

## **Skyward: A Total Eclipse of the Sun.**

*by David H. Levy*

As I am writing this April 2024 edition of *Skyward*, in less than a month there will be a total eclipse of the Sun. The Moon's great shadow will trace a path across North America, including the United States, and Eastern Canada.

A total eclipse of the Sun is one of the most breathtaking sights all of Nature has to offer. The Sun will vanish. In its place will be a jeweled crown. The Moon's dark central shadow will touch the Earth in the Pacific Ocean at sunrise and hit the North American coast over Mexico, north of Guadalajara. The shadow will then cross the border into the United States (where I will be, and hope that the shadow will not get stopped at the border) and head for Dallas. Millions of people in several major cities across the United States will enjoy a stunning experience of a total eclipse of the Sun, including San Antonio, Austin, Dallas, Indianapolis, and Carbondale. The shadow will cross the border into Canada, where cities like Hamilton, Niagara Falls, Kingston, most of the Thousand Islands in the St Lawrence River, and Montréal, will experience totality. Downtown Montréal will experience a twilight sky early in the afternoon—its streetlights will switch on—and then the shadow will race through Sherbrooke on its way toward Newfoundland. Finally, the shadow will head over the Atlantic Ocean where sunset will mark the end of this incredible, precious event.

Virtually everyone else in the United States and most of Canada will see a partial eclipse during which a portion of the Sun will be blocked by the new Moon. For those readers planning to watch the eclipse, I have four salient pieces of advice.

1. Whenever any of the Sun is visible. It is vital to use special eclipse glasses. An unprotected view of the Sun could cause permanent blindness. However, when the total phase of the eclipse begins and the Sun is completely covered by the Moon, take your glasses off and enjoy the spectacle. I knew that even when, at age 15, I saw my first total eclipse with my parents, on 1963 July 20. (My first eclipse, on 1959 October 2, with Mom and brother Gerry, was a partial.) In the minutes before the total phase began, I looked toward the west to watch the Moon's ominous shadow approaching. At the onset of totality, I tore off my glasses and gazed at the atmosphere of the Sun. Dad had a fit. He raised his voice and demanded that I put my glasses back on. My solution: I put the glasses back on. Then I turned slightly away from Dad, and promptly took them off again. The simple rule is, if any of the Sun itself is visible, use the eclipse glasses. But when the Sun is totally covered by the Moon, all bets, and glasses, are off.

2. For readers who are very close to the Moon's deep central shadow, so that, say, more than 99% of the Sun is covered by the Moon, nothing is gained. A 99.99% eclipse is still a partial eclipse. The closer to the path of the Moon's shadow, the more important it is to make the effort to get into the shadow.

3. If the sky is clear, the atmosphere of the Sun, the magnificent corona (roughly circular since the sunspot cycle is near its maximum) will prevent total darkness. If the sky is cloudy, then it could become very dark. By far the darkest total solar eclipse for me was on 1970 March 7, in

Nova Scotia; the sky was covered by a layer of stratus cloud. It was so dark that I could barely see my fingers.

4. I can't remember the fourth piece of advice.

Viewing a total solar eclipse should be on everybody's bucket list. It is a unique and unforgettable event. Surrounding the Sun, the brighter planets like Venus and Jupiter might appear, and although Comet Pons–Brooks will be in the sky northwest of Jupiter, about a quarter of the way between Jupiter and the Sun, it will probably be difficult to spot.

I have seen 99 eclipses. If the sky is clear on the night of the full Moon on March 24/25, then I will see what is called a penumbral eclipse of the Moon during which the Moon is dimmed a bit by the outer shadow of the Earth. It will be what we call an almost total penumbral eclipse of the Moon during which almost all of the Moon will be embedded in the outer shadow of the Earth but none of the umbra, or inner shadow. That will be my 100th eclipse. And then, the total eclipse on April 8 will be my 101st.

In his autobiography *Starlight Nights*, published in 1965, Leslie Peltier wrote about the first eclipse he saw on 1918 June 8. Revising a little bit, Samuel Taylor Coleridge's *The Rime of the Ancient Mariner*, Peltier changed the original

“The hornéd Moon, with one bright star/ Within the nether tip.” ...to the less poetic but more correct, and surely more fun, “A hornéd Sun, with one dark Moon/Within its nether tip.”