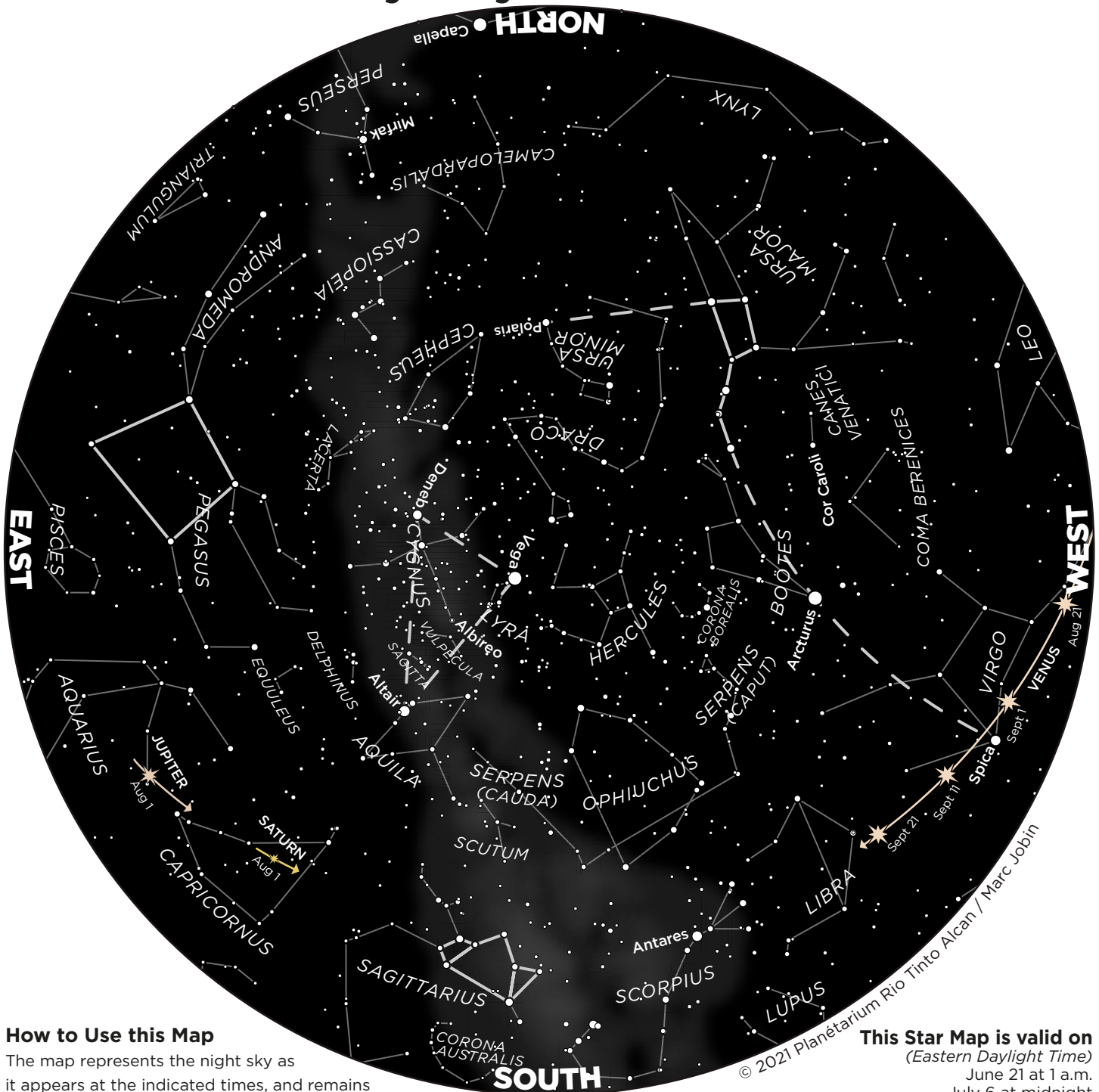


## The Starry Sky – Summer 2021



### How to Use this Map

The 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 shaded area outlines the Milky Way.

