

Ode to E Pluribus Unum for September 25 2022



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The Lagoon Nebula without Stars



Image Credit & Copyright: Sameer Dhar

Ridges of glowing interstellar gas and dark dust clouds inhabit the turbulent, cosmic depths of the Lagoon Nebula.

Also known as M8, the bright star forming region is about 5,000 light-years distant. But it still makes for a popular stop on telescopic tours of the constellation Sagittarius, toward the center of our Milky Way Galaxy.

Dominated by the telltale red emission of ionized hydrogen atoms recombining with stripped electrons, this stunning, deep view of the Lagoon is nearly 100 light-years across. Right of center, the bright, compact, hourglass shape is gas ionized and sculpted by energetic radiation and extreme stellar winds from a massive young star.

In fact, although digitally removed from the featured image, the many bright stars of open cluster NGC 6530 drift within the nebula, just formed in the Lagoon several million years ago.

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Ghostly Rings of Neptune Shine in new JWST Image



*Neptune and its rings glow eerie white in this new James Webb Space Telescope images
(Image credit: NASA/ESA/CSA and STScI)*

In the new picture, our solar system's eighth planet Neptune shimmers like a glorious crystal ball, with a stack of gauzy rings wrapped magically around it.

<https://bit.ly/3Lyn8SJ>

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Jester's Cap



From Henry Beard's *Poetry for Cats*....

Kubla Kat

By Samuel Taylor Coleridge's Cat

In Xanadu did Kubla Kat

A splendid sofa-bed decree
With silken cushions soft and fat
A perfect feline habitat
Set on a gilt settee.

And twice ten yards of fine brocade
The golden ottoman arrayed:
And there were pillows packed with airy down
Hand-plucked from sacred swans in Thessaly;
And lace draped from a massive silver crown
Adorned the ornate rosewood canopy.

And ah! that seat effused a potent lotion
Pressed from the leaves of rare hypnotic herbs
Sweet source of wondrous dreams that naught disturbs.
Oh magic mint! Sublime and blissful potion!
The fragrance of that place of slumber
Floated on the balmy breeze
Drawing kittens without number:
Persians, Manx, and Siamese.
It was a miracle of opulence,
A shining sofa-bed with catnip scents!

A songbird with a small guitar
In a vision I once did note:
It was a wise and winsome owl,
Sitting in a pea-green boat,
Singing a song to me,
And hand in hand, on the edge of the sand,
We danced by the light of the moon.

And when I arose from my languorous swoon
I build that divine divan,
That cushy couch! that smell of spice!
And all who saw should stop and yawn,
And none would cry, Get Down! Begone!
The lights are dimmed, the curtains drawn.
Tiptoe round him, still as mice,
And let him catnap on his bed,
For he on catnip leaves has fed,
And lapped the milk of Paradise.

Or....

To go outside, and there perchance to stay
Or to remain within: that is the question:

Whether 'tis better for a cat to suffer
The cuffs and buffets of inclement weather
That Nature rains on those who roam abroad,
Or take a nap upon a scrap of carpet,
And so by dozing melt the solid hours
That clog the clock's bright gears with sullen time
And stall the dinner bell. To sit, to stare
Outdoors, and by a stare to seem to state
A wish to venture forth without delay,
Then when the portal's opened up, to stand
As if transfixed by doubt.

To prowl; to sleep;
To choose not knowing when we may once more
Our readmittance gain: aye, there's the hairball;
For if a paw were shaped to turn a knob,
Or work a lock or slip a window-catch,
And going out and coming in were made
As simple as the breaking of a bowl,
What cat would bear the household's petty plagues,
The cook's well-practiced kicks, the butler's broom,
The infant's careless pokes, the tickled ears,
The trampled tail, and all the daily shocks
That fur is heir to, when, of his own will,
He might his exodus or entrance make
With a mere mitten? Who would spaniels fear,
Or strays trespassing from a neighbor's yard,
But that the dread of our unheeded cries
And scratches at a barricaded door
No claw can open up, dispels our nerve
And makes us rather bear our humans' faults
Than run away to unguessed miseries?

Thus caution doth make house cats of us all;
And thus the bristling hair of resolution
Is softened up with the pale brush of thought,
And since our choices hinge on weighty things,
We pause upon the threshold of decision.

