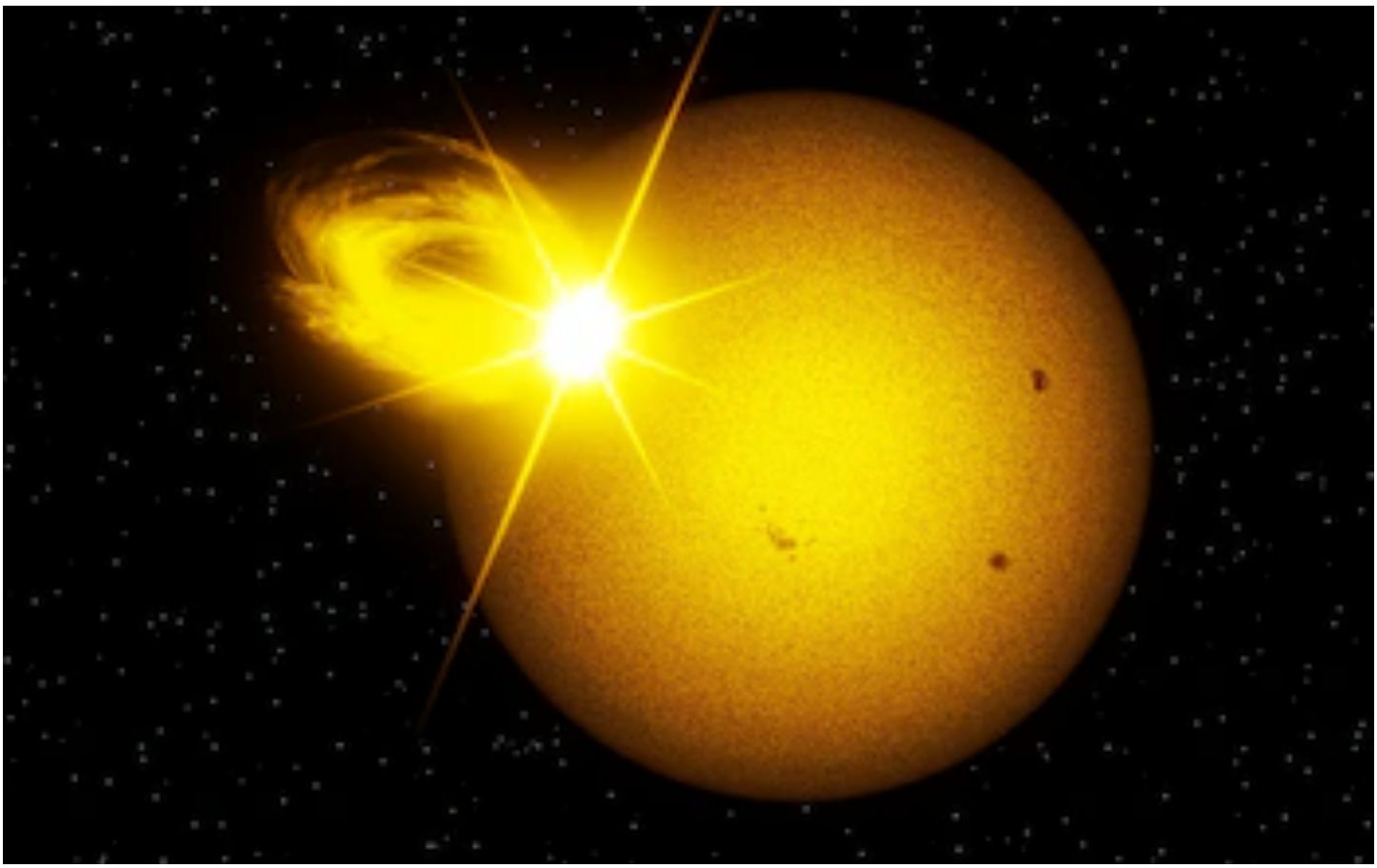
Solar superflare that could take down power supplies ‘overdue’

Observing other systems has shown we are in much more jeopardy from the Sun than previously thought



Superflares from our Sun have the power to create majoe geomagnetic storms on Earth Credit: MPS/Alexey ChizSarah KnaptonScience Editor

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Science Editor
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Earth is overdue for a dangerous ‘superflare’ from the Sun that could wipe out satellites and power grids, scientists have warned.

The flares, which burst from the Sun’s surface at more than one octillion

joules, have 100 times more energy than the Carrington Event, the most intense geomagnetic storm ever recorded on Earth, which occurred in 1859. The Carrington Event knocked out telegraph systems and even set fire to paper in offices.

An international team of scientists analysed data from more than 55,000 sun-like stars observed by Nasa's Kepler space telescope between 2009 and 2013.

"We cannot observe the Sun over thousands of years," said Dr Sami Solanki, director at the Max Planck Institute for Solar System Research (MPS). "Instead, however, we can monitor the behavior of thousands of stars very similar to the Sun over short periods of time. This helps us to estimate how frequently superflares occur."

Researchers identified 2,889 superflares on 2,527 of the observed stars, suggesting that a sun-like star produces a superflare approximately once per century, meaning we are already overdue a huge event.

"We were very surprised that sun-like stars are prone to such frequent superflares", said D Valeriy Vasilyev, of the MPS.

Earlier studies had suggested that superflares occur only one thousand to ten thousand years. However, the new research has used more precise and sensitive data.

'Stark reminder'

"The new data are a stark reminder that even the most extreme solar events are part of the Sun's natural repertoire," said Dr Natalie Krivova, from the MPS.

If a flare the size of the Carrington Event happened today, researchers have estimated there is a 71 per cent chance the British power grid would be affected while mobile phone reception could die and airlines would be grounded without GPS.

In 1989, a major geomagnetic storm caused a nine-hour outage of electricity transmission across Quebec. While in 2003, Sweden lost power for around one hour.

In May this year, Starlink suffered a degraded surface following the biggest

geomagnetic storm because of solar activity in two decades, causing the Northern Lights to be seen across Britain.

Evidence that superflares have hit the Earth in the past have been found in prehistoric tree trunks and in samples of millennia-old glacial ice. The most violent is believed to have occurred in the year 775 AD.

Experts say forecasting solar flares is vital, so that precautions should be taken, such as switching off satellites until it passes.

The European Space Agency's (ESA) Vigil satellite is due to launch in 2031 which will be positioned 60 degrees to the Sun to provide an early warning of dangerous solar storms before they can be seen from the ground.

The MPS is currently developing the Polarimetric and Magnetic Imager for this mission.

The research was published in the journal Science.

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