Ode to E Pluribus Unum for Sunday August 18 2024

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When Deadly Storms Arrive

Keith Ladzinski for National Geographic

On this particular morning, photographer Keith Ladzinski was in Wichita, Kansas, midway through a project to photograph the dramatic and destructive weather that barrels across the middle of the United States every spring.

Nick Moir, the expedition leader and weather sage, sat stooped on the edge of the bed, poring over a litany of apps and online radars in search of a good storm cell for us to pursue. "Nick is fluent in the subtle hieroglyphics of location forecasting, which are incomprehensible to almost everyone else," Ladzinski explained.

Driving under cloudless blue skies for hundreds of miles they left that serene day behind entering a dark scene of clouds, distant lightning, and intermittent rain. As they neared the heart of the cell, they found ourselves contending with high winds, torrential rain, and merciless hail. Krystle, at the wheel, accelerated to get in front of the storm, but it was moving too.

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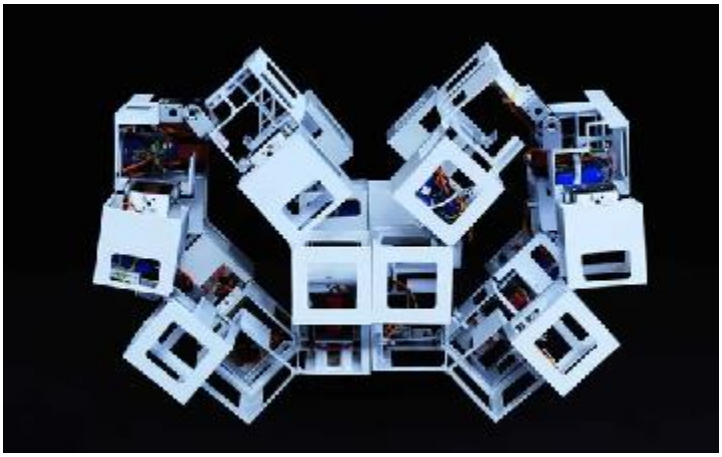
Origami-Inspired 'Transformer' Robots Could Build Space Habitats

These configurable bots could launch flat and then be assembled in space.



Engineers from North Carolina State University have created a configurable cubed structure called a transformer bot.
(Image credit: Photo courtesy of Jie Yin, NC State University)

Engineers from North Carolina State University (NC State) have created a plastic cubed structure that can transform into more than 1,000 configurations using only three active motors. In theory, their design — which was largely inspired by the paper-folding art of origami — offers a more efficient way to send assembly structures into space, where the robot could then "transform" to serve various purposes, including carrying a load, according to an NC State statement.

https://bit.ly/3MoADpr

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The Most Detailed Map of Brain Connections Ever Made

In a world first, Harvard biologists worked with Google to diagram a cubic millimeter of human cerebral cortex at the subcellular level, paving the way for the next generation of brain science.

