

BBC A PSYCHOLOGIST'S GUIDE TO BEATING THE BURNOUT

Science Focus

MEANING OF LIFE NOT INCLUDED

How to start
STARGAZING AT HOME

Discovering the
SEASONS OF THE HUMAN BODY

Finding answers to
VACCINE SAFETY MYTHS

MYSTERIES OF THE UNIVERSE

Why are monster black holes at the heart of every galaxy?

Why is there something rather than nothing?

Where is two thirds of the Universe?

Why haven't we seen alien life?

What is dark matter?

Does time exist?



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Health

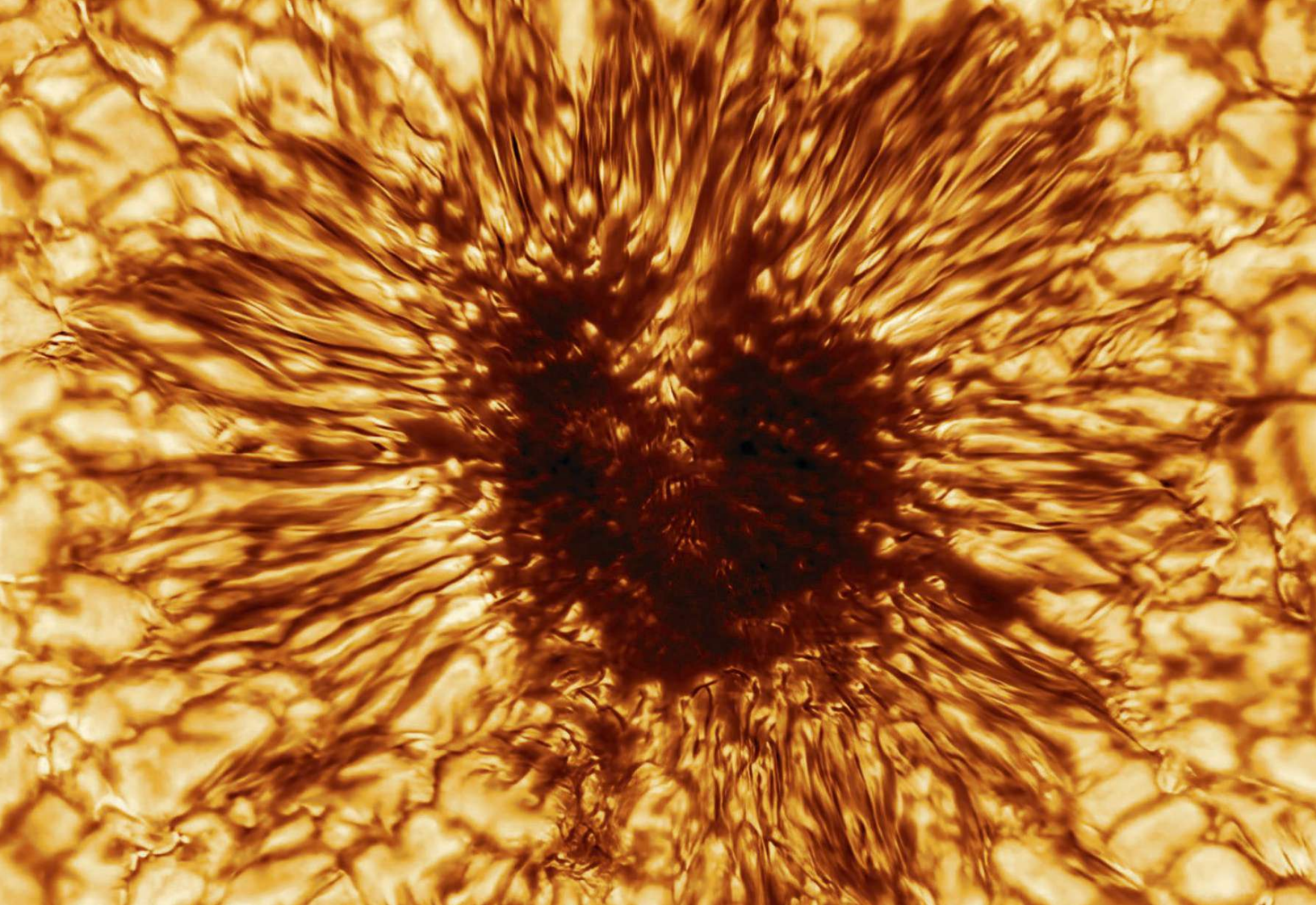
Michael Mosley on how to lower your blood pressure

Dinosaurs

How they came to rule the planet

Food

Restaurant puts 'no-kill' meat on the menu



ASTRONOMY

Most in-depth sunspot image to date captured by world's largest solar telescope

This stunning image was taken by the Daniel K Inouye Solar Telescope (DKIST) in Maui, Hawaii. It shows the rich, deep-brown heart of a sunspot surrounded by red and orange streaks flaring outwards, giving it the appearance of a psychedelic sunflower.

The Sun has a powerful magnetic field that slowly flips its poles every 11 years. Throughout this cycle, the electromagnetic activity varies across the Sun's surface. Since a new solar cycle began last year, researchers at the National Science Foundation (NSF) in the US have been working to better capture intricate details of sunspots using DKIST, which despite being the world's largest solar

telescope, with an aperture measuring four metres across, is still under construction.

"It's really exciting to see the Sun and sunspots with this extremely high resolution, and see so many details that we've never seen before," said Dr Thomas Rimmele, associate director at the NSF's National Solar Observatory.

"The sunspot image achieves a spatial resolution about 2.5 times higher than ever before and shows magnetic structures as small as 20km on the surface of the Sun," he added.

The sunspot in this image measures approximately 15,000km in diameter – large enough to comfortably fit the planet Earth to inside it.

Sunspots form in areas where the magnetic fields are particularly strong. Their dark appearance is due to the magnetic fields being so strong that they keep the heat within the Sun from emanating to the surface, making them cooler than the areas that surround them. But temperatures considered cold for the Sun are still more than 200 times hotter than room temperature (around 20-22°C) here on Earth.

The streaks radiating outwards from the dark centre of the sunspot are hot and cold gases being redirected by the magnetic field.

While many of the processes that occur within the Sun remain a mystery, we know that these spots and other associated solar events are capable of affecting GPS systems, power grids and satellites here on Earth.

With construction of the DKIST due to be completed in 2021, this preliminary image gives us just a taste of what's to come. Greater insights into the star's behaviour are expected in the run-up to the next solar maximum, which is predicted to occur in mid-2025.