And that doesn't even get us to

Mots d'heure: gousses, râteaux, the first of which begins

Un petit, d'un petit s'étonne au halle
Un petit, d'un petit, ah! degres te fallent....*

You have to say these out loud to get the jokes.

* Footnote from the text: "The inevitable result of a child marriage."

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Addendum to Last Week's Walking Thoughts

All Bulldogs Matter

All Bulldog Matter, no matter if they come from a breeder, a shelter, rescue or a friend.

 by Southern California Bulldog Rescue Inc. 



My daughter Jenn arrived on the planet loving bulldogs and wanted to make sure they received recognition from the Ode. Her school days' bedroom wall had an annotated poster of 'A Bulldog and all of its parts.' That sufficed for sex education in those days.

Meanwhile I await similar input from proud corgi and Siberian husky owners

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Meet a Merciless' Sea Monster with Broken Teeth



<https://bit.ly/3R19hGI>

The extinct predator, named *Thalassotitan atrox*, grew to about 30 to 33 feet (9 to 10 meters) long and likely fed on any other marine reptiles it came across, including fellow mosasaurs. Smaller than two meters, you and I would not make for a light snack.

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More on the Gaels



Mick says to Paddy: "Close your curtains the next time you're making love to your wife. The whole street was watching and laughing at you yesterday."
Paddy says: "Well the joke's on them because I wasn't even home yesterday."

Paddy & Mick find three grenades, so they decide to take them to a police station.
Mick: "What if one explodes before we get there?"
Paddy: "We'll lie and say we only found two."

Mick goes to the vet with his goldfish. "I think it's got epilepsy", he tells the vet.
Vet takes a look and says, "It seems calm enough to me".
Mick says, "I haven't taken it out of the bowl yet".

Paddy spies a letter lying on his doormat. It says on the envelope: "DO NOT BEND".
Paddy spends the next 2 hours trying to figure out how to pick the bloody thing up.

Paddy was driving home, drunk as a skunk, suddenly he has to swerve to avoid a tree, then another, then another. A cop car pulls him over as he veers about all over the road. Paddy tells the cop about all the trees in the road.
Cop says "For God's sake Paddy, that's your air freshener swinging about!"

Reilly went to trial for armed robbery. The jury foreman came out and announced, 'Not guilty.'
'That's grand!' shouted Reilly. 'Does that mean I can keep the money?'

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How are Injuries Converted to Regeneration Signals?



The freshwater polyp Hydra is known for its ability to regenerate. After the head or foot is removed – or both the head and the foot – Hydra is able to regenerate the missing structures, reforming fully intact organisms. The Heidelberg scientists investigated the molecular interactions that lead from damage to regeneration of the absent structures.

The picture shows a Hydra regenerate from which the head and foot were previously removed. Regeneration via recombinant Wnt led to the formation of a second head with tentacles instead of a regenerated foot.

© Anja Tursch and Thomas W. Holstein (Heidelberg University)

The phenomenon of regeneration was discovered over 200 years ago in the freshwater polyp Hydra. Until now, however, it was largely unclear how the orderly regeneration of lost tissues or organs is activated after injury. In its investigations of Hydra, an interdisciplinary research team at Heidelberg University was able to show how wound healing signals released upon injury are converted into specific signals of pattern formation and cell differentiation. Essential components are the mitogen-activated protein kinases (MAPK) and the Wnt signalling pathway – molecular mechanisms that have remained relatively unchanged throughout evolution.

The ability to regenerate varies widely in animals. Most mammals and vertebrates have only limited regeneration capacity, while basal and simple animals that emerged early in evolution, like cnidarians and planarians, can regenerate their whole body. In all cases, the process of regeneration begins with wound healing. The cells at the site of injury

proliferate and form an undifferentiated mass – a blastema – from which the missing structures are re-patterned. This activates genetic processes that also control embryonic development. To determine the molecular mechanisms involved, the research team led by Prof. Dr Thomas W. Holstein studied the freshwater polyp Hydra to understand the basic features of this activation of regeneration.

