

Tech

## Closest ever photographs of the Sun reveal super-hot 'flares' near star's surface

Temperatures were so extreme - even from millions of miles away - that one scientist likened taking the shots to "throwing your smartphone into a fire"

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The closest ever photographs captured of the Sun have revealed super-hot "flares" swirling near the solar surface using imaging technology developed by London scientists.

Taken from about 48 million miles away by the [European Space Agency](#) and [Nasa's](#) British-built [Solar Orbiter satellite](#), pictures and video are the best quality footage of a phenomenon so hot - millions of degrees C they make the Sun's 6,000C gaseous outer plasma look positively mild.

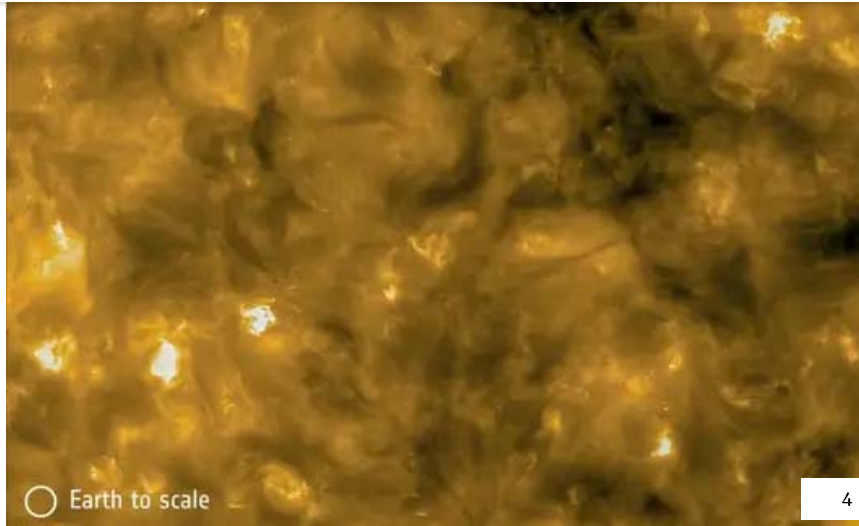
While researchers knew about larger solar flares, it is the first time smaller ones have been captured in detail and abundance.

The images - later colourised and enhanced by processing software for greater clarity - were captured by the probe's resistant 9.6 megapixel and 4.2MP cameras, at such extreme temperatures that one scientist on the mission likened the photographic conditions to "throwing your smartphone into a fire".

The probe's close pass to get the shots was made on its elliptical orbit between Venus and Mercury, the innermost planets to the Sun, after it spent months travelling through space following its [blast-off from Cape Canaveral in Florida attached to a Nasa Atlas V rocket](#).

Swirling flares seen in the images, dubbed "campfires", are understood to be caused by small changes in the Sun's magnetic field.

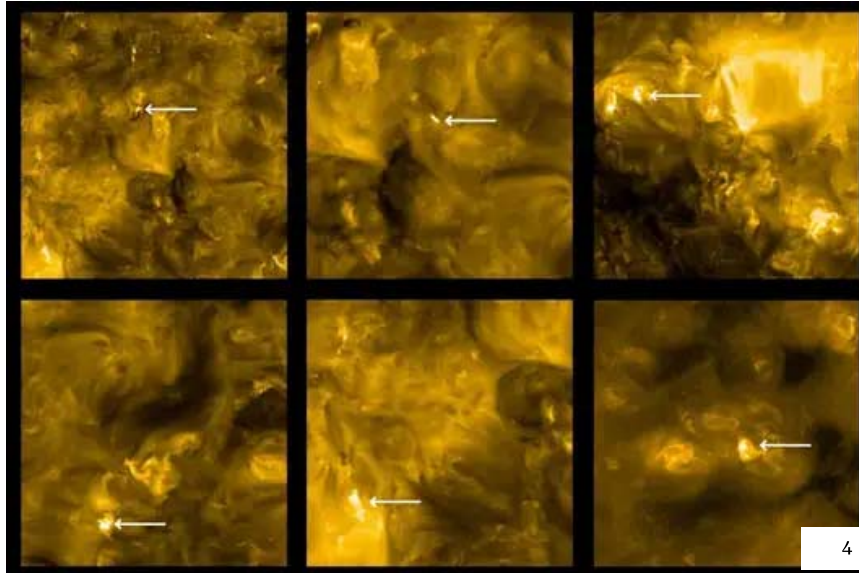
The mission will help scientists better understand space weather, which can damage satellites and affect radio signals, GPS and electricity networks back on Earth.



