

CURIOUS?

IFLSCIENCE

WHAT HAPPENS IF
SOMEONE ACTUALLY
FINDS NESSIE?

CAN YOU LEARN
TO ROLL YOUR RS?

NOVEMBER 2025



How Do We Predict The Weather?



20°



Today 20/9°



Monday 14/8°



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NEWSBITES



LGBTQ+ STEM Day

November 18 is the annual International Day of LGBTQIA+ People in STEM, a celebration of diversity, inclusion, and visibility in science, technology, engineering, and math (STEM), recognizing the vital contributions of LGBTQ+ individuals across the entire STEM spectrum.

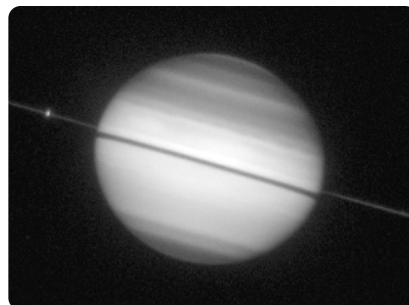
Visibility and representation matter greatly, especially in areas like STEM, where historically LGBTQ+ people have been underrepresented or faced discrimination. Now, more than ever, it's important to acknowledge that science doesn't exist without the humans behind it. Sharing the stories, experiences, and ongoing challenges of LGBTQ+ professionals not only inspires others – including our future scientists – but reminds us that diversity strengthens discovery and that science flourishes when everyone has the freedom to share their unique perspectives. As Pride in STEM chair and founder, and IFLScience space reporter, Dr Alfredo Carpineti says: "Political attacks against LGBTQ+ people and science have been going on hand in hand for several years now, but have intensified significantly this year. Standing up for people's freedom to be, for facts, and for human rights has never been more important." Find out more [here](#).

A Supersonic Return?

The first test flight of NASA's experimental X-59 quiet supersonic jet is expected to happen this month, demonstrating the first supersonic vehicle – meaning it can travel faster than the speed of sound – that can travel without creating a sonic boom (the thunderclap sound from the pressure of the shock waves being released) but a soft "thump". Concorde could travel from London to New York in just 3.5 hours, but the disruptive sonic boom it produced led to restricted flight routes over land. If the X-59 is successful, it could change the rules of that ban and supersonic flights could return to the skies.

Saturn's Rings Disappear Again

On November 23, Saturn's rings will "disappear" for the second time this year due to the planet's alignment with Earth. As Saturn completes its 29-year orbit, it leans at an angle of 26.7 degrees from us. However, when Earth passes through Saturn's "ring plane" – which happens around every 15 years – its rings will appear edge-on. From that angle, and because they are so thin, they reflect very little light, so they will practically vanish. The rings disappeared in March, earlier this year, but on Nov 23, they will appear at their thinnest. View using a telescope late in the evening when Saturn will be at its highest. Before and after this date, the rings begin to fade in and out of view.



Comets Galore!

We have plenty of comets to choose from this month, with some potentially visible to the naked eye but definitely with a pair of binoculars or a simple telescope. Discovered just this year, Comet C/2025 A6 (Lemmon) will reach perihelion – its closest approach to the Sun – on November 8. Comets are often brighter and develop larger comas and tails the closer they get to perihelion as the Sun's heat causes the ice in these "dirty snowballs" to sublimate, turning to gas and dust that reflects sunlight. Another new comet, C/2025 K1 (ATLAS), will make its closest approach to Earth on November 24-25. Comet C/2025 R2 (SWAN) is so new it's not clear yet if it will stick around for November. And finally, our interstellar pal Comet 3I/ATLAS is due to reappear from behind the Sun in late November, too.





See King Tut's Treasures In World-First

We fear we may have said this before, but finally (finally!) the largest and most complete Egyptology museum – in fact, the largest archaeological museum devoted to any single civilization – in the world is set to open on November 1. The Grand Egyptian Museum is fittingly located just 2 kilometers (1.2 miles) from the Pyramids of Giza in Cairo, Egypt, and houses over 100,000 artifacts, 20,000 of which are being shown to the public for the first time. The most anticipated exhibit is definitely the Tutankhamun Gallery, which displays the full dazzling collection of the boy king's treasures all in one place for the first time ever. This includes the famous golden funerary mask and 5,000 objects ranging from gilded coffins, ceremonial chariots, and ivory-inlaid furniture to gold and precious stone jewelry, weapons made from meteorites, board games, clothes, and musical instruments. The sheer scale of riches has to be seen to be believed. His mummy and sarcophagus, however, remain in a temperature-controlled environment in his tomb in the Valley of the Kings, near Luxor.



