

Ode to E Pluribus Unum for Sunday December 22 2024

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Jupiter Abyss



Image Credit: NASA, Juno, SwRI, MSSS; Processing & License: Gerald Eichstädt & Sean Doran

What's that black spot on Jupiter? No one is sure.

During one pass of NASA's Juno over Jupiter, the robotic spacecraft imaged an usually dark cloud feature informally dubbed the Abyss. Surrounding cloud patterns show the Abyss to be at the center of a vortex.

Since dark features on Jupiter's atmosphere tend to run deeper than light features, the Abyss may really be the deep hole that it appears -- but without more evidence that remains conjecture.

The Abyss is surrounded by a complex of meandering clouds and other swirling storm systems, some of which are topped by light colored, high-altitude clouds. The featured image was captured in 2019 while Juno passed only about 15,000 kilometers above Jupiter's cloud tops.

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Chords & Riffs

Gustavo Dudamel: Notre Dame Reopening



elimpulso.com

Gustavo Dudamel leads the Orchestre Philharmonique de Radio France for the reopening of Notre-Dame de Paris. December 7, 2024.

Ariane Delacroix Faure' Pia Jesu <https://youtu.be/1AWvFxfSFqY?t=1>

Saint-Saëns Symphony No. 3 <https://youtu.be/yeckyz-GJJk>

Beethoven Fifth Symphony <https://youtu.be/-G9VFwvg3-4>

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Can Neuralink's Brain Implant Control a Robotic Arm?

Elon Musk's brain implant company is launching a new study to test whether its wireless device can control a robotic arm.



Vibrel Kurnosov Getty Images

A BCI, or brain-computer interface, is a system that allows people to directly control outside devices with their brain waves. It works by reading and decoding intended movement signals from neurons. Neuralink's BCI involves a coin-sized device dubbed N1 that is surgically implanted in the brain by a robot. The company is currently evaluating the safety of its BCI, as well as its ability to control a computer in individuals with paralysis.

<https://bit.ly/3CLUMnL>

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Christmas with the Mannheim Steamroller



Pianist Anna Lackoff shares the spotlight with violinist Mark Agnor during a recent performance of 'Mannheim Steamroller Christmas.' The holiday show brought down the house at the Ellen Eccles Theatre here in Logan on Dec. 13 and will be performed again on Dec. 14 (Image courtesy of Facebook).

Founded in 1974 by percussionist/composer Chip Davis, the original Mannheim Streamroller was best known for its "Fresh Aire" series of albums that blended classical music with New Age and Rock.

The group's now-famous first holiday album was released in 1984 followed by many more, quickly making Davis' band into one of the most popular Christmas music artists of all time.

As drummer Tom Sharpe explained the Mannheim Streamroller Christmas concert here in Logan celebrated the 50th anniversary of the band's inception and the 40th anniversary of its tours marking the holiday season. For that reason, its show here offered a blend of modern arrangements of traditional Christmas carols and hymns from seven previously released holiday albums, plus deep cuts from "Fresh Aire I, III and IV."

<https://music.youtube.com/channel/UCnfRfrXvDjd7GYH58P13Low>

Thanks to my buddy Kay Martin for reminding me of the group and its Christmas tradition.

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Airport Hotels Became a \$13 Billion Business by Being Boring

They have little charm or surprise—but sometimes that's the point.



