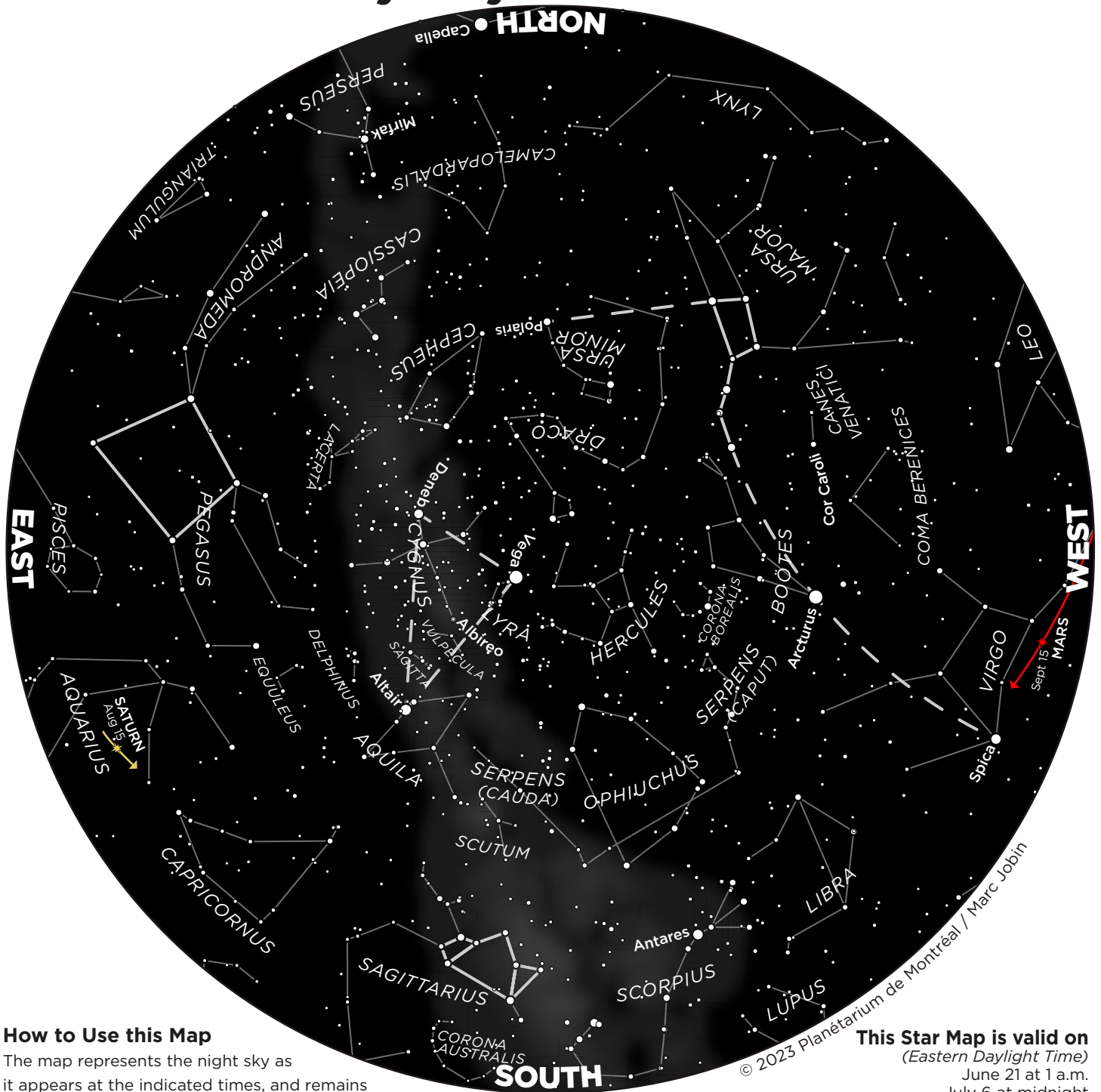


## The Starry Sky – Summer 2023



### 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.

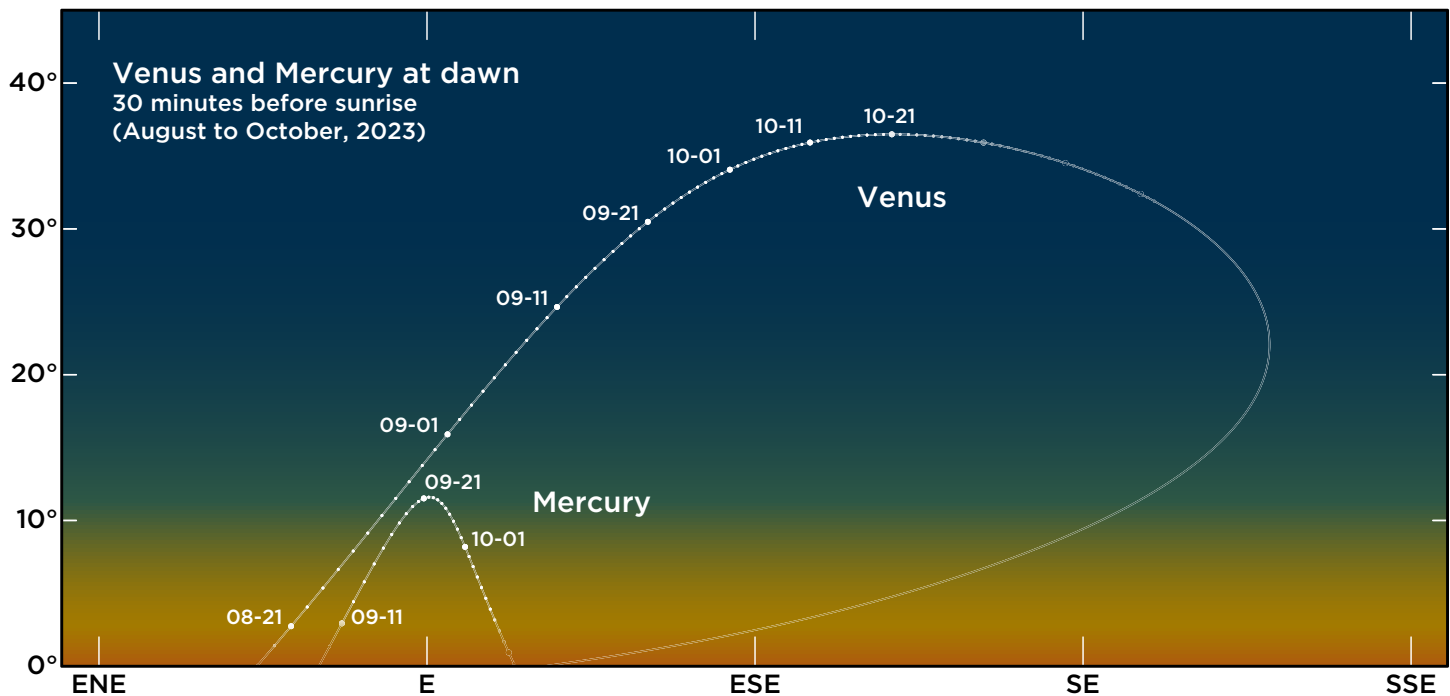
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# The Sky This Summer

*Mars and Venus both disappear from the evening sky this summer, but Venus reappears in the morning sky, where it joins Saturn and Jupiter.*



M. Jobin, Planetarium de Montréal

## Venus transitions from evening to morning star

While **Venus** can still be easily spotted after sunset in early summer, this beautiful Evening Star apparition is coming to an end. The brilliant inferior planet has climbed very high in the twilight sky since December 2022, all thanks to its favourable orbital inclination with respect to the western horizon. But this advantage will be lost as the Sun reaches and passes its highest declination during the summer solstice.

The now unfavourable geometry combined with the ever-narrowing angle between Venus and the Sun is instead drawing the planet closer to the horizon at nightfall and adversely affecting its visibility: Note how Venus appears increasingly lower on the horizon from one evening to the next. By early July, it's only half as high as it was two months earlier. Around July 9, Venus shines at its brightest (magnitude  $-4.7$ ) for this apparition and appears as a crescent, 25% illuminated and 38 arc seconds in diameter, when viewed through a small telescope.

Venus drops very quickly after that. The lovely planet disappears for good in the dazzle of the setting Sun during the last evenings of July, more than two weeks before its inferior conjunction on August 13.