### This Star Map is valid 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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# Venus and Mars dancing at twilight

*Venus and Mars will be treating us to a three-act show after the Sun goes down during the first weeks of summer.*

**D**espite it appearing quite low on the horizon at nightfall, **Venus** is likely the first planet you'll spot, blazing so brightly that it pierces the veil of twilight. In the second half of June, you can find it about 10 degrees above the west-northwestern horizon, 30 minutes after sunset. But don't wait too long or you'll miss the beautiful Evening Star, which disappears beneath the horizon only an hour and a half after our daytime star.

Although Venus is the attention grabber, Mars should not be overlooked. But at magnitude +1.8, the Red Planet is now significantly dimmer than it was at the time of its opposition in October 2020—and nearly 200 times dimmer than Venus—so, you'll have to wait for the sky to darken further in order to get a good view. When summer arrives, Mars will be about 10 degrees above the west-northwestern horizon, 45 minutes after the Sun sets.

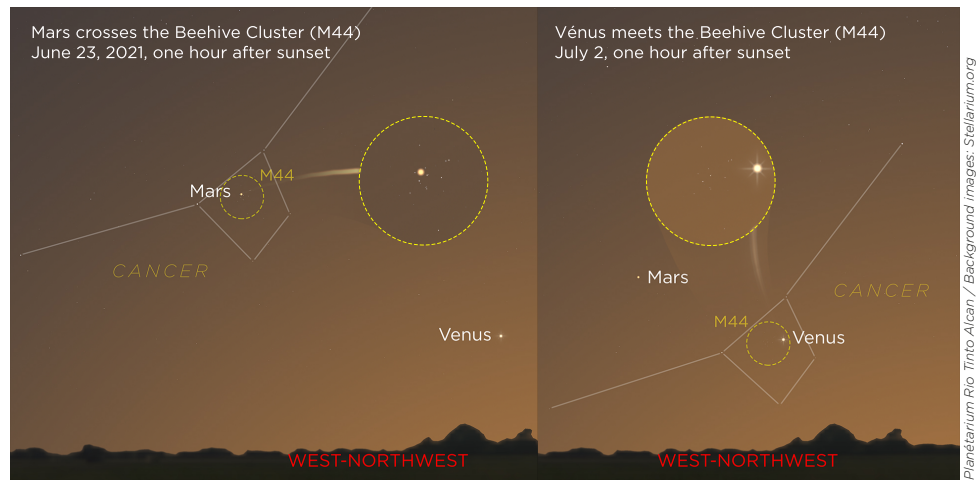
### Act I: Encounters with the Beehive

Take a closer look and you'll see that **Mars** has company in early summer. Binoculars or a small, low-magnification telescope will reveal a group of tiny stars close to the Red Planet: This star cluster is known as the Beehive Cluster (M44), located at the centre of the constellation Cancer, 577 light-years from our Solar System. **On the evening of June 23**, Mars will pass directly in front of the cluster—a single ruby set against a backdrop of diamonds. The challenge is to find the best time to

fully enjoy this spectacular scene: To get a good view, one must wait for the sky to be dark enough, but before the constellation Cancer sinks too low on the horizon. Start tracking it 45 minutes after the Sun goes down: Viewing conditions should be optimal about one hour past sunset. You'll need a perfectly clear horizon to stand any chance of success.

Mars continues its eastward dash through the stars, sweeping past M44 just one day after its encounter with the cluster. The focus should now shift to Venus, since it is also travelling eastward through the constellations and towards the heart of

Cancer. Venus's turn to cross paths with M44 comes only a few days later: **On the evening of July 2**, the dazzling Evening Star will brush by the star cluster. Viewing will be trickier this time because the Sun is approaching Cancer, which means this spring constellation is now very low on the horizon at twilight: One hour after sunset, Venus and the Beehive Cluster will be just 4 degrees high in the sky. And while the planet is easily visible that close to the horizon, the same cannot be said for the cluster of faint stars: Viewing conditions have to be perfect to stand any chance of spotting them in a small telescope.

