

Ode to E Pluribus Unum for Sunday April 16 2023

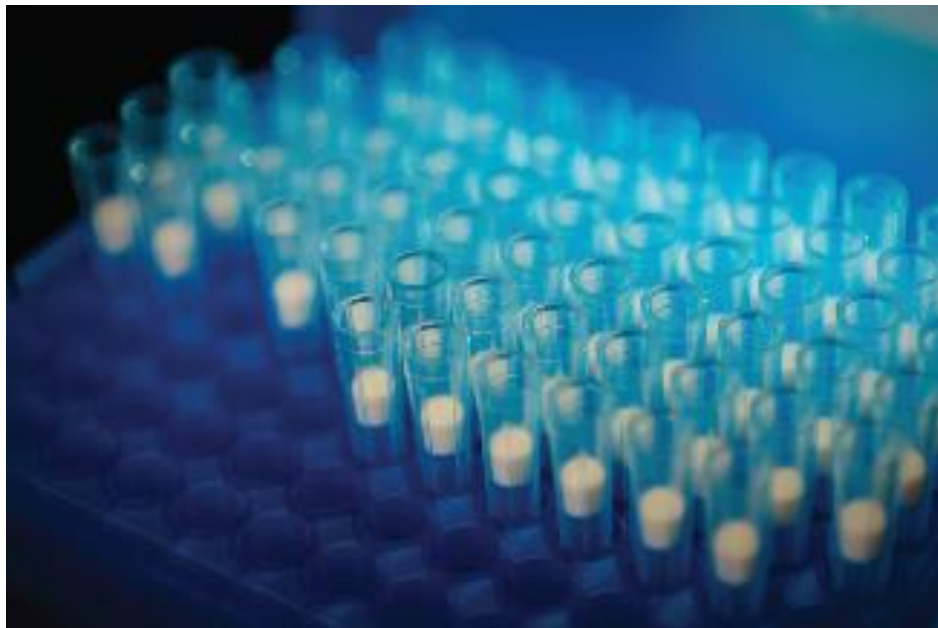
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Breaking News:

Parkinson's Disease Biomarker Found



In an enormous leap forward in the understanding of Parkinson's disease (PD), researchers have discovered a new tool that can reveal a key pathology of the disease: abnormal alpha-synuclein — known as the "Parkinson's protein" — in brain and body cells. The breakthrough, announced April 12, 2023 as it was published in the scientific journal The Lancet Neurology, opens a new chapter for research, with the promise of a future where every person living with Parkinson's can expect improved care and treatments — and newly diagnosed individuals may never advance to full-blown symptoms.

The tool, called the α -synuclein seeding amplification assay (α Syn-SAA), can detect pathology in spinal fluid not only of people diagnosed with Parkinson's, but also in

individuals who have not yet been diagnosed or shown clinical symptoms of the disease, but are at a high risk of developing it.

The assay can confirm the presence of abnormal alpha-synuclein, detected in most people with PD, with astonishing accuracy: 93 percent of people with Parkinson's who participated in the assay were proven to have abnormal alpha-synuclein. "We've never previously been able to see in a living person whether they have this alpha-synuclein biological change happening in their body," says Todd Sherer, PhD, chief mission officer, The Michael J. Fox Foundation (MJFF).

The biomarker breakthrough was achieved by an international coalition of scientists led by MJFF and its landmark clinical study, [Parkinson's Progression Markers Initiative \(PPMI\)](#). Its significance as a milestone in the pursuit of a cure and better treatments and therapies for Parkinson's is highlighted in an article today on leading health and science news website STAT, which stated "The trophy is science — and specifically research funded by the Michael J. Fox Foundation for Parkinson's Research that has resulted in the clearest evidence yet that the presence of a particular misfolded protein, alpha-synuclein, can be used to determine if people have Parkinson's. It is an advance that may soon be used to develop better diagnostics, but more importantly could rapidly accelerate the search for treatments for the disease." [Read the article here.](#)

A protein normally found in the nervous system, alpha-synuclein — like amyloid in Alzheimer's disease — can start to misfold and clump, damaging neurons and causing Parkinson's disease to develop. It has previously been possible to confirm the presence of these clumps only through postmortem analysis.

