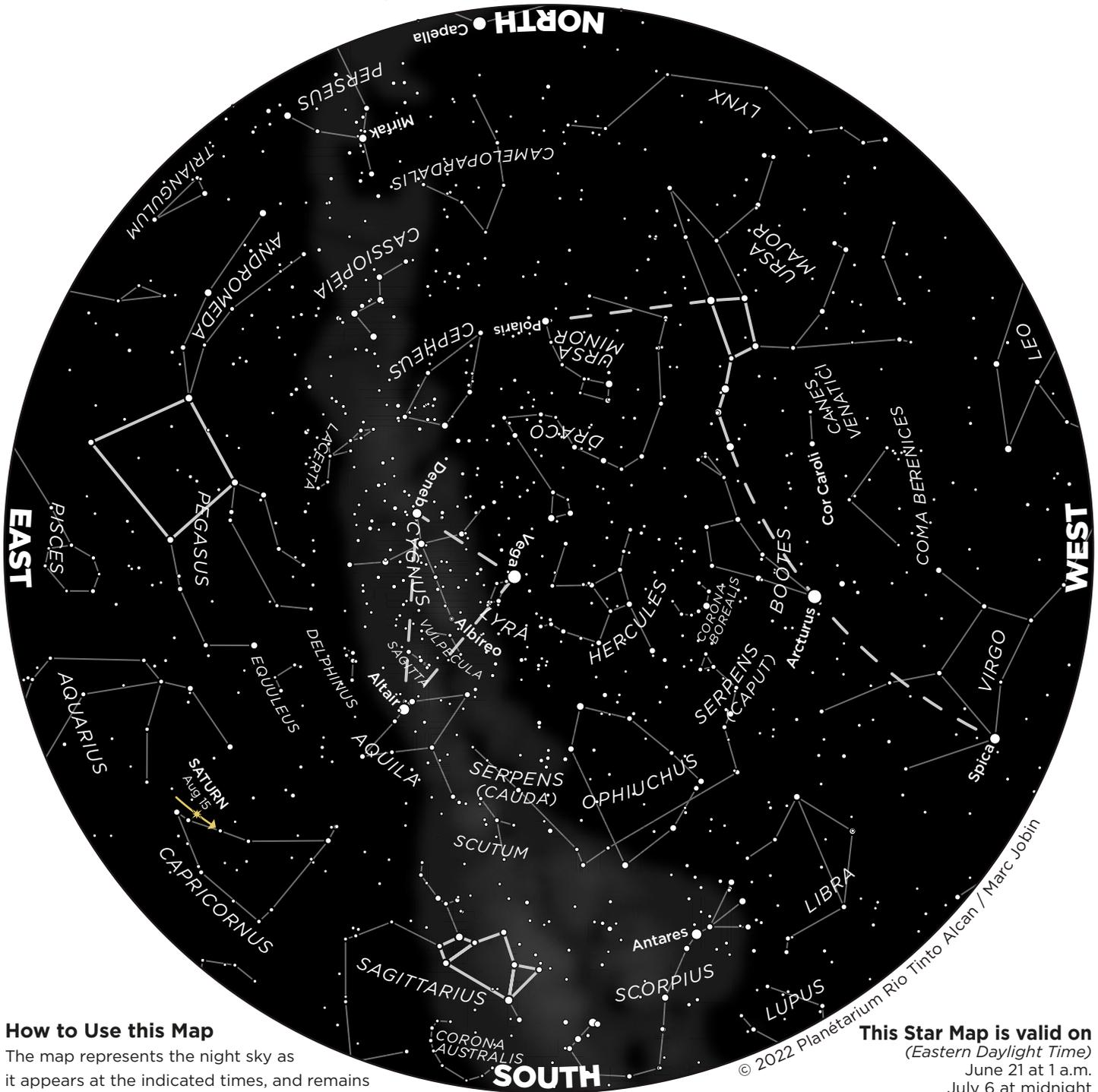


## The Starry Sky – Summer 2022



### How to Use this Map

The map represents the night sky as it appears at the indicated times, and remains usable several hours before and after.

