

Ode to E Pluribus Unum for Sunday February 5 2023

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The Seventh World of Trappist-1



Illustration Credit & Copyright: Michael Carroll

Seven worlds orbit the ultracool dwarf star TRAPPIST-1.

A mere 40 light-years away, many of the exoplanets were discovered in 2016 using the Transiting Planets and Planetesimals Small Telescope (TRAPPIST) located in the Atlas Mountains of Morocco, and later confirmed with telescope including NASA's Spitzer Space Telescope.

The TRAPPIST-1 planets are likely all rocky and similar in size to Earth, and so compose one of the largest treasure troves of terrestrial planets ever detected around a single star.

Because they orbit very close to their faint, tiny star they could also have regions where surface temperatures allow for the presence of ice or even liquid water, a key ingredient for life. Their tantalizing proximity to Earth makes them prime candidates for future telescopic explorations of the atmospheres of potentially habitable planets.

All seven exoplanets appear in the featured illustration, which imagines a view from the most distant known world of this system, TRAPPIST-1h, as having a rocky landscape covered in ice. Meanwhile, in the imagined background, one of the system's inner planets crosses in front of the dim, orange, nearly Jupiter-sized parent star.

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Crew Dragon Astronauts to Receive Space Medal

Outside of space circles, the space medal is not a particularly well-known honor.



NASA astronauts Doug Hurley and Bob Behnken (foreground) work on Crew Dragon's touchscreen displays.

NASA

Vice President Kamala Harris on Tuesday will bestow the Congressional Space Medal of Honor on Doug Hurley and Robert Behnken. The former NASA astronauts launched on the debut flight of SpaceX's Crew Dragon spacecraft in May 2020.

Hurley, the spacecraft commander, and Behnken, its pilot, will receive the medal for "bravery" exhibited during the Demo-2 mission to the International Space Station. Their debut mission was a complete success, and since this pioneering flight, NASA has flown five operational missions on board Crew Dragon, along with two private spaceflights.

An operational Crew Dragon has provided NASA with its sole means of reaching the space station aside from the Russian Soyuz vehicle—saving the space agency from the embarrassment of relying on Russia for this transport amid escalating tensions surrounding the war in Ukraine.

Outside of space circles, the space medal is not a particularly well-known honor, especially because it has not been awarded in nearly two decades. However, the medal is prestigious and often only given to astronauts who have died during spaceflight activities.

Over the course of more than four decades, the Congressional Space Medal of Honor [has only been awarded](#) to 28 astronauts, ever. Of those, 17 were given posthumously to the crews of the Apollo 1, Challenger, and Columbia accidents.

The US Congress authorized the president to award the medal "to any astronaut who in the performance of his duties has distinguished himself by exceptionally meritorious efforts and contributions to the welfare of the Nation and of mankind."

President Jimmy Carter bestowed the first awards on Apollo astronauts Neil Armstrong, Frank Borman, Pete Conrad; Gemini's Gus Grissom; and Mercury's Alan Shepard and John Glenn in 1978. When not awarded posthumously, the award has gone to pioneers, such as Shannon Lucid, who conducted a long-duration spaceflight on the Mir space station, or astronauts who have flown first on new vehicles, such as John Young and Robert Crippen on the space shuttle.

Within the next two years, additional astronauts will pioneer new spacecraft and may become eligible for the medal.

Later this spring, as soon as April, Butch Wilmore and Suni Williams will make the debut crewed launch on Boeing's Starliner spacecraft to the space station. Then, perhaps in late 2024 or early 2025, four astronauts will fly on board NASA's Orion spacecraft around the Moon. These four crew members for the Artemis II mission, expected to include a Canadian astronaut, are likely to be named sometime this spring.

By Eric Berger for ars Technica

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Gustav Holst - The Planets: Jupiter
Berklee Contemporary Symphony Orchestra



<https://youtu.be/q3cpOrB1GW8?t=1>

The BCSO is the premiere symphony at Berklee College of Music, offering students, faculty, and guest artists the opportunity to come together and perform some of the most influential music ever written.