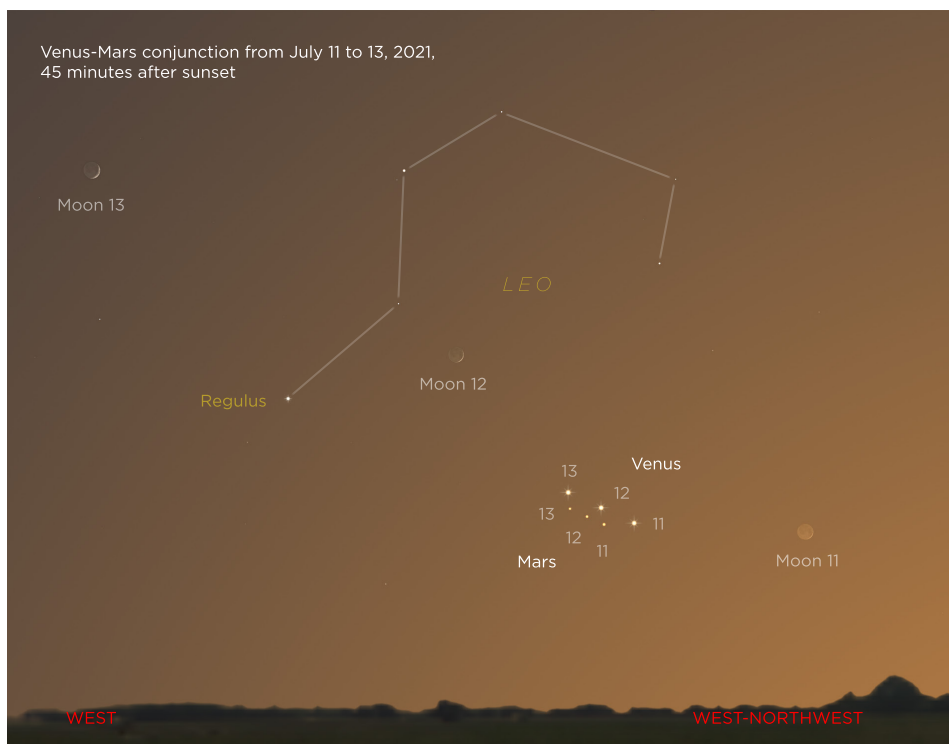


Planetarium Rio Tinto Alcan / Background Images: Stellarium.org

### Act II: Duo at twilight

As Venus continues its eastward march, you may notice that it is moving faster than the Red Planet and that the gap between the two planets is decreasing with every passing evening. Venus and Mars will eventually slide past one another. **On July 11**, 45 minutes after sunset, Venus can be seen above the west-northwestern horizon, with Mars just 1 degree to its left and, as a bonus, a thin lunar crescent just 5 degrees to its right; the three celestial bodies will line up beautifully parallel to the horizon.

However, the ultimate encounter takes place **on July 12 and 13 at twilight**, when the two planets will pass less than 1/2 a degree from each other. On the 12<sup>th</sup>, the crescent Moon can be found 7 degrees higher and to the left of the planetary duo. After several minutes, when the twilight colours begin to fade and the sky grows darker, a few stars will emerge to the upper left of Venus and Mars: You'll recognize the Sickle asterism, similar to a mirror image of a question mark pattern that outlines the celestial Lion's head and mane; Regulus, located at the base of this question mark, represents the Lion's heart. ➡

