Ode to E Pluribus Unum for Sunday September 15 2024

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King of Wings Hoodoo Under the Milky Way

Image Credit & Copyright: Wayne Pinkston (LightCrafter Photography)

This rock structure is not only surreal -- it's real. Perhaps the reason it's not more famous is that it is smaller than one might guess: the capstone rock overhangs only a few meters. Even so, the King of Wings outcrop, located in New Mexico, USA, is a fascinating example of an unusual type of rock structure called a hoodoo.

Hoodoos may form when a layer of hard rock overlays a layer of eroding softer rock. Figuring out the details of incorporating this hoodoo into a night-sky photoshoot took over a year. Besides waiting for a suitably picturesque night behind a sky with few

clouds, the foreground had to be artificially lit just right relative to the natural glow of the background.

After much planning and waiting, the final shot, featured here, was taken in May 2016. Mimicking the horizontal bar, the background sky features the band of our Milky Way Galaxy stretching overhead.

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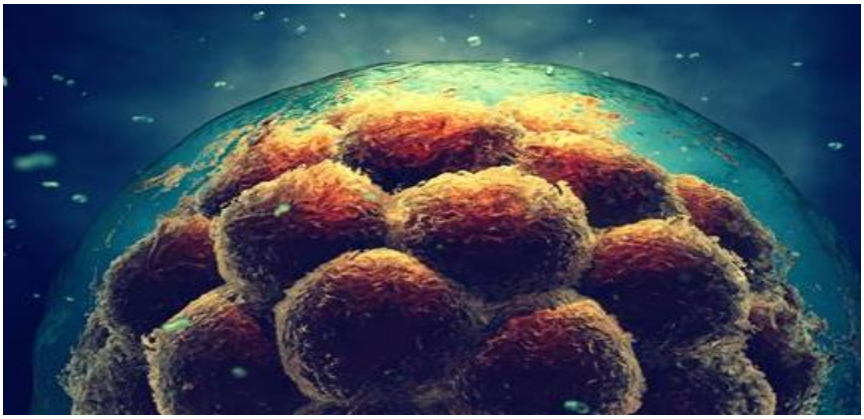
Stem Cells: What They Are and What Their Future Holds



earth.com

Stem cells have two important properties. They are able to make more cells like themselves. That is, they self-renew. And they can become other cells that do different things in a process known as differentiation.
Stem cells are found in almost all tissues of the body. And they are needed for the maintenance of tissue as well as for repair after injury.

https://youtu.be/sqMj6Re7WNU

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40 Images from the International Dog Photography Awards

Photo by Claudio Piccoli.

The International Dog Photography Awards is all about celebrating the special bond we share with our dogs through the art of photography. This competition shines a spotlight on the most talented dog photographers worldwide while also discovering fresh talent and spreading a love for photography.

https://bit.ly/3SU3gy3

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Chords & Riffs

Erich Wolfgang Korngold (1897-1957)

New York Times

Korngold was an Austrian composer and conductor, who fled Europe in the mid-1930s and later adopted US nationality.

A child prodigy, he became one of the most important and influential composers in Hollywood history. He was a noted pianist and composer of classical music, along with music for Hollywood films, and the first composer of international stature to write Hollywood scores.

Korngold scored 16 Hollywood films in all, and received two more nominations for Oscars. Along with Max Steiner and Alfred Newman, he is one of the founders of film music. Although his late-Romantic style of classical composition was no longer as popular when he died in 1957, his music underwent a resurgence of interest in the 1970s beginning with the release of the RCA Red Seal album The Sea Hawk:

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Hilary Hahn Violin Concerto in D major, Op 35 https://youtu.be/lcGEGl5bdbk
The Sea Hawk - Jeffrey Schindler https://youtu.be/42NqTuTDTGE
Adventures of Robin Hood https://youtu.be/PDyjPB_AEBU
Concerto for piano left hand and orchestra https://youtu.be/nfelJcLYLuA

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A Nervous System Driven Prosthesis Aids Walking

Hugh Herr and Hyungeun Song.

A new surgical procedure gives people more neural feedback from their residual limb. With it, seven patients walked more naturally and navigated obstacles.

State-of-the-art prosthetic limbs can help people with amputations achieve a natural walking gait, but they don't give the user full neural control over the limb. Instead, they rely on robotic sensors and controllers that move the limb using predefined gait algorithms.