Prehistoric Planet: Ice Age

Prehistoric Planet is back, but this time it's starring a new cast of giants: Ice Age megafauna that range from incredibly cute baby woolly rhinos and **snow sloths** to scarily life-like saber- and scimitar-toothed cats. Yes, there will be mammoths and even dwarf elephants just 1 meter (3 feet) tall, but at IFLScience, we are here for the Ice Age weirdos. Enter *Glyptotherium* (shown here), a slightly embarrassed-looking giant armadillo the size of an American bison. The five-part natural history series from Apple TV premieres globally on November 26.

WHAT'S UP?



TITAN'S TRANSITING (AGAIN)

It's been a busy year for the largest Saturnian moon

Name: Titan transits Saturn

Appearance: Tiny moon hangs out in front of big-ass planet and lets us see

Location: Saturn's orbit (you're gonna need a telescope for this one, gang)

also essential, although there's not much you can do to help with that.

Is this the first time it's happened this year?

Sorry to be the one letting you know you've missed out, but nope. Transit fans have been fed well in 2025, with Titan visibly passing in front of Saturn four times so far this year, including a rare daylight transit of its shadow back in May.

What's so great about this one then?

It's happening at the same time as Saturn's rings have disappeared from our view – they'll be at their narrowest and this is a relatively uncommon combination of events.

Will this be the last chance I get to see Titan transit?

Nope – you've got not just one, but two chances to witness Titan transiting Saturn next month. The first is on December 8, between 5:38 pm - 11:52 pm UTC, and the second is a Christmas Eve treat taking place between 4:58 pm - 10:59 pm UTC. Fingers crossed Santa's sleigh won't get in the way of your telescope for that one.

What in the good name of astronomy is a transit?

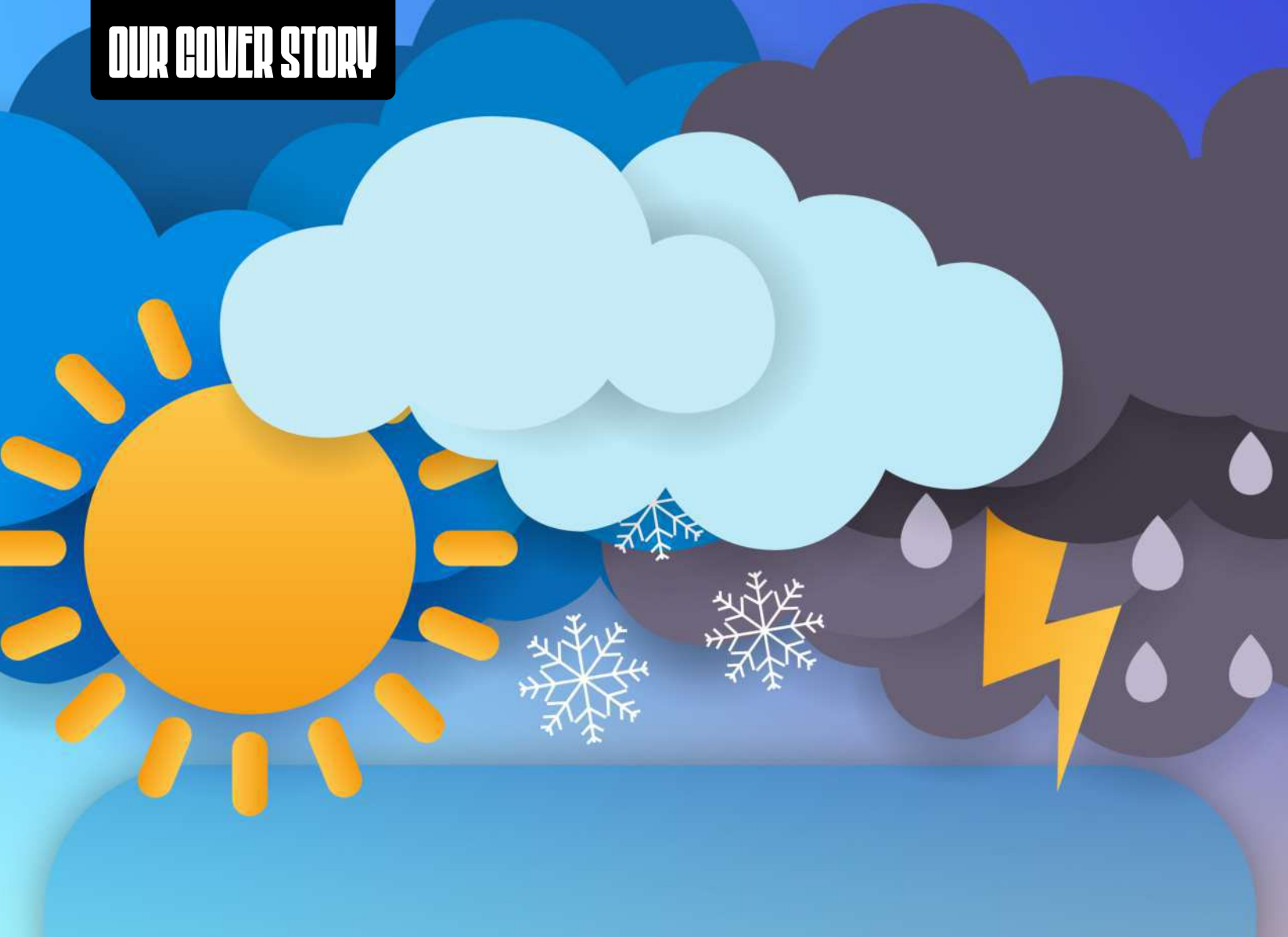
It's one celestial object passing in front of another, from the perspective of Earth. That might mean a planet passing in front of a star, or in the case of this month's event, a moon passing in front of a planet – specifically Titan passing in front of ringed gas giant, Saturn, appearing as a little dot interrupting the planet's creamy color.