indonesiaexpat.id

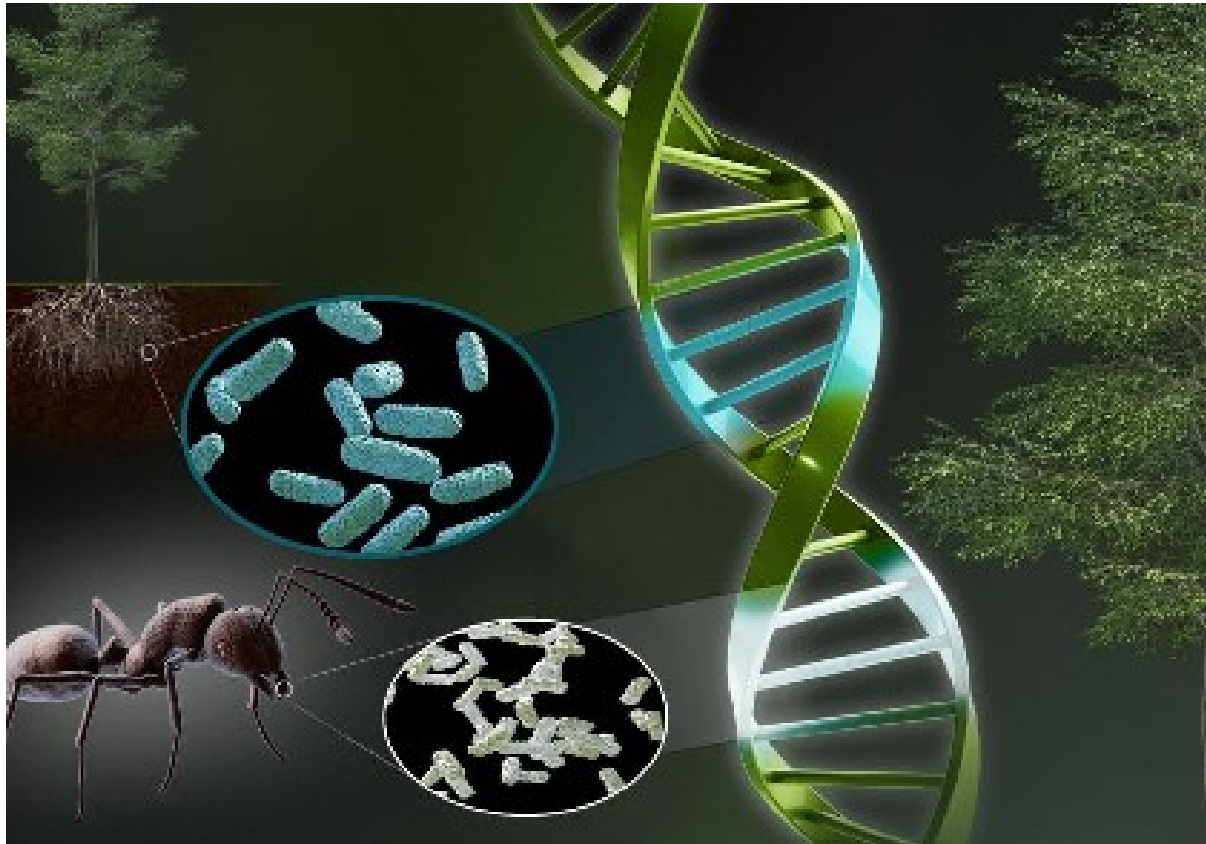
I was eating a Cobb salad at a Courtyard by Marriott a few miles south of Denver International Airport, trying to penetrate one of the great mysteries of modern life. The parking lot was full. The lobby was empty. The street outside was also empty, except for the shuttle vans that appeared, twice hourly, then shuddered off into the distance. Transportation hubs have always supported lodging businesses that seem to reflect back the character of their travelers. Other centuries had bawdy roadhouses and wharf-side taverns and cosmopolitan train station hotels. What did it mean that we have this?

The use case for the airport hotel sounds like a riddle. "People go there because they want to not be there," says Jan Freitag, director of hospitality analytics at CoStar Group. It's the ultimate liminal space, subject to the same unspoken airport rules that lead people to nonchalantly spend \$19 for a soggy turkey sandwich or a breakfast cabernet at the terminal wine bar. If you check into an airport hotel late at night and leave early the next day, are you really even there? And yet there you are, with nowhere to go but the waffle bar. Might as well have that second helping.

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Photosynthesis Gene Discovery Boosts Plant Height.



*A team of scientists discovered a naturally occurring gene in the poplar tree that enhances photosynthetic activity and significantly boosts plant growth. The gene, *Booster*, contains DNA from two associated organisms found within the tree, and from a protein known as Rubisco that is essential to photosynthesis.*

Credit: Andy Sproles/ORNL, U.S. Dept of Energy

A team of scientists with two Department of Energy Bioenergy Research Centers — the Center for Bioenergy Innovation, or CBI, at Oak Ridge National Laboratory and the Center for Advanced Bioenergy and Bioproducts Innovation, or CABBI, at the University of Illinois Urbana-Champaign — identified a gene in a poplar tree that enhances photosynthesis and can boost tree height by about 30% in the field and by as much as 200% in the greenhouse.

