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Featured Researcher | Mary Kidd

Title

Hosting Citizen CATEe Training Workshop

Investigator

PI: Mary Kidd

Funding

National Solar Observatory

Eclipse Allowed Unique View of Sun's Atmosphere

When darkness fell midday on Aug. 21 during a total solar eclipse, a telescope set up at Tennessee Tech looked at the light of the sun's corona.

It has been nearly four decades since a solar eclipse was viewable from the United States and as the 2017 event arched its way across the country, a network of citizen scientists, universities and high schools worked to get some

unique imagery of the sun's corona, which is the outer atmosphere of the sun typically not fully visible from Earth, through the Citizen Continental-America Telescopic Eclipse Experiment.

"It is really unusual to have an eclipse like this cross over such a large land mass," said Mary Kidd, Tech Physics Professor and Regional Coordinator for Citizen CATE. "There were all these sites along the eclipse path and we were taking images. At the end of the day, we should have a 90-minute video of the corona as the moon's shadow passed over the United States."

What's so special about that?

"When we are studying the sun, looking at the behavior of the corona tells us a lot about the mass leaving the sun," Kidd said. "The particles leaving the sun can eventually impact the earth."

Typically, getting images of the sun's inner corona is difficult. Astrophysicists can artificially create scenarios that will allow them to look at portions of the corona, but a 90-minute video the Citizen CATE Experiment hoped to generate will give scientists a full view only possible during a total solar eclipse.

"It is great to have this chunk of time were we can look at the corona and how it is evolving," Kidd said.

To create this video, a fleet of identical telescopes and associated computer equipment were set up and manned by citizen scientists and students at more than 68 sites. While the totality of the eclipse, when the inner corona was visible, only lasted approximately two minutes at each site, the combined data will offer the first look at how the sun's atmosphere behaves over 90 minutes.

One of those telescopes was set up inside Tennessee Tech's Tucker Stadium for the university's Eclipse Fest and Viewing Party.

"New scientific results about the dynamics of the magnetic fields and plasmas in this part of the solar corona will be derived from the data, and the image sequence will provide a beautiful perspective of the solar eclipse as never seen before," according to the Citizen CATE organization.

Tech was the headquarters for Citizen CATE in Tennessee, and recently, 30 Citizen CATE observers from 12 sites along the path of totality gathered at the university to practice using their identical equipment in a training coordinated by Kidd.

The training workshop was funded by the National Solar Observatory. Tennessee Tech's participation in Citizen CATE was funded by the College of Arts and Sciences.

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