When is the transit happening?

November 22, between 6:52 pm - 01:10 am UTC (a rare win for UK-based astronomy fans).

How can I see it?

You'll need to use a telescope, but that doesn't necessarily mean a fancy setup. While you're likely to get a better view with a bigger telescope, you should be able to see the transit even with a small one. Clear skies are



HOW DO WE PREDICT THE WEATHER?

We've been trying to unravel meteorological mysteries since ancient times – just how far have we come?

By Tom Hale



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Today, in the ever-drizzly London, the city woke up to beautiful blue skies with a fresh breeze. Within hours, the capital regressed into its stereotype and fell into a murky mess of rain and dull skies. But by late afternoon, the Sun was beaming once again, baking the day's earlier rainfall into a hot, humid soup.

Somehow, this erratic chain of events was predicted by most weather forecasters days ago with almost spot-on timing. Forecasters can certainly get it wrong – just ask Michael Fish. The esteemed BBC weatherman famously said on October 15, 1987: "A woman rang the BBC and said she heard there was a hurricane on the way. Well, if you're watching, don't worry, there isn't!" Hours later, the Great Storm of 1987 hit the UK, killing 22 people in total and causing over £1 billion (\$1.3 billion) in damage.

However, aside from the odd example, the ability of weather services to look into the future, at least in meteorological terms, must be acknowledged as nothing short of remarkable. So, how do they do it?

From talking with the gods to God-like tech

The need to understand the weather is an old one. Ancient civilizations looked skyward for guidance, carefully observing astronomical and meteorological signs in hopes of predicting whether the future holds storms or droughts. The stakes were high: understanding the weather could determine the right moment to plant crops, carry out rituals, **embark on journeys**, or wage war.

Cuneiform tablets from ancient Mesopotamia show how the Babylonians closely tied the divine to the everyday with their weather forecasts, using observations and stories of gods to deduce what might be in store for the weather ahead. How accurate those early forecasts were is anyone's guess. Many relied on the movements of planets and the supernatural; imaginative methods, albeit unscientific.

The science of weather prediction began to take shape during the Renaissance and Enlightenment, an era when curiosity about the natural world was exploding. The hygrometer, an instrument to measure the humidity of air, was **described** by Nicholas Cusa in the 15th century, while Galileo Galilei invented an early thermometer in the 1590s, and Evangelista Torricelli invented the barometer for reading atmospheric pressure in 1643.

"AROUND THE LATE 1970S, THE SATELLITE ERA WAS IMPORTANT BECAUSE WE REALLY GOT TO SEE THINGS FROM A COMPLETELY DIFFERENT PERSPECTIVE, WHICH WE NEVER HAD BEFORE."

