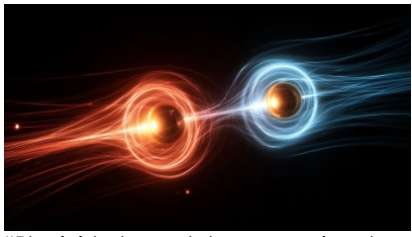




Access to 30,000 technical, economic and market intelligence. Research topics include information and communication technologies; aerospace and defence; automotive and transportation; chemicals, materials and foods; electronics and security; energy and power systems; environment, building and technologies; healthcare; measurement and instrumentation; and industrial automation and process control. The research focuses on market strategies, forecast and analysis, as well as emerging technologies, to aid in the identification and generation of growth opportunities.

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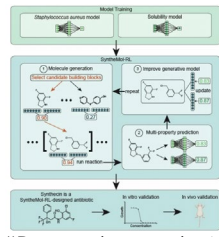
AI
AI just discovered new physics in the fourth state of matter



"Physicists have taken a major step toward using AI not just to analyze data, but to uncover entirely new laws of nature. By combining a specially designed neural network with precise 3D tracking of particles in a dusty plasma—a strange "fourth state of matter" found from space to wildfires—the team revealed hidden patterns in how particles interact. Their model captured complex, one-way (non-reciprocal) forces with over 99% accuracy and even overturned long-held assumptions about how these forces behave.."

Source: [Emory University](#) (23 Apr 2026)

AI
McMaster-built AI speeds up drug discovery, designs new antibiotic in early tests



"Researchers at McMaster University have developed a new generative artificial intelligence (AI) model capable of drastically speeding up drug discovery — and, in early tests, it has already designed a brand-new antibiotic.

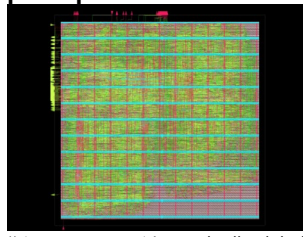
The discovery is a demonstration of how AI could dramatically improve the slow and costly search for new antimicrobial medicines, as bacteria and other microbes continue to evolve resistance to our current suite of drugs.

The new model, called SyntheMol-RL, is trained to explore a vast chemical space of up to 46 billion possible compounds — far beyond what could realistically be tested in the lab, where even large-scale screens top out at around a million molecules. Drawing on roughly 150,000 molecular 'building blocks' and a set of 50 chemical synthesis reactions, the AI model is designed to generate structurally novel antibiotic candidates.

"In the lab, we can build chemical compounds using a set of smaller chemical fragments, which can be stuck together like molecular Lego blocks," says Assistant Professor Jon Stokes, whose laboratory developed the new model. "SyntheMol-RL configures those fragments in different ways, faster than humans ever could, to create new, larger chemical compounds that should — based on its knowledge — be antibacterial."

Source: [McMaster University](#) (23 Apr 2026)

AI
AI Agent Designs a RISC-V CPU Core From Scratch: Startup Verkor.io's agentic AI orchestrated the entire design process from a 219-word prompt



"Ace — an AI-controlled table-tennis robot — shows that autonomous systems can compete with humans at complex, fast-paced, interactive tasks.

Few sports require a more finely honed combination of speed, perception and skill than table tennis. Watching a professional game is a jaw-dropping experience that shows how a player can, through training and physical prowess, estimate ball speed and spin with astounding accuracy, and, by combining this with fast reflexes and agility, achieve the tactical gameplay and incredible pace the sport is known for. Writing in Nature, Dürer et al.1, a new player comes to the fore: an artificial-intelligence agent that combines a robotic arm with an AI-based control system. The system, called Ace, can not only challenge professional players, but also provide valuable insights on human strategy and movement."

Source: [IEEE](#) (27 Apr 2026)

AI
Robot can beat elite players at table tennis

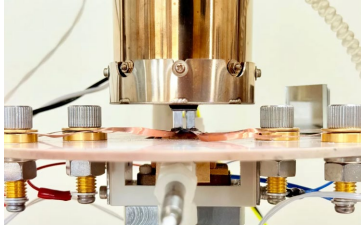


"The well-known phrase "man is what he eats" (Der Mensch ist, was er isst), by Ludwig Feuerbach, asserts that the physical, mental, and even moral constitution of human beings is directly linked to what they consume. Today, this idea is widely internalized, with growing awareness around food, nutrition, and the impact of what we ingest on our bodies. Yet, this same level of awareness doesn't extend to the environments we inhabit, where materials continue to be treated as technical decisions rather than active agents in the relationship between body and space. Considering that a large portion of the global population spends around 90% of their time indoors, it is rarely discussed what actually composes these spaces at their most fundamental level: materials. Walls, floors, and finishes are often approached as technical or aesthetic choices, when in reality they can function as continuous sources of exposure to potentially harmful substances..

