

## The Starry Sky — Summer 2017

### This Star Map is Accurate on...

(Eastern Daylight Time)

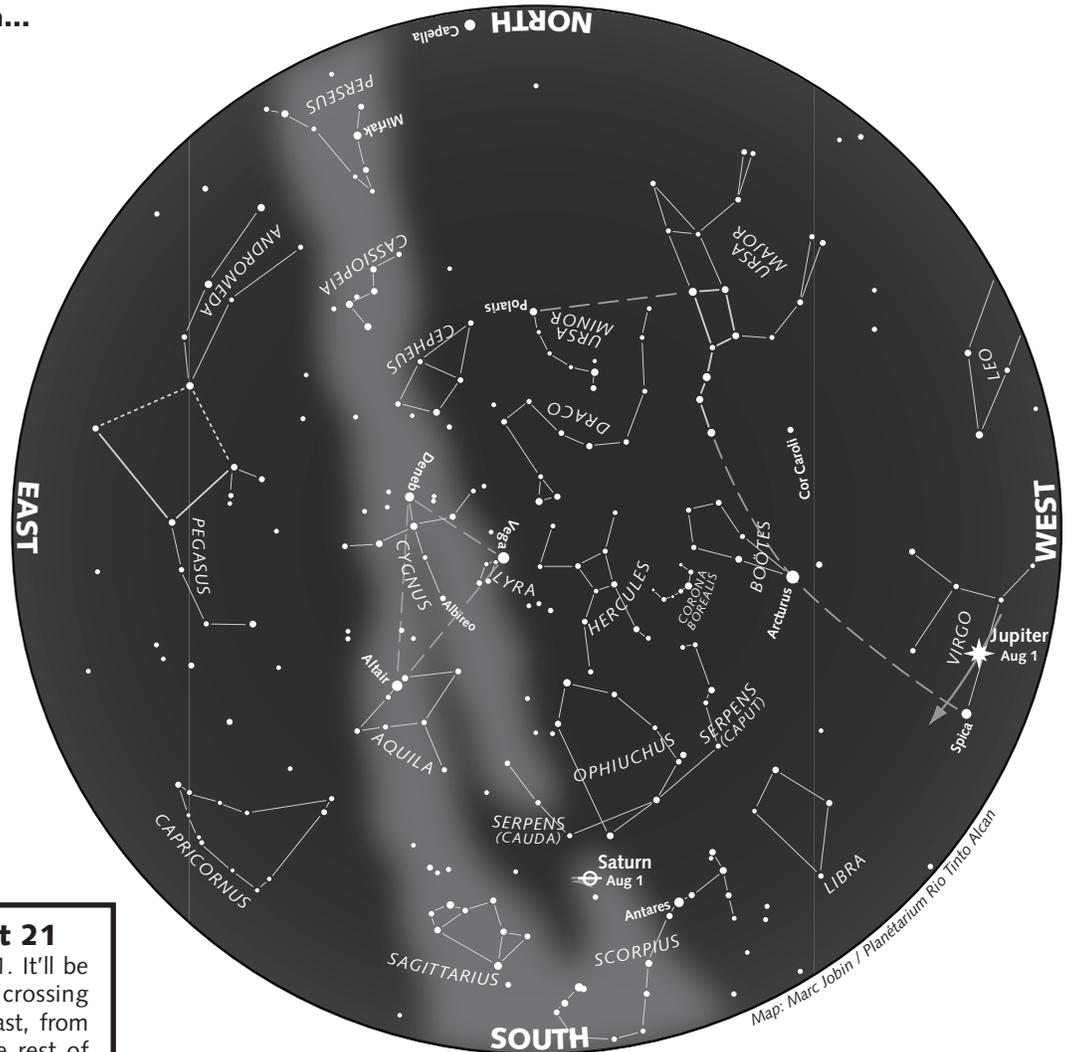
- June 21 at 1 a.m.
- July 6 at midnight
- July 21 at 11 p.m.
- August 6 at 10 p.m.
- August 21 at 9 p.m.
- September 6 at 8 p.m.