But it wasn't until the 19th century that weather forecasting began to resemble the science we know today.

Dan DePodwin, AccuWeather's Director of Forecasting Operations, told IFLScience that modern weather predictions were made possible thanks to a series of technological developments over the past 200 years, many of which had nothing to do with weather in the first place.

"A lot of people point to the invention of the telegraph as an important marker because it was able to communicate what was happening in one spot, and what was happening in another spot, really quickly," explained DePodwin.

"Carrier pigeons and post were not very helpful at communicating this. The real-time or close-to-real-time information transmission was really key."

Armed with faster communication and better instruments, early meteorologists could finally piece together a picture of how weather systems moved across vast regions. By the late

1800s, coordinated networks of observers were sharing readings of temperature, pressure, and wind, allowing forecasts to become more than just local guesswork.

The US Weather Bureau, the spiritual predecessor to today's National Weather Service, was established in 1870, tasked by the federal government to provide weather forecasts and warnings for the US. However, their predictions were "pretty crude," said DePodwin, and were only able to forecast one or two days in advance with accuracy.

"In terms of where we're at today with all the technology we have – satellites and computer models – I'd say that that really starts to get going during World War Two, and especially after World War Two," he continued.

"Around the late 1970s, the satellite era was important because we really got to see things from a completely different perspective, which we never had before. It helped us learn a lot about how the atmosphere works. From there, the ability to use that data in computer models helps us understand the weather and predict it. That really took off in the '70s, '80s, and '90s, and then has only just accelerated here in the 21st Century," DePodwin noted.

How do they actually predict the weather?

All of these technologies – satellites, fancy instruments, computer models, and rapid communications – are still the foundation of the weather forecasts you see today on your smartphone.

Unimaginable quantities of data are now gathered from every corner of the globe, measuring everything from air temperature and surface temperature to air pressure, humidity, wind speed, and ocean currents.

High above, satellites orbit the planet, capturing data and images of swirling storms and tracing the subtle shifts in cloud cover. Weather balloons are also launched around the world several times a day to understand the temperature, humidity, and wind speed at different levels of the atmosphere.

Meanwhile, on the ground and at sea, thousands of weather stations, buoys, and sensors track conditions as they appear at the surface. Plus, radar is used to observe precipitation by sending out pulses of radio waves and “reading” their returning echoes.

This mass of information is transmitted across different networks and fed into colossal supercomputers, which run huge numbers of calculations, weaving the raw numbers into models that reflect the real world.

“We take that data and it’s run through computer models, which use all of these theoretical mathematical equations to model how this current atmospheric state will transition in time based on how we know the atmosphere operates,” explained DePodwin.

“A lot of atmospheric science is fluid dynamics, really, and there’s a lot of math and science that’s been done over the [past] century or so to understand how all that works. That’s all been broken down into the equations.”

In the past few years, it has become a tedious cliché that artificial intelligence (AI) is going to revolutionize countless industries. Whatever your stance on that is, it’s undoubtedly true for weather forecasting. In fact, many of these systems have already been using AI for years.

“I like to tell people that AccuWeather has used AI before it became a mainstream word,” DePodwin told IFLScience.

AI’s great skill is to process unbelievably large amounts of data very quickly, then acutely identify trends within the complexity. In weather forecasting, that means spotting subtle signals – perhaps an odd shift in pressure, temperature, or wind – that might fit into a predictable pattern in weather.

By learning from decades of historical data and continuously updating with new observations, AI can tweak predictions, highlight risks, and even uncover relationships that human forecasters or traditional models might miss.

“To me, one of the biggest differences of AI weather forecasts is that they can run within minutes, versus running for hours or an hour. You get data back much quicker, which is really interesting. The accuracy, I would say, is surprisingly accurate for how new the technology is,” he added.

AI isn’t going to kill the human touch

However, AI isn’t about to cull the human meteorologists anytime soon. DePodwin pointed out that one of the most underappreciated parts of forecasting is communication. Predictions for the public can’t just be numbers and incomprehensible charts; they have to be shaped into stories that are clear, engaging, and responsible. When dangerous conditions loom, those messages must strike the right balance of urgency and context so people can act wisely.

Along with distributing weather news to everyday people, services like AccuWeather also provide tailored insights to businesses and private enterprises, where their guidance can guide major, life-defining decisions.

Social subtleties are not AI’s current forte, nor are they conveyed very effectively across a cold computer screen, so it looks like human experts are here to stay (for now).

