SINGAPORE UNIVERSITY OF TECHNOLOGY AND DESIGN

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17 Nov - 21 Nov 2025

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AI

A Single Beam of Light Runs AI With Supercomputer Power

"Aalto University researchers have developed a method to execute AI tensor operations using just one pass of light. By encoding data directly into light waves, they enable calculations to occur naturally and simultaneously. The approach works passively, without electronics, and could soon be integrated into photonic chips. If adopted, it promises dramatically faster and more energy-efficient AI systems."

Source: AALTO (16 Nov 2025)

AI

'Tiny' AI Model Beats Massive LLMs at Logic Test

"A small-scale artificial-intelligence model that learns from only a limited pool of data is exciting researchers for its potential to boost reasoning abilities. The model, known as Tiny Recursive Model (TRM), outperformed some of the world's best large language models (LLMs) at the Abstract and Reasoning Corpus for Artificial General Intelligence (ARC-AGI), a test involving visual logic puzzles that is designed to flummox most machines.

The model — detailed in a preprint on the arXiv server last month1 — is not readily comparable to an LLM. It is highly specialized, excelling only on the type of logic puzzles on which it is trained, such as sudokus and mazes, and it doesn't 'understand' or generate language. But its ability to perform so well on so few resources — it is 10,000 times smaller than frontier LLMs — suggests a possible route for boosting this capability more widely in AI, say researchers.

"It's fascinating research into other forms of reasoning that one day might get used in LLMs," says Cong Lu, a machine-learning researcher formerly at the University of British Columbia in Vancouver, Canada. However, he cautions that the techniques might no longer be as effective if applied on a much larger scale. "Often techniques work very well at small model sizes and then just stop working," at a bigger scale, he says."

Source: Nature (13 Nov 2025)

ARCHITECTURE

The Montreal Biodome: From Olympic Velodrome to a Space for Life

"The history of the Olympic Games, while marked by athletic achievement, is consistently contrasted by infrastructure challenges. Across host cities, from Athens to Rio and Beijing, similar issues arise: significant cost overruns and the complex issue of legacy. The big question is: What is the best viable long-term use for purpose-built sport venues? Montreal's 1976 Games shared this fate after building an Olympic Park that faced heavy criticism for cost overruns and debt from specialized construction. Post-Games, venues like the Montreal Velodrome risked becoming a financial burden. However, the city demonstrated a proactive response by proposing the transformation of the building into a thriving civic asset that now stands as an internationally recognized example of successful Olympic venue repurposing.

To host the Olympics, the city commissioned French architect Roger Taillibert to design an Olympic park that included a stadium, a swimming pool, and a velodrome. The latter hosted both track cycling and judo events during the Games; however, for many years after the Olympics ended, the facility faced the challenge of having no defined permanent post-Games purpose. During that time, it hosted other major events, such as "Les Floralies Internationales de Montréal" in 1980, an international horticultural exhibition. In 1988, the city explored the possibility of transforming the velodrome into The Biodome: an environmental enclosure that would use the existing light-filled shell of the velodrome to house and display multiple, self-contained, recreated, and climate-controlled biospheres."

Source: Archdaily (12 Nov 2025)

AVIATION

Hypersonic Breakthrough Could Enable Planes That Fly 10 Times the Speed of Sound

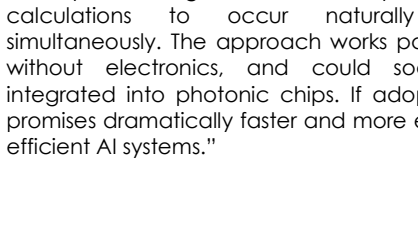
"Hypersonic flight could one day make long-haul travel as quick as a short movie. Researchers are testing how turbulence behaves at extreme speeds, a critical hurdle for designing these aircraft. Their laser-based krypton experiments suggest turbulence at Mach 6 behaves more like slower airflow than expected. The results could simplify hypersonic vehicle design and accelerate progress toward ultra-fast travel."

If it ever becomes achievable, hypersonic flight could dramatically reshape international travel. What currently requires an entire day could become a short trip lasting no more than a feature length movie. A route such as Sydney to Los Angeles, which now takes about 15 hours, might be reduced to only one hour."

Source: Stevens Institute of Technology (14 Nov 2025)

DESIGN

Visions2030 Installation in Brazil Prompts Visitors To "Imagine Hopeful Solutions" With AI



"New York-based creative studio Visions2030 has created a trio of domes installed at the Museum of Tomorrow in Rio de Janeiro, where visitors fabricate a vision of the future via a series of AI prompts.