Students perform each semester at regional world-class venues such as New England Conservatory's Jordan Hall, Northeastern University Fenway Center, Massachusetts Institute of Technology's Kresge Auditorium, or Boston Symphony Orchestra's Symphony Hall.

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NASA's Lunar Gateway: The Plans for a Permanent Space Station



2022 will see NASA, with help from its international partners, take the first major step on humanity's journey back to the Moon, and the start of a mission to establish an outpost alongside Earth's natural satellite.

<https://www.sciencefocus.com/space/nasa-lunar-gateway/>

Its deployment schedule seems to me to be a little optimistic

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Joe Kittinger's Long Leap into History



Shown her exiting the gondola in 1960, Kittinger went on to do amazing things for another 60+ years, passing away this past December at the age of 94.

<https://bit.ly/3PtnL1U>

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The Crash of the X-31A



https://check-six.com/Crash_Sites/X-31_crash_site.htm
<https://youtu.be/x1E3xpePbmA?t=2>
https://youtu.be/8luPq3K2_jE

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Researchers Study Frog Spatial Skills

Using tiny trackable pants and a “frog spa,” a Stanford University-led team has conducted the first known comparative study of how male and female amphibians navigate their surroundings.



A Brilliant-Thighed poison frog wears a tracking belt that enables researchers to find and track its movements in the rainy and muddy rainforest of the Nature Reserve Les Nouragues in French Guiana.

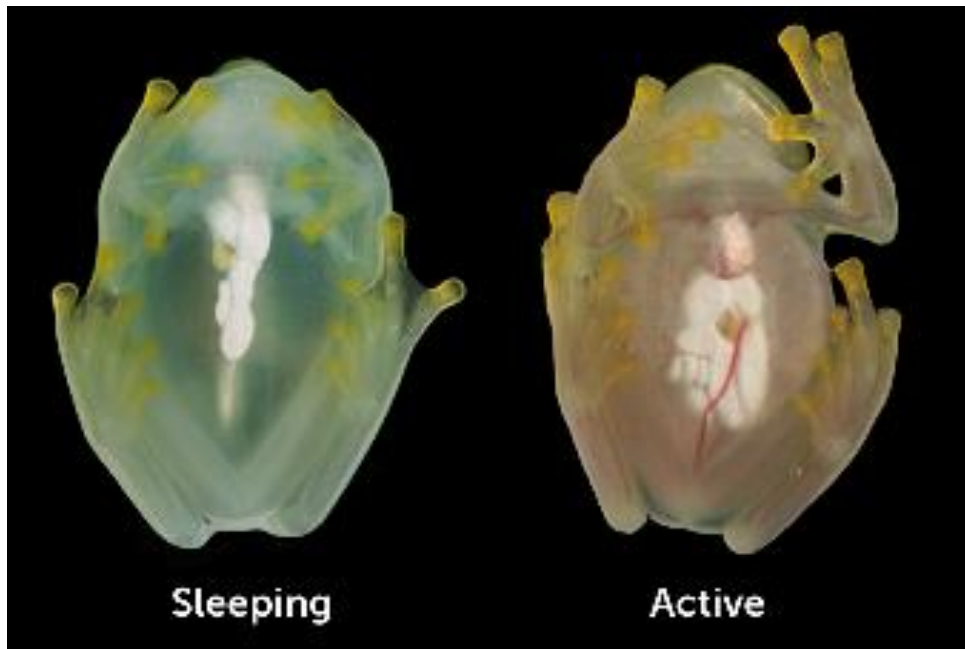
(Image credit: Andrius Pašukonis)

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Sleeping Glass Frogs Hide by Storing Most of their Blood in their Liver

The animals up their transparency by packing away red blood cells with no ill effects



When a glass frog wakes up and starts moving around, the blood that it had hidden in its liver while sleeping starts to circulate once more, decreasing the tiny frog's transparency.

Jesse Delia

By Susan Milius

As tiny glass frogs fall asleep for the day, they take almost 90 percent of their red blood cells out of circulation.

