

A Guide to Observing Eclipses of the Moon

by Andrew Fraknoi

What Happens During an Eclipse of the Moon?

When the full Moon and the Sun are exactly opposite each other in our skies, so that the Earth gets between them, the Earth's shadow falls on the Moon, darkening it over the course of several hours. Such a *lunar eclipse* is visible to everyone on the Earth who can see the Moon at that time.

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. Light bent through the Earth's atmosphere still reaches the shadowed Moon, shrouding it in a dull brown or reddish glow. The exact color of the glow and its darkness depend on the amount of soot in our atmosphere – coming mainly from recent eruptions of volcanoes and from cloud cover, storm activity, and human pollution around the globe.

Is it Safe and How do I Watch?

Since the Moon is always safe to look at, and the eclipse only makes the Moon darker, there is no danger in watching this eclipse with your eyes or through a [telescope](#). (The dangerous eclipse is the solar one, where it is the Sun that gets covered. Solar eclipses can be viewed without proper filters only during the fleeting minutes of actual totality.) You can enjoy viewing a lunar eclipse with unaided eyes, binoculars, or a small telescope.

How Often Do Lunar Eclipses Occur and When Are the Next Ones?

You can get anywhere from 0 to 3 lunar eclipses per year. Some of these will be *total* eclipses, where the Moon is completely inside the dark part of the Earth's shadow, while others are *partial*, meaning that only some of the Moon is in shadow. Between 2000 BC and 3000 AD, there are 7718 eclipses of the Moon, for an average of 1.3 per year.

The next eclipses of the Moon visible from the U.S. will be Feb. 21, 2008 (total), June 26, 2010 (partial and only visible in the West), and Dec. 21, 2010 (total).

What Can We Learn from Such Eclipses?

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 suggested to the ancient Greeks, more than 2000 years ago, that the Earth's must be a sphere. Eclipse after eclipse, they saw that the Earth cast a round shadow, and deduced that we lived on a round planet – long before there were spacecraft and astronaut pictures showing the Earth's blue globe from orbit.