The gene, which scientists named *Booster*, also increased the biomass of another plant species, *Arabidopsis*, or thale cress, indicating the potential for higher yields from other crops if successful on a larger scale.

<https://bit.ly/3OEyFSL>

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'Neural Tourniquet' that Can Stop Bleeding with Nerve Stimulation

Researchers stimulated the vagus nerve in healthy volunteers and showed it triggered blood clot formation, which they say could be used to prevent blood loss after surgery.



A device that attaches to the ear can stimulate the vagus nerve, thus promoting blood clotting. The technology, called transcutaneous auricular neurostimulation (tAN), has been tested in an early trial sponsored by the company Five Liters.

(Image credit: The Feinstein Institutes for Medical Research)

Zapping the vagus nerve promotes blood clotting, new research suggests.

These findings are the first evidence in humans of a "neural tourniquet," or a brain-based pathway that could reduce bleeding, said study co-author Dr. Jared Huston, a trauma surgeon at the Feinstein Institutes for Medical Research at Northwell Health in New York.

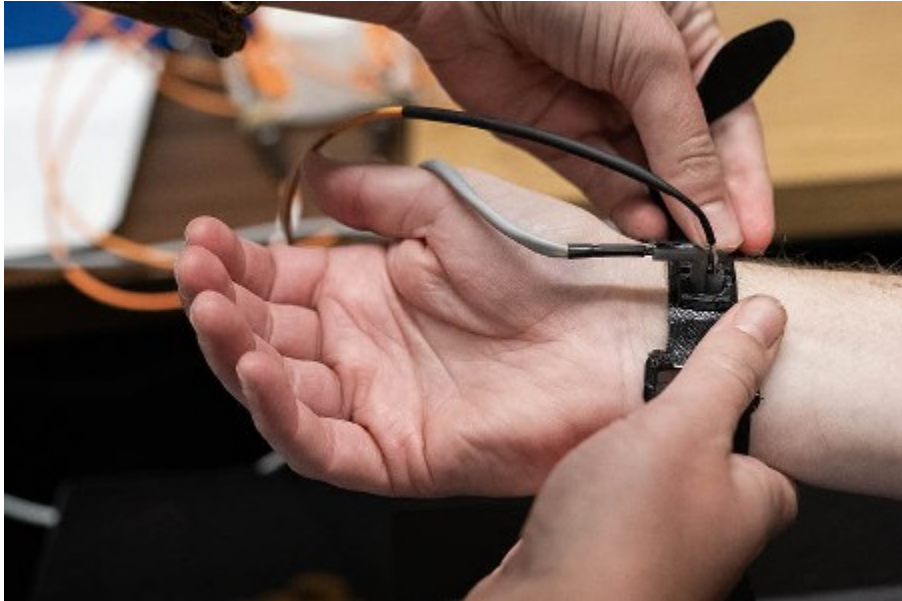
If a future clinical trial directly shows that the nerve stimulation decreases blood loss, the technique could be used before planned surgeries to protect patients from excessive bleeding,

<https://bit.ly/3B2AeXD>

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Using Light to Monitor Blood Pressure and Track Cancer Treatment

Understanding how light interacts with living cells and tissues is the foundation of BU engineer Darren Roblyer's medical device inventions, which can open up a whole new way of monitoring health



This doesn't look like a typical blood pressure monitor—but that's exactly what it is. This device was designed and engineered in Darren Roblyer's Optical Technologies Lab at BU and uses light to track blood pressure, instead of the standard—and sometimes uncomfortable—cuff.
Boston University

Here's an experiment: Turn on your phone's flashlight and place the tip of your finger over the small beam of light. What do you see? Your finger is illuminated, but the light isn't passing entirely through. You're looking at what's called a diffusive glow, which is what happens when all the cells and molecules that make up your finger absorb and scatter the steady beam of light in an instant.

"The light changes direction millions of times so that it turns into a diffuse red glow," explains Darren Roblyer, a Boston University College of Engineering associate professor of biomedical engineering. Understanding how light interacts with living cells and tissues is the foundation of his work. It might not be as simple as shining a phone flashlight on your finger, but the principles of diffusive glow apply to many of Roblyer's medical device inventions for tracking health.

