

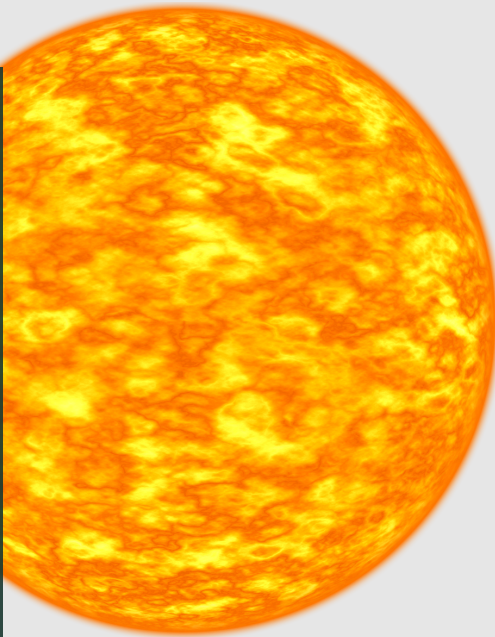


# SPARC WEEKLY



## CAMPFIRE

*The Solar Orbiter probe first spotted solar campfires when it was about half the distance from Earth to the sun.*



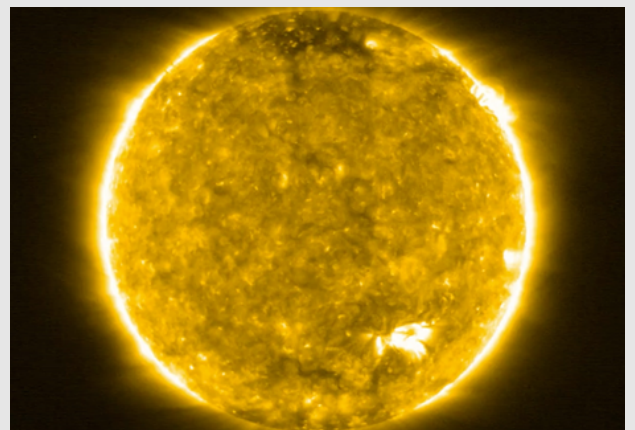
Campfires are small eruptions on the sun's surface. They are similar to massive explosions known as solar flares and coronal mass ejections, or CMEs. But campfires are only about a millionth or a billionth the size of those outbursts.

The European Space Agency's Solar Orbiter snapped the first pictures of campfires in 2020. To the probe's ultraviolet camera, these events appeared as flickers of UV light. Like solar flares and CMEs, campfires are thought to arise when magnetic fields on the sun interact. But scientists are still teasing out just how the sun's campfires ignite.

Campfires may be puny by solar standards. But they're still pretty epic events. The smallest ones are a few hundred kilometers (miles) across. That's about as big as Arkansas. And campfires can stretch thousands of kilometers above the sun's surface. Each one lasts no longer than a few minutes. But campfires light up much more frequently than larger solar flares — which could help solve a longstanding mystery about the sun. Namely, why the sun's outer atmosphere, or corona, is so hot.

The solar corona is millions of degrees Celsius. That's much hotter than the sun's surface, which sizzles at about 5,500° Celsius (9,930° Fahrenheit). Perhaps campfires, which boast temperatures around 1 million degrees Celsius, add heat to the corona.

<https://www.snexplores.org/article/scientists-say-campfire-definition-pronunciation>



# PEOPLE SYMPATHIZE WITH BULLIED AI BOTS

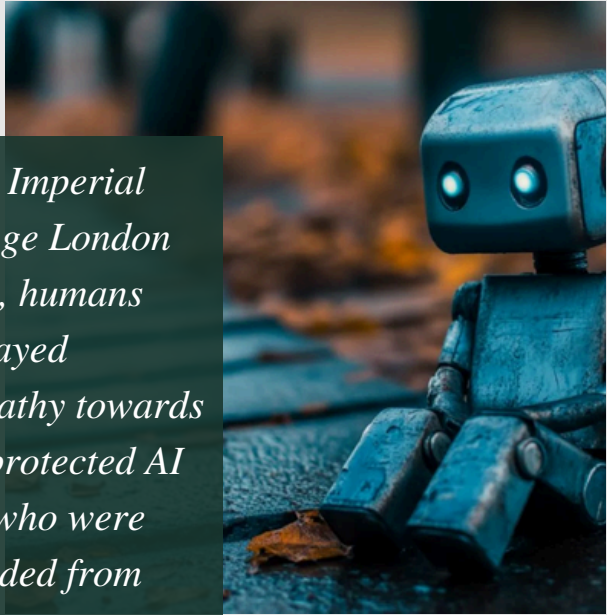
(The study is published in Human Behavior and Emerging Technologies.)