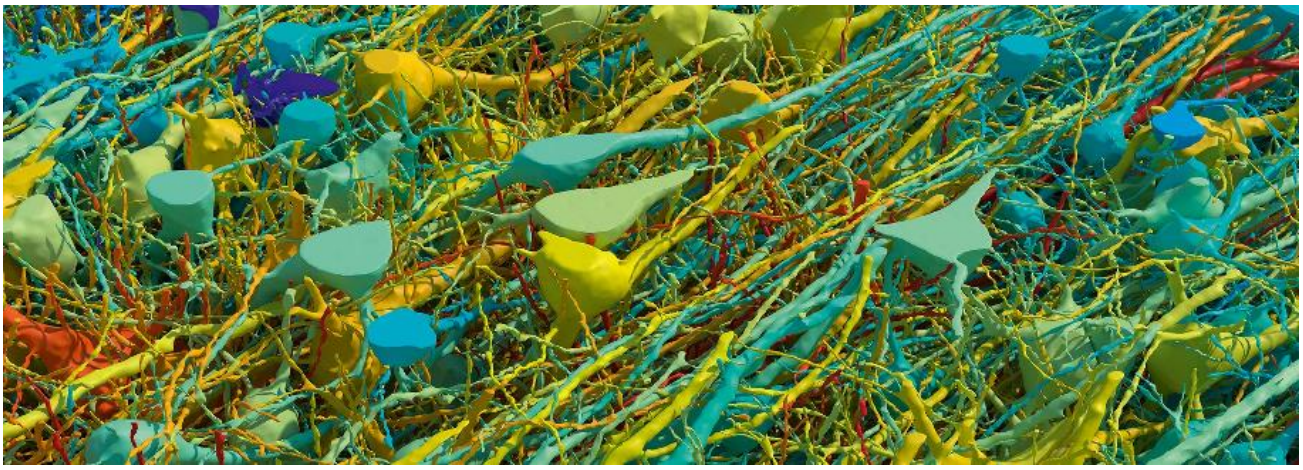

Image Google Research and Lichtman Lab (Harvard University) rendered by Daniel Berger (Harvard)

This image could be hung in a gallery, but it started life as a tiny chunk of a woman's brain. In 2014, a woman undergoing surgery for epilepsy had a tiny chunk of her cerebral cortex removed. This cubic millimeter of tissue has allowed Harvard and Google researchers to produce the most detailed wiring diagram of the human brain that the world has ever seen.

The brain map has been made open access, which means that these images have opened up boundless possibilities for progress in neuroscience, particularly as this is the first publicly available wiring diagram of the human brain at subcellular level. Both Berger and Lichtman emphasized that they did not go into the project with concrete aims of discovery but rather wanted to create the "possibility to observe," and from this, they hope (and expect) that "further insights will come" from both the Lichtman lab and external researchers.

https://bit.ly/4fIM4ph

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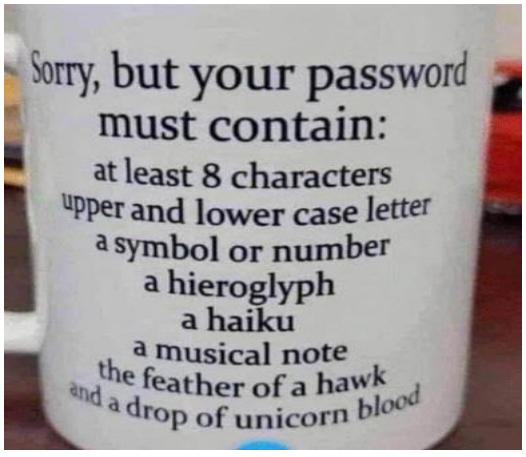

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Frank Sinatra Fly Me to the Moon Sung by Terry Fator

youtube

https://youtu.be/jlcY2cXA9nA

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Massive Biomolecular Shifts Occur in Our 40s and 60s

We undergo two periods of rapid change, averaging around age 44 and age 60, according to a Stanford Medicine study.
Ratana21/Shutterstock.com

Time marches on predictably, but biological aging is anything but constant, according to a new Stanford Medicine study.

If it's ever felt like everything in your body is breaking down at once, that might not be your imagination. A new Stanford Medicine study shows that many of our molecules and microorganisms dramatically rise or fall in number during our 40s and 60s.

https://bit.ly/4fJVP6C

You see? It wasn't just my imagination.

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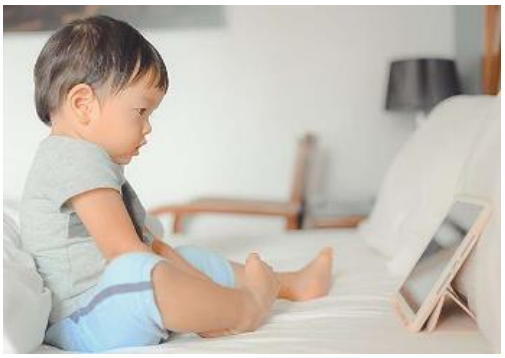
More Toddler Screen Time Brings More Tantrums, Study Finds



Healthday

Using tablets as "e-babysitters" for toddlers could lead to more tantrums, which in turn can have harried parents trying to calm them by handing them a tablet, new research shows.

This type of "vicious cycle" played out during the early years of many of the Canadian youngsters tracked in the study.

