

EXPLORING THE SOLAR SYSTEM

Big Sun, Small Moon

Try this!



A tennis ball and a beach ball are different sizes. Can you make them *appear* to be the same size?



Hand the beach ball to a friend. What happens to the *apparent size* of the beach ball if your friend walks away?



Now, hold up the tennis ball. Can you make the tennis ball and the beach ball appear to be the same size? How far apart are you and your friend?

The farther away an object is, the smaller it appears.

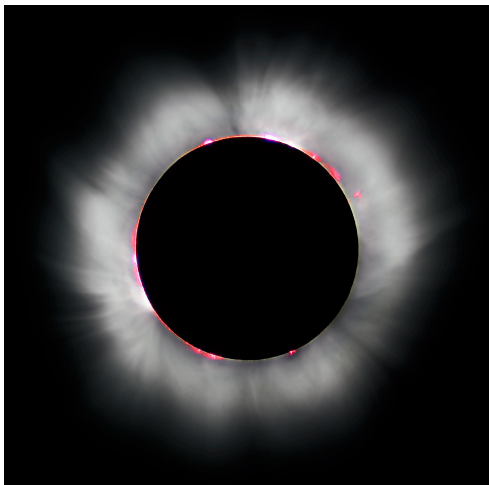
Solar eclipses are possible because the Sun and the Moon have the same *apparent size* in the sky. The Sun is actually much bigger than the Moon, but they look the same size because the Sun is much farther away. The Sun's diameter is about 400 times wider than that of the Moon, but the Sun is also about 400 times farther away from Earth. In astronomy, scientists often refer to objects by their *apparent size* as seen from Earth. The Sun and Moon just happen to have a very similar apparent size!



One of these people looks smaller, but he's really just farther away.

Solar eclipses are possible because of this amazing coincidence. During a solar eclipse, the Moon comes very close to covering the entire Sun. Earth is the only place in the whole solar system where a total solar eclipse can be observed!

NASA scientists study solar eclipses from Earth and space. During the August 2017 total solar eclipse, observatories on Earth will use a variety of equipment to explore the Sun and its surrounding halo of plasma. Meanwhile, the Lunar Reconnaissance Orbiter (LRO) spacecraft will collect images of the Moon's shadow crossing Earth. Many other NASA missions will also obtain images and data taken during the event.



Plasma around the Sun is visible during a solar eclipse.

The general public can also participate in some studies of the August 2017 eclipse. For example, in several high altitude balloon projects, students will be launching balloons equipped with cameras that will photograph the eclipse from high up in the Earth's atmosphere!