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Weekly Discovery

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10 August - 14 August 2026

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3D PRINTING

Scientists just 3D printed one of the hardest metals on Earth

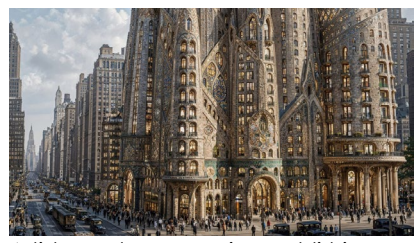
Tungsten carbide-cobalt (WC-Co) is valued because it can withstand intense wear, pressure, and repeated use. That exceptional hardness makes it ideal for industrial tools, but it also creates a major manufacturing challenge. The material is difficult to shape, expensive to produce, and often requires more raw material than ultimately ends up in the finished component.

Researchers have now tested a different way to manufacture WC-Co cemented carbide using additive manufacturing (AM, also commonly known as 3D printing). Their approach could reduce waste and lower production costs while preserving the strength and hardness that make the material so useful.

Source: Hiroshima University (4 August 2026)

ARCHITECTURE

Realistic AI architectural renderings must be labelled under EU AI Act



Artists and companies publishing realistic AI-generated architectural renderings in the European Union without labelling risk being fined under provisions in the EU AI Act that came into force last week.

The EU Artificial Intelligence Act Article 50, which came into force on 2 August, requires creators of realistic-looking images, audio or video to disclose if the content is AI-generated or modified to reduce incidences of harm through deception.

Many creative works are exempt from the provisions, but realistic AI-generated visualisations of buildings and interiors appear to fall under the act's categorisation of "deepfakes", according to Szymon Sieniewicz, a counsel at law firm Addleshaw Goddard.

"If it's very realistic scenery with people walking around and it is AI generated, it will need to be labelled as AI generated," he told Dezeen.

Companies using AI to modify product photos, using chatbots on their homepage or publishing AI-generated text on matters of public interest will also face new obligations under the provisions.

Source: Dezeen (10 August 2026)

ARCHITECTURE

Beijing Named World Capital of Architecture 2029 by UNESCO-UIA

UNESCO-UIA World Capital of Architecture is a title created jointly by UNESCO and the International Union of Architects (UIA). On 5 August 2026, Beijing was named World Capital of Architecture for 2029, a title awarded every three years to a city that hosts a year of architecture-focused programming timed to coincide with the UIA World Congress of Architects. The designation was made upon the recommendation of the Joint Committee for the World Capital of Architecture, chaired by architect Dominique Perrault. It follows the recent conclusion of the UIA World Congress of Architects 2026 in Barcelona, current World Capital of Architecture, and builds on the experience of Rio de Janeiro and Copenhagen.

Source: Archdaily (7 August 2026)

ARCHITECTURE

Elon Musk reveals plans for world's largest building

Elon Musk's companies SpaceX and Tesla have announced plans to collaborate on a chip-building factory in Texas named Terafab, which will measure over 100 million square feet and is expected to become the largest building in the world.

Terafab is set to be built in Grimes County and span over 100 million square feet (9.3 million square metres), exceeding the current world's largest building by floor area, the 65 million-square-foot (six million-square-metre) AvtoVAZ main assembly building in Russia.

"Terafab will be epic in both its mission and in its sheer size, designed to build new compute at an unprecedented scale and speed," said SpaceX in an announcement.

The enormous factory will encompass manufacturing, packaging, and testing of advanced logic and memory devices, creating semiconductors for chips to be used in devices such as Tesla's Optimus robots and self-driving Cybercabs, as well as SpaceX's planned data centres in space.

Source: Dezeen (10 August 2026)

ARCHITECTURE

MVRDV Reveals Bihailou Art Village in Shenzhen as a Vertical Village Interpretation

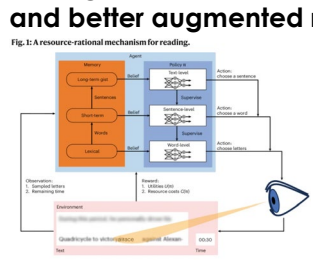
Designed by MVRDV, Bihailou Art Village is a mixed-use cultural and commercial centre currently under construction in Shenzhen, China. Located in the Shatoujiao neighborhood near the Hong Kong border, the mixed-use project combines cultural, commercial, and public programs within a vertically stacked composition derived from the firm's "Vertical Village" concept. Designed to accommodate independently operating venues while maintaining publicly accessible circulation, the development reinterprets the scale and spatial character of the surrounding urban fabric through a series of distinct volumes.