The bottom line, according to the researchers, "Tablet use in early childhood can disrupt the ability to manage anger and frustration and lead to increased outbursts in young children."

https://bit.ly/3yrmxjL

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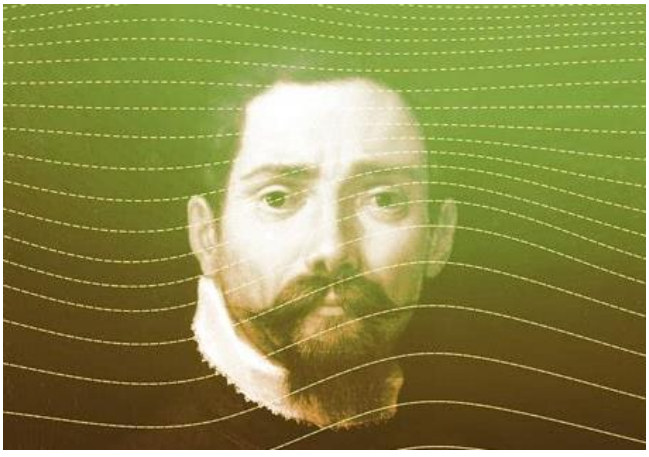
Chords & Riffs

Giovanni Gabrieli (1554-1612)



harmonia mundi

An Italian Renaissance composer, organist, and teacher, celebrated for his sacred music, including massive choral and instrumental motets for the liturgy, Giovanni's

principal publications were the two immense Sacrae symphoniae of 1597 and 1615 (printed posthumously), both of which contained purely instrumental music for church use or massive choral and instrumental motets for the liturgy.

In the late 1550s Gabrieli left Italy for an extended period of foreign travel. He served in the Bavarian court chapel at Munich under another great Franco-Fleming, Orlando di Lasso, then visited the court of Graz in Austria, and finally was patronized by the noble Fugger family in Augsburg. In 1564 he returned to Venice to become second organist at St. Mark's, where he remained until 1584, when he succeeded the virtuoso performer Claudio Merulo as first organist—a position he held until his death in 1586.

His motets and masses exploit the tonal variety possible when instruments are added to a choir.

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Canzon in Echo Duodecimi https://youtu.be/34hc9eXVREU
Sonata XVIII à 14 https://youtu.be/-wHYhGf89s0
Magnificat a 14 https://youtu.be/45udZI2KKao
Jubilate Deo https://youtu.be/Zcyk4Vs0bME

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Horses Can Plan and Strategize, New Study Shows

Getty images

A new study has suggested horses are more intelligent than previously thought, having been observed to quickly adapt to a treat-based game with changing rules.

Researchers from Nottingham Trent University (NTU) said they were surprised by how the horses quickly grasped the game, busting previous theories that equine brains respond only to immediate stimuli and are not complex enough to strategise.

The new findings could lead to more humane horse training regimes and improvements to their welfare, researchers said.

https://bit.ly/3WYCyXI]

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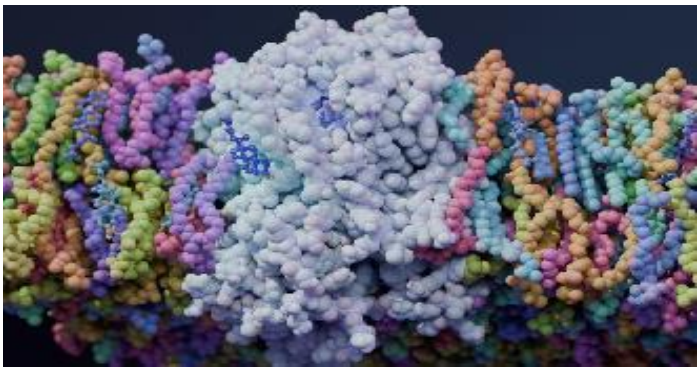
The Microscopic World of Nanophotography – In Pictures



A render of data from real molecular dynamics simulations. You've got a cholesterol molecule (light blue, centre) binding to the human glycine transporter 2 (grey) inside a messy mixture of flexible phospholipids (bright colours), and more rigid sterols (blue).
Photograph: Ada Quinn

Each year during National Science Week, the Australian Institute for Bioengineering and Nanotechnology runs a contest showcasing creativity in research for images using microscopes and other scientific tools that cannot be seen with the human eye. With the winner set to be revealed at the end of August, here are the finalists.

https://bit.ly/3AgKw5u

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What Are Neutrinos, and How Can We Measure Their Mass?

