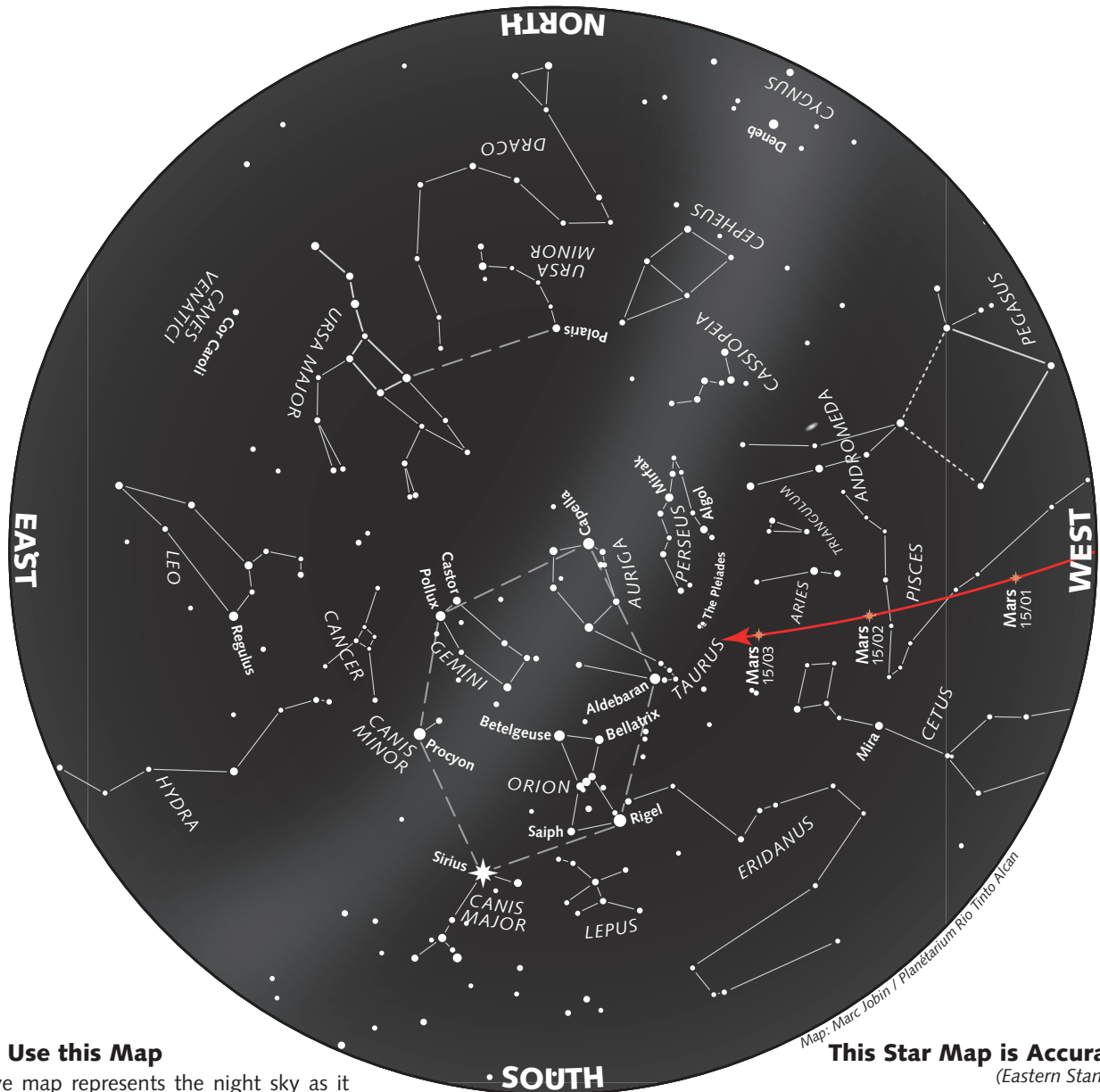


## The Starry Sky — Winter 2018-19



### How to Use this Map

The above 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 light-coloured area outlines the Milky Way.

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

(Eastern Standard Time)

- December 21 at midnight
- January 6 at 11 p.m.
- January 21 at 10 p.m.
- February 6 at 9 p.m.
- February 21 at 8 p.m.
- March 6 at 7 p.m.

Daylight Time takes effect early on the morning of Sunday, March 10: Timekeeping devices move one hour ahead.

# The Sky This Winter

This winter, Venus, Jupiter and Saturn show up late at night and at dawn.

Mars is the only bright planet visible in the evening, except for a brief appearance by Mercury in February.

## Mars alone in the evening sky

Mars gradually drifts away from Earth and grows ever dimmer throughout the first half of the year. The red planet is also embarked on a mad dash through the constellations, starting in Pisces as winter begins, entering Aries on February 12 and crossing into Taurus on March 23. As Mars travels along the ecliptic, it maintains its height in the sky at nightfall. When it lights up at twilight, Mars looks like an orangey star some 40 degrees above the horizon, moving from the south (in December) to the west (in March) as the weeks go by. Mars sets around 10:30 p.m. all winter.

The crescent Moon comes to within a few degrees of Mars on the evenings of January 12, February 10 and March 11, making it easier to pinpoint the red planet.

## Venus descends at dawn

Winter starts off nicely for Venus since it's at its greatest western elongation (47 degrees to the right of the Sun) on January 5. At this point, the Morning Star rises over three and a half hours before the Sun and is visible at a good height in the southeast at the end of the night and at dawn. Venus has phases, much like the Moon. Through a telescope, the dazzling planet appears as a "half-Venus" in early January but becomes increasingly gibbous throughout winter and into spring.

