The Pocket Planetarium ★

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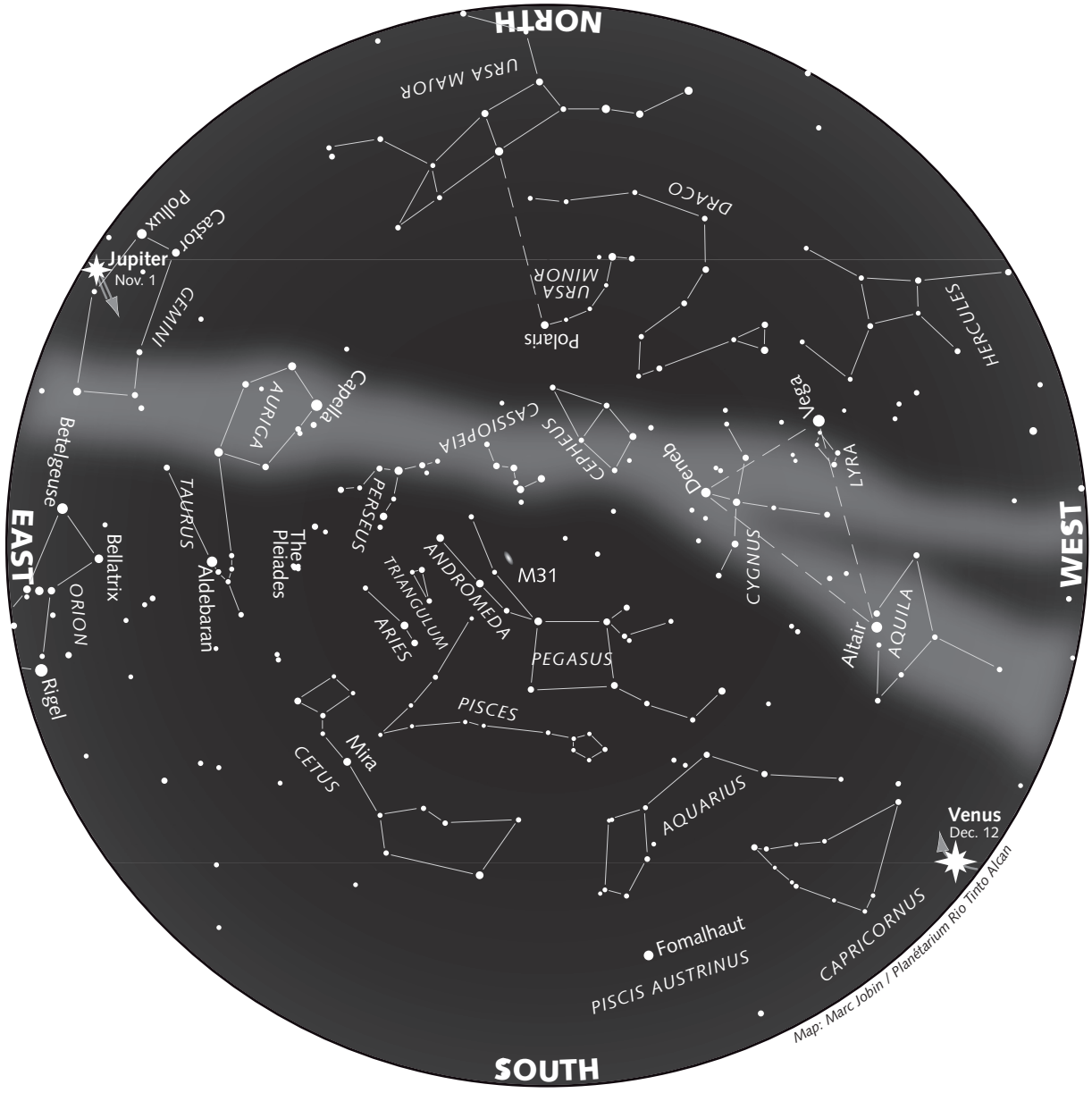
The Starry Sky — Autumn 2013



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

Few planets are visible in the evening sky this fall: Venus sets shortly after twilight ends, while Mars, Saturn and Mercury are only visible in the pre-dawn hours. However, Jupiter appears between the two groups and rises progressively earlier in the evening.

Venus rules the twilight

The less-than-favourable opposition of **Venus,** currently underway, continues throughout the fall: The Evening Star is visible after sunset, low on the southwest horizon. Luckily, Venus is so bright that it pierces the glow of twilight. On November 1, the dazzling planet attains its greatest elongation, 47 degrees east (left) of the Sun. Its visibility improves over the following weeks as the line between Venus and the Sun becomes more vertical with respect to the horizon. The result: Venus finally gains some altitude. But this improvement is gradually cancelled out, as the planet begins to approach the Sun.

Despite its low position in the sky, don't hesitate to observe Venus with a small telescope; as autumn progresses the planet moves closer to Earth, revealing its "dark side" (the side opposite the Sun). Venus will appear like a crescent that gets increasingly thinner and larger: The change in size and shape is spectacular! Over a two-month period, from the beginning of November to the end of December, its apparent diameter will more than double, from 25 to 60 arc seconds, while it changes from a half-Venus to a thin crescent sliver. Around the end of December and beginning of the new year, just a few days before its January 11 inferior conjunction, the Venusian crescent will be about one thirtieth the size of a full Moon.

The crescent Moon will be near Venus, at twilight, on October 7 & 8, and again, early in the evening, on November 6 and December 5.