The solar flares can be seen burning brightly, with Earth for scale on the bottom left (Solar Orbiter/ESA/NASA)

Photos and video were taken through a mega-telescope, with instrument electronics [University College London's](#) Mullard Space Science Laboratory, which enables cameras to capture such high-resolution

These images, released today after being beamed back to Earth last month, were shot at about 500C behind shields as the orbiter calibrates its mission system



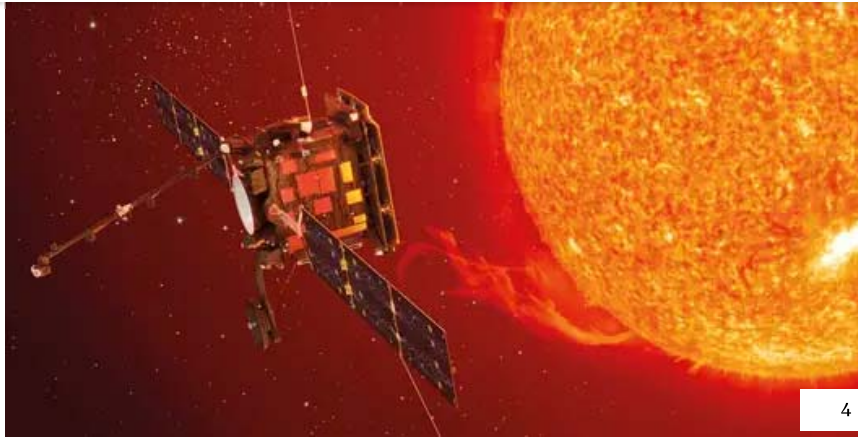
The "campfire" flares can be seen in the Sun's gaseous outer plasma (Solar Orbiter/ESA/NASA)

But despite the vast distance to upload its shot: Earth - 200 times our planet's distance to the moon, the compressed images took only about 11 minutes to relay through the cosmos using a telemetry link that is 100 times slower than a terrestrial 3G connection

The observational spacecraft, solar-powered and in a highly elliptical orbit, is due to make another pass of the Sun at a distance of just 26 million miles away

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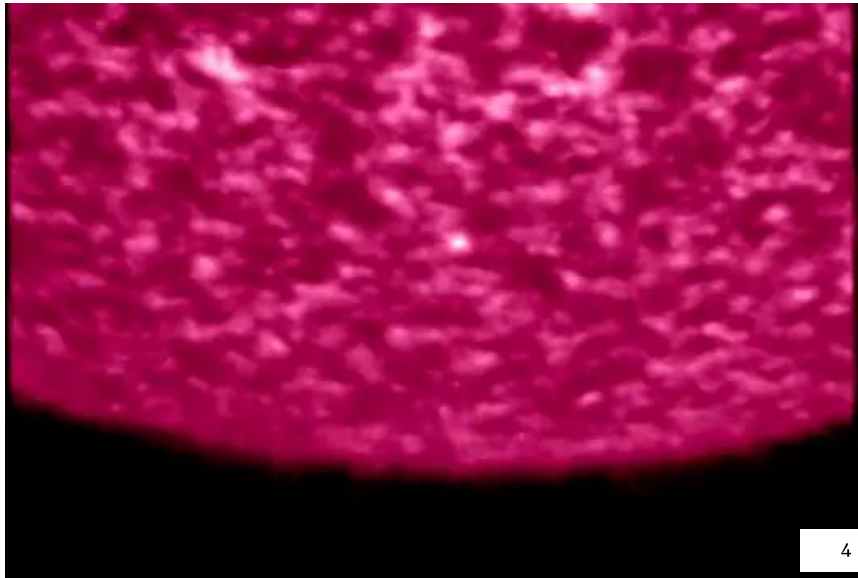
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Artist's impression of the Solar Orbiter on its mission (PA)

Professor Louise Harra, who worked on its imaging system and spectrometer as a co-principal investi; the mission, told the Standard from the World Radiation Centre in Davos: "This is already the clos telescope to the Sun, and the orbit it's in is very challenging, so it has to be cleverer than r

"We have to highly compress the data because we're so far aw



The images were taken using instrument electronics built by University College London (Solar Orbiter/ESA/NASA)

Dr David Long, a solar physics expert at UCL Mullard Space Science Laboratory and also an ESA co-prir investigator, said: "No images have been taken of the Sun at such a close distance before and the level o they provide is impressiv

"They show miniature flares across the surface of the Sun, which look like campfires that are millions c

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