The new tool cleverly takes advantage of a telling characteristic of alpha-synuclein that is pathologic: it causes nearby, normal alpha-synuclein to also misfold and clump. For the assay, spinal fluid samples are prepared with a fluorescing agent that lights up if alpha-synuclein clumps form. Normal alpha-synuclein is then seeded into the spinal fluid sample. If abnormal alpha-synuclein is present in the sample, clumps form and the dye lights up. If no abnormal alpha-synuclein is present, the dye doesn't fluoresce.

After being tested in small, independent studies, in 2022 the assay was validated in the large, well-characterized cohort of PPMI. The validation was carried out in some 1,123 samples of spinal fluid contributed by PPMI participants over the years. The assay proved amazingly accurate, with 93 percent of participants with Parkinson's having an abnormal test. (Very few tests for neurologic disorders are over 90 percent sensitive for disease.) And, importantly, the test was abnormal in less than 5 percent of people without Parkinson's.

Steady and critical advances in the pursuit of a reliable and accurate biomarker test have been the hallmark of PPMI, which was built for this purpose. The discovery

enabled by the new test is the latest, and most significant, finding to date from the study.

Today, with this discovery in hand, Parkinson's is moving from a disease primarily understood, diagnosed and measured through subjective clinical assessments to an objectively biologically defined disease — which makes possible new paradigms for clinical care, including earlier diagnosis and targeted treatments, and faster, smarter and cheaper drug development.

By helping to identify people at the earliest stages of PD, "We could then study what happens at different biological stages of the disease," says Dr. Sherer. Says Ken Marek, MD, PPMI principal investigator, "αSyn-SAA enables us to move to another level in effecting new strategies for prevention of disease."

MJFF is urgently driving the next stages of development of αSyn-SAA toward widespread and standard use. Since today the tool can elicit a binary response — showing that abnormal synuclein is either present or not — there is tremendous promise in optimizing it, in order to measure the amount of alpha-synuclein present. Optimized assays would also detect abnormal synuclein through blood draw or nasal swab — a simple test that could be done in any doctor's office.

"I'm moved, humbled and blown away by this breakthrough, which is already transforming research and care, with enormous opportunity to grow from here," says Michael J. Fox. "I'm so grateful for the support of patients, families and researchers who are in it with us as we continue to kick down doors on the path to eradicating Parkinson's once and for all."

Read more of Michael J. Fox's thoughts on the historic importance of the biomarker breakthrough and its implications for "biology's century" in his opinion piece published today in STAT. [Go to article.](#)

Tune in Thursday, April 20, at 12 p.m. ET for a special edition of our Third Thursdays Webinar and learn more about the discovery of the biomarker and what it means for patients and their families. [Register now.](#)

