Ode to E Pluribus Unum for Sunday August 27 2023

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Half Dome in Bold Relief

Photograph by Jeff Boyce

The plutonic batholith at the eastern end of Yosemite Valley in Yosemite National Park, California is named for its distinct shape. Standing at nearly 8,800 feet above sea level, Half Dome is composed of quartz monzonite, an igneous rock that solidified several thousand feet within the Earth. At its core are the remains of a magma chamber that cooled slowly and crystallized beneath the Earth's surface. The solidified magma chamber was then exposed and cut in half by erosion, therefore leading to its geographic name.

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In Search of Sharks

Join shark enthusiast Callum Evans on his journey to find the lesser-known shark species living in South Africa's productive kelp forests.

https://bit.ly/3XnxGKh

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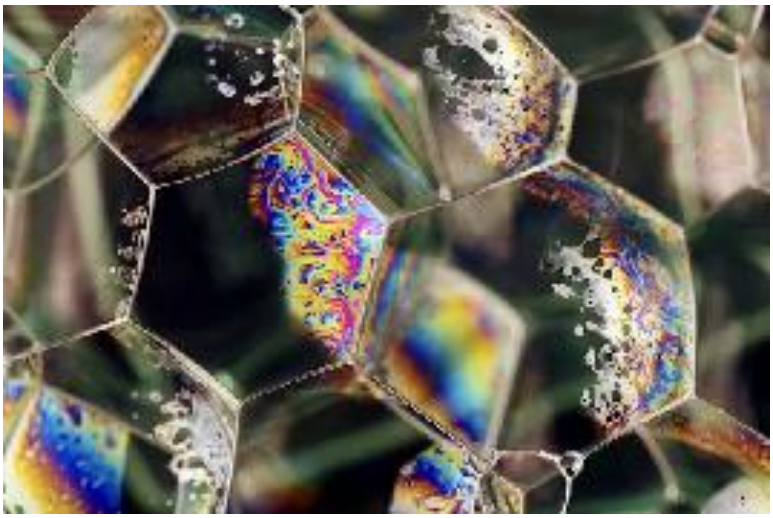
Why Kids Really Need Math

A mathematician explains how math is everywhere – from soap bubbles to Pixar movies



Math helps explain the shapes of bubbles and the reason they naturally pack together without any gaps.
Adrienne Bresnahan/Moment via Getty Images

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Harvard Report: Loneliness in America

How the Pandemic Has Deepened an Epidemic of Loneliness and What We Can Do About It

The global pandemic has deepened an epidemic of loneliness in America.

Our report suggests that 36% of all Americans—including 61% of young adults and 51% of mothers with young children—feel "serious loneliness." Not surprisingly, loneliness appears to have increased substantially since the outbreak of the global pandemic.

The report also explores the many types of loneliness, various causes of loneliness, and the potentially steep costs of loneliness, including early mortality and a wide array of serious physical and emotional problems, including depression, anxiety, heart disease, substance abuse, and domestic abuse. While Americans clearly need to adopt distancing measures to curb the spread of the novel coronavirus, the report authors argue that we also must take steps to alleviate loneliness, particularly for the populations the survey suggests are most affected.

The report is based on an online survey of approximately 950 Americans in October 2020. Because of certain data limitations, the data should be considered preliminary. More information is available in the report's methodology section.

READ THE REPORT

"As a society, we do little to support emerging adults at precisely the time when they are dealing with the most defining, stressful decisions of their lives related to work, love, and identity. Who to love? What to be?"

Key findings

In our recent national survey of American adults, 36% of respondents reported serious loneliness—feeling lonely "frequently" or "almost all the time or all the time" in the four weeks prior to the survey. This included 61% of young people aged 18-25 and 51% of mothers with young children.

43% of young adults reported increases in loneliness since the outbreak of the pandemic. About half of lonely young adults in our survey reported that no one in the past few weeks had "taken more than just a few minutes" to ask how they are doing in a way that made them feel like the person "genuinely cared."

Young adults suffer high rates of both loneliness and anxiety and depression. According to a recent CDC survey, 63% of this age group are suffering significant symptoms of anxiety or depression.

"We need to return to an idea that was central to our founding and is at the heart of many great religious traditions: We have commitments to ourselves, but we also have vital commitments to each other, including to those who are vulnerable."

