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## The 1st ever Election Day Blood Moon lunar eclipse is coming on Nov. 8

By [Joe Rao](#) last updated November 07, 2022

This will be the second and final lunar eclipse of 2022.



A photograph of a total lunar eclipse in Canta, east of Lima on May 15, 2022. (Image credit: ERNESTO BENAVIDES/AFI

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Early on Election Day morning, early risers will have an opportunity to observe the first total lunar eclipse of 2022.

[Subscribe](#)want to try and catch this one  
otal lunar eclipse on

[Space.com](#) for free, courtesy of several webcasts from observatories across the United States, beginning at 3 a.m. EST (0800 GMT).

The [lunar eclipse](#) coming our way next Tuesday morning favors the western half of North America and the Hawaiian Islands (where the [moon](#) will appear almost directly overhead at mid-eclipse). Along the Atlantic Seaboard, the moon will set while it begins to emerge from total eclipse. For central and eastern Asia, Indonesia, New Zealand and Australia, the eclipse will be happening on Tuesday *evening* as the moon is rising.

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(Image credit: Celestron)

Looking for a telescope for the lunar eclipse? We recommend the [Celestron Astro Fi 102](#) as the top pick in our [best beginner's telescope guide](#).

In all, Space.com estimates that 2.7 billion people will have an opportunity – weather permitting – to enjoy the best part of this lunar show. In other parts of the world, either only the partial stages of the eclipse will be visible, or the eclipse will occur when it's daytime and the moon is not above their local horizon.

[This map and accompanying diagram](#) depicting the moon's track through the Earth's shadow are courtesy of Eclipsewise.com. The timetable below tells what to expect at your location and when. Dashes indicate that the moon has set and is below the horizon.

Swipe to scroll horizontally



## Total Eclipse of the moon. Nov. 8, 2022

Eclipse event	EST	CST	MST	PST
Penumbra first visible?	3:48 a.m.	2:48 a.m.	1: <sup>40</sup>	
Moon enters umbra	4:08 a.m.	3:08 a.m.	2: <sup>0</sup>	
Total eclipse begins	5:16 a.m.	4:16 a.m.	3: <sup>1</sup>	
Mid-eclipse	5:59 a.m.	4:59 a.m.	3: <sup>11</sup>	<a href="#">PLAY SOUND</a>
Total eclipse ends	6:41 a.m.	5:41 a.m.	4: <sup>2</sup>	
Moon leaves umbra	----	----	5: <sup>2</sup>	01:05
Penumbra last visible?	----	----	6:09 a.m.	5:09 a.m.

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A total lunar eclipse has five stages, with different things to watch for at each.

The first penumbral stage begins when the moon's leading edge enters the pale outer fringe of the Earth's shadow, called the penumbra. But the shading is so weak that most people won't notice anything until about 70% of the lunar disk is immersed into the penumbra; or about 20 minutes before first contact with the much darker umbral shadow. Some folks with exceptionally acute vision can detect the penumbra when the moon has intruded about halfway across the penumbra or about 30 minutes before it first touches the umbra. Watch for a slight darkening to become apparent on the moon's upper left side. The penumbral shading (or "smudge") becomes stronger as the minutes tick off and the moon moves deeper in.

The second stage is partial eclipse. This begins much more dramatically when the moon's leading (left) edge enters the umbra, Earth's inner shadow, where no direct sunlight reaches. With a [telescope](#), you can watch the edge of the umbra slowly engulfing craters, mountains and lunar maria (the darker plains on the [moon's surface](#)), as your local night sky slowly and progressively gets darker. Take note of the [Pleiades star cluster](#), which will be situated high above the moon, becoming more prominent as the eclipse progresses.

#### TOP TELESCOPE PICK



(Image credit: Celestron)

The moon looks absolutely incredible through a good telescope with a moon filter. We recommend this pick in our [best beginner's telescope guide](#).

A little over an hour into partial eclipse, only a final bright sliver of moon remains. The moon is likely showing an eerie reddish/coppery glow. The contrast in both light and shadow creates the "Japanese lantern effect."