“Our largest customers want to interact with a meteorologist, a human. They don’t want to interact with an AI. That, I think, will be a tough nut to crack for AI,” DePodwin said.

“We work with people who are making decisions about whether to stop trains, or to shelter their employees from a tornado, or whatever it might be. Talking to a person or knowing you’re getting that warning from a human is an important part of that communication chain. To see how AI plays into all that, I’m not quite clear how that works in the future.”

So listen to your friendly, neighbourhood meteorologist. It might just save your life. 🌩️



GOING OUT WITH A BANG

This alien-like protrusion is the impressive blossom stalk of *Agave americana*. Impressive, but also quite sad, as once most agave plants flower, they die. This is known as being monocarpic and is seen in several plant families. This one is particularly momentous as *A. americana* is known as the “century plant” because it only flowers once and it can take 30 years for it to happen.



CAN YOU LEARN TO ROLL YOUR RS?

And if so, how?

By Laura Simmons

Q&A

My name is Laura, and I have a confession to make: I cannot roll my Rs. Now, as a native speaker of English, you might not think this would majorly impact my life. But I've also been a student of Spanish since the age of 12, and the rolled R sound? Well, it comes up a lot.

After all these years, I'd basically written off my chances of learning to produce this elusive sound, but a chance conversation fanned the flames of curiosity once again. So, I spoke to **Dr Helen Nuttall**, Senior Lecturer in Cognitive Neuroscience and head of the Neuroscience of Speech and Action Lab at Lancaster University, to talk all things speech production – and just maybe, keep my dreams of Spanish mastery alive.

Is there a proper scientific term for the rolled R consonant?

HN: Yes. There is something called the International Phonetic Alphabet, which breaks down all the sounds of different languages. When I was a linguistics undergrad – I'm really fun at parties – I would take that to parties on my laptop and get people to click on things and we would reproduce different sounds. The scientific name for that sound, as you would read it on the International Phonetic

WE HAVE QUESTIONS



Alphabet, is an alveolar trill. Alveolar refers to the place in your mouth relative to where your teeth and hard palate are – there's a little ridge behind your teeth called the alveolar ridge. And then the trill is the category of sound where there's that repeating, kind of tapping, physical movement at that particular place within your mouth.

Are some sounds just harder than others?

HN: People can, with continued practice, try to learn these types of sounds like the alveolar trill, and may get there with consistent practice, and looking at the mouth and listening to how the sound's coming out. But for some people, there may be physiological constraints that make the articulation and just the production of that sound physically more difficult for a person – every person is different, the position of our eyes and mouth, and it's the same with our ability to make these different types of sounds. There may be physical changes in our mouth, differences that make that a little bit more difficult.

We've all had that experience where the brain and the mouth feel disconnected. What's going on there?

HN: One thing [is] those "tip of the tongue" moments, where you're looking at somebody, or maybe an object, and you have this real sense that you know [...] the word you're searching for but there's this inability to physically pronounce it. On a neurobiological level, you may have retrieved or activated the meaning of what that thing is. But then when your brain has tried to activate the phonological pattern – the speech sounds that you've got to put together to articulate that word – there's just a disconnect. You have that moment where you're like, "It's going to come to me in a minute!"

There are also instances where you have retrieved the way to put together those sounds, but when you're producing them, you're just stuttering over your words and things are not coming out. And sometimes that's made worse by tiredness and stress and things like that, certainly by alcohol, which has different effects on the motor system and planning processes.

So, there are a number of different reasons why that can happen, all totally normal.

Is there a period of time in our lives when learning speech production is easier?

HN: When you're born, your brain is basically a blank canvas for all intents and purposes. Of course, there are genetic differences and things like that, but it's ready to receive stimulation through environmental exposure.

When babies are very, very small, under the age of one, they can hear differences in different languages, and they can tell apart those sounds. [...] That's not to say that when you're older you will fail to be able to differentiate those different sounds, but that biological sensitivity is very much there and ready for you to learn as soon as you're born. The sounds that you're exposed to within that first year help set the auditory motor frameworks in your brain so that you become an efficient listener and producer of the main language or languages that you've received within that first year of life.

All of that is because of a process readers might be familiar with: neuroplasticity, the brain's ability to be shaped and moulded by experiences. However, neuroplasticity and brain flexibility last our entire life. I feel really passionately when people say things like, "you can't teach an old dog new tricks" – it's not really true. [...] It's not fair to write people off as we get older as being incapable of learning these new things.