Jupiter, which emerges on the horizon early in the year, ascends toward Venus, and from January 21 to 24, the two bright planets remain within 3 degrees of each other. The minimum gap (2° 25') occurs on the morning of January 22. The dynamic duo is found low in the southeast as of 5 a.m. but climbs about 20 degrees in the south-southeast in the light of dawn. On the morning of January 31, the crescent Moon shines between Jupiter and Venus, only 2½ degrees to the right of the Morning Star.

## Seasonal Milestones

The **winter solstice** occurs on December 21, 2018 at 5:23 p.m. EST, and the **spring equinox** takes place on March 20, 2019 at 5:58 p.m. EDT. Winter will last exactly 88 days 23 hours 25 minutes.

Earth is at **perihelion**, closest to the Sun, on January 3 at 12:20 a.m. The Earth-Sun distance is then "only" 147 099 761 km.

## Phases of the Moon

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

Full moon	Last quarter
December 22 at 12:49	December 29 at 4:34
January 21 at 0:16	January 27 at 16:10
February 19 at 10:53	February 26 at 6:28
March 20 at 21:43*	March 28 at 0:10*
New moon	First quarter
January 5 at 20:28	January 14 at 1:45
February 4 at 16:04	February 12 at 17:26
March 6 at 11:04	March 14 at 6:27*
April 5 at 4:50*	April 12 at 15:06*

A few weeks later, it's Saturn's turn to approach Venus. The two planets are less than 2½ degrees apart from February 16 to 20, and on the morning of February 18, Saturn is only 1 degree below Venus. Look for the pair low in the southeast one hour before sunrise.

Unfortunately, due to the geometry of planetary orbits, Venus quickly loses height at dawn as winter continues. As of March, Venus is less than 10 degrees high when civil dawn begins, and less than 5 degrees high as of April.

The crescent Moon appears in the vicinity of Venus several times: on the mornings of January 1 and 2, the mornings of January 31 and February 1, and the mornings of March 2 and 3.

## Jupiter in the morning sky

Jupiter was in solar conjunction on November 26. In early winter, the giant planet reappears at dawn and can be seen low in the southeast 45 minutes before sunrise. On the morning of December 21, Mercury (magnitude -0.4) comes within 1 degree of Jupiter (magnitude -1.8), so catch this duo at dawn. But Jupiter soon moves away from the Sun and, in early January, shines about 10 degrees above the horizon at dawn. At the same time, Jupiter ascends toward Venus. From January 21 to 24, the two bright planets are less than 3 degrees apart (on the morning of January 22, the gap shrinks to less than 2½ degrees). A spectacular sight. As the weeks pass, Jupiter rises earlier and earlier. By late winter, the giant planet climbs in the southeast in the second half of the night and lies at dawn about 20 degrees above the southern horizon.

The crescent Moon is found between Jupiter and Venus on the morning of January 2, and only 3 degrees to the left of Jupiter on the morning of January 3. The crescent again approaches Jupiter on the mornings of January 30 and 31. On the morning of February 27, the crescent Moon is less than 2½ degrees to the upper right of Jupiter: the lovely couple can be seen in the south-southeast at the end of the night and at dawn.

## Saturn emerges at dawn

Saturn is in conjunction with the Sun on January 2, on the other side of our star. Hence, the ringed planet isn't visible when winter kicks off. Only in late January does it reappear, at dawn on the southeastern horizon. Saturn becomes easier to spot as the weeks pass and it moves away from the Sun and climbs higher. It approaches Venus in February, and the two remain less than 2½ degrees apart from February 16 to 20 (with a minimum gap of only 1 degree on the morning of February 18). Admire the pair low in the southeast one hour before sunrise. For the rest of winter, Saturn is visible only at the very end of the night and at dawn.

On February 1 at dawn, the thin crescent Moon lies between Venus and Saturn, and the next morning, on February 2, it's less than 2½ degrees to the lower left of Saturn. On the morning of March 1, the crescent is less than 3½ degrees to the upper right of Saturn. The



## Total lunar eclipse

A total lunar eclipse is set for the night of January 20–21. Starting at 10:33 p.m. Eastern Time, we begin to see the circular profile of Earth's shadow cast on the full Moon (the start of the partial phases of the eclipse). For one hour and two minutes (from 11:41 p.m. to 12:43 a.m.), the Moon is totally obscured by Earth's shadow and takes on the famous orangey red hue of lunar eclipses. Maximum eclipse is reached at 12:12 a.m. After totality, the partial phases play out in reverse and wrap up at 1:50 a.m.

In southern Quebec, everybody can fully enjoy the phenomenon because the eclipsed Moon is in an ideal position: very high in the sky, at 64 degrees above the southern horizon at its maximum. The next total lunar eclipse completely visible from Quebec occurs only in three years, on the night of May 15–16, 2022.

next morning, on March 2, the crescent appears between Saturn and Venus, 5 degrees to the right of the Morning Star.

## Mercury in the evening sky

As fall gives way to winter, Mercury is visible in the morning sky where a very good apparition, underway since early December, is now ending. The tiny planet can be found low on the southeastern horizon 45 minutes before sunrise. Mercury and Jupiter meet up on the morning of December 21 with less than 1 degree separating them. Mercury draws ever closer to the Sun over the next few days and becomes lost in the light of dawn in the first week of January.

Mercury then puts in a very good appearance in the evening sky from February 15 to March 4, when the planet is visible above the west-southwestern horizon 30 to 45 minutes after sunset. Mercury is at greatest elongation on February 26, 18 degrees to the east (the left) of the Sun. The tiny planet is much brighter at the start of this apparition and quickly dims after March 4 as it plunges back toward the Sun and the horizon. The best visibility occurs from February 18 to March 1.

Clear skies!

Research and text: **Marc Jobin**