Key recommendations

Providing people with information and strategies, including public education campaigns, that can help them cope with loneliness, including strategies that help them identify and manage the self-defeating thoughts and behaviors that fuel loneliness.

Building not just our physical but our social infrastructure at every level of government and in our communities. We need to begin reimagining and reweaving our social relationships in health care, schools, and many other institutions.

Working to restore our commitments to each other and the common good to renew a founding promise of this country: that we have commitments to ourselves, but we also have vital commitments to each other, including to those who are vulnerable.

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Cybersickness, the Common Virtual Reality Side Effect

treedrop.com

Cybersickness affects more than half of those who use virtual reality experience to some degree. Here's what educators need to know about cybersickness and how to prevent it.

https://bit.ly/45jQe1g

This is aimed at the classroom but the situation applies to all users.

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The Floor is Lava

How concrete, asphalt and urban heat islands add to the misery of heat waves

During heat waves, a substantial amount of the sun's energy is absorbed and reflected by surfaces exposed to its rays, leading to their temperatures increasing significantly. These warm surfaces then transfer their heat to the surrounding air, increasing the overall air temperature. While some permeable and moist surfaces, like grass or soil, absorb less heat, other construction materials like asphalt or concrete are capable of absorbing as much as 95% of the sun's energy, which is then radiated back into the surrounding atmosphere.

https://bit.ly/3OQ0Sa7

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Flash Mob at the Bank of America Tower

https://youtu.be/rq9TgLE7ePw?t=1

This makes me very very happy.

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The secret colony

As with many seabirds, I smell the gannets.

Words & photography by Rebecca Gibson

A combination of fish and white guano spattered on rocks produces a heady aroma. Closer to the cliffs, smell blends to sound and squawking grows louder with each step. Six gannets appear just a few metres away and I raise my camera to take a photo.

https://bit.ly/45Gp8kP

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Are Colleges Spending Money They Don't Have?

The price of college is rising, and for once, we can't blame inflation. Spending increased by 38% at the median flagship school (the best known and usually the oldest public university in each state) between 2002 and 2022—and they passed the tab to students, contributing to the $1.6 trillion student debt crisis, according to the Wall Street Journal's analysis of the 50 schools' financial statements.

Driving the increase: Over the 20 years analyzed, the median flagship's salaries and benefits rose by ~40%, spending on athletic coaches jumped by 50%, and millions of dollars were pumped into new construction and renovations, according to data the WSJ analyzed from the Knight-Newhouse College Athletics Database. Administrative costs have also become a greater share of institutional spending, per US News and the National Center for Education Statistics.

But that shiny new student union and all those higher salaries don't pay for themselves. To afford them, every school in the Wall Street Journal's analysis increased tuition and fee revenue per student by double digits from 2002–2022:

At the University of Oklahoma, tuition and fees per student rose 166% in the two decades analyzed.

Penn State, the most expensive flagship state school, costs the average student nearly $27,000 a year.

Big picture: Schools are spending so much because there's no one to stop them. Economist James V. Koch found that trustees approve 98% of cost-increasing proposals at large public universities, and Holden Thorp, former chancellor of the University of North Carolina at Chapel Hill, told the WSJ that universities are just "devouring money."

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Even 4,000 Steps a Day Can Have Big Health Benefits

But the more you walk, the better off you'll be.

Credit...Yana Paskova for The New York Times

Exercise scientists long ago debunked the notion that you need to hit 10,000 steps each day to stay healthy and live longer. Even a little movement is good, they argue, though more is better. Now, a new study underscores that people can reap significant benefits from a comparatively small number of daily steps.

Researchers analyzed 17 studies that looked at how many steps people took, typically in a weeklong period, and followed up on their health outcomes after around seven years. They concluded that a habit of walking just under 4,000 steps per day reduced the risk of dying from any cause, including from cardiovascular disease.

That translates into a 30- to 45-minute walk, or roughly two miles, although it varies from person to person, said Dr. Seth Shay Martin, a cardiologist at Johns Hopkins Medicine and an author of the study. But the more steps you take, the better off you are: Mortality risk decreased by 15 percent with every additional 1,000 steps participants took.

"It's the best medicine we can recommend: Just going out for a walk," said Dr. Randal Thomas, a preventive cardiology specialist at the Mayo Clinic who was not involved with the study.