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Rubin's Galaxy

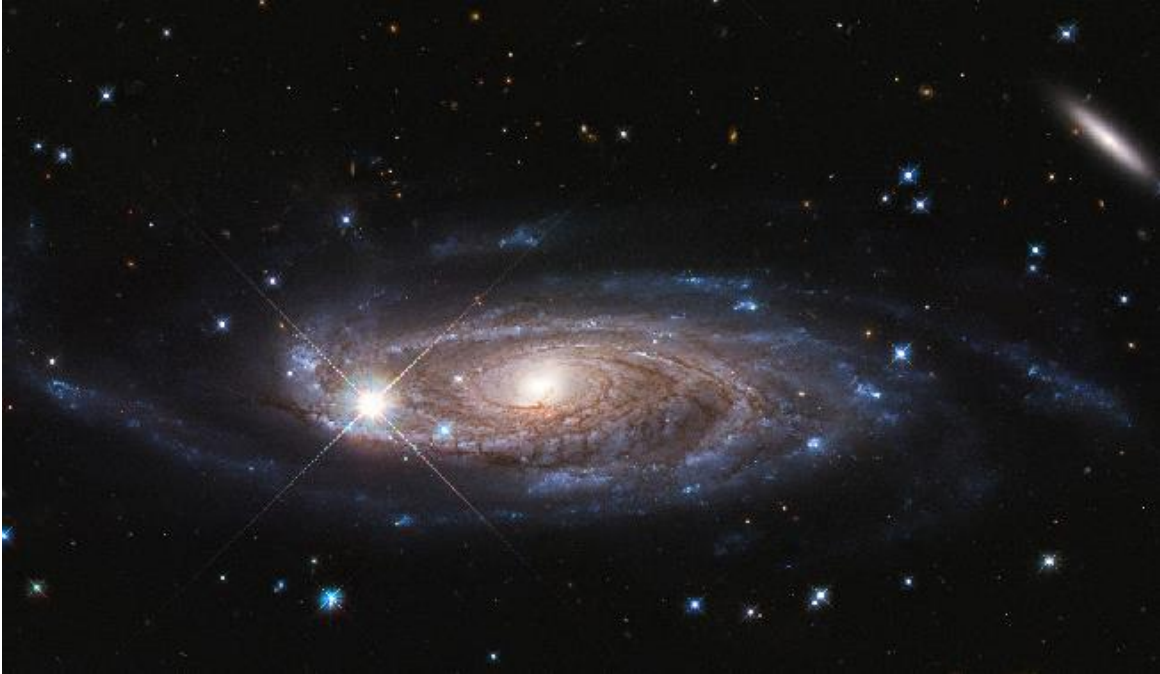


Image Credit: NASA, ESA, B. Holwerda (University of Louisville)

In this Hubble Space Telescope image the bright, spiky stars lie in the foreground toward the heroic northern constellation Perseus and well within our own Milky Way galaxy.

In sharp focus beyond is UGC 2885, a giant spiral galaxy about 232 million light-years distant. Some 800,000 light-years across compared to the Milky Way's diameter of 100,000 light-years or so, it has around 1 trillion stars. That's about 10 times as many stars as the Milky Way.

Part of an investigation to understand how galaxies can grow to such enormous sizes, UGC 2885 was also part of An Interesting Voyage and astronomer Vera Rubin's pioneering study of the rotation of spiral galaxies. Her work was the first to convincingly demonstrate the dominating presence of dark matter in our universe.

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Giant Wind Propelled Sculptures



Jansen at work
Pinterest

These "live" sculptures by Theo Jansen are propelled only by the wind...beautiful and mesmerizing at the same time!

<http://bit.ly/43hCwex>

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A Marine Corps Birthday Ball: One for the Books



<https://bit.ly/3GxQ9g2>

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Ocean Photographs by Henley Spiers

The ocean photographer, writer and expedition leader, Henley Spiers, joins Oceanographic for one year to capture and share the ocean stories he feels the world needs to see and hear - with the support of a £45,000 fund.



Large olive ridley turtle . 'manicured' by a group of reef fish. Baja California, Mexico

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Spacex Starship Will Launch Private Moon Rover in 2026



Astrolab is planning to operate an entire fleet of FLEX rovers on the lunar surface.

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Photosynthesis Doesn't Work Exactly the Way We Thought it Did



*Photosynthetic algae viewed under the microscope. Their green color is the result of the pigment chlorophyll found inside photosystems.
(Image credit: Shutterstock)*

Researchers have serendipitously discovered that a key step in photosynthesis can occur much earlier in the process than previously believed.

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**I think
senility is
going to be a
fairly smooth
transition for
me.**

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How the Brain Slows Down When We Focus Our Gaze

Computer simulations explain change of pace in the visual cortex



Road systems resemble richly structured clustered networks.

Changing between slow and fast integration of information, the brain can flexibly modulate the timescales on which it operates. This is the result of a new study by an international team of researchers. Their analysis of experimental data from the visual cortex and their computer simulations also provide an explanation for how different timescales can arise and how they can change: the structure of the neural networks determines how fast or slow information is integrated.

Different processes in the brain happen on different timescales: While sensory input can be handled within tens of milliseconds, decision making or other complex cognitive processes may require integrating information over up to several minutes. Correspondingly, some areas in the brain are faster-paced than others. These intrinsic timescales are not rigid and invariable. However, so far little was known about how they can adapt to different situations and tasks.