The prosthetic takes advantage of muscles' tendency to move in tandem, with control of one leg muscle signaling a complementary action in the other through the body's nervous system. While traditional surgery severs this muscle connection at the amputation site, a below-the-knee surgery can retain them. A bionic prosthetic can then use electrodes to detect muscle movements, resulting in a more natural gait than traditional robotic legs (more, w/video). In contrast, traditional prosthetics rely on preprogrammed gaits responding to environmental factors like terrain.

https://bit.ly/3W875li

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3D Printing Creates Strong, Stretchy Hydrogels That Stick to Tissue

Medical applications Laboratory tests showed how the 3D printed material moulds and sticks to organs such as this porcine heart.
(Courtesy: Casey Cass/CU Boulder)

A new method for 3D printing, described in Science, makes inroads into hydrogel-based adhesives for use in medicine.

3D printers, which deposit individual layers of a variety of materials, enable researchers to create complex shapes and structures. Medical applications often require strong and stretchable biomaterials that also stick to moving tissues, such as the beating human heart or tough cartilage covering the surfaces of bones at a joint.

https://bit.ly/4cQJTx4

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New Device Stops Bleeding from Gunshot Wounds in Seconds

Cresilon's Traumagel, which can stop bleeding from wounds in seconds, is already being looked at for future uses by the Department of Defense.

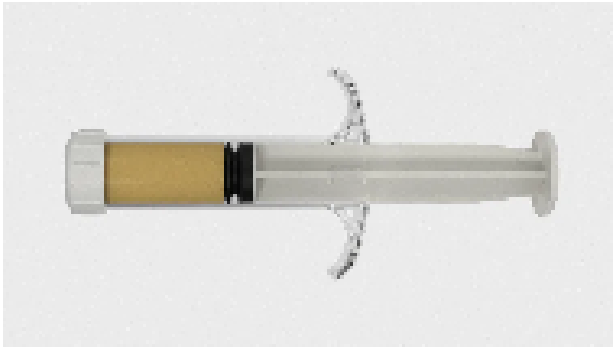

Photo: Courtesy Cresilon]

As advanced as medicine is in some areas, when it comes to stopping bleeding, most solutions are decidedly old school: applying pressure and trying to absorb blood with powder or by packing wounds with gauze.

Traumagel, which will launch later this year, is a 30-ml syringe of an algae- and fungi-based hemostatic gel that's the color and texture of hummus. It can be applied directly into a wound, helping stanch bleeding within seconds.

The FDA cleared its use for moderate to severe bleeding. Joe Landolina, founder of Brooklyn-based Cresilon, which makes Traumagel, says that in addition to stopping bleeding quickly, the product's "flowable" properties can improve the safety of treating something like a gunshot wound.

https://bit.ly/4dX3TPB

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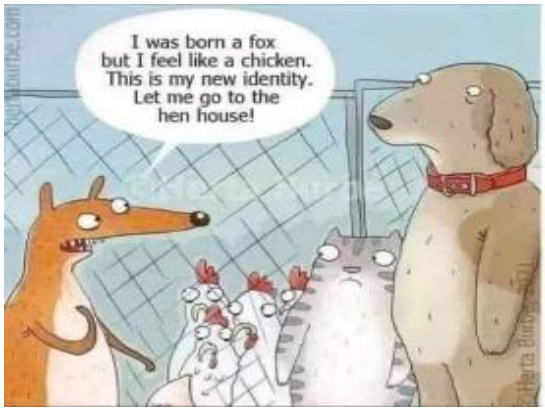

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Why Hyundai is All in on Hydrogen

For the Korean company, it's much more than an alternative fuel—it represents a potentially life-changing global transformation

Hyundai

Jay Chang, president and CEO of Hyundai announced at the Consumer Electronics Show that Hyundai Motor Group (HMG), a conglomerate renowned for its popular automotive brands and a first mover in the hydrogen industry, will accelerate hydrogen demand by off-taking approximately 3 million tons annually by 2035 through its businesses spanning the entire value chain, becoming both a hydrogen provider as well as its largest consumer.

One of the company's groundbreaking upstream businesses is currently in operation at a waste treatment site in Chungju City, Korea. There, the Group's waste to hydrogen (W2H) project harnesses biogas extracted from food wastes. This biogas is then reformed into hydrogen through an advanced process.