The core of their investigations is the doctoral thesis of Anja Tursch. She repeated the key experiment of Geneva naturalist Abraham Trembley (1710 to 1784) which led him to discover the regeneration phenomenon. The Hydra polyp is bisected, prompting the upper half to regenerate a new “head” and the lower half a new “foot” – hence totally different body parts can grow from the exact same tissue at the cut surface in the middle. Building on their previous work on Hydra regeneration, the researchers at the Centre for Organismal Studies (COS) of Heidelberg University have now shown how this is possible.

Regardless of where it occurs, any damage triggers nonspecific signals for an injury response, i.e. wound healing, via calcium ions and the production of reactive oxygen species. The signals are transmitted intracellularly by three mitogen-activated protein kinases – p38, JNKs, and ERK. Activation of these three molecules is required for both head and foot regeneration. Wnt signalling pathways are then activated that are important during embryonic development for the formation of rudimentary organs and the body axis. The generic signals of wound healing are thus transferred into position-specific signals of patterning and cell differentiation for regeneration.

“Our experiments show that the Wnt signalling pathway is a main component of the initially general injury response and, depending on signal strength, directs the tissue toward head or foot development,” explains Prof. Holstein. This is why, in the case of MAPK inhibition, the otherwise absent regeneration can be induced by artificially generated, recombinant Wnt proteins. “It was also surprising that in middle body parts that had both head and foot removed, heads can be induced at both ends in this way,” adds Dr Suat Özbek, a member of Prof. Holstein’s “Molecular Evolution and Genomics” research group at the COS.

Wnt/ β -catenin, one piece of the Wnt signalling pathway, was already known to encode positional information for new head structure formation. In collaboration with mathematicians led by Prof. Dr Anna Marciniak-Czochra, the research team of Prof. Holstein and Dr Özbek developed a model that shows how basal positional information in the tissue transforms the initially undifferentiated injury response into a differential patterning process via the Wnt signalling pathway. “Because MAPKs and Wnts are highly evolutionarily conserved, this mechanism is likely deeply embedded in our genome, which is important for regenerative processes in vertebrates and mammals as well,” stresses Thomas Holstein.

The research was done under the auspices of the “Mechanisms and Functions of Wnt Signaling” Collaborative Research Centre (CRC 1324) funded by the German Research Foundation. The results were published in the “Proceedings of the National Academy of Sciences” (PNAS).

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Got Ants on Your Kitchen Counter?

The planet harbors about 20 quadrillion ants. That's 20 thousand million millions, or in numerical form, 20,000,000,000,000,000 (20 with 15 zeroes) so maybe a few hundred of the critters attacking the sugar bowl isn't an earth-shaking event.



A purple Rhytidoponera ant carries her prey between her jaws. Many ants serve as predators that help keep populations of other insects in check.

Francois Brassard

<https://bit.ly/3R3a88y>

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Space Force Reveals Official Song: "Semper Supra"



USAF

"Semper Supra" was named after the USSF motto, which is Latin for "Always Above." It was created to capture the esprit de corps of both current and future Guardians, and intends to bring together service members by giving them a sense of pride.

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

I'm having a hard time keeping my feet from tapping.

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The Burning Man Exodus. 10 Hours Long Traffic Jam.



If I ever needed a solid reason for never going to burning man this would do.

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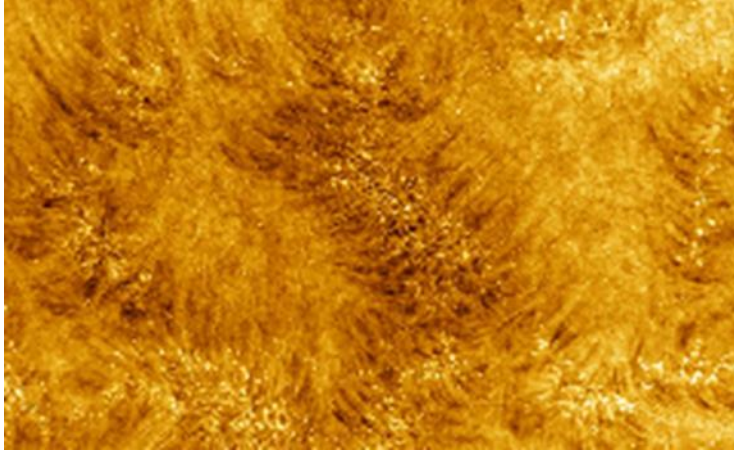
Sly Insects Show Off Their Expert Camouflages



<https://bit.ly/3qk10BK>

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World's Largest Solar Observatory Releases First Images of Sun's Atmosphere



The Daniel K. Inouye Solar Telescope is the largest telescope built specifically to study the Sun, and the detail in its images is amazing

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

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SockGate Rocks the Chess World



Oh my. Do you need to leave shoes and socks at the door before your chess match?

