The Pocket Planetarium ★

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The Starry Sky — Autumn 2014

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 Daylight Time, except where mentioned otherwise)

September 21 at 1 a.m.
October 6 at midnight
October 21 at 11 p.m.
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

While Mars, Jupiter and Mercury are visible at different periods throughout the night, Venus and Saturn pass behind the Sun; and two eclipses capture our attention in October.

Jupiter the star of autumn

Jupiter is, without doubt, the best positioned planet for observing this fall. As the season begins, the gaseous giant straddles the border between Cancer and Leo and is visible during the second half of the night: It emerges above the east-northeast horizon around 3:00 A.M. But as fall, progresses, the giant planet rises earlier and earlier: Toward the end of October, it rises before 1:00 A.M. and is high in the southeast by dawn. As a bonus, starting on November 2, the switch to standard time means that Jupiter will rise before midnight. At the beginning of December, the gaseous giant rises around 10:00 P.M. and culminates in the south before daybreak. The planet begins its retrograde movement on December 9 and will arrive at opposition on February 6, 2015. Throughout this winter and spring, Jupiter will be easy to observe in the evening.

The lunar crescent will appear near Jupiter on the mornings of October 17 & 18. Then, on the night of November 13 to 14, the last quarter moon will pass 6 degrees to the right of the giant planet. And lastly, a gibbous moon will appear next to Jupiter on the nights of December 10 to 11 and 11 to 12.

Mercury visible at dawn

Mercury offers its best apparition of the year in the morning sky this autumn. After passing between the Sun and Earth (inferior conjunction) on October 16, the tiny planet will re-emerge at dawn over the mornings that follow. Faint and hard to spot at first, it rapidly gains brightness during the last week of October and can be easily seen above the east-southeast horizon 45 minutes before sunrise. Mercury reaches its greatest separation west (to the right) of the Sun on November 1, after which it begins moving sunward once more. The furtive planet will remain visible until mid-November before disappearing into the glow of dawn, and will be on the far side of the Sun (superior conjunction) on December 8.

Phases of the Moon

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

Full moon	**Last quarter**
Sept. 8 at 21:38	Sept. 15 at 22:05
Oct. 8 at 6:51	Oct. 15 at 15:12
Nov. 6 at 17:23*	Nov. 14 at 10:15*
Dec. 6 at 7:27*	Dec. 14 at 7:51*
New moon	**First quarter**
Sept. 24 at 2:14	Oct. 1 at 15:33
Oct. 23 at 17:57	Oct. 30 at 22:48
Nov. 22 at 7:32*	Nov. 29 at 5:06*
Dec. 21 at 20:36*	Dec. 28 at 13:31*

Mars at twilight

Due to its rapid eastward movement relative to the stars, the gap between **Mars** and the Sun has remained constant for the past few months. As such, the Red Planet has appeared at nearly the same place in the sky evening after evening; and it occupies the same place this fall as it did all summer — visible right above the southwest horizon at twilight, an hour after sunset.

From September 24 to October 1, Mars is located less than 4 degrees above Antares and moves to within 3 degrees of the star on September 27. Both objects are about the same brightness (Mars is slightly brighter) so this is a good time to compare their colour: You'll understand why Antares means "rival of Mars". **At twilight on September 29,** the lunar crescent hangs just above Mars and Antares — a sight to enjoy! The Red Planet crosses the border of Sagittarius on October 21, and receives the Moon's company again on October 27 & 28 and November 25 & 26. It enters Capricornus on December 4, where it will end the year and begin the next. The Sun will eventually overtake Mars, engulfing it in its glare, but not before the end of this winter.

Saturn moves from twilight to dawn

At the beginning of autumn, **Saturn** is still visible in the southwest at twilight. On September 27, a thin crescent moon rests just 3 degrees to the right of the planet. Both objects can be seen just above the southwest horizon an hour after sunset. But the gap between Saturn and the Sun diminishes as the evenings go by: The ringed planet appears ever closer to the horizon and becomes lost in the Sun's glare toward the end of October. Saturn passes behind the Sun (superior conjunction) on November 18 and gradually reappears in December, above the southeast horizon at dawn. On the morning of December 19, the lunar crescent will appear 5 degrees to the upper right of Saturn.

Venus behind the Sun

Venus has been shining as the Morning Star since last January, but the dazzling planet disappears into the glow of dawn during the latter half of September. It passes behind the Sun on October 25 and gradually emerges in the evening twilight around the second week of December. Scan the southwest horizon 30 minutes after sunset: What's the earliest date you can spot the Evening Star?

Clear skies!

Research and text: **Marc Jobin**
Adaptation: **Louie Bernstein**

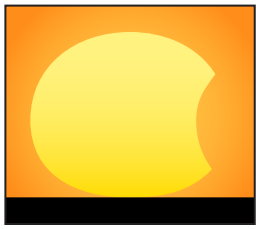
Two eclipses in October

A lunar eclipse at daybreak

The second total lunar eclipse this year, and second in a series of four in 2014 & 2015, will occur **toward night's end and at dawn on October 8.** The eclipse will be visible from Quebec, but under difficult conditions; only the initial partial phases (starting at 5:14 A.M. EDT) will be observable against a dark sky. The rest of the event will unfold close to the western horizon as daylight encroaches: One can expect to lose sight of the Moon when totality begins at 6:25. Throughout most regions of Quebec, the Moon will set during totality: In Montreal for example, moonset will occur at 7:07, a bit after mid-eclipse (at 6:54), and after sunrise, which is at 7:01. However, those in western North America will be able to see the eclipse from beginning to end under a dark sky.

A partially eclipsed sunset

A partial solar eclipse will occur in certain parts of North America **at the end of the afternoon on October 23.**



M. Jobin / Planétarium Rio Tinto Alcan; data from CalSky.com

In Montreal, the eclipse begins at 5:38 P.M. (EDT), just 15 minutes before sunset. As the Sun touches the west-southwest horizon, the Moon's silhouette will barely cover 8% of the Sun's disk (as the above simulation illustrates). A perfectly clear view of the horizon is essential. Those in western and northern regions of the continent are favoured, since they'll see 74% of the Sun's surface hidden by the Moon. **CAUTION: Special filters are required to observe the Sun safely through optical instruments.**

For more details on this subject see the October Sky at **montrealspaceforlife.ca**

Seasonal Milestones

The **autumn equinox** takes place on September 22, 2014, at 10:29 P.M. (EDT), and the **winter solstice** occurs on December 21 at 6:03 P.M. (EST): Autumn will last exactly 89 d 20 h 34 min.

We **return to Eastern Standard Time** at 2 A.M. on the morning of November 2; clocks are set back one hour.

The Pocket Planetarium *is a seasonal information newsletter published by the Rio Tinto Alcan Planetarium, 4801, avenue Pierre-De Coubertin, Montréal (Québec) H1V 3V4*
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