

# SHAPE OF SUN'S CORONA ACCURATELY PREDICTED

Relevant for: Geography | Topic: The Earth and the Solar System

Good match: The LASCO instrument's observation overlaid on the large scale coronal magnetic field lines predicted by the team.

Solar physicists from Centre for Excellence in Space Sciences (CESSI), IISER Kolkata, have succeeded in predicting the shape of Sun's corona at the time of the annular eclipse on December 25. The corona is the outermost part of the Sun's atmosphere. This is the second successful prediction, counting the last solar eclipse that was viewed from South America on July 2 this year. While the earlier prediction differed slightly from the actual image, this time, it has been pretty close to the real thing. This was imaged by NASA and European Space Agency's space-based Solar and Heliospheric Observatory (SOHO) using the LASCO instrument. "For the South American Eclipse of 2 July, our predicted streamer tilts were slightly larger than observed at large distances from the Sun. This time, it is far better. We are still trying to figure out why this worked so well this time," says Dibyendu Nandi, who is a professor and Principal Investigator at CESSI.

The Predictive Solar Surface Flux Transport model developed by the CESSI team can predict the shape of the corona well in advance. Prantika Bhowmik, now at Durham University, UK, developed this model with Dr Nandi. "Our previous research indicates that we can predict the large-scale structure of the Sun's corona up to two months in advance. This is great, because this gives advance knowledge and a large window of preparedness for space weather driven by coronal magnetic fields," says Dr. Nandi. Space weather consists of the varying conditions such as solar wind and is different from weather on earth.

"The dynamic events on the Sun can affect Earth's outer atmosphere and our technologies, leading to disruption in communication and navigation networks (GPS). These are more frequent during solar maxima and pose a threat to space reliant technology and astronauts," says Soumyaranjan Dash, PhD student at IISER Kolkata who works on this model.

This time, they had used inputs and made the prediction 43 days ahead of the eclipse. "The only way to verify these models is to either have photographs taken during the eclipse which captures the Sun's corona or use space- or ground-based instruments which use an artificial disc to occult the Sun's surface to make the faint corona visible," Dr Nandi adds in an email to *The Hindu*.

This time, since this was an annular eclipse with a ring of bright solar surface visible, the corona was not directly observable. The only option was to use a coronagraph with an occulting disc. "The only functional one in the world is in Hawaii in Mount Mauna Loa which has been having bad weather. Also it was night in Hawaii when the eclipse happened," he adds. So the researchers used the images generated by the space based coronagraph instrument LASCO on board the SOHO satellite.

You have reached your limit for free articles this month.

Register to The Hindu for free and get unlimited access for 30 days.

Already have an account ? [Sign in](#)

Sign up for a 30-day free trial. [Sign Up](#)

Find mobile-friendly version of articles from the day's newspaper in one easy-to-read list.

Enjoy reading as many articles as you wish without any limitations.

A select list of articles that match your interests and tastes.

Move smoothly between articles as our pages load instantly.

A one-stop-shop for seeing the latest updates, and managing your preferences.

We brief you on the latest and most important developments, three times a day.

\*Our Digital Subscription plans do not currently include the e-paper ,crossword, iPhone, iPad mobile applications and print. Our plans enhance your reading experience.

*Why you should pay for quality journalism - [Click to know more](#)*

Please enter a valid email address.

The founder-CEO of India's first private space start-up company says privatisation can create thousands of jobs in the space sector

In 2-4 hours the novel molecule killed actively dividing drug-resistant strains

Subscribe to The Hindu now and get unlimited access.

Already have an account? [Sign In](#)

Sign up for a 30-day free trial. [Sign Up](#)

To continue enjoying The Hindu, You can turn off your ad blocker or [Subscribe to The Hindu](#).

[Sign up for a 30 day free trial.](#)

**END**

Downloaded from **crackIAS.com**

© **Zuccess App** by crackIAS.com