Hold the map up to the sky in front of you and turn it so the direction you are facing appears at the bottom. Lines identify the constellations. The shaded area outlines the Milky Way.

### This Star Map is valid on

- (Eastern Daylight Time)
- June 21 at 1 a.m.
- July 6 at midnight
- July 21 at 11 p.m.
- August 6 at 10 p.m.
- August 21 at 9 p.m.
- September 6 at 8 p.m.

Visit us on [montrealspaceforlife.ca](http://montrealspaceforlife.ca)

# The Sky This Summer

*This summer, the bright planets will emerge one by one in the second half of the night.*

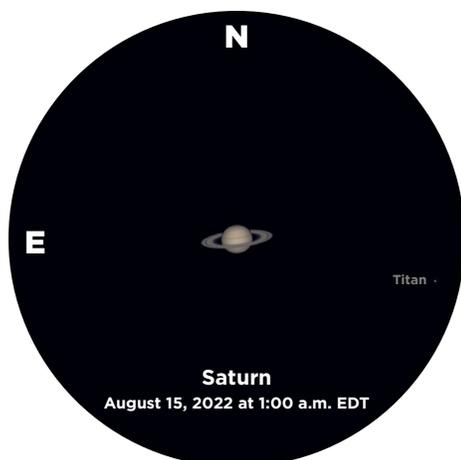
*Scan the dawn sky from right to left and you'll behold Saturn, Jupiter, Mars and Venus in one fell swoop.*

*Even Mercury will join this planetary parade for a few days.*

## Saturn leads the parade

**Saturn** is the first to rise and, as such, heads off this planetary procession. In early summer, the majestic ringed planet appears above the east-southeastern horizon past midnight, then climbs slowly and culminates about 30 degrees high in the south at dawn. But as the weeks go by, Saturn can be spotted increasingly earlier each evening, such that when it reaches opposition on August 14, it rises at twilight, culminates around 1 a.m. and sets in the west-southwest at dawn.

Wait for Saturn to reach its maximum altitude before aiming a telescope in its direction: Your reward will be an enchanting view of its famous rings, 42 arc seconds wide and tilted about 14 degrees toward us. (The planet itself is only 18.8 arc seconds in diameter at the time of opposition.) Also note the dot of light close to the planet: That would be Titan, its biggest and brightest moon, whose position changes from night to night as it completes its orbit in just under 16 days.



Saturn is not the brightest planet, but it still rules over Capricornus, where it can be found this year near the border with Aquarius: In fact, Saturn is the only remarkable beacon of light in these two constellations devoid of bright stars. If you're still unsure whether you've spotted Saturn, note that the waning gibbous Moon will visit the planet **during**

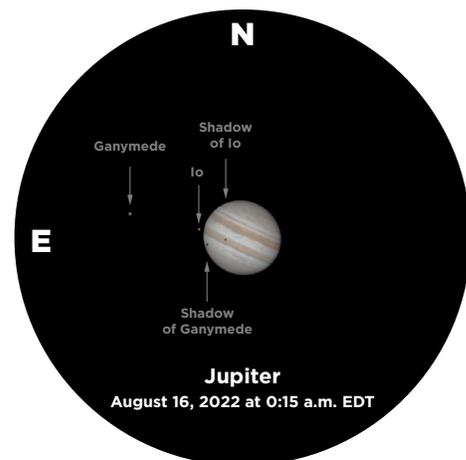
**the night of July 15 to 16.** Then **on the night of August 11-12**, the now-full Moon will come to within 4½ degrees below Saturn. Finally, the waxing gibbous Moon will swing 6 degrees below the planet **on the night of September 7-8.**

## Jupiter follows closely

A little over an hour after Saturn, it's **Jupiter's** turn to emerge above the eastern horizon. It's so bright you can't miss it! Jupiter is currently straddling the border of Pisces and Cetus, another region of sky lacking bright stars. The two stars that form the left side of the famous square of Pegasus point south, in the approximate direction of the giant planet, and can help you anticipate when it will rise. In early summer, Jupiter emerges above the eastern horizon past 1 a.m. and can be found about 30 degrees high in the southeast at the crack of dawn. In early August, Jupiter rises around 10:30 p.m. and culminates at dawn, 45 degrees above the southern horizon. At the autumn equinox, the giant planet is days away from its opposition, which will occur on September 26: It rises at twilight in the east and culminates in the middle of the night, at around 1 a.m.

