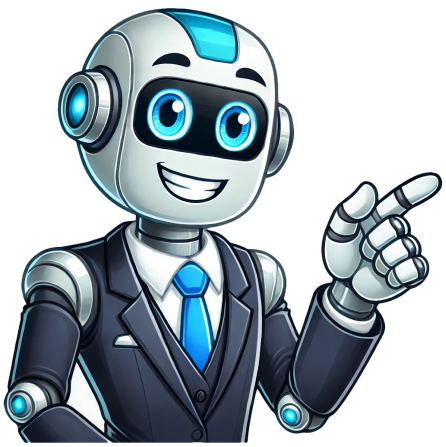


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By Kathryn HulickMay 21, 2025 Artificial Intelligence Adam Beckers new book, More Everything Forever, investigates the dangers of a billionaire-driven tomorrow, in which trillions of humans live in space, served by AI. By Ashley YeagerApril 15, 2025 Artificial Intelligence When classifying climate misinformation, general-purpose large language models lag behind models trained on expert-curated climate data. Artificial Intelligence A new set of artificial intelligence models could make protein sequencing even more powerful for better understanding cell biology and diseases. By Lauren LefferMarch 31, 2025 Artificial Intelligence AI models are growing ever-more capable, accurate and impressive. The question of if they represent general intelligence is increasingly moot. By Lauren LefferMarch 11, 2025 Artificial Intelligence AI medical benchmark tests fall short because they dont test efficiency on real tasks such as writing medical notes, experts say. 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The map could lead to a deeper understanding of how information flows in the brain. Sign up for our newsletter We summarize the week's scientific breakthroughs every Thursday. Scientific clockmakers debuted the worlds first prototype nuclear clock. Nuclear clocks would base time on fluctuating energy levels in atomic nuclei. While the prototype isnt a fully operational timepiece, its development showed scientists the precise frequency of light required to set off fluctuations in the energy levels of atomic nuclei (SN: 10/5/24, p. 7). Nuclear clocks could help scientists explore fundamental physics an area of science teeming with potential discovery. Physicists used a laser (shown) to probe a jump between two energy levels in thorium-229, which could serve as a nuclear clock.ChuanKun Zhang/JILA Giant panda biology took a huge leap forward this year: For the first time, researchers transformed the bears skin cells into stem cellsthat can be coaxed into any other type of cell in the body (SN: 10/19/24, p. 10). Being able to take skin cells and end up with, say, the precursors of sperm and egg cells gives conservationists a leg up in defending giant pandas from extinction by boosting breeding and expanding the bears small gene pool. This year, scientists took skin cells from this giant panda and transformed them into a kind of stem cell that can potentially become any kind of cell in the body.Imaginechina Limited / Alamy Stock Photo A eukaryote has joined some bacteria and archaea in the nitrogen fixation club. A type of marine alga has an internal factory that transforms nitrogen into ammonia, a biologically usable form (SN: 4/11/24). The factory probably started as a separate life-form that entered a symbiotic relationship with the eukaryote. Over millennia, the two may have become so intertwined that they became one organism. The unicellular algae *Braurudospharea bigelowii* (shown here in a 1000x magnification) is the first eukaryote known to fix nitrogen, thanks to its nitroplast organelle (arrow).Tyler Coale By smashing protons into a fixed target, physicists witnessed a predicted but never-before-confirmed form of particle decay (SN: 10/19/24, p. 16). The collision produced subatomic particles called kaons. Those kaons decayed into an uncommon combination of three other types of particles at a rate of about 13 in 100 billion times. Continued investigation into the decay might help unveil new physics. An experiment at CERN (shown) detected an extremely rare decay of subatomic particles called kaons.M. Brnce/CERN The Cyathea rojasiana tree fern is the first plant known to turn its dead leaves into roots (SN: 2/24/24, p. 5). The leaves sprout rootlets, which the fern may use to search out nutrients in the soil of Panamanian forests. Researchers now want to figure out how the rootlets absorb nutrients. Cyathea rojasiana tree ferns in Panamas Quebrada Chorro forest revive their dead leaves by turning them into tiny roots.J. Dalling In a sleepy galaxy not too far away, a supermassive black hole appears to be gradually waking up, providing astrophysicists with their first peek of a black hole transitioning from dim and quiet to bright and active (SN: 7/13/24 & 7/27/24, p. 7). When supermassive black holes consume material such as stars, they usually glow for only a few days to weeks. But lucky for scientists, this black hole has remained luminous for years. While researchers are not completely certain why the black hole continues to glow, theyre following the situation closely and hoping to glean some insights into how black holes grow. A supermassive black hole in galaxy SDSS1335+0728 has lit up, possibly giving astronomers a look at how such beasts are awakened.M. Kornmesser/ESO The rate of Earths rotation is well established, but scientists measured it in a new way, using entangled quantum particles (SN: 7/14/24 & 7/28/24, p. 5). The theories of quantum physics and gravity are largely incompatible, so it was