The Pocket Planetarium ★

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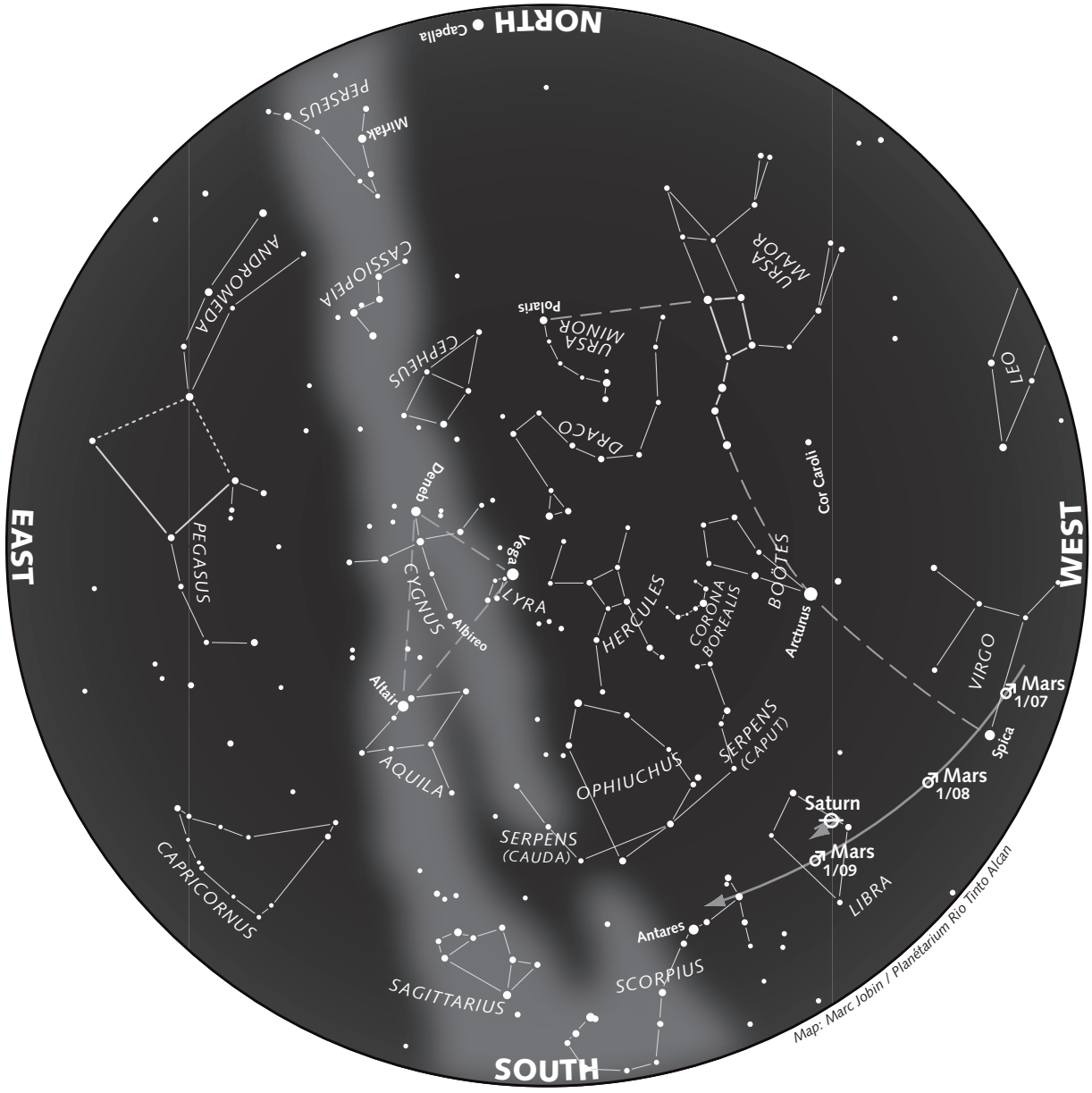
Astronomical Information Newsletter of the Rio Tinto Alcan Planetarium

The Starry Sky — Summer 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)

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.

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The Sky This Summer

Mars and Saturn are still observable early in the evening. But the most spectacular planetary display of the year will occur at dawn, as Venus and Jupiter come within a hair's breadth of each other.

Saturn visible in the evening

There's still time to observe **Saturn** with a telescope during the first few weeks of summer: Toward the end of June and beginning of July, the ringed planet culminates in the south at twilight and sets in the west-southwest after midnight. To see the most of Saturn's rings and observe Titan, the planet's largest moon, it's best to get started when the evening is young. As the season advances, Saturn will appear progressively lower in the sky at twilight: By summer's end it will hover just ten degrees above the southwest horizon at nightfall.

Because Saturn is the farthest of the bright planets, it moves the slowest against the background stars: It takes nearly thirty years to complete one tour of the zodiac constellations. Until July 21, the planet moves in retrograde (to the right) among the stars of Libra, after which it resumes its direct course toward the east. Mars steadily approaches the ringed planet and passes less than four degrees beneath it from August 21 to 28.

