Dinosaur-killing impact crater might have been teeming with life

About 66 million years ago, the Chicxulub asteroid smashed into Earth, kicking up tsunamis and dropping hot debris that annihilated non-avian dinosaurs and many other species. But not everything it left in its wake was destructive. This space rock hit what is now the partially submerged Yucatan Peninsula, and at the bottom of the ocean, the impact generated enough heat to create a hydrothermal system that persisted for 8 million years and may have been a hotbed of life.

When researchers drilled for samples in the impact zone in 2016, they studied the types of rock that had formed as a result of the asteroid strike. This gave more insight into what happened in the immediate and long-term aftermath of this cataclysmic event.

The collision was intense enough to cause deformation far beneath the surface. Subterranean effects reached 35 km (almost 22 miles) down, and included the melting an immense amount of rock. Exposure to seawater made that rock porous. As hot water seeped into the pores, a hydrothermal system formed. The hot water gushing into an isolated region of the freezing depths could have attracted microorganisms and possibly other life forms that were otherwise struggling to survive.

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https://arstechnica.com/science/2026/09/dinosaur-killing-impact-crater-might-have-been-teeming-with-life/

A local network of implants uses your body as the wiring

Most implants like pacemakers and insulin pumps work in isolation. To help them coordinate with each other, a team of Georgia Tech researchers built a networking system that sends signals through body tissue instead of antennas and radio waves.

Radio problems

Implants that communicate today mostly rely on radio protocols like Bluetooth Low Energy or near-field communication (NFC). Both are a poor fit for in-body data transfer, says Alex Abramson, a Georgia Tech engineer and co-author of the new study.

The first problem is power. “If you want an implant to remain in an active state such that it can respond within milliseconds, it’s very difficult to do that with the Bluetooth system,” Abramson said. According to the paper, Bluetooth components, when they’re activated, can cut an implant’s battery life by up to 90 percent.

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With PRIMA, NASA will try to build a billion-dollar space telescope in record time

The first in a new class of space telescopes is on track to reach the launch pad in the early 2030s, NASA announced this week.

The PRIMA mission will be the first of NASA's Probe Explorers, a new line of observatories intended to do more science for less money. The agency's space telescopes typically fall into lower-cost "Explorer-class" missions, with cost caps in the range of a few hundred million dollars, or flagship observatories like the recently launched Nancy Grace Roman Space Telescope, which came with a price tag of some $4.3 billion.

With the Probe Explorers, NASA officials seek to find a better balance between the smaller Explorer missions and multibillion-dollar flagships. NASA has studied potential Probe Explorer mission concepts for several years after an independent panel of scientists recommended the new mission category. But it wasn't clear until recently whether NASA's science budget, which is under pressure from the Trump administration, would be sufficient to actually start developing one.

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Finding the cells that put our brain to sleep

For a long time, sleep research has treated the cerebral cortex as a passive follower reacting to signals from the deep brain. “Usually, sleep is associated with being controlled by subcortical regions,” said Geoffrey Terral, a neuroscientist at the Albert Einstein College of Medicine in New York.

The cortex is where the slow rhythms of deep sleep can be seen, but researchers assumed the signals that triggered them originated elsewhere. In a recent Nature study, Terral and Renata Batista-Brito, who runs the lab, report a population of cortical cells that challenges that assumption.

These cortical cells make up only around one percent of the cortex’s inhibitory neurons, and switching them on in a mouse puts the animal to sleep. “What our work shows is that the cortex can not only see this rhythm but also initiate it by itself, and this is sufficient to promote sleep,” Terral said.

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Meet the winner of Nikon’s Small World in Motion video contest

Abnormal beating of airway cilia from a child with Primary Ciliary Dyskinesia, a genetic disorder affecting respiratory function. Credit: Ning Xu, Tsinghua University
Abnormal beating of airway cilia from a child with Primary Ciliary Dyskinesia, a genetic disorder affecting respiratory function. Credit: Ning Xu, Tsinghua University
A Chinese optical engineer is the winner of this year’s Small World in Motion competition, sponsored by Nikon. Ning Xu of Tsinghua University in Beijing beat out 346 other video entries from 40 different countries with his super-resolution video (above) of the abnormal beating of cilia in the airways of a child with a rare genetic respiratory disorder.

Founded in 2011, the Nikon Small World in Motion competition is a spinoff of the company’s Small World Photomicrography Competition, which has been around since 1974. Both are meant “to showcase the beauty and complexity of things seen through the light microscope”—one through still photographs, the other through photovideography, taking advantage of all the technological advances that now allow users to make movies or time-lapse images through the microscope.

Primary ciliary dyskinesia (PCD) is a genetic disorder that adversely affects the tiny hairlike structures that line the lungs, among other areas. Their wavelike motion helps move around germs, mucus, dust, and other irritants so the body can dispel them via coughing or sneezing. In people born with PCD, there is something wrong with those cilia, so those irritants build up, causing respiratory infections, among other complications. The cilia might be the wrong size, the wrong shape, or missing altogether. They might move abnormally or

not move at all.

