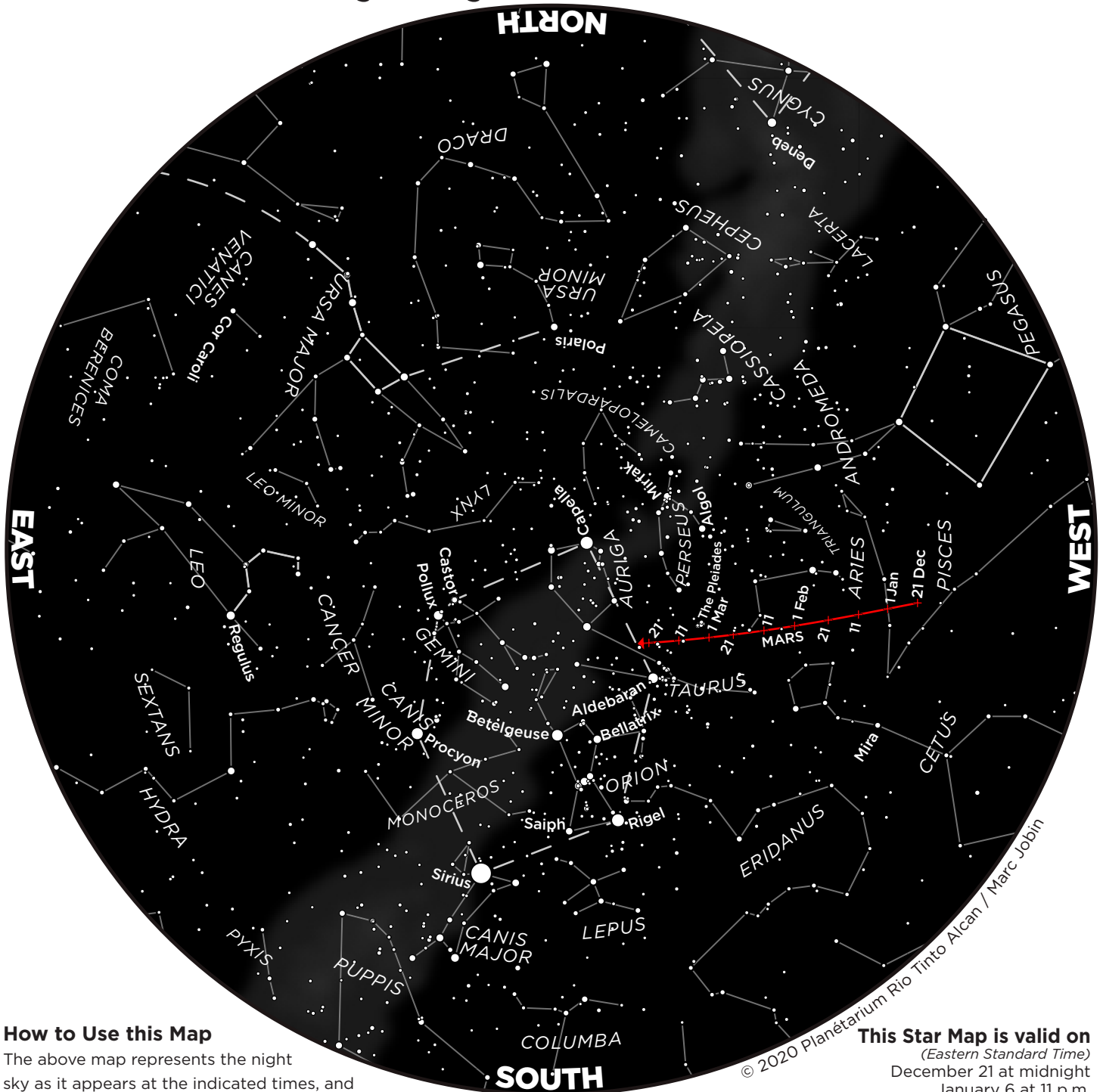


The Starry Sky – Winter 2020-21



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.

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

One by one, Venus, Jupiter and Saturn head behind our star—the Sun—and disappear in its glare. Mars remains visible in the evening sky, where Mercury also puts in an appearance.

Mars accompanies our evenings

Several months have passed since October 6, when **Mars** made its closest approach to Earth during a very favourable opposition. The Red Planet has already pulled far away from us and will continue to do so until fall 2021. As such, it appears increasingly smaller and has already waned considerably. It nevertheless remains clearly visible in the evening sky throughout the winter and even into spring. During the last evenings of December, Mars can be found striding high in the southeast at dusk, appearing as a still-bright (mag -0.5) orange star that culminates nearly 55 degrees high around 7 p.m. and disappears below the western horizon after 1:30 a.m. But Mars culminates earlier and earlier: By late January, it stands 60 degrees high in the south before the end of twilight and sets in the west-northwest around 1 a.m. In March, the Red Planet is still visible high overhead in the southwest at nightfall, but given its magnitude of around +1, it is noticeably fainter than at the start of the season.

Mars can easily be tracked with the naked eye as it dashes eastward through the constellations. On January 5, the Red Planet crosses the constellation border into Aries from Pisces, and then enters Taurus on February 23. It draws ever closer to the Pleiades and, **on the evening of March 3**, comes to within just 2½ degrees south of the star cluster. The planet continues on its journey, wandering between

the Hyades and Pleiades star clusters **from March 5 to 9**. Note that while Mars is a little less luminous than the star Aldebaran, the two have a similar reddish colour.