A team of researchers from Tübingen, Princeton, Stanford, Newcastle, and Washington has now investigated how the timescale of a brain area can vary during task execution. Specifically, they asked: when a subject focuses their visual attention or redirects it to a specific point in space, how does that change the timescale of neural activity in the corresponding brain area? To answer this, the researchers analyzed previously published data recorded from the visual cortex V4 – the brain area involved in visual attention – of macaque monkeys during two different visual attention tasks.

For both tasks, the team observed that the neural activity unfolded not on a single timescale, but on at least two different ones: a slow and a fast timescale. Remarkably, the slow-paced timescale also changed during task execution: whenever the attention was directed to an area in the visual field, the slow activity in the corresponding neural populations became even slower. Moreover, they observed that the slower the activity, the shorter the reaction times. "This may seem counterintuitive, but it is actually quite plausible", comments Roxana Zeraati, researcher at the University of Tübingen and at

the Max Planck Institute for Biological Cybernetics. "A slow timescale means that there is a stronger correlation between the present state of the brain and its state a moment ago. When the neurons are attending to something, they remember their own past activity better, and this implies a slower timescale."

Rich network structure enables flexible behavior

The researchers wondered how a network of neurons can create these different timescales. "We tested three different hypotheses with computer simulations", summarizes Anna Levina, assistant professor in Tübingen and Zeraati's PhD advisor. "Do we see the different timescales simply because some neurons operate faster and others slower? Or, as a second option, could their different biophysical properties be responsible? Only our third conjecture proved true: the answer does not lie in the properties of single neurons, but in the structure of the network."

Depending on how the neurons are connected to each other, different timescales arise: so-called clustered networks, for example, generate slow timescales. "You can compare a clustered network to the European road system", explains Levina, who led the project together with her colleague Tatiana Engel from Princeton. "Any two places in Paris are very well connected to each other, but it is a lot harder to get from a village in Burgundy to a beach in Portugal. At the same time, the airline network might look almost random. It is very hard to reach a nearby city, but you can go almost anywhere without many connecting flights. Networks that look more like airlines would not evolve as long timescales as the road network."

The team was able to construct networks that replicated in the computer simulation exactly the timescales from the experimental data. The models also account for the observed modulations in timescales during tasks: the efficacy of interactions between neurons increases slightly, and this in turn changes the pace of neural events. The findings could change our outlook on the brain: "Our experimental observations combined with the computational model provide a basis for studying the link between the network structure, functional brain dynamics, and flexible behavior", the publication concludes.

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AI and the American Smile

How AI misrepresents culture through a facial expression.



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Dawn Aerospace's Space Plane Aces First Rocket-Powered Flights

The Mk-II Aurora aims to become the first plane to fly to space twice a day.



Dawn Aerospace's robotic Mk-II Aurora space plane flew with a rocket engine for the first time

in March 2023.
(Image credit: Dawn Aerospace)

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HUSBANDS ARE THE BEST
PEOPLE TO SHARE
SECRETS WITH.
THEY'LL
NEVER
TELL ANYONE,
BECAUSE THEY
AREN'T EVEN LISTENING.



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Priceless Marbles



This was posted by Sara Feeley Johnson, a buddy from Cherry Point days.

I was at the corner grocery store buying some early potatoes. I noticed a small boy, delicate of bone and feature, ragged but clean, hungrily apprising a basket of freshly picked green peas.

I paid for my potatoes but was also drawn to the display of fresh green peas. I am a pushover for creamed peas and new potatoes. Pondering the peas, I couldn't help

overhearing the conversation between Mr. Miller (the store owner) and the ragged boy next to me.

"Hello Barry, how are you today?" "H'lo, Mr. Miller. Fine, thank ya. Jus' admirin' them peas. They sure look good." "They are good, Barry. How's your Ma?" "Fine. Gittin' stronger alla' time."