<https://deadspin.com/how-do-you-cheat-in-live-chess-1849521544>

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LA to DC in an Hour? Ancient History

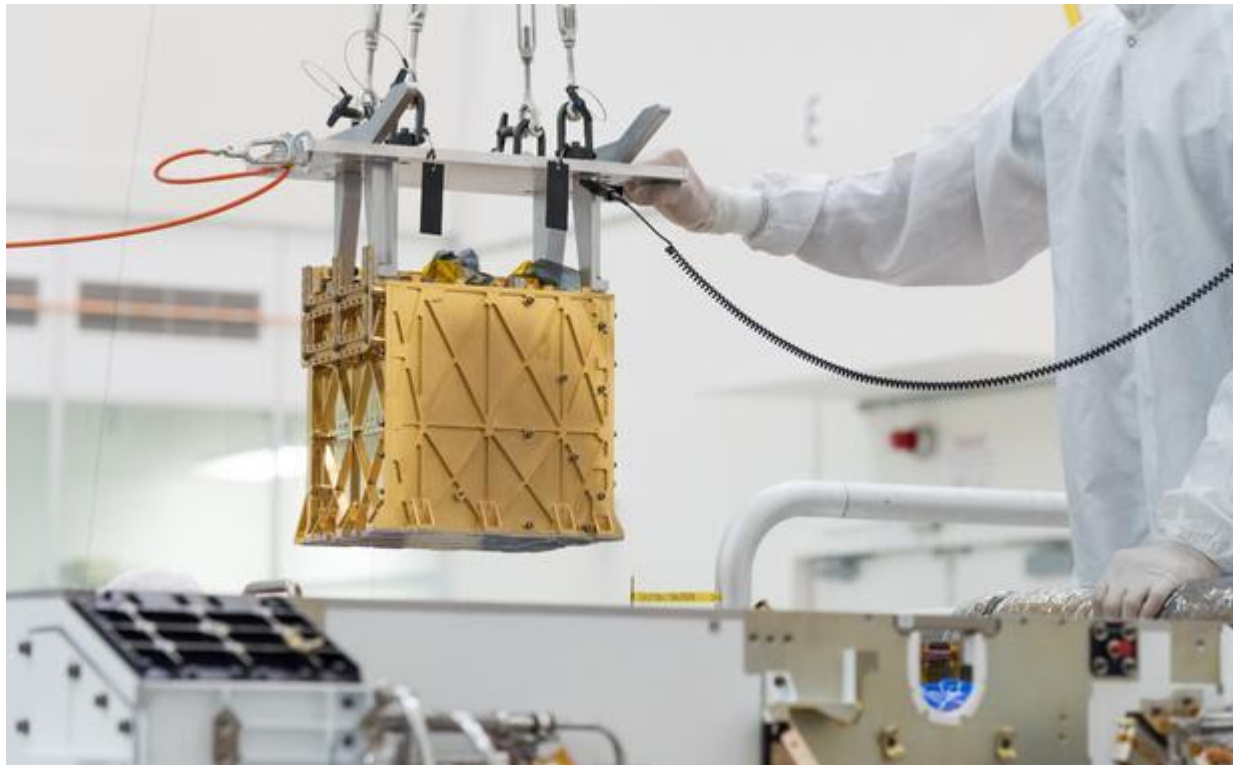


<https://www.19fortyfive.com/2022/09/the-sr-71-blackbird-was-so-fast-it-went-from-los-angeles-to-washington-d-c-in-an-hour/>

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What is the MOXIE Experiment?

By Jacob Koshy; The Hindu news@newsalerth.thehindu.com - Sep 7, 2022,



The Mars Oxygen In-Situ Resource Utilization Experiment, or MOXIE, was launched as part of NASA's Perseverance rover mission and has been successfully making oxygen from the planet's carbon-dioxide-rich atmosphere since it landed there in February 2021.