Jupiter heads toward opposition

Jupiter is currently located among the stars of Gemini. As the season begins, the brilliant planet rises in the east-northeast just after midnight, and by dawn it climbs some fifty degrees above the horizon. Toward the end of October, Jupiter rises around 10 P.M. and culminates high in the south just before 6 A.M. As autumn ends, the giant planet appears as evening begins and culminates around 1:00 in the morning. When Jupiter reaches opposition on January 5, it will remain visible from dusk to dawn.

As the weeks pass, the giant planet gains altitude in the evening sky, eliminating the need to wait till dawn for telescopic observations. You can gradually reacquaint yourself with the cloud bands that stripe its atmosphere as you follow the captivating ballet of its four Galilean moons. **During the night of October 11 to 12,** a rare event will occur: From 00:32 A.M. to 1:37 A.M., three Galilean moons (Callisto, Europa and Io) will simultaneously cast their shadows on Jupiter. The next time this occurs will be on January 23 to 24, 2015; after that, it won't happen again until 2032!

The crescent Moon will be 5 degrees to the lower right of Jupiter on the morning of September 28; next, a gibbous Moon will appear near the giant planet on the nights of October 24 to 26. Then, on the nights of November 21 to 22, and December 18 to 19, the Moon will pass just 5 degrees away from Jupiter.

Mars changes constellations

Mars is visible during the second half of the night. Because of its rapid eastward motion among the stars, the Red Planet appears above the same point on the horizon from night to night. Look for it about 3:00 A.M. EDT (2:00 A.M. EST) 10 degrees above the eastern horizon. Mars enters Leo on September 26, heading toward Regulus; it passes within a degree of the bright star, **on the mornings of October 15 & 16.** The planet's orange hue offers a remarkable contrast next to the blue-white colour of Regulus. Mars continues its course among the constellations and moves into Virgo on November 25. Its brightness gradually increases, though it is still far from Earth and remains quite small when seen through a telescope. The situation will improve over the winter as the Red Planet approaches opposition in April.

The crescent Moon will be near Mars on the mornings of September 30 & October 1, and again on the mornings of October 29 & 30. On the morning of November 27, the lunar crescent will be less than 6 degrees to the right of the Red Planet.

Saturn in the morning sky

As fall begins, **Saturn** is located to the right of Venus at twilight; on October 7, the crescent Moon appears between the two planets. However, Saturn sinks gradually closer to the west-southwest horizon as night falls: The ringed planet vanishes in the glow of twilight during the latter half of October and moves behind the Sun (conjunction) on November 6.

After mid-November, Saturn reappears at dawn above the east-southeast horizon, and rises to meet Mercury: The two planets are closest to one another on the mornings of November 25 & 26. **On the morning of December 1,** about 45 minutes before sunrise, a very thin lunar crescent will appear suspended just below the ringed planet. Mercury is not far away to the lower left of the Moon, and adds its presence to this beautiful morning twilight scene. Over the following weeks, Saturn continues to ascend away from the Sun, climbing ever-higher above the southeast horizon. By the end of autumn, an hour before sunrise as dawn breaks, the ringed planet will be about 20 degrees high. However, patience is in order: Saturn will be at its best next May...

Mercury at dawn

This fall, **Mercury** offers its best apparition of the year in the morning sky. Starting with the second week of November, you'll find the tiny planet above the east-southeast horizon at dawn, about 45 minutes before sunrise. On the 18th, Mercury reaches its greatest elongation west (right) of the Sun, and then re-descends toward the horizon. Meanwhile, the furtive planet meets Saturn, which is rising away from the Sun: **On the morning of November 26,** the two planets are about half-a-degree apart; Mercury is below Saturn and the brighter of the two. On December 1, 40 minutes before sunrise, the lunar crescent will appear just above the horizon between both planets. The gap between Mercury and the Sun diminishes from day to day: By mid-December, the tiny planet vanishes in the glow of dawn and passes behind the Sun (superior conjunction) on the 29th.

Clear skies!

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Adaptation: **Louie Bernstein**

Phases of the Moon

*(Eastern Daylight Time; * = Standard Time)*

New moon	First quarter
Sept. 5 at 7:36	Sept. 12 at 13:08
Oct. 4 at 20:34	Oct. 11 at 19:02
Nov. 3 at 7:50*	Nov. 10 at 0:57*
Dec. 2 at 19:22*	Dec. 9 at 10:12*
Full moon	**Last quarter**
Sept. 19 at 7:13	Sept. 26 at 23:55
Oct. 18 at 19:38	Oct. 26 at 19:40
Nov. 17 at 10:16*	Nov. 25 at 14:28*
Dec. 17 at 4:28*	Dec. 25 at 8:48*

The Geminids drown in moonlight

The Geminids, one of the top three annual meteor showers — even more numerous than the famous Perseids — will reach their maximum activity on December 14, around 1:00 in the morning. Their radiant is near the twin stars, Pollux and Castor. However, this year, the Geminids will be submerged in the light of the nearly-full Moon. Since they offer fewer bright meteors than the Perseids, and since their period of activity is shorter, the Geminids are even more affected by the Moon's presence. Conditions will be much better in 2014.

Seasonal Milestones

The **autumn equinox** will take place on September 22 at 4:44 P.M. EDT; the **winter solstice** will occur on December 21 at 12:11 P.M. EST: Autumn will last 89 d 20 h 27 min.

During the night of November 2 to 3, we **return to Eastern Standard Time:** 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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