Naeblys/Getty Images

The weirdest subatomic particles require enormous equipment to study

Sometimes known as "ghost particles," these mysterious little packets of energy have no electrical charge, have almost no mass and come in at least three distinct varieties. New research is bringing science closer than ever to understanding the nature of neutrinos, from their size to their fundamental properties.

https://bit.ly/4cj6y5V

Problem number One: We don't yet know what we don't know.

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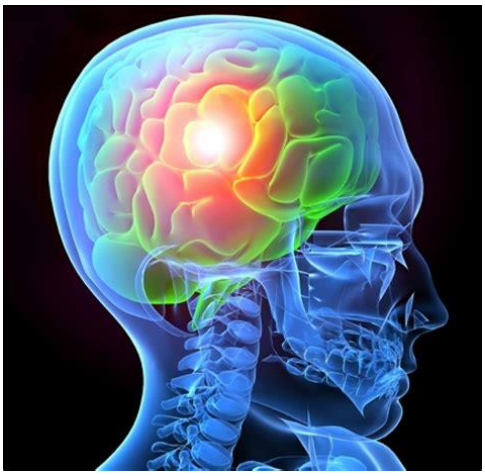
Western Neuroscientists Reveal Thoughts of Brain-Injured Patients



brainline.org

In a new paper published in the prestigious journal Lancet Neurology, Western University neuroscientist Adrian Owen and his colleagues at Western, Lawson Health Research Institute and Harvard University describe new developments in the field of neuroimaging that can reveal the thoughts, actions and intentions of brain-injured individuals based solely on the pattern of activity observed in their brain. Most importantly, this breakthrough can be used to predict survival rates of intensive care unit (ICU) patients.

https://bit.ly/4bUp17H

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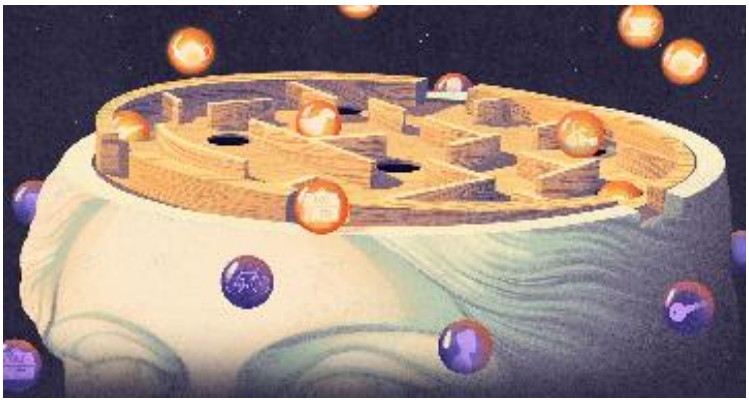
How the Brain Decides What to Remember

Electric ripples in the resting brain tag memories for storage and add credence to advice about the importance of rest.



Quanta Magazine

György Buzsáki first started tinkering with waves when he was in high school. In his childhood home in Hungary, he built a radio receiver, tuned it to various electromagnetic frequencies, and used a radio transmitter to chat with strangers from the Faroe Islands to Jordan.

He remembers some of these conversations from his "ham radio" days better than others, just as you remember only some experiences from your past. Now, as a professor of neuroscience at New York University, Buzsáki has moved on from radio waves to brain waves to ask: How does the brain decide what to remember? New studies from his lab and others have suggested that the brain tags experiences worth remembering by repeatedly sending out sudden and powerful high-frequency brain waves.

https://bit.ly/3WnLvtv

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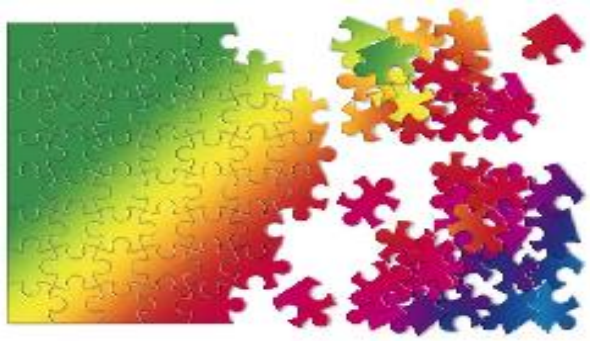
Accommodating Neurodiversity in the Classroom and Beyond



When it comes to preparing our education system for neurodiverse students, the level of involvement can vary and might not always produce the intended results.