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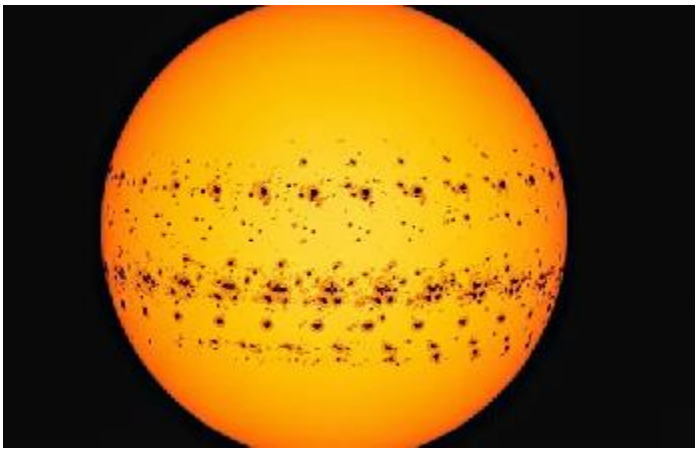
Sunspots surge to 23-year high

Solar maximum continues to intensify far beyond initial expectations



There was an average of 215.5 daily sunspots on the sun's surface during August. This time-lapse image shows every visible dark patch moving across the sun during this time.
(Image credit: SDO/Şenol Şanlı/Uğur İkizler)

The average number of visible dark patches on the sun's surface in August was higher than any other month since September 2001. The final count was more than twice as high as experts initially predicted it would be.

The number of sunspots peaked on Aug. 8, when up to 337 sunspots were observed on the sun, which is the highest total in a 24-hour period since March 2001.

These numbers indicate what some scientists have already suspected — that we have entered solar maximum. However, we can't be certain of this until long after sunspot numbers begin to drop again.

https://bit.ly/4geLiAA

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3 Sun Mysteries We Still Haven't Cracked

We understand a lot about the sun but these three mysteries continue to baffle scientists.
(Image credit: Javier Zayas Photography via Getty Images)

Our understanding of the sun has come a long way in recent decades, but there are still multiple outstanding mysteries that current and future missions hope to solve.

Since we began sending satellites to space, our knowledge of the sun has increased exponentially. We saw the sun at new wavelengths, observing our local star in ultraviolet and X-rays for the first time. These observations revealed many new unexplained phenomena on the sun. Many of these early solar observations have been long since explained, but there are still ongoing mysteries about the sun that scientists are working to understand.

Here, we outline three of the main outstanding puzzles of our local star, although there are certainly others. Most current and future projects to observe the sun, either from the ground or in space, include one or more of these mysteries as a primary science goal.

https://bit.ly/4dz0Vki

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Rome: From Farming Villages to Empire in Three Minutes

getty images

The Video https://youtu.be/JAU5F8Jtc4c

Interactive map.

The Etruscans

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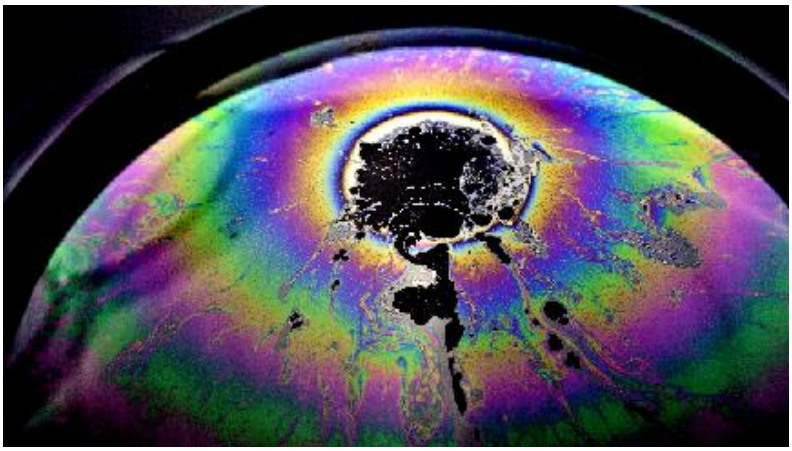
Physicists Study How Universes Might Bubble Up and Collide

Since they can't prod actual universes as they inflate and bump into each other in the hypothetical multiverse, physicists are studying digital and physical analogs of the process.