When Jupiter rides high in the sky and the atmosphere is stable, the planet is an absolutely spectacular sight in a telescope. By the time it reaches opposition, Jupiter's disc can swell to 50 arc seconds, effectively appearing larger than Saturn's rings. Its lighter and darker parallel cloud bands reveal a feast of details that change continuously. The planet spins around itself in less than 10 hours; you only need a few minutes of careful observation to see that rotation. The movement of the four Galilean moons is also obvious within minutes, especially for the faster ones like Io and Europa. You may even get lucky and witness various phenomena as these moons overtake each other, cast their shadows onto the Jovian clouds, pass in front of the planet's disc or disappear into its shadow.

**On the morning of June 21**, at the first light of dawn, the last quarter Moon lies 5 degrees to the lower



right of Jupiter. **The night of July 18 to 19**, the waning gibbous Moon shines 4 degrees to the lower left of Jupiter, and **during the night of August 14 to 15**, it gradually comes to within 2½ degrees below Jupiter at dawn. **On the night of September 10 to 11**, the Moon lies 5 degrees below Jupiter at dawn. **On the evening of September 11**, the waning gibbous Moon can be found 5½ degrees to the lower left of Jupiter, but the gap widens throughout the night.

## Mars wanders through the constellations

**Mars** orbits the Sun at a much faster speed than Jupiter. From our Earthly viewpoint, the Red Planet dashes eastward through the constellations: It starts in Pisces, then crosses the border into Aries on July 8. On August 9, it enters Taurus, where it will hang out the rest of the year. To observe this movement for yourself, note the widening gap with Jupiter: It's about 15 degrees when summer kicks off, but continues to grow as the weeks go by, exceeding 70 degrees by September!

Thanks to its rapid eastward trek, Mars continues to rise very late this summer, long after Saturn and Jupiter. Not till August will you finally see this orange "star" before midnight, low on the east-northeastern horizon; at dawn, however, it can be found very high in the southeast.

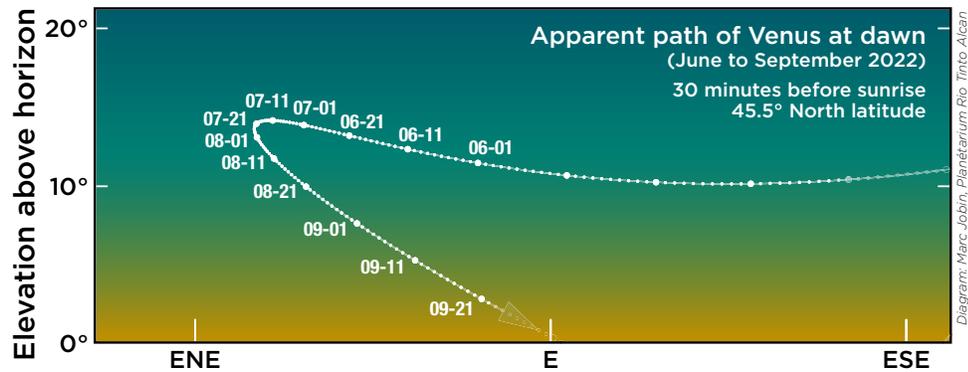
In the meantime, the distance between Earth and Mars is gradually

shrinking, while the Red Planet's brightness keeps increasing. It is now comparable to that of the brightest stars, but Mars is still too small to reveal anything interesting through a telescope. You'll have to wait until the fall and the weeks surrounding its opposition on December 7 (when the planet is at its closest to Earth this year) for the view to be worthwhile.

**On the morning of June 22**, at the first light of dawn, the waning Moon hangs 6½ degrees to the right of Mars; Jupiter shines a little further to the right.

**Toward the end of the night of July 20-21**, the waning Moon comes within 3 degrees to the right of Mars. **By night's end on August 18-19**, the last quarter Moon hangs a mere 2 degrees above Mars, forming a lovely trio with the Pleiades star cluster, 4 degrees above the Moon. **On the morning of August 20**, the waning Moon forms a beautiful parallelogram with the Pleiades, Mars and the Hyades. (See figure below.)

