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3D MAP

**Giant 3D Map Shows Almost Every Building in the World**



"Scientists have produced the most detailed 3D map of almost all buildings in the world. The map, called GlobalBuildingAtlas, combines satellite imagery and machine learning to generate 3D models for 97% of buildings on Earth.

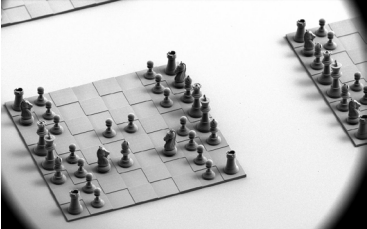
The data set, published in the open-access journal *Earth System Science Data* on 1 December<sup>1</sup>, covers 2.75 billion buildings, each mapped with footprints and heights at a spatial resolution of 3 metres by 3 metres.

The 3D map opens new possibilities for disaster risk assessment, climate modelling and [urban planning](#), according to study co-author Xiaoxiang Zhu, an Earth observation data scientist at the Technical University of Munich in Germany. It could also help to improve how researchers monitor [United Nations \(UN\) Sustainable Development Goals](#) for cities and communities, Zhu adds."

Source: [Nature](#) (11 Dec 2025)

3D PRINTING

**Metalenses Improve Microscopic 3D Printing Precision: Light-Warping Physics Speeds Up Two-Photon Lithography Techniques**



"With the help of the kind of light warping that makes ["invisibility cloaks"](#) possible, scientists have developed a new kind of [3D printing](#) that is capable of both microscopic detail and high throughput. The researchers suggest their new technique could enable the mass production of complex nanometer-scale structures. The potential applications include [drug delivery](#) and [nuclear fusion](#) research.

Currently the most precise method for 3D printing complex microscopic features is [two-photon lithography](#). The technique uses liquid resins that solidify only when photosensitive molecules within the resin absorb two photons of light at the same time instead of just one. [Two-photon lithography](#) enables the fabrication of items with [voxels](#)—the 3D equivalent of pixels—only a few dozen nanometers in size.

However, two-photon [lithography](#) has proven too slow for large-scale practical applications. This has largely rendered it a laboratory tool to produce microscopic prototypes.

Until now, two-photon lithography has depended on conventional [lenses](#), which have limitations that slow down the technique. Now, in a new study, Xia and his colleagues have experimented with ["metalenses,"](#) which can bend light in unexpected ways."

Source: [IEEE Spectrum](#) (17 Dec 2025)

AI HEALTHCARE

**AI Learns to Decode the Diseases Written in Your DNA**



"Scientists at the Icahn School of Medicine at Mount Sinai have created a new artificial intelligence system that can do more than flag harmful genetic mutations. The tool can also forecast the types of diseases those mutations are most likely to cause.

The approach, known as V2P (Variant to Phenotype), is intended to speed up genetic testing and support the development of new therapies for rare and complex illnesses. The research was published in the December 15 online issue of *Nature Communications*."

Source: [The Mount Sinai Hospital](#) (16 Dec 2025)

ARCHITECTURE

**Converging Architectural Trends in 2025: Circularity, Biomaterials, and Carbon-Conscious Design**



"The phenomenon known in biology as *convergent evolution* describes how distant species can develop similar structures when confronted with comparable challenges. Dolphins and ichthyosaurs, for example, are separated by millions of years of evolutionary history, yet both evolved nearly identical hydrodynamic bodies. Architecture has its own parallels: A-frame structures emerged independently in both the European Alps and Japan, even without direct cultural exchange, as spontaneous responses to snow, wind, and material scarcity.

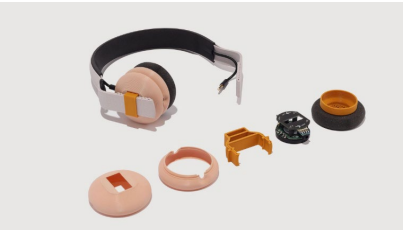
The construction industry today faces major challenges related to labor shortages, rising material costs, supply chain instability, and increasing regulatory and sustainability demands, all in a context of low productivity and slow digitalization. These pressures make it harder to deliver projects on time, on budget, and with the required environmental performance. Yet, their outcomes converge around a shared set of values: circularity, responsibility, regeneration, and material intelligence. Discussions around building retrofits, adaptive reuse, low-carbon design, territorial resilience, biodiversity, or Indigenous knowledge systems may seem to belong to separate agendas, yet all point toward the same shift: rethinking architecture through the lens of ecological limits and social reciprocity. The paths vary, but the direction is the same.