So, I could still learn to roll my Rs?

HN: If you were doing speech therapy or you wanted to do a particular sound that you were struggling to articulate, you would engage in quite a structured practising kind of experience. You would have different exercises that you would practice. So, there may be ground that you can cover with some more practice for sure. 🌟



SCIENCE FACT OR FICTION:

WHAT HAPPENS IF SOMEONE ACTUALLY FINDS NESSIE?

IFLScience went to Scotland looking for the Loch Ness monster. Katy Evans asks what happens if we, or anyone, finds it?





locals will feel when they find out, as we were proudly assured time and again during our visit that it did.

When I asked them about it, however, they insisted that it had just been “a bit of fun at the time in response to media queries,” which both corroborates what the spokesperson told the BBC recently, and misses the point the agency was trying to make when it spoke to the BBC **back in 2018**. At the time, Nick Halfhide of Scottish Natural Heritage, as NatureScot was known then, explained the code of practice was drawn up to help protect *any* new species – including a “monster” – found in the loch. He noted that lessons learnt while putting together the “partly serious, partly fun” code in 2001 were still relevant years later when new species were being found all over Scotland. Which means it would still be relevant today.

“I’M NOT SAYING IN THE MODERN DAY CRYPTIDS ARE CREDIBLE, BUT EVERYTHING WAS CRYPTIC UNTIL IT WAS DISCOVERED.”

Nobody turns down a trip to Loch Ness, a chance to visit the supposed home of the world’s favorite cryptid (sorry, Bigfoot, I will not be taking questions). Do I believe in Nessie? No. Did the trip raise more questions than I was anticipating? Yes. Because, as a journalist preparing for an investigation, I do have to consider all angles, including... what if we actually found it?

In researching for the trip, I came across an article by the BBC referencing the Nessie Contingency Plan, the surprisingly official-sounding apparent Scottish government plan, should the improbable happen. NatureScot, the Scottish nature agency, reportedly had guidelines in place that offered Nessie the same protections as other protected Scottish wildlife: it cannot be killed, captured, or removed from its habitat. I was impressed. It’s not a bad thing to hedge your bets, even if it is a bit of a joke, because immediate protection of extremely endangered “lost” species upon

rediscovery can be long and arduous and is not guaranteed, as **Dr Barney Long**, Senior Director of Conservation Strategies at Re:wild, told me later.

“The Nessie Contingency Plan was produced back in 2001, at a time when there was a lot of Nessie-hunting activity on the loch. We were regularly being asked by the media and others what we would do if or when she, or he, was found,” a NatureScot spokesperson told **the BBC**.

“The code of practice, which was partly serious and partly for a bit of fun, was drawn up to offer protection not just to the elusive monster, but to any new species found in the loch.”

Now, as it turns out, NatureScot does not in fact have guidelines in place to protect Nessie should it be found, at least not in 2025. I was disappointed, sure, when they told me, but it will be nothing compared to how the

Just because Nessie is a potentially mythical creature whose existence is based solely on personal anecdotes and blurry photos doesn’t mean it’s a bad plan to have some protections in place juuust in case, so we don’t wipe it off the planet immediately should scientific evidence prove its existence real.

After all, as Long pointed out during our chat, 100 years ago, the only things we had to go on to suspect some species were real were local anecdotes and reported sightings – until “credible” proof of existence showed up.

“I mean, the okapi was a cryptid that no one believed in until someone found it,” he told IFLScience. “I’m not saying in the modern day cryptids are credible, but everything was cryptic until it was discovered.”

What makes a species “lost”?

Long heads up conservation strategies at Re:wild, an independent non-profit organization founded by Leonardo DiCaprio, among others, dedicated to global conservation efforts, partnering with everyone from governments and global leaders to Indigenous peoples and local communities in their mission to protect and restore the wild, which includes searching for lost species. Since 2017, incredibly, 15 have been found.

I asked Long what makes a species “lost” as opposed to extinct – or even a cryptid, which is defined as a creature whose existence is disputed or unsubstantiated by science – and as it turns out, he wrote the book, or at least the **paper**, on just that.

“It’s species that have not been seen for over 10 years in the wild or in the trade and are not in captivity,” he explained. “We use the

IUCN Red List, and if something has been declared extinct or presumed extinct, we do not include it on the list because we don’t want to conflict with the standard threat categorization that the world’s experts have put together.”