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Next comes the third stage: the total eclipse, beginning when the last rim of the moon is completely hidden, the moon is likely to glow some shade of red or orange. These hues are caused by sunlight skimming and bending through [Earth's atmosphere](#): it's the combined light of all the sunrises and sunsets that ring our world at any given moment. If an astronaut were standing on the moon, he or she would see the sun completely hidden and the



Alexander Krivenyshev

May 15, 2022 @ 11:30pm New York

Amateur astronomer Alexander Krivenyshev captured these views of the total lunar eclipse of May 15, 2022 over New York City.  
(Image credit: Alexander Krivenyshev, WorldTimeZon.com)

## Light or dark?

On rare occasions, such as in 1963 and 1992, the totally eclipsed moon does go almost black. On other occasions, such as in 1967 and 2003 it can appear as bright as a newly minted penny. Sometimes, rather than a distinctive red or orange it turns brown and more closely resembles the color of a bar of milk chocolate.

Two factors determine the moon's brightness and color during totality. The first is how deep into the moon penetrates into the umbra; the umbra's center is much darker than its edges. For this upcoming eclipse, the moon will track to the north of the umbra's center. At mid-eclipse the moon's lower limb will be just grazing the umbra's center, but its upper limb will be tucked about 780 miles (1,250 kilometers) inside the umbra's outer edge. So, the top part will be distinctly brighter than the lower part.

The other factor is the state of the Earth's atmosphere along the sunrise-sunset line. If the atmosphere is very bright. But if a major [volcanic eruption](#) has recently polluted the atmosphere with ash, the eclipse will be ashen gray, or almost black. The Agung volcano in Indonesia in 1991 and the Pinatubo volcano in the Philippines in 1991 were the primary reasons for the lunar eclipses that followed in the wake of these eruptions.

In addition, blue light refracted by Earth's clear, ozone rich upper atmosphere can scatter around the umbra's edge.

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A time lapse of a total lunar eclipse. (Image credit: Diane Miller/Getty Images)

## Emerging from the shadow

As was the case last May, the duration of totality will run unusually long, lasting 85 minutes. And then, as the moon continues eastward along its orbit, events recur in reverse order. The moon's leading edge re-emerges into sunlight, ending totality and beginning stage four: partial eclipse again.

When all of the moon escapes the penumbra, only the last penumbral shading is left for stage five. This final duskiness slowly fades away, leaving the brilliant mid-autumn full moon to resume its normal guise.

## Look for Uranus too!

By a fortuitous coincidence, the planet [Uranus](#), magnitude +5.6, will appear less than 2 degrees to the upper left of the moon during totality. Spot it with your [binoculars](#) or telescope by first making a sighting of the yellow-white +6.3 magnitude star HIP 13448 which during totality will appear about a degree to the moon's upper left. Then continue a similar distance in the same direction until you come to another "star" appearing about twice as bright as HIP 13448. Only that will not be a star, but the sixth planet out from the sun. Can you see anything of Uranus's aquamarine blue-green tint? Contrast with the orange-red moon may make this color a bit more obvious.

And for some fortuitous locations: northwestern North America, Asia, Japan and occult (hide) Uranus.

In a telescope, Uranus is a tiny disk 3.7 arc seconds wide. It's 1.74 billion miles (2 moon's 240,000 miles (387,000 km).

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*Joe Rao serves as an instructor and guest lecturer at New York's [Hayden Planetarium](#) and [History magazine](#), the [Farmers' Almanac](#) and other publications. Follow us on Tv*



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Skywatching Columnist



Joe Rao is Space.com's skywatching columnist, as well as a veteran meteorologist and eclipse chaser who also serves as an instructor and guest lecturer at New York's Hayden Planetarium. He writes about astronomy for Natural History magazine, the Farmers' Almanac and other publications. Joe is an 8-time Emmy-nominated meteorologist who served the Putnam Valley region of New York for over 21 years. You can find him on Twitter and YouTube tracking lunar and solar eclipses, meteor showers and more. To find out Joe's latest project, visit him on Twitter.

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