The study could not definitively prove whether the steps themselves decreased the risk of developing diseases and dying, or if people who tend to be healthier anyway also get more steps in throughout the day. And because the researchers combined data across studies to determine that 4,000-step target, it may not confer the same benefit for every person, said Jennifer Heisz, an associate professor at McMaster University and the author of "Move the Body, Heal the Mind," who was not involved in the study.

"I wouldn't want people to look at that as a magical number, that you must be above that exact step count," Dr. Martin said. "It's more so that more is better."

That principle is already well established in exercise research, said Dr. I-Min Lee, a professor of medicine at Harvard Medical School and an expert on step counts and health, who was also not involved with the study. But the new research emphasizes that fitness is not "all or nothing," she said: Every little bit of exercise helps. The small snippets of movement built into our day — trailing from the bedroom to the bathroom, darting out to get coffee — add up and make a difference, she said.

But people who don't consider themselves to be active, or who may struggle to exercise because of chronic conditions, may underestimate the value of the movement they get, Dr. Heisz said. Taking an extra loop around the block, or stepping out for a 10-minute walk break, can have a big impact.

People who are at the high end of the step counts in these studies are likely already exercising, whether they're running or playing sports, Dr. Lee said; it is those who currently get few steps who could benefit most from moving more.

To incorporate that extra exercise, people can start by evaluating their baseline steps, either with a fitness tracker or a step counter built into a smartphone, and think about how to add just one walk into their day, Dr. Martin said. That can mean taking a meeting on the phone while walking instead of doing a video call, parking your car farther away or bringing your kids to the park and chasing them around, he suggested.

"People think, 'Oh, well, this isn't going to get me to those 10,000 steps, I'm not even close, so why bother?'" Dr. Heisz said. "It's a discouraging thing. But saying and keeping this mantra that some is better than none, I think you really can get mental health and physical benefits from just short, brief movement breaks."

By Dani Blum for The Wall Street Journal'

If WSJ says so it must be true

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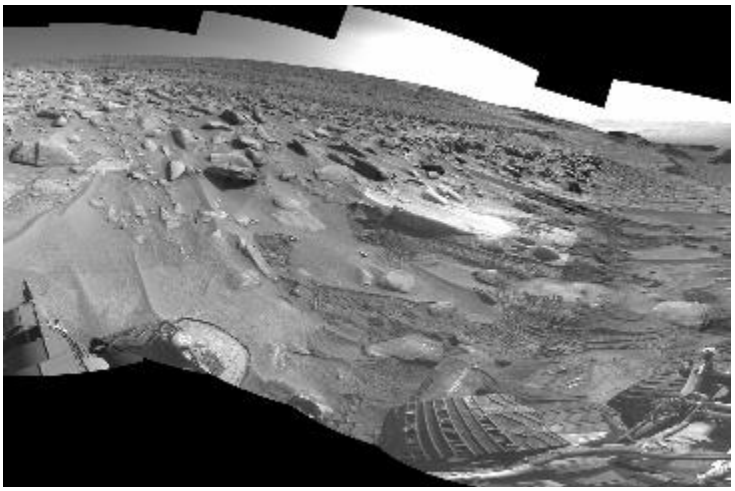
Curiosity Rover Faces Its Toughest Climb Yet on Mars



Shortly before the rover's 11th anniversary on the Red Planet, its team helped guide it up a steep, slippery slope to examine meteor craters.

https://bit.ly/455MnVm

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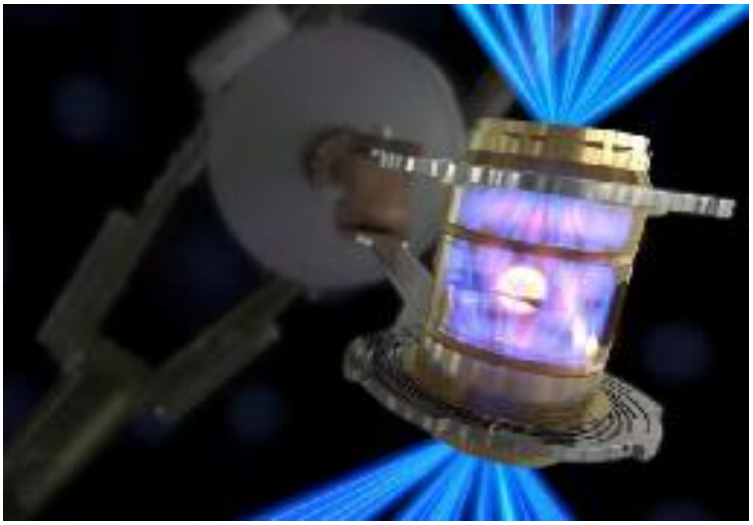
Physicists Achieve Fusion with Net Energy Gain for Second Time