On July 7 at twilight, a gibbous moon will appear one degree below Saturn, but the gap between the two grows as the evening progresses. At nightfall on August 3, a first quarter moon will appear to the right of the ringed planet. **On August 31,** a lunar crescent will form a flat celestial triangle with Saturn to the right and Mars to the lower left: Look for this spectacular trio in the twilight, just above the southwest horizon.

Seasonal Milestones

This year the **summer solstice** occurs on June 21 at 6:51 A.M. (EDT); the **autumn equinox** will take place on September 22 at 10:29 P.M. Summer will last exactly 93 days 15 hours 38 minutes.

On July 3 at 8 P.M. (EDT), Earth is at **aphelion,** the point on its orbit farthest from the Sun. The Earth–Sun distance will then be 152 093 481 km.

Phases of the Moon

(Eastern Daylight Time)

Full moon	Last quarter
June 13 at 0:11	June 19 at 14:39
July 12 at 7:25	July 18 at 22:08
August 10 at 14:09	August 17 at 8:26
Sept. 8 at 21:38	Sept. 15 at 22:05
New moon	**First quarter**
June 27 at 4:08	July 5 at 7:59
July 26 at 18:42	August 3 at 20:50
August 25 at 10:13	Sept. 2 at 7:11
Sept. 24 at 2:14	October 1 at 15:33

Mars flees the Sun

Mars was at opposition last April. Since then, the Red Planet has moved away from Earth and is beyond the range of small amateur telescopes: Its surface details are now very difficult to discern. However, observations continue with the naked eye.

Over the coming weeks, Mars' rapid eastward movement causes its separation from the Sun to remain about the same. From evening to evening, at the end of twilight, the Red Planet can be found hovering at the same point in the sky, about 15 degrees above the southwest horizon. In comparison, the background stars of Virgo continue to parade past Mars, which passes a little over a degree north of Spica **on July 13.**

On July 5 at twilight, the first quarter moon will be less than half-a-degree below the Red Planet; the gap between the two will increase over the course of the evening. On August 2 at nightfall, a lunar crescent will appear 5 degrees to the right of Mars; and the following evening, the first quarter moon will be to the planet's left, near Saturn.

Mars crosses into Libra on August 10 and quickly approaches Saturn: **From August 21 to 28,** Mars will appear less than 4 degrees below the ringed planet. The gap between the two will be at a minimum on the evening of the 25th. A crescent moon will join the duo **on August 31 at twilight.** On September 13, Mars crosses into Scorpius and moves toward Antares.

Venus and Jupiter meet at dawn

Venus has been visible at dawn since January, but its presence in the morning sky is coming to an end. The dazzling planet approaches the Sun and appears lower on the horizon with each passing day: It can be seen shining in the morning twilight, in the east-northeast, an hour before sunrise. **On June 24,** the crescent moon will appear less than 3 degrees to the right of Venus; on July 24, the lunar crescent will again appear next to the brilliant planet, this time 6 degrees to its right.

Also on July 24, **Jupiter** is in conjunction with the Sun, which means it will pass behind our star. During the first half of summer, the giant planet will remain completely submerged in the glare of sunlight, but it reemerges in the dawn sky around August 8 or 9. Look for Jupiter low on the east-northeast horizon, just below brilliant Venus, about 45 minutes before sunrise. Needless to say, a perfectly unobstructed horizon is essential.

Over the following days, Jupiter quickly rises to meet Venus and the gap between the two brightest planets closes: **On the morning of August 18, one hour before sunrise,** Venus and Jupiter will be a quarter-of-a-degree apart — that's half the apparent diameter of the Moon! The morning after this conjunction (the most spectacular of the year), the two planets will move apart once more: Venus continues its sunward plunge while Jupiter gains some altitude. **On the morning of August 23,** a crescent moon will join the pair creating a magnificent scene in the dawn sky.

In September, Venus will gradually disappear in the Sun's glare: It will pass behind the Sun (superior conjunction) on October 25. As for Jupiter, the giant planet continues to gain more altitude with each passing day; early on the morning of September 20, a lunar crescent will appear to Jupiter's lower right before dawn.

A bleak year for the Perseids

As it does each summer, the famous Perseid meteor shower will return around mid-August, but specialists expect a rather poor show this year. The Moon is to blame: It will be full on August 10, just two days before the Perseids' maximum, which is forecast to arrive around 8:00 P.M. on August 12. During the night of the 12th to 13th the Moon will become visible at the end of twilight, and its glare will flood the night until dawn, drowning out many faint meteors; as the shower's radiant rises in the sky moonshine will counter the increase in meteoric activity. Next year's show should be better since the Perseids will occur around the new moon...

Mercury in the morning sky

This summer, **Mercury** will offer its only interesting apparition in July. The elusive planet is visible in the morning sky, low on the east-northeast horizon about 45 minutes before sunrise. Mercury reaches its greatest elongation west (to the right) of the Sun on July 12, after which it gradually descends sunward. However, it also gets brighter during the second half of July, which will help to spot it a few degrees to the lower left of dazzling Venus. At dawn on July 25, a very thin lunar crescent will appear to the right of Mercury, 30 minutes before sunrise. Around the end of July, the tiny planet vanishes in the glow of daybreak.

Clear skies!

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