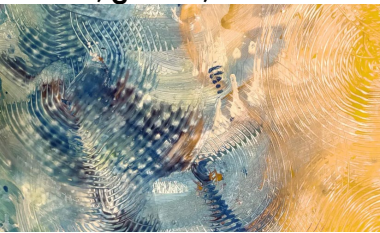
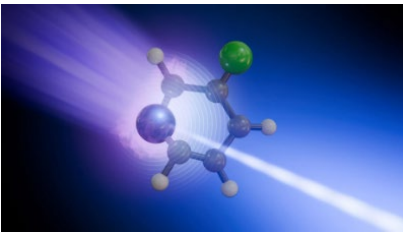
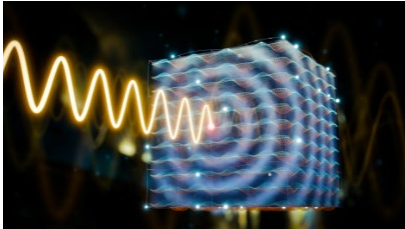
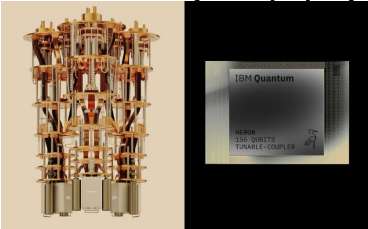


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ARCHITECTURE Net zero verification scheme launched for UK buildings  "Certification company Bureau Veritas has launched the UK Net Zero Carbon Buildings Standard, a voluntary verification scheme that determines a building's carbon performance. Now open for submissions, the UK Net Zero Carbon Buildings Standard assesses net-zero claims of buildings against an industry-agreed definition, aiming to minimise greenwashing. New buildings, existing buildings and retrofit projects can be entered voluntarily to the standard, which grants a Net Zero Carbon Aligned verification to buildings that meet the set criteria. Verification requires 12 months of in-use building data Buildings submitted to the scheme will be assessed by Bureau Veritas based on 12 months of in-use energy data and as-built upfront embodied-carbon data. To be verified as Net Zero Carbon Aligned, buildings must remove on-site fossil fuels, generate on-site renewable energy and minimise the upfront embodied carbon and measured in-use energy consumption. Offsets cannot be used to meet any of the required limits, but can be considered to tackle residual carbon when mandatory requirements are met." Source: Dezeen (31 July 2026)	ARCHITECTURE Shenzhen Natural History Museum Designed by 3XN, B+H Architects, and Zhubo Opens in China  Designed by the 3XN, B+H Architects, and Zhubo Design consortium, the Shenzhen Natural History Museum has opened to the public in Shenzhen, China. Covering more than 100,000 square meters, the institution is the largest natural history museum in South China and among the largest recently completed museums of its kind worldwide. Developed as part of Shenzhen's expanding cultural infrastructure, the project brings together exhibition, research, education, and public space within a single civic destination. 3XN led the architectural design, B+H Architects served as lead consultant, executive architect, and landscape architect, and Zhubo Design provided local technical expertise and regulatory coordination throughout the project's development. Source: Archdaily (29 July 2026)	AI AI can tell if your brain is aging faster than you are  "A new machine-learning approach that examines brain activity during sleep may help identify people with an elevated risk of developing dementia. The research was led by scientists at UC San Francisco and Beth Israel Deaconess Medical Center in Boston. The system estimates a person's "brain age" by analyzing electrical signals collected through electroencephalography, or EEG, while they sleep. Researchers found that dementia risk increased when the brain appeared older than the person's actual chronological age. For every 10-year increase between estimated brain age and actual age, the likelihood of developing dementia rose by nearly 40%. People whose estimated brain age was younger than their actual age had a lower risk. Source: University of California (31 July 2026)	AI Are AI Models Working Harder Than They Need to? Lizy K. John says weightless neural networks could slash AI's energy bill  Much of modern AI runs on multiplication. Neural networks behind everything from generated answers to photo organization and song recommendations perform millions or billions of operations that multiply inputs by learned weights. Lizy K. John thinks that's more work than the job requires. John, a professor of electrical and computer engineering at the University of Texas at Austin, has spent the past five years working on a class of models called weightless neural networks. Instead of repeatedly multiplying inputs by weights, these networks pass binary inputs through interconnected lookup tables—closer to consulting a collection of stored answers than solving the same arithmetic problem repeatedly. Depending on the task, she says, the networks can be less than a thousandth the size or 1,000 times as fast as conventional alternatives while maintaining comparable accuracy. Her team's work has so far focused on small, specific problems: medical sensors, activity tracking, keyword spotting. But she thinks the same approach could eventually reach much bigger targets, including the transformer models behind today's chatbots. Source: IEEE Spectrum (30 July 2026)
AI AI Is Hyper-Scaling Digital Inequality The next AI divide is about who gets to build, govern, and benefit  Artificial intelligence is rapidly becoming part of everyday infrastructure—in some places. It helps write emails and software code, filters job applications, powers recommendation systems, and is increasingly being integrated into education, health care, finance, and public administration. Industry leaders talk about "AI for everyone," while governments rush to publish national AI strategies and build sovereign compute. Yet over the past decade, working on digital inclusion and digital literacy projects in regions from Europe to sub-Saharan Africa and Southeast Asia, I've seen the same pattern repeat: Each new wave of "transformative" technology lands on a landscape already stratified by connectivity, skills, and institutional capacity. The current AI wave is no exception. If anything, it amplifies those underlying fractures. Still, some countries are exploring ways of participating in AI development without directly replicating the frontier-model race dominated by the United States and China. Recent developments in South Africa and Indonesia illustrate both the possibilities and challenges. The stakes extend far beyond access to AI. Countries that remain primarily consumers rather than creators of AI risk losing opportunities to build local innovation ecosystems, strengthen public-sector capacity, and ensure that their own languages, cultures, and societal priorities are reflected in AI systems. In this sense, the AI divide is also	ENERGY New process turns plastic waste into hydrogen fuel while trapping the carbon  Plastic is found throughout modern life, from water bottles and shopping bags to vehicle dashboards. Once these products are thrown away, however, they become extremely difficult to recycle. Conventional recycling often requires workers or machines to separate plastics by type, adding expense and complexity to the process. These challenges help explain why only 9% of discarded plastic is recycled. About 79% is sent to landfills, while another 12% is burned, a practice that releases carbon dioxide into the atmosphere. A new chemical process can transform three of the most common plastics into high-purity hydrogen without sorting them first. The technique operates at much lower temperatures than traditional gasification and captures most of the plastic's carbon in solid or liquid forms instead of releasing it as carbon dioxide.	ENERGY Ultrafast X-rays capture chemistry unfolding atom by atom  Ultrafast X-rays revealed how a molecule converts absorbed light into motion in just trillionths of a second. Individual atoms recorded different stages of the process, opening a powerful new window into light-driven chemistry. Scientists have observed how energy moves through a molecule immediately after it absorbs light, revealing that individual atoms can record very different parts of the transformation. Using rapid X-ray flashes produced at the European XFEL, the researchers followed changes at specific atoms as the molecule released and redistributed the absorbed energy. Their results show that exposure to light can make an atom more responsive to the movement of neighboring atoms. The technique gives scientists a way to examine extremely fast chemical reactions at the atomic scale and in real time. It could eventually improve understanding of how DNA withstands light exposure, how energy travels through materials designed to harvest light, and how other fundamental light-driven processes occur.	ENERGY Scientists left water inside a battery and nearly doubled its power  A surprisingly simple change could make sodium-ion batteries far more powerful while opening the door to turning seawater into drinking water. Researchers at the University of Surrey found that sodium vanadium oxide performs much better when its naturally occurring water is left inside instead of being removed during manufacturing. Sodium ion batteries could offer a more sustainable way to store large amounts of energy, and new research suggests they may eventually serve another valuable purpose: helping remove salt from seawater.