Image credit: Getty Images)

Our neurodiverse student population deserves to have proper representation in order to accurately prepare them for a

successful future. Recently, we have become more sensitive to children's needs and challenges, but we can always do more to help everyone navigate neurodiversity.

Offering choice is one of the best ways to have students feel comfortable and welcomed in a classroom. It might seem like a natural thing to do, but in some cases there might need to be a heightened sense of preparedness to make sure teachers are ready for their students.

https://www.techlearning.com/news/accommodating-neurodiversity-in-the-classroom-and-beyond

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I asked my daughter who has worked in this arena for many years for her thoughts on the article. Her response was highly illuminating, to wit:

Last quarter, the teacher I work with set up the first quarter of the coming school year by telling the AI the desired topic and providing all of the leveled worksheets and material the students would need.

The teacher to then able to purchase the materials in a bundle and for a fair price. The best part is that those suggested materials covered the entire curriculum. Art projects that fit the topic; vocabulary words necessary to follow topic; critical thinking lessons…incredible!

I think AI will do a lot to help the classroom neurodiversity situation. It will remove teachers' egos, staleness, and lack of understanding from the equation and provide strategies and tools to support teachers and the children.

While I do think all teachers should be trained to understand differences and know how to academically meet their needs, not all are capable of learning and understanding how to successfully work with the emotional side of the more challenging students. That is something AI cannot teach. It is a matter of instincts, the ability to read people and knowing the next five things that might happen because one unnoticed tell-tale sign can turn a classroom upside down.

I believe core classes should never allow disruptive students into GenEd rooms and I feel for teachers who are now having their classrooms destroyed by "inclusiveness" and because they don't recognize the invisible signs.

Thanks for sharing. I will forward the article to my workmates.

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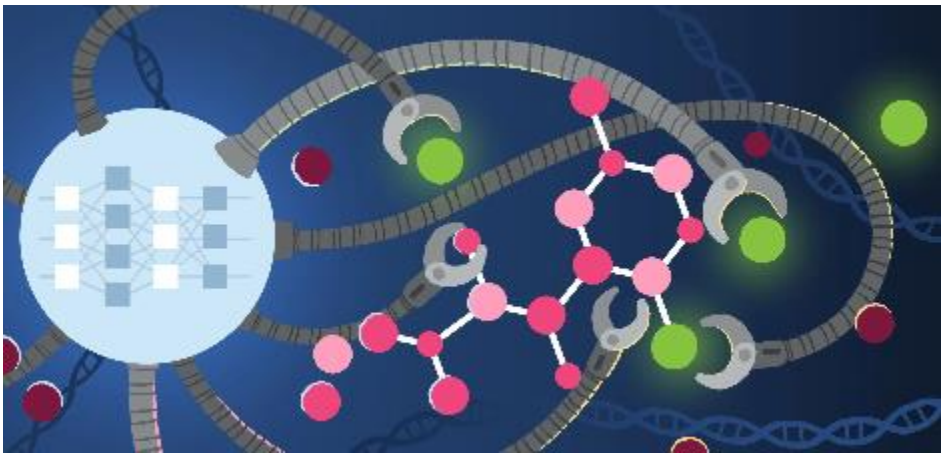
New AI Tools Predict How Life's Building Blocks Assemble



Adam Nickel for Quanta Magazine

Proteins are the molecular machines that sustain every cell and organism, and knowing what they look like will be critical to untangling how they function normally and malfunction in disease. Now researchers have taken a huge stride toward that goal with the development of new machine learning algorithms that can predict the folded shapes of not only proteins but other biomolecules with unprecedented accuracy.