More than a retrospective, this article looks back at 2025 to understand what we believe will pave the way forward. It explores how these forces are shaping four central fronts of architectural practice and shows how the convergence of these movements may define the architecture of the coming years."

Source: [Archdaily](#) (16 Dec 2025)

DESIGN

**The Top 10 Gadgets Of 2025**



"As part of our [review of 2025](#), Dezeen contributing editor [Rima Sabina Aouf](#) shares her picks of this year's [gadgets](#), including a tiny sunlight emulator, a video player for your dreams and a vest for listening to trees.

Artificial intelligence ([AI](#)) continued to be a big focus for new product launches over the last 12 months, with US technology company [Meta](#) attempting to take the lead with new wearables and smaller companies like [Modem](#) exploring alternative visions for ambient computing.

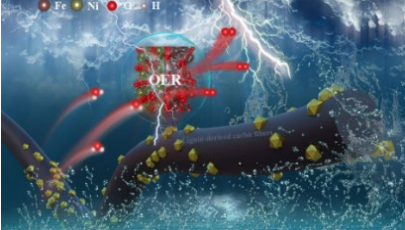
At the same time, this has been a bumper year for slimmed-down tech, with dumbphones, focus-promoting interfaces and intentionally minimal USPs making repeat appearances.

Read on for 10 great gadgets from this year..."

Source: [Dezeen](#) (12 Dec 2025)

ENERGY

**Paper Mill Waste Could Unlock Cheaper Clean Energy**



"Researchers have developed a catalyst sourced from renewable plant waste that shows strong potential for speeding up clean hydrogen production. The material is produced by embedding nickel oxide and iron oxide nanoparticles into carbon fibers made from lignin, creating a structure that improves both efficiency and durability during the oxygen evolution reaction, a crucial part of water electrolysis.

The study, published in *Biochar X*, reports that the catalyst reaches a low overpotential of 250 mV at 10 mA cm<sup>2</sup> and remains highly stable for more than 50 hours when operating at elevated current density. These performance levels point to a viable, low cost alternative to the precious metal catalysts typically used in large-scale water splitting."

Source: [Shenyang Agricultural University](#) (11 Dec 2025)

HEALTH TECH

**Scientists Reveal a Tiny Brain Chip That Streams Thoughts in Real Time**



"A new brain implant could significantly reshape how people interact with computers while offering new treatment possibilities for conditions such as epilepsy, spinal cord injury, ALS, stroke, and blindness. By creating a minimally invasive, high-throughput communication path to the brain, it has the potential to support seizure control and help restore motor, speech, and visual abilities.

The promise of this technology comes from its extremely small size paired with its ability to transmit data at very high speeds. Developed through a collaboration between Columbia University, NewYork-Presbyterian Hospital, Stanford University, and the University of Pennsylvania, the device is a brain-computer interface (BCI) built around a single silicon chip. This chip forms a wireless, high-bandwidth link between the brain and external computers. The system is known as the Biological Interface System to Cortex (BISC)."

Source: [COLUMBIA](#) (9 Dec 2025)

MATERIALS

**A Simple Turn Reveals A 1,500-Year-Old Secret on Roman Glass**

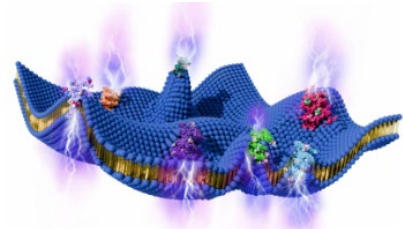


"A museum visit sparked a revelation when a Roman glass cup was turned around and its overlooked markings came into focus. These symbols, once dismissed as decoration, appear to be workshop identifiers used by teams of skilled artisans. The findings challenge centuries of assumptions about how Roman glass was made. They also restore identity and agency to the anonymous makers behind these stunning objects."