When viewed through a telescope, Mars is unfortunately shrinking rapidly: By late December, its apparent diameter decreases below 11 arc seconds (half of what it was at opposition), and by winter's end, Mars will be only 6 arc seconds across. While this makes it considerably more difficult to distinguish surface details, it also presents a wonderful challenge for amateur astrophotographers.

The Moon and Mars meet up several times this winter. On the evening of December 23, the waxing gibbous Moon comes to within 5½ degrees south of the Red Planet. On the evening of January 20, the first quarter Moon lies 7 degrees below Mars; the next evening, the gibbous Moon can be found 8 degrees higher and to the left of the planet. On the evening of February 18, the gibbous Moon passes less than 4 degrees to the south of the Red Planet. Finally, **on the evenings of March 18 and 19**, the lunar crescent joins the remarkable Hyades-Pleiades-Mars trio: simply breathtaking!

Mercury makes a fine appearance

At mid-northern latitudes, evening apparitions of **Mercury** are much more favourable (for geometric reasons) during winter or spring—when the planet closest to the Sun climbs high above the horizon at twilight. And this winter will be no different.

Mercury begins the season in superior conjunction (December 19, 2020), but the tiny planet gradually emerges in the evening sky in early 2021. It puts in a very good appearance **from January 10 to 31**; it reaches its greatest elongation, 19 degrees east of the Sun, on January 23, and becomes visible a few degrees above the southwestern horizon 30 to 45 minutes after sunset. Mercury is much brighter at the start of this apparition but quickly dims after February 1 as it plunges back toward the horizon. Given these limiting factors, the prime viewing window extends from January 15 to 25.

A few evenings earlier, **on January 11**, Mercury (magnitude -0.9) crosses paths with Jupiter (magnitude -1.9): The two planets will be less than 1½ degrees apart. But this conjunction won't be easy to see, as it occurs very low on the southwestern horizon, only 30 minutes after the Sun sets.

Jupiter and Saturn sink into the twilight

Jupiter orbits the Sun at a faster speed than **Saturn**, and after their very close conjunction on December 21, when scarcely one-tenth of a degree separates them, the two planets gradually pull away from each

other: Note how the gap increases with every passing evening. As winter kicks off, the pair still shine in the southwest after sunset, but sink ever closer to the horizon at twilight. The glare of the setting Sun will inevitably overtake them: Saturn disappears first during the second week of January, while brighter Jupiter remains visible for another week. Saturn will be in solar conjunction on January 23, on the other side of our daytime star, followed by Jupiter on January 28.

The ringed planet is the first to reappear in the morning sky: After mid-February, Saturn can be spotted very low in the east-southeast at dawn. Then it's Jupiter's turn to pull away from the Sun and re-emerge in the dawn sky in late February, when it can be found low on the east-southeastern horizon 30 minutes before sunrise. Their visibility improves with each passing day, but we'll have to wait until spring before the planets can be spotted in a still-dark sky.

On March 10 at dawn, the very thin crescent Moon lies 5½ degrees to the lower right of Jupiter and forms a triangle with Saturn, 9 degrees further west; but this encounter will be difficult to see, since the Moon will be very low on the southeastern horizon a mere 30 minutes before sunrise.

Venus disappears at dawn

The start of winter marks the end of **Venus's** wonderful period of visibility in the morning sky. In December and the first half of January, the brilliant planet can still be seen above the southeastern horizon at dawn, 30 minutes before sunrise. But Venus loses altitude with each passing day, and spotting it becomes increasingly trickier; it vanishes with the rising glow of daybreak during the last week of January. Over the next few months, Venus is too close to the Sun and becomes completely lost in our star's brilliance.

Venus is in superior conjunction (on the opposite side of the Sun) on March 26, after which it moves into the evening sky. However, it will take a few more weeks before it pulls away from the Sun's glare and emerges at twilight.

On the morning of January 11, see if you can spot the very thin crescent Moon hanging 4 degrees to the right of Venus: Look for them low in the southeast, 30 minutes before sunrise.

Clear skies!

Research and text: **Marc Jobin**

SEASONAL MILESTONES

The **winter solstice** occurs on December 21, 2020 at 5:02 a.m. EST, while the **spring equinox** happens on March 20, 2021 at 5:37 a.m. EDT. Winter will last exactly 88 days 23 hours 35 minutes.

Earth is at **perihelion**, closest to the Sun, on January 2 at 8:50 a.m. The Earth-Sun distance is then "only" 147 093 162 km.

The **switch to Daylight Time** takes place early on the morning of Sunday, March 14: Set your clocks ahead one hour.

PHASES OF THE MOON

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

New moon	First quarter
December 14 at 11:16	December 21 at 18:41
January 13 at 0:00	January 20 at 16:01
February 11 at 14:06	February 19 at 13:47
March 13 at 5:21	March 21 at 10:40*
Full moon	Last quarter
December 29 at 22:28	January 6 at 4:37
January 28 at 14:16	February 4 at 12:37
February 27 at 3:17	March 5 at 20:30
March 28 at 14:48*	April 4 at 6:02*