Ode to E Pluribus Unum for Sunday September 12 2021…*A long one*

A Blue Moon in Exaggerated Colors

Image Credit & Copyright: Robert Fedez

The Moon is normally seen in subtle shades of grey or gold. But small, measurable color differences have been greatly exaggerated to make this telescopic, multicolored, moonscape captured during the Moon's full phase. The different colors are recognized to correspond to real differences in the chemical makeup of the lunar surface.

Blue hues reveal titanium rich areas while orange and purple colors show regions relatively poor in titanium and iron. The familiar Sea of Tranquility, or Mare Tranquillitatis, is the blue area toward the upper right. White lines radiate across the orange-hued southern lunar highlands from 85-kilometer wide ray-crater Tycho at bottom right.

The full moon that occurred earlier this month could be counted as a seasonal blue moon because it was, unusually, the third of four full moons to occur during northern summer (and hence southern winter). The featured 272-image composite demonstrates that the full Moon is always blue, but usually not blue enough in hue to ooh.

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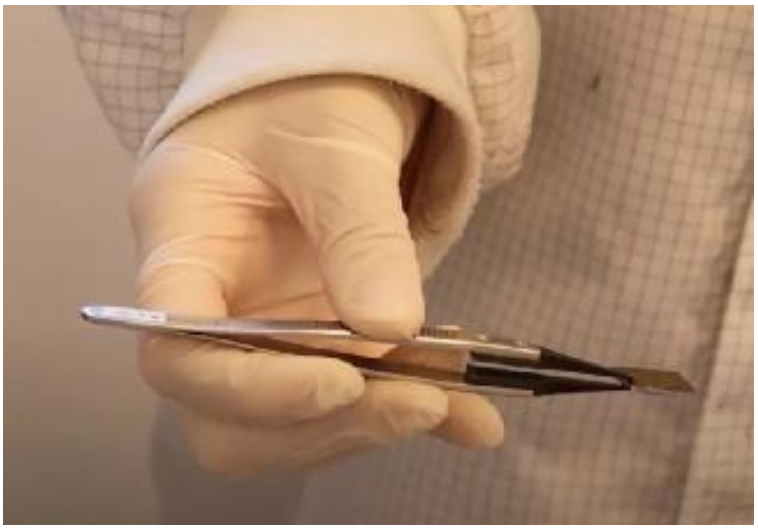
World's Thinnest Electronic Device is 2 Atoms Thick

By Ben Turner – Live Science Staff WriterThe device uses quantum tunneling to encode data.



The tiny device has the potential to shrink computers beyond existing physical limitations. *(Image credit: Tel Aviv University)*

Scientists have developed the world's thinnest piece of technology, a tiny device only two atoms thick that can be used to store electronic information.

The device consists of two layers, one made up of boron and the other of nitrogen, arranged in a repeating hexagonal structure. By taking advantage of a strange quantum mechanical effect called quantum tunneling, electrons from the boron and nitrogen atoms are able to zip across the gap between the two layers, changing the state of the device and allowing it to encode digital information.

This is similar to the way current state-of-the-art computing devices work. The hearts of computers contain many tiny crystals, each consisting of roughly a million atoms stacked in multiple, 100-atom layers. By shuttling electrons across gaps between the layers, computers are able to switch between the two binary states (0 and 1) that form the basis of the basic unit of digital information, the bit.

"In its natural three-dimensional state, this material (the crystal) is made up of a large number of layers placed on top of each other, with each layer rotated 180 degrees relative to its neighbors," Moshe Ben Shalom, a physicist at Tel Aviv University and a co-author of the study that developed the new technology, said in a statement. "In the lab, we were able to artificially stack the layers in a parallel configuration with no rotation, which hypothetically places atoms of the same kind in perfect overlap despite the strong repulsive force between them (resulting from their identical charges)."

Quantum tunneling enables particles — in this case electrons — to pass through seemingly impassable barriers. This is because in quantum physics, particles exist as both waves and particles simultaneously; those waves are the projected probabilities of the particle existing in a given space. Much like a wave smashing against a groin at sea will result in a smaller wave propagating to the other side, particles that exist as waves

also have some probability of existing at the other side of a barrier.It is this ability that allows electrons to leap between the device's boron and nitrogen layers.

In reality, the team said that the two layers do not perfectly align, instead preferring to slide slightly off center from one another so that the opposite charges of each layer overlap. This causes the free electrons (negatively charged) to move toward one layer and the positively charged atomic nuclei to the other, creating a small amount of electronic polarization — one side being positively charged and the other negatively charged — inside the device. By adjusting how one layer relates to the other, the polarization can be reversed — changing the device from one binary state to the other, and with it the stored information.

By reducing the size of the technology down to just two layers of atoms, the researchers could speed up the electron movement. Quicker electron movement could make future devices faster, less dense and more energy efficient.

Throughout the rise of computing in the late 20th and early 21st centuries, the growth of computer processing power was described by Moore's law, which says that the number of transistors that can fit on a chip doubles every two years, with an accompanying increase in performance. But as chip makers hit fundamental physical limits on how small transistors can get, this trend is slowing. The researchers hope that electronic chips based upon the new device's design could change this slowdown.

"We hope that miniaturization and flipping (the polarization of the device) through sliding will improve today's electronic devices, and moreover, allow other original ways of controlling information in future devices," lead author Maayan Vizner Stern, a doctoral candidate at Tel Aviv University, said in the statement.

The researchers published their findings June 25 in the journal Science.

Originally published on Live Science

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GAME CHANGER

Jayne Torvill and Christopher Dean's Legendary Bolero Performance

https://www.youtube.com/watch?v=KNCSij0hUp8

Torvill and Dean will forever be remembered for the revolution they brought to the (sorry to traditionalists) rather boring Ice Dancing performances served up at competitions. The team's presentation at the Sarajevo 1984 Winter Olympics elicited a negative response from some of the judges and competitors, but not from those in the stands and at home watching on TV who found their interpretation of Maurice Ravel's Bolero absolutely stunning. Relive this beautiful moment.

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A Short Lesson on Maps

You may have seen this before, but it's worth a second look

https://www.youtube.com/watch?v=OxibNlbn-f4

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2022 Rivian R1T Pick Up Motor Trend Review

The most remarkable pickup we've ever driven

https://www.motortrend.com/reviews/2022-rivian-r1t-electric-pickup-truck-first-drive-review/

The 2022 Rivian R1T is the first mass-produced electric truck to hit the U.S. market, but that's hardly the most interesting thing about it. Its electric powertrain notwithstanding, the R1T is unlike any pickup we've ever driven—part truck, part sport sedan, and 100 percent amazing. It's been speculated that pickup buyers are too conservative to embrace electrification, but after our first drive in a pre-production Rivian R1T, both on- road and off-, we think this is the electric truck that will turn them into believers.

There's so much we want to tell you about the Rivian R1T that it's difficult to pick a place to start, so let's begin with the basic layout.

Sizewise, the R1T is a tweener, slotting somewhere between a midsize pickup like the Chevy Colorado and a traditional half-tonner like the Ford F-150. The Rivian R1T's shape and compact bed mimic those of "lifestyle" trucks like the Honda Ridgeline and Hyundai Santa Cruz, but it'll tow 11,000 pounds according to Rivian and rock crawl like a Jeep Gladiator according to us. And it jets around corners like no pickup truck ever has.

Rivian's killer apps are its powertrain and suspension setup. The R1T features a four- motor, four-wheel-drive system with a height-adjustable air suspension and interconnected hydraulics for damping and roll control. Like many EVs, it is very quick: The two motors at each axle deliver 415 horsepower and 413 lb-ft of torque to the front wheels and 420 horses and 495 lb-ft to the rears, and Rivian claims a 0-60 time of 3.0 seconds. We've yet to turn an R1T over to our test team, but we think that number is eminently possible.

A motor powering each corner also means remarkable agility on- or off-road. With each wheel independently powered, the Rivian R1T offers real-time torque vectoring, delivering power precisely to the corner where it's needed with no delays for clutches to close or viscous couplings to couple. Rivian's electric truck takes full advantage of this by providing a plethora of drive modes and submodes that prove how programmable and adaptable the platform is.

Rivian R1T On-Road: The Beauty Of Torque Vectoring

The standard on-road drive mode is aptly called All-Purpose, and if you never switched the Rivian R1T out of this default setting, you'd still find it to be remarkably swift and sure-footed. The R1T jets away from traffic lights, rides comfortably, and holds a quick, steady line through sweeping curves. If you're worried about stretching the limits of the R1T's 300-mile estimated range (there's a 400-mile battery pack coming, too), the R1T can be switched to two-wheel drive—only the front wheels are powered, making it front-wheel drive—to conserve power in a drive mode aptly dubbed "Conserve."

We were enjoying the Rivian plenty through twists and turns when we engaged in an experiment of sorts: We activated Sport mode, pushed hard enough into a sharp bend to provoke a little understeer, and then nailed the throttle. We felt the R1T's torque-vectoring superpowers at work: The outside-rear motor powered up and brought the R1T's nose around, and we blasted out of the turn like the Millennium Falcon—and this with four occupants in the cab, several hundred pounds of gear in the bed, and all-terrain tires. It's a sensation we've experienced in only a handful of cars, and never in a heavily laden pickup truck.

Rivian R1T Off-Road: Tread Lightly—And Silently

The R1T has a separate set of drive modes for off-roading, and they allow the driver to raise the suspension and ease throttle response in various degrees. This allows the same truck that flies through paved curves to tip-toe over obstacles that might give even a Jeep Wrangler pause. Unlike an internal combustion off-roader, the Rivian has no low-hanging bits like driveshafts and differentials and exhaust pipes, just a smooth, flat undertray from which the wheels and their attachments protrude. Ground clearance starts at a very usable 7.9 inches and extends to 14.4, the latter exceeding the Jeep Gladiator Rubicon's dirt-to-truck number by 3.3 inches. The R1T also has a built-in air compressor, so you can air down the tires for off-roading with the knowledge you can easily pump 'em back up for pavement.

