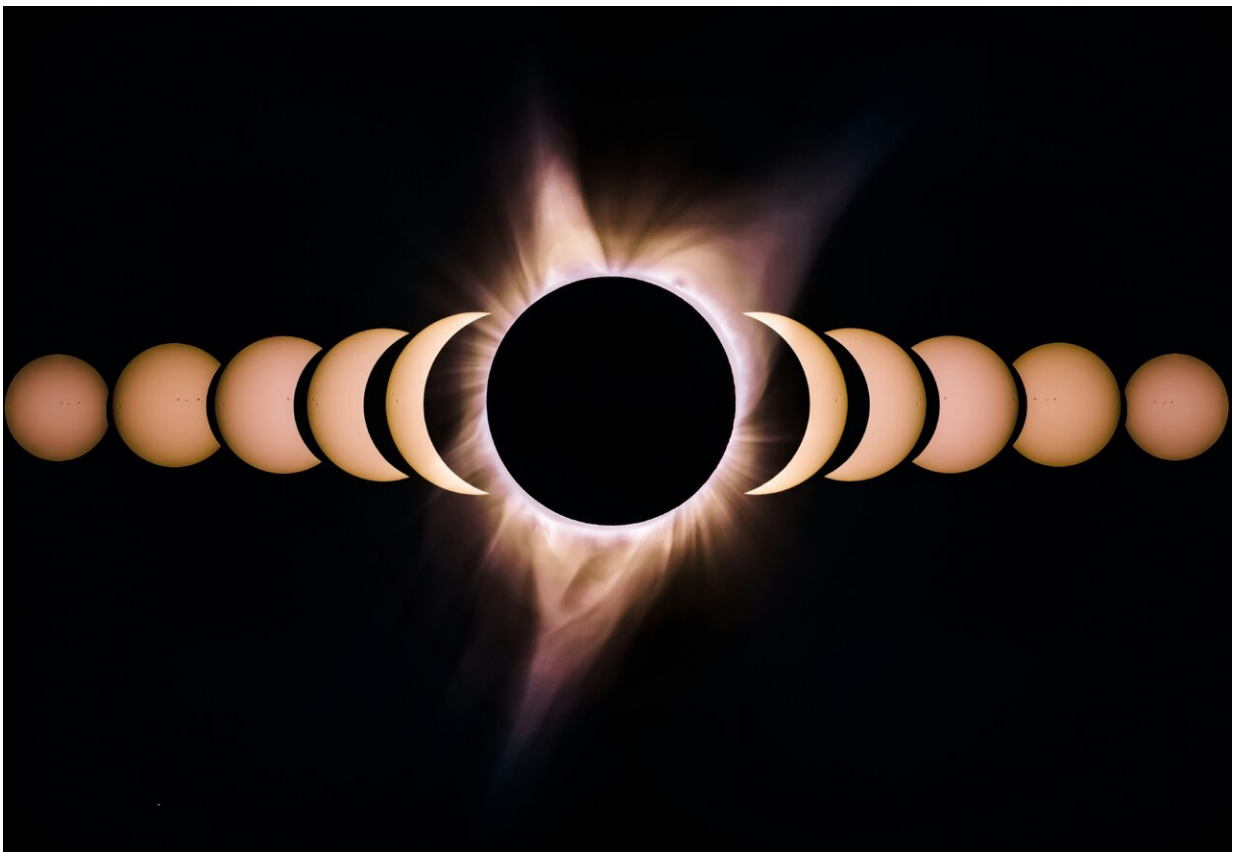


Solar eclipse chasers from Colorado will seek clues for predicting geomagnetic space storms

April 8 2024, by Bruce Finley, The Denver Post



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When Monday's solar eclipse casts its shadow, Colorado-based scientists

will chase it in a jet flying faster than 500 mph and aim a coffin-shaped instrument straight at the sun's corona, taking measurements that eventually could help weather forecasters predict space storms.

The federal government increasingly tracks geomagnetic space storms because [solar flares](#) and geomagnetic bursts from the sun can knock out power grids, satellites and air traffic control.

The scientists from the National Center for Atmospheric Research in Boulder prepared near a runway at the Rocky Mountain Metropolitan Airport last week, installing their instrument on a Gulf V jet under overhead windows.

They'll exploit the darkness during the eclipse to closely observe swirling streaks of exploding brown gases around the sun that otherwise are hard to study. Shortly before the moon completely covers the sun, they'll take off from Tucson and race over Texas to keep the sun's corona—its [upper atmosphere](#)—in their sights for as long as possible.

Colorado will experience a [partial eclipse](#), with a maximum of about 65% of the sun covered at 12:40 p.m. in Denver.

"In a technological society, your life could really be interrupted by [space weather](#)," said astrophysicist Jenna Samra of the Smithsonian Astrophysical Observatory in Massachusetts, the lead scientist on this NCAR project.

"The data we get from this eclipse is going to inform the design of future instruments to measure the corona's magnetic field. That could potentially improve space weather predictions," Samra said.

A space weather bulletin issued on March 24 by the U.S. National Oceanic and Atmospheric Administration's Space Weather Prediction

Center—also based in Boulder—warned of a severe geomagnetic storm after explosions of gases and ejections of magnetic material from the sun.

No major disruptions of technology were reported during the storm, the fourth of such intensity since 2019, NOAA project manager Bryan Brasher said. In December, a NASA telescope detected a strong solar flare pulsing from the sun. It disrupted [radio communications](#) in the United States and other sunlit areas. Several pilots reported trouble.

The sun's cycles are nearing an 11-year peak that can lead to increased solar winds, flares and geomagnetic storms.

During Monday's eclipse, the scientists plan to stay in the shadow as far as the area above Dallas, extending their observation time by 50% compared with the time a ground-based team could study the corona.

It's a "mission of opportunity," Samra said, because close observation of the sun's atmosphere is usually impossible due to brightness—light millions of times brighter than on Earth, blotting out views.

A research team of seven scientists, technicians, and pilots will fly in the jet as the instrument, called an Airborne Coronal Emission Surveyor, measures [infrared light](#) emitted by the corona. Scientists say that by measuring the intensity of the light, they can calculate the temperatures and the density of particles in the corona—information useful in studying other stars.

One big mystery is why the corona gas around the sun is millions of times hotter than the sun's surface. Later, analyzing light data, the scientists will try to identify patterns that could be used to detect geomagnetic storms.

The jet will fly at an elevation of 45,000 feet, about 10,000 feet higher than commercial airliners, NCAR officials said.

Solar flares pulse away from the sun at [light speed](#), reaching the earth in about eight minutes—too fast to anticipate impacts, Samra said. But solar ejections of charged gases that become rotating geomagnetic storms move more slowly, around 1,000 kilometers per hour. "For that, there's time."

NOAA space weather forecasters say that, because of the growing technological dependence, human societies are more vulnerable—requiring a better understanding of solar dynamics.

"Right now, we can only forecast a couple of days in advance," Brasher said. "We have a lot further to go."

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Citation: Solar eclipse chasers from Colorado will seek clues for predicting geomagnetic space storms (2024, April 8) retrieved 2 May 2024 from <https://phys.org/news/2024-04-solar-eclipse-chasers-colorado-clues.html>

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