In a paper published n Nature, Google DeepMind and its spinoff company Isomorphic Labs announced the latest iteration of their AlphaFold program, AlphaFold3, which can predict the structures of proteins, DNA, RNA, ligands and other biomolecules, either alone or bound together in different embraces.

https://bit.ly/3Wdypic

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106 Years Ago, 11 Biplanes of the Italian Air Force Flew Over the Alps to Drop Leaflets Over Vienna

Gabriele D'Annunzio, in the front seat, and pilot Captain Natale Palli, in the S.V.A. two-seater

biplane, ready to take off for the flight over Vienna on 9 August 1918.
(Image credit: Army War College, Historical Section. US D.o.D.)

At 5:30 in the morning of Aug. 9, 1918, eleven Ansaldo S.V.A. biplanes took off from a field at Due Carrare, near Padua in the Italian North East, for a daunting 1200 km round trip that brought them over the Alps and to the capital of the Austro-Hungarian empire, Wien (known as Vienna in Italian), to drop over 400,000 propaganda leaflets, in one of the most famous propaganda missions in history.

Together with the ten single-seater S.V.A.5 planes (so named after the two designers, Savoia and Verduzio, and the maker, Ansaldo), there was a single S.V.A.10 twin-seater biplane carrying the famous poet and soldier Gabriele D'Annunzio.

https://theaviationist.com/2024/08/09/flight-over-vienna/

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Vivian Maier, the Nanny Street Photographer

A self-portrait taken in New York by Vivian Maier in 1954
Estate of Vivian Maier / Maloof Collection / Howard Greenberg Gallery, NY

The self-taught artist is getting her first museum exhibition in New York City, where she nurtured her nascent interest in photography

Vivian Maier took more than 150,000 photographs as she scoured the streets of New York and Chicago. She rarely looked at them; often, she didn't even develop the negatives. Without any formal training, she created a sprawling body of work that demonstrated a wholly original way of looking at the world. Today, she is considered one of the best street photographers of the 20th century.

https://bit.ly/4618Xj8

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Martin Mars: A Majestic Farewell

AVweb

The Canadian Forces Snowbirds happened to be at the Abbotsford International Airshow, about 15 minutes away from the Mars's intended route, on Sunday and put together a plan to escort the giant flying boat to its final destination of Pat Bay in Victoria, B.C. The plane will be the centerpiece of an aerial firefighting exhibit at the B.C. Aviation Museum.

https://youtu.be/js8uQOMQiaI?t=953

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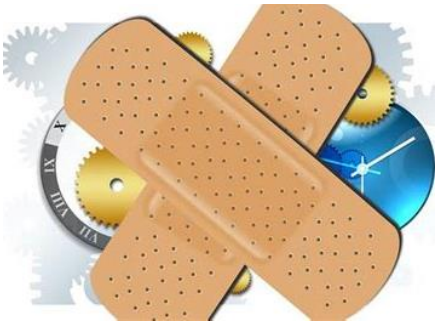
Cheap, High-Tech 'Electric Bandage' Speeds Wound Healing



indianexpress.com

The bandages could be a game-changer in treating slow-healing wounds caused by diabetes and other chronic illnesses, researchers say. Those sorts of wounds significantly increase a person's risk of amputation and death.

In animal testing, wounds treated with electric bandages healed 30% faster than wounds treated with conventional bandages, researchers reported Aug. 7 in the journal Science Advances.

https://bit.ly/3AnmLJ5

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COP: Anything in the car I should know about?
ME: nah just stuff you shouldn't know about
COP: cool, have a good day

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Footage of Blue Whale Nursing Her Calf on 5000 Km Journey

Screenshot of the recent video of two blue whales filmed off the coast of Timor-Leste, north of Australia.
Image credit: ©Angel Lai/Insiders Divers

Underwater footage of a mother pygmy blue whale nursing its calf has been caught on camera for the first time, providing a rare glimpse into the private life of one of Earth's largest animals.

The video was recently filmed off the coast of Timor-Leste in Southeast Asia by a research and citizen science program led by the Australian National University (ANU) that has been studying the blue whales in these waters since 2006.

https://youtu.be/PsJreEEVLHU

Blue whales can grow up to 33 meters (108 feet) in length, making them the largest animal to ever exist on planet Earth. Despite what you might have heard, it's also the heaviest animal to ever live, weighing 270 metric tons. Pygmy blue whales however reach around 24 meters (79 feet) and weigh around 90 tons, which is still not to be sniffed at.