If our universe is a bubble that inflated inside a larger multiverse, it might bear scars from collisions with nearby bubbles.
Phil Degginger / Science Source

Some physicists embrace the multiverse to explain why our bubble looks so special (only certain bubbles can host life), while others reject the theory for making no testable predictions (since it predicts all conceivable universes). But some researchers expect that they just haven't been clever enough to work out the precise consequences of the theory yet.

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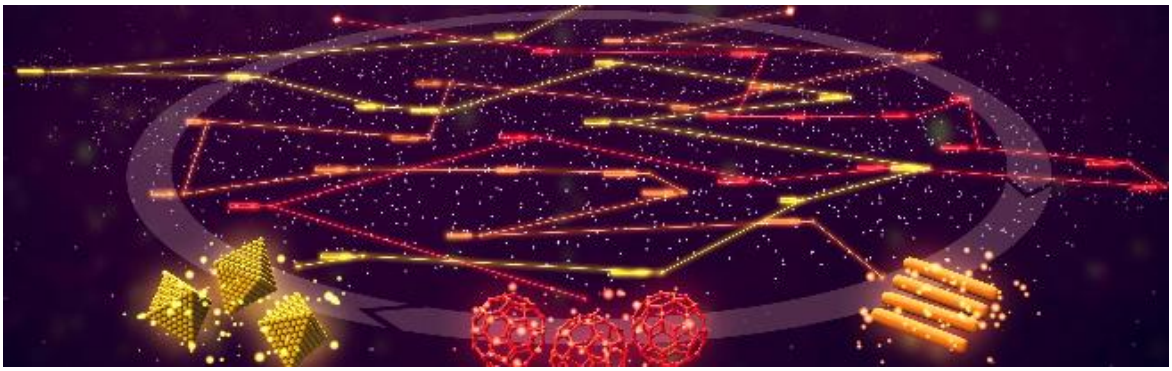
New AI Approach Accelerates Targeted Materials Discovery And Sets the Stage for Self-Driving Experiments



SLAC

The method could lead to the development of new materials with tailored properties, with potential applications in fields such as climate change, quantum computing and drug design.

Scientists have developed an AI-based method that helps gather data more efficiently in the search for new materials, allowing researchers to navigate complex design challenges with greater precision and speed.

Their work, published today in npj Computational Materials, lays the foundation for "self-driving experiments," where an intelligent algorithm defines the parameters for the next set of measurements at facilities such as SLAC's Linac Coherent Light Source (LCLS). The new method also allows for the rapid discovery of new materials, which may show promise in fields such as climate change, quantum computing and drug design.

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Smart City Technologies that Will Transform Urban Living

getty

According to tech experts, the era of smoothly functioning, technology-empowered smart cities may not be "right now," but it isn't far off. Below, 19 members of Forbes

Technology Council explore rising trends in smart city technology that are or will soon be boosting convenience, safety, sustainability and more in urban areas.

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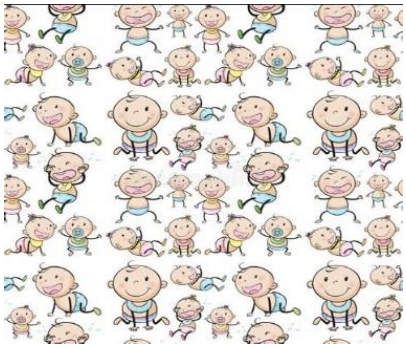
The Number of People Born Every Year, by Region (1950–2023)



It's a commonly known fact that the world population has more than doubled since the 1970s, to 8 billion people in 2024. But where exactly has all that increase taken place? And what can examining these birth trends tell us about the future?

We visualize the number of births in each global region, from 1950 to 2023. All figures were sourced from the UN World Population Prospects 2024.

https://bit.ly/3LSoXuE

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Three-Quarters of Pedestrian Deaths Happen After Dark

Magna's thermal sensing system that 'sees' the road four times farther than typical headlights technology can help change that.

