

Astrophysicists ask public to rank sunspots

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'Sunspots' and 'solar storms' are the feature of an ambitious project being launched internationally by astrophysicists at Trinity College Dublin today. Members of the public will work as part of a global team to better understand sunspot and solar storm phenomena and their impacts on Earth. They will do this by 'rating' the relative complexity of each sunspot image they see on the Sunspotter website, based on its size, shape and arrangement of 'magnetic blobs'.

After stimulating over 300,000 'Citizen Science' mouse clicks from over 1,600 volunteers since the Sunspotter website was launched in Ireland in February, the [astrophysicists](#) are releasing a new set of over 250,000 sunspot images for people to work through. Each of the 13,000 images released in February was classified more than 50 times in a single month. Due to the success of the first phase, and to the staggering amount of data still to work through, the team hopes people from across the globe will now get involved.

Solar flare expert and Irish Research Council Research Fellow in Trinity's Astrophysics Research Group in the School of Physics, Dr Paul Higgins, is the lead scientist on the project. He said: "The reason we cannot just use computers to classify all of this data is that 'complexity' is not easily quantifiable. Humans can easily compare two objects, like a skateboard and a lorry and decide, 'this one is more complex', but this is beyond current computer software. However, the data we collect from Sunspotter volunteers may allow us to train a computer algorithm to measure sunspot complexity in the near future."

Sunspotter currently uses an efficient algorithm, called 'Elo' to determine the best way to rank sunspot images by their complexity. Elo was also featured in the Oscar-winning film 'The Social Network' as college students ranked their peers on their looks. "With Sunspotter, people are literally playing a game of 'Hot or Not' with sunspots," added Dr Higgins.

This project is part of the 'Zooniverse', a web portal devoted to Citizen Science projects and which has over 1,000,000 volunteers contributing to new cutting-edge science every day. Michael Parrish is the lead developer of Sunspotter. He added: "The 'Elo' algorithm is used to rapidly sort sunspots as Sunspotter volunteers make their classifications by giving each one a score."

After the Irish launch in February, the team achieved a 'true' measure of complexity for sunspots, for the first time ever. With the new set of images, the team hopes to measure 'complexity evolution' within individual sunspots as they are born, erupt, and slowly decay.

The overall goal is to discover a physical connection between patterns of [sunspot](#) evolution, complexity, and eruptions. As well as producing the beautiful Aurora Borealis and Australis, better known as the Northern and Southern Lights, solar eruptions disrupt GPS, damage satellites and endanger astronauts; if the Apollo 16 and 17 astronauts had left for the Moon a bit earlier or later, they would have been blasted by radiation from an intense solar storm.

[Sunspotter](#) has been designed so that anyone, from kids to grandparents, can help the team improve forecasts of solar eruptions. You can be among the first to contribute by logging on to [sunspotter.org](#) from June 13 to indicate which sunspots you think are complex, and which are simple.

"Our team has put a lot of effort into directly engaging the public in this project. We are running a live launch event at Fair Oaks Public Library in an underserved area of the SF Bay Area in California. We hope that Sunspotter will spark an interest in science for people who see it as a job for geniuses – and who have certainly never considered that they could contribute to science themselves," concluded Dr Higgins, who is currently working as a visiting researcher at the Lockheed Martin Solar and Astrophysics Laboratory in California.

Provided by Trinity College Dublin

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