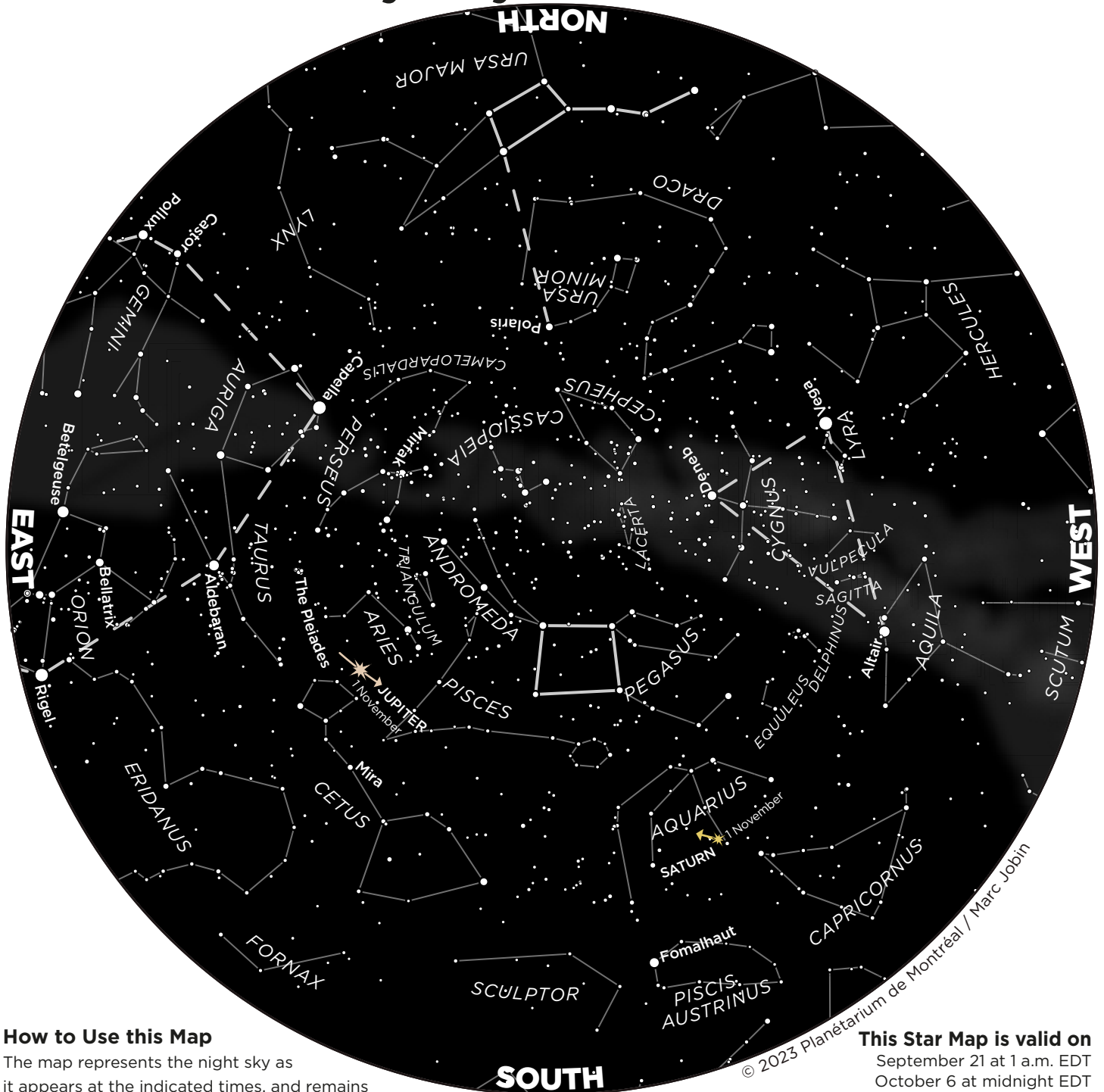


## The Starry Sky – Autumn 2023



### 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.

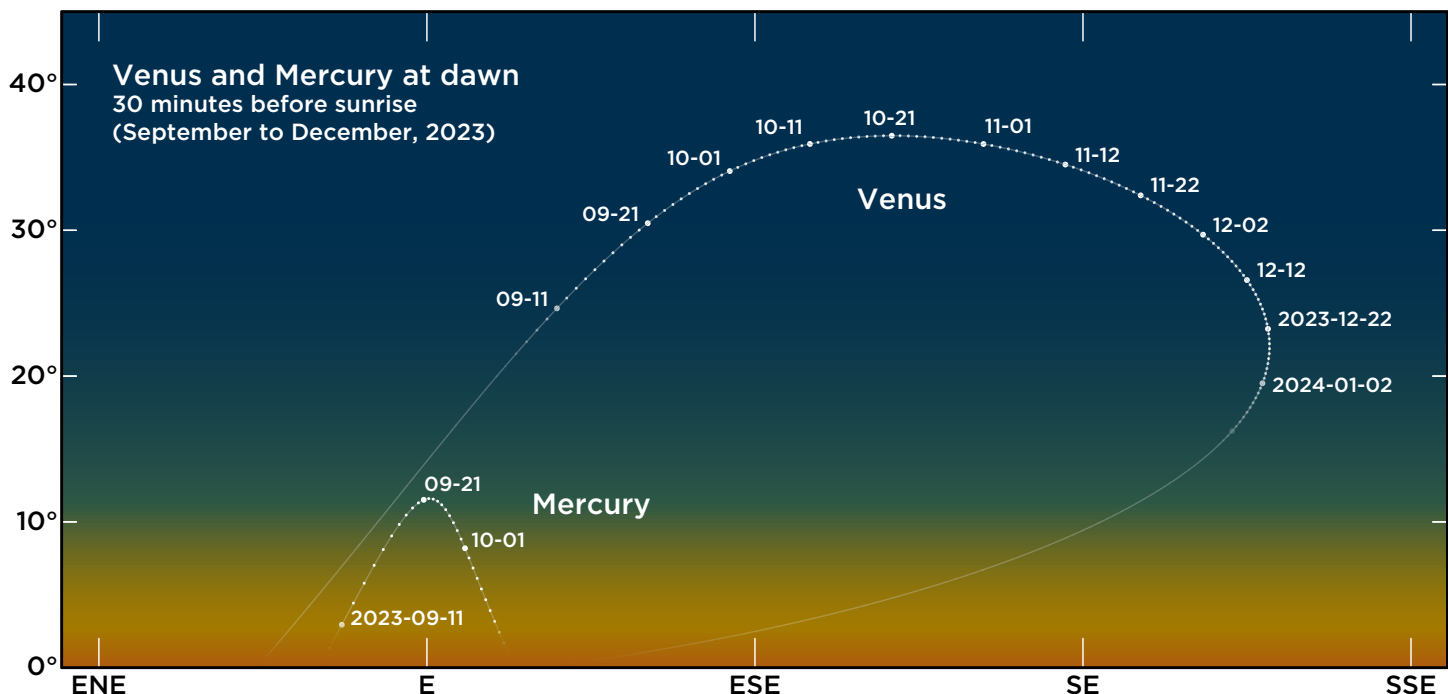
### This Star Map is valid on

- September 21 at 1 a.m. EDT
- October 6 at midnight EDT
- October 21 at 11 p.m. EDT
- November 6 at 9 p.m. EST
- November 21 at 8 p.m. EST
- December 6 at 7 p.m. EST

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# The Sky This Autumn

*Saturn and Jupiter are the stars of our fall evenings, while Venus shines like a beacon by night's end and dawn. Early risers can also spot Mercury, which makes a fine morning appearance as the season kicks off.*



## Saturn shines in the evening

**Saturn** was at opposition at the end of August. It accompanies our evenings throughout fall, appearing at twilight in the darkening sky, about 15 degrees above the southeastern horizon at the start of the season. But as the weeks go by, it appears noticeably higher in the sky at nightfall, working its way south along the horizon. By mid-December, Saturn already culminates in the south once night sets in.

This year, the ringed planet is in Aquarius, a vast constellation that lacks in bright stars and is difficult to distinguish in a light-polluted urban sky. Saturn (magnitude +0.7 in November) therefore appears to shine solo in its section of sky and is impossible to confuse with anything else.

A telescope will reveal the ever-present magic of Saturn. The planet has moved away slightly from Earth since its August 27 opposition, but its disc still subtends 18 arc seconds across and its rings span about 40 arc seconds: spectacular! Since Earth's position with respect to Saturn changes continuously, the tilt of Saturn's rings increases very slightly to 10.5 degrees this November. However, the overall trend of decreasing tilt over the next few years means that, in 2024 and even more so in 2025, Saturn's rings will appear nearly edge-on. So, enjoy the view this fall.

