

# Facts about the US solar eclipse on August 21

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On Monday, August 21, for the first time in 99 years, a total solar eclipse will march across the entire United States.

"The Great American Eclipse" will cast a shadow over the whole country, moving diagonally from Oregon in the northwest to South Carolina in the southeast.

Here are some facts on this [eclipse](#), and what makes it so unique.

## Why is this a big deal?

This is the first eclipse to pass over the United States in the 21st century.

It is the first total eclipse on American soil since 1991, when one was visible from the Big Island of Hawaii.

But it has been 38 years since the mainland United States glimpsed a total eclipse. The last one was in 1979, and that swept only a handful of northwestern [states](#).

Having a [total solar eclipse](#) move across entire the United States is quite rare. The last time it happened was in 1918.

A different kind of eclipse—called an [annular eclipse](#), or "Ring of Fire" eclipse—did cross the United States from coast to coast in 1994.

Because the Moon was near its farthest point from Earth at that time in

its orbit, it blocked about 94 percent of the Sun's light.

## **What is an eclipse?**

Solar eclipses occur when the Moon moves between the Earth and the Sun, blocking light from the Sun.

Total solar eclipses happen because the Sun's diameter is 400 times wider than the Moon's, but it is also 400 times farther away.

From Earth's perspective, this geometry makes the Sun and Moon appear to be the same size.

When the two line up just right, the Moon obscures the entire Sun, and the skies go dark.

These total eclipses happen every 12 to 18 months somewhere in the world, often over the open ocean since most of the Earth is covered by water.

## **When will it happen?**

The partial phase of the Great American Eclipse begins over the Pacific Ocean at 8:46 am local time (1546 GMT).

Unless it's cloudy, Lincoln Beach, Oregon, will be the first location in the continental US to see the eclipse, beginning at 9:05 am (1605 GMT), according to NASA.

"Totality"—the term for when the Moon completely blocks out light from the Sun—begins near Lincoln Beach, Oregon, at 10:16 am Pacific time (1:16 pm Eastern, or 1716 GMT).

The path of totality spans about 70 miles (113 kilometers) and will pass through 14 states.

"Its longest duration will be near Carbondale, Illinois, where the Sun will be completely covered for two minutes and 40 seconds," says the US space agency.

The [total eclipse](#) ends at 2:48 pm (1848 GMT) near Charleston, South Carolina.

Then, the [partial eclipse](#) resumes as the Moon moves out of the Sun's way. The event ends when the lunar shadow leaves the United States, at 4:09 pm (2009 GMT).

The entire eclipse will take a total of four hours, four minutes to make its way across the nation.

## **Who will be watching?**

Hundreds of millions of people will fall under the shadow of the eclipse, since the whole country will be darkened—some parts more than others.

About 12 million people live in the path of totality, according to the American Astronomical Society.

## **What can we learn?**

Researchers say the eclipse is important because it will enable astronomers to study the outer realm of the Sun, known as the corona.

Understanding more about how the Sun works, and how solar flares emerge, can help protect astronauts in space as well as electrical grids on

Earth.

## **How should I watch it?**

To avoid eye damage, experts say everyone should wear special solar glasses or use darkened welder's glass when looking at the Sun.

The light from the Sun can burn the retina, leading to permanent or long-term damage and blind spots in one's center of vision.

Another option, to avoid looking skyward, is to make a pinhole in a sheet of paper or cardboard, and project the Sun's image onto another piece of paper.

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