"This technology measures the optical effects of what happens when your heart beats," says Roblyer, who's also a member of the [BU Photonics Center](#). Each time your heart beats, blood flow speeds up and then slows down, and, at the same time, arteries expand and contract, increasing and decreasing the volume of blood in the arteries.

"We're measuring both of those things, and we are extracting a whole lot of information from those waveforms and then using that to predict blood pressure."

<https://bit.ly/3ZlAr06>

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Bio-Derived "Sponge" Soaks Up Microplastics



earthbuddies.net

What do squid bones and cotton fibers have to do with one another? Perhaps the future of microplastics cleanup. Researchers report that when they combine cotton with exfoliated sheets of chitin—the hard biomaterial that forms fingernails, insect exoskeletons, and, yes, squid ‘bones’ (their internal shells, also called quills)—the solid, porous foam formed attracts and immobilizes a wide array of microscopic bits of plastic.

Microplastics have become a ubiquitous scourge around the globe. They include bits of plastics 5 millimeters or smaller and come from everything from worn down chunks of plastic containers, paints, synthetic fabrics and tires. They’ve been detected in mountain snows, ocean sediments and just about everywhere in between. Researchers have also detected them in tissues throughout the human body, where they are thought to contribute to a wide array of health problems.

While researchers have come up with a variety of filters for capturing microplastics, few have proven efficient, reliable and cheap. In the new study, researchers found that their chitin/cotton foams could capture up to 99.9% of four of the most abundant types of microplastics from real-world water samples. And because the foams are made from two of the most abundant biopolymers on the planet, they could be cheap to make on a large scale and also degrade naturally when no longer useful.

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Does Zepbound Cause Greater Weight Loss Than Wegovy?

Eli Lilly said its obesity drug Zepbound led to more weight loss than its main rival, Novo Nordisk’s Wegovy, in the first head-to-head clinical trial on the two weekly injections.



morning brew design

Separate studies on the drugs, along with a recent head-to-head analysis of health records, have similarly implied that Zepbound outperforms Wegovy in terms of weight

loss. A late-stage study on Zepbound showed that it helped patients lose more than 22% of their weight on average over 72 weeks, while a separate study on Wegovy showed that it led to 15% weight loss on average over 68 weeks.

But the Wednesday data appears to be the most concrete evidence of Zepbound's edge, as the trial randomly assigned 751 patients to receive the maximum dose of either drug. The study specifically followed patients who were obese or overweight with at least one weight-related medical condition, not including diabetes.

<https://bit.ly/3OGIJfb>

Might they include a 'healthy' diet and lifestyle category in the next contest?

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Field Notes from a Gear Tester

A season of testing Patagonia gear in Washington State



Abegg executes some top-tier ridgeline ballet en route to Dragontail Peak, with co-tester Hutchins close behind.

Photos by Steven Gnam

"A gust of cold air rolls off the glacier above us, and I ball the warm, waffled fabric of my shirtsleeves in my fists," explains Jenny Abegg. After a full day of pulling ropes, jamming my arms in cracks and wiping snot off my nose, the cuffs have yet to show any signs of pilling: a far cry from the last two prototypes I tested. I think we're finally getting close with this new recycled fabric. Later, I'll take a close look at the back and shoulders—hot spots for wear after 12 hours carrying a backpack—and send photos and notes to Kelly Cordes, Patagonia's field testing coordinator.

Being a gear tester at Patagonia goes something like this: Kelly sends pieces of gear to whomever he feels will put them through the most rigorous tests, based on everything from where we live and what sports we do, to what aspects of gear we're especially picky about. Thermal-weight baselayer prototypes might go to testers who live in northern mountain climates; a belay coat prototype with an innovative hood fit might go to an ice climber who has strong feelings about hoods.

<https://bit.ly/49tqAdh>

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The Ancient City That Mastered Water

While other Moorish cities in Spain fell to Christian warriors, Granada resisted for another 200 years. Here's why.



Alhambra palace and fortress

awayandfar.com

Have you ever wondered if water can flow uphill? In this video, we dive into the incredible engineering of the Alhambra Palace in Granada, Spain. Join us as we explore the history, architecture, and groundbreaking technology behind one of the world's most stunning architectural masterpieces. Discover how this medieval marvel used advanced hydraulic systems to power fountains, underfloor heating, and even water clocks, and watch until the end to learn how you can enter this month's giveaway!

