SINGAPORE UNIVERSITY OF TECHNOLOGY AND DESIGN

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AI

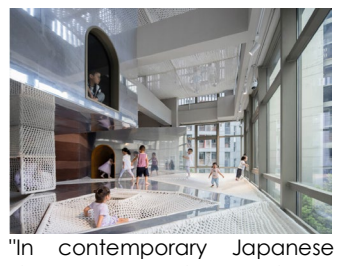
Why tiny bee brains could hold the key to smarter AI

"Researchers discovered that bees use flight movements to sharpen brain signals, enabling them to recognize patterns with remarkable accuracy. A digital model of their brain shows that this movement-based perception could revolutionize AI and robotics by emphasizing efficiency over massive computing power."

Source: University of Sheffield (18 Aug 2025)

ARCHITECTURE

The Built Environment as a Third Teacher: Architectural Play in Japanese and Chinese Kindergartens



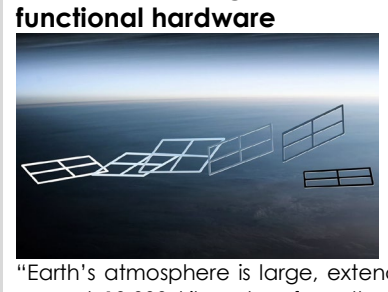
"In contemporary Japanese and Chinese kindergarten design, architects are transforming the interior spaces from a simple container into an active, multi-sensory environment. This shift seems to follow Studies in developmental psychology that suggest that a child's experience of space begins with a sensorimotor engagement through touch and manipulation. Thus, they place a strong emphasis on the use of materials and the approach of learning through play. Architects seem to be moving beyond traditional classrooms, into environments that are tactile, stimulating, and rooted in their specific contexts. The buildings themselves become tools for education, encouraging children to learn and explore through direct physical engagement.

This new typology rejects rigid, compartmentalized spaces in favor of flexible, integrated interiors that not only carry out its fundamental architectural function. They also double as dynamic playgrounds and interactive environments that promote movement, collaboration, and a sense of discovery. By blurring the lines between furniture and architecture, these designs not only may be able to provide children with a broader sense of freedom but also foster a different kind of education by leveraging on the psychological aspects of how young children understand their surroundings."

Source: Archdaily (24 Aug 2025)

CLIMATE MEDELING

Fancy Flying Trick Could Bring Sensors to Earth's "Ignorosphere": Now the challenge is to incorporate functional hardware



"Earth's atmosphere is large, extending out to around 10,000 kilometers from the surface of the planet. It's so large, in fact, that scientists break it into five separate sections. There's one particular section that hasn't received a whole lot of attention due to the difficulty in maintaining any craft there.

Planes and balloons can visit the troposphere and stratosphere, the two sections closest to the ground, while satellites can sit in orbit in the thermosphere and exosphere, allowing for a platform for consistent observations. But the mesosphere, the section in the middle, is too close to have a stable orbit but too sparse in air density for traditional airplanes or balloons to work.

As a result, we don't have a lot of data on it, but it impacts climate and weather forecasting, so scientists have simply had to make a lot of assumptions about what it's like up there. Now, a new study from researchers at Harvard and the University of Chicago might have found a way to put stable sensing platforms into the mesosphere, using a novel flight mechanism known as photophoresis.

The mesosphere itself is located between 50 and 85 km up, and while it isn't technically considered "space," it is very different from the lower levels of the atmosphere we are more accustomed to. It's affected both by weather from below and above, reacting to solar storms as often as hurricanes. Since it serves as that kind of interface level, it plays a critical role in how the layers both above and below it react as well."

Source: IEEE Spectrum (26 Aug 2025)

CLIMATE SCIENCES

Net zero needs AI — five actions to realize its promise

"In 2024, the global average annual temperature exceeded 1.5 °C above pre-industrial levels for the first time. Greenhouse-gas emissions are rising, and the window to reach net zero by 2050 is closing fast.

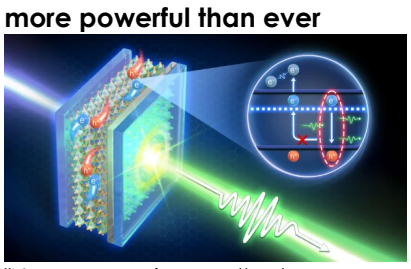
Artificial intelligence (AI) systems can play a crucial part by improving energy and resource-use efficiency, accelerating innovation and expanding people's capacity to act. But without swift, deliberate effort, this opportunity could slip away.