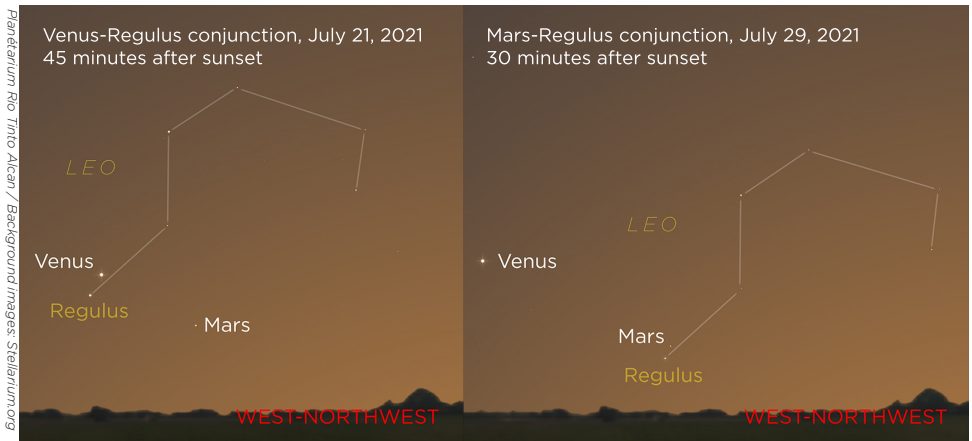


Planetarium Rio Tinto Alcan / Background Image: Stellarium.org

**Act III: Rendez-vous with Regulus**

The constellation Leo, which culminates in late winter and spring, is about to get swallowed up by the Sun, and Regulus will be the first to slip beneath the horizon. This first-magnitude star is the next target of our two planets, which continue their journey across the celestial sphere. Venus has now taken the lead, having caught up with and overtaken Mars. **On July 21 at twilight**, the bright Evening star glides just over 1 degree north of Regulus: 45 minutes after sunset, the pair hangs a mere 6 degrees above the western horizon.

As the evenings progress and Venus pulls away from Regulus, Mars inches ever closer to it. **On July 29 at twilight**, the Red Planet lies just over 1/2 a degree above the star: 30 minutes after the Sun goes down, the pair hangs a mere 4 degrees above the horizon. The finale is almost here for Mars: The Sun is relentlessly closing in on the planet, which will disappear in the solar glare around mid-August. Venus, on the other hand, will remain visible after sunset until early 2022. ★



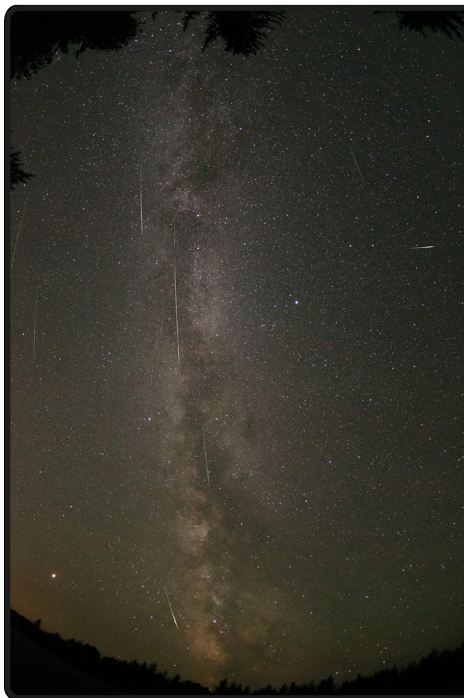
**SEASONAL MILESTONES**

The **summer solstice** happens on June 20, 2021 at 11:32 p.m. EDT, and the **autumn equinox** is set to occur on September 22 at 3:21 p.m. Summer 2021 will last exactly 93 days 15 hours 49 minutes; it is the longest of the four astronomical seasons.

On July 5 at 6:27 p.m. EDT, Earth reaches **aphelion**, the point in its elliptical orbit farthest from the Sun: The Earth-Sun distance will then be 152,100,527 km, 5 million kilometres more than at the time of perihelion in early January.