Lead author Jianan Zhou, from Imperial's Dyson School of Design Engineering, said: "This is a unique insight into how humans interact with AI, with exciting implications for their design and our psychology."

People are increasingly required to interact with AI virtual agents when accessing services, and many also use them as companions for social interaction. However, these findings suggest that developers should avoid designing agents as overly human-like.

Senior author Dr Nejra van Zalk, also from Imperial's Dyson School of Design Engineering, said: "A small but increasing body of research shows conflicting findings regarding whether humans treat AI virtual agents as social beings. This raises important questions about how people perceive and interact with these agents.

"Our results show that participants tended to treat AI virtual agents as social beings, because they tried to include them into the ball-tossing game if they felt the AI was being excluded. This is common in human-to-human interactions, and our participants showed the same tendency even though they knew they were tossing a ball to a virtual agent. Interestingly this effect was stronger in the older participants."

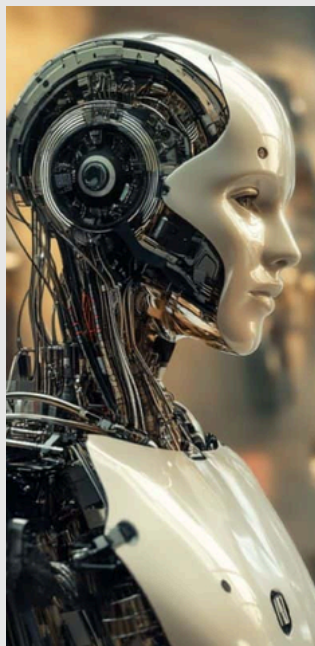


*In an Imperial College London study, humans displayed sympathy towards and protected AI bots who were excluded from playtime.*

## People don't like ostracism, even toward AI

Feeling empathy and taking corrective action against unfairness is something most humans appear hardwired to do. Prior studies not involving AI found that people tended to compensate ostracised targets by tossing the ball to them more frequently, and that people also tended to dislike the perpetrator of exclusionary behaviour while feeling preference and sympathy towards the target.

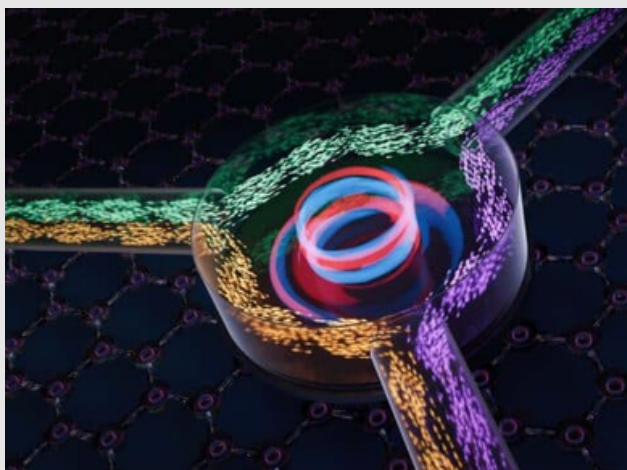
To carry out the study, the researchers looked at how 244 human participants responded when they observed an AI virtual agent being excluded from play by another human in a game called 'Cyberball', in which players pass a virtual ball to each other on-screen. The participants were aged between 18 and 62. In some games, the non-participant human threw the ball a fair number of times to the bot, and in others, the non-participant human blatantly excluded the bot by throwing the ball only to the participant.



*The researchers say the study, which used a virtual ball game, highlights humans' tendency to treat AI agents as social beings -- an inclination that should be considered when designing AI bots.*

Participants were observed and subsequently surveyed for their reactions to test whether they favoured throwing the ball to the bot after it was treated unfairly, and why.