An extra set of eyes on the road.
Image: Jason Loudermilk/Magna

Originally named "Night Vision" and introduced on the 2005 BMW 7 Series, Magna's thermal sensing product sees the road ahead up to four times farther than the typical headlight range. Currently available on 40 different vehicle models across 13 manufacturers like Bentley, BMW, Audi, Volkswagen, Porsche, and examples from Stellantis (Dodge, Fiat, Ram, Peugeot, Jeep, and more) and GM, this technology was created to reduce pedestrian and cyclist deaths.

This is how it works.

https://bit.ly/45XdLGa

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Homefront Dad Shows Mom How He's Caring for the Little Darling

A graphic artist living in Germany works from home while his wife leaves their baby girl with him each day as she goes off to work.

A few months ago, he got tired of her texting to check on how he was doing with the baby, so he started photoshopping responses to text back to her. Here's a book titled Naked Drinks.

I'll try and include a different one in subsequent Odes.

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'Spiders of Paradise' Show Colorful Courtship Dances

Maria Fernanda Cardoso

Maratus, often referred to as Peacock Spiders, are known for the males having a huge range of vibrant, iridescent patterns on their upper abdomens. Their colorful patterns range from spots to stripes to intricate patterns that almost resemble faces or even artwork.

https://bit.ly/4dPMKrq

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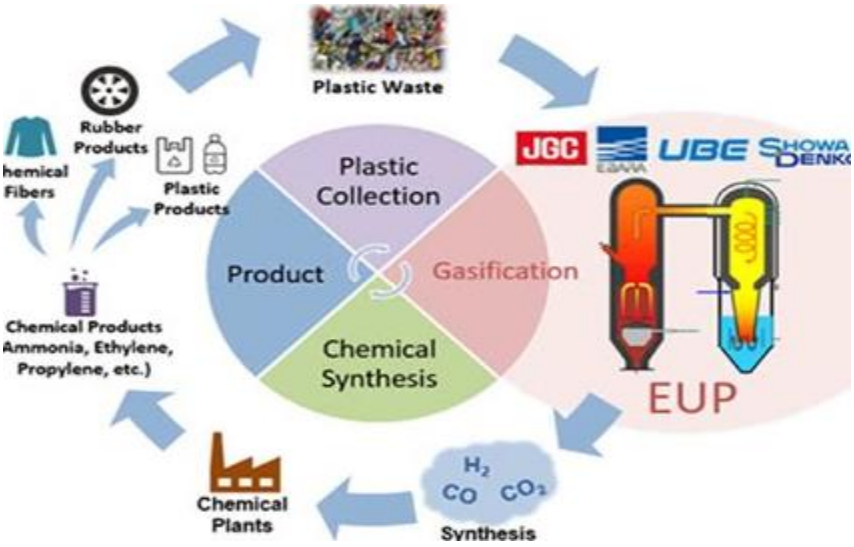
UC Berkeley Process to Recycle Plastics Indefinitely



sustainableplastics.com

Every day, California dumps about 15,000 tons of plastic into landfills, according to CalRecycle. That's enough plastic to fill 290 Olympic-size swimming pools, or enough plastic waste to cover the entire UC Berkeley campus three feet deep - every single day.

Now, scientists at Cal and Lawrence Berkeley National Laboratory have discovered a novel approach to tackle hard-to-recycle products. They take plastic that's a solid, and do chemical reactions on it…turn it into a gas,

https://bit.ly/3Zlkj0l

CalRecycle will probably claim some credit, but the organization has fought gasification projects tooth and nail for years. It remains to be see if Berkley's approach will survive.

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How to Win Radio Contests

Those concert tickets, movie passes, and travel packages can be yours if you follow this advice from a frequent radio contest winner.

radioloveit.com

Jared is a legend for all kinds of reasons, the main one being that you can't listen to FM radio in the greater Toronto area without hearing him win a contest. The man routinely wins three to four prizes a week.