It is within this context that the Healthy Materials Lab (HML), founded in 2015 at Parsons School of Design, proposes a shift in perspective. Based on the recognition that the design and construction industry, especially within the affordable housing sector, plays a critical role in the declining health of both people and ecosystems, the lab argues that material specification should be understood as a central public health concern. We spoke with Jonsara Ruth and Alison Mears, architects and founders of the lab, who shared how this initiative has been developed over the past decade and why material selection may be one of the most critical decisions in contemporary architectural practice. The lab emerged supported by a three-year grant from the JPB Foundation, enabling the development of research on material impacts and the formulation of strategies aimed at architectural practice.."

Source: [Nature](#) (22 Apr 2026)

AI
AI Designs Thermoelectric Generators 10,000 Times Faster Than We Can Turning waste heat into electricity just got easier



"Waste heat is everywhere: car engines, industrial machinery, kitchen appliances—even your own body. Some of that lost energy can be converted into electricity using thermoelectric generators: compact, solid-state devices that produce power directly from temperature differences without the need for spinning turbines or moving parts.

But designing materials that make these systems efficient has long been an engineering slog, requiring slow simulations and painstaking experiments to identify combinations that conduct electricity while limiting unwanted heat flow.

Now researchers in Japan have built an artificial-intelligence tool that can design thermoelectric generators 10,000 times faster than conventional approaches. Prototypes built based on the tool's recommendations performed on par with today's leading thermoelectric devices, the study found.

The research, reported 15 April in Nature, could boost a long-promised but not widely adopted clean-energy technology by dramatically accelerating the search for affordable

ARCHITECTURE
"Of all the projects in Saudi Arabia, this was the one capable of meeting its deadline" says architect behind 1km-tall skyscraper



"Saudi Arabia's Jeddah Tower is on course to be the world's first kilometre-tall building. But, architect Gordon Gill tells Dezeen in this interview, a skyscraper double that height is already realistic.

Together with Adrian Smith and Robert Forest, Gill co-founded Chicago-based studio Adrian Smith + Gordon Gill Architecture, a skyscraper specialist and the firm behind Jeddah Tower.

One of the most hotly anticipated buildings of the century, the megatall skyscraper is currently rising just outside the port city of Jeddah.

It is set to soon surpass the 830-metre-tall Burj Khalifa in Dubai – designed by Gill's partner Smith while at SOM – as the world's tallest building."

CYBERSECURITY
What Anthropic's Mythos Means for the Future of Cybersecurity The new reality rewards systems that can be tested and patched continuously



"Two weeks ago, Anthropic announced that its new model, Claude Mythos Preview, can autonomously find and weaponize software vulnerabilities, turning them into working exploits without expert guidance. These were vulnerabilities in key software like operating systems and internet infrastructure that thousands of software developers working on those systems failed to find. This capability will have major security implications, compromising the devices and services we use every day. As a result, Anthropic is not releasing the model to the general public, but instead to a limited number of companies.

The news rocked the internet security community. There were few details in Anthropic's announcement, angering many observers. Some speculate that Anthropic doesn't have the GPUs to run the thing, and that cybersecurity was the excuse to limit its release. Others argue Anthropic is holding to its AI safety mission. There's hype and counterhype, reality and marketing. It's a lot to sort out, even if you're an expert.

We see Mythos as a real but incremental step, one in a long line of incremental steps. But even incremental steps can be important when we look at the big picture."

HEALTH
Move smarter not harder: how less exercise is more



"If you think you need to 'go hard' at the gym to make your muscles stronger, think again!

New research at ECU has revealed strenuous exercise and soreness is not needed to improve muscle size, strength, or performance.

"The idea that exercise must be exhausting or painful is holding people back," ECU's Director of Exercise and Sports Science, Professor Ken Nosaka, said.

"Instead, we should be focussing on eccentric exercises which can deliver stronger results with far less effort than traditional exercise - and you don't even need a gym!"

