

# SUN BLOCK

A total solar eclipse will occur on April 8.

By Andy Boyles, Contributing Science Editor

A total solar eclipse plucks a chord deep in the human mind. Even people who know that the event is temporary are surprised by the strange effect it has. They know that the Moon is just passing between Earth and the Sun, blocking the Sun's light for a few minutes. Soon, the Moon will move on, and the day will continue like any other day.

But for those few minutes, the eclipse is a wonder, as many authors throughout history have described. The Moon's enormous shadow stretches from one horizon

to the other. It rushes toward anyone in its path, dragging its blanket of darkness over the land. It can feel like the shadow of a predator or the end of the world. As a total eclipse begins and reaches full darkness, the temperature can drop ten degrees or more. People sometimes gasp and scream—or clap and cheer.

## An Astronomer's Dream

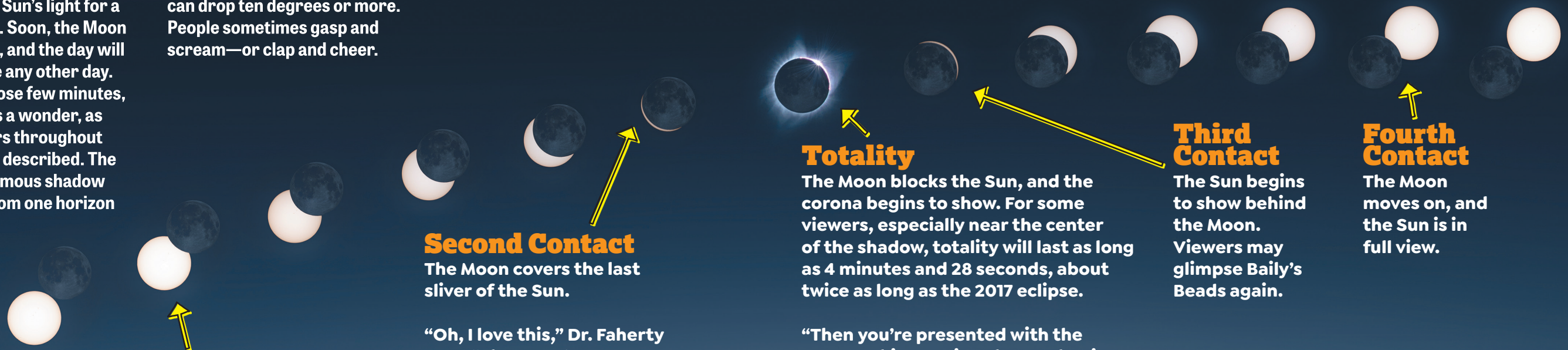
Dr. Jackie Faherty is an astronomer who dreamed for years of seeing a total solar eclipse. In 2017, she finally had her chance. She left her office at the American Museum of

Natural History in New York and drove to Wyoming with her eight-year-old nephew. She knew that Casper, Wyoming, was likely to have clear weather.

Dr. Faherty found a high spot where she could experience the eclipse. "I really wanted to see if I could watch the shadow of the Moon chasing across

the foreground," she says. "If you're high up, you'll watch as the shadow approaches, and then—*poof!*—the Sun's gone. It's so cool."

At last, the time arrived.



### First Contact

The Moon begins to move in front of the Sun.

Dr. Faherty says the Moon reminds her of the Death Star from the Star Wars movies. This "bite out of the Sun" effect also occurs in partial eclipses.

### Second Contact

The Moon covers the last sliver of the Sun.

"Oh, I love this," Dr. Faherty says. "The Moon's got mountains on it. It's got ridges and it's got troughs. And so, as it's closing in on its final, complete block of the Sun, the last rays of the Sun are reaching you through valleys on the surface of the Moon. And you'll get a bunch of them close to the end. Those are called Baily's beads."

### Totality

The Moon blocks the Sun, and the corona begins to show. For some viewers, especially near the center of the shadow, totality will last as long as 4 minutes and 28 seconds, about twice as long as the 2017 eclipse.

"Then you're presented with the corona, this massive plasma that is surrounding the Sun," Dr. Faherty says. "And you can even see these brighter pink loops, which are solar storms. There's like a big loop of material that's emerging from the Sun and then coming back on itself. All of that pops out if you're in totality."

### Third Contact

The Sun begins to show behind the Moon. Viewers may glimpse Baily's Beads again.

### Fourth Contact

The Moon moves on, and the Sun is in full view.

This enhanced time-lapse image shows the stages of a total solar eclipse, from left to right. During an eclipse, the Moon will appear as a dark disk moving across the Sun.

A Total Solar Eclipse, Step by Step

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Dr. Faherty and her nephew were in their chosen spot, along with a crowd of people who had come to hear her explain the sights as they were about to happen. "We had the best weather," Dr. Faherty says.

When the big event occurred, she didn't hear anyone scream. "There were gasps, there were cheers," she says. "I was thrilled to finally see a total solar eclipse for the first time."

The eclipsed Sun became a spectacular sight. The only downside was that someone nearby began setting off fireworks in the dark. The loud sounds and bright lights distracted people from the marvel of the eclipse.

Then the Moon moved on, and the Sun came out again.

A total eclipse leaves an impression. Few people who have stood in the shadow of the Moon can forget the experience.

### Here It Comes!

On April 8, a total eclipse

Everywhere in the contiguous U.S. and Hawai'i will have a partial eclipse. The closer you are to the line of totality, the darker it will get.



**NEVER** look straight at a solar eclipse!

**The temperature can drop ten degrees or more.**

will occur in parts of Hawai'i, Mexico, the contiguous United States, and Canada.

Moving about 1,900 miles an hour, the Moon's 115-mile-wide shadow will sweep across the Pacific Ocean and move from the

southwest to the northeast. It will pass over Mexico, then parts of Texas, Oklahoma, Arkansas, Missouri, Kentucky, Illinois, Indiana, Ohio, Pennsylvania, New York, Vermont, New Hampshire, and Maine. The Moon's shadow will then darken areas of southeastern Canada.

Millions of people in the United States will experience the total eclipse because they live in the shadow's path. Many more will travel to the path just

to witness the event. Partial solar eclipses will occur that day in every state except Alaska.

Dr. Faherty encourages everyone who can to safely view the eclipse, even if they cannot get to the path of totality. "The partial is still so good," she says. "I love the partial. It's so weird to watch the Moon actually moving in front of the Sun and knowing what that object is, and it just keeps going—because it's in motion! You're watching orbital motion there." ☿

## How to Watch a Solar Eclipse SAFELY

**NEVER** look into the bright rays of the Sun. Severe eye damage can occur.

### Use Solar-Safe Eyeglasses

The American Astronomical Society urges that you NOT look directly at the Sun or an eclipse unless you have filters or glasses that meet the transmission requirements of the ISO 12312-2 international safety standard. Be wary of glasses that claim to be safe but do not specify that they meet these requirements.



### Nature's Viewer

Find a spot where the Sun shines through the leaves of a tree, casting a dappled shadow onto a light-colored surface, such as a sidewalk. (You may want to spread out a plain bedsheet or a piece of poster board.) Watch the light spots in the tree's shadow. Lots of tiny eclipses will take bites out of the sunlight. A breeze may make them shimmer and wave.



### Draining Sunlight

Hold a colander with round holes in the sunlight so that its shadow falls onto a light-colored surface. Turn the colander so that the Sun shines through the holes, showing a spray of tiny suns on the ground. The little suns will become eclipses as the Moon passes in front of the Sun.