Initial data shows an energy output greater than 3.5 megajoules.

https://bit.ly/3s5u18j

Here's a writeup of the previous event.

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Beethoven: Piano Concerto Number 4

Hélène Grimaud: Beethoven - Piano Concerto No. 4, Op. 58 (Orchestre de Paris, Christoph Eschenbach)

https://youtu.be/8siki1iGkU0

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The Cuttlefish Spectacle

In South Australia, the Edges of Earth expedition team explores the giant cuttlefish mating season, one of nature's greatest spectacles.

https://bit.ly/47zNy0U

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Imaging Multiple Sclerosis

In a Stanford Medicine-led study, researchers found a molecular signal that could help confirm diagnosis of MS early and dramatically improve treatment through sensitive, real-time monitoring of patients' therapeutic response.

https://bit.ly/45jQe1g

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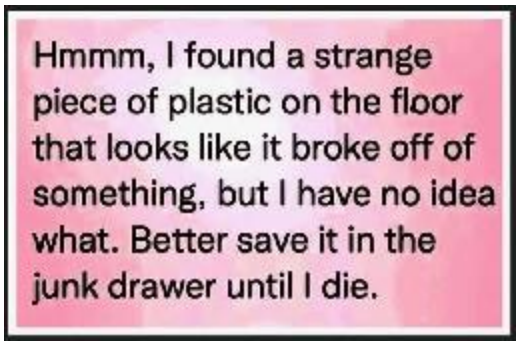

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How Money Laundering Actually Works

Robert Mazur is a former government agent who investigated drug-money laundering for the US Drug Enforcement Administration, the Internal Revenue Service intelligence division, and the Customs Service. While deep undercover in hot spots such as Florida, Colombia, and Panama, Mazur successfully infiltrated criminal rings and cartels, including Pablo Escobar's, by posing as a wealthy, mob-connected businessman. He helped manage the illicit fortunes of the Medellín and Cali cartels while gathering evidence that would lead to some of the largest money-laundering prosecutions in history.

https://youtu.be/R5FSXCYrlt0

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Digital Maps of the Ancient World

https://www.facebook.com/hashtag/ancientmaps

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Better They Said It Than I

Sometimes, when I look at my children, I say to myself, 'Lillian, you should have Remained a virgin.'
Lillian Carter (mother of Jimmy Carter)

I had a rose named after me and I was very flattered. But I was not pleased to read the description in the catalogue: - 'No good in a bed, but fine against a wall.'
Eleanor Roosevelt

Last week, I stated this woman was the ugliest woman I had ever seen. I have since been visited by her sister, and now wish to withdraw that statement.
Mark Twain

The secret of a good sermon is to have a good beginning and a good ending; And to have the two as close together as possible.
George Burns

Santa Claus has the right idea. Visit people only once a year.
Victor Borge

Be careful about reading health books. You may die of a misprint.
Mark Twain

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Scientists Uncover Hidden Math That Governs Genetic Mutations.

How much damage can a genetic sequence take before it can't do its job? A basic math equation holds the answer.
(Image credit: Muhammet Camdereli via Getty Images)

https://bit.ly/3OCudDM

I'd like help not only in understanding this, but even more importantly accepting it