Source: [Washington State University](#) (16 Dec 2025)

MATERIALS

**Living Cells May Generate Electricity from Motion**



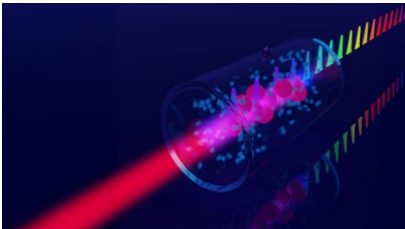
PEER REVIEW

**More Than Half of Researchers Now Use AI For Peer Review — Often Against Guidance**



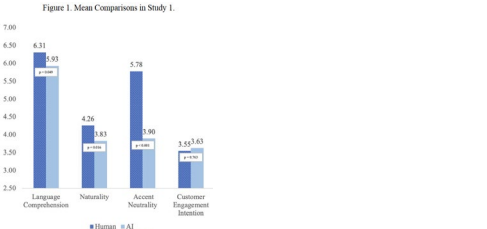
QUANTUM

**New Quantum Antenna Reveals a Hidden Terahertz World**



VIDEO TRANSLATION

**EXPRESS: Generative AI For Video Translation: Consumer Evaluation in International Markets**



<p>“Cells may generate their own electrical signals through microscopic membrane motions. Researchers show that active molecular processes can create voltage spikes similar to those used by neurons. These signals could help drive ion transport and explain key biological functions. The work may also guide the design of intelligent, bio-inspired materials...”</p>	<p>“More than 50% of researchers have used artificial intelligence while peer reviewing manuscripts, according to a <a href="#">survey of some 1,600 academics</a> across 111 countries by the publishing company Frontiers.</p> <p>Nearly one-quarter of respondents said that they had increased their use of AI for peer review over the past year. The findings, posted on 11 December by the publisher, which is based in Lausanne, Switzerland, confirm what <a href="#">many researchers have long suspected</a>, given the <a href="#">ubiquity of tools powered by large-language models</a> such as ChatGPT.</p> <p>"It's good to confront the reality that people are using AI in peer-review tasks," says Elena Vicario, Frontiers' director of research integrity. But the poll suggests that researchers are using AI in peer review "in contrast with a lot of external recommendations of not uploading manuscripts to third-party tools," she adds."</p>	<p>“A research team from the Faculty of Physics and the Centre for Quantum Optical Technologies at the Centre of New Technologies, University of Warsaw has introduced a new way to measure hard-to-detect terahertz signals using a "quantum antenna." In their work, the scientists applied an innovative radio wave detection setup based on Rydberg atoms that not only senses terahertz radiation, but also accurately calibrates a so-called frequency comb in this part of the spectrum. Until recently, the terahertz range was considered a blank area in the electromagnetic spectrum, and the method reported in the journal Optica opens the door to extremely sensitive spectroscopy and a new class of room-temperature quantum sensors."</p>	<p>“Generative AI tools (e.g., HeyGen, Adobe Firefly, and InVideo AI) now allow marketers to translate videos not only by converting language but also by adjusting speech style, voice, and lip movements. Following this advancement, this exploratory study examined differences in perceived translation quality between AI-translated and human-translated marketing videos in international contexts. Two between-subject experiments were conducted involving English-to-Indonesian translation (Study 1) and Indonesian-to-English translation (Study 2). AI translation consistently yielded lower perceived naturality and accent neutrality than human translation. For language comprehension, AI performed worse in Study 1 but better in Study 2, indicating that translation direction matters. However, despite the perceptual differences, the two translation methods did not affect customer engagement intention. This study offers early evidence on how consumers evaluate AI video translation and provides 12 directions for future research."</p>
Source: <a href="#">PNAS</a> (16 Dec 2025)	Source: <a href="#">Nature</a> (15 Dec 2025)	Source: <a href="#">University of Warsaw</a> (13 Dec 2025)	Source: <a href="#">SAGE</a> (23 Nov 2025)

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