"Good. Anything I can help you with?" "No, Sir. Jus' admirin' them peas." "Would you like take some home?" asked Mr. Miller. "No, Sir. Got nuthin' to pay for 'em with."

"Well, what have you to trade me for some of those peas?" "All I got's my prize marble here." "Is that right? Let me see it" said Miller. "Here 'tis. She's a dandy." "I can see that. Hmmmmm, only thing is this one is blue, and I sort of go for red. Do you have a red one like this at home?" the store owner asked. "Not zackley but almost."

"Tell you what. Take this sack of peas home with you and next trip this way let me look at that red marble," Mr. Miller told the boy. "Sure will. Thanks Mr. Miller."

Mrs. Miller, who had been standing nearby, came over to help me. With a smile she said, "There are two other boys like him in town, all three are in very poor circumstances. Jim just loves to bargain with them for peas, apples, tomatoes, or whatever. When they come back with their red marbles, and they always do, he decides he doesn't like red after all and he sends them home with a bag of produce for a green marble or an orange one, when they come on their next trip to the store."

I left the store, smiling to myself, impressed with this man. A short time later I moved to Colorado, but I never forgot the story of this man, the boys, and their bartering for marbles.

Several years went by, each more rapid than the previous one. Just recently I had occasion to visit some old friends in that Idaho community and, while I was there, learned that Mr. Miller had died. They were having his visitation that evening and, knowing my friends wanted to go, I agreed to accompany them. Upon arrival at the mortuary, we fell into line to meet the relatives of the deceased and to offer whatever words of comfort we could.

Ahead of us in line were three young men. One was in an army uniform and the other two had nice haircuts, wore dark suits and white shirts... all very professional looking. They approached Mrs. Miller, standing composed and smiling by her husband's casket. Each of the young men hugged her, kissed her on the cheek, spoke briefly with her and moved on to the casket.

Her misty light-blue eyes followed them as, one by one, each young man stopped briefly and placed his own warm hand over the cold pale hand in the casket. Each left the mortuary awkwardly, wiping his eyes.

Our turn came to meet Mrs. Miller. I told her who I was and reminded her of the story from those many years ago and what she had told me about her husband's bartering for marbles. With her eyes glistening, she took my hand and led me to the casket.

"Those three young men who just left were those boys. They just told me how they appreciated the things Jim "traded" them. Now, at last, when Jim could not change his mind about color or size... they came to pay their debt."

"We've never had a great deal of the wealth of this world," she confided, "but right now, Jim would consider himself the richest man in Idaho."

With loving gentleness, she lifted the lifeless fingers of her deceased husband. Resting underneath were three exquisitely shined red marbles.

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Walmart-EV-Fast-Charging



Walmart to launch coast-to-coast EV fast-charging network across thousands of stores

The world's largest retailer, Walmart, plans to build its own "coast-to-coast" EV fast-charging network by 2030 to help deliver a convenient and affordable charging experience.

Walmart to launch EV fast-charging network across stores

As the auto industry accelerates its transition toward fully electric, zero-emission vehicles, businesses are looking to adapt.

According to data from Cox Automotive – despite total vehicle sales falling 8% in the US last year – EV sales grew 65%, reaching 5.8% of all new car sales in the US.

The number of electric vehicles on the road is only projected to continue trending higher, with the US aiming for a 50% EV sales share by 2030. Several initiatives have been passed to accelerate the transition.

For one, the Inflation Reduction Act passed last August provides EV buyers up to \$7,500 in tax credits based on where the vehicles materials are sourced from and assembled.

In addition, \$5 billion in funding is being made available over the next five years to establish a nationwide EV charging network in the US through the NEVI Formula Program.

Walmart already has nearly 1,300 EV fast-charging stations through a partnership with Electrify America installed across over 280 US retail locations. The new initiative will promote a coast-to-coast network across thousands of Walmart and Sams Club Stores by 2030, according to the retailer.

With a Walmart store or club located within 10 miles of roughly 90% of Americans, the EV fast-charging network will help increase access to affordable charging solutions as demand grows.

The big-box retailer says the plan is the latest in its efforts to transform its business and supply chains to become more environmentally conscious and achieve zero emissions by 2040.