<https://youtu.be/xLaLpMeOyHk>

If you haven't visited Alhambra, by all means do so.

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FLASHMOB CENTRAL

Denver Airport Holiday Flash Mob



youtube

<https://youtu.be/P99p6l8v0FQ>

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99 Year-Old Dick Van Dyke Stars in Coldplay Video



mossandfogg

At age 99, Van Dyke is still going strong, dancing barefoot, and sharp as a tack, reminiscing on his charmed life.

He stars in Coldplay's new music video, All My Love, and the band pays special tribute to this special actor throughout the Director's Cut.

<https://www.bbc.com/news/articles/c3vrl93553qo>

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Amazon's Supercomputer Powered by Homegrown AI Chips

The company's megacluster of chips for artificial-intelligence startup Anthropic will be among the world's largest, it said, and its new giant server will lower the cost of AI as it seeks to build an alternative to Nvidia

A new Trainium2 Ultraserver in the 'Quiet Lab' at Annapurna Labs; an engineer works on a testing unit of a new Trainium2 Ultraserver.

Jordan Vonderhaar for WSJ



Amazon's cloud computing arm Amazon Web Services Tuesday announced plans for an "Ultracluster," a massive AI supercomputer made up of hundreds of thousands of its homegrown Trainium chips, as well as a new server, the latest efforts by its AI chip design lab based in Austin, Texas.

The chip cluster will be used by the AI startup Anthropic, in which the retail and cloud-computing giant recently invested an additional \$4 billion. The cluster, called Project Rainier, will be located in the U.S. When ready in 2025, it will be one of the largest in the world for training AI models, according to Dave Brown, Amazon Web Services' vice president of compute and networking services.

<https://bit.ly/4gpD2x2>

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Thinking Slowly: The Paradoxical Slowness of Human Behavior



Artistic rendering of the brain's "speed limit" - we think, process, and decide at the slow pace of 10 bits per second.

Credit: J. Zheng

Caltech researchers have quantified the speed of human thought: a rate of 10 bits per second. However, our bodies' sensory systems gather data about our environments at a rate of a billion bits per second, which is 100 million times faster than our thought processes.

This new study raises major new avenues of exploration for neuroscientists, in particular: Why can we only think one thing at a time while our sensory systems process thousands of inputs at once?

<https://bit.ly/3ZEsjb8>

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How Microchips Are Made



alamy

Ever wondered how those tiny marvels powering our electronic world are made? From silicon-rich sand to intricate layers crammed with billions of transistors, the journey of a microchip is a fascinating tale of innovation and precision. Join us as we dive into the high-tech world of microchip manufacturing, where every step counts in creating the brains behind our devices.

Stay tuned for a glimpse into one of our most complex feats of technology, where advancements are happening every day.

<https://youtu.be/g8Qav3vIv9s>

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America's Best Mountain Towns



Eureka Springs, Arkansas

Natural beauty and adrenaline aside, what distinguishes a great mountain town from a good one is a sense of evergreen allure. Not confined to seasonal attractions, these are places with amenities and activities year-round, be it leaf-peeping in the fall or camping in the spring.

<https://bit.ly/4cmC5Uq>

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The Line Continues to Grow



alamy

A Jewish man was leaving a convenience store with his espresso when he noticed a most unusual Italian funeral procession approaching the nearby cemetery. A black hearse was followed by a second black hearse about 50 feet behind the first one. Behind the second hearse was a solitary Italian man walking a dog on a leash. Behind him, a short distance back, were about 200 men walking in single file.

The Jewish man couldn't stand the curiosity. He respectfully approached the Italian man walking the dog and said: "I am so sorry for your loss, and this may be a bad time to disturb you, but I've never seen an Italian funeral like this. Whose funeral, is it?"

"My wife's."

"What happened to her?"

"She yelled at me and my dog attacked and killed her."

He inquired further, "But who is in the second hearse?"

"My mother-in-law. She came to help my wife and the dog turned on her and killed her also."

It was a very poignant and touching moment of Jewish and Italian brotherhood ..
Silence passed between the two men.

The Jewish man then asked "Can I borrow the dog?"