Off-roading in the R1T is a mind-bender. It moves smoothly and silently, its four-motor drivetrain sensing slip and meting out power to each wheel as needed. There is no crawler gear ratio to engage, no differentials to lock, no anti-roll bars to release; just steer and apply appropriate throttle, and the R1T simply drives over whatever you point it at with eerie smoothness and silence—the loudest sound we heard was the crunching of pebbles under its tires. The R1T's superhero regenerative braking system also ensures it slows as well as it goes, so the R1T doesn't run away on steep downgrades.

The Rivian's regenerative brakes probably deserve their own separate story, but we'll give them a paragraph here. The R1T has four user-selectable levels of regeneration. Drivers who aren't familiar or comfortable with one-pedal driving—an EV feature whereby the driver needs only work the accelerator in most situations, as the electric motors slow the vehicle when you lift off—can leave it in Low or Medium and the R1T slows in a manner comparable to engine braking in a gasoline-powered car. We preferred Maximum mode for off-road driving, though, as it allowed us precise speed control without worry of locking the wheels as we might with the friction brakes. Out on the open road, Maximum mode equated to getting on the binders pretty hard, so we

dialed back to High. The R1T's regenerative brake setup is powerful enough to bring the truck to a halt, and we only needed the brake pedal for panic stops.

A Place For Your Stuff

Obviously, we were pretty well blown away with the way the Rivian R1T drives, and we think most pickup buyers will be, as well. But there are other impressive aspects of its personality, and one is storage. The Rivian's powertrain is arranged rather like a skateboard. Keeping a traditional pickup shape left room for a large cargo bay under the power-operated hood. There's also a full-width (transverse!) pass-through behind the rear seats and ahead of the bed, which Rivian calls the Gear Tunnel. Among the things you can fill it with is an optional ($5,000) kitchen that can be outfitted with a full set of Snow Peak utensils and an induction range. And the bed offers a lockable tonneau cover—electrically powered, naturally.

Conversely, interior storage for small odds and ends is a little lacking, but for the most part we liked the R1T's cab, particularly the comfortable front seats and excellent visibility. The rear seat is not particularly comfortable for taller riders, mostly thanks to the upright backrest angle and firm cushion, though legroom isn't an issue.

Possible Flaw: The Rivian R1T's User Interface

If there was one thing about this truck that gave us pause, it's the user interface. Rivian has taken a Tesla-like approach, minimizing the use of physical switchgear in favor of touchscreen menus and multipurpose buttons on the steering wheel. Even the air conditioning vents must be adjusted through the screen, a Tesla Model 3-aping feature that seems nifty at first but quickly reveals itself to be a major pain in the posterior—who wants to swipe through the climate menu just to adjust a vent?

We loved the screens' crisp graphics and smooth animations, but the menu system has a high learning curve. On several occasions we found ourselves unable to adjust the cruise control speed because the steering wheel buttons were still set to adjust the mirrors and steering column. Some of our staffers (primarily the younger ones) had no trouble breezing through the menus, but others found it overwhelming. That said, we drove pre-production trucks whose user interface was still being updated and finalized. Rivian's engineers were eager for our feedback, and we're hopeful the software in production trucks will be more user-friendly.

2022 Rivian R1T: This Changes Everything

Our first drive of the Rivian R1T left us very impressed, not just with the truck but with the prospect of what electrification can do for one of America's most popular vehicle segments. The Rivian R1T feels like a vehicle of the future, but it also feels like one very well grounded in the here and now. It hauls and tackles difficult terrain as well as or better than internal combustion pickups, and its combination of on-pavement handling prowess and off-road finesse is simply unmatched in any other current truck. If the Rivian R1T is the future of the pickup truck—and we certainly think it is—then the future cannot come quickly enough. —Aaron Gold

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Archaeologists Have Found the Lair of an Exiled Anglo-Saxon Hermit King

By Ben Turner – Live Staff Writer

Anchor Church cave could be one of the oldest intact domestic interiors in the UK.

Until recently, archaeologists thought the cave dated to the 18th century. Their estimate was nearly 1000 years off the mark.
(Image credit: Mark Horton /Edmund Simons /Royal Agricultural University)

A British cave dwelling has been identified as the refuge for an exiled Anglo-Saxon king, according to archaeologists.Anchor Church Caves, located by the River Trent in a secluded part of the countryside in central England, was long considered to be an 18th-century "folly" — an extravagant building made solely for ornamentation or as a joke.

But a new study has revealed that the cave house is the real deal. The 1,200-year-old structure was built during the tumultuous life of the Northumbrian king Eardwulf, who was hounded from his throne to live as a hermit, and later became a saint.

Local legend said Eardwulf, or St. Hardulph as he was later known, lived inside the cave dwelling after he was deposed and exiled for mysterious reasons in A.D. 806. A fragment from a 16th-century book states that Eardwulf "has a cell in a cliff a little from the Trent," and the banished king was buried in A.D. 830 at a location just 5 miles (8 kilometers) from the cave

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Edmund Simons, an archaeologist at the Royal Agricultural University in England and the principal investigator of the project, is convinced that Eardwulf lived in the caves under the watchful eyes of his enemies.

"The architectural similarities with Saxon buildings, and the documented association with Hardulph/Eardwulf, make a convincing case that these caves were constructed, or enlarged, to house the exiled king," Simons said in a statement.

Eardwulf lived and ruled during a time of persistent political instability in medieval England. During the seventh, eighth and ninth centuries, seven key kingdoms and over 200 kings intrigued, murdered and warred against each other in a fervent, constant scramble for supremacy.

Eardwulf took the throne in A.D. 796 after the killing of his two immediate predecessors, and ruled Northumbria for only 10 years before he was chased from power (possibly, according to some scholars, by his own son) to spend his remaining years in exile in the rival kingdom of Mercia.

With all of this civil strife, hiding in a cave with the remainder of one’s disciples was far from the most abnormal idea Eardwulf could have come up with, Simons said.

"It was not unusual for deposed or retired royalty to take up a religious life during this period, gaining sanctity and in some cases canonization," he said. "Living in a cave as a hermit would have been one way this could have been achieved."

The cave's narrow openings were widened to allow for 18th century parties.

The researchers reconstructed the original plan of the caves, which includes three rooms and an easterly facing chapel, using detailed measurements, a drone survey, and a careful study of the architectural features — which closely resemble other Saxon architecture. Despite having been overlooked by historians until recently, cave dwellings may be "the only intact domestic buildings to have survived from the Saxon period," Simons said. The team has identified over 20 other cave houses in west-central England that could date back as far as the fifth century.

The Anchor Church Caves were later modified in the 18th century, according to the team, when it was written that the English aristocrat Sir Robert Burdett "had it fitted up so that he and his friends could dine within its cool and romantic cells," according to the researchers. Burdett added brickwork and window frames to the caves, as well as widening the openings so that well-dressed women could enter, the statement said.

"It is extraordinary that domestic buildings over 1,200 years old survive in plain sight, unrecognized by historians, antiquarians and archaeologists" Mark Horton, a professor of archaeology at the Royal Agricultural University, who is leading excavations of Viking and Anglo-Saxon remains at Repton, close to the caves, said in the statement. "We are confident that other examples are still to be discovered to give a unique perspective on Anglo-Saxon England."

The researchers published their findings in the journal Proceedings of the University of Bristol Speleological Society.

Originally published on Live Science.

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It’d be Worse if You’d Married the Jerk

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My Life As A One-Man Band: Tommy Emmanuel

https://www.youtube.com/watch?v=ENJuNCkPfx0

Tommy Emmanuel created a life for himself as a one-man band and has become one of Australia's most respected musicians. With light vim and pure talent, he demonstrates his unique playing style, which is notably a development of the Travis picking technique and blending of rhythm and melody.

In his career, he's played on recordings for Air Supply and Men at Work and in his twenties he joined one of Australia's biggest rock acts, Dragon. Now, as a two-time Grammy nominee with a career spanning five decades, he has, for several years, performed over 300 concerts annually. He's worked with Martin Taylor on a jazz-inspired duet album The Colonel and the Governor. His most recent original material is Little By Little (2011).

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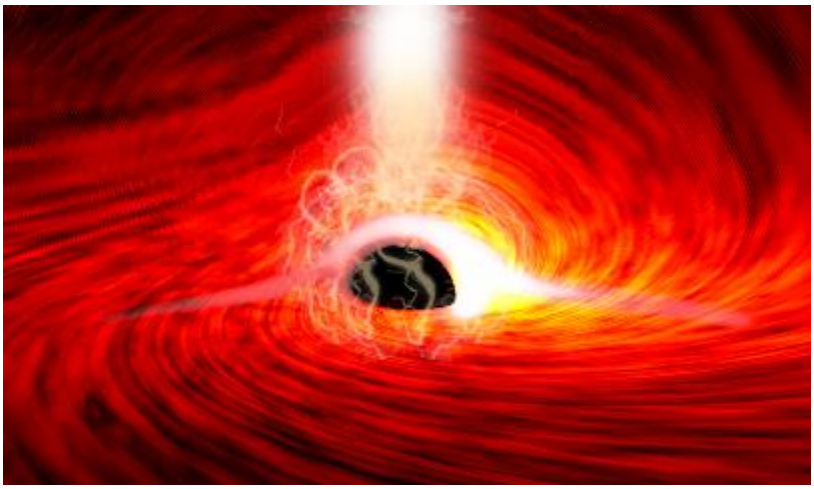
First Detection of Light from Behind a Black Hole

Fulfilling a prediction of Einstein's theory of General Relativity, researchers report the first-ever recordings of X-ray emissions from the far side of a black hole.

By Taylor Kubota

Watching X-rays flung out into the universe by the supermassive black hole at the center of a galaxy 800 million light-years away, Stanford University astrophysicist Dan Wilkins noticed an intriguing pattern. He observed a series of bright flares of X-rays – exciting, but not unprecedented – and then, the telescopes recorded something unexpected: additional flashes of X-rays that were smaller, later and of different "colors" than the bright flares.



Researchers observed bright flares of X-ray emissions, produced as gas falls into a supermassive black hole. The flares echoed off of the gas falling into the black hole, and as the flares were subsiding, short flashes of X-rays were seen – corresponding to the reflection of the flares from the far side of the disk, bent around the black hole by its strong gravitational field.
(Image credit: Dan Wilkins)

According to theory, these luminous echoes were consistent with X-rays reflected from behind the black hole – but even a basic understanding of black holes tells us that is a strange place for light to come from.

