SINGAPORE UNIVERSITY OF TECHNOLOGY AND DESIGN

Weekly Discovery

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4 May - 8 May 2026

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AI

This AI knew the answers but didn't understand the questions

"For decades, psychologists have debated whether the human mind can be explained by one unified theory or must be broken into separate parts like memory and attention. A recent AI model called Centaur seemed to offer a breakthrough, claiming it could mimic human thinking across 160 different cognitive tasks. But new research is challenging that bold claim, suggesting the model isn't truly "thinking" at all—it's just memorizing patterns."

Source: Science China Press (30 Apr 2026)

AI

Deepfake Detection Dataset Aims to Keep Up With Generative AI The MNW benchmark pulls from more sources and will be updated regularly

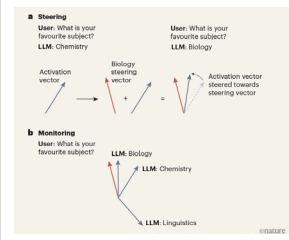
"With the rise of AI-generated content online, it's becoming more difficult—and more important—to help the public identify whether an image, audio clip or video is real or fake. To combat the problem, a team of researchers from Microsoft, Northwestern University in Evanston, Ill., and Witness, a non-profit organization that assists activists and journalists in addressing the challenges associated with AI-generated content, have come together to create a novel dataset of AI-generated media to help build more robust detection systems.

The researchers describe their new dataset, called the Microsoft-Northwestern-Witness (MNW) deepfake detection benchmark, in a study published 10 April in IEEE Intelligent Systems. The dataset was intentionally built using diverse samples of AI-generated media in order to reflect the current AI-generation landscape as much as possible."

Source: IEEE (4 May 2026)

AI

Algorithm that gets 'under the hood' of AI models could effectively steer their responses



"A method for identifying representations of concepts in neural networks could provide a more-effective way to control and monitor artificial-intelligence systems.

Is it possible to know whether the response of an artificial-intelligence model is factually correct without having a human check it? Neural networks, on which many AI systems are based, can encode concepts such as truthfulness. Concepts are often represented by neural networks as numeric patterns, but identifying these patterns and using them to steer the behaviour of AI models is a substantial challenge. Writing in Science, Beaglehole et al.1 report an approach to AI steering that outperforms alternative methods on a coding task, and show that this approach can be used to control and monitor AI models from the 'inside'…

The authors report that for the set of 512 concepts, RFM-based steering vectors generally outperformed steering vectors that were found using other common techniques, including difference-in-means. Perhaps this should be unsurprising, because difference-in-means captures only a single direction in activation space (the line between two average activation vectors), whereas the RFM approach iteratively learns which dimensions of the activation space are most predictive and weights them accordingly. This captures more-sophisticated concept representations than does difference-in-means.."

Source: Nature (27 Apr 2026)

AI

Medical AI moving faster than safety checks

"Flinders University experts are warning that artificial intelligence (AI) must be carefully evaluated and governed before it is adopted widely in healthcare, saying rapid advances do not automatically translate into safe use for patients.

In an expert commentary titled 'AI can reason like a physician; what comes next? published in Science, Flinders researchers caution that while new AI systems show impressive capabilities, strong results in controlled studies do not mean they are ready for routine use in hospitals or clinics.

The authors say there is an urgent need to understand how emerging AI tools can be safely integrated into everyday clinical practice, with patient outcomes remaining the central focus.

Despite these warnings, the researchers acknowledge that recent advances in AI create genuine opportunities to support doctors, particularly in busy and high-pressure care settings.."

Source: Flinders Uni (30 Apr 2026)

ARCHITECTURE

Nike opens permanent Air Lab in Milan with "industrial-grade robots for anyone to use"

"During Milan design week, sports brand Nike unveiled a permanent laboratory where anyone can experiment with its Air technology over the coming years.

Air Lab is a permanent addition to Dropcity, a centre for architecture and design that was launched in 2024 by architect Andrea Caputo and occupies a row of 15 previously abandoned warehouse tunnels behind Milan Central Station.

During the city's annual design festival, five of the arches hosted a preview exhibition called NikeAir_Lab that showcased the past, present and future of Nike Air technology through samples, swatches and machinery relating to the company's innovations.

The technology displayed, including robotic arms, thermoforming machines and pneumatic cylinder kits, will become part of Dropcity's workshop facilities, which are accessible to anyone looking to develop prototypes for building elements, furniture or industrial products."

