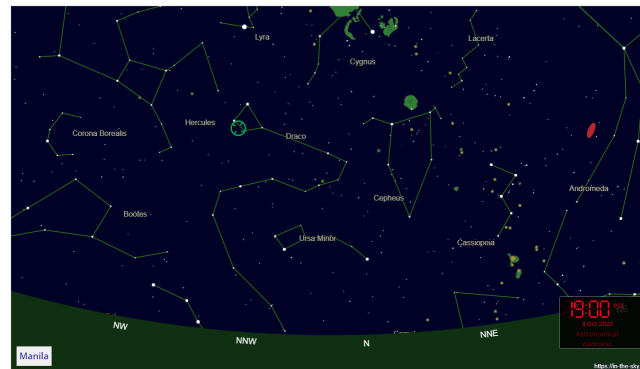


Figure 7: The view of the northwestern sky during the peak of Draconids on 09 October 2022 at 07:00 PM when the shower's radiant represented by the green solid circle.

The **Orionid Meteor Shower**, produced by comet 1P/Halley, is active from 02 October to 07 November, with peak activity occurring on 21 October, and is estimated to produce 14 meteors per hour. The Orionids' best display might be seen after its radiant constellation Orion fully rises around 10:30 PM on 21 October to the dawn of the following day (Figure 9). The presence of nearly new Moon in Leo presents minimal interference with the meteor shower observation [11].

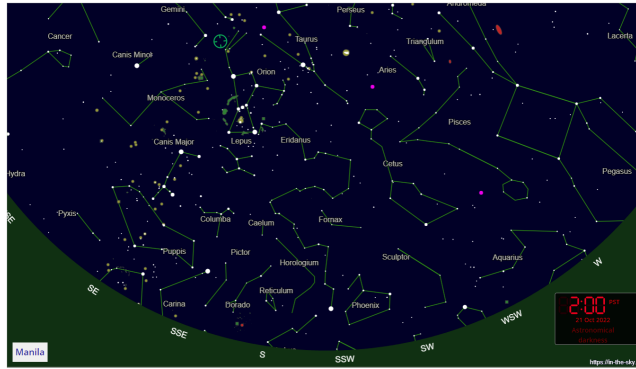


Figure 8: The view of the southern sky during the peak of Orionids on 21 October 2022 at 02:00 AM when the shower's radiant represented by the green solid circle.

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.

## 100 Hours of Astronomy

The **100 Hours of Astronomy**, a global project by the International Astronomical Union–Office of the Astronomy Outreach (IAU-OAO) will be celebrated on 01–04 October. PAGASA, in collaboration with the National Outreach Coordinator of the Philippines will host an astronomy outreach activity in selected Grade 1 students, which aims to engage children with the sky as they gain basic understanding of our astronomical surroundings.

## World Space Week

The **World Space Week (WSW)** is a week-long international celebration of science and technology and its contribution to the betterment of the human condition. It is an annual space event celebrated globally every 04–10 October, and for this year, the theme of the celebration is “Space and Sustainability”. For this year’s celebration, PAGASA prepared a webinar activity that will be livestreamed on PAGASA’s Official Facebook page and an outreach activity in a chosen small community. These activities aim to promote astronomy and public awareness, and to inspire Filipinos to pursue careers in science and technology.

## Calendar of Astronomical Events for October 2022

Table 1 shows summary of the astronomical events for the month of October 2022. All times displayed are in Philippines Standard Time (PhST).

Table 1: The summary of astronomical events for the month of October 2022

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20 September 2022

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## References

- [1] PAGASA Special Publication No. 840: The Philippine Star Atlas, 2019
- [2] C. Guide, "Constellations: A Guide to the Night Sky" <https://www.constellation-guide.com/constellations-by-month/september-constellations>, Last accessed on 2022-08-16, 2022.
- [3] K.A. Zimmermann, "Space.com Pegasus Constellation: Facts Notable Features" <https://www.space.com/16743-constellation-pegasus.html>, Last accessed on 2022-08-16, 2022.
- [4] D. Ford, "In-The-Sky.org Guide to the night sky: Jupiter at opposition" [https://in-the-sky.org/news.php?id=20220926\\_12\\_100](https://in-the-sky.org/news.php?id=20220926_12_100), Last accessed on 2022-08-16, 2022.
- [5] D. Ford, "In-The-Sky.org Guide to the night sky: Saturn at opposition" [https://in-the-sky.org/news.php?id=20240908\\_12\\_100](https://in-the-sky.org/news.php?id=20240908_12_100), Last accessed on 2022-08-16, 2022.
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- [7] D. Ford, "In-The-Sky.org Guide to the night sky: September -Perseid meteor shower 2022" [https://in-the-sky.org/news.php?id=20220909\\_10\\_100](https://in-the-sky.org/news.php?id=20220909_10_100), Last accessed on 2022-08-16, 2022.
- [8] Philippine Astronomical Handbook 2022
- [9] D. Ford, "In-The-Sky.org Guide to the night sky: September equinox" [https://in-the-sky.org/news.php?id=20220923\\_07\\_100](https://in-the-sky.org/news.php?id=20220923_07_100), Last accessed on 2022-08-16, 2022.