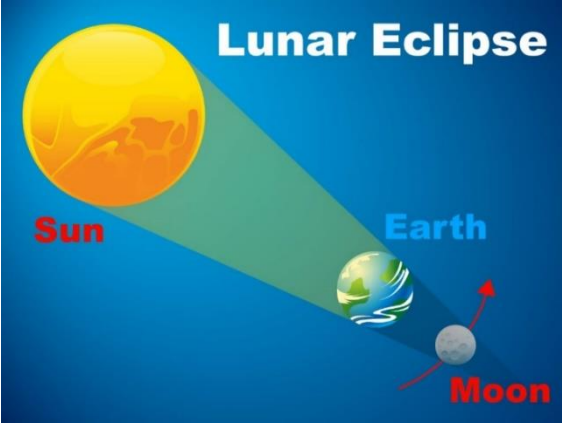


The Mar. 13-14, 2025 Total Eclipse of the Moon
 An Information Sheet by **Andrew Fraknoi** (*U. of San Francisco, Fromm Institute*)



Photo by Giuseppe Donatiello (in public domain)



NASA Diagram

1. What Is Happening?

On late Thursday evening and early Friday morning, March 13-14, a total eclipse of the Moon will be visible from throughout the U.S. (and most of North and 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.

Note: March 14th is sometimes called Pi Day (3.14 are the first digits of Pi) and is also Einstein's birthday.

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 parts of the eclipse late Thursday night; on the East Coast, all parts of the eclipse happen after midnight. Thus the times (see box below) are not so convenient for people who have to go to work or school Friday morning, but, it may be that, with advance notice, allowances can be made.

2. When Will the Eclipse Happen in the US?

Event	Pacific	Mountain	Central	Eastern
Partial eclipse starts	10:09 pm	11:09 pm	12:09 am	1:09 am
Total eclipse starts	11:26 pm	12:26 am	1:26 am	2:26 am
Total eclipse ends	12:31 am	1:31 am	2:31 am	3:31 am
Partial eclipse ends	1:47 am	2:47 am	3:47 am	4:47 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 disk of the Moon become dark and reddish (total eclipse). The total eclipse lasts 1 hour 5 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. Note that this eclipse will happen high in the sky for most observers and so it may be visible even if you have hills or buildings on the horizon.

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)

6. The Eclipse from the Moon

An eclipse of the Moon from Earth can be seen as an eclipse of the Sun (by the Earth) from the Moon. See the diagram on page 1 and imagine you are on the side of the Moon facing Earth. Normally, there is no one on the Moon to see such an eclipse. But now there is (at least a robot representative of humanity)!

Firefly Aerospace (a private company) has landed its Blue Ghost capsule on the surface of the Moon and it is taking good pictures. From their website, it appears that the Firefly group is aware of the eclipse and is planning to take images.

Andrew Fraknoi is a retired astronomer, textbook author, and college professor. He is the lead author of a free, on-line astronomy textbook at: <http://bit.ly/astronomytextbook> (now the most frequently-used introductory astronomy textbook in the U.S.) and writes science fiction stories on astronomical themes (8 published so far). He is co-author (with Dennis Schatz) of a children's book about eclipses: [When the Sun Goes Dark](#) and appears regularly on regional and national radio programs explaining astronomy. You can read his fiction, and see more about his educational work and writings, at <http://www.fraknoi.com> The International Astronomical Union has named Asteroid 4859 Asteroid Fraknoi in recognition of his work advancing the public understanding of science.