The colorful cells cram into hideaway pockets inside the frog liver, which disguises the cells behind a mirrorlike surface, a new study finds. Biologists have known that glass frogs have translucent skin, but temporarily hiding bold red blood brings a new twist to vertebrate camouflage (SN: 6/23/17).

"The heart stopped pumping red, which is the normal color of blood, and only pumped a bluish liquid," says evolutionary biochemist Carlos Taboada of Duke University, one of the discoverers of the hidden blood.

What may be even more amazing to humans — prone to circulatory sludge and clogs — is that the frogs hold almost all their red blood cells packed together for hours with no blood clots, says co-discoverer Jesse Delia, now at the American Museum of Natural History in New York City. Wake the frog up, and cells just unpack themselves and get circulating again.

Hiding those red blood cells can double or triple the transparency of glass frogs, Taboada, Delia and colleagues report in the Dec. 23 *Science*. That greenish transparency can matter a lot for the snack-sized frogs, which spend the day hiding like little shadows on the undersides of the leaves high in the forest canopy.

A photo on the left showing a sleeping female glass frog with most of her red blood cells tucked into her liver. While the photo on the right shows the frog while awake with blood circulating and less transparent.

When a glass frog wakes up and starts moving around, the blood that it had hidden in its liver while sleeping starts to circulate once more, decreasing the tiny frog's transparency.

What got Delia wondering about transparency was a photo emergency. He had studied glass frog behavior, but had never even seen them asleep. "They go to bed, I go to bed — that was my life for years," he says. When he needed some charismatic portraits, however, he put some frogs in lab dishes and at last saw how the animals sleep the day away.

"It was really obvious that I couldn't see any red blood in the circulatory system," Delia says. "I shot a video of it — it was crazy."

As he pitched his project to a Duke University lab for support, he was stunned to discover that another young researcher was pitching the same lab to study transparency in glass frogs. "I was like, oh, man," Delia says. But the leader of the biological optics lab at Duke, Sönke Johnsen, told Delia and his rival, Taboada, that they had different skill sets and should tackle the problem together. "I think we were hardheaded at first," Delia says. "Now I consider him as close as family."

Scientists and journalists share a core belief in questioning, observing and verifying to reach the truth. Science News reports on crucial research and discovery across science disciplines. We need your financial support to make it happen — every contribution makes a difference.

To show what red blood cells do in living frogs made a tough puzzle. Light microscopy wouldn't work for seeing through the mirrorlike outer tissue of the liver. Nor would anything that woke up the frogs (*Hyalinobatrachium fleischmanni*), because the red blood cells would rush out through the body. Even anesthetizing the frogs kept the liver trick from working.

The answer Delia and Taboada found comes from a technique called photoacoustic imaging, mostly used by engineers. It reveals hidden interiors thanks to the subtle vibrations created by light striking various molecules and causing slight energy releases. Duke's Junjie Yao joined team glass frog to tailor the technique to frog livers, taking special care not to wake the animals in the process.

When tiny glass frogs fall asleep, they store almost 90 percent of their red blood cells in their liver, increasing the animals' transparency (seen in the first clip), which may help hide them from predators. When the animals wake up, their blood starts to course again (second clip).

Despite glass frogs' name, transparency among vertebrates can get much more extreme, says fish biologist Sarah Friedman of the National Oceanic and Atmospheric Administration's Alaska Fisheries Science Center in Seattle. She tweeted an image in June of a newly caught blotched snailfish (*Crystallichthys cyclospilus*), clear enough in most of its body to show flesh tones and finger lines in her hand as she cradled it. And that's not even the best example. The larval stages of tarpon fish and eels, glassfishes and a kind of Asian glass catfish "are almost perfectly transparent," says Friedman, who wasn't involved in the new study.

But these marvels have the advantage of living in water, she says. Evolving exquisite glassiness is easier where there's not as sharp a visible difference between animals' bodies and their watery homes. Still, having a transparent body is pretty cool, on land or sea.

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I FOUND A BOOK CALLED
HOW TO SOLVE 50% OF
YOUR PROBLEMS. SO, I
BOUGHT TWO.

