

The Nov. 8, 2022 Total Eclipse of the Moon

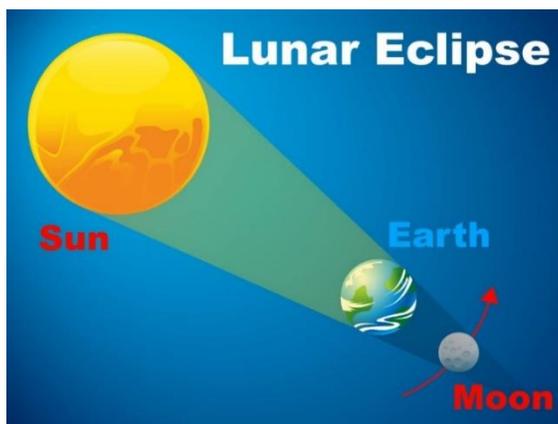
An Information Sheet by **Andrew Fraknoi** (*U. of San Francisco, Fromm Institute*)



Photo by Giuseppe Donatiello (in public domain)

1. What Is Happening?

On Tuesday morning, Nov. 8, a total eclipse of the Moon will be visible from throughout the U.S. (and much of North and all of South America). In a lunar eclipse, the Moon and the Sun are exactly opposite each other in our sky, and the Earth gets between them. This means the Earth's shadow falls on the Moon, darkening it.



(NASA Diagram)

It's a nicely *democratic* event; no special equipment is needed to see it (provided it's not cloudy or foggy.) The West Coast will see all parts of the eclipse in the sky; on the East Coast, the Moon will set while it's still in total eclipse and the sky brightens for morning twilight. However, we do not need to admit that, throughout the U.S., the times (see box below) are not so convenient for working people.

2. When Will the Eclipse Happen in the US?

Event	Pacific	Mountain	Central	Eastern
Partial eclipse starts	1:09 am	2:09 am	3:09 am	4:09 am
Total eclipse starts	2:17 am	3:17 am	4:17 am	5:17 am
Total eclipse ends	3:42 am	4:42 am	5:42 am	6:42 am
Partial eclipse ends	4:49 am	5:49 am	6:49 am	-----

As the Moon moves slowly through the Earth's shadow, we first see only part of the Moon darkening (partial eclipse). But then, as the Moon moves fully into the Earth's shadow, we see its entire globe become dark and reddish (total eclipse). The total eclipse lasts an impressive 1 hour 25 minutes, and then it's partial again.

3. What Is Visible During a Lunar Eclipse?

As the shadow of the Earth covers the Moon, note that our natural satellite doesn't become completely dark. Some of the sunlight bent by the Earth's atmosphere still reaches the shadowed Moon and gives it a dull brown or reddish glow. The exact color of the glow and its darkness depend in part on the "sooty-ness" of our atmosphere – how recently volcanoes have erupted, plus how much cloud cover, storm activity, fire smoke, and human pollution there is around the globe. Once the Moon is eclipsed, the stars in the sky should become easier to see. On the East Coast, the eclipse gets lower and lower in the sky as morning approaches. You might be able to take some great photos as the eclipsed Moon slowly sets toward the West (WNW) above the dawn landscape!

4. Is It Safe to Watch, and How Do I Watch?

Since the Moon is safe to look at, and eclipses make the Moon *darker*, there's no danger in watching the eclipse with your eyes, binoculars, or a telescope. And lunar eclipses don't require you to go to a dark location. Bring binoculars to see the Moon larger, but just your eyes are fine. Be sure to bundle up against the cold night and to take someone along with whom you like to spend time in the dark!

5. What Can I Tell My Kids (or Grandkids)?

Suggest that they take a careful look at the shadow of the Earth as it moves across the bright face of the Moon. What shape is it? The round shape of the Earth's shadow during such eclipses suggested to the ancient Greeks, more than 2000 years ago, that the Earth's shape must be round like a ball. Eclipse after eclipse, they saw that the Earth cast a round shadow, and deduced that we lived on a ball-shaped planet (long before we had pictures of it from space).



Note the round shadow (Photo by Brian Day NASA)

Andrew Fraknoi is a retired astronomer, textbook author, and college professor. He is the lead author of a free, on-line astronomy textbook at: <https://openstax.org/details/books/astronomy-2e> (now the most frequently-used intro astronomy textbook in the U.S.) and writes science fiction stories on astronomical themes. He was co-author (with Dennis Schatz) of two books about eclipses: *Solar Science* (a book of activities) and *When the Sun Goes Dark* (a children's book.) You can read his fiction and see more about his educational work at <http://www.fraknoi.com> His colleagues have named Asteroid 4859 Asteroid Fraknoi in honor of his educational work.