Realizing net zero — balancing the amount of carbon emissions emitted with the amount removed — by mid-century will require rapid, large-scale transformations. Electricity generation must nearly double by 2050 as transport, heating systems and industries shift from fossil fuels to electric power. Renewable-energy capacity must triple by the end of this decade to meet the rising demand without simultaneously increasing emissions."

Source: Nature (22 Aug 2025)

CREATIVITY

A simple trick just made tiny lasers more powerful than ever



"New processing method suppresses Auger recombination in perovskite films, enabling record-setting quasi-continuous-wave laser performance.

Researchers at Zhejiang University have found a way to stop performance-killing Auger recombination in perovskite lasers, using a clever additive during processing. Their method produced a record-breaking laser with unprecedented efficiency, pointing toward chip-ready optical devices."

Source: SPIE (23 Aug 2025)

DESIGN

Studio GOGO's Lego jewellery is "made to be played with"

"Plastic Lego bricks replace gemstones in these customisable rings by Berlin jewellery brand Studio GOGO, allowing wearers to change up the design as they see fit.

Crafted from recycled silver, Studio GOGO rings consist of a simple band and a central plate that carefully replicates the shape and size of a Lego tile.

The rings can be worn unadorned or stacked with the wearer's choice of Lego bricks to suit their current tastes.

Studio GOGO's earliest pieces were centred around the classic two-by-two square tile, but the range has since expanded to incorporate cross-shaped, rectangular and circular tiles.

"My pieces are made to evolve with you, to be played with, customised and maybe even passed down," studio founder Thanh-Truc Nguyen told Dezeen.

"At the heart of my jewellery is the belief that meaning, memory and creativity belong in the things we wear every day.""

Source: Dezeen (20 Aug 2025)

DESIGN

"World's first" self-driving golf trolley follows players around the course

"Technology firm Botronics has developed an autonomous AI-powered golf trolley that acts like a personal caddie, trailing players from hole to hole, providing tips on club selection and recording data to help improve their game.

The iXi trolley currently exists as a functioning prototype, created with support from product design studio Futurewave.

Belgium-based Botronics set out to eliminate the struggle of manually pushing or pulling heavy trolleys around the golf course so golfers can focus entirely on their game.

Co-founder Eric Piraux said he was inspired to create the product after driving home from the golf course in his self-driving Tesla car.

"I wondered, why can't my golf trolley do the same?" he said. "So I assembled a team of top engineers to turn this dream into a reality."

Billed as the "world's first smart self-driving golf trolley", iXi utilises artificial intelligence software to navigate the course on its own and incorporates cameras and microphones so it can be controlled using gestures and voice commands.

The device uses GPS and pre-loaded maps of more than 40,000 golf courses to plot its way around, either following the player or travelling ahead to clear the path.

When the player shows iXi their hand, the trolley follows them along paths or across fairways, stopping to allow them to play their next shot."

Source: Dezeen (22 Aug 2025)

ELECTROMECHANICAL RESHAPING (EMR)

Forget LASIK: Safer, cheaper vision correction could be coming soon

"Scientists are developing a surgery-free alternative to LASIK that reshapes the cornea using electricity instead of lasers. In rabbit tests, the method corrected vision in minutes without incisions."

Source: ACS (18 Aug 2025)

FIBERS

Reinventing fiber-based pressure sensors

"Pressure sensors are crucial in many emerging applications, but traditional designs are often bulky or inflexible. In a recent study, researchers from Japan developed a fiber-shaped pressure sensor that overcomes this limitation by increasing—rather than decreasing—its resistance when compressed. Owing to a unique multi-walled conductive core made from graphene nanoplatelets, these fibers could enable fine-tuned tactile sensing for next-generation smart textiles and robotic grippers.