A word of advice: Since Saturn can currently be found a dozen or so degrees south of the celestial equator, it doesn't rise much over Quebec. The best time for viewing will be when the planet culminates in the south, which will occur increasingly earlier in the evening this fall: around 11 p.m. EDT in late September, 9 p.m. in late October, and 6 p.m. (EST) in late November. At that time, Saturn will be about 32 degrees above the horizon.

The waxing gibbous Moon will pass a mere 3 degrees below Saturn **on the evening of September 26**. It moves to within 5 degrees below the planet in late evening on October 23, and shines 4½ degrees from Saturn at nightfall on November 20. Finally, **on December 17 at twilight**, we can admire the lunar crescent as it hangs 3½ degrees below the ringed planet.

## Jupiter at opposition

**Jupiter** shines brightly in the constellation Aries, outshining all other nearby celestial objects, except for the Moon, which draws close to it every month. The giant planet clears the east-northeastern horizon around 9 p.m. in early fall, shining like a cosmic beacon in the night! Jupiter appears increasingly earlier as the weeks go by, and once it reaches opposition on November 3, it rises at the same time as

the Sun sets, at around 5:30 p.m. EDT (or 4:30 p.m. EST).

To the naked eye, Jupiter is certainly spectacular when it's close to the horizon, but if you want to admire it through a telescope, it's best to wait until the planet emerges from the turbulent layers of our atmosphere and climbs higher in the sky. The view of its fascinating cloud bands and four Galilean moons will be far better. At 13 degrees north of the celestial equator, Jupiter is much better positioned than Saturn, meaning it passes much higher in the Montreal sky during the night. Jupiter will culminate at a height of over 57 degrees above the southern horizon: at around 3 a.m. (EDT) in late September, around 1 a.m. in late October, and around 10 p.m. (EST) in early December.

The waning gibbous Moon forms a spectacular duo with Jupiter, appearing only 2¼ degrees above the giant planet when they rise together **at around 8 p.m. on October 1**. Another intriguing meetup will take place **on the evening and night of October 28-29**, as the now-full Moon gradually comes to within 2½ degrees of Jupiter. Lastly, the waxing gibbous Moon gradually inches closer to Jupiter **throughout the evening and night of November 24-25**: The gap narrows to about 2½ degrees as the two celestial bodies sink

toward the western horizon at around 4 a.m.

### Venus rules the dawn sky

**Venus** passed between Earth and the Sun (inferior conjunction) on August 13, before reappearing at dawn a few days later. Now the Morning Star, the brilliant planet gains significant altitude before sunrise thanks to the favourable inclination of the ecliptic to the horizon during fall. At the start of the season, Venus can be found more than 30 degrees above the east-south-eastern horizon 30 minutes before sunrise. Around October 20, it reaches its highest elevation for this morning apparition: over 35 degrees at dawn. In the middle of fall, Venus rises four hours before the Sun and shines intensely in the final hours of the night, attracting the attention of early risers.

Take advantage of the first fall mornings to admire Venus at its most spectacular through a telescope. In late September, the Morning Star will appear as a thick crescent, 30% illuminated and 36 arc seconds in diameter. Check it out frequently and you'll see its appearance change virtually day by day. The further Venus gets from Earth, the thicker but smaller its crescent becomes. By October 23, the brilliant planet reaches its greatest elongation for this apparition, 46 degrees west of our star:

A telescope will reveal a "half-Venus," 23 arc seconds in diameter. In the following weeks, we'll be treated to a gibbous,

increasingly "full" and small Venus. On the winter solstice, it is 75% illuminated but only 15 arc seconds in diameter. You'll also see that Venus has lost altitude by then, appearing at less than 25 degrees above the south-southeastern horizon at the break of civil dawn.

**On the morning of October 10**, from 3:30 a.m. until dawn, the thin waning Moon can be found 6 degrees to the upper left of Venus; look closely between the two celestial bodies and you'll see Regulus, the alpha star of Leo. **On the morning of November 9**, the thin lunar crescent shines less than 1 degree to the lower left of the Morning Star: a spectacular duo that will be visible both in a dark sky by night's end and in the early light of dawn. Lastly, **on the morning of December 9**, the thin waning Moon hovers less than 4 degrees to the right of Venus, slightly lower than the planet.