### How to Use this Map

The map on the right 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 light-coloured area outlines the Milky Way.

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### Solar eclipse on August 21

A solar eclipse is set for August 21. It'll be a total eclipse in a narrow path crossing the United States from west to east, from Oregon to South Carolina. In the rest of North America and in Central America, the Caribbean and the north of South America, the eclipse will be partial to varying degrees. In Quebec, from 25 to 60% of the Sun's surface will be hidden at maximum eclipse.

In Montreal (illustrated below), the phenomenon starts at 13:21 (Eastern Daylight Time), culminates at 14:38 and ends at 15:50. At maximum eclipse, the moon will hide 58.3% of the surface of the sun.

**Protect your eyes!** For safe methods for viewing the sun, to learn more about eclipses and to find the times of the phenomenon elsewhere in Quebec, visit [espacepourlavie.ca/en/eclipse2017](http://espacepourlavie.ca/en/eclipse2017)



M. Jobin / Planétarium Rio Tinto Alcan

# The Sky This Summer

*This summer, Jupiter and Saturn stand out early in the night, while Venus shines at dawn. But the real attention-grabber is the Moon. It'll throw a wrench into the Perseids, and even eclipse the Sun!*

## Jupiter shines at twilight

Bright **Jupiter** is the first celestial body to appear at twilight above the southwest horizon. The planet will be about 30 degrees high early in the season and then slowly descend as summer progresses. For telescope viewing, conditions will only worsen as the weeks go by. In the first half of summer, it's still possible to see the giant planet in a dark sky, but as of mid-August, Jupiter sets in the west before twilight ends. Afterwards, you can spot the planet only in the afterglow of sunset, and it'll be increasingly hard to see in the bright twilight in the second half of September. Jupiter disappears completely in early October and moves behind the Sun (conjunction) on the 26<sup>th</sup>.

Note the presence of Spica, the brightest star in the constellation Virgo, right near the giant planet. Thanks to Spica, you can appreciate the slow movement of Jupiter in relation to the background stars. Indeed, Jupiter gradually moves toward the star throughout the summer. The smallest gap between the two (just 3 degrees) occurs on September 11.

The Moon draws near Jupiter on the evenings of June 30 and July 28, August 24 and 25, and again on September 21 at twilight.

## Saturn emerges in the evening

In opposition on June 15, **Saturn** can be observed in the evening all summer long and for most of the fall. The ringed planet shines above the south horizon at twilight and then over the next hours gradually descends to

the southwest horizon. Saturn is in retrograde motion till August 25 and then resumes its direct motion eastward in relation to the stars. Its current position in the constellation Ophiuchus, near the border with Sagittarius, coincides with the lower part of the ecliptic (declination: -22 degrees). As a result, Saturn doesn't rise much in the sky in relation to the horizon. These conditions mar our view of its famous rings. This year, the rings show us their northern side with their maximum opening and are tilted about 27 degrees toward Earth. It's still worth the effort, though, to observe the beautiful rings through a telescope, especially in early summer when Saturn is highest in the sky.

The gibbous Moon lies right near Saturn on the evenings of July 6 and August 2 and moves close to the planet again on August 29 and 30. The crescent Moon draws near Saturn on September 26 at twilight and in the evening.

## Venus reigns at dawn

**Venus** is now the dazzling Morning Star. From mid-July to mid-September, it rises about three hours before the Sun. As civil dawn begins, the planet shines spectacularly at over 20 degrees high toward the east. Early birds who enjoy an unobstructed horizon in this direction can follow the sparkling planet during a series of cosmic encounters. For example, for a few days **around July 10**, Venus slips between the Pleiades and the Hyades, two star clusters in the constellation Taurus, which is rising. On September 1, Venus passes one degree south of M44, the famous Beehive Cluster in the constellation Cancer. Venus then quickly approaches Regulus, the brightest star in Leo, and on the morning of September 20, only a half degree separates the two bodies. Finally, **on the morning of October 5**, Venus and Mars will be just a quarter of a degree apart.