MOXIE was able to produce oxygen on seven experimental runs, in a variety of atmospheric conditions, including during the day and night, and through different Martian seasons. In each run, the instrument reached its target of producing six grams of oxygen per hour — about the rate of an average tree on Earth.

The big picture is that a scaled-up version of MOXIE could be sent to Mars ahead of a human mission, to continuously produce oxygen at the rate of several hundred trees. At that capacity, the system should generate enough oxygen to both sustain humans once they arrive, and fuel a rocket for returning astronauts back to Earth.

MOXIE's oxygen production on Mars also demonstrates success in being able to harvest and using a planet's materials (in this case, carbon dioxide on Mars) to make resources (such as oxygen) that would otherwise have to be transported from Earth.

MOXIE works by first drawing the Martian air in through a filter that cleans it of contaminants. The air is then pressurized, and sent through the Solid OXide Electrolyzer (SOXE) that electrochemically splits the carbon dioxide-rich air into oxygen ions and carbon monoxide.

The oxygen ions are then isolated and recombined to form breathable, molecular oxygen, or O₂, which MOXIE then measures for quantity and purity before releasing it harmlessly back into the air, along with carbon monoxide and other atmospheric gases.

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Vanished Arm Of Nile Helped Ancient Egyptians Transport Pyramids Materials

By Owen Jarus

The ancient branch is long gone.



*New finds shed light on the Nile's water level at the time the Giza Pyramids were built.
(Image credit: JimPix via Getty Images)*

When the ancient Egyptians built the pyramids of Giza around 4,500 years ago, the Nile River had an arm — one that has long since vanished — with high water levels that helped laborers ship materials to their construction site, a new study finds.

The discovery builds on previous archaeological and historical findings that the Nile had an extra arm flowing by the pyramids. But now, by analyzing ancient pollen samples taken from earthen cores, it's clear that "the former waterscapes and higher river levels" gave the Giza Pyramid's builders a leg up, a team of researchers wrote in a paper published Aug. 29 in the journal the Proceedings of the National Academy of Sciences(<https://www.pnas.org/doi/abs/10.1073/pnas.2202530119>).

The research sheds light on how the pyramids — royal tombs for the pharaohs Khufu, Khafre and Menkaure — rose to monumental heights. Their towering stature was achieved, in large part, thanks to the Nile's now-defunct Khufu branch, which "remained at a high-water level during the reigns of Khufu, Khafre, and Menkaure, facilitating the transportation of construction materials to the Giza Pyramid Complex," the team wrote in their paper.

Researchers have known for decades that the long-gone Khufu branch extended up to the Giza plateau in ancient times, but the new project aimed to find exactly how the water levels had changed over the past 8,000 years.

To reconstruct the Nile's past, in May 2019 the team drilled five cores into the Giza floodplain. The researchers measured the amount of pollen found in different parts of the cores to determine how pollen levels had changed over time. Time periods when water was plentiful should have more pollen than periods that were arid, the study authors wrote.

The pollen analysis revealed that at the time the ancient Egyptians built the Giza pyramids, water was plentiful enough that the Khufu branch would have flowed near the Giza pyramids. "It was a natural canal in the time of the fourth dynasty [when the pyramids were built]," study lead author Hader Sheisha, a physical geographer at Aix-Marseille University in France, told Live Science in an email.

Sheisha noted that the water level was important for pyramid construction. "It would be very difficult if not impossible to build the pyramids without the Khufu branch and without it having a good level, which provides enough accommodation space for the boats carrying such heavy blocks of stone," she said. When exactly the branch went extinct is not certain, but the research shows that by 2,400 years ago the water level of the branch was very low.

The finds fit well with previous archaeological finds, which revealed a harbor close to the pyramids, as well as ancient papyri records that detailed workers bringing limestone to Giza via boat, the team noted in their paper.

Live Science contacted several experts not involved with the research to get their thoughts. Most were unable to comment at press time, but one who did, Judith Bunbury, a geo-archaeologist at the University of Cambridge in the United Kingdom, praised the research.

"The paper is an exciting contribution to our understanding of the dialogue between humans and their environment in Egypt within the context of changing climate," Bunbury told Live Science in an email.