### Mercury at dawn

In early fall, **Mercury** makes its best appearance of the year in the morning sky. Until October 10, look for the tiny planet 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 low on the horizon after October 10; the best visibility occurs from September 16 to October 3.

### Mars hidden behind the Sun

**Mars** is not visible from Earth this fall. The Red Planet lies in the direction of the Sun and becomes completely lost in our star's bright light. It even passes behind the Sun (solar conjunction) on November 18 and will gradually reappear at dawn during winter 2024.

*Clear skies!*

Research and text: **Marc Jobin**

## SEASONAL MILESTONES

The **autumn equinox** occurs on September 23, 2023 at 2:50 a.m. EDT, and the **winter solstice** will happen on December 21 at 10:28 p.m. EST. Astronomical autumn will last precisely 89 days 20 hours and 38 minutes.

**We return to Winter Time** early on Sunday morning, November 5. At 2:00 a.m. Eastern Daylight Time, clocks are set back one hour: It will then be 1:00 a.m. Eastern Standard Time.

## PHASES OF THE MOON

(Eastern Standard Time, except \* = Daylight Time)

New moon	First quarter
September 14 at 21:40*	September 22 at 15:32*
October 14 at 13:55*	October 21 at 23:29*
November 13 at 4:27	November 20 at 5:50
December 12 at 18:32	December 19 at 13:39
Full moon	Last quarter
September 29 at 5:57*	October 6 at 9:48*
October 28 at 16:24*	November 5 at 4:37*
November 27 at 4:16	December 5 at 0:49
December 26 at 19:33	January 3 at 22:30

## A PARTIAL SOLAR ECLIPSE ON OCTOBER 14

The countdown is on: Only a few months remain before the highly anticipated total solar eclipse hits southern Quebec on April 8, 2024. But until then, you'll have a great opportunity to test your approved solar filters, cameras and other observation equipment. In fact, six lunar cycles before the big event, **on October 14, 2023**, the Moon also has a meetup with the Sun, but will be too far from Earth to completely obscure our star: This eclipse will be annular when observed from a narrow corridor on Earth.

This "path of annularity," between 180 and 240 kilometres wide, begins at sunrise in the Pacific Ocean, off the coast of British Columbia. It makes landfall in Oregon, crosses several western and southwestern states (from Nevada to Texas), then sweeps over Mexico's Yucatán peninsula, Belize, Honduras, Nicaragua, Panama, Colombia and Brazil, before finally ending after sunset in the South Atlantic Ocean.

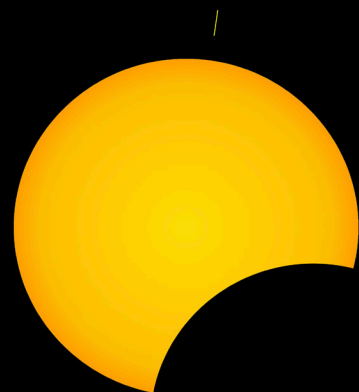
Elsewhere in North and South America, the eclipse will be partial. In Quebec, the eclipse unfolds in the early afternoon: In Montreal, first contact occurs at 12:12:00 p.m. (EST)

and last contact, which signals the end of the eclipse, occurs 2 hours 11 minutes and 56 seconds later, at 2:23:56 p.m. The eclipse reaches its maximum at 1:17:49 p.m., with the Moon covering 17.2% of the Sun's surface; both celestial bodies will be 36 degrees high toward the south in Montreal's sky (azimuth = 191°). Times, durations and directions are similar elsewhere in the Greater Montreal area, but may vary by several dozens of seconds from the values mentioned.

Of course, the usual precautions apply when it comes to observing the Sun. Protect your eyes, cameras and optical instruments with approved filters, **placed in front of the main aperture of the instrument**: This is crucial to reduce the intensity of solar radiation before it is concentrated by the optical system. This applies whether you're observing the eclipse with the naked eye (protecting your eyes with the famous "eclipse glasses") or through binoculars or a telescope. These same techniques must be used during the partial phases of the April 8 eclipse.

Get all the details at:

[espacepourlavie.ca/en/eclipse2023](https://espacepourlavie.ca/en/eclipse2023)



The October 14, 2023 Solar Eclipse in Montréal

C1: 12:11:59.7 (EDT)  
 MAX: 13:17:49.3 (view above)  
 C4: 14:23:55.7

Duration of partial eclipse: 2h 11min 56s  
 Magnitude: 0.285 Obscuration: 17.2%