becoming a divide in economic opportunity and technological influence. Source: IEEE Spectrum (29 July 2026)	Source: UCLA (02 July 2026)	Source: European XFEL (29 July 2026)	Source: University of Surrey (1 August 2026)
GLOBAL WARMING Scientists detect a sharp acceleration in global warming  Global warming appears to have shifted into a faster gear. After removing the effects of El Niño, volcanic eruptions, and solar cycles, researchers found that the planet has warmed at roughly 0.35°C per decade over the past ten years, compared with just under 0.2°C per decade from 1970 to 2015. The acceleration, which becomes visible around 2013 to 2015, appeared across five major global temperature datasets with more than 98% statistical certainty. Source: PIK (27 July 2026)	OPTICS World-first photonic time crystal opens a new era of light control  An international research team has experimentally produced the first all-optical photonic time crystal (PTC), a material designed to change its optical behavior rapidly and repeatedly over time. The researchers came from École Polytechnique, Collège de France, and Helmholtz-Zentrum Dresden-Rossendorf (HZDR). Reported in Nature, the achievement was made possible by HZDR's powerful TELBE superradiant terahertz source. The system allowed the scientists to explore a previously inaccessible form of light-matter interaction in the terahertz range. In the future, the approach could contribute to ultrafast optical computers, advanced telecommunications, and entirely new terahertz lasers. Controlling how light behaves inside materials has already led to technologies that shape modern life. Optical fibers carry information across communication networks, lasers provide highly precise light sources, and optical sensors are widely used in chemistry and biology. Source: École Polytechnique (31 July 2026)	MATERIALS This new alloy is up to 10 times stronger than steel and surprisingly flexible  Engineers have transformed a notoriously brittle cobalt-aluminum compound into a material that is both extremely strong and capable of bending without breaking. Their nanoscale design produced a yield strength about six to 10 times greater than high-strength structural steel while sustaining substantial deformation at room temperature. The approach could enable tougher turbine blades and higher-performance engines. Intermetallics are solid materials made from two or more metallic elements arranged in a highly ordered crystal structure. Their unusual atomic organization can give them exceptional strength, high melting temperatures, and strong resistance to creep, which is the slow deformation of a material under prolonged heat and stress. These qualities make intermetallics valuable for demanding technologies, including jet engines, gas turbines, energy storage systems, and automotive components. However, many of these materials have a major weakness. They tend to be extremely brittle. Source: Purdue University (30 July 2026)	QUANTUM IBM Claims Quantum Advantage With New Validation Techniques Three results show calculations that are out of reach of classical computers yet have good evidence of correctness (whitepaper)  Quantum computers promise to solve problems beyond the most powerful classical supercomputers. But this raises a fundamental challenge: how do you prove the validity of answers that can't be calculated any other way? In a trio of papers released yesterday, IBM and collaborators say they have demonstrated several techniques for solving this conundrum. The holy grail for quantum computing is a machine that unambiguously solves problems that are impossible for a classical machine, something that has come to be known as "quantum advantage." Pinning down exactly what counts as advantage has proven trickier though. So far, most demonstrations have relied on highly contrived problems that bear little resemblance to real world use cases. They have also struggled to show their answers were correct, as classical ground truth is missing and statistical workarounds rely on strong assumptions about how the hardware will behave. In a series of collaborations with researchers at the University of Chicago and quantum software startups Algorithmiq and Qedma, IBM claims to have now demonstrated three separate instances of quantum advantage alongside methods that validate the results are correct despite not being classically simulatable. Source: IEEE Spectrum (31 July 2026)

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