Eccentric exercise is when muscles work as they lengthen, usually during the 'lowering' part of the movement such as lowering a dumbbell, walking downstairs or slowly sitting down in a chair.

The study showed muscles generate more force during these movements - while using

materials and device designs that efficiently convert heat into electricity. Takao Mori, deputy director of the Research Center for Materials Nanoarchitectonics in Tsukuba, Japan, and his team conducted the research.

"It's a solid piece of work and points to the future role that AI will play in the design" of such technologies, says Zhifeng Ren, the director of the Texas Center for Superconductivity at the University of Houston, who was not involved in the study."

Source: [IEEE](#) (24 Apr 2026)

Source: [Dezeen](#) (23 Apr 2026)

Source: [IEEE](#) (15 Apr 2026)

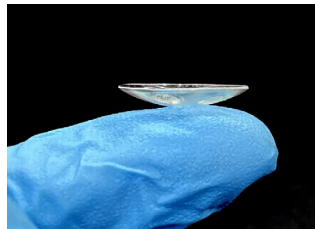
less energy than they would by lifting or pulling an object and walking upstairs.

"You can gain strength without feeling as exhausted. So, you get more benefit for less effort. That makes eccentric exercise appealing for a wide range of people," Professor Nosaka said..."

Source: [Edith Cowan University](#) (23 Apr 2026)

HEALTHCARE

Contact Lens Uses Microfluidics to Monitor and Treat Glaucoma: The design uses a smartphone-based neural network to track eye pressure



"More than 80 million people suffer from glaucoma globally, making it the second most common cause of blindness worldwide. The disease—caused by elevated internal eye pressure damaging the optic nerve—is incurable, but its progression can be slowed with drugs to control eye pressure.

Now, researchers have developed an electronics-free smart contact lens that can track the disease in real time and also deliver drugs in response. The all-polymer lens includes a microfluidic sensor that monitors eye pressure, as well as pressure-activated drug reservoirs that dispense medicine as eye pressure rises.

"A lot of patients forget to take the medicine at the right time," says Yangzhi Zhu, an assistant professor at the Terasaki Institute for Biomedical Innovation. "For our technology, we don't need the user to manually operate or trigger. Everything is based on the sensor and the closed-loop drug delivery." "

Source: [IEEE](#) (17 Apr 2026)

MATERIALS

Researchers create fireproof building material from sawdust



"Experts at technology university ETH Zurich and research institute Empa have developed a process that uses the mineral struvite to convert sawdust into a recyclable, non-combustible composite material.

According to the research, which was led by Ronny Kürsteiner, the material could be used for internal walls and offer a lightweight alternative to cement-bonded particleboards.

To make the composite material, the researchers used an enzyme extracted from watermelon seeds to control the crystallisation of struvite – a colourless ammonium magnesium phosphate with fire protection properties.

Large crystals were formed in the process, which filled the cavities between sawdust particles and bound them together. The material was pressed in a mould for two days and later taken out to dry."

Source: [Dezeen](#) (14 Apr 2026)

MATERIALS

Graphene kills harmful bacteria "superbugs" but spares human cells



"Scientists have uncovered how graphene oxide pulls off a remarkable trick: it hunts down and destroys harmful bacteria while leaving human cells completely unharmed. By targeting a molecule found only in bacterial membranes, this ultra-thin carbon-based material acts with laser-like precision—offering a powerful new alternative to traditional antibiotics. Even more exciting, it works against drug-resistant "superbugs," promotes faster wound healing, and keeps its antibacterial strength even after repeated washing..."

Source: [KAIST](#) (26 Apr 2026)

OPTICS

Glasses-free display switches between 2D and 3D



"Three-dimensional display technology creates the illusion of depth by delivering slightly different images of a scene to each eye. This can be achieved using specialized glasses, but glasses-free 3D displays promise a more natural experience for entertainment, education and design. However, practical glasses-free displays, which are commonly based on optical devices called lenticular lenses, can generally only display high-quality images when viewed from a narrow range of angles. Furthermore, they have a limited resolution when displaying 2D images, which are still desirable for commercial displays. Writing in Nature, Moon et al.1 report a thin display that can switch between wide-angle 3D and high-resolution 2D operation, achieved using a nanostructured film called a metasurface."

Source: [Nature](#) (18 Apr 2026)

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