They found that most of the time, the participants tried to rectify the unfairness towards the bot by favouring throwing the ball to the bot. Older participants were more likely to perceive unfairness.



<https://www.sciencedaily.com/releases/2024/10/241017113151.htm>

## **Human caution**

The researchers say that as AI virtual agents become more popular in collaborative tasks, increased engagement with humans could increase our familiarity and trigger automatic processing. This would mean users would likely intuitively include virtual agents as real team members and engage with them socially.

This, they say, can be an advantage for work collaboration but might be concerning where virtual agents are used as friends to replace human relationships, or as advisors on physical or mental health.

Jianan said: "By avoiding designing overly human-like agents, developers could help people distinguish between virtual and real interaction. They could also tailor their design for specific age ranges, for example, by accounting for how our varying human characteristics affect our perception."

The researchers point out that Cyberball might not represent how humans interact in real-life scenarios, which typically occur through written or spoken language with chatbots or voice assistants. This might have conflicted with some participants' user expectations and raised feelings of strangeness, affecting their responses during the experiment.

Therefore, they are now designing similar experiments using face-to-face conversations with agents in varying contexts such as in the lab or more casual settings. This way, they can test how far their findings extend.



## RESEARCHERS DEVELOPED A CAT'S EYE-INSPIRED VISION SYSTEM FOR AUTONOMOUS ROBOTICS

Cats are known for their amazing vision in both bright light and darkness.

Their eyes are uniquely adapted: during the day, vertical slit-shaped pupils help them focus and reduce glare.

At night, their pupils widen to let in more light, and a reflective layer called the tapetum lucidum boosts their night vision, giving their eyes that familiar glow.

A group of Korean researchers led by Professor Young Min Song from Gwangju Institute of Science and Technology (GIST) designed a new vision system that uses an advanced lens and sensors inspired by feline eyes.

The system includes a slit-like aperture that, like a cat's vertical pupil, helps filter unnecessary light and focus on key objects. It also uses a special reflective layer similar to the one found in cat eyes that improves visibility in low-light conditions.

<https://www.sciencedaily.com/releases/2024/10/241015141345.htm>



*Autonomous systems like drones, self-driving cars, and robots are becoming more common in our daily lives. However, they often struggle to "see" well in different environments -- like bright sunlight, low light, or when objects blend into complex backgrounds. Interestingly, nature may already have the solution to this problem.*

This research was published in the journal *Science Advances* on September 18, 2024, and represents a significant advancement in artificial vision systems, demonstrating enhanced object detection and recognition capabilities and positioning it at the forefront of technological breakthroughs in autonomous robotics.

"Robotic cameras often struggle to spot objects in busy or camouflaged backgrounds, especially when lighting conditions change. Our design solves this by letting robots blur out unnecessary details and focus on important objects," explains Prof. Song.

This approach has the additional benefit of being energy-efficient, as it relies on the design of the lens rather than on heavy computer processing.

## WHO ARE WE?

SPARC Robotics Team's mission and vision is to make our environment the best it can be. On a volunteer basis, we look at the problems that are happening around us and make them our problems, both as SPARC and individually, and help as much as we can with appropriate projects.

NASA ACCP (Astro Camp Community Partners) was only in the US until four years ago. This year they came to Turkey with us after four years of traveling to many countries. ACCP educates school-age children from kindergarten to high school on science-related topics of interest with practical knowledge and application, while also supporting children's craft development, general culture and questioning skills.

As SPARC, we have brought this training provided by NASA to our country in the most comprehensive way and our continuous communication with NASA not only enables us to improve our trainings day by day, but also gives us the opportunity to learn about the innovations in the field of STEM instantly, from the most accurate source and to spread the knowledge we have around us.

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## EDITOR

Hello, I'm Defne Ulu and I am the editor of this edition of our newsletter. From now on with my friend Defne Yağmur Şehidoğlu, we will be preparing the SPARC newsletters.

I hope you learned new and interesting facts from these articles and I hope it has helped you to keep your mind out of your problems while reading it.

Have a good day.  
See you next week!!