Long explains there are finer definitions, including “missing” species, those which have not been seen in five years, and even “shadow” species – species that are rarely actually seen by scientists (because they live in the deep sea, for example) but have no known threats.

The definition is not perfect, Long notes, but it is gaining acceptance within the conservation community.

“Obviously, there’s a clear difference between cryptids and ‘lost’ because lost is a known species, whereas ‘cryptid’ is the species is not

yet known,” he pointed out.

So, Re:wild is not in the business of searching for unsubstantiated creatures, but what kind of credible proof do they need to put time and resources into searching for a species not seen in at least a decade without going on a wild goose chase?

How to find a lost species

First, Long explained, they have to select and prioritize their searches. Working with the IUCN Species Survival Commission, the list of lost species is now over 4,000, so they draw up a “**most wanted**” list. For this, they try and include a wide variety of marine and terrestrial animals, plants, and invertebrates from around the world, species that will also, frankly, capture the public’s attention.

It usually starts with reported sightings. Ideally, that needs to be verified, and it needs to be



THE FUTURE OF
IFLSCIENCE

in the wild. However, initial sightings might occur in wet markets or other similar locations. The goal then is to follow the trail of where the species was caught and try to confirm its presence in the wild. Expeditions are then launched to gather evidence like videos, photos, or DNA.



"Sometimes we send out an expedition and they find it straight away, which is great, we know it's there. Then, the discussion goes to, well, how many are there? What's its distribution? What are the threats? What does it need to be properly conserved and recovered?" Long said.

Other species they can spend years looking for before they make the call. "The one we've been looking for the longest is Miss Waldron's red colobus in Cote d'Ivoire and Ghana. This would be the first primate extinction in over 500 years, if we were to confirm it's extinct."

Despite field, eDNA, and thermal imaging surveys with drone cameras, and interviews with locals, it's **not looking good** for the red colobus subspecies, though Long says there are still two final sites to explore. However, the IUCN will make the final call.

What happens after rediscovery?

"To say it's not lost, it just requires one confirmed field record," Long said. "It then goes into: this is a data-deficient species that needs a lot more data and conservation action. It goes from a lost species search to a conservation project immediately."

The Vietnamese **silver-backed chevrotain**, a mouse-deer lost for 30 years and rediscovered in 2019, is an excellent example of a rediscovered species leading to a comprehensive conservation program, including anti-poaching operations and long-term action plans. From conducting

interviews with locals to obtaining camera trap images, multiple surveys across Vietnam found four populations. "Actually, just yesterday, we found a new population," Long shared.

Now, six years after the rediscovery, they've just supported the launch of the first breeding program for it with local partners and global experts.

However, how quickly a conservation program can get off the ground depends on many factors, from the political will of the nation the species is found in to protect its habitat and put protection laws in place to funding.

So what about Nessie?

As Scotland's national animal is the unicorn, and they are supremely proud of their world-famous cryptid, it's unlikely there would be much resistance against developing a full conservation program for it, should irrefutable proof of its existence turn up.

Curiously, however, when we asked people around Loch Ness what they would do if they found it, other than taking a zillion photographs, most people responded they'd keep quiet so it could live in peace.

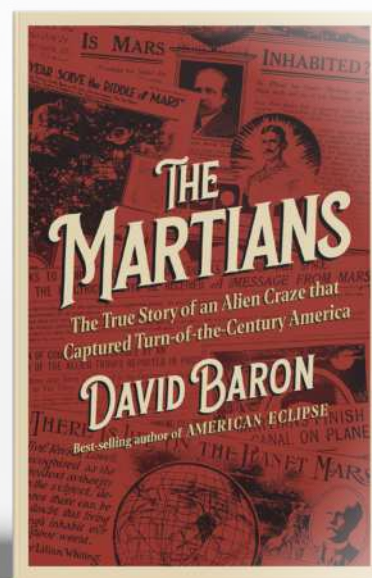
"I don't think I'd let on that I'd discovered it," **Steve Glew**, Skipper of the Loch Ness Centre's *Deepscan* research vessel and tour boat, told IFLScience. Steve claims to have had his own sighting of the "monster" in 2019. "I'm inclined to keep it a secret, whatever it was," he said. "Maybe I have discovered it."

