

Public Engagement and the Potential for Outreach Opportunities During Solar Eclipses

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Solar eclipses provide a unique opportunity not only for scientists to ascertain astronomical and heliophysical data that would not otherwise be collectable via terrestrial observation, but also provides the option for public engagement and outreach events to help foster interest in astronomy, physics, and STEM-related topics more broadly amongst the lay populace. The total solar eclipse occurring on April 8, 2024 over large swaths of Mexico, the United States, and Canada will prove no different, as countless professional researchers will use their time in totality to conduct experiments to help the scientific community better understand solar science. Concurrently, millions of people will experience darkness during midday as the umbral shadow of the Moon crosses the continent, providing abundant opportunities for citizen science experiments.

Most places on Earth experience a total solar eclipse just once over the course of several generations, as totality tends to recur over a given location only about once every 350 years. As a result, the April 8, 2024 total solar eclipse will be especially important and awe-inspiring for those in northwestern Kentucky, eastern Missouri, and southern Illinois. Passing over towns and cities including Paducah, KY, Ste. Genevieve, MO, and Carbondale, IL, this will be the second total solar eclipse occurring over this region in just 6 years, 7 months, and 18 days. In particular, the intersection point of the centerlines of both the August 21, 2017 and April 8, 2024 total solar eclipses lies in a field in Makanda, Illinois, just seven miles southwest of downtown Carbondale. Hundreds of thousands are therefore expected to journey to this part of the country to experience totality, some for the second time at the same location in less than seven years. As such, the April 8, 2024 eclipse provides a unique opportunity for outreach and engagement with the public in a way not often possible in other more remote locations and for other less noteworthy solar eclipses.

In particular, this eclipse provides an avenue for scientists and science communicators to conduct research pertaining to the environmental and societal impacts of solar eclipses, taking advantage of the unique circumstances of this rare celestial recurrence. In addition to general “citizen science” projects—including amateur telescopic observations, pinhole projections, and meteorological data gathering—this eclipse provides a unique opportunity before, during, and after April 8th to interact with members of the public and to understand from their perspectives what drives them to seek out such an event, potentially twice in their lives. Additionally, this eclipse provides ample opportunity to engage those who may never have seen a total solar eclipse before, to understand the psychology behind why they have chosen to seek out this eclipse, and how their experience compared to any expectations. Taken as a whole, these accounts from the general public—coupled with the science achieved by both citizen scientists and professional researchers—can help provide scientists and science communicators with vital information to help spread the word and engage the public more effectively about future solar eclipses, including those of August 2026 and August 2027 in Europe and of August 2044 and August 2045 in North America.