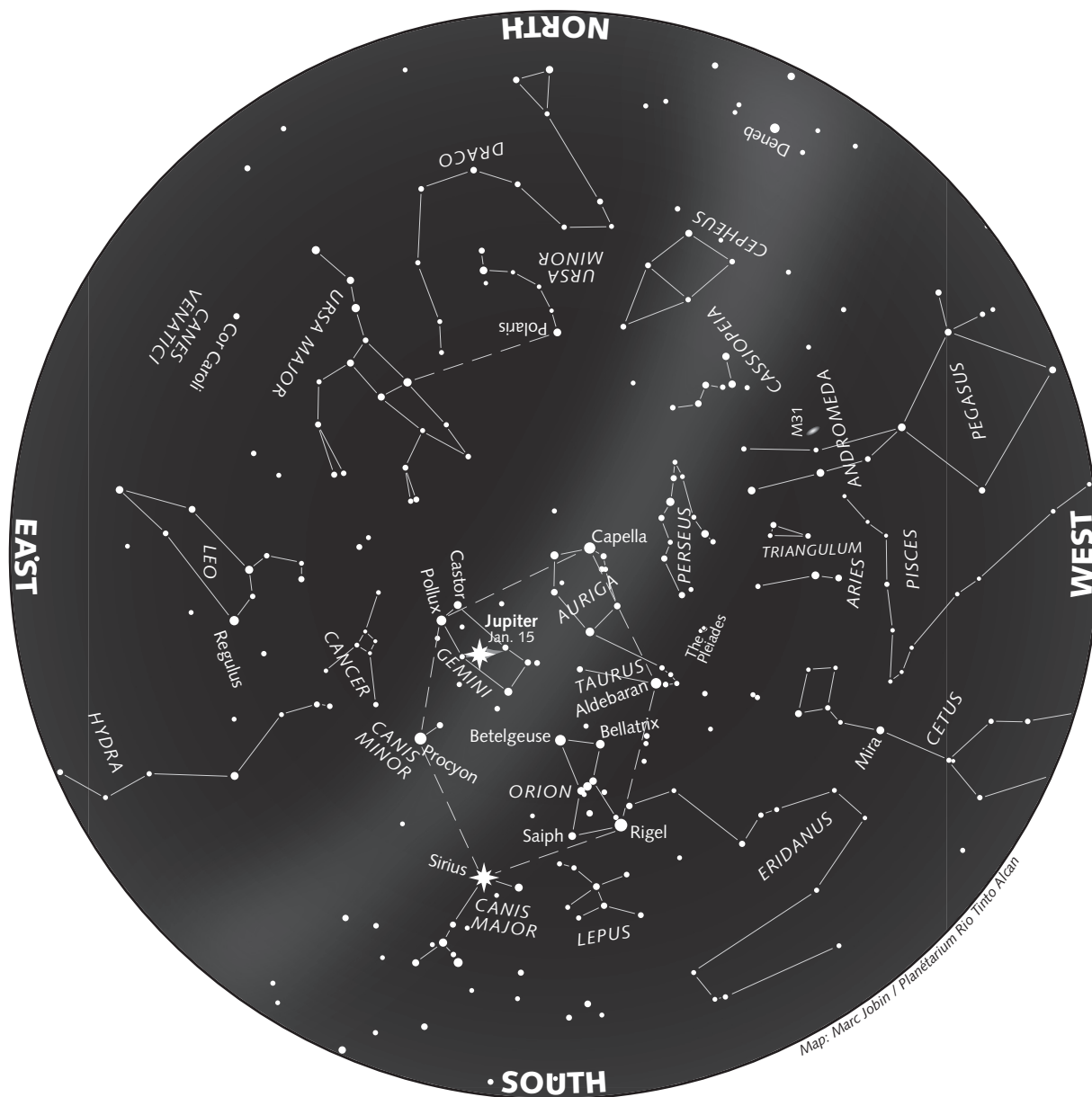


## The Starry Sky — Winter 2013-14



### 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.

# The Sky This Winter

*Jupiter rules the night this winter, but it's not the only planet that beckons our attention.*

*In January, Mercury pays a brief visit at twilight; Saturn rises late at night and Venus shines as the brilliant Morning Star at dawn. Meanwhile Mars waits until early spring to capture our interest.*

## Jupiter takes centre stage

**Jupiter** begins the winter season, and the New Year, in fine form, since the giant planet is at opposition on January 5. It rises in the northeast at dusk and sets in the northwest at dawn. But toward the end of January, and for the rest of the winter, Jupiter is already above the horizon at twilight and sets before dawn. Conditions for observing the planet can hardly be more favourable: This gas giant, located at the heart of Gemini, culminates high in the sky around midnight in January, and progressively earlier as the weeks pass.

Telescopes reveal an incredible world! Take time to study Jupiter's cloud bands, looking for swirls, garlands and festoons. Even through the smallest lens the four Galilean moons, which endlessly orbit the planet, jump to our attention. However, upon examination with larger instruments, these "points of light" are revealed to be tiny disks!

The gibbous Moon appears near Jupiter on the nights of January 14 to 15, February 10 to 11, and again on March 9 to 10.