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Jacob Collier Plays the Audience



<https://youtu.be/3KsF309XpJo>

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The Amazing British Library at Age 50



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

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Oh no...Not a Flying Tyrannosaur, Please



*Life reconstruction of the 120-million-year-old bird Cratonavis zhui.
(Image by ZHAO Chuang)*

Bizarre cretaceous bird from China shows evolutionarily decoupled skull and body

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

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Paraprosdokians

A paraprosdokian is a sentence or statement with an unexpected ending. It means "against expectations" in Greek

Will glass coffins be a success?

Remains to be seen.

What's the difference between a hippo and a zippo?

One is really heavy and the other is a little lighter.

Hear about the new restaurant called Karma?

There's no menu - you get what you deserve.

I went to buy some camouflage trousers yesterday, but couldn't find any.

What do you call a bee that can't make up its mind?

A maybe.

I tried to sue the airline for losing my luggage. I lost my case.

Is it ignorance or apathy that's destroying the world today?

I don't know and don't really care.

I wasn't originally going to get a brain transplant, but then I changed my mind.

Which country's capital has the fastest-growing population?

Ireland. Every day it's Dublin.

I saw an ad for burial plots, and I thought: "That's the last thing I need!"

Need an ark?

I Noah guy.

You're not completely useless, you can always serve as a bad example.

I broke my finger last week. On the other hand, I'm okay.

Don't spell part backwards. It's a trap.

And the Lord said unto John, "Come forth and you will receive eternal life."

But John came fifth, and he got hell.

Did you hear about the guy who got hit in the head with a can of soda?

He was lucky it was a soft drink.

To the mathematician who thought of the idea of zero.

Thanks for nothing!

Son: "Dad, can you tell me what a solar eclipse is?"

Dad: "No sun."

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Does a Tail Wag the Dog when it Comes to Agility?

Dogs' tails play little or no role in acrobatic manoeuvres, and are more likely a communication tool, researchers say



Moving the tail mid-jump only changed a dog's trajectory by a fraction of a degree, the researchers found.

Photograph: Paul Marriott/Rex/Shutterstock

By Ian Sample Science editor, the Guardian

After decades of research into man's best friend, scientists have concluded that the tail cannot, in fact, wag the dog.

An international team decided to investigate the purpose of the dog's tail after studies showed that numerous animals from lizards to squirrels used their tails to pull off impressive manoeuvres, such as righting themselves mid-air when falling from trees.

While cats don't need a tail to flip themselves over and land on their feet, they do use their tails for balance and as counterweights to perform extreme hunting moves in the wild, including rapid, tight turns to keep up with their prey.

With dogs more inclined to stay on the ground, scientists were unclear whether the animals' tails helped with agile movements or primarily served as waggable communication devices, and/or to fend off unwanted visitors such as flies.

To learn more, Dr Ardian Jusufi – who studies animal locomotion at the Max Planck Institute for Intelligent Systems in Stuttgart – and his colleagues built a mathematical model that allowed them to check what happens when dogs twist and turn their torsos, and move their legs and tails, when they bound into the air.

Their conclusions appear in a preprint titled: “Tail wags the dog is unsupported by biomechanical modelling of Canidae tails use during terrestrial motion.” In the paper, which has not been peer-reviewed, the researchers describe how the modelling showed tail movements made almost no difference to a dog’s trajectory when it leapt into the air.

The finding suggests that tails are not as critical for agile movements in dogs as they are for other animals. Moving the tail mid-jump, the researchers found, changed the dog’s trajectory by a mere fraction of a degree.

Across the dog family, “It appears the inertial impacts that tail movement has on complex manoeuvres such as jumping, have little to no effect,” the authors write. “The utilising of the tail during jumping ... achieves very low amounts of centre of mass movement across all species with the largest being under a single degree.”

“We believe that this implies that dogs utilise their tails for other means, such as communication and pest control, but not for agility in manoeuvres,” they add.