Source: Dezeen (29 Apr 2026)

ARCHITECTURE

Designing with Air: Rethinking Architecture Beyond the Wall

"Architecture is traditionally chronicled through the persistence of the solid. We define the discipline by the weight of the lintel, the mass of the pier, and the resistance of the wall. Even when lightness is invoked, it is usually understood as a subtractive act, the thinning of a section or the precarious reduction of a load. Yet there is a parallel history, less visible and harder to isolate, in which the primary material of construction is not what occupies space, but what moves through it.

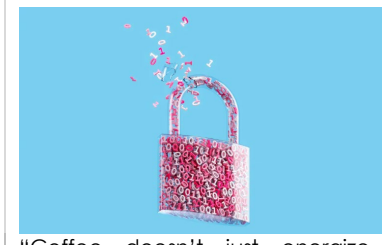
To treat air as a medium is to move past the binary of the envelope. The boundary between the interior and the world ceases to be a line of absolute separation and becomes, instead, a site of filtration and pressure. We begin to see the building as a thermal valve, a series of gradients where moisture, velocity, and heat are not merely background "conditions" to be mitigated by mechanical systems, but are the very substances being shaped.

This shift suggests an architecture that works through calibration. As the climate becomes increasingly erratic, the impulse to seal the interior behind an airtight skin feels less like a solution. A different logic emerges when we consider the building as a porous participant in its territory, a structure that organizes space through the manipulation of invisible flows.."

Source: Archdaily (2 May 2026)

HEALTH

Scientists just discovered what coffee is really doing to your gut and brain



"Coffee doesn't just energize—it actively reshapes the gut and mind. Researchers found that both caffeinated and decaf coffee altered gut bacteria in ways linked to better mood and lower stress. Decaf even improved learning and memory, while caffeine boosted focus and reduced anxiety. Together, they show coffee works through multiple pathways beyond just caffeine.

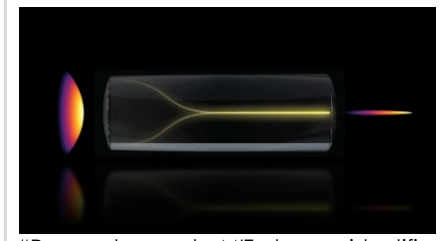
Researchers at APC Microbiome Ireland, a leading research center at University College Cork, have taken a major step toward understanding how coffee benefits the body. For the first time, scientists have closely examined how coffee interacts with the gut-brain axis, the communication network that links the digestive system and the brain.

The findings, published in Nature Communications and supported by the Institute for Scientific Information on Coffee (ISIC), show that regularly drinking both caffeinated and decaffeinated coffee can shape the gut microbiome and influence mood and stress."

Source: University College Cork (3 May 2026)

HEALTH

MIT scientists turn chaotic laser light into powerful brain imaging tool



"Researchers at MIT have identified an unexpected effect in optical physics that could lead to a faster and more detailed way to image living tissue. Under specific conditions, what normally looks like a scattered and disordered laser signal can reorganize itself into a narrow, highly focused "pencil beam."

With this self-formed beam, the team produced 3D images of the human blood-brain barrier at speeds about 25 times faster than the current gold-standard approach, while preserving similar image quality. The method also makes it possible to watch individual cells absorb drugs in real time. This could help scientists evaluate whether treatments for conditions such as Alzheimer's or ALS are actually reaching their intended targets in the brain."

Source: MIT (23 Apr 2026)

MATERIALS

The hidden structure behind a widely used class of materials

NANO

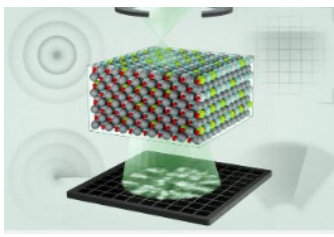
Scientists built a memory chip that breaks the rules of miniaturization

PHYSICS

Oxford physicists achieve first-ever "quadsqueezing" breakthrough in quantum physics

ROBOTS

Inside the company building America's first mail-order servant robot



“Materials called relaxor ferroelectrics have been used for decades in technologies like ultrasounds, microphones, and sonar systems. Their unique properties come from their atomic structure, but that structure has stubbornly eluded direct measurement.