**From August 26 to September 3**, Mars makes its way between the Pleiades and Hyades star clusters, appearing like an extra orangey star in the constellation Taurus and rivalling Aldebaran. **The night of September 15 to 16**, the waning gibbous Moon can be found between the Pleiades, the Hyades and Mars. **On the following night, September 16-17, at about 11 p.m.**, the waning gibbous moon lies a mere 3 degrees to the left of Mars, near the Pleiades and Hyades clusters; the gap between Mars and the Moon widens throughout the night.



**Venus exits the morning sky**

When night gives way to dawn, dazzling **Venus** makes its appearance above the east-northeastern horizon, getting in on the summer planetary show. At the start of the season, the beautiful Morning Star is only about 10 degrees high at the break of civil dawn, about 40 minutes before sunrise. Venus gains 1 or 2 degrees in altitude over the next few weeks, but after mid-July, it begins a slow slide that carries it closer to the Sun. For the remainder of summer, the Morning Star will appear progressively lower on the horizon before sunrise. It gets lost in the Sun's glare in the early days of fall; it then passes behind our star on October 22.

Through a telescope, Venus appears as a gibbous disc this summer, increasingly illuminated "face-on" and decreasing in size the farther away it gets from us. Just before it disappears in September, it will appear as a tiny dazzling dot, 10 arc seconds in diameter and 99% illuminated.

**On the morning of June 26, 45 minutes before sunrise**, the thin lunar

crescent lies less than 2 degrees to the left of Venus; also note the beautiful Pleiades star cluster looming over them. **On the morning of July 26, still at dawn**, the crescent Moon now hangs 3½ degrees above the Morning Star. The waning Moon once again swings by brilliant Venus on August 25 and 26 at dawn, but not as closely as before.

**Mercury brings up the rear**

**Mercury** is the closest planet to the Sun and the one that orbits our star the fastest. It is only visible either at dawn or at twilight and only for a few days each time. The tiny planet makes an average appearance in the morning sky **from June 9 to July 7**, but viewing conditions will be optimal between June 16 and July 3: 45 minutes before sunrise, look for a small dot of light low on the east-northeastern horizon, to the lower left of Venus. **On the morning of June 27**, the very thin waning Moon lies 3 degrees to the upper left of the tiny planet.

*Clear skies!*

Research and text: **Marc Jobin**

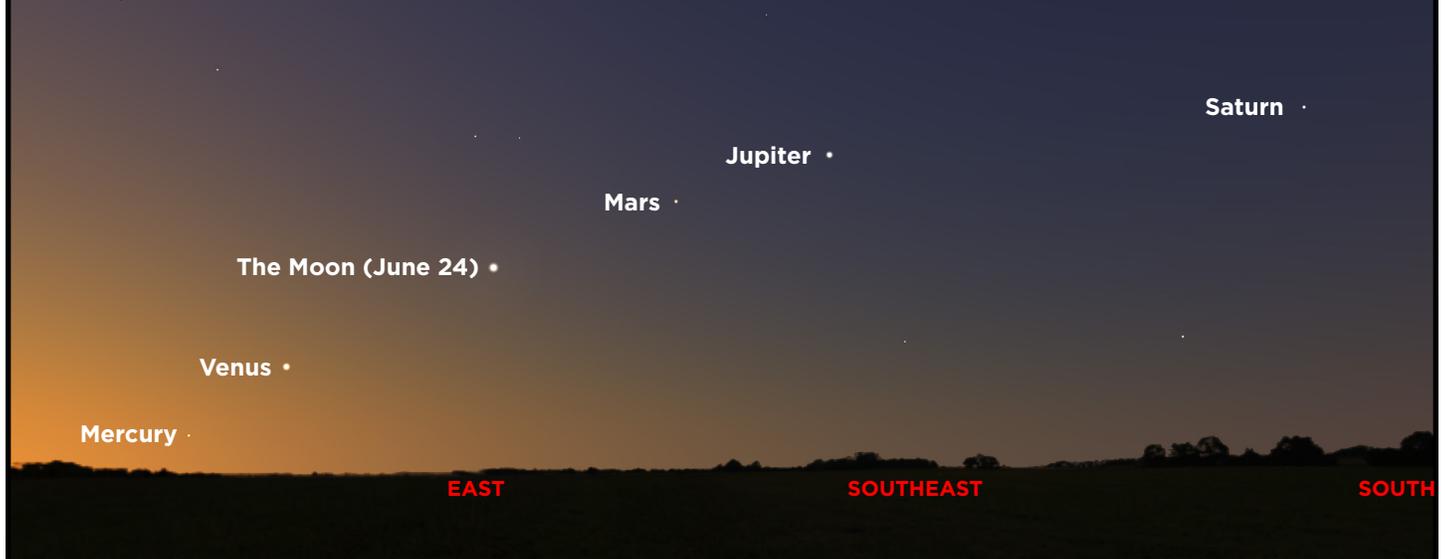
**MARS AND THE MOON MEET THE PLEIADES AND THE HYADES**