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Nonprofit that tracks meteors taken down by “critical blow” from a cyberattack

The International Meteor Organization, the nonprofit that coordinates and publishes amateur and professional observations of meteor phenomena, said its infrastructure has suffered a “critical blow” from a cyberattack.

“We recently suffered a cyberattack that dealt a critical blow to aging infrastructure, taking much of our site offline,” a static page on its website on Wednesday said. “We expect several weeks of partial downtime as we transition to new infrastructure and services.”

“I am very sad to see the site down”

In the meantime, the IMO said it’s prioritizing the reporting of fireball observations, which can be reported here. The organization is also providing some information on its Facebook page.

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Researchers swap in human brain cells for a mouse’s cortex

In recent years, there has been a lot of excitement about the potential for studying human diseases in what are called “organoids.” These small patches of tissue, formed using stem cells, appear to produce many of the same cell types and at least some of the structures normally formed in actual organs, and thus can provide a better model for diseases that rely on the sometimes complex interactions among multiple specialized cell types that are a feature of the human body.

But even the most sophisticated organoids lack a lot of the features of a real human body. This is especially true for brain organoids, which don’t form any of the connections with specialized brain structures needed to behave “normally.” On Wednesday, a research group at Stanford University described a possible way to study brain organoids in a somewhat more natural context: They genetically wiped out a large portion of the mouse brain and replaced it with human brain organoid cells.

The replacements

Organoids, because they adopt a three-dimensional tissue structure and consist of various specialized cells, provide a much better model for an intact tissue than simply having a bunch of disassociated cells lying flat on a culture dish. But they still have a lot of limitations—they're not hooked up to a circulatory system that allows the liver to process chemicals the organoid produces and don't have immune cells moving through them, to give just a couple of examples.

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Scientists develop new method for deciphering ancient scrolls

The Vesuvius Challenge is an ongoing project that combines "digital unwrapping" with crowdsourced machine learning to decipher the so-called Herculaneum scrolls, badly charred 2,000-year-old papyri too fragile to be physically unrolled. The effort just got an additional boost. A team of researchers created their own contemporary model papyrus scrolls—charring them just like the originals—to validate a screening method to determine which of the Herculaneum scrolls were written in lead-based ink and hence are the most promising candidates for further analysis. They described the process in a new paper

published in the journal PLoS ONE.

As previously reported, the ancient Roman resort town of Pompeii wasn’t the only city destroyed in the catastrophic 79 AD eruption of Mount Vesuvius. Several other cities in the area, including the wealthy enclave of Herculaneum, were fried by clouds of hot gas, called pyroclastic pulses and flows. But still, some remnants of Roman wealth survived. One palatial residence in Herculaneum—believed to have once belonged to a man named Piso—contained hundreds of priceless written scrolls made from papyrus, singed into carbon by volcanic gas.

The scrolls stayed buried under volcanic mud until they were excavated in the 1700s from a single room that archaeologists believe held the personal working library of an Epicurean philosopher named Philodemus. The few opened fragments helped scholars identify various Greek philosophical texts, including *On Nature* by Epicurus and several by Philodemus himself, as well as a handful of Latin works. But the more than 600 rolled-up scrolls were so fragile that it was long believed they would never be readable, since even touching them could cause them to crumble.

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What happens when neutrinos

swap identities inside a supernova?

Our basic understanding of core-collapse supernovae hasn’t changed in decades. Large stars burn through all the fuel at their cores and start creating heavier elements in reactions that consume energy. The lack of energy from these reactions allows gravity to pull the interior of the star in on itself, collapsing it into a neutron star or black hole. The energy released by this process then blows the remainder of the star apart.

And, generally, that’s right. But there’s an entire busload of devils in the details. The statistics of supernovae that we’ve observed indicate that the model may be seriously incomplete. And on the theoretical side, there are still plenty of uncertainties, including over some of the basics, such as whether all core collapses actually result in a supernova.

A paper being released by Physical Review D provides what might be a potential explanation for the discrepancy: flavor-changing neutrinos. Neutrinos play a key role in our current models of supernovae, and right now, those models don’t take into account one of neutrinos’ most striking features: their ability to change identity.

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Trump EPA moves to wipe out climate rules for power plants

On the heels of the hottest summer on record and a United Nations report warning that global temperatures are likely to push climate risks to “increasingly dangerous heights,” the Trump administration overturned most of a Biden-era rule limiting climate pollution from power plants, the second-largest source of greenhouse gas emissions.

The Environmental Protection Agency announced a final plan Monday that guts the 2024 Carbon Pollution Standards, which the agency said exceeds its authority under the Clean Air Act by requiring control technologies “that are not adequately demonstrated.” The agency also proposed revoking “all remaining GHG emissions requirements for power plants,” arguing their emissions “have no material impact on climate change.”

The plan to revoke the Carbon Pollution Standards was initially revealed last spring.

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