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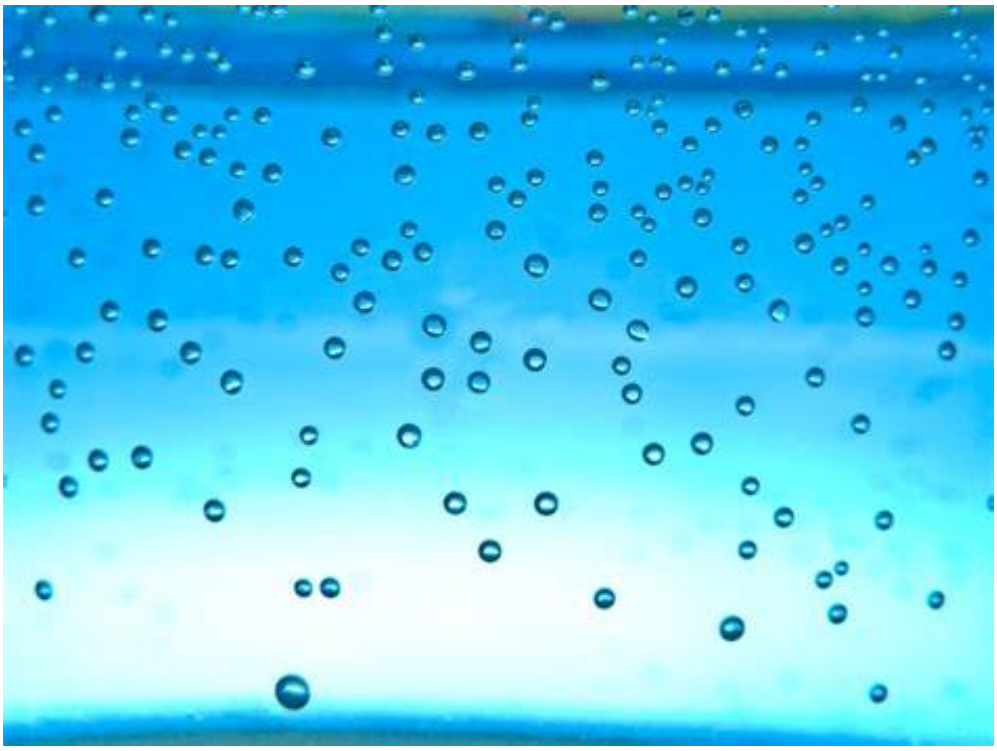
The Bubbly Chemistry Behind Carbonated Beverages



When you open a bottle or can, the pressure above the carbonated liquid drops to match the pressure outside of the bottle or can. The pressure release results in a

hissing sound, and you see bubbles rising in the liquid as the H_2CO_3 converts back to CO_2 and that gas escapes to the surface.

https://bit.ly/44iFG0N

Pop-pop, fizz-fizz…H_2CO_3, reverts to what CO_2 is.

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Daytime Polarization Patterns Point the Way to True North

Overlay of a star-trail photograph, in which stars (white arcs) appear to rotate around the north celestial pole, and a numerical simulation of time-invariant polarization lines (dark lines) as measured by a polarimetric camera during daytime.
Courtesy: Thomas Kronland-Martinet (CNRS/Aix-Marseille University), and ESO/B Tafreshi (twanight.org)

Can you tell which way is north just by looking at the daytime sky, without using a compass or GPS or even knowing the position of the Sun? Thanks to a new optical method, the answer could soon be "yes". Developed by researchers at Aix-Marseille University in France, the method works by analyzing the polarization patterns in scattered daylight. As well as aiding the development of alternative navigation techniques, it could help us understand how animals use physical phenomena to migrate.

At present, there are three main ways of identifying True North. One is to use the positions of the stars, as navigators have done throughout human history. Another is to rely on magnetic compasses. The third, most recent, method involves global navigation satellite systems such as GPS. However, each method has its drawbacks. Stars are only visible at night and in good weather. Magnetic compasses are easily affected by

magnetic interference, including from natural sources such as iron-bearing rocks. And satellite navigation systems are vulnerable to jamming and hacking.

In recent years, researchers have turned to insects and migrating birds for fresh ideas about how to navigate using sparse magnetic and visual cues. Cataglyphis ants are known to use celestial polarization, for example, while migrating birds calibrate their internal magnetic compass by observing the rotation of stars around the celestial pole. Some birds may also use polarization to navigate during the day.

Skylight polarization

The new method, which the researchers have dubbed SkyPole, relies on skylight polarization, which occurs when particles in the atmosphere scatter light. Unlike colour or intensity, skylight polarization is invisible to the human eye, and it produces a distinct pattern that depends on the Sun's position with respect to an observer on the Earth's surface.