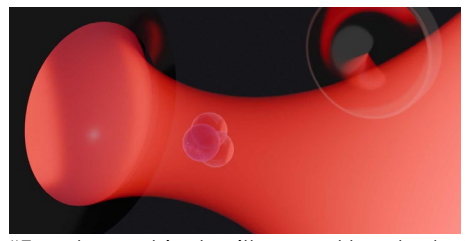
The need for pressure sensors has been steadily increasing across diverse applications, from robotic grippers that need accurate tactile feedback to wearable devices that monitor human movement. Ideally, to be effectively integrated into prosthetic limbs, smart textiles, or robots, pressure sensors need to be flexible, sensitive, and durable. However, traditional film-based and aerogel-based sensors are often too large and rigid, hindering their adoption in many fields.

These limitations have motivated research into fiber-based pressure sensors, which could offer enhanced versatility and miniaturization. A major hurdle that remains is the design of a sensing mechanism that works efficiently given a fiber's series circuit structure. In a conductive fiber, a local decrease in resistance, which is the common response for most pressure sensors, has a small impact on the fiber's overall conductivity. To be truly effective, a fiber pressure sensor needs to exhibit the opposite behavior: a substantial increase in overall resistance when compressed."

Source: Eurekalert! (27 Aug 2025)

QUANTUM

Pure quantum state without the need for cooling



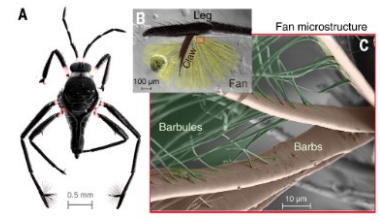
"Even large objects with several hundred million atoms can exhibit quantum mechanical behaviour – without cooling and at room temperature, as researchers at ETH Zurich have shown. This yields exciting potential for new technologies."

- For many future applications of quantum technology, not only individual atoms but also much larger particles must be capable of being controlled quantum mechanically.
- ETH researchers have been able to stabilise a relatively large object to such an extent that it moves almost exclusively in a quantum physical manner.
- The research has the potential to benefit the future development of sensitive quantum sensors, for example for navigation systems or applications in medicine.

Source: ethz (Aug 2025)

QUANTUM

Ultrafast elastocapillary fans control agile maneuvering in ripple bugs and robots

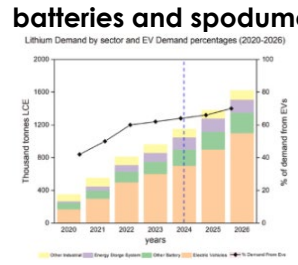


"Fans attached to the legs of Rhagovelia, commonly known as ripple bugs, automatically deploy protrusions on their middle legs under water. Ortega-Jimenez et al. examined this phenomenon from the structural, behavioral, and energy consumption perspectives (see the Perspective by Aubin). They show that the protrusions have a flat-ribbon microarchitecture, enabling fast capillary actuation. Furthermore, the individual barbs have divergent rigidity in orthogonal directions, facilitating both elastocapillary morphing and effective force production during a propulsive stroke, which enhances thrust production through unsteady vortices and capillary waves. The researchers designed an insect-scale robot equipped with synthetic, ultralight, ultrafast elastocapillary fans and demonstrated how these structures enable a variety of movements at impressive speeds. — Marc S. Lavine."

Source: Science (21 Aug 2025)

SUSTAINABILITY

A comprehensive review on the recovery of lithium from lithium-ion batteries and spodumene



"The growing demand for Lithium-Ion batteries (LIBs) for use within varied electronics and electric vehicles (EVs) has raised concerns about the sustainability of lithium extraction from natural deposits. This study provides a comprehensive comparison of lithium recovery through mining of spodumene deposits, and the recovery of lithium from used batteries via recycling, in terms of technological, economic and environmental impacts. Lithium recovered through mining and refining operations prompt significant land disruption and soil contamination and possess large ecological, water and carbon footprints. Contrastingly, lithium recovered through battery recycling undergoes successive heat and chemical treatments, leading to waste minimisation and a significant reduction in greenhouse gas (GHG) emissions, up to 17–61 % subject to the recycling techniques employed, without disrupting land or contaminating soil, and occurring at a significantly lower capital cost. Moreover, the water footprint of lithium recovery through recycling is also much lower in contrast with mining. Considering technological, economic and environmental factors, this review paper presents lithium recovered through the recycling of LIBs as a feasible option. Lastly, the study discusses the major challenges and future prospects for improving the feasibility and sustainability of lithium recovery."

Source: Science direct (Aug 2025)

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