"Any light that goes into that black hole doesn't come out, so we shouldn't be able to see anything that's behind the black hole," said Wilkins, who is a research scientist at the Kavli Institute for Particle Astrophysics and Cosmology at Stanford and SLAC National Accelerator Laboratory. It is another strange characteristic of the black hole, however, that makes this observation possible. "The reason we can see that is because that black hole is warping space, bending light and twisting magnetic fields around itself," Wilkins explained.

The strange discovery, detailed in a paper published July 28 in Nature, is the first direct observation of light from behind a black hole – a scenario that was predicted by Einstein's theory of general relativity but never confirmed, until now.

"Fifty years ago, when astrophysicists starting speculating about how the magnetic field might behave close to a black hole, they had no idea that one day we might have the techniques to observe this directly and see Einstein's general theory of relativity in action," said Roger Blandford, a co-author of the paper who is the Luke Blossom Professor in the School of Humanities and Sciences, Stanford professor of physics and SLAC professor of particle physics and astrophysics.

How to see a black hole

The original motivation behind this research was to learn more about a mysterious feature of certain black holes, called a corona. Material falling into a supermassive black hole powers the brightest continuous sources of light in the universe, and as it does so, forms a corona around the black hole. This light – which is X-ray light – can be analyzed to map and characterize a black hole.

The leading theory for what a corona is starts with gas sliding into the black hole where it superheats to millions of degrees. At that temperature, electrons separate from atoms, creating a magnetized plasma. Caught up in the powerful spin of the black hole, the magnetic field arcs so high above the black hole, and twirls about itself so much, that it eventually breaks altogether – a situation so reminiscent of what happens around our own Sun that it borrowed the name "corona."

"This magnetic field getting tied up and then snapping close to the black hole heats everything around it and produces these high energy electrons that then go on to produce the X-rays," said Wilkins.

As Wilkins took a closer look to investigate the origin of the flares, he saw a series of smaller flashes. These, the researchers determined, are the same X-ray flares but reflected from the back of the disk – a first glimpse at the far side of a black hole.

"I've been building theoretical predictions of how these echoes appear to us for a few years," said Wilkins. "I'd already seen them in the theory I've been developing, so once I saw them in the telescope observations, I could figure out the connection."

Future observations

The mission to characterize and understand coronas continues and will require more observation. Part of that future will be the European Space Agency's X-ray observatory, Athena (Advanced Telescope for High-ENergy Astrophysics). As a member of the lab of Steve Allen, professor of physics at Stanford and of particle physics and astrophysics at SLAC, Wilkins is helping to develop part of the Wide Field Imager detector for Athena.

"It's got a much bigger mirror than we've ever had on an X-ray telescope and it's going to let us get higher resolution looks in much shorter observation times," said Wilkins. "So, the picture we are starting to get from the data at the moment is going to become much clearer with these new observatories."

Co-authors of this research are from Saint Mary's University (Canada), Netherlands Institute for Space Research (SRON), University of Amsterdam and The Pennsylvania State University.

This work was supported by the NASA NuSTAR and XMM-Newton Guest Observer programs, a Kavli Fellowship at Stanford University, and the V.M. Willaman Endowment at the Pennsylvania State University.

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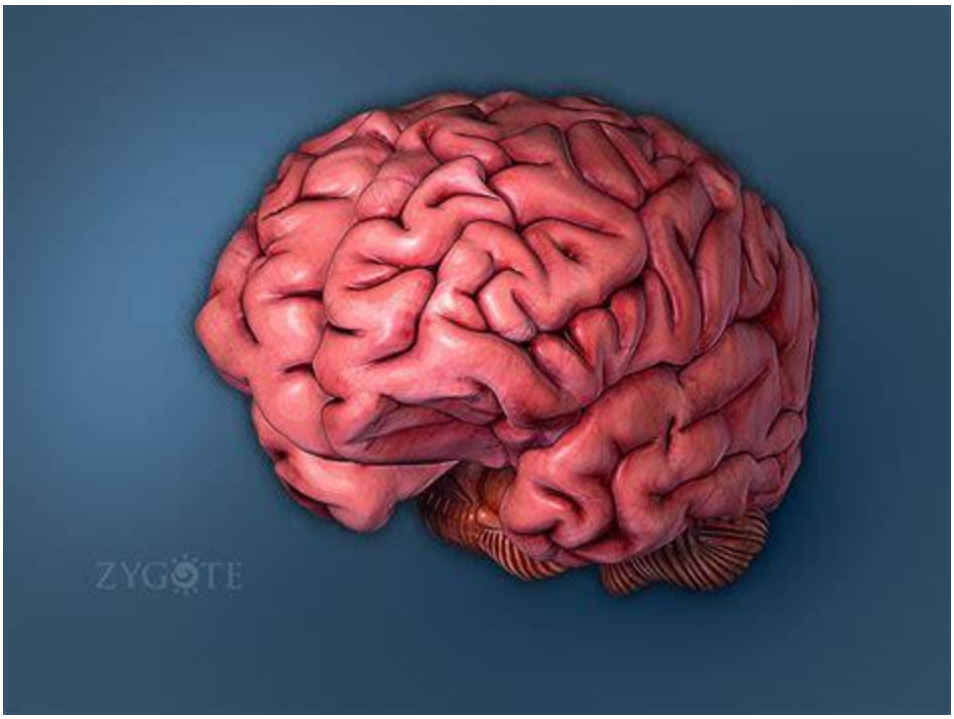
Might Be Different if it Came From AB Normal



In the hospital the relatives gathered in the waiting room, where a family member lay gravely ill. Finally, the doctor came in.

I'm afraid I'm the bearer of bad news,' she said as she surveyed the worried faces. The only hope left is a brain transplant. It's an experimental procedure, very risky. Insurance will cover the procedure, but you will have to pay for the brain.'

The family members sat silently absorbing the news. Then someone asked, 'How much will a brain cost?'

The doctor responded, '$5,000 for a male brain; $2000 for a female brain.'

The moment became awkward. Some of the men actually had to 'try' to not smile, avoiding eye contact with the women.

One relative, unable to control his curiosity, finally blurted out the question everyone wanted to ask.

'Why is the male brain so much more than a female brain?'

The doctor smiled and then she explained to the entire group, 'it's just standard pricing procedure. We have to price the female brains a lot lower because they've been used!'

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Is It Time for Another Victor Borge Fix?

Darn Rootin' Shootin' Tootin' it is, so how about Hans Christian Mozart?
https://www.youtube.com/watch?v=RtDX1Vl-Jxk

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Stravinsky Firebird

Finale Phantom Regiment: https://www.youtube.com/watch?v=Zcv7qSQj8i8

Khan Academy Partners: https://www.youtube.com/watch?v=BfWrscJ4aps

The Florida Orchestra's Surprise Performance at International Plaza:
https://www.youtube.com/watch?v=YS7xtUiSHCM

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Language, Oscillation, Synchronicity, Antimatter,

If you've still got last week's Ode, pop it up to use as a backdrop for a note I received from friend and Odester, Joseph Horton, MD. The pieces? Language and Synchronicity. Joe? Well this is what he does while he's doing a dozen other things at the same time.

Of course because it's not in my DNA I don't believe in multi-tasking, but then there's Joe and I have to concede all bets are off for people in this world like him. Scary.

Language and oscillators belong, I believe, together. Think about it--both are central to communication. Identical twins raised apart proved the key to this. I'm going to throw out a lot of lemmas, then synthesize them into a (hopefully coherent) thesis. Stay with me here....

When I was a teenager, there were several questions I wanted to answer: Do we really have free will? How do we know if we're awake and what we see is real vs we're asleep and dreaming it? How does the blob of matter we call the brain become conscious? For that matter, what exactly is consciousness? And how does a single fertilized ovum become a conscious, thinking person?

I've managed to answer a few of these, but not all.

The brain is a blob of highly and interestingly organized matter, but ultimately it has to obey all the physical laws that define how the rest of the universe acts. Apart from how it's organized, matter making up the brain is in no way special or different from the rest of matter in the known universe. The laws of physics do not get suspended when we go beneath the skin.

That said, for any given stimulus, there's a response. And we can't really control it--it just...happens. You think of some clever new things and people ask you how you thought of them. What do you say? Me? I haven't a clue what makes me think of most of the stuff I come up with. It just...happens. This suggests to me that the brain has a lot going on under the hood while I'm aware of other things. Eventually some of them reach the surface. In college, our Psych 1 prof regarded conscious experience as a "corollary discharge," presumably being a corollary to what else was going on.

When we do an electroencephalogram (EEG), we're sensing cyclical electromagnetic activity of the brain. That's why the needles move back and forth in a complexly rhythmic way.

When we do ECT, aka "shock" therapy, we induce a seizure, which more or less resets the brain. While it seems as if this should be harmful, it is, in fact, the gold standard against which the efficacy of antidepressant medications are measured. After the seizure, things settle down and the patient is typically better, at least for a while.

The way that radio communication happens is that a transmitter establishes a carrier wave with very constant frequency and/or amplitude. By electronic sorcery, it superimposes voice and/or music on that carrier wave, and out it goes with a "to whom it may concern" address takes on to the signal. At the receiving end, what we call the "radio" is actually a radio, well, receiver. It is able to generate a near-perfect replica of the carrier wave, so it can lock onto (resonate with) the incoming modulated carrier

wave. Thus synchronized, it essentially subtracts its internally generated carrier wave from the incoming wave; that leaves the signal for us to hear.

In practice, it's easiest for us to use simple sine waves as carriers, and that's been pretty much a universal standard. Nowhere is it written that it has to be that way, though.

Around 1980, a pair of ~40 year old twins, each named Jim, became aware of one another's existence. They had been separated at birth and raised apart. This made the news, and that news reached some Midwest psychologists who realized that they constituted the perfect sample set to be able finally to put the nature/nurture debate to rest. They contacted the twins, who agreed to be "observed" and interviewed. The psychologists, of course, knew that it was all nurture, but finally they'd have actual data to show it.