According to previous research, dogs use their tails to communicate everything from dominance and friendliness to fear and appeasement. A tail held high signifies confidence or a dog’s willingness to play, while a stiff tail can express a threat or anxiety. When the tail is down low or tucked between the legs, the animal might be afraid, but loose wagging from side to side communicates friendliness.

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Royal Italian Writing Desk and Armchair



<https://youtu.be/Z9oiQQfN74c>

Enough cubbyholes for the Medici to hold poisons for all their friends.

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'Pac-Man' Microorganisms Gobble Down Viruses



Halteria is a single-celled organism covered in cilia, or tiny hairs that help it move through the water. It has an appetite for viruses.

(Image credit: Proyecto Agua via flickr)

If these organisms are eating viruses in nature, it could change the way scientists think about global carbon cycling.

Are viruses the new gourmet meal du jour? Maybe for the tiny, single-celled organisms that live in freshwater bodies around the world.

A new study, published Dec. 27 in the journal [Proceedings of the National Academy of Sciences](#) (opens in new tab), finds that single-celled organisms called *Halteria* may be munching on viruses like Pac-Man eats pellets — and could possibly change the way scientists think about global [carbon](#) cycling.

The [viruses](#) in question belong to the genus *Chlorovirus* and are found in essentially every body of freshwater, but mostly in inland water such as lakes and ponds. Chloroviruses infect algae, stuffing the algae full of viruses until they explode. This explosion releases carbon and other nutrients into the environment that would

have otherwise been eaten by the algae's predators; instead, these nutrients are made available to other microorganisms.

This micro-recycling, while a bonus for other microorganisms, may not benefit the food chain overall, study first author [John DeLong](#) (opens in new tab), an ecologist at the University of Nebraska–Lincoln, said [in a statement](#) (opens in new tab). Energy generally passes upward through the food chain as predators eat prey that have themselves consumed more simple and basic sources of nutrients, like algae. But when viruses destroy algae, that traps those nutrients at the bottom of the food chain.

"That's really just keeping carbon down in this sort of microbial soup layer, keeping grazers from taking energy up the food chain," DeLong said.

With the sheer numbers of viruses and microorganisms teeming in lakes, ponds and other bodies of freshwater, DeLong wondered, is there anything eating viruses and restoring the movement of nutrients up the food chain? In a literature search, he found previous research about virus-eating single-celled organisms called protists, so there was precedent for "virovory," a term that DeLong and his team coined to refer to virus-only diets.

"[Viruses are] made up of really good stuff: nucleic acids, a lot of nitrogen and phosphorus," he said. "Everything should want to eat them. So many things will eat anything they can get a hold of. Surely something would have learned how to eat these really good raw materials."

Luckily, samples for his study weren't hard to find. DeLong drove to a nearby pond and took some pond water back to the lab. He concentrated as many microorganisms as he could into drops of water and added a generous helping of *Chlorovirus* to some of them.

What he found was, devoid of any other food source, *Halteria* seemed to be chowing down on viruses. The *Halteria* in a drop of water with viruses grew 15 times their original size within two days, while the number of chloroviruses plummeted. In the water drop without viruses, *Halteria* did not grow.

Related Stories

- [Hidden secrets revealed in microscopic images of ancient artifacts](#)
- [Stunning video captures a virus on the verge of breaking into a cell](#)
- [Dozens of ancient viruses are 'switched on' in healthy cells throughout our bodies](#)

To confirm the viruses were eaten by the microscopic *Halteria*, DeLong's team tagged the chlorovirus's [DNA](#) with fluorescent green dye; soon enough, they spotted the glowing viruses in *Halteria*'s vacuole, a structure equivalent to its stomach.

The team was thrilled, but they have more questions to answer, such as do *Halteria* eat viruses in nature? Or did they just gobble up whatever snack they could find in their small drop of water? Further, what does this potential diet mean for freshwater ecosystems around the globe? DeLong suspects that in a small pond, *Halteria* and other microorganisms could be eating 10 trillion viruses per day.

"If you multiply a crude estimate of how many viruses there are, how many [microorganisms] there are and how much water there is, it comes out to this massive amount of energy movement (up the food chain)," DeLong said. "If this is happening at the scale that we think it could be, it should completely change our view on global carbon cycling."