The Lumisphere Experience (The Lumisphere) is temporarily located in front of the Santiago Calatrava-designed Museum of Tomorrow and consists of three Buckminster Fuller-informed domes, which guide visitors through a meditative experience where they eventually create an ideal picture of a future environment using Artificial Intelligence (AI).

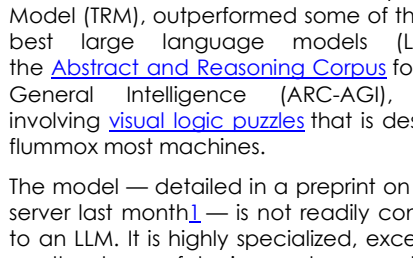
"In this audiovisual environment, where artificial intelligence technology and culture meet, the audience is encouraged to awaken creativity, expand collective awareness, and imagine innovative and hopeful solutions to urgent global challenges," said the Museum of Tomorrow.

Created by Visions2030 with San Francisco-based experiential design studio Minds Over Matter, the installation encourages visitors to "dream big" in the face of often-negative narratives around climate change."

Source: Dezeen (13 Nov 2025)

DESIGN

MIT Design Intelligence Lab Explores "Sustainable Consumer Electronics" With Geolectric



"MIT Design Intelligence Lab has designed Geolectric, a lantern that explores alkaline-based geopolymers as a sustainable alternative to consumer electronics, and was given as a gift to the Irish president.

The minimalist lantern consists of two geopolymer pieces connected by a ribbed glass tube.

A proximity sensor, embedded in the top piece, can sense movement above it, which triggers a ring of LEDs inside the lamp to intensify when a hand approaches. It only fully lights up when the surface is touched.

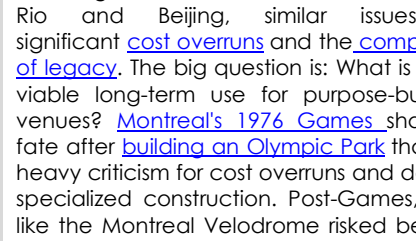
"It creates a very magical experience," said Marcelo Coelho, the director of the MIT Design Intelligence Lab, which created the lamp. The project has been shortlisted in the Bespoke design category of Dezeen Awards 2025.

Geopolymers are made by mixing certain minerals with an alkaline solution until they harden, and are still in early development. However, they show strong potential as low-carbon materials."

Source: Dezeen (17 Nov 2025)

DESIGN

Extreme-Pressure Experiment Reveals a Strange New Ice Phase

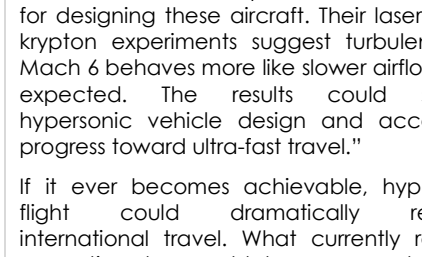


"Researchers at KRISS observed water's rapid freeze–melt cycles under ultrahigh pressure and discovered Ice XXI, the first new ice phase found in decades. Using advanced high-pressure tech and microsecond XFEL imaging, they uncovered complex crystallization pathways never seen before. Ice XXI's structure resembles the high-pressure ice found inside Jupiter and Saturn's moons, hinting at planetary science implications."

Source: NST (16 Nov 2025)

HEALTH

Daily Music Listening Linked to Big Drop in Dementia Risk



"Older adults who regularly listen to or play music appear to have significantly lower risks of dementia and cognitive decline. The data suggests that musical engagement could be a powerful, enjoyable tool for supporting cognitive resilience in aging.

Listening to music after the age of 70 appears to be associated with a meaningful reduction in dementia risk. A research team from Monash University analyzed data from more than 10,800 older adults and found that people in this age group who regularly listened to music experienced a 39 percent lower likelihood of developing dementia."

Source: Monash University (17 Nov 2025)

HEALTH AND MEDICINE

Using Robotic Testing to Spot Overlooked Sensory Deficits in Stroke Survivors

OPTICS

The "Great Unified Microscope" Can See Both Micro and Nanoscale Structures

QUANTUM

Princeton's New Quantum Chip Marks a Major Step Toward Quantum Advantage

ROBOTICS

Students Compete—And Cooperate—In FIRST Global Robotics Challenge: This Year's Challenge Focused on Protecting Ecosystems and Species

"A decade ago, at age 55, Don Lewis suffered a stroke in his sleep. When he woke up, he couldn't move his left arm or leg. Lewis' neighbor realized his truck hadn't moved in two days and called 911 for a welfare check. When paramedics found him, he was paralyzed on one side.