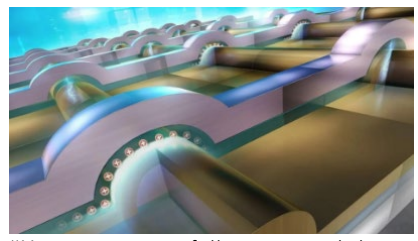
Now a team of researchers from MIT and elsewhere has directly characterized the three-dimensional atomic structure of a relaxor ferroelectric for the first time. The findings, which will be reported in Science, provide a framework for refining models used to design next-generation computing, energy, and sensing devices.

“Now that we have a better understanding of exactly what’s going on, we can better predict and engineer the properties we want materials to achieve,” says corresponding author James LeBeau, MIT’s Kyocera Professor of Materials Science and Engineering. “The research community is still developing methods to engineer these materials, but in order to predict the properties those materials will have, you have to know if your model is right.”

In their paper, the researchers describe how they used an emerging technique to reveal the distribution of electric charges in the material, with a surprising result.

“We realized the chemical disorder we observed in our experiments was not fully considered previously,” says co-first authors Michael Xu PhD ’25 and Menglin Zhu, who are both postdocs at MIT. “Working with our collaborators, we were able to merge the experimental observations with simulations to refine the models and better predict what we see in experiments.”.”

Source: Science (30 Apr 2026)

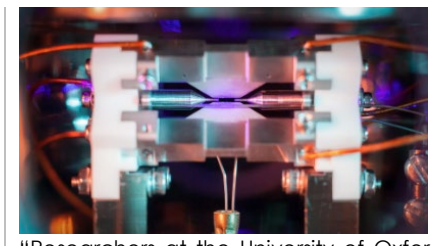


“Have you ever felt your smartphone heat up after heavy use or watched the battery drop at the worst possible moment? A big reason is the electronic circuits and memory inside the device, which consume energy and release heat as they operate.

At the most basic level, computer memory stores information as 0s and 1s by controlling how easily electricity can pass through a material. If scientists can design memory that requires far less electricity, it could dramatically reduce the energy demands of phones, computers, and other electronics.

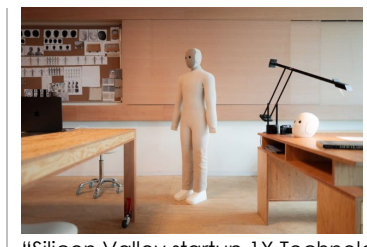
A new kind of memory device may finally solve the problem of overheating and battery drain in electronics. By shrinking components to an extreme scale and redesigning their structure, researchers found a way to reduce energy loss instead of increasing it. The result is a tiny memory unit that improves as it gets smaller—something once thought impossible. This could pave the way for ultra-efficient smartphones, wearables, and AI systems.”

Source: Science Tokyo (3 May 2026)



“Researchers at the University of Oxford have demonstrated a new kind of quantum interaction using a single trapped ion. By carefully generating and controlling increasingly complex forms of "squeezing" -- including a fourth-order effect called quadsqueezing -- they have made quantum behaviors accessible that had previously been out of reach. The work also introduces a new way to engineer these interactions, with potential uses in quantum simulation, sensing, and computing. The findings were published today (May 1) in Nature Physics..”

Source: Oxford (26 Apr 2026)



“Silicon Valley startup 1X Technologies will start shipping its Neo humanoid robots into people's homes this year. Dezeen's Ellen Eberhardt was given an exclusive look behind the scenes where designers are turning the stuff of science fiction into reality.

"There's this really interesting dialogue around whether this is skin or clothing," 1X Technologies (1X) designer Danny Chambers said, examining the 3D-knitted bodysuit of a Neo robot lying lifelessly on a plywood desk, Frankenstein-style….

The founder was looking for a design evolution from Neo's predecessor, Eve, an industrial semi-humanoid robot released by Børnich in 2022 which rolls around factory floors on a set of wheels.

"His prompt was: can you make this cool?" Sleeper told Dezeen. "Bernt's got all this very beautiful wood design taste, but he didn't know how to infuse that in the brand. He brought me in as the first non-engineering hire."

"I broke down the problem and asked, all right, if we want to connect this world of technology to normal, everyday humans, what is that going to look like? And then we redesigned the robot from the ground up in, like, the first six weeks I was there."."

Source: Dezeen (23 Apr 2026)