By JoAnna Wendel for Live Science

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Largest Asteroid Ever to Hit Earth Was Twice as Big as the Rock that Killed Off the Dinosaurs

The destructive space rock was somewhere between 12.4 and 15.5 miles wide.



The Vredefort crater was birthed 2 billion years ago when the largest asteroid ever to hit Earth impacted the planet. A new study suggests the gargantuan space rock was even bigger than previously predicted.

(Image credit: Lauren Dauphin/NASA Earth Observatory/Landsat)

<https://www.livescience.com/vredefort-asteroid-bigger-than-expected>

By Harry Baker for Live Science

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More Successful Commercials



Carls Junior/Hardees

<https://youtu.be/CQZ0DFqediY>

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The Beauty of Historic High-Rise Buildings in the U.S.

Go where only drones can go.



Cathedral of Learning In Pittsburg

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

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Robot Report Best Picks from CES 2023



*Robosen's fully articulated Disney Pixar cobranded Buzz Lightyear robot.
Credit: The Robot Report*

<http://bit.ly/3Wsy8oi>

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Commercials with Bling



<https://youtu.be/LeQ1EL0Cf0A>

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Be thankful we're
not getting all the
government we're
paying for.

WILL ROGERS

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Why Chocolate Feels So Good? It's Down to Lubrication



Scientists have decoded the physical process that takes place in the mouth when chocolate is eaten, as it changes from a solid into a smooth emulsion that many people find totally irresistible.

By analysing each of the steps, the interdisciplinary research team from the [School of Food Science and Nutrition](#) and the [School of Mechanical Engineering](#) at the University of Leeds hope it will lead to the development of a new generation of luxury chocolate that will have the same feel and texture but will be healthier to consume.

During the moments it is in the mouth, the chocolate sensation arises from the way the chocolate is lubricated, either from ingredients in the chocolate itself or from saliva or a combination of the two.

Fat plays a key function almost immediately when a piece of chocolate is in contact with the tongue. After that, solid cocoa particles are released and they become important in terms of the tactile sensation, so fat deeper inside the chocolate plays a rather limited role and could be reduced without having an impact on the feel or sensation of chocolate.

Health benefits

Anwasha Sarkar, Professor of Colloids and Surfaces in the School of Food Science and Nutrition at Leeds, said: "Lubrication science gives mechanistic insights into how food actually feels in the mouth. You can use that knowledge to design food with better taste, texture or health benefits.

"If a chocolate has 5% fat or 50% fat it will still form droplets in the mouth and that gives you the chocolate sensation. However, it is the location of the fat in the make-up

of the chocolate which matters in each stage of lubrication, and that has been rarely researched.

“We are showing that the fat layer needs to be on the outer layer of the chocolate, this matters the most, followed by effective coating of the cocoa particles by fat, these help to make chocolate feel so good.”

The [study](#) - published in the scientific journal *ACS Applied Materials and Interfaces* - did not investigate the question of how chocolate tastes. Instead, the investigation focused on its feel and texture.

We believe that a next generation of chocolate can be developed that offers the feel and sensation of high-fat chocolate yet is a healthier choice.

Dr Siavash Soltanahmadi, School of Food Science and Nutrition

Tests were conducted using a luxury brand of dark chocolate on an artificial 3D tongue-like surface that was designed at the University of Leeds. The researchers used analytical techniques from a field of engineering called tribology to conduct the study, which included in situ imaging.

Tribology is about how surfaces and fluids interact, the levels of friction between them and the role of lubrication: in this case, saliva or liquids from the chocolate. Those mechanisms are all happening in the mouth when chocolate is eaten.

When chocolate is in contact with the tongue, it releases a fatty film that coats the tongue and other surfaces in the mouth. It is this fatty film that makes the chocolate feel smooth throughout the entire time it is in the mouth.

