

Weekly Discovery

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13 Oct - 17 Oct 2025

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AI
Fast, Tiny, And Smart AI: Small Language Models for Your Phone A Hybrid Architecture Boosts Speed and Memory Efficiency



“While most of the AI world is racing to build ever-bigger language models like OpenAI’s [GPT-5](#) and Anthropic’s Claude Sonnet 4.5, the Israeli AI startup [AI21](#) is taking a different path.

AI21 has just unveiled [Jamba Reasoning 3B](#), a 3-billion-parameter model. This compact, open-source model can handle massive [context windows](#) of 250,000 tokens (meaning that it can “remember” and reason over much more text than typical language models) and can run at high speed, even on [consumer devices](#). The launch highlights a growing shift: smaller, more efficient models could shape the future of AI just as much as raw scale.

“We believe in a more decentralized future for AI—one where not everything runs in massive data centers,” says [Ori Goshen](#), Co-CEO of AI21, in an interview with *IEEE Spectrum*. “Large models will still play a role, but small, powerful models running on devices will have a significant impact” on both the future and the economics of AI, he says. Jamba is built for developers who want to create edge-AI applications and specialized systems that run efficiently on-device.

AI21’s Jamba Reasoning 3B is designed to handle long sequences of text and challenging tasks like math, coding, and logical reasoning—all while running with impressive speed on everyday devices like [laptops](#) and [mobile phones](#). Jamba Reasoning 3B can also work in a hybrid setup: simple jobs are handled locally by the device, while heavier problems get sent to powerful cloud [servers](#). According to AI21, this smarter routing could dramatically cut AI infrastructure costs for certain workloads—potentially by an order of magnitude.”

Source: [IEEE Spectrum](#) (8 Oct 2025)

AI
Artificial Intelligence Emerging as Powerful Patient Safety Tool in Pediatric Anesthesia



“**SAN ANTONIO** — Artificial intelligence (AI) could soon help anesthesiologists keep children safer in the operating room and improve their recovery with better pain management, suggests a systematic review presented at the [ANESTHESIOLOGY® 2025 annual meeting](#).

Providing anesthesia care for children is especially challenging because their anatomy can vary dramatically, even among patients of the same age. The researchers found AI performed better than standard methods for determining the appropriate size and placement of breathing tubes, monitoring oxygen levels and assessing postoperative pain. AI consistently: improved the prediction, mitigation and management of complications; enhanced clinical accuracy and decision-making; and allowed anesthesiologists to intervene sooner when complications occurred.

“Think of AI as the co-pilot, while the anesthesiologist makes all the final decisions,” said Aditya Shah, B.S., lead author of the study and a medical student at Central Michigan University College of Medicine, Saginaw. “AI can continuously analyze thousands of data points in real time and learn patterns from past cases, spotting subtle changes sooner and helping tailor decisions to each child’s unique anatomy. However, it does not replace the anesthesiologist’s training and expertise; it simply adds another layer of safety and support.”

The researchers analyzed 10 studies and found that AI tools were more effective than current screening/analysis methods. Although AI tools for pediatric anesthesia are still in the research stage, their significant benefits make it likely they will be incorporated into practice in the near future, Shah said.”

Source: [Eurekalert!](#) (11 Oct 2025)

ARCHITECTURE
Beyond Private Dining: Exploring The Communal Table as Public Space Infrastructure



“The habit of [sitting at the table and sharing a specific moment](#) with other people has been present for centuries in the most diverse cultures. The Greek Symposium, Roman Convivium, Medieval Feasts and Banquets, and Parisian Salons are just a few examples of how this custom was historically built and has been relevant in social and political negotiations, intellectual discussions, and philosophical debates.

Commensality often serves as a ritual for bonding, negotiation, and celebrating important events. In many Spanish-speaking cultures, the stretch of time after the meal when the entire family stays seated and talks is so present that there is a word for it: *sobremesa* — literally translated as “upon the table” (though in Spanish it more accurately means “dessert” or “after-meal conversation”). But, despite often being associated with sharing a meal, the table can be considered a flexible platform open to many possibilities for appropriation and interaction.

Whether it’s for putting together a family puzzle, for sharing a workspace with others, or for meetings, debates, and conversations, tables are capable of gathering groups and stimulating face-to-face interactions, strengthening bonds and meaningful exchanges. These are some of the reasons why communal tables, which aim to be a kind of invitation for a large group of people to gather, have been explored in temporary or permanent installations in public spaces around the world.”

