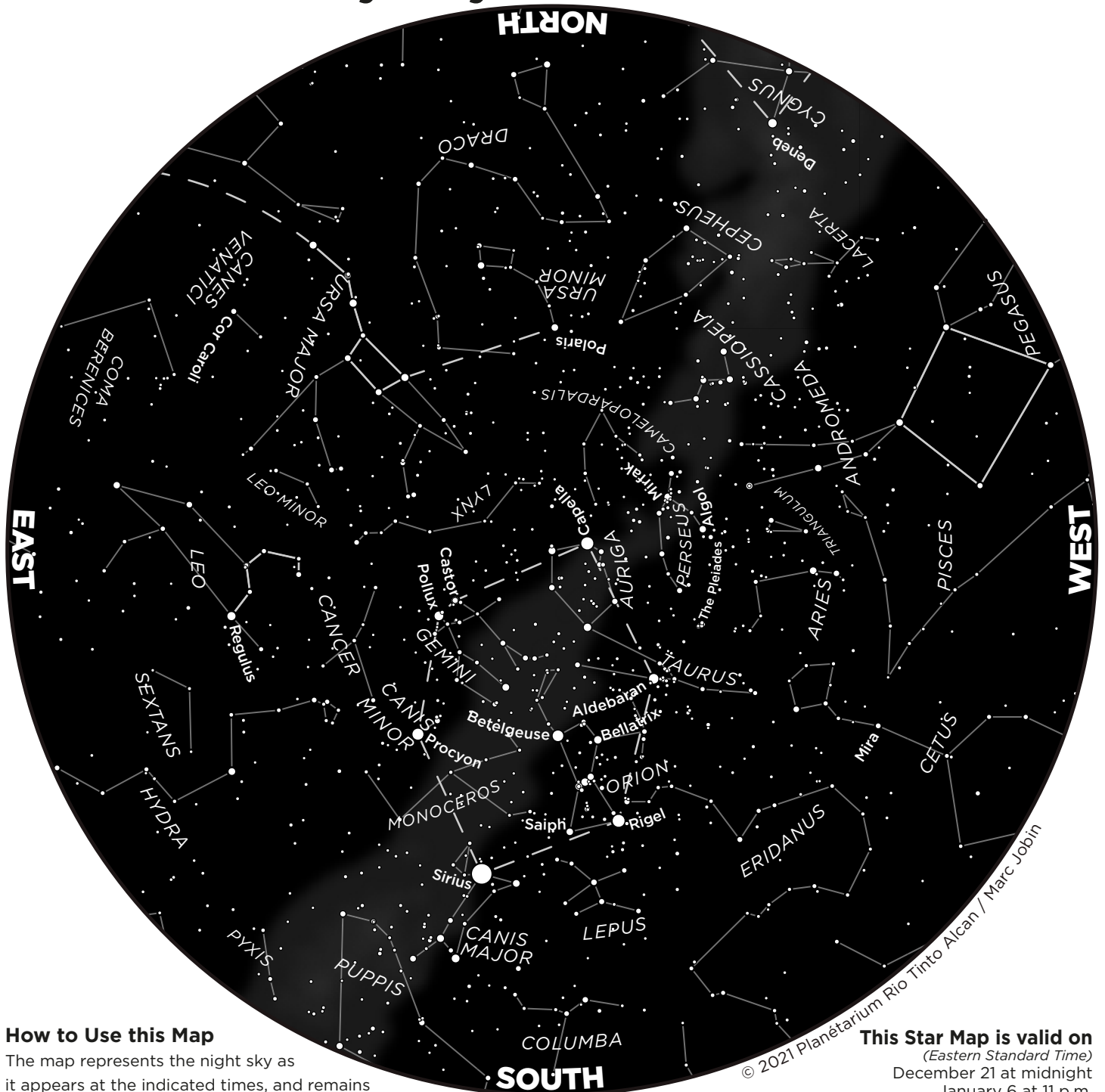


The Starry Sky – Winter 2021-22



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 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.

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The Sky This Winter

The planets that have graced our evenings over the past few months vanish one by one in the Sun's glare this winter; some will quickly re-emerge in the morning sky, while others will stay hidden until springtime.

Venus becomes the Morning Star

In 2022, early risers will likely be the only ones out there enjoying a (very) early morning apparition of **Venus**, which will continue for most of the year. The bright Evening Star disappears in the dazzle of the setting Sun as of the final days of December; it reaches inferior conjunction (between the Earth and the Sun) on January 8 and officially re-enters the morning sky.

Venus quickly pulls away from the Sun and, only a few days later, around mid-January, the new Morning Star becomes increasingly visible above the east-southeastern horizon, about 30 minutes before sunrise. A few weeks later, around mid-February, Venus climbs to 18 degrees above the southeastern horizon just as civil dawn begins; that's also when the planet shines its brightest (magnitude -4.8), around February 9. But Venus won't get any higher during this morning apparition, because even though the planet is still moving away from the Sun, the unfavourable inclination of the ecliptic to the horizon becomes an issue: After mid-February, Venus sinks ever lower as it slowly glides along the horizon from southeast to east-northeast as the weeks go by. Venus reaches its greatest elongation, 46.6 degrees west of the Sun, on March 20, but it has already dipped a good 5 degrees at dawn.