The project builds upon the Vertical Village concept, originally developed by MVRDV and The Why Factory in 2011 and published as a book the following year. Conceived as a response to the rapid densification and increasing uniformity of many Asian cities, the research proposed an alternative model for high-density development by combining the diversity and individuality associated with village life with the compactness of urban environments. Rather than organizing all functions within a single volume, the concept plans a collection of independent units stacked vertically while maintaining access to daylight, views, and individual entrances.

Source: Archdaily (5 August 2026)

AI

AI model captures how humans read, paving the way to personalised text and better augmented reality



Researchers at Aalto University, together with international partners, have developed the most accurate model yet of how humans read. The new model uses reinforcement learning, a type of AI used in robotics, to explain—and recreate—the choices readers make as they move through text.

'For the first time we've used AI methods to understand—not just mimic—how people read,' says Professor Antti Oulasvirta from Aalto University. In a study to be published on Monday, August 10, in Nature Human Behaviour, researchers say the model could power smarter Augmented Reality (AR) displays and tailor complex texts to different readers and everyday situations.

Earlier models learned from large datasets pairing text snippets with eye tracking data, then mimicked human behaviour, but they lacked true understanding of the content and didn't generalise well across languages or contexts, explains Oulasvirta. In contrast, the new model follows the psychological mechanisms readers use to direct attention, revealing how understanding is built as the eyes move through words, sentences and paragraphs.

Understanding how human memory serves reading is the key to unlocking enormous potential for customisable apps, services or products, according to Oulasvirta.

Source: Aalto University (10 August 2026)

AI

New survey: Parents and educators say the rise of AI requires students to develop stronger data skills

As artificial intelligence rapidly reshapes education and the workforce, a majority of parents and educators believe it's essential for students to develop data literacy skills, according to a new survey released today by Data Science 4 Everyone and Mathematica.

The survey of more than 1,300 parents, teachers, school leaders, and state and local education officials found widespread agreement that it's crucial for data literacy to be a central part of learning for K-12 students. Key findings include:

88% of respondents believe all students should be data literate before graduating high school

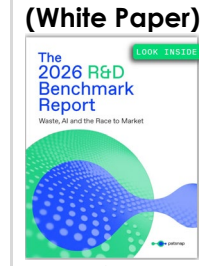
84% of respondents said data literacy and data science should be integrated across multiple subjects, not just math or computer science

76% of respondents believe AI has made data education more important than ever

Source: University of Chicago (10 August 2026)

AI

The 2026 R&D Benchmark Report: Waste, AI and the Race to Market (White Paper)



Innovation leaders face increasing pressure to deliver breakthrough products faster while making smarter investment decisions. Yet, new research shows that many organizations continue to lose significant R&D budget on projects that never reach commercialization, even as AI adoption accelerates.

Based on a survey of more than 200 senior R&D professionals across North America, the UK, and Europe, this industry report reveals where innovation teams are losing time, budget, and competitive advantage—and how better intelligence can improve decision-making before costly investments are made.

In this report, you'll learn:

Why more than one-third of organizations spend 25–40% of their R&D budget on projects that never reach market.

Why nearly half of respondents estimate losing more than $1 million every time a late-stage project is canceled.

How AI adoption has surged, yet most organizations still use it primarily for execution, not for the strategic decisions that determine which projects deserve investment.

Why earlier access to competitive, market, and patent intelligence delivers the greatest impact during ideation and feasibility, before significant resources are committed.