**PHASES OF THE MOON**  
*(Eastern Daylight Time)*

<b>New moon</b>	<b>First quarter</b>
June 10 at 6:53	June 17 at 23:54
July 9 at 21:17	July 17 at 6:11
August 8 at 9:50	August 15 at 11:19
September 6 at 20:52	September 13 at 16:39
<b>Full moon</b>	<b>Last quarter</b>
June 24 at 14:40	July 1 at 17:11
July 23 at 22:37	July 31 at 9:16
August 22 at 8:02	August 30 at 3:13
September 20 at 19:55	September 28 at 21:57

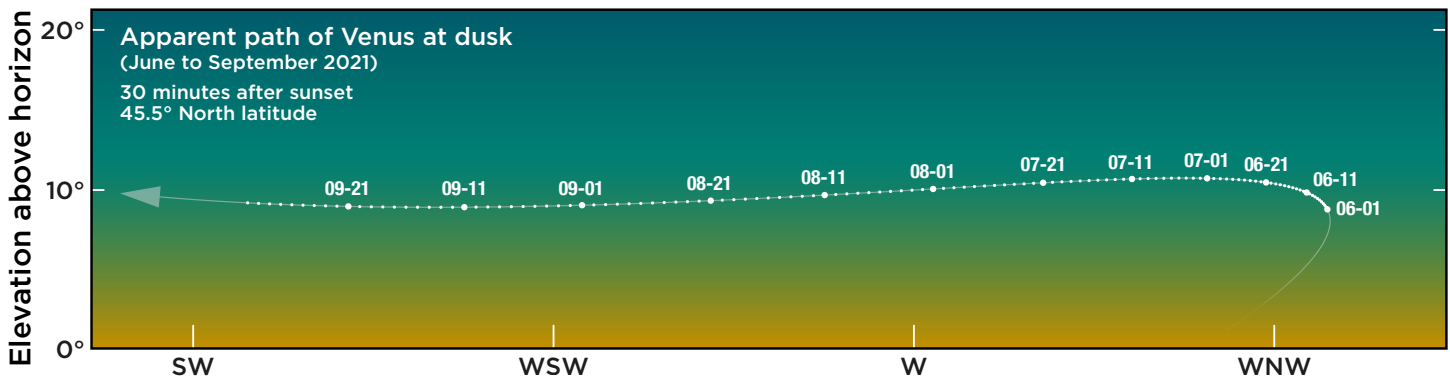


**GET READY FOR THE PERSEIDS!**

**The Perseid meteor shower**—a classic among classics—is synonymous with beautiful summer nights. Although ranked third among the annual meteor showers in terms of intensity, the Perseids are the best known and certainly the most popular because they take place during the summer, making them a big draw for avid star gazers.

In 2021, the “traditional” peak of Perseid activity is expected between 3 and 6 p.m. (ET) on August 12—late afternoon for us. However, observations in recent years have shown variability in the exact moment Earth crosses the densest parts of the meteor stream, which roughly follows the orbital path of comet Swift-Tuttle, meaning that this window could in fact extend from 10 a.m. to 11 p.m. on August 12. **The night of August 12-13 is the one closest to peak activity, but the night of August 11-12 will be almost as good.** The Perseids will put on a great show this year because the Moon will be new on August 8 (first quarter occurs on the 15<sup>th</sup>), making for perfect viewing conditions during the more favourable second half of the night, when the radiant (located above the northeastern horizon in the evening) climbs higher in the sky. During the two nights closest to peak activity, one can expect up to 50 meteors per hour under clear, dark skies, free from light pollution. Keep in mind that the Perseids are active (though at lower rates) from mid-July to the third week of August, so you’ll probably get a chance to spot a few shooting stars during your summer stargazing adventures. More about the Perseids and tips for observing meteors on our Website at: [espacepourlavie.ca/en/perseids](https://espacepourlavie.ca/en/perseids)

*Left: Many meteors, Perseids and others, have left luminous streaks on this composite image taken on the night of August 12-13, 2018, during the peak of the Perseids. (Photo: Marc Jobin)*





# The Sky This Summer

*Venus shines very low in the western twilight sky where it crosses paths with Mars, which is slowly disappearing in the Sun's glare. Saturn and Jupiter will be at their best in August when they reach opposition within weeks of each other.*

## Spotlight on Saturn and Jupiter

The two gas giants, Jupiter and Saturn, will be on full display this summer. Although the gap between them has widened since last year, they continue to form a striking duo in the sky.