Originally published on Live Science.

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Einstein's General Relativity Theory Passed Another Test

By Robert Lea

The MICROSCOPE mission tested the weak equivalence principle with free-falling objects in a satellite.



The MICROSCOPE experiment was designed to test Einstein's theory of general relativity.

(Image credit: ONERA)

Scientists have demonstrated that Einstein's theory of general relativity is correct to a remarkable degree of accuracy, despite having been around for more than a century.

<https://www.youtube.com/watch?v=Rk-TdpcyqzE>

<https://www.youtube.com/watch?v=JF04GJqJa3Y>

The team behind the research wanted to test a component of Einstein's theory of general relativity called the weak equivalence principle, which states that all objects, regardless of their mass or composition, should free-fall the same way in a particular gravitational field when interference from factors like air pressure is eliminated. To do so, the scientists measured the acceleration of free-falling objects in a French satellite called MICROSCOPE, which launched in 2016.

One of the most famous tests of the weak equivalence principle occurred during an Apollo 15 moonwalk, when astronaut David Scott dropped a feather and a geological hammer at the same time; without air resistance, both objects accelerated toward the moon's surface at the same rate. In similar style, MICROSCOPE carries free-falling test

masses made of platinum and titanium alloys. Electrostatic forces keep the test masses in the same relative positions to each other, so any difference generated in this applied electrostatic force would have to be the result of deviations in the objects' accelerations.

The team's results, which are the culmination of 20 years of research, revealed that acceleration in pairs of objects in free fall differed by no more than 1 part in 10^{15} , or 0.000000000000001, meaning they found no violations in the weak equivalence principle larger than that.

Want to know more?

<https://youtu.be/eU2hGIrBULA?t=2>

As well as placing constraints on deviations in the weak equivalence principle, the findings also disfavor any deviations in Einstein's 1915 theory of gravity, general relativity, as a whole. Scientists continue to look for such deviations because general relativity, the best description we have of gravity, doesn't jive with quantum physics, the best model we have of reality at incomprehensibly small scales.

No sign of deviation, then, means still no hint of extensions to general relativity waiting to be found that could bridge the gap to quantum physics.

"We have new and much better constraints for any future theory because these theories must not violate the equivalence principle at this level," Gilles Métris, a MICROSCOPE team member and a scientist at the Côte d'Azur Observatory in France, said in a statement (opens in new tab) from the American Physical Society, which published the research.

The fact the new research found no violation of the weak equivalence principle puts the highest constraints yet on this element of general relativity, and the results also lay the groundwork for even more sensitive tests in the future.

That's because the scientists included suggestions for how the experimental setup they used could be improved. Potential upgrades include reducing imperfections in the coating of satellites that can impact acceleration measurements as well as replacing wired systems with ones that use wireless connections, they wrote.

A satellite implementing these improvements could potentially pick up violations of the weak equivalence principle as tiny as 1 part in 10^{17} , 100 times more sensitive than MICROSCOPE. But the team predicts these improvements won't be feasible for some time yet, meaning that for now, the MICROSCOPE experiment will remain the best test of the weak equivalence principle.

"For at least one decade or maybe two, we won't see any improvement with a space satellite experiment," Manuel Rodrigues, a MICROSCOPE team member and a scientist at ONERA, a French research institute specializing in aerospace, said in the same statement.

The team's research was published Wednesday (Sept. 14) in the journal *Physical Review Letters* (opens in new tab) and a special issue of *Classical and Quantum Gravity*.

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Phyllis Latour...Super Spy



23-year-old Phyllis Latour jumps from a US Air Force bomber and parachutes into occupied Normandy to gather intelligence on Nazi positions in preparation for D-Day. She uses an entrenching tool strapped to her leg to bury her 'chute and clothes, and begins a 4 month mission of impeccable spycraft posing as a poor teenage French girl.

Latour had been trained by the British Special Operations Executive (SOE). She learned about encryption and surveillance, how to send messages in Morse code, and how to repair the wireless sets. She had to pass grueling physical tests set in the rough terrain of the Scottish highlands. She learned the techniques of close combat, and described how they were taught by a cat burglar who had been released from jail on "how to get in a high window, and down drain pipes, how to climb over roofs without being caught." Latour was determined to exact revenge against the Nazis, who had killed her godfather.