The show then moves to the morning sky. In the second half of summer and into the fall, the ecliptic's angle with the horizon is favourable for observing Mercury and Venus at dawn. As of August 20 or 21, just one week after Venus's inferior conjunction, early risers will catch glimpses of it very low on the eastern horizon, about 30 minutes before sunrise. In only a few days, the dazzling Morning Star rises to an impressive height. In early September, it already exceeds an altitude of 15 degrees, a half-hour before sunrise. By mid-October, it will reach a height of over 35 degrees at dawn, completely dominating the final hours of the night. Venus's excellent morning apparition will continue until March 2024.

A telescope will reveal Venus at its largest and thinnest crescent phase during the first days after its return to the morning sky; it then begins waxing toward fullness while its diameter decreases with each passing day. The planet achieves maximum brightness around September 19 (mag.  $-4.7$ ) and dims slightly over the fall and winter.

**On the evening of June 21**, the lunar crescent lies a mere 3 degrees to the upper right of Venus, while the much more inconspicuous Mars hangs  $4\frac{1}{2}$  degrees to the upper left, completing the triangle.

**On July 19 and 20 at twilight**, the crescent Moon lies a few degrees from the Evening Star; Mars and Regulus are also close by, above Venus. On the morning of September 11 and 12, the waning Moon passes to the far left of Venus.

## Last glimpse of Mars

**Mars** is still easily visible at nightfall during the first weeks of summer. Look for it low on the western horizon at twilight and you'll see a tiny orange dot discreetly shining a little higher and to the left of dazzling Venus.

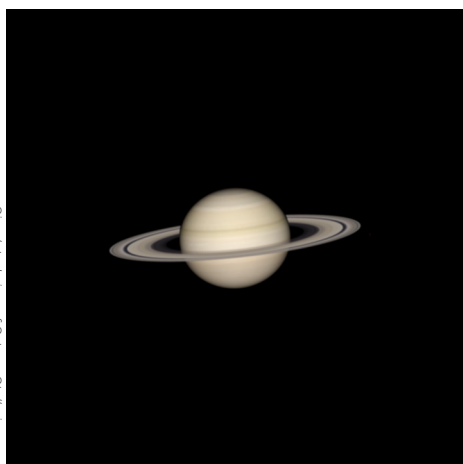
**On the evening of July 9 and 10**, Mars passes less than 1 degree to the upper right of Regulus, the alpha star of Leo, while Venus shines to the lower right of the star. The crescent Moon joins this celestial trio **on the evening of July 20**, 30 minutes after sunset. Mars can be spotted to the upper left of Regulus, with the Moon above both celestial bodies, whereas Venus shines directly below Regulus. That same evening, try locating elusive Mercury a dozen or so degrees to the right of Venus.

But the Red Planet's time is almost up. As summer progresses, Mars appears progressively lower once night sets in and disappears early below the horizon. The Sun eventually—and inevitably—catches up to it. Mars vanishes in the glare of sunset in September.

## The opposition of Saturn

If you point a telescope skyward this summer, **Saturn** is sure to be a highlight. The ringed planet, which arrives at opposition on August 27, is in Aquarius this year—a constellation devoid of bright stars over which Saturn rules with its brilliance (magnitude +0.4 at opposition). This region of sky will also serve as a background for the planet's retrograde loop from June 18 to November 4, when Saturn resumes its direct motion.

When viewed through a telescope, the planet's disc subtends about 19 arc seconds across, and the equatorial bulge caused by this gas giant's fast rotation is easy to see. But those spectacular rings (spanning over 43 arc seconds!) are what really capture our attention. Their tilt has decreased significantly since last year, varying between 7 and 10 degrees from mid-June to mid-October and reaching about 9 degrees at the time of the 2023 opposition. In 2025, they will appear nearly edge-on.



Simulated view of Saturn. Stellarium.org

*Planet Saturn as it will appear through a good amateur telescope on the night of opposition, August 27, 2023. Its rings will be tilted toward Earth by just 9 degrees, a noticeably shallower angle than last year.*

Because of its position on the ecliptic this year, at a declination close to -12 degrees, Saturn rises only a little more than 30 degrees above the horizon when it culminates in the south, making this the best time for viewing. The culmination takes place around 3 a.m. in late July, around 1 a.m. in late August, and around 11 p.m. in late September.