A lot of these prizes aren't huge—a $50 gift card, say, or a trip to African Lion Safari. But some of them are big—he went to the Grammys in 2012, for example, and once got a check for $1,200. What's his secret?

https://bit.ly/3z0xdpM

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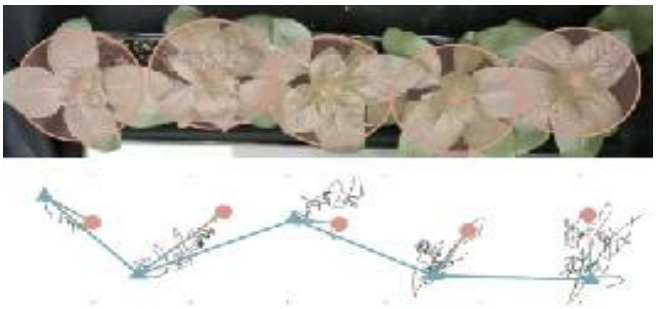
Why Do Plants Wiggle? New Study Provides Answers



Researchers mapped out the movements of five sunflower plants over the course of a week (bla

For many humans, plants might seem stationary and even a little dull. But green things actually move a lot. If you watch a timelapse video of a sunflower seedling poking up from the soil, for example, it doesn't just shoot straight up. Instead, as the sunflower grows, its crown spins in circles, twists into corkscrews and, in general, wiggles around—albeit very slowly.

Now, researchers co-led by Orit Peleg at CU Boulder and Yasmine Meroz at Tel Aviv University have discovered one role for these chaotic movements, also known as "circumnutations." In greenhouse experiments and computer simulations, the group showed that sunflowers take advantage of circumnutations to search the environment around them for patches of sunlight.

https://bit.ly/46NlVBq

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Dramatic Photos Show La Palma Volcano’s Ongoing Eruption

Photographer Arturo Rodríguez was taking a shower at his home in Tenerife, the largest of the Spanish Canary Islands, when he heard an alarmed voice blare from the TV in the next room. "It just erupted! It just erupted—I can't believe it!" the reporter yelled into the camera.

In the weeks leading up to that fateful September day, a swarm of earthquakes had rattled the neighboring island of La Palma, hinting at the movement of magma under the surface. Rodríguez, who was born and raised in La Palma, was preparing for a trip to photograph scientists as they monitored the island's volcanoes, which had slumbered for the past 50 years. And then one roared awake.

https://bit.ly/4dQQTeb

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Gargantuan Waves in Earth's Mantle May Make Continents Rise

Monks Cowl in the Great Escarpment of South Africa. This dramatic formation arose during the breakup of Gondwana, a new study shows.
(Image credit: Leisa Tyler via Getty Images)

Dramatic cliffs and high plateaus are caused by the same wave triggered in Earth's middle layer when continents pull apart, a new study finds.

As continents break up, massive cliff walls may rise near the boundaries where the crust is pulling apart. That breakup sets off a wave in Earth's middle layer, the mantle, that slowly rolls inward over tens of millions of years, fueling the rise of plateaus, the new study found.

In the new study, published Aug. 7 in the journal Nature, Gernon and colleagues studied three iconic coastal escarpments that formed during the breakup of Earth's last supercontinent, Gondwana. One, along India's coast, fringes the Western Ghats for about 1,200 miles (2,000 kilometers); another, in Brazil, rings the Highland plateau for about 1,900 miles (3,000 km); and the Great Escarpment of South Africa encircles the Central Plateau and spans a staggering 3,700 miles (6,000 km), according to the study. The interior plateaus in these regions can rise a kilometer or more, Gernon said.

https://bit.ly/3YB2rhi

Another of those tantalizing 'maybes.'

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Biohybrid Robot Controlled and Powered By a King Oyster Mushroom

Moss&Fogg

The more we learn about fungi, the more we realize how sophisticated and unique these organisms are.

Researchers at Cornell University have engineered two types of robots where a mushroom's mycelium, or rootlike threads, grow directly into the hardware itself. This robot is then controlled by mycelium signals, and its sensitivity to light.

https://bit.ly/3ZfmWQX

Check out the videos.

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If Potatoes Are the Perfect Vegetable, Why Are We Eating Fewer?

The humble potato is a miraculous vegetable, but Americans are eating less of them than ever before and have ditched fresh potatoes for frozen. Is it time to rebrand the spud?

Getty Images

Compared with other carb-loaded staples like pasta, white bread, or rice, potatoes are rich in vitamin C, potassium, and fiber. They're also surprisingly high in protein. If you hit your daily calorie goal by eating only potatoes, then you'd also exceed your daily goal for protein, which is 56 grams for a man aged 31–50.