Since the Earth rotates around a north–south axis, an observer in the northern hemisphere will, over the course of a day, see the Sun trace out a path around the north celestial pole – that is, the point in the sky that corresponds to the intersection between the Earth's rotational axis and the celestial sphere. Patterns in the degree of daylight polarization will therefore rotate around this pole during the day, just as constellations revolve around the North Star at night.

"The state of polarization remains constant at any time of the day at the north celestial pole," explains Thomas Kronland-Martinet, a member of the study team and a PhD student at Aix-Marseille's Institut des Sciences du Mouvement (ISM) and the Institut Matériaux Microélectronique Nanosciences de Provence (IM2NP). "It is the only point in the sky to have this property."

Using the skylight pattern as a navigational cue

By collecting images of polarization patterns over time with a polarimetric camera, the researchers were able to pinpoint the north celestial pole at the intersection of "polarization invariances" – that is, the polarization measured between two distinct time periods.

"Contrary to previous studies, we do not compute the Sun's position in our method, but directly use the skylight pattern as a navigational cue," Kronland-Martinet explains. "More precisely, we consider time variation of the skylight polarization, which allows us to easily calculate the celestial pole's position without having to process complex trigonometry calculus. What is more, we need no other information than polarization images, making our method very simple."

According to the researchers, SkyPole could be used to calibrate compasses for inertial navigation systems that are subject to drift over time. It could also aid marine navigation by, for example, enabling the development of automatic polarimetric sextants. According to Kronland-Martinet, it could even become an alternative to satellite-based navigation. "While highly precise, [satellite navigation systems] can be easily blurred and spoofed and might not be the best candidate for when robust information is needed – for example, in autonomous vehicles," he tells Physics World.

At present, SkyPole's long data collection times make it unsuitable for instantaneous global positioning, but members of the team are exploring ways to make it faster. They report their work in PNAS.

Isabelle Dumé for Physics World

Do you think this and a good clock might replace the GPS constellation?

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Ingenious Construction Workers That Are on Another Level

https://bit.ly/447HREF

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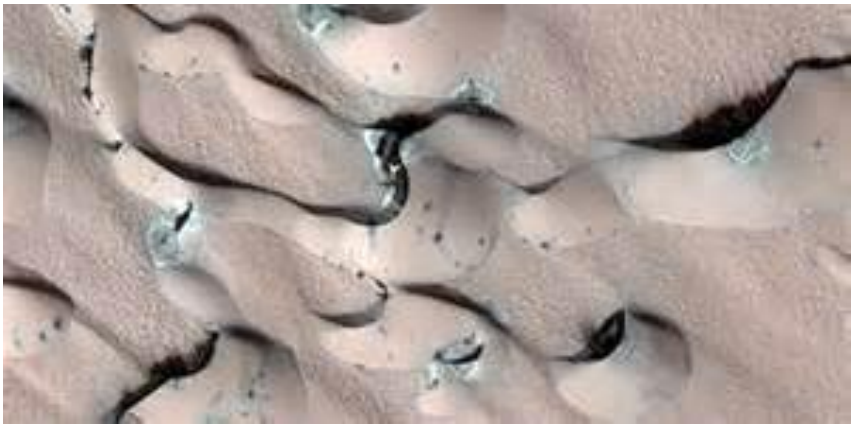
Dune Patterns Reveal Environmental Change on Earth and… Other Planetary Bodies as Well



Dunes on Mars show changing climate conditions.

Researchers have analyzed the shifting patterns of entire dune fields on Earth and Mars, as seen from orbit, and found they are a direct signature of recent environmental change. This new tool can be applied anywhere with dunes, such as Mars, Titan, and Venus.

https://bit.ly/3KKeOQm

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The Alan Parsons Project - Games People Play

An English audio engineer, songwriter, musician and record producer gained fame as a badminton player before settling into his music career.