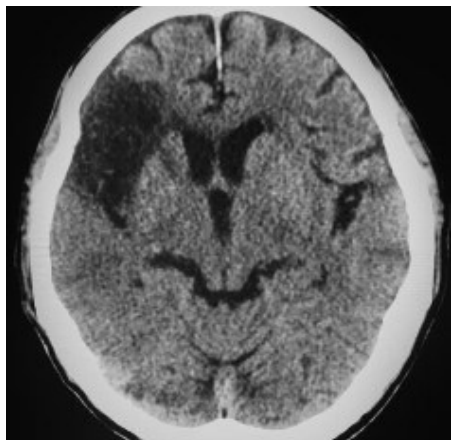
The Italian man replied, "Get in line."

Over the years I have seen or heard told this story involving people from every clime and place on the planet. Clearly, it has universality as well as staying power.

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New AI Stroke Brain Scan Readings Are Twice as Accurate as Now

AI pinpoints stroke timing, treatment potential from a single scan



New AI software can read the brain scans of patients who have had a stroke, to more accurately pinpoint when it happened and help doctors work out whether it can be successfully treated.

It is hoped that the new technology will ultimately enable faster and more accurate emergency treatment of patients in a hospital setting. Knowing the time the stroke started is important because standard treatments only work in the very early stages post-stroke – and may otherwise cause secondary damage.

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First Evidence of the Antimatter Partner of Hyperhelium-4

The finding also represents the first evidence of the heaviest antimatter hypernucleus yet at the LHC

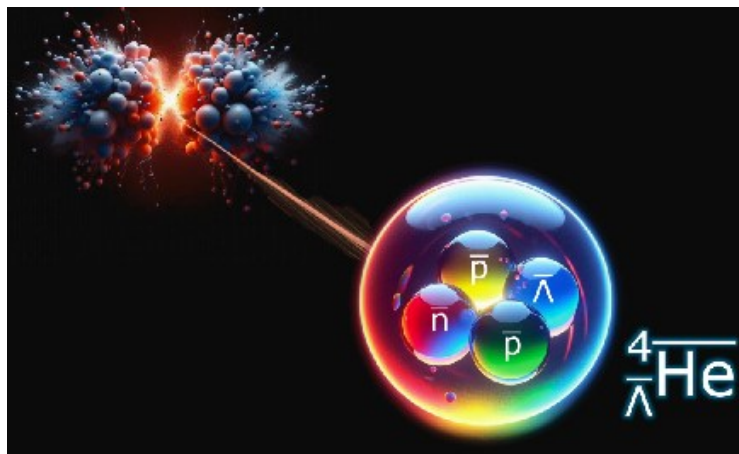


Illustration of the production of antihyperhelium-4 (a bound state of two antiprotons, an antineutron and an antilambda) in lead-lead collisions. (

Image: Janik Ditzel for the ALICE collaboration)

Collisions between heavy ions at the Large Hadron Collider (LHC) create quark-gluon plasma, a hot and dense state of matter that is thought to have filled the Universe around one millionth of a second after the Big Bang.

Heavy-ion collisions also create suitable conditions for the production of atomic nuclei and exotic hypernuclei, as well as their antimatter counterparts, antinuclei and

antihypernuclei. Measurements of these forms of matter are important for various purposes, including helping to understand the formation of hadrons from the plasma's constituent quarks and gluons and the matter–antimatter asymmetry seen in the present-day Universe.

The ALICE measurement is based on lead–lead collision data taken in 2018 at an energy of 5.02 teraelectronvolts (TeV) for each colliding pair of nucleons (protons and neutrons). Using a machine-learning technique that outperforms conventional hypernuclei search techniques, the ALICE researchers looked at the data for signals of hyperhydrogen-4, hyperhelium-4 and their antimatter partners. Candidates for (anti)hyperhydrogen-4 were identified by looking for the (anti)helium-4 nucleus and the charged pion into which it decays, whereas candidates for (anti)hyperhelium-4 were identified via its decay into an (anti)helium-3 nucleus, an (anti)proton and a charged pion.

<https://bit.ly/3BbqtGJ>

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Giant Holiday Drone Show Sets Records



mossandfogg

With nearly 5,000 drones flying together, this massive drone show in Texas recently impressed audiences and set a Guinness World Record, with the largest aerial display of a gingerbread village.