Potatoes aren't just amazing from a nutritional point of view—they are one of the original disruptive food technologies. First domesticated in the Andes and then brought to Europe by Spanish colonizers in the mid-1500s, wherever potatoes were grown they supercharged local societies. Potatoes were well suited to growing in cool, wet, European climates and produced veritable bounties compared with established crops like wheat, barley, and oats.

https://bit.ly/3TokpQP

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How does grapefruit interact with drugs?

Grapefruit and grapefruit juice can affect the amount of medication that reaches the bloodstream. But why?

Substances in grapefruit can block the action of specific enzymes and "transporters" that affect how much of a drug enters the bloodstream.
(Image credit: Gabi Musat / 500px via Getty Images)

Why does grapefruit interact with certain medications, and what are examples of drugs people shouldn't take with grapefruit?

The primary culprit behind these drug interactions is a group of chemicals in grapefruit called furanocoumarins, that can mess with some molecules and enzymes — proteins that perform chemical reactions in the body — in the small intestine.

This can happen with certain blood-pressure medications, such as nifedipine (brand name Procardia and Adalat CC). These drugs work by relaxing blood vessels to lower blood pressure, but consuming grapefruit can increase the amount of the drug in the body, causing blood pressure to drop too low. This chain of events can also lead to a too-slow heart rate, or bradycardia.

https://bit.ly/4gjNjeX

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Pilot Takes Future Drone on Its First Flight

437 Vanguard Loyal Wingman prototype flies.

Scaled Composites

The prototype of the future Loyal Wingman uncrewed fighter flew for the first time last week with test pilot Brian Maisler twisting the knobs. The Scaled Composites Model 437 Vanguard took off from Mojave Air and Space Port in California for the local flight and Maisler didn't mention any hitches. "Today's first flight was in a good jet with a great team," said Maisler. "This is the best part of my job. Thanks to everyone and their two years of hard work culminating in making this an uneventful and fun day."

Although the plane will eventually fly uncrewed in conjunction with crewed aircraft, the Vanguard is believed to be the test bed for basic aerodynamics and performance testing. It's designed to be a low-cost and even expendable helper on combat missions where it can chip in to the fight with up to 2,000 pounds of weapons, up to and including two AIM 120 missiles. It has a range of 3,000 nm and endurance of six hours.

By Russ Niles, AVWeb

I think this is superior to a totally autonomous drone.

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CCA: Loyal Wingman Collaborative Combat Aircraft

mikeshouts.com

As envisioned by service leaders, CCA will lead to loyal wingman drones flying alongside fighters, a force multiplier that will be the airpower backbone of America's future military. It's no surprise that such a program is complex — and comes with a lot of questions about how these systems will be used, whether the technology will be ready, and who will make them.

https://youtu.be/u92zn2kp3gk?t=1

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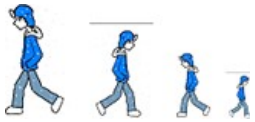
My Walking Thoughts



For Sunday September 15 2024

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[This is a piece I wrote in 1967 after dinner with one of the Blue Angel pilots flying F-4 Phantoms.

I was never a member of the Blues though I think I could have done the stick-and-throttle stuff without killing anyone. But it takes a very special person to handle all the other tasks that make the Blues the most visible symbol of Naval Aviation…in fact of the entire naval establishment… a very, very *heavy burden.]*

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The Blue Angels…from the Slot

Except for appearances in front of crowds or at functions in their honor when they act out the role others expect, the *Blues* (pilots and to a lesser degree, crewmembers) are

serious, soft-spoken, almost remote. Not aloof, mind you, but occupied more with matters of their responsibility and…mortality.

And why not? It's easy enough to grasp. It's what you experience the minute you go outside the safe limits you've set for yourself. Go on, put yourself in their spot; locked in the middle of the famous Blue Angel Diamond. You've nothing to lose but a little complacency.

***

You find there are three spaces you'll transit during a performance. The first is when you start your walkdown to the plane. It's rehearsed--ritualized because someone decided that demonstration pilots should look precise from the moment they hit the flightline.

The second space is transition. It has no name. Nowhere is it written down. You and your teammates never talk about it, but everyone knows it's there--inviolate. Let it be too short and you find yourself rushing to catch up; too long, and you fidget. The goal is a melding of man (or woman) and machine; a mutual absorption of identities that occurs in a flash of recognition.