Walmart is also working to reduce emissions from its fleet by purchasing zero-emission electric vehicles from GM's Brighdrop and EV startup Canoo.

Photo credit: PlugShare

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Elephant Peels a Banana with Her Trunk in Incredible Footage

An Asian elephant at the Berlin Zoo, Pang Pha, taught herself to peel bananas with her trunk by watching her keepers.



Scientists recently discovered a new elephant behavior that is simply bananas. An Asian elephant (*Elephas maximus*) at the Berlin Zoo can use her trunk to peel bananas before eating them, a new study reveals.

https://youtu.be/Tr_Ed-6eHxA?t=3

She wasn't trained to do this; instead, researchers believe she picked up the skill by watching zookeepers peel bananas for her.

An incredible video shows the elephant, named Pang Pha, first grasp the banana with the end of her trunk. Then, she twists her trunk around on itself, breaks the banana by ripping off the stem end, and throws the rest on the ground. She then picks up the banana again, this time by pinching the frayed peel with her trunk, and uses the banana's weight to methodically peel the fruit. This might not be exactly the way keepers peel bananas, but it's a remarkable feat for a thumbless animal.

Related: Do elephants really "never forget"?

Study first author Lena Kaufmann (opens in new tab), a doctoral student at Humboldt University of Berlin, began working with the elephant to study how the animals sense touch sensations with their trunks. Soon after, the zookeepers began to mention other intriguing behaviors they had spotted, like banana peeling. Kaufman didn't believe it at first. To see for herself, Kaufmann began to feed Pang Pha bananas to see what would happen.

"I started bringing bananas for her," Kaufmann told Live Science. "And I didn't see anything. She just took the banana and ate it. So I started doubting it."

But Kaufmann was bringing green bananas, fresh from the supermarket, and Pang Pha would simply swallow them whole. When Kaufmann offered Pang Pha a more ripe banana, one with little brown spots on the peel, the elephant grasped the banana and carefully opened it to get at the pulp inside.

It turned out that Pang Pha has preferences. She will eat green bananas whole when offered them, but will take time to peel sweeter, more ripe bananas. She does not, however, like extremely ripe bananas.

"At first, I gave her a [brown banana] and she basically dropped it and left it on the floor," said Kaufmann. "After that, I gave her a second one, and immediately she threw it at me."

Through repeated experimentation, Kaufmann learned that Pang Pha will occasionally peel and eat an overripe banana, but she clearly doesn't seem to enjoy them.

Kaufmann next studied how and when she peels bananas in social situations, where she is being fed bananas as a part of a group. In these cases the vast majority of Pang Pha's bananas were eaten without being peeled. That is, until she was on her last banana, which she would take her time to peel 60% of the time.

Kaufmann believes that Pang Pha's reluctance to peel bananas during group feeding is a sign that she optimized the behavior for her benefit. When alone, Pang Pha is more likely to carefully peel each banana, but when eating communally, she has to eat very quickly, or the other elephants might leave her with no bananas. In that case, she swallows them whole, but chooses to savor the last banana.

Pang Pha's remarkable feat was described April 10 in the journal *Current Biology* (opens in new tab).

By Cameron Duke for Live Science

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Say "I do" in front of the "Wienermobile of Love?"