They were totally unprepared for what they found. These guys were literally carbon copies of one another. The looked the same (they were identical twins, after all), dressed the same, wore their hair the same, got married at the same age, got divorced at the same time, got remarried at the same age to women with the same names, named their sons the same--James (their names were both Jim), but they gave their sons the same middle names, but spelled differently: Allen and Alan, had houses on corner lots, had workshops in which they built nearly identical picket fences; workshops weren't identical but, in an odd way, had the same neat "syntax" for want of a better word.

You get the idea. But this raises an interesting question: how does this work?

I can think of two possibilities: either 1) DNA is far, far more subtle than we've ever dreamed it could be or 2) the twins communicate.*

Now, you know me: I'm a nuts and bolts kinda guy. Data are data, so when they conflict with theory, data win. What's necessary is a good explanation. Consider again how a radio works. We need a carrier wave that gets modulated. Think again about the EEG--very complex waveforms. If you wanted to make a receiver for a modulated complex waveform--like what a brain has and radiates--how would you do it? Maybe make it from an identical set of specs as the transmitter? Like, just maybe, a twin?

So maybe explanations 1 & 2 are both right: they communicate precisely because DNA is so subtle.

I'm not going to dwell on this too much now because this is all a lot to swallow.

You're telling me.

Synchronicity

As for the synchronicity videos, they're merely wonderful. I only had to take two semesters of physics in college, which was a relief to me at the time. First semester was the usual statics and dynamics. Second, though, was special relativity and wave

theory, both of which were truly fascinating. Wave theory especially. It seems to me that the London bridge effect had a precedent: the Tacoma Narrows bridge. Why they didn't install dampers to prevent oscillations is beyond me. I thought everyone in the world learned from the Washington experience. Apparently not.

Maybe they liked the sound more than the theory.

Antimatter

Regarding antimatter: on 14 February, your Ode talks a little about that. As far as there being entire stars of antimatter, it would be easy to look for.

When a positron and an electron annihilate, they convert into a pair of 511 kEv photons going in opposite directions: it's the principle on which PET (positron emission tomography) is based. So whatever coronal mass ejections happen from an anti-star, when they run into regular matter, there should be a lot of those photons.

I have no idea whether anyone has looked for that, but if I were doing the experiment, that's how I'd do it. They're in the x-ray energy range, so our x-ray telescopes would be the right observatories to use. I'll let you do the scrape for that one.

And here I thought PET was what Coke and Pepsi came in.

Pakicetus Anubis

Why do you suppose it went extinct?

I think it didn't like its name, but maybe it was something else.

The Good, the Bad and the Ugly

Soren Madsen, guitar https://www.youtube.com/watch?v=yNNXfeg1V2k

Ennio Morricone´s "The Good, the Bad and the Ugly" arranged and played by Soren Madsen. Recorded in Efterskolen for Scenekunst (School of Performing Arts), Malling, Denmark, September 2020.

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Bob Gandt's book, Bogeys and Bandits

In it, he describes the McCormack twins, Rick and Russ:

"Who the hell is Roman Three-oh-seven?" demanded the Air Boss. His exasperation level was peaking out. What he wanted to do now was wring some peckerhead fighter pilot's scrawny neck. The Air Boss was trying figure out what was going on with Roman 307. Some guy kept checking in on the radio, identifying himself as Roman 306.

"Roman Three-oh-seven airborne. . . Roman Three-oh-seven leaving marshal. . . Roman Three-oh-seven commencing approach. . ." The only problem was, they didn't have any goddamn Roman 307, at least in the air.

"Lemme get this straight, Roman Three-oh-seven," said the Air Boss. "You say you're a Hornet and you're out there in the pattern tonight?"

"Yes, sir."

"Well, son, I'm looking down at the flight deck this very minute at a parked airplane with a pilot in the cockpit. Its number happens to be Three-oh-seven. And my board says that pilot is someone named McCormack. Could you be that gentleman?"

A moment of radio silence. "No, sir. I mean, Yes, I could be, but that's not me."

"Then just who might it be, pray tell?"

"Me, sir," said another voice. "I'm McCormack, the one on deck. That guy out there just thinks he's me."

"I see. He thinks he's you. Well, in that case, you out there, the one who thinks he's Roman Three-oh-seven, would you kindly take a minute to look at your digital display and tell us what number your airplane thinks it is?"

"Yes, sir."

After half a minute, "Ah, sir, it looks like I'm. . . ah, not really Roman Three-oh-seven. It looks more like. . . ah, Roman Three-ten. Sorry about the confusion, sir."

The Air Boss, of course, didn't know about the Heckle and Jeckle phenomenon—that the twins had been screwing up events all their lives with their proclivity for transposing identities. In this instance, Russ had mentally transported himself into Rick's jet, assuming his brother's call sign. It was a classic McCormack brothers mind-warp. Up in his glass-paned aerie in Pri-Fly, the Air Boss was glowering at the blackened sky, out there where some peckerhead in Hornet number 310 was flying around. He lowered his microphone and tilted back in the high, swivel chair. He rubbed his temples with his fingertips. "I've been doing this stuff too long," he muttered. "I think it's making me crazy."

You see what I have to put up with? Yikes, Joe, one of these days I'm going to look into renting some of this Multi-Tasking stuff.

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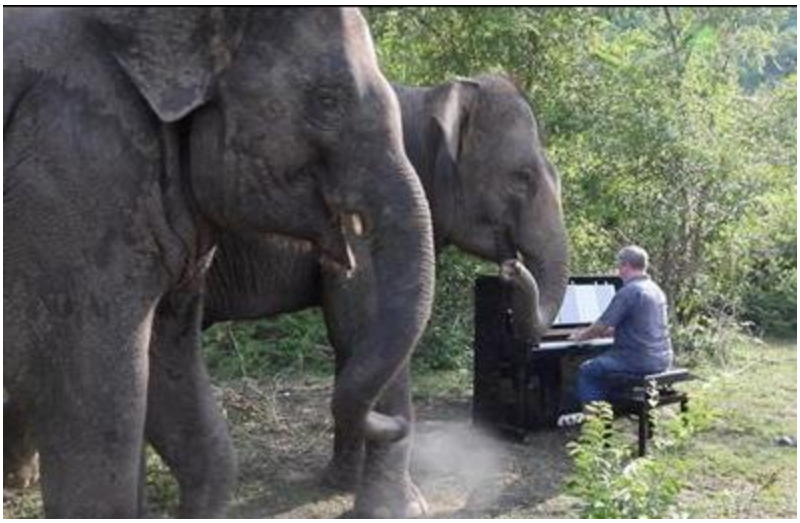

And The Waltz Goes On https://youtu.be/fKDt7HyU4Ic

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Want to live on 'Mars'?

NASA is seeking participants to live in fake Martian habitat for whole year

By: Seth Borenstein, The Associated Press, Nexstar Media Wire

To prepare for eventually sending astronauts to Mars, NASA began taking applications Friday, Aug. 6, 2021, for four people to live for a year in Mars Dune Alpha — a 1,700-square-foot Martian habitat,
(ICON/NASA via AP)

Want to find your inner Matt Damon and spend a year pretending to be isolated on Mars? NASA has a job for you.

To prepare for eventually sending astronauts to Mars, NASA began taking applications Friday for four people to live for a year in Mars Dune Alpha. That's a 1,700-square-foot

Martian habitat, created by a 3D-printer, and inside a building at Johnson Space Center in Houston.

The paid volunteers will work a simulated Martian exploration mission complete with spacewalks, limited communications back home, restricted food and resources and equipment failures.

New race to space: NASA administrator lays out plan to put Americans back on the moon and beyond

NASA is planning three of these experiments with the first one starting in the fall next year. Food will all be ready-to-eat space food, and at the moment, there are no windows planned. Some plants will be grown, but not potatoes like in the movie "The Martian." (Damon played stranded astronaut Mark Watney, who survived on spuds.)

"We want to understand how humans perform in them," said lead scientist Grace Douglas. "We are looking at Mars-realistic situations."

Fake Mars Mission

This 2021 photo provided by ICON and NASA shows construction of the Mars Dune Alpha 1,700-square-foot Martian habitat, being made by a 3D-printer, inside a building at Johnson Space Center in Houston.
(ICON/NASA via AP)

The application process opened Friday and NASA isn't seeking just anybody. The requirements are strict, including a master's degree in a science, engineering or math field, or pilot experience. Only American citizens or permanent U.S. residents are eligible. Applicants have to be between 30 and 55, in good physical health with no dietary issues and not prone to motion sickness.

That shows NASA is looking for people who are close to astronauts, said former Canadian astronaut Chris Hadfield. And, he said, that's a good thing because it is a better experiment if the participants are more similar to the people who will really go to Mars. Past Russian efforts at a pretend Mars mission called Mars 500 didn't end well partly because the people were too much like everyday people, he said.

For the right person this could be great, said Hadfield, who spent five months in orbit in 2013 at the International Space Station, where he played guitar and sang a cover video of David Bowie's "Space Oddity."

Denver to France in 120 minutes? Blue Origin flight could help usher in commercial space travel

"Just think how much you're going to be able to catch up on Netflix," he said. "If they have a musical instrument there, you could go into there knowing nothing and come out a concert musician, if you want."

There could be "incredible freedom" in a "year away from the demands of your normal life."

Attitude is key, said Hadfield, who has a novel "The Apollo Murders" coming out in the fall. He said the participants need to be like Damon's Watney character: "Super competent, resourceful and not relying on other people to feel comfortable."

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Motley Crue: Not Your Garden Variety Brit Rockers

Kickstart My Heart: https://youtu.be/CmXWkMlKFkI

Doctor Feelgood: https://www.youtube.com/watch?v=trGX3ET3jTQ

The 1982 'Crüesing Through Canada' Tour saw the band involved in a number of highly publicized incidents. Motley Crüe were arrested at Edmonton International Airport when they saw that Vince's carry-on bag was crammed with porn magazines and for wearing their spiky stage costumes through Customs. Both incidents were PR stunts.

Secondly, there was an alleged bomb threat against the band when they played at Scandals Disco in Edmonton. However, this incident was also a PR stunt. The band was finally banned for life from the city when Tommy threw a television from a hotel window.

During the 1980s, Motley Crüe was as well known for their backstage antics with drugs and groupies as they were for their music. However, their mix of glam rock and heavy metal produced a number of best-selling albums, including Shout at the Devil (1983), Theatre of Pain (1985) and Girls, Girls, Girls (1987).