You don't think it, you *know* it in the fit of the seat cushion; how your knuckles brush the canopy rails as you glide your hand by the rows of switches on either console. One instant, you're out there with the audience; the next, you're in here with a *you* that melds with an amalgam of boron and honeycomb, aluminum and silicon; an improbable collection of million year-old acid-etched neurons poised to plunge to the depths of the imagination, and beyond.

The third is fulfillment. Not like any others at all. You don't see it or hear it or taste it or smell it or even feel it. "Aha," you say, "You sense it!" But wait. It's deeper; less dense. It radiates from some central core with a wavelength and amplitude so impossibly small, it courses through you the way a spaceship hurtles through the interstellar void. It lies far beneath awareness, yet it possesses you, permeating from within. It nestles in the synthetic binding force holding us fast to all the other stuff of this new being. The neuron; the synapse; the whirling turbine, marshalled electron; the molecules of air awaiting the implacable rendering of Bernoulli’s Law. Here, physics and fantasy become inextricably one.

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"Smoke on," The Boss orders to stir the crowd prior to taxi-out.

It's a gathering thing, beginning as whole images. You take the runway with three other glistening icons drawn together by as yet incomplete forces. You're aware of the back pressure of the throttles on your palm; of gloves that interdict your union with the sculptured handles that bristle with the buttons of your trade. You acknowledge the curt power-up head nod of the man ahead--Number Two in the formation who rides the

leader's starboard wing--and note remotely that your engine instruments track the forward plunge of your left hand.

"Burners…*now*!" the Boss calls releasing brakes, and as the shiny pack leaps forward your world contracts until it encompasses a jittering slice of wingtip and one square foot of reference area on Two's fuselage. Nothing else matters until you're airborne and ready to duck into the *slot* beneath the leader's aircraft.

"Four's aboard," you hear a lip mike distorted voice report in your headset knowing it's yours but sensing it's coming from somewhere outside the flight.

"Tighten it up, Three," that voice intrudes again, coaxing the left-hand wingman up into position.

As Number Four, the slot man, yours is the most difficult of transitions--really the hairiest of the program--where immediately upon becoming airborne, you snap the gear handle sharply up against its stop, simultaneously tapping the stick to the left to commence a slide beneath Number Two's tail.

Even before you've reached the space between the two wingmen, you bias the stick back to the right and scootch the throttles forward to tuck beneath the Boss and balance off the diamond formation. It may look simple from the viewing stands, but it isn't. Invisible vortices stream back and below the lead and wingmen ladling the air with downwash; most violent and dangerous during the initial transition from lift-off to climb. To flirt with these so close to the ground is to court disaster and you taste the surge of adrenaline each time you catch a momentary buffet.

"Ease the power," the Boss coaches, but it isn't necessary because at a range of six feet from your nose to his tail, just the slightest mismatch of power becomes apparent in the blink of an eye. That's what it's about--relative motion.

In the course of the show, the formation will attain speeds as high as 600 feet per second while separated by less than five feet. The trick is to sense any opening or closing velocity while the differential is still slight and take immediate corrective action. In point of fact, you are hardly ever stabilized in position, rather constantly correcting and re-correcting with minute movements of the stick and throttle.

"Fifty-six," Boss reports, advising the altitude in hundreds of feet at the top of the opening loop. The backdrop shifts from sky to earth as you settle lightly into your shoulder straps. You watch the runway emerge from the canopy bow, blossom, then slide beneath the nose as the flight continues its arc back into the sun.

You didn't count them, but you know that in the forty seconds since brake release, you've sawed the throttles back and forth more than a thousand times. The stick grip has traveled nearly an eighth of a mile at four inches or less a crack. The wingtips on either side of your canopy have fluttered and flopped in the turbulence but on-balance they've never strayed more than a foot from their prescribed position--three feet out and locked at eyeball level.

The cockpit temperature is a cool 55 degrees, yet you can feel the sweat beading on your forehead and soon a stinging drop finds your eye. You blink, but there's nothing you can do except endure the discomfort. In 20 seconds, you'll be out of sight of the crowd where you can loosen up just enough for you to wipe your face…but for now you take it.

"Three, bring it aft a tad," the voice intrudes again, and you sense his wing sliding back six inches to its proper place.

You think, *Well, we nailed the opener, only 33 more maneuvers to go.*

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