## Toward the opposition of Mars

**Mars** will be at opposition on April 8: On this date, the Red Planet will be closer to Earth than at any other time over the next two years. Mars is small, and usually too far away for telescopes to reveal any detail: Conditions favour observation only during the weeks surrounding opposition. This year, Mars' apparent diameter will barely exceed 12 arc seconds from March to May, reaching a maximum of only 15 arc seconds at opposition. This remains small compared to Jupiter's disk-size, which presently appears three times larger!

This winter, as the distance separating Earth and Mars decreases, the Red Planet will appear to grow in telescope eyepieces and it will shine noticeably brighter in the sky! Starting around mid-February, Mars will rival even the brightest stars: For a few days surrounding opposition, it will equal Sirius, with a magnitude of  $-1.4$ .

## Phases of the Moon

(Eastern Standard Time; \* = Daylight Time)

Full moon	Last quarter
December 17 at 4:28	December 25 at 8:48
January 15 at 23:52	January 24 at 0:19
February 14 at 18:53	February 22 at 12:15
March 16 at 13:08*	March 23 at 21:46*
New moon	First quarter
January 1 at 6:14	January 7 at 22:39
January 30 at 16:38	February 6 at 14:22
March 1 at 3:00	March 8 at 8:27
March 30 at 14:45*	April 7 at 4:31*

Mars is currently in Virgo and this winter it will come within a few degrees of the bright star Spica. Note the contrast between the star's blue-white colour and the planet's orange hue. During this opposition, Mars' position among the constellations places it low in the Quebec sky; but one must observe the Red Planet when it culminates in the south to ensure optimal observations. In January, Mars rises in the east shortly after midnight and reaches its highest point around 5:00 in the morning; in February, the planet appears at about 11:00 P.M. and culminates at 4:00 A.M.; by March, it becomes visible at 10:00 in the evening and attains its highest altitude in the south at 3:00 in the morning.

A waning lunar crescent will appear below Mars on the morning of December 26, and a gibbous Moon will be near the Red Planet on January 23. The gibbous Moon will also appear near Mars during the nights of February 18 to 20, and again on the night of March 18 to 19.

## Mercury at twilight

This winter, **Mercury** has an excellent apparition in the evening sky. From January 20 to February 5, we find the tiny planet above the west-southwest horizon at twilight, about 45 minutes after sunset. Mercury reaches its greatest eastern elongation (to the left of the Sun) on January 31 after which it starts moving closer to the horizon, rapidly losing brightness until it disappears completely in the glow of twilight. The furtive planet passes between the Earth and Sun (inferior conjunction) on February 15, and re-emerges a few days later in the morning sky for a less-than-favourable apparition. The lunar crescent will be near Mercury on the evening of January 31.

## Venus in the morning

**Venus'** sojourn through the evening sky comes to an end as the New Year begins. The dazzling planet was visible last fall above the southwest horizon at dusk; it rapidly approaches the Sun toward the end of December and disappears in the glow of twilight after the first week of January. Venus passes between the Earth and Sun (inferior conjunction) on January 11, and a few days later it moves into the dawn sky above the east-southeast horizon. This morning apparition will last until next October. You can follow the evolution of the planet's crescent phases through a telescope this winter: The crescent thickens from week to week, and its apparent diameter shrinks as the planet moves farther from Earth. The lunar crescent will appear near Venus on the mornings of January 28 and February 26.

## The Quadrantids, a meteor shower to watch

**On January 3 at 3:00 P.M.** Eastern Time, the Quadrantids are predicted to reach their peak, just three days after the new Moon. One of the two most prolific showers of the year — even better than the famous Perseids — the Quadrantids will benefit from excellent observing conditions. The downside is: The time of peak activity favours observers in Asia. Given their maximum is of short duration, there might only be a few meteors left to see by the time night falls in Quebec and the rest of North America. The Quadrantids' **radiant** is located in the northern part of Boötes, where the obsolete constellation of Quadrans Muralis used to be. It gains altitude in the northeast during the latter part of the night. Something to watch for...

## Saturn late at night

**Saturn** shines among the stars of Libra this winter. As the season begins, the ringed planet appears above the east-southeast horizon around 4:00 in the morning and reaches an altitude of 20 degrees by dawn. At the end of January, it rises at 2:00 A.M. and culminates by daybreak, but its constellational position keeps it low in the sky. By the beginning of March, Saturn rises at midnight and is only 28 degrees above the southern horizon when night ends. To observe Saturn with a telescope, wait until it culminates, just before dawn: If you train your instrument on the planet, its magnificent rings will reward your effort. The rings are nicely open this year, inclined about 22 degrees toward Earth.

**Early on the morning of January 25**, the lunar crescent will be less than 2 degrees below Saturn. The last quarter Moon will appear near the ringed planet on the mornings of February 21 and 22. And finally, a gibbous Moon will pass beneath Saturn on the night of March 20 to 21.

*Clear skies!*

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Adaptation: **Louie Bernstein**

## Seasonal Milestones

The **winter solstice** occurs on December 21 at 12:11 P.M. EST and the **spring equinox** will take place on March 20, 2014, at 12:57 EDT. Winter will last exactly 88d 23h 45min.

On January 4 at 7:00 A.M. EST, the Earth reaches **perihelion**, the point in its orbit closest to the Sun. The Earth — Sun distance will then be 147 104 781 km.

We switch to **Eastern Daylight Time** during the night of March 8 to 9; clocks advance one hour.