In 1984, Vince Neil was charged with 'driving under the influence' (of alcohol) and 'vehicular manslaughter' and sentenced to 30 days in jail, for a crash that killed his passenger, Nicholas 'Razzle' Dingley, the drummer in Hanoi Rocks. The band later released box sets entitled Music To Crash Your Car To.

Three years later, Sixx was declared dead on the way to hospital when he suffered a heroin overdose. However, one medic refused to give up on him and gave him two shots of adrenalin to the heart and revived him. The incident was the inspiration for the song 'Kickstart My Heart', from the album Doctor Feelgood (1989) which reached number 16 in the US charts. Shortly prior to the album's release, the band had been ordered into rehab and they have stated that their newfound sobriety had a positive influence on their music.

Do you think maybe their followers ought to consider rehab?

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Most Popular Songs Each Month Through the Sixties

https://www.youtube.com/watch?v=hDWPNgRNdHI

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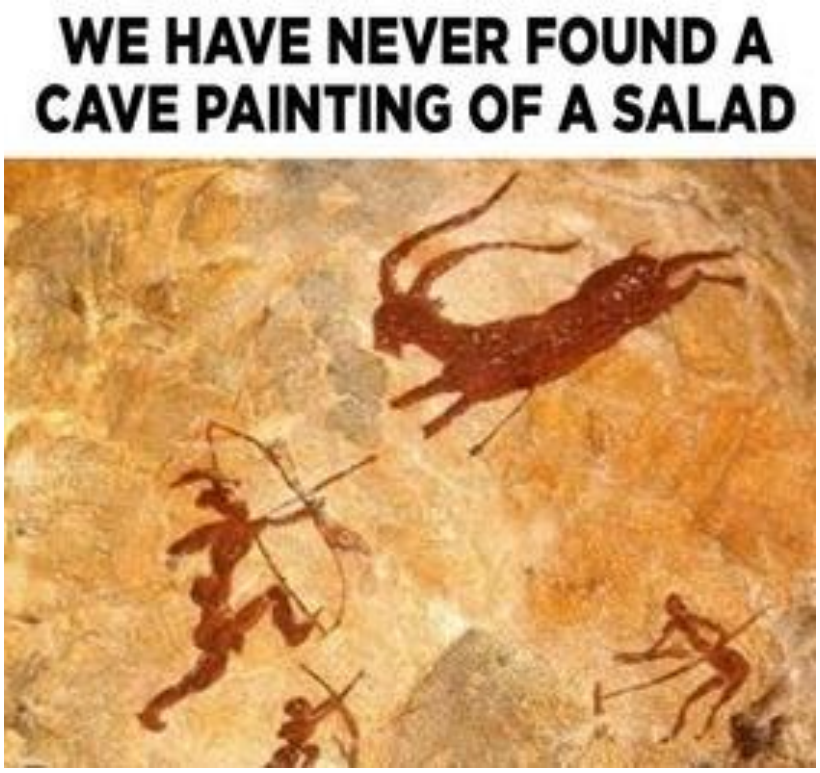

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Ecumenicism in Action

I went to an Inter-Religious Integration Seminar.

The Bishop came, laid his hands on my hand and said, "By the will of Jesus Christ, you will walk today!"
I smiled and told him I was not paralyzed.

The Rabbi came, laid his hands on my hand and said, "By the will of God Almighty, you will walk today!
I was less amused when I told him there was nothing wrong with me.

The Mullah came, took my hands and said, "Insha Allah, you will walk today!"
I snapped at him, "There's nothing wrong with me"

The Hindu sadhu came and said "Beta, you will walk on your legs today."
I said "Babaji - nothing wrong with my legs"

The Buddhist Monk came, held my hands and said, "By the will of The Great Buddha, you will walk today!"
I rudely told him there was nothing wrong with me.

After the Seminar, I stepped outside and found my car had been stolen.

I believe in all religions now.....

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A Better Way to Track Methane in the Skies

Several studies have found that the EPA underestimates the amount of methane leaking from U.S. oil and gas operations by as much as half. A new Stanford-led study shows how better data can lead to more accurate estimates and points to some of the causes of the EPA's undercount.

By Andrew Myers

When Stanford University graduate student Jeff Rutherford began his doctorate in 2018, the amount of methane entering the atmosphere from oil and gas extraction operations – mostly due to fracking – had become a major matter of contention. Tracking this harmful greenhouse gas falls to the Environmental Protection Agency.

A drone sniffs for methane in Colorado.
(Image credit: Sean F. Boggs / Environmental Defense Fund)

To help in their accounting, the EPA uses computer models that take a "bottom-up" approach, counting the total number of well heads, storage tanks, miles of pipeline and other sources of methane, declaring an average annual release per component, and totaling everything up. They call it an "inventory."

The only problem is that other organizations taking a "top-down" approach – using satellite imaging or atmospheric measurement to calculate the actual total methane emissions – were saying that the EPA was missing the mark by as much as half.

"Top-down approaches were finding total emissions double the EPA's estimates, but the reason why was not clear," Rutherford said of what motivated him and Adam Brandt, his advisor and a professor of energy resources engineering, to develop a new model. The subject of a paper published Aug. 5 in Nature Communications, their model attempts to bridge the gap between top-down and bottom-up approaches.

"If our emissions-based models that we use to make important climate-related decisions are not correct, it is a big problem," said Brandt, who is also the director of Stanford's Natural Gas Initiative.

Better data

Like the EPA, Brandt and Rutherford take a bottom-up approach, but using the very latest component-level data to tabulate the true amount of methane more accurately. The data Rutherford and Brandt use in their model have been gathered by directly sampling at various components of the oil and gas industry where methane is most likely escaping — connectors, valves and hatches on well heads, storage tanks, etc.

"We use a very similar approach as the EPA, but with different underlying data," said Rutherford. "The EPA's inventory and their modeling are actually very good – the best there is. It took me two years of digging through it to understand and try to build on it."

Results from the new model closely approximate what the top-down modelers have been saying: Current estimates are low. The Brandt and Rutherford model comes within the margin of error of the top-down inventories.

One major source of these missing emissions, Rutherford said, is liquid storage tanks. Some emissions are intentional – such as "flashing," in which dissolved methane under pressure escapes when the pressure is reduced. "It's like opening a beer," Rutherford analogized. "It's liquid as long as there is high enough pressure, but if you release the pressure, the gas quickly escapes." But much is due to operator errors, such as when a technician accidentally leaves a hatch open or separation equipment malfunctions. The combination of the two leads to very high emissions from storage tanks, although storage is only one component among many where Rutherford and Brandt point the finger.

The upshot of their new methane inventory is twofold, Brandt said. The first is awareness. It highlights a key shortfall in the current modeling that is used to make important environmental decisions and spotlights specific activities that should be targeted for remediation or regulation. Second, he said, the goal is not to replace

existing models, but to provide a useful baseline tool upon which to base modifications to those models to make future inventories more accurate.

To that end, Rutherford has been making the rounds talking to state and federal regulators as well as oil and gas producers about the findings of the new model and how they can best make use of the lessons learned.

"It is helpful simply to identify that there is a problem," Rutherford said. "But, beyond that, our model offers up some clear actionable steps to improve our inventories and ways operators can adjust their practices that could really make a difference in reducing the amount of methane entering the skies."

Adam Brandt is also a senior fellow at the Precourt Institute for Energy. Evan Sherwin, postdoctoral scholar at Stanford, is also a co-author. Additional co-authors are from Harrisburg University of Science & Technology, the Joint Institute for Strategic Energy Analysis at the National Renewable Energy Laboratory, the California Air Resources Board, Colorado State University and the Environmental Defense Fund.

This research was funded by the California Air Resources Board. Additional support was provided by Novim.

To read all stories about Stanford science, subscribe to the biweekly Stanford Science Digest.

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Eating 1 Hot Dog Takes 35 Minutes Off Life, Study Suggests

By Kayla Rivas , Fox News

Researchers released a nutritional index this week aiming to inform guidelines and help

Americans achieve healthier and more environmentally stable diets.
Getty Images/iStockphoto

Findings included over 5,000 foods in the US diet classified by health burden and environmental impacts.

"We use the results to inform marginal dietary substitutions, which are realistic and feasible," authors wrote. "We find that small, targeted, food-level substitutions can achieve compelling nutritional benefits and environmental impact reductions."

The foods studied ranged from 74 minutes lost to 80 minutes gained per serving. Sugary drinks, hot dogs, burgers and breakfast sandwiches were linked with most minutes of healthy life lost, whereas fruits, non-starchy and mixed vegetables, ready-to-eat cereals and cooked grains were associated with the largest gains.

More specifically, researchers found that consuming one 85-gram serving of chicken wings translated to 3.3 minutes of life lost, owing to sodium and harmful trans fatty acids, while a beef hot dog on a bun resulted in some 36 minutes lost "largely due to the detrimental effect of processed meat," study authors wrote. What's more, peanut butter and jelly sandwiches were associated with an increase of 33 minutes.

Foods like salted peanuts, baked salmon and rice with beans were also associated with gains between 10 and 15 minutes.

Researchers from the University of Michigan School of Public Health, Department of Environmental Health Sciences published findings in the Nature journal, detailing their newly developed Health Nutritional Index, drawing on the 2016 GBD study for dietary risk components and harmful health effects linked to certain foods.

"Previous studies investigating healthy or sustainable diets have often reduced their findings to a discussion of plant-based versus animal-based foods, with the latter stigmatized as the least nutritious and sustainable," the study reads. "Although we find that plant-based foods generally perform better, there are considerable variations within both plant-based and animal-based foods that should be acknowledged before such generalized inferences are warranted."

Researchers also classified foods by nutritional and environmental impact, or shorter-term global warming. Healthy environmentally sustainable foods included nuts, fruits, vegetables, legumes, whole grains and some seafood, whereas foods with poor nutritional value and production linked to high environmental impacts (i.e., greenhouse gas emissions) included beef, processed meat, pork and lamb, cheese-based foods and certain salmon dishes. In contrast, most poultry, dairy, egg-based foods and cooked grains fell into an intermediate zone.

"In agreement with previous studies, this suggests that nutritionally beneficial foods might not always generate the lowest environmental impacts and vice versa," study authors wrote.