Source: IEEE & Wiley (2026)

ENERGY

NETWORKS

QUANTUM

QUANTUM

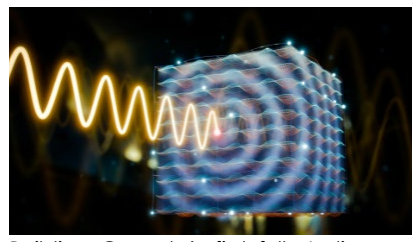
New fuel cell breakthrough could help power energy-hungry data centers

The rapid expansion of data centers across the United States is putting growing pressure on the nation's electricity supply. These facilities require enormous amounts of power not only to operate their computing equipment, but also to keep it cool. The Electric Power Research Institute estimates that data centers could account for as much as 9% of annual U.S. electricity generation by 2030, compared with 4% of total electricity demand in 2023.

Researchers are now exploring ways to reduce some of that strain. A team led by Gang Wu, the Elvera and William R. Stuckenberg Professor in the McKelvey School of Engineering at Washington University in St. Louis, has developed an approach that could improve low-temperature fuel cells and potentially expand their use as an alternative source of electricity.

Source: Washington University (8 August 2026)

A Remote Indigenous Community Built One of Canada's Fastest Fiber Networks



Building Canada's first fully Indigenous-owned-and-operated fiber-optic network was an uphill battle for Brian Nakogee, WJBTN's finance officer, who had to secure capital from agencies less familiar with the challenges of remote northern life. For the people of Fort Albany First Nation, accessing many vital supplies and services means traveling about 500 km to the regional city of Timmins. By land, the trip is possible for only a few weeks each winter, when the swampy tundra freezes hard enough to construct a temporary road. "The southern way of doing things is very different than how we here in remote areas piece things together," says Nakogee.

Telecommunications giants long saw little profit in serving the subarctic coast of James Bay. But even as satellite internet started to become available in remote communities, WJBTN staff saw the value in building and owning its own hard-wired internet service instead of relying on outside companies. Today, the nonprofit operates one of the fastest networks in Canada, while keeping both infrastructure ownership and revenue within the First Nations communities it serves.

WJBTN is part of a broader movement among Indigenous and remote communities seeking more control over their telecommunications infrastructure. In the United States, 30 tribes now operate fiber-to-the-home networks, many launched during COVID. Canada has since created a dedicated Indigenous broadband funding stream. And as more communities pursue the expertise and funding to build their own networks, WJBTN's experience offers a blueprint for what locally owned connectivity can look like in some of the hardest places to serve.

Source: Spectrum IEEE (30 July 2026)

This tiny gold crystal could bring quantum technology out of the deep freeze

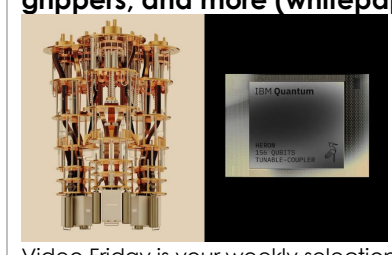
Quantum materials could reshape fields as varied as high-performance computing, secure communication, sensitive detection, and energy production. Yet one persistent limitation has kept most of them from becoming practical technologies.

Almost every quantum material discovered so far works only when cooled to temperatures near absolute zero. At ordinary temperatures, heat causes atoms to vibrate constantly. Those vibrations disrupt the fragile quantum effects researchers want to control.

Suppressing this motion typically requires large cryogenic refrigeration systems. As a result, quantum materials can perform remarkable tasks in carefully controlled laboratories, but they are difficult and expensive to use in real-world devices.

Source: Louisiana State University (8 August 2026)

Drones Go Heavy in DARPA Lift Challenge This week's selection of awesome robot videos also includes NASA's Skyfall water-hunting Martian helicopter, gecko-inspired robotic grippers, and more (whitepaper)



Video Friday is your weekly selection of awesome robotics videos, collected by your friends at IEEE Spectrum robotics.

The DARPA Lift Challenge is taking place through this weekend. There are a couple of very brief overview videos from the past couple of days, which are only really interesting because they give you a quick look at some utterly bizarre heavy-lift drone designs. If you like what you see, DARPA has recorded livestreams of the entire event so far. We've posted one of those at the end of this section, and if you want to be impressed by some super-weird drones, check out this and this.

Source: IEEE Spectrum (7 August 2026)