"At the hospital, they told me an aneurysm caused my stroke," he said.

He would remain there for two months, and after extensive physical therapy, Lewis regained use of his left leg. His left arm remains paralyzed.

"I feel pain when I hit it or scrape it walking through a doorway, but I can't control the motion."

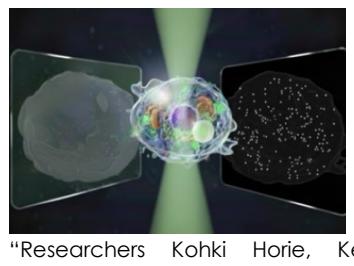
Since then, the cancer survivor has had two more strokes.

Now, Lewis is helping University of Delaware researchers understand one of the most overlooked challenges in stroke recovery – proprioception, the body's ability to sense movement and position.

"To simplify the concept, in class, I tell my undergraduates to close their eyes and touch their nose; if people can't do that, it means they likely have impaired proprioception," said Jennifer Semrau, associate professor of kinesiology and applied physiology, in the College of Health Sciences.

In findings recently published in Neurorehabilitation and Neural Repair, Semrau and doctoral candidate Joanna Hoh suggest it's possible to identify hidden sensory losses after stroke without requiring patients to move their affected arm. This advance could make assessments more accessible in clinical settings."

Source: Eurekalert! (17 Nov 2025)



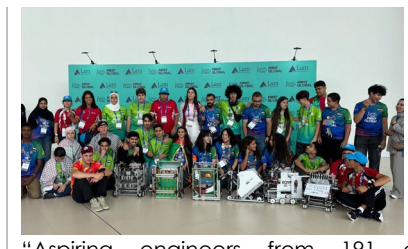
"Researchers Kohki Horie, Keiichiro Toda, Takuma Nakamura, and Takuro Ideguchi of the University of Tokyo have built a microscope that can detect a signal over an intensity range fourteen times wider than conventional microscopes. Moreover, the observations are made label-free, that is, without the use of additional dyes. This means the method is gentle on cells and adequate for long-term observations, holding potential for testing and quality control applications in the pharmaceutical and biotechnology industries. The findings are published in the journal Nature Communications."

Source: Tokyo Uni (14 Nov 2025)

"A Princeton team built a new tantalum-silicon qubit that survives for over a millisecond, far surpassing today's best devices. The design tackles surface defects and substrate losses that have limited transmon qubits for years. Easy to integrate into existing quantum chips, the approach could make processors like Google's vastly more powerful."

"The real challenge, the thing that stops us from having useful quantum computers today, is that you build a qubit and the information just doesn't last very long," said Andrew Houck, leader of a federally funded national quantum research center, Princeton's dean of engineering and co-principal investigator on the paper. "This is the next big jump forward."

Source: Princeton (17 Nov 2025)



"Aspiring engineers from 191 countries gathered in Panama City in October to compete in the FIRST Global Robotics Challenge. The annual contest aims to foster problem-solving, cooperation, and inspire the next generation of engineers through three challenges that are inspired by a different theme every year. Teams of students from 14 to 18 years old from around the world compete in the three day event, remotely operating their robots to complete the challenges. This year's topic was "Eco-equilibrium," emphasizing the importance of preserving ecosystems and protecting vulnerable species.

Turning Robotics Into a Sport

Each team competed in a series of ranking matches at the event. The matches consisted of several simultaneous goals, lasting two minutes and 30 seconds. First students guided their robots in gathering "biodiversity units" (multicolored balls) and delivering them to their humans. Next the robots removed "barriers" (larger, grey balls) from containers and disposed of them in a set area. Then team members threw the biodiversity units into the now-cleared containers to score points. At the end of the match, each robot was tasked with climbing a 1.5 meter rope. The team with the most points won the match.

To promote collaboration, each match had two groups, which consisted of three individual teams and their robots, competing for victory. Each team controlled its own robot, but had to work together with the other robots in the group to complete the tasks. If all six robots managed to climb the rope at the end of the match, each team's scores were multiplied by 1.5."

Source: IEEE Spectrum (15 Nov 2025)