**Saturn** is the first to emerge in the southeast: In early summer, it appears above the horizon before midnight and culminates 27 degrees above the southern horizon at dawn. As the weeks go by, Saturn rises and culminates earlier: By mid-July, it emerges before 10 p.m. and culminates around 2 a.m., and by mid-August, it rises before 8 p.m. and culminates at midnight.

Located about 18 degrees to the left of Saturn, the very brilliant **Jupiter** trails its fellow gas giant by less than an hour but culminates slightly higher, at approximately 30 degrees above the southern horizon.

Saturn spends the entire summer within the borders of the constellation Capricornus, where it undergoes its retrograde loop from May 23 to October 10. Jupiter is also in retrograde motion from June 20 to October 10, but it straddles the border of Aquarius and Capricornus, crossing it on August 18. Saturn reaches opposition on August 2, then Jupiter sweeps to opposition a few days later, on August 19.

Before you point your telescope at the planets, wait for them to reach their highest point in the sky: The image quality will be better. Saturn's famous rings, tilted about 18 degrees this summer, are spectacular. You'll be amazed by Jupiter's four Galilean moons, which are visible in nearly any optical instrument and constantly change positions over a matter of hours; in a larger telescope, the planet's turbulent atmosphere, with its light and dark cloud bands complete with swirls and vortices, will blow you away.

The Moon will meet up with the two planets several times in the coming months. The waning gibbous Moon moves to within 5 degrees below Saturn **on the night of June 26-27**, and shines 6½ degrees below Jupiter **on the night of June 28-29**. The full Moon swings 8 degrees below Saturn by the end of **the night of July 23-24**. **On the evening of July 24**, the waning gibbous Moon can be found 7 degrees below the ringed planet; the Moon will form a striking duo with Jupiter **on the night of July 25-26**. **On the evening of August 20**, the waxing gibbous Moon lies a mere 4½ degrees south of Saturn. Toward the end of **the night on August 21-22**, the full Moon moves within 4 degrees south of Jupiter. **On the night**

**of September 16-17**, the waxing gibbous Moon swings 4 degrees south of Saturn and the following night, **on September 17-18**, it moves within 4½ degrees south of Jupiter.

## Venus, the discreet Evening Star

**Venus** is one of two planets visible in the early evening this summer. However, the beautiful Evening Star is in the midst of an apparition that can only be described as downright poor: In fact, even though Venus gradually pulls away from the Sun over the next few months, it barely gains any altitude, thanks to unfavourable celestial geometry. It's a good thing the planet is so bright, because it peaks at less than 10 degrees above the horizon at the end of civil twilight, slowly working its way from west-northwest to west-southwest as the weeks go by. Venus sets less than 90 minutes after the Sun throughout summer, which means you'll have to act fast if you plan on pointing an optical instrument in its direction.

A small telescope is all you need to clearly make out Venus's phases, much like those of the Moon. This summer, Venus appears "gibbous" but slowly changes phase: The illuminated portion of its disc shrinks from 92% to 65%, while its size grows from 11 to 18 arc seconds.

Apart from its duet with Mars in June and July (see other text), Venus also encounters the thin lunar crescent **on the evening of September 9**: The Moon will lie a mere 4 degrees to the upper right of the dazzling Evening Star, low in the west-southwest, 30 to 45 minutes after sunset.



Planétarium Rio Tinto Alcan / Background image: Stellarium.org

## Mercury in the morning sky

**Mercury**, the planet closest to the Sun, has short periods of visibility that alternate between dusk and dawn. This summer, the tiny planet makes an average appearance in the morning sky between June 28 and July 21: Look for Mercury above the east-northeastern horizon about 30 to 45 minutes before sunrise. Too faint to be visible in the glow of daybreak before the final days of June, Mercury becomes considerably brighter at the end of this viewing window but loses significant altitude since it is moving towards the Sun. Viewing conditions will be optimal from July 1 to 18. **On the morning of July 8**, the very thin waning Moon will lie 4 degrees to the left of Mercury.

*Clear skies!*

Research and text: **Marc Jobin**