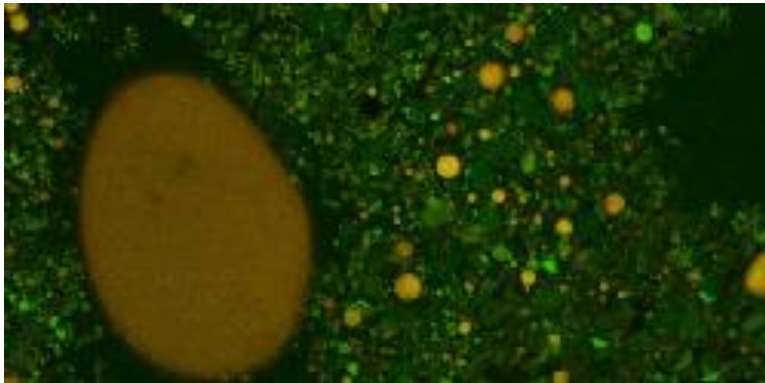


Image taken from a confocal microscope showing the structure of the molten chocolate mixed with saliva after it has experienced forces that mimic the eating process.

Dr Siavash Soltanahmadi, from the School of Food Science and Nutrition at Leeds and the lead researcher in the study, said: “With the understanding of the physical mechanisms that happen as people eat chocolate, we believe that a next generation of

chocolate can be developed that offers the feel and sensation of high-fat chocolate yet is a healthier choice.

“Our research opens the possibility that manufacturers can intelligently design dark chocolate to reduce the overall fat content.

“We believe dark chocolate can be produced in a gradient-layered architecture with fat covering the surface of chocolates and particles to offer the sought after self-indulging experience without adding too much fat inside the body of the chocolate.”

Revenue from chocolate sales in the UK is forecast to grow over the next five years, according to research from the business intelligence agency [MINTEL](#). Sales are expected to grow 13% between 2022 and 2027 to reach £6.6 billion.

The researchers believe the physical techniques used in the study could be applied to the investigation of other foodstuffs that undergo a phase change, where a substance is transformed from a solid to a liquid, such as ice-cream, margarine or cheese.

This project received funding from the European Research Council under the European Union’s Horizon 2020 research and innovation programme.

The study – [Insights into the multiscale lubrication mechanism of edible phase change materials](#) – was authored by Siavash Soltanahmadi, Michael Bryant and Anwesha Sarkar, all from the University of Leeds.

The advanced in situ tribo-microscopy methods were developed as part of the 'Friction: The Tribology Enigma' project; a programme grant funded by the Engineering and Physical Sciences Research Council, under grant no. [EP/R001766/1](#)

Further information

For more details, please contact David Lewis in the press office at the University of Leeds: d.lewis@leeds.ac.uk

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Original River Dance and Followers



Michael Flatley <https://www.youtube.com/watch?v=abd8jgiTKH0&t=7s>
Japan <https://www.youtube.com/watch?v=UCVR7y4SpqY>
China <https://www.youtube.com/watch?v=JotwZfpiKKo>
Ireland <https://www.youtube.com/watch?v=H7pF67oOgOY&t=11s>
Reel Around the Sun <https://youtu.be/9jxCbaLG0w4>

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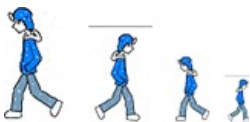
Belgian Bus Company Safety Ad #2



<https://www.youtube.com/watch?v=Vp1dW93LZ3w>

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My Walking Thoughts



For Sunday February 5 2023

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The Buzz

...as in Buzz Aldrin who married his 'longtime love' Anca Faur (63) on his 93rd birthday on January 27.

Neither is what I would call a spring chicken but both appear to be in fine fettle for the wedding, that took place in Los Angeles.

Like most of the Apollo folks Aldrin saw service as a fighter pilot in Korea-- He flew 66 combat missions in F-86 Sabres and shot down two Mikoyan-Gurevich MiG-15 aircraft-- then earned his Doctor of Science in astronautics from Massachusetts Institute of Technology before joining the astronaut corps.

Along with wishing the newlyweds a long and wonderful marriage I'd like to point out that Aldrin in my estimation was the premier Apollo astronaut quite a fete given the competition for the title.