# More to Watch This Summer

## FIVE NAKED-EYE PLANETS AT DAWN

During the last week of June,  
at dawn, 45 minutes before sunrise



During the last mornings of June, search out Mercury and then take a moment to contemplate the entire scene. From left to right, from the east-northeastern horizon to the south, you'll behold Mercury, Venus, Mars, Jupiter and Saturn all in one glance. These are the same five planets that our distant ancestors gazed upon, long before the telescope was invented. And they're exactly in order of their distance from the Sun.

The simulated view (above) shows the appearance of this celestial panorama on the morning of June 24, but the position of the planets will remain very similar for a few days. The obvious exception is the Moon, which moves significantly from night to night, sneaking up on each planet in turn: It meets Saturn on June 18; Jupiter on June 21; Mars on June 22; Venus on June 26; and finally, Mercury on June 27.

(Background image: Stellarium.org)

## THE PERSEIDS CONTEND WITH THE FULL MOON

This year, the Perseids will take place under the worst possible conditions. The meteor shower will peak on August 12 at around 9 p.m. (EST), but the Moon, which will be full on August 11, will put a damper on viewing the shooting stars. The nights closest to the shower's peak (August 12-13, and also 11-12), when the meteors should be most abundant, will be affected by the encroaching light from our satellite, visible in the sky from dusk to dawn.

This light pollution is impossible to escape, even in remote locations away from the city. The veil of light overpowers the faintest meteors and lets only the occasional bright meteor peek through. During the two nights closest to peak activity, you can expect

to spot **no more than three or four Perseids per hour**, and only under very clear skies with an unobstructed, 360-degree view. Tips for diehards determined to spot a few shooting stars: Keep the Moon behind you, hidden behind trees, a building or some other obstruction, and focus your attention on the northern part of the sky.

Keep in mind, however, that the Perseids are active (though at much lower rates) from mid-July through the third week of August. You'll probably manage to see a few shooting stars under the dark, moonless skies of early August. For more details, go to

[espacepourlavie.ca/en/perseids](http://espacepourlavie.ca/en/perseids)

## SEASONAL MILESTONES

The **summer solstice** happens on June 21, 2022 at 5:13 a.m. EDT, and the **autumn equinox** is set to occur on September 22 at 9:03 p.m. Summer will last exactly 93 days 15 hours 50 minutes.

On July 4 at 3:10 a.m. EDT, **Earth reaches aphelion**, the point in its elliptical orbit farthest from the Sun: The Earth-Sun distance will then be 152,098,455 km.

## PHASES OF THE MOON

(Eastern Daylight Time)

Full moon	Last quarter
June 14 at 7:52	June 20 at 23:11
July 13 at 14:38	July 20 at 10:19
August 11 at 21:36	August 19 at 0:36
September 10 at 5:59	September 17 at 17:52
New moon	First quarter
June 28 at 22:52	July 6 at 22:14
July 28 at 13:55	August 5 at 7:07
August 27 at 4:17	September 3 at 14:08
September 25 at 17:54	October 2 at 20:14