Finally, researchers found that swapping 10% of daily caloric consumption from beef and processed meat for fruits, vegetables, nuts, legumes and certain seafood could

reap significant health benefits, with the team citing a gain of some 48 minutes per person per day and a 33% smaller dietary carbon footprint.

No hot dogs? No hamburgers? No fried chicken? I'd like a second opinion.

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What is the Hippocampus?

By Natalie Grover for Live Science

The hippocampus is small, but mighty important.

The hippocampus plays a role in memory and learning.
(Image credit: Shutterstock)

The hippocampus is a seahorse shaped organ that sits on the underside of each temporal lobe — the part of the brain near our ears. The hippocampus is a small but important part of the brain that's responsible for storing memories, learning and navigation.

What Does the Hippocampus Do?

The hippocampus is a heavily investigated part of the brain, but it wasn't until the 1950s that scientists were truly able to grasp what role it plays. In 1953, Henry Molaison consented to an experimental procedure allowing doctors to surgically remove his hippocampus and neighboring regions to address his epilepsy.

The surgery stopped his seizures, but caused Molaison to develop a form of amnesia. He was able to form fresh memories but they lasted minutes, and he could no longer permanently store new information, according to neuroscientist Larry R. Squire's 2009 review of Molaison's case, published in the journal Neuron.

Molaison described his state as "like waking from a dream … every day is alone in itself," Squire wrote. All Molaison could recall were events that occurred years before his surgery. Still, he did eventually improve his performance on certain motor tasks, such as the ability to draw a shape reflected in a mirror even though he had no recollection of ever having done it before.

Molaison's case provided the first scientific evidence that there are multiple types of memory, and that the hippocampus acts in concert with other regions of the brain to encode and store memories. (Molaison lived for another 55 years after his surgery.)

Data on Molaison, who went on to become the most intensively studied subject in neuroscience, alongside other patients with varying degrees of hippocampal damage (triggered by accident or disease), convinced scientists that the hippocampus plays a key role in memory. However, according to a 2009 review published in the journal Nature, scientists are still unsure what, exactly, that role is.

Research suggests that the hippocampus might store spatial information, and act as an internal GPS — key to remembering where you have been and how to get to where you want to be. Studies on rats have found that an intact hippocampus is required for initial spatial awareness and long-term retention of certain spatial memory tasks, in particular those that require finding the way to a hidden goal.

Human studies indicate that the hippocampus plays a role in finding shortcuts and new routes between familiar places. Researchers from University College London compared MRI scans of London's iconic black cab drivers (notorious for their extensive navigation experience) to control subjects who weren't taxi drivers. The study, published in 2000 in the journal Proceedings of the National Academy of Sciences, found that part of the hippocampus was larger in the taxi drivers versus the control group, and that more experienced drivers had bigger hippocampus organs.

"This increased volume was attributed to them having more neurons in this area of the brain," said Amy Reichelt, a neuroscientist at the University of Adelaide, Australia, who was not associated with the study.

How the Hippocampus Directs Behavior and Emotion

The hippocampus is not only implicated in memory, navigation and learning, but can also affect mood and behavior.

Stress itself can impact the hippocampus, and in turn, our demeanor, Reichelt said. "If we're getting any sort of oxidative stress build up — that can start to damage the function of the neurons in the hippocampus, and then lead to forgetting things," she said. And that can lead to frustration or other changes in mood, she added.

Because part of the hippocampus is connected to the amygdala — an almond-shaped region of the brain central to processing fear and other emotions — it, too, is believed to be involved in emotion processing.

Animal data suggest that the hippocampus is one of the few areas of the brain where new nerve cells are generated, even in adulthood, according to a 2011 review published in the journal Neuron. Animal research has also shown that promoting the proliferation of neurons within the hippocampus can improve mood, and these effects might also be reflected in humans, Reichelt said.

Although research suggests that antidepressants act on the serotonin system, they might also be increasing the ability of the brain to modify its connections or rewire itself

in areas, such as in the hippocampus. Antidepressants take roughly four weeks to kick in, which coincides with the approximate period of how long it takes for new neurons to integrate into the hippocampus properly, Reichelt said.

What Happens When the Hippocampus is Damaged?

In patients with Alzheimer's disease, one of the first things to falter is the ability to make new memories because of the gradual decrease in size of the hippocampus, according to a 2012 review published in the journal Annals of Indian Academy of Neurology. The gradual decline in size and function of this part of the brain is also associated with a string of other severe mental illnesses, such as depression, schizophrenia and epilepsy.

According to Epilepsy Research UK, hippocampus damage has been observed in 50-75% of patients with epilepsy who had autopsies, but it is not yet clear that the damage is a cause or consequence of recurrent seizures.

In general, the hippocampus is a particularly vulnerable part of the brain and can be adversely affected by many different conditions, including long-term exposure to high levels of stress, or head injury, the 2012 review concluded.

How to Promote a Healthy Hippocampus

The best way to stimulate the hippocampus — and improve our memory — is exercise.

Physical aerobic exercise increases blood flow to the brain — but it also stimulates the birth of new neurons, as does stimulating the brain by engaging crossword puzzles or games such as chess or sudoku.

Reichelt's research suggests that high fat and high sugar foods also have a rapid, detrimental inflammatory impact on the hippocampus. Eating a healthy diet is key, she said; a diet that is high in anti-inflammatory and antioxidant rich foods, including blueberries, leafy green vegetables, fatty fish, and spices, such as turmeric.

"I think that it's critical that we eat well, and … stay active," she said, adding that while memory declines with age, a healthy lifestyle can help mitigate that decline, although it cannot completely neutralize it.

Continuing Research

In order to robustly address problems like memory and cognitive decline, scientists must understand the brain as a whole — a significant challenge, given the organ and its machinations remain an enigma even to those who have long been involved in unpacking its complexity.

One key question scientists are still trying to understand is how memories are formed. Scientists are using new techniques to look at the specific cell types involved in forming memories, Reichelt said, highlighting an approach called optogenetics that uses specific wavelengths of light to switch off key sets of neurons in the hippocampus and related brain structures with high precision.

In a lab setting, this technique is used to switch off neurons in a rat during an event that would normally be remembered. By switching off some neurons, researchers can identify which sets of neurons are imperative for memory encoding.

"By delving deeper into the activity of types of neurons, and the brain circuitry they work with, scientists have a greater understanding of how the hippocampus works," she said.

"But the brain … itself is just such a complex organ — it's a mystery to so many of us and we're still just really scratching the surface."

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I Want a 2004 Porsche Carrera GT

The concept was never intended for production, but Porsche already had a V-10 engine on hand. One of the best engines ever fitted to a production car, the V-10 was originally developed in the early 1990s for Formula One, and when that didn't happen the engine was further developed for the Le Mans program. Eventually it would end up in the Carrera GT, where it displaced 5.7 liters and delivered 603 horsepower and 435 pound-feet of torque. With the Carrera GT weighing just 3,042 pounds thanks to its lightweight carbon-fiber monocoque and a host of other weight-saving mods, the V-10 was able to rocket the car from 0-62 mph in just 3.9 seconds.

A technical tour de force, derived from a Le Mans prototype, this Porsche Carrera GT is a 612 horsepower racing car, with road registration.

Early in the morning of 28 September 2000, before sunrise, Porsche presented the Carrera GT concept car to the world’s press in Paris. Behind the wheel, two-time rally world champion Walter Röhrl navigated the V10 mid-engined car around the Place Charles-de-Gaulle, with the Arc de Triomphe rising majestically at its centre.

As the rain fell, Röhrl had the job of transferring the engine’s sheer power as cleanly as possible from the rear axle to the square’s wet and slippery cobbles in front of the international media. The photos of Röhrl in the open-top Carrera GT en route from the Arc de Triomphe to the Louvre, escorted by French motorcycle police, caused a sensation among car fans around the world.

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Once the green light was given, the first production Carrera GT's rolled off the assembly line at the then-new plant in Leipzig, Germany, in 2003. Production would run for four years, during which time Porsche built 1,270 examples.

Delivered new on October 29, 2004 at New Country Porsche of Greenwich, Connecticut, this GT Silver Metallic example was special-ordered with the rare Black Leather interior option. Additionally, a full Paint Protection Film wrap was applied to the entire exterior and underside of the car, ensuring that it remains in pristine condition. Religiously maintained on an annual basis by the original selling dealer, its original owner accumulated a total of 1,345 miles on the odometer before it's second long-term owner purchased the Carrera GT on May 7, 2009 from Porsche Gold Coast in Jericho, NY.

Adding an additional 590 miles to the odometer, over the next twelve years, the second owner kept the Carrera GT in show worthy condition, and in July, 2019 relocated the car to his residence in Florida. Most recently, in December 2020, at 1,931 miles a full engine-out service was performed by The Collection in Coral Gables, Florida.

A technical tour de force, derived from a Le Mans prototype, this Porsche Carrera GT is a 612 horsepower racing car, with road registration.

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What is Multiverse Theory?

By Paul Sutter

Do We live in a Multiverse? Maybe, Maybe Not.

View of a cityscape with it's reflection above, depicting parallel worlds. If the multiverse exists, there could be another you somewhere out there, doing exactly what you're doing now.
(Image credit: Getty Images)

Multiverse theory suggests that our universe, with all its hundreds of billions of galaxies and almost countless stars, spanning tens of billions of light-years, may not be the only one. Instead, there may be an entirely different universe, distantly separated from ours — and another, and another. Indeed, there may be an infinity of universes, all with their own laws of physics, their own collections of stars and galaxies (if stars and galaxies can exist in those universes), and maybe even their own intelligent civilizations.

It could be that our universe is just one member of a much grander, much larger multitude of universes: a multiverse.

Theoretical Evidence of the Multiverse

The concept of the multiverse arises in a few areas of physics (and philosophy), but the most prominent example comes from something called inflation theory. Inflation theory describes a hypothetical event that occurred when our universe was very young — less than a second old. In an incredibly brief amount of time, the universe underwent a period of rapid expansion, "inflating" to become many orders of magnitude larger than its previous size, according to NASA.

Inflation of our universe is thought to have ended about 14 billion years ago, said Heling Deng, a cosmologist at Arizona State University and an expert in multiverse theory. "However, inflation does not end everywhere at the same time," Deng told Live Science in an email. "It is possible that as inflation ends in some region, it continues in others."