noteworthy that the experiments measurements aligned with Earths known rotation rate. Physicists hope the experiment will open doors for further research into demystifying how gravity and quantum physics interact. In a laboratory experiment, scientists sent entangled particles of light (red squiggles) into an interferometer (illustrated) that was sensitive enough to measure Earths rotation.Marco Di Vita Questions or comments on this article? E-mail us atfeedback@sciencenews.org | Reprints FAQ A version of this article appears in the April 1, 2025 issue of Science News. Executive Office of the President. Executive Order 14168. Federal Register. Vol. 90, January 30, 2025, p. 8615. S. Raguraman et al. Exploring uncharted territory: A case report on de la Chapelle syndrome presenting as male subfertility. International Journal of Surgery Case Reports. Vol. 118, May 2024, 109360. doi: 10.1016/j.ijscr.2024.109630. M. zdemir et al. Ovotesticular Disorder of sex development: an unusual presentation. Journal of Clinical Imaging Science. Published online July 12, 2019. doi: 10.25259/JCIS.45.2019. M.R. Khan et al. A novel sex chromosome mosaicism 45,X/45,Y/46,XY/47,XXY causing ambiguous genitalia. Annals of Clinical & Laboratory Science. Vol. 47, NovemberDecember 2017, p. 761. PMID:29263053 A.A. Maan et al. The Y chromosome: A blueprint for mens health? European Journal of Human Genetics. Vol. 25, August 30, 2017, p. 1181. doi: 10.1038/ejhg.2017.128. Weight-loss drugs stole much of the spotlight in 2023, but these medical advances treating other conditions are also worthy of attention (SN: 12/13/23). On December 8, the U.S. Food and Drug Administration approved the worlds first CRISPR/Cas9 gene-editing therapy (SN: 12/8/23). The treatment, called Casgevy, targets sickle cell disease by helping patients produce healthy hemoglobin. In people with the disease, hemoglobin is abnormal, causing red blood cells to become hard and crescent shaped, which can block blood flow. By March 2024, the FDA will decide whether the same therapy can be used to treat beta-thalassemia, a disorder that reduces hemoglobin production. Sign up for our newsletter We summarize the week's scientific breakthroughs every Thursday. The Alzheimers drug lecanemab (brand name Leqembi) won full FDA approval in July. Like the drug aducanumab approved in 2021, lecanemab removes the amyloid plaques that build up in the brains of people with Alzheimers. The drug doesnt stop the disease, but in a clinical trial, lecanemab slowed cognitive decline by about 30 percent over 18 months compared with a placebo (SN: 8/12/23, p. 9). In June, the FDA approved the first gene therapy for children with Duchenne muscular dystrophy. Due to a faulty gene, people with this muscle-wasting disease dont make the protein dystrophin, which helps keep muscle cells intact. The therapy helps the body produce a version of the missing protein (SN: 6/22/23). Several ways to protect against respiratory syncytial virus arrived this year. In May, the FDA approved the first RSV vaccine, called Arexvy, in the United States, for adults age 60 and older (SN: 6/17/23, p. 8), and then in August, a vaccine for pregnant people, called Abrysvo (SN: 8/25/23). A monoclonal antibody a lab-made antibody that mimics immune system proteins won approval in July to protect children 2 and younger from the virus, which sends as many as 80,000 young children to U.S. hospitals each year (SN: 4/27/23). But in October, limited supplies of the therapy led the U.S. Centers for Disease Control and Prevention to recommend reserving it for babies at highest risk for complications from RSV. Until August, the only medication in the United States specifically targeting postpartum depression required a 60-hour intravenous infusion in a hospital (SN: 3/22/19). With FDA approval of zuranolone (brand name Zurzuvae), those afflicted with postpartum depression can take an oral medication at home and experience improvement in as little as three days. In July, the FDA ruled that the oral contraceptive norgestrel, first approved in 1973, be available without a prescription. Its the first OTC daily birth control pill in the United States. Some public health experts argue that reducing barriers to contraception is especially important to reproductive autonomy now that state bans have limited access to abortion (SN: 5/19/23). Sponsor Message The chikungunya virus can cause fever and severe joint pain, and be fatal to newborns. In November, the FDA approved the first vaccine against the virus, which is transmitted by mosquitoes. The virus is most prevalent in tropical regions, but the FDA warns that its spreading to new parts of the globe. The nasal spray Narcan, aka naloxone, can reverse the effects of an opioid overdose within minutes. In March, the FDA ruled this life-saving drug can be sold over the counter. Officials hope that easier access to Narcan can help fight the opioid epidemic, which claimed the lives of nearly 645,000 people from 1999 to 2021 due to overdoses.

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