## PHASES OF THE MOON

(Eastern Daylight Time, 24-hour clock)

New moon		First quarter	
June 18 at 0:37	June 26 at 3:50	June 26 at 3:50	June 26 at 3:50
July 17 at 14:32	July 25 at 18:07	July 25 at 18:07	July 25 at 18:07
August 16 at 5:38	August 24 at 5:57	August 24 at 5:57	August 24 at 5:57
September 14 at 21:40	September 22 at 15:32	September 22 at 15:32	September 22 at 15:32
Full moon		Last quarter	
July 3 at 7:39	July 9 at 21:48	July 9 at 21:48	July 9 at 21:48
August 1 at 14:32	August 8 at 6:28	August 8 at 6:28	August 8 at 6:28
August 30 at 21:36	September 6 at 18:21	September 6 at 18:21	September 6 at 18:21
September 29 at 5:57	October 6 at 9:48	October 6 at 9:48	October 6 at 9:48

## Jupiter in the morning sky

Giant **Jupiter** is so bright that it's impossible to miss when it emerges above the eastern horizon. Located in the constellation Aries this year, it rises a little over two hours after Saturn: around 2:30 a.m. in early summer, 1 a.m. in mid-July, 11 p.m. in mid-August, and 9 p.m. in mid-September. The perfect time to aim a small telescope at it will be a few hours later, when the planet climbs high enough in the sky—ideally at an altitude of at least 30 degrees. You'll be amazed by its four brightest moons and the cloud bands that stripe its atmosphere. Optimal viewing conditions are yet to come, however, since Jupiter will only reach opposition in early November.

The waning crescent Moon will be its neighbour on the mornings of July 11 and 12. **During the night of August 7-8**, the last quarter Moon passes a mere 2 degrees above Jupiter; at dawn, the duo can be found very high in the southeast. The waning gibbous Moon appears near Jupiter on the nights of September 3-4 and 4-5.

## Mercury makes an appearance at dawn

Orbiting closer to the Sun than Venus, tiny **Mercury** also benefits from favourable conditions: It makes a very good showing in the morning sky in early fall. **Between September 14 and October 10**, look for it low on the eastern horizon, between 45 and 60 minutes before sunrise. Mercury reaches its greatest elongation, 18 degrees west of the Sun, on September 22. The planet is too faint before this window of visibility, and too low after; the conditions will be best from September 16 to October 3.

*Clear skies!*

Research and text: **Marc Jobin**

## SEASONAL MILESTONES

The **summer solstice** occurs on June 21, 2023 at 10:58 a.m. EDT, and the **autumn equinox** will happen on September 23 at 2:50 a.m. Astronomical summer will last precisely 93 days 15 hours and 52 minutes.

On July 6 at 4 p.m. EDT, **Earth reaches aphelion**, the point in its elliptical orbit farthest from the Sun: The Earth-Sun distance will then be 152 093 251 km.

## Return of the Perseids

The balmy mid-August nights bring us the most famous of all meteor showers. In 2023, the "traditional" peak of **Perseids** activity is expected between 10 p.m. on August 12 and 5 p.m. on August 13, Eastern Time; observations in recent years have shown variability in the exact moment Earth crosses the densest parts of the meteor stream left behind by comet Swift-Tuttle. **The night of August 12-13 is the one closest to peak activity**, but the nights before and after will be good backups, especially if the weather won't cooperate.

The waning Moon (new on the 16<sup>th</sup>) won't interfere with viewing until the very end of the night. The conditions will therefore be very good for the Perseids, which are extremely popular with the public and one of the three strongest meteor showers of the year. Under reasonably dark skies free of light pollution, we can expect to see over 50 meteors an hour on the morning of the 13<sup>th</sup>.

According to certain computer models, the Earth may also cross a very old stream of dust left behind by the comet in 68 BCE: The encounter is expected **between 9 and 10:45 p.m. on the evening of August 13**, but it's impossible to predict the intensity and duration of the resulting spike in activity, so stay alert!

The Perseids are active (though at much lower rates) from mid-July through the third week of August. The radiant of this shower lies above the northeastern horizon in the evening and reaches a much higher elevation just before dawn puts an end to the show: This favourable geometry results in an increasing number of visible meteors during the later hours of a given night.

For more information and meteor viewing tips, see our website at

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