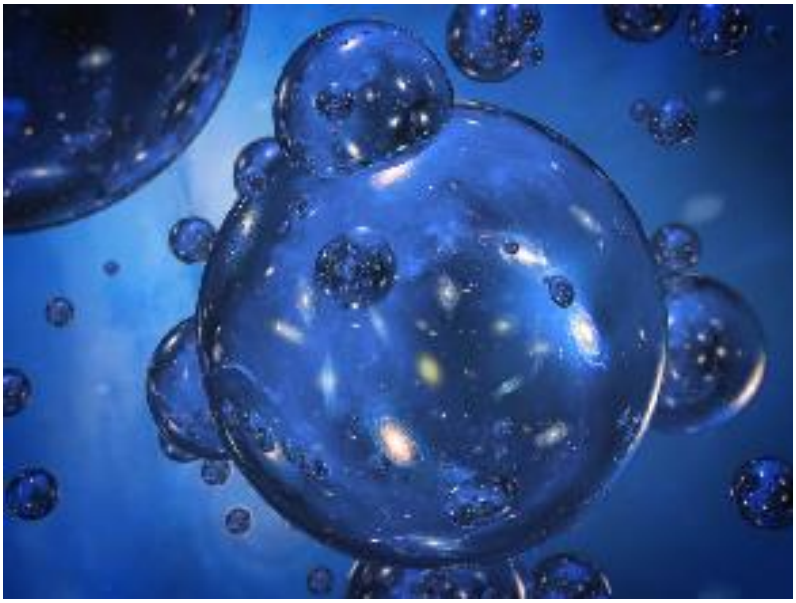
Thus, while inflation ended in our universe, there may have been other, much more distant regions where inflation continued — and continues even today. Individual universes can "pinch off" of larger inflating, expanding universes, creating an infinite sea of eternal inflation, filled with numerous individual universes.

In this eternal inflation scenario, each universe would emerge with its own laws of physics, its own collection of particles, its own arrangement of forces and its own values of fundamental constants. This might explain why our universe has the properties it does — particularly the properties that are hard to explain with fundamental physics, such as dark matter or the cosmological constant, Deng said.

"If there is a multiverse, then we would have random cosmological constants in different universes, and it is simply a coincidence that the one we have in our universe takes the value that we observed," he said.

The biggest piece of evidence for the multiverse is that life exists, particularly intelligent life capable of making cosmological observations. Certain aspects of our universe seem special and important for supporting life, such as the longevity of stars, the abundance of carbon, the availability of light for photosynthesis and the stability of complex nuclei, said McCullen Sandora, an affiliate research scientist at the Blue Marble Space Institute of Science. But "all these features are typically not the case if you get handed a random universe," Sandora told Live Science in an email. "The multiverse offers one explanation for why all these features are favorable in our universe, which is that other universes exist as well, but we observe this one because it's capable of supporting complex life," Sandora said.

In other words, so many things had to line up just right in our universe that the existence of life seems improbable. And if there was only one universe, it likely shouldn't have life in it. But in a multiverse, there are enough "chances" for life to appear in at least one universe. But this theory is not especially compelling, so most scientists remain skeptical of the multiverse idea.



Multiverse theory suggests that inflation may not occur at the same rate everywhere. Individual universes may "pinch off" other expanding universes, creating an infinite sea of inflating universes.
(Image credit: Getty Images)

Physical Evidence of the Multiverse

Many scientists have tried to find more physical, hard evidence for the multiverse's existence. For example, if a neighboring universe happened to be close to ours long ago, it may have collided with our universe, creating a detectable imprint. That imprint could be in the form of distortions in the cosmic microwave background (the light left over from when the universe was a million times smaller than it is today) or in strange galaxy properties in the direction of the collision, according to the Early Universe blog published by University College London.But all of these types of searches have come up empty, so the multiverse remains hypothetical.

Deng is searching for evidence of the multiverse by looking for special kinds of black holes that could be artifacts of pieces of our universe that separated into their own universe via a process called quantum tunneling. If some regions of our universe separated this way, they would have left behind "bubbles" in our universe that would turn into these unique black holes, which may still exist today, according to Deng.

"The potential detection of these black holes can then point to the existence of a multiverse," Deng said.

Life in the Multiverse

Perhaps the most mind-bending implication of the multiverse is the existence of doppelgängers. If there really are an infinity of universes but a finite number of ways to arrange particles in any individual universe, then the same patterns are bound to be repeated, eventually. That would mean that at some incredible (but finite!) distance, there would be an exact copy of you reading an exact copy of this article. And because there would be an infinite number of universes, there would be an infinite number of these exact scenarios all happening simultaneously, according to the Institute of Physics.

If this makes you feel a little uncomfortable, then perhaps it's reassuring to know that the multiverse has not been proven to exist … yet.

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Ranked: The Fastest Growing Cities in the U.S.

Woodland, Texas

The world has become increasingly more urbanized, especially in America. Despite being one of the largest countries on the planet, over 80% of the U.S. population currently is concentrated in key metropolitan areas, and this urban concentration is only expected to increase in the coming years.

Which U.S. cities are leading this growth?

Here are the fastest growing urban areas in the U.S. with over 300,000 residents, based on their projected annual growth rate from 2020 to 2025.

	City	State	Growth Rate
1	The Woodlands	Texas	4.76%
2	Temecula-Murrieta	California	3.66%
3	Concord	North Carolina	3.51%
4	Visalia	California	3.39%
5	Myrtle Beach	South Carolina	3.16%
6	Fayetteville-Springdale	Arkansas	3.04%
7	Kissimmee	Florida	2.95%
8	Charlotte	North Carolina	2.84%
9	Victorville-Hesperia-Apple Valley	California	2.82%
10	Raleigh	North Carolina	2.80%
11	Cape Coral	Florida	2.72%
12	Provo-Orem	Utah	2.66%
13	Santa Clarita	California	2.41%
14	Austin	Texas	2.39%
15	Lancaster-Palmdale	California	2.14%
16	Las Vegas	Nevada	2.11%
17	Lafayette	Louisiana	2.06%
18	Bonita Springs-Naples	Florida	1.99%
19	McAllen	Texas	1.96%
20	Port St. Lucie	Florida	1.94%

Coming in as America's fastest growing city is The Woodlands, Texas. This Houston-adjacent community is projecting an extreme population increase, reflecting the rapid population growth of the state of Texas.

According to 2020 Census data, Texas is America's third fastest growing state, with a population of over 29 million—that's more than the entire population of Australia.

The second fastest growing city is Temecula-Murrieta, California, which lies in the center of the triangle formed by Los Angeles, San Diego, and Palm Springs. Despite the fact that five of the 20 fastest growing cities are in California, the Golden State's overall population has been somewhat stagnant in recent years. In 2018, California's population growth rate dipped to 0.47%—its slowest growth rate on record.

The Main Factors that Impact City Growth

What contributes to a city's population growth? According to academic research conducted by Gilles Duranton and Diego Puga, there are several key drivers that impact urban growth:

Transportation and housing supply: Restrictions on housing supply, along with poor transportation options or limited roads, tend to hinder urban growth.

Amenities: This includes "natural" amenities, such as the weather—one of the most reliable predictors of city growth. Warmer temperatures in January and cooler temperatures in July are both strongly correlated with urban growth.

Agglomeration effects: An educated city is more likely to be an entrepreneurial city, which attracts new firms and helps foster growth for existing firms. As a result, its population naturally increases.

Duranton and Puga stress that municipal and city governments likely play a role in a city's population growth too—however, more research on the topic is needed to confirm their hypothesis.

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Salad Chain Sweetgreen Acquires Spyce Robotic Kitchen Tech

Amelia Lucas for CNBC News

Sweetgreen has bought Spyce, a Boston restaurant company that made a name for itself with its automated kitchen.

Since its founding in 2015, Spyce has raised $24.88 million from investors, including famed chef Daniel Boulud, according to Pitchbook.

The deal could make Sweetgreen more attractive to investors as it seeks to enter the public markets through an initial public offering.

Salad chain Sweetgreen announced Tuesday that it has bought Spyce, a Boston restaurant company that made a name for itself with its automated kitchen.

Since its founding in 2015, Spyce has raised $24.88 million from investors, including famed chef Daniel Boulud, according to Pitchbook. The company's robotic kitchen and conveyor belts are able to cook and serve its warm bowls and salads without any human intervention. Spyce has two restaurant locations, both in Boston.

The acquisition is expected to close in the third quarter this year. Financial terms were not disclosed.

Sweetgreen said it is determining where and how it will incorporate Spyce's technology into its own restaurants. The company said the deal is intended to improve the customer experience by filling orders faster and more accurately and giving its employees more time to focus on preparing food.

The deal follows Sweetgreen's move in June to file for an initial public offering confidentially. Ownership of Spyce's technology could make Sweetgreen more attractive to investors as it seeks to enter the public markets. Rising labor costs have been putting pressure on profits across the restaurant industry, incentivizing companies to invest in automation and artificial intelligence technology to take care of simpler tasks. For example, McDonald's bought Apprente in 2019 and has recently begun testing the software to take orders from some Chicago restaurants' drive-thru lanes.

Sweetgreen's latest funding round earlier this year valued it at nearly $1.8 billion after the coronavirus pandemic spurred massive growth for its digital sales. Because it is still a privately held company, it does not disclose its financial results.

Spyce was founded by a group of MIT students in 2015. It uses recipes from acclaimed chef Daniel Boulud, though the cooking process has always been automated.

An earlier iteration used rotating woks that tumbled and cooked ingredients. Human employees then added toppings and garnishes.

Now, Spyce uses an "Infinite Kitchen" that sears, steams, and assembles meals by itself in ~2-3 minutes -- a plus as customers seek contact-free options amid the pandemic.

Allie Weinstock, Sweetgreen's PR and communications manager, called the acquisition an "investment in our future." For now, Sweetgreen is focusing on updating Spyce's tech and developing a new product and concept that will work with Sweetgreen as it scales.