It would be a dangerous mission. Years later Latour told an interviewer "The men who had been sent just before me were caught and executed. I was told I was chosen for that area [of France] because I would arouse less suspicion." She used bicycles to tour the region, often under the guise of selling soap, and passed information to the British on Nazi positions using coded messages. Acting the part of a silly country girl, she would chatter with German soldiers. She moved constantly to avoid detection. Often she would spend nights sleeping in forests and foraging for food.

Latour developed an ingenious plan to conceal her activities. She carried her secret codes on a piece of silk, pricking each one with a pin when it had been used. She concealed the silk in a hair tie. When she was briefly detained by the Germans and subjected to search, she brazenly removed the tie and let her hair fall, to show that she

had nothing to hide. During the summer of 1944 she sent 135 coded messages, helping Allied bombers to identify German targets.

After the war, Latour married and settled in New Zealand, raising four children. Her children knew nothing about their mother's service until her oldest son discovered the information on the Internet in 2000. She was presented with the Chevalier of the Legion of Honour by the French government in 2014, as part of the 70th anniversary of the battle of Normandy. Still living in New Zealand, Latour is 101.

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How Golden Retrievers Train to Slay the Competition.



<https://youtu.be/5iTTNRE-njM>

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Erik Satie 1866-1925



Satie is praised by historians for helping to provide the pre-war pathway to minimalism in classical music. His piano compositions, most famously the *Gymnopédies* suite of 1888 and the *Gnossiennes* suite of 1893, set the tone for experimentation within the next century of composers.

Satie's love of repetition in melody and chordal changes helped to shape the foundation of the New York School (Cage, Feldman, Wolff, etc.) and West Coast minimalism (Terry Riley, Steve Reich). Even his compositional forms, such as A-B-A-B-C-B, can be seen in everything from early jazz to contemporary pop.

About 1917 the group of young composers known as Les Six adopted him as their patron saint. Later the School of Arcueil, a group including Darius Milhaud, Henri Sauguet, and Roger Désormière, was formed in his honour.

Satie was dismissed as a charlatan by musicians who misunderstood his irreverence and wit. They also deplored the nonmusical influences in his life—during his last 10 years his best friends were painters, many of whom he had met while a café pianist. Satie was nonetheless deeply admired by composers of the rank of Darius Milhaud, Maurice Ravel, and, in particular, Claude Debussy—of whom he was an intimate friend for close to 30 years. His influence on French composers of the early 20th century and on the later school of Neoclassicism was profound.

Gnossiennes 1-6 <https://youtu.be/y7kvGqiJC4g>

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How JWST Data Have Already Revealed Surprises

The first image contains a galaxy cluster's past and recent star birth in more remote galaxies



Three examples of multiply imaged galaxies — marked with white, red and yellow arrows — popped out of this small region of the first JWST image. The gravity from a foreground galaxy cluster distorted the light from these galaxies, making them appear in at least two places at once.

reproduced from m. pascale et al/arxiv.org 2022

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

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Taiwanese Aircraft Industry's New High Performance Models



Weight and balance experiments show needs for further investigation.

<https://bit.ly/3S0pQCX>

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Is the US Measuring Extreme Heat Wrong?

Recent studies have revealed flaws in the heat index. With rising temperatures and humidity, maybe it's time for a more holistic approach.



<https://bit.ly/3BqZ6Ek>

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Are You a Target For Mosquitos?

Even if you're not this is an interesting article



<https://mail.google.com/mail/u/0/?shva=1#inbox/FMfcgzGqQcprgMzcmDWDFMgFPzqFcCJM?projector=1&messagePartId=0.1>

They show no signs of going extinct.

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A Couple of My Favorite Brubecks



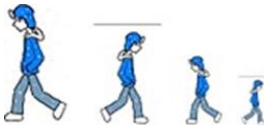
My Favorite Things <https://youtu.be/43T0HdVNOD8?t=1>

Brubeck Meets Bach https://youtu.be/FQO90Q_E4rg?list=RDFQO90Q_E4rg

May we all have time for a few thousand more

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My Walking Thoughts



For September 25 2022