Source: [Archdaily](#) (10 Oct 2025)

DESIGN
Pentagram Refreshes Karri's Screen-Free Smartphone for Kids



“Inspired by the simplicity of walkie talkies, design agency [Pentagram](#) has updated tech company Karri’s [smartphone](#) for kids with new features intended to make communication “as intuitive as possible”.

Designed for ages five to 13, the [Karri](#) messenger aims to give young people a way to chat with loved ones – without all the distractions that come with standard smart phones.

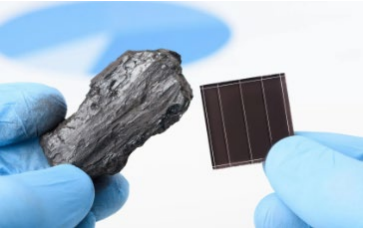
Children are able to use the SIM-operated device to send voice notes to parents or guardians, who can then listen and respond via the Karri app on their own smartphones.

The app can also show the location of a child, plus the Karri’s battery level and network status. There’s additionally the option to set up safe areas or “geo fences” for the child, and be notified should they move beyond these boundaries.

An enhanced version of the device is set to launch in early 2026.”

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

ENERGY
When Sunshine Became Cheaper Than Coal

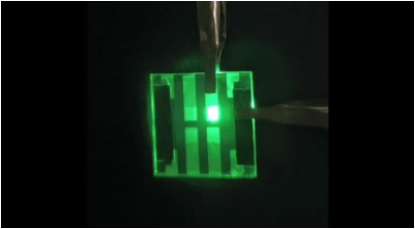


“Solar energy is now the cheapest source of power worldwide, driving a massive shift toward renewables. Falling battery prices and innovations in solar materials are making clean energy more reliable than ever. Yet, grid congestion and integration remain key challenges. Experts say smart grids and sustained policy support are crucial to accelerate the transition.

Solar energy is now so cost-effective that, in the sunniest countries, it costs as little as £0.02 to produce one unit of power, making it cheaper than electricity generated from coal, gas or wind, according to a new study from the University of Surrey.”

Source: [University of Surrey](#) (7 Oct 2025)

MATERIALS
Scientists Create a Paper-Thin Light That Glows Like the Sun



“Scientists have developed an ultra-thin, paper-like LED that emits a warm, sunlike glow, promising to revolutionize how we light up our homes, devices, and workplaces. By engineering a balance of red, yellow-green, and blue quantum dots, the researchers achieved light quality remarkably close to natural sunlight, improving color accuracy and reducing eye strain.”

Source: [ACS](#) (11 Oct 2025)

MATERIALS
New 3D Printing Method 'Grows' Ultra-Strong Materials

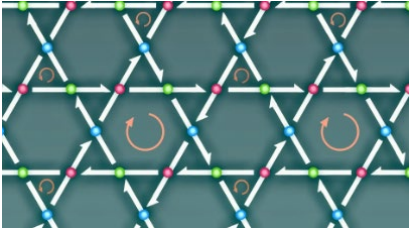


“EPFL researchers have pioneered a 3D printing method that grows metals and ceramics inside a water-based gel, resulting in exceptionally dense, yet intricate constructions for next-generation energy, biomedical, and sensing technologies.

Now, Yee and his team have published a paper in *Advanced Materials* that describes a unique solution to this problem. Rather than using light to harden a resin that is pre-infused with metal precursors, as previous methods have done, the EPFL team first creates a 3D scaffold out of a simple water-based gel called a hydrogel. Then, they infuse this ‘blank’ hydrogel with metal salts, before chemically converting them into metal-containing nanoparticles that permeate the structure. This process can then be repeated to yield composites with very high metal concentrations.”

Source: [EPFL](#) (8 Oct 2025)

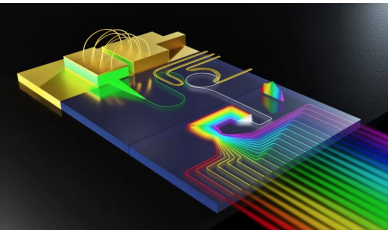
MATERIALS
A Strange Quantum Metal Just Rewrote the Rules of Electricity



“In a remarkable leap for quantum physics, researchers in Japan have uncovered how weak magnetic fields can reverse tiny electrical currents in kagome metals—quantum materials with a woven atomic structure that frustrates electrons into forming complex patterns. These reversals amplify the metal’s electrical asymmetry, creating a diode-like effect up to 100 times stronger than expected. The team’s theoretical explanation finally clarifies a mysterious phenomenon first observed in 2020, revealing that quantum geometry and spontaneous symmetry breaking are key to this strange behavior.”