In Games People Play, Parsons used an instrument he invented called a Projectron on this track. Similar to a mellotron, it used tape loops to play back samples. A studio

boffin with high technical acuity, Parsons cut his teeth doing engineer work at Abbey Road Studios, where he worked with The Beatles and Pink Floyd.

https://www.youtube.com/watch?v=SLi7Ljcy6n8

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Marine Lt. Col. Jasmin "Jaws" Moghbeli Off to Space

This former Marine Cobra pilot saw combat in Afghanistan. Now, she's commanding her first space mission.

https://bit.ly/45Xg1fJ

Sierra Hotel

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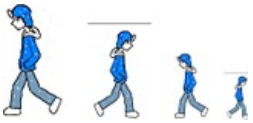
My Walking Thoughts



For Sunday August 27 2023

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Last weekend was the annual Wings Over Camarillo Airshow, shortened to a single day because of the threatened Hurricane. Though it never really came we did get an inch of pitty-pat rainfall on Sunday, so it was probably a wise decision. Instead of the thunder of high-powered aircraft, nearby Ojai (where I live) received a swarm of earthquakes, -- the largest of which was 5.1 on the Richter Scale that rattled things a bit--but I've heard of no significant damage.

Anyway, the Saturday airshow was, in my opinion, the best ever with wonderful displays, exciting flight demonstrations, a car show, and to me the ability to meet and speak with Retired Navy Captain, Royce Williams, who at 97 is every bit the amazing man you could possibly expect of a genuine American hero. What made the opportunity all the better was that two weeks before, I had profiled him in my weekly newsletter, Ode to E Pluribus Unum. Here's the gist:

'Operation Just Reward': A tale for the ages

By Christian Josi

70 years ago this Nov. 18, one of the greatest and certainly the hardest-won dogfighting triumphs in military aviation history took place in international waters off the Korean coast. On that day, 27-year-old Royce Williams found himself suddenly alone in the sky in his F9F-5 Panther, staring down seven superior Russian MiG-15s who had come to eat his lunch and move on to sink his nearby carrier, the USS Oriskany.

Grumman F9F-5 Panther

By any clear-headed calculation, lunch-eating is exactly what should have happened at that moment. Except it didn't. What did ensue was a fierce 35-minute dogfight (note that most last mere seconds, and in exceptional cases have lasted up to five minutes) which ended with Williams safely back on the deck of the now-safe Oriskany after a dicey landing, 263 bullet holes and a 37-millimeter shell gash in his crippled Panther.

It didn't end quite as well for at least for six of the seven MiGs that set out to dispatch the outgunned American, as only one of them returned to base.

Though one of the most extraordinary feats in the history of military aviation had just happened, there was no celebration and no dramatic recounting from Capt. Williams to his shipmates. Quite the contrary. A frank conversation and handshake with his admiral was intended to be the last time the mission would be spoken of.

Turns out the circumstances and detail surrounding the dogfight, which ended so badly for the Soviets, contained a level of sensitivity that necessitated immediate top-secret classification. No one outside of a very small cadre of individuals knew a whiff of it for over 50 years until the Soviet Union fell and it was reported out of their archives. One of those in the loop, Dwight D. Eisenhower, was president-elect of the United States at the time. Eisenhower summoned Capt. Williams for a visit and a drink during a dramatic pre-inaugural fact-finding visit to Seoul because he wanted to meet the young aviator. Yet even in that rarified setting, the mission was not discussed.

When the U.S. government finally declassified it all in December of 2017, no one was more surprised than Capt. Williams' wife and his brother — a fellow elite military aviator with whom he shared a long-running friendly pilots' rivalry.

Capt. Williams had gone half a century without breaking his promise to his admiral. Half a century keeping secret something that could bring him immediate fame, fortune and a place among the greatest aviators in history. As 146 of his fellow Korean War heroes were honored and celebrated with well-deserved Medals of Honor, he was content with his Silver Star, knowing full well that an upgrade was out of the question for national security reasons.

But as Mr. Issa says, "America owes Williams a debt of gratitude that can never be repaid, and we won't stop fighting until he is at least given the proper recognition he has not sought but richly deserves."

Thanks to Mr. Issa's laudable efforts to force the issue (remember, Capt. Williams is 97 and we don't have all the time in the world here) and thanks to the longtime determination of his "Operation Just Reward" comrades plus the endorsements of over 100 retired general officers and admirals, The American Legion, Distinguished Flying Cross Society, Special Operations Association of America and others, the most deserved and overdue military honors upgrade of all time may well be imminent.

Let's make it so. America could use a feel-good moment, and if anyone deserves a Hollywood ending it's Capt. E. Royce Williams. Let's challenge Congress to come together immediately upon return from the July 4 recess and pass H.R. 5909,

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Wings Over Camarillo 2024 is scheduled to take place next August 17 & 18, so add it to your calendar and make plans to show up.