Venus puts on a fascinating show in any small telescope, changing shape and size over the weeks and months: In fact, this lovely planet has phases much like the Moon's. When Venus emerges in January, it appears as a thin but very long crescent (3% for a diameter of 60 arc seconds), after which the size of its disc decreases rapidly, while its illuminated portion increases. Venus is moving away from the Earth and is showing us more of its sunlit side. Around mid-February, when it shines at its maximum for this apparition, its disc will appear as a thick crescent (26%) with a significantly smaller diameter (40 arc seconds). And when Venus reaches its greatest elongation on March 20, its brightness will have faded a little (magnitude -4.5); through a telescope, the planet appears as a "half-Venus," 24 arc seconds in diameter.

On February 26 at dawn, the thin waning Moon lies 13 degrees to the right of Mars and Venus, low in the southeast, 45 minutes before sunrise. **The next morning, February 27**, the very thin crescent Moon hangs 4½ degrees below Mars and 9½ degrees below the dazzling Venus; the three celestial bodies will form a nearly vertical line, very low in the southeast, 30 minutes before sunrise. You can also track how the angular separation between Venus and much fainter Mars changes with each passing day: **On March 16**, the angle reaches its minimum, with less than 4 degrees separating the pair.

Mercury shows up at twilight

Mercury ends 2021 and kicks off 2022 with a very good showing in the evening sky: **From late December until January 16**, you should be able to spot Mercury above the southwestern horizon, 30 to 45 minutes after sunset. The tiny planet is considerably brighter at the beginning of this apparition and quickly dims after mid-January, as it plunges back toward the horizon; the prime viewing window extends from January 1 to 13. Mercury reaches inferior conjunction (between the Earth and the Sun) on January 23 and emerges in the morning sky, where it makes an average appearance: **From January 31 to February 25**, 45 minutes before sunrise, look for the little planet low on the southeastern horizon. Mercury is too faint before the end of January, and then dips too low in late February; the best visibility occurs from February 4 to 23.

On January 3 at twilight, the very thin lunar crescent lies 5 degrees below Mercury and 11 degrees due left of the very brilliant Venus; however, the Moon will be very difficult to spot, very low on the southwestern horizon a mere 20 minutes after the Sun sets.

Saturn and Jupiter washed out by the Sun

When 2022 gets underway, **Saturn** will still be visible very close to the southwestern horizon at twilight; **late in the day on January 4**, 45 minutes after sunset, the thin crescent Moon hangs 5 degrees to the lower left of Saturn. But this period of visibility will soon come to an end, as the ringed planet slowly vanishes in the glow of the setting Sun after January 20. Solar conjunction occurs on February 4, and Saturn reappears in the morning sky by month's end, very low in the east-southeast, 30 minutes before sunrise. Saturn gradually pulls away from the Sun over the next few weeks, and at the spring equinox, it can be seen above the east-southeastern horizon, 45 minutes before daybreak, lower and to the left of dazzling Venus.

The considerably brighter **Jupiter**, located about 20 degrees east of Saturn, dominates the sky at nightfall during the first weeks of

winter. But the giant planet is also about to disappear in the glare of sunset: It will be fairly easy to spot until mid-February, very low on the southwestern horizon, 30 to 45 minutes after sunset, eventually vanishing during the third week of February. Jupiter is in solar conjunction on March 5, when it is 5.97 AU away from us. It reappears in April, due east at dawn.

On January 5 at twilight, the thin lunar crescent lies 5 degrees below Jupiter; admire the pair low in the southwest, 45 minutes after sunset and in the early evening. **On February 2 at twilight**, the thin crescent hangs 4½ degrees to the lower left of Jupiter, low on the west-southwestern horizon, 30 minutes after sunset.

Return of the Red Planet

After its solar conjunction on October 8, **Mars** is slowly returning to the morning sky. But the Red Planet is only visible at the very end of the night and just before the first light of dawn, very low in the southeast. It is still far from Earth (more than 2.3 AU), tiny and fairly dim (mag. +1.5), but you can track the planet's movement through the constellations—it's worth the effort. Starting in Ophiuchus early in the year, near the star Antares in Scorpius, Mars then enters Sagittarius on January 19 and Capricornus on March 5, where it eventually crosses paths with Venus (on March 16) and Saturn (on April 5).

On the morning of January 29, the thin waning Moon lies a mere 3½ degrees to the lower right of Mars, low in the southeast, 1 hour before sunrise. Venus shines like a beacon about 10 degrees to the left of Mars—note how the two planets cozy up to one another over the next few weeks. **On the morning of February 27**, the very thin crescent Moon hangs 4½ degrees below Mars and 9½ degrees below Venus; the three celestial bodies will line up vertically, very low in the southeast, 30 minutes before sunrise. **On March 16**, the angular separation between Venus and Mars is at its smallest, at roughly 4 degrees.

Clear skies!

Research and text: **Marc Jobin**

SEASONAL MILESTONES

The **winter solstice** happens on December 21, 2021 at 10:59 a.m. EST, and the **spring equinox** occurs on March 20, 2022 at 11:33 a.m. EDT. This winter will last exactly 88 days 23 hours and 34 minutes.

Earth reaches **perihelion**, closest to the Sun, on January 4 at 1:52 a.m. The Earth-Sun distance is then "just" 147 105 052 km.

The switch to Eastern Daylight Time takes place early on Sunday morning, March 13: Set your clocks ahead one hour.

PHASES OF THE MOON

(Eastern Standard Time, except * = Daylight Time)

New moon	First quarter
December 4 at 2:43	December 10 at 20:35
January 2 at 13:33	January 9 at 13:11
February 1 at 0:46	February 8 at 8:50
March 2 at 12:35	March 10 at 5:45
Full moon	Last quarter
December 18 at 23:35	December 26 at 21:24
January 17 at 18:48	January 25 at 8:41
February 16 at 11:56	February 23 at 17:32
March 18 at 2:17*	March 25 at 0:37*