The crescent Moon also shows up near Venus on the mornings of June 20 and 21. On July 20 and August 19, the crescent passes less than 4 degrees from the planet. It neighbours Venus again on the mornings of September 17 and 18.

## Mercury appears in the morning sky

**Mercury** is the planet closest to the Sun, and its visibility alternates between twilight and dawn every few weeks. This summer, the small planet first makes a fair appearance in the evening sky in July. It can be seen at twilight, a half hour after sunset, very low in the west-northwest sky. Mercury is brighter at the start of this observation window but quickly fades after mid-July and then draws closer to the Sun and lies too low after August 1.

## Contemplating the Perseids

**It won't be a banner year for the Perseids.**

First, peak activity for the famous meteor shower will occur in the daytime for North American observers. The peak period will fall on August 12, most likely between 3 and 5:30 p.m., although possibly anytime between 10 a.m. and 10 p.m. according to past observations. The nights of August 11-12 and 12-13 will therefore both be equally far from this peak. Yet it's the waning gibbous Moon (the full Moon is on August 7) that will mask the shooting stars the most. It rises before 11 p.m. and will affect observation conditions in the second half of the night, in fact during the hours when the radiant reaches its optimal height and the Perseids put on their best show. All these adverse factors mean that **we shouldn't expect to observe more than a dozen meteors an hour** on the two nights closest to the peak. Astronomical conditions will be much more favourable in 2018, so better luck next year!

Mercury then returns to make an excellent appearance in the morning sky from September 8 to 28. This time, it can be seen above the east horizon at dawn, 45 minutes before sunrise. **From September 16 to 18**, Mercury is in conjunction with the red planet (they're only a third of a degree apart on the 16<sup>th</sup>). Venus shines slightly higher, and the crescent Moon also joins the party.

## Mars comes out at dawn

**Mars** is in conjunction with the Sun, on the other side of our star, on July 26. The red planet is therefore unobservable for the whole first part of summer but gradually emerges in the morning sky in early September thanks to a favourable tilt of the ecliptic. Mars can be seen first with binoculars on the east-north-east horizon at dawn. **On the morning of September 5**, 45 minutes before sunrise, Mars lies two-thirds of a degree from Regulus, the brightest star in Leo, with Mercury 2½ degrees to their right. As Mars moves away from the Sun on the following mornings, the planet Mercury will guide us to the red planet, and it'll then be possible to spot it with the naked eye. Indeed, **on September 16**, one hour before sunrise, Mercury appears only a third of a degree above Mars. **On the morning of October 5**, Mars passes just a quarter of a degree under brilliant Venus.

*Clear skies!*

Research and text: **Marc Jobin**

## Seasonal Milestones

The **summer solstice** occurs on June 21, 2017 at 0:24 a.m. EDT, and the **autumn equinox** takes place on September 22 at 4:02 p.m. Summer will last exactly 93 days 15 hours 38 minutes.

On July 3 at 4 p.m., Earth reaches **aphelion**, the point in its orbit farthest from the Sun. The Earth-Sun distance will then be 152 092 504 km.

## Phases of the Moon

(Eastern Daylight Time)

New moon	First quarter
June 23 at 22:31	June 30 at 20:51
July 23 at 5:46	July 30 at 11:23
August 21 at 14:30	August 29 at 4:13
Sept. 20 at 1:30	Sept. 27 at 22:54
Full moon	Last quarter
July 9 at 0:07	July 16 at 15:26
August 7 at 14:11	August 14 at 21:15
September 6 at 3:03	September 13 at 2:25
October 5 at 14:40	October 12 at 8:25