If that world record sounds rather niche and dubious to you, you'd be right. But the charming scenes shown in the display are fun enough to dismiss the absurdity.

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What Is Entropy? A Measure of Just How Little We Really Know.

Exactly 200 years ago, a French engineer introduced an idea that would quantify the universe's inexorable slide into decay. But entropy, as it's currently understood, is less a fact about the world than a reflection of our growing ignorance. Embracing that truth is leading to a rethink of everything from rational decision-making to the limits of machines.



Kristina Armitage/Quanta Magazine

"Nothing in life is certain except for death, taxes, and the second law of thermodynamics," wrote MIT physicist, Seth Lloyd.

200 years after the seeds of entropy were first sown, what's emerging is a conception of this quantity that's more opportunistic than nihilistic.

<https://bit.ly/3Dbbygj>

Is entropy a measure of uncertainty?

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12 Chefs Make Pancakes (Michelin Star, Diner & More)



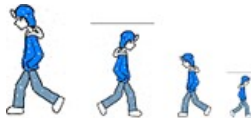
dailystar.uk

Flour, eggs, and milk are the basic ingredients for pancakes, but what happens if you get 12 different chefs to make their version of the same classic dish? From the school cafeteria to Michelin Star restaurants, see how these chefs put their own spin on pancakes.

<https://youtu.be/KeYwtT8zikY>

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My Walking Thoughts



For Sunday December 22 2024

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Whoosh

"Compass," Lieutenant Crayton reminded me I had forgotten to align the heading indicator to that of the runway... *'a rank amateur mistake,'* I was forced to admit. *'No more of those today.'*

Resetting the card to 130 degrees, I ran the throttle full-forward to the stop with one last check to confirm there were no warning lights and that all engine instruments were in the 'green.' Braced to receive a serious kick in the back, I released the brakes, then... *Uh, more a nudge.*

Unlike the T-28 that came thundering out of the blocks loaded for bear, the Cougar gathered way more genteelly, its airspeed indicator disengaging itself from the Zero peg reluctantly before fluttering its way to and finally past the 80-knots index where things began to happen at an accelerating pace.

100..... 110.... 120... liftoff, followed in short order by gear handle up... *thump thump... thump...* 170 knots flaps up, at which point I noticed we were climbing through 500 feet at (*yikes*) 250 knots.

I took what was likely my first breath since brake release, realizing the airfield had been replaced by a lot of open range occupied by... uh... a dilapidated barn... a small group of cattle gathered around a water tank... the emergence of Baffin Bay's northwards pointing finger, and beyond, the coastal waterway, Padre Island, and the Gulf of Mexico.

"When you get tired of sightseeing, how about bending around to the west," Lieutenant Crayton interrupted my reverie.

Now heading into the heart of the King Ranch, the same voice suggested I begin to investigate the Cougar's performance... which I was finding to be crisp and intuitive.

"Remember how to do a barrelroll?" the voice asked.

I thought I did, so without thinking about my sauntering airspeed I began the maneuver. About the time I had hit the first checkpoint (45 degrees nose above the horizon, 45 degrees change in heading, and 90 degrees angle of bank) I realized I had made a tiny mistake... insufficient airspeed to complete the maneuver. *'Oops,'* I viewed the predicament with more than a little concern, wondering *'is this where I get myself into the spin Lieutenant Craton had talked about?'*

Not quite, but I gave away a lot of hard-gained altitude before I had us back to straight and level flight.

"Next time you might want to pick up at least 375 knots before starting."

'Uh-huh, just like the operations guide suggested.' So I did, adding an extra 25 knots to be on the safe side. Then as I wafted over the top of a loop at zero knots and zero g, I began to get a feel for the difference between high-altitude, swept wing jet performance and what I'd experienced in the Mentor and Trojan.

"Ok, let's climb to 40 thou and see if this bird'll go supersonic," which I did and it did... *barely...* achieving a stately 1.03 mach with the nose pointed nearly 60 degrees down.

"A little wakeup call for the folks in Falfurrias," boss Clayton opined.

Meager as the trade of 20 thousand feet of altitude for a little dip into the supersonic regime had been, it was one of those insightful moments that separated me from my past life.

At this point we are halfway through the FAM-1 flight. Next week we'll get on to the rest.

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