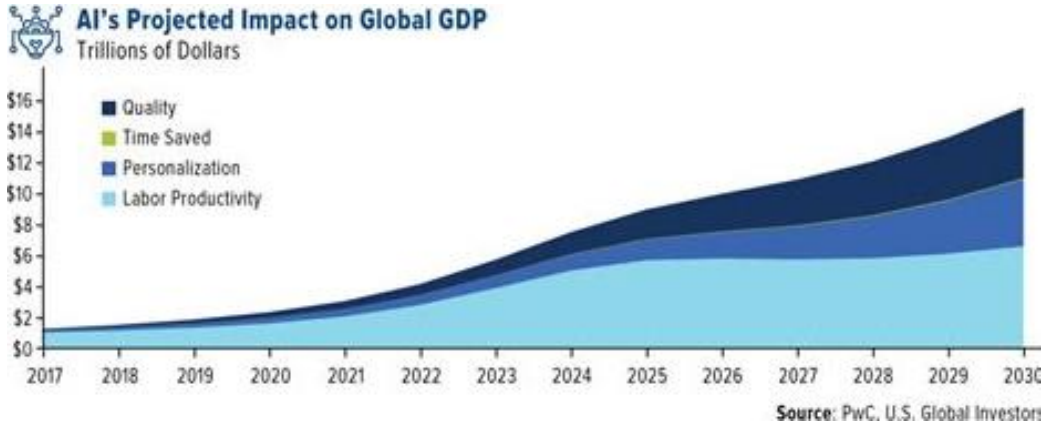


Why Pay for a Wedding When You Can Get Married at the Wienermobile for Free?

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The Potentially Large Effects of AI on Economic Growth



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See the Wildflower 'Superbloom' Happening Across California



<http://bit.ly/3KzovjM>

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Why Robotic Worms Could One Day Dig Beneath Your Feet



*To propel itself, sections of the robotic earthworm can expand outwards and lengthwise.
Christine Ro*

For decades, scientists have been developing soft robots inspired by a creature often taken for granted - the humble earthworm.

<http://bit.ly/415fxSD>

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ENGLISH LESSON

Tsunami ——— T is silent

Honest ——— H is silent

Psychology ——— P is silent

Knife ——— K is silent

Wife ——— Husband is silent

Class dismissed ...

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50 Photographs That Reshaped Sport

Pain, triumph, disaster – and a pair of tightly squeezed testicles. Here are some of the images that changed the way we see sport for ever



*Aerial photograph of Ali seconds after defeating Cleveland Williams in 1966.
Neil Leifer/Sports Illustrated/Getty Images*

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The Mysterious Deep Time Movements of Snails

How do organisms that are so sedentary end up being so incredibly widely dispersed?



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Photographing Corals

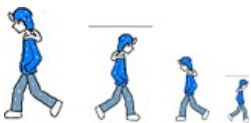


Singapore-based underwater photographer Kin Soon Cheong has documented coral scenes around Southeast Asia for a while. In this online interview, he talks about the hardships of photographing corals, his love for the species, his favourite dive spots in Southeast Asia, and much more.

<https://oceanographicmagazine.com/features/photographing-corals/>

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My Walking Thoughts



For Sunday April 16 2023

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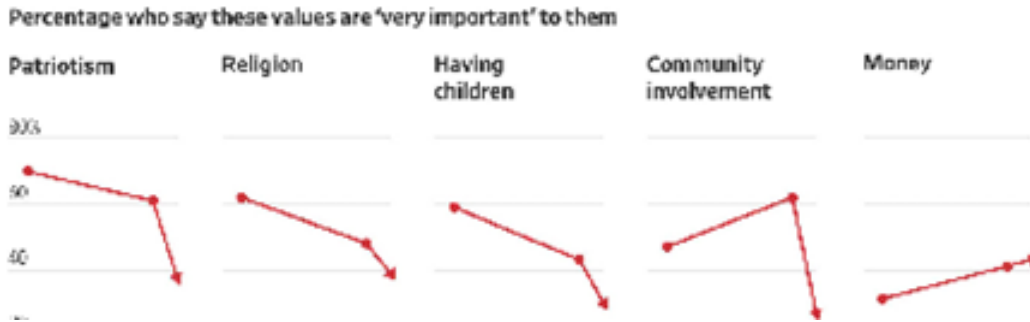
Get Serious: About Purpose

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This is a guest post to The Free Press magazine by Katherine Boyle that struck a gong as I read it. What she terms 'purpose' I call 'mission' and though I have not always been as attentive to mine, it defines what I see as value.

I don't know who Ms. Boyle is, but instinctively I feel she's put her finger on the most critical challenge we as a people face. What will it take to regain our sense of purpose?

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We have become a treatment-resistant Prozac Nation. But the practice of believing in something—anything—can pull us out.

<https://bit.ly/40SHdda>

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