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First Implantation of Titanium Heart Harnessing Maglev Technology

A spinning heart could save lives.

This device makes blood rush around the body using the same technology that makes maglev trains rush down their tracks.
Image Credit: BiVACOR, Inc.

A titanium heart was implanted in a patient. BiVACOR's titanium heart is a new type of TAH. Australian by design, it was approved to be tested in five human patients in an Early Feasibility Study in the USA. The first of those patients was implanted on July 9 and lived with the device for 8 days, until it was replaced with a donor heart.

The implantation of a total artificial heart (TAH) is a proposed solution to help people with heart failure who need a heart transplant. Heart failure affected 6.7 million people

in the US alone between 2017 and 2020, but in 2021 only 3,817 heart transplantations were performed. Currently, TAH implantation is seen as a bridge to heart transplant in severe cases of heart failure.

https://bit.ly/3yOa1dY

IOC awards 2034 Winter Games to Salt Lake City

Park City's Olympic Legacy
visitparkcity.com

Salt Lake City was formally awarded the 2034 Winter Olympics following a Wednesday vote by the International Olympic Committee in Paris, which gives Utah its second Games after hosting in 2002.

Salt Lake City was the lone contender the Olympic committee was considering for 2034. Climate change and high operational costs have reduced the number of cities willing and able to welcome the Winter Games. Utah has capitalized on low interest elsewhere, pitching itself to Olympic officials as an enthusiastic repeat host if the committee goes forward with a proposed permanent rotation of Winter Olympic cities.

https://bit.ly/3yljYj0

Sound like an underwhelming victory to me.

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Hydrogen-Powered VTOL Aircraft Makes Record 523-Mile Journey — And Lands with 10% of Its Fuel Left in the Tank

Joby Aviation's hydrogen-electric air taxi recently flew three times further than the company's battery-electric air taxi.
(Image credit: Joby Aviation)

An air taxi has completed the first forward flight of a hydrogen-fueled aircraft capable of vertical takeoff and landing — and it broke a distance record in the process.

The flight, which was three times further than the distance records set by electric vehicles of the same developer, "demonstrates the potential for hydrogen to unlock emissions-free, regional journeys," according to a statement from Joby Aviation, the company behind the air taxi prototype. The air taxi had 10% of its hydrogen fuel load remaining after the flight, meaning it could fly even longer in the future.

https://bit.ly/4fyfnKS

It turns out that the oil companies are finding pools of hydrogen as they explore for oil, discoveries that may hasten the adoption of hydrogen fueled autos, heavy equipment, aircraft, and ocean going vessels.

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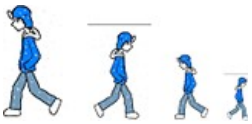
My Walking Thoughts



For Sunday August 18 2024

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My Introduction to 'The Overlay'

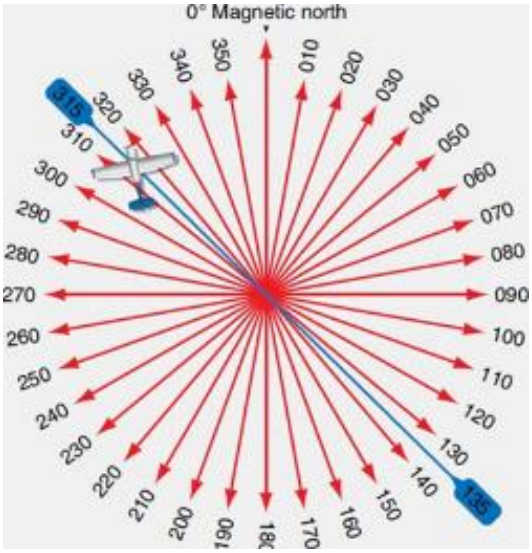
When I arrived for my first Radio Instrument hop, Lt. Searcy motioned me to follow him to one of the several briefing rooms that lined VT-3's hangar walls. It was here students and instructors went over the details of an upcoming flights: what they were to accomplish, how they were supposed to proceed, and what the measures for success and failure were. Later in the syllabus students were required to manage the discussion, but here today as a polliwog my input was limited to listening and giving an occasional grunt to prove I was still alive.