Source: [Nagoya University](#) (8 Oct 2025)

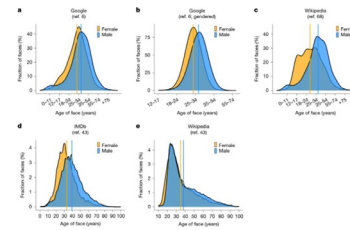
PHOTONICS
Powerful And Precise Multi-Color Lasers Now Fit on a Single Chip



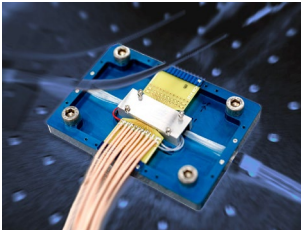
SCIENCES
Decades-Old Photosynthesis Mystery Finally Solved



SOCIOLOGY
Age And Gender Distortion in Online Media and Large Language Models



TELECOMMUNICATIONS
Cisco Bridges Classical and Quantum Networks: New Quantum Compiler Makes Connected Qubits “Network Aware”



“Researchers at Columbia Engineering have developed a compact light source that generates dozens of high-power wavelengths, paving the way for a new generation of data center hardware and portable sensing technologies... Today, creating a powerful frequency comb requires large and expensive lasers and amplifiers. In their new paper in Nature Photonics, Lipson, Eugene Higgins Professor of Electrical Engineering and professor of Applied Physics, and her collaborators show how to do the same thing on a single chip. “Data centers have created tremendous demand for powerful and efficient sources of light that contain many wavelengths,” says Gil-Molina, who is now a principal engineer at Xscape Photonics. “The technology we’ve developed takes a very powerful laser and turns it into dozens of clean, high-power channels on a chip. That means you can replace racks of individual lasers with one compact device, cutting cost, saving space, and opening the door to much faster, more energy-efficient systems.” “This research marks another milestone in our mission to advance silicon photonics,” Lipson said. “As this technology becomes increasingly central to critical infrastructure and our daily lives, this type of progress is essential to ensuring that data centers are as efficient as possible.”	“Scientists from the Indian Institute of Science (IISc) and Caltech have finally solved a decades-old mystery about how photosynthesis really begins. They discovered why energy inside plants flows down only one of two possible routes — a design that lets nature move sunlight with astonishing precision. Using advanced computer simulations, the researchers showed that one branch has a much higher energy barrier, blocking electrons from moving freely.”	“Are widespread stereotypes accurate or socially distorted? This continuing debate is limited by the lack of large-scale multimodal data on stereotypical associations and the inability to compare these to ground truth indicators. Here we overcame these challenges in the analysis of age-related gender bias, for which age provides an objective anchor for evaluating stereotype accuracy. Despite there being no systematic age differences between women and men in the workforce according to the US Census, we found that women are represented as younger than men across occupations and social roles in nearly 1.4 million images and videos from Google, Wikipedia, IMDb, Flickr and YouTube, as well as in nine language models trained on billions of words from the internet. This age gap is the starkest for content depicting occupations with higher status and earnings. We demonstrate how mainstream algorithms amplify this bias. A nationally representative pre-registered experiment (n = 459) found that Googling images of occupations amplifies age-related gender bias in participants’ beliefs and hiring preferences. Furthermore, when generating and evaluating resumes, ChatGPT assumes that women are younger and less experienced, rating older male applicants as of higher quality. Our study shows how gender and age are jointly distorted throughout the internet and its mediating algorithms, thereby revealing critical challenges and opportunities in the fight against inequality.”	“In the drive to make a practical quantum computer, researchers are developing bigger and better quantum networks—ones with capabilities that will complement and enhance quantum computing. Put another way, building a functioning quantum network that can exchange many qubits securely, over long distances, could be a useful end goal completely apart from the quantum-computer race. In that vein, Cisco launched a quantum-networking software system on 25 September. The networking giant’s technology could help to bring about more powerful quantum sensors, secure position verification, and quantum-enhanced imaging tech—to list just three of a range of emerging, noncomputing applications for quantum networks. The team has a hybrid purpose in mind as well, says Ramana Kompella, vice president and head of research at Cisco in San Jose, Calif.: quantum networks that can work with classical computers and conventional computer networks. “This is a very fascinating field for us because until now, classical computing didn’t have access to a quantum network,” Kompella says. “But imagine if you had access to a quantum network, what can you actually enable in terms of new capabilities?” Kompella has an answer to his own question. “We can secure classical networking with the help of quantum signals by detecting eavesdroppers on long-distance fiber-optic communications,” he says.”
Source: Columbia (7 Oct 2025)	Source: IISc (13 Oct 2025)	Source: Nature (8 Oct 2025)	Source: IEEE Spectrum (9 Oct 2025)

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