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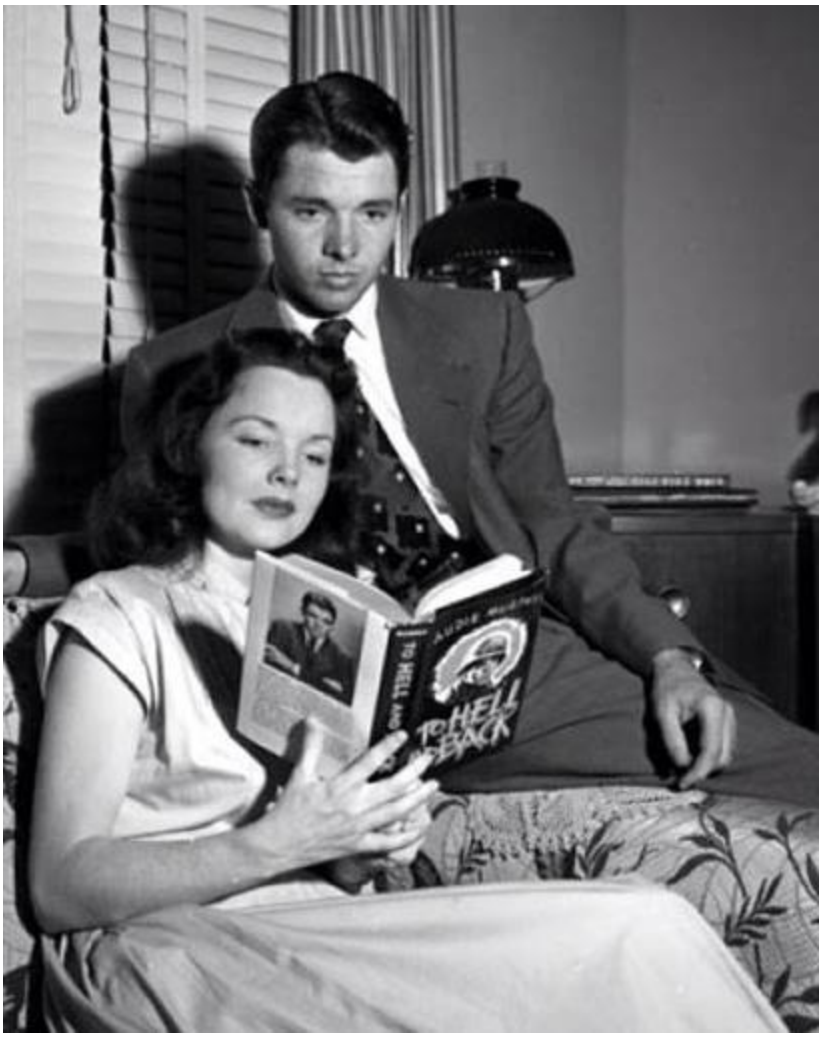
Audie Murphy's Wife



Pamela reading Audie's book
pinterest

Audie Murphy, the kid from Farmersville, Texas, was only 46 years old when he died in a helicopter crash into the Virginia Mountains He was bothered all his life when he came back from the War and it really affected his life. He never got the medical help he should have gotten. Not many young people know who Audie Murphy was or how big a war hero he was. Two or three of the medals he earned would make most servicemen proud, but to have earned his decorations in battle is truly unbelievable.

List of Audie Murphy's Decorations:

- Medal of Honor
- Distinguished Service Cross
- Silver Star (with oak leaf cluster)
- Legion of Merit
- Bronze Star (with oak leaf cluster and Valor Device)
- Purple Heart (with two oak leaf clusters)
- U.S. Army Outstanding Civilian Service Medal

- U.S. Army Good Conduct Medal
- Presidential Unit Citation (with First Oak Leaf Cluster)
- American Campaign Medal
- European-African-Middle Eastern Campaign Medal (w/ one Silver Star and four Bronze Service Stars (representing nine Campaigns) and one Bronze Arrowhead (representing assault landing at Sicily and Southern France)
- World War II Victory Medal
- Army of Occupation Medal (with Germany Clasp)
- Armed Forces Reserve Medal
- French Fourrage in Colors of the Croix de Guerre
- French Legion of Honor - Grade of Chevalier
- French Croix de guerre (with Silver Star)
- French Croix de guerre (with Palm)
- Medal of Liberated France
- Belgian Croix de guerre (with 1940 Palm)

Additionally, Murphy was awarded: The Combat Infantry Marksman badge with Rifle Bar, Expert Badge with Bayonet Bar.

From the Los Angeles Times on April 15, 2010:

Pamela Murphy, widow of WWII hero and actor, Audie Murphy, died peacefully at her home on April 8, 2010. She was the widow of the most decorated WWII hero and actor, Audie Murphy and established her own distinctive 35 year career working as a patient-liaison at the Sepulveda Veterans Administration Hospital, treating every veteran who visited the facility as if he was a VIP. Any soldier or Marine who came into the hospital got the same special treatment from her. She would walk the hallways with her clipboard in hand making sure her boys got to see the specialist they needed. If they didn't, watch out.

Her boys weren't Medal of Honor recipients or movie stars like Audie, but that didn't matter to Pam. They had served their Country. That was good enough for her. She never called a veteran by his first name. It was always "Mister." Respect came with the job. "Nobody could cut through VA red tape faster than Mrs. Murphy," said veteran Stephen Sherman, speaking for thousands of veterans she befriended over the years: "Many times, I watched her march a veteran who had been waiting more than an hour right into the doctor's office." She was even reprimanded a few times, but it didn't matter to Mrs. Murphy. "Only her boys mattered. She was our angel."

Audie Murphy died broke in a plane crash in 1971, squandering millions of dollars on gambling, bad investments, and yes, other women. "Even with the adultery and desertion at the end, he always remained my hero," Pam told me. She went from a comfortable ranch-style home in Van Nuys - where she raised two sons - to a small apartment taking a clerk's job at the nearby VA to support herself and start paying off her faded movie star husband's debts. At first, no one knew who she was. Soon,

though, word spread through the VA that the nice woman with the clipboard was Audie Murphy's widow. It was like saying General Patton had just walked in the front door. Men with tears in their eyes walked up to her and gave her a hug. "Thank you," they said, over and over.

The first couple of years, I think the hugs were more for Audie's memory as a war hero. The last 30 years, they were for Pam. One year I asked her to be the focus of a Veteran's Day column for all the work she had done. Pam just shook her head no. "Honor them, not me," she said, pointing to a group of veterans down the hallway. "They're the ones who deserve it." The vets disagreed. Mrs. Murphy deserved the accolades, they said. Incredibly, in 2002, Pam's job was going to be eliminated in budget cuts. She was considered "excess staff." "I don't think helping cut down on veterans' complaints and showing them the respect they deserve should be considered excess staff," she told me. Neither did the veterans. They went ballistic, holding a rally for her outside the VA gates. Pretty soon, word came down from the top of the VA: Pam Murphy was no longer considered "excess staff." She remained working full time at the VA until 2007 when she was 87.

"The last time she was here was a couple of years ago for the conference we had for homeless veterans," said Becky James, coordinator of the VA's Veterans History Project. Pam wanted to see if there was anything she could do to help some more of her boys. Pam Murphy was 90 when she died. What a lady.

by Dennis McCarthy, Los Angeles Times

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Hi-Tech Wooden Flooring Can Turn Footsteps into Electricity

Swiss scientists develop prototype 'nanogenerator' that produces renewable energy when trodden on

The prototype device being used to power a lightbulb.
Photograph: Jianguo Sun, Kunkun Tu, Simon Büchele, Javier Pérez-Ramírez, Ingo Burgert, Guido Panzarasa

By Natalie Grover, Science correspondent

Scientists have developed technology that can turn footsteps into electricity.

By tapping into an unexpected energy source, wooden flooring, researchers from Switzerland have developed an energy-harvesting device that uses wood with a combination of a silicone coating and embedded nanocrystals to produce enough energy to power LED lightbulbs and small electronics.

This device, called a nanogenerator, is based on sandwiching two pieces of wood between electrodes.

The wood pieces become electrically charged owing to contact and separation when stepped on via a phenomenon called the triboelectric effect. This effect occurs when electrons can transfer from one object to another, akin to the static electricity produced when you rub a balloon on your hair for a few seconds.

If a material is tribo-positive it tends to lose electrons, and if it is tribo-negative it tends to attract electrons, said the senior study author, Guido Panzarasa, a group leader in the professorship of wood materials science located at Eidgenössische Technische Hochschule Zürich and the Swiss Federal Laboratories for Materials Science and Technology Dübendorf.

"Wood doesn't have a strong tendency to lose nor attract electrons. As such, wood is a terrible triboelectric material, but wood is an excellent building material," he said, noting that it is also beneficial given the material is a natural and renewable resource that also stores carbon dioxide.

To boost wood's triboelectric properties, the researchers coated one piece of it with a common silicone that gains electrons upon contact, while the other piece was embellished with nanocrystals that have a tendency to lose electrons. After testing different types of wood, they found that radially cut spruce – a common wood for construction in Europe – generated 80 times more electricity than natural wood.

Using a wood floor prototype with a surface area slightly smaller than an A4 piece of paper produced enough energy to drive household LED lamps and small electronic devices such as calculators, the researchers found. They successfully lit up a lightbulb with the prototype when a human adult walked upon it, according to the paper published in the journal Matter.

"Imagining making a floor with these kinds of devices, the amount of energy that could be produced by people just walking," said Panzarasa. "Our focus was to demonstrate the possibility of modifying wood with relatively environmentally friendly procedures to make it triboelectric. Spruce is cheap and available and has favorable mechanical properties."

Prof Nick Jenkins, the leader of the centre for integrated renewable energy generation and supply research group at Cardiff University, who was not involved in the research, suggested the typical application of such a device could be powering an Internet of

Things device. “Of course, if a continuous supply of energy were required, such as for lighting, then this would need continuous motion to provide the input power.”

Panzarasa cautioned that so far, this was proof-of-concept data, and the technology needed more work before it could be scaled up for industrial use.

“We have been focusing our attention on developing the approach to make it even more industrially friendly. And for this we need to maybe sacrifice the overall efficiency in favour of easier methods of a wood modification,” he said.

“So that even though the electrical output of a single device would not be as high as the one we published, the union of many devices across a larger flooring unit will eventually produce a significant amount of energy.”

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