"You've been preparing flight plans over in ground school, right?" Lt. Searcy began the preflight briefing session destined to take the better part of an hour.

"Yes sir."

"Well, we'll do this one together so grab a low altitude chart and a flight plan form and let's get started."

If details of the brief are a bore, skip down a couple of paragraphs, but if you're the tiniest bit interested, our route of flight called for a turn to the north after takeoff to intercept and track inbound on the 263 degree radial of the Crestview VOR[1]. From there we would fly direct to the Montgomery, Alabama VOR before reversing course to fly past Crestview and on to Santa Rosa Field where we would perform a simulated approach. Then with the fun and games were over, I could pop the bag and relax while Lt. Searcy took us home to Whiting.



[1] *VOR is the principal navigation aid defining the routes aircraft use to go from one place to another. What make the VOR special is that rather than being a simple point source on which an aircraft could home, it radiates 360 discrete 'radials' allowing a pilot to find and hold a precise track over the ground*

Armed with this information I filled in the flight log with such details as VOR frequencies, altitudes, headings, distances, along with time and fuel required for each of the legs. That done, Lt. Searcy went over various contingencies that might force us to amend the plan, after which he quizzed me on a variety of emergency procedures, a standard part of each briefing session.

As Lt. Searcy explained, we would not actually file a flight plan and place ourselves into the air traffic control system, instead he would act that part under the callsign as "Searcy Departure" or "Searcy Center", so I would be communicating with him on the intercom rather than with the real control agencies.

Before leaving the hangar, I checked the weather for our route of flight, read the Notices to Airmen (NOTAMs) to see if there were any facilities or flight systems anomalies—e.g. runways closed, navaids down for maintenance, etc.—to affect our flight, and finally a precautionary pit stop on the way out, hoping as Lt. Searcy had opined, this would be a piece of cake.

***

Now ensconced in my canvas overcast, I called on the intercom, "Searcy Departure, Two Whiskey 421 standing by for flight clearance IFR to Santa Rosa Outlying field."

"Whisky 421 is cleared as filed, right turn after airborne to a heading of zero-one-zero. Remain below one-thousand two hundred feet until clear of the field boundary then climb to seven-thousand five hundred feet. Contact Searcy Departure Control on 127.3."

I checked the instructions against my flight plan, read back the clearance word-for-word, and settled down to sync myself with the gauges, controls, switches, and readings that would soon be under my control.

It was here for the first time in my very short flying career that a new vision of what was about to unfold intruded on what until then had been the simple aspect of using the throttle, rudders, control stick and a few other devices to drill my way through the air. Instead, what I suddenly saw was a new dimension totally separate from what I had come to believe to be the essence of flight.

What I was coming aware of was a…Uhh, what was it?…How do I describe it?…as, well maybe an *overlay* that transported me to an entirely different plain in which situational awareness was the main aspect rather than merely motoring around. Rather than obscuring the other elements of flight, the overlay cast them in a richer image. A whole new world was opening up around me and unprepared as I was, I allowed it to envelope me.

***

The flight? Well RI#1 turned out to be that promised *piece of cake*.

- We flew the route as planned
- The Route put us at each waypoint just a planned
- The fuel burn was as calculated
- Lt. Searcy hadn't even bothered to pull the circuit breaker for the gyro horizon.

During the debrief, Lt. Searcy made several comments on ways to improve my performance—e.g. *You need to anticipate that if you've made a correction in one direction, pretty soon you'll have to counter it slightly*—after which he ticked off a full list of Above Average grades for the flight.

***

Back in my room that night I replayed the entire flight sequence from start to finish trying to see what had happened to me in that short interlude before takeoff…the feeling that I was embarked in a different and far more exacting dimension…the feeling I was into an entirely different medium…something less like air or even water, something more viscous…something with a certain but for the time being undefined structure or purpose.

Answers would have to wait until later in the program but that night and many more to follow, I slept fitfully, knowing I was missing something important, but clueless what it was.

***

Next week, join me for a night instrument out-and-in training flight to New Orleans, clicking off 5 miles per minute in high blower.