Since Nessie fever is alive and well in 2025, with at least three sightings reported on the **Official Loch Ness Monster Sightings Register** so far this year, and two more just the week before we arrived, perhaps we don't need confirmation. Perhaps, instead, harnessing that passion for cryptids and directing it towards supporting conservation efforts for known lost species – taking part in citizen science, for example – is a more worthy goal than trying to prove the existence of a monster.

So, did we find Nessie? Well, we're inclined to agree with Steve; we wouldn't tell you if we did, so what do you think? 🌟



WHY MARS?



It's one of the biggest questions of our time: "Is there life on Mars?" But how did our hopes of finding extraterrestrial life end up being pinned to a dusty Red Planet half the size of Earth, and how has the view of what that life might look like changed? In *The Martians*, author David Baron takes us on the wild ride that is the origin of Mars mania.

By the time the Mars craze reached its zenith, toward the end of the twentieth century's first decade, one could scarcely avoid the Martians even in the stately parlors and ballrooms of New York's rarefied society.

Mamie Fish, a legendary hostess famed for her acid wit and outlandish functions, threw a dinner for twenty in the winter of 1907. Between courses, a dweller from the Red Planet materialized through scarlet drapes and boomed to the bewildered guests, "Mortals, I am here to tell you the things we know of you in Mars." Across town, at the J. Hamilton P. Hodgsons, another Martian dropped by for New Year's Eve. Though unable to speak English, he was

said to converse with partygoers by means of a so-called mystiscope, a device that helpfully enabled translation. A year or two earlier, at the enormous Midtown playhouse known as the New York Hippodrome, some of the handsomest couples in the city – husbands in evening dress, wives in flowing gowns and pearls – had filled the boxes for the premiere of *A Yankee Circus on Mars*. On a stage that stretched to seemingly astronomical proportions, acrobats and bareback riders performed amid a chorus of Martians three hundred strong.

The Martians that appeared in Manhattan's theaters and elite drawing rooms were – one might reasonably assume – mere humans in alien attire, but those that showed up in the magazines and daily papers surely were not. Artists' renditions depicted the Martians the way scientists imagined their environment had molded them: tall and lithe, perhaps winged or gilled, sporting an insect's antennae or an elephant's trunk. The illustrations left readers agape and aghast. "The Martians may be very fine intellectual people," remarked one Jane Jones of Binghamton, New York, "but we do not, and never shall like their looks."

Although their visages were homely, the physical infrastructure they had erected was something to behold. Telescopic observations revealed on Mars "great centres of population" and "a network of marvelously designed canals traversing the deserts," The New York Times reported in a story that was hardly meant to be a hoax. Photographs corroborated the existence of such monumental feats of hydraulic engineering. The New York World declared in a headline, scientists now know positively that there are thirsty people on

Mars, and among those who knew this positively was Alexander Graham Bell, America's elder statesman of science. Having reviewed the evidence, he saw "no escape from the conviction that Mars is inhabited by a highly civilized and intelligent race of beings."

Meanwhile, towering above the trees on Long Island's north shore stood the instrument that might soon enable humankind to contact the Martians, an interplanetary radio transmitter that had been financed by J. P. Morgan, the Wall Street titan and one of the nation's most sober money men. Philosophers, spiritualists, even God-fearing clergy craved to learn what those sapient aliens across the void might teach us. "Someday theology will be shaken out of its seed-pod present of Earth-centrism and egotism by the study of soul-life on this brother-planet," a Chicago minister wrote with avid expectation to the astronomer who, more than anyone, had staked his career on understanding the Martians and their society. "So toil away, and God bless you!"

For a decade and a half, the Mars craze spread like a raging epidemic – or a burgeoning wildfire – across class divides and borders, but particularly in the United States, consuming almost everything in its path. In the midst of it all, as if in the fog of a long, drawn-out battle, it was often difficult to discern the truth, to separate insight from delusion, to identify who were the geniuses and who were the cranks. By the time the frenzy abated in the years around World War I, some of the glorified participants would end up publicly humiliated and bankrupt, even institutionalized, and the world's perception of its place in the universe would be forever altered. ☀



Q&A WITH

DAVID BARON

AUTHOR OF:

THE MARTIANS: THE TRUE STORY OF AN ALIEN CRAZE THAT CAPTURED TURN-OF-THE-CENTURY AMERICA

Recently, NASA announced the discovery of life on Mars. Or, more accurately, the **most promising potential evidence** for ancient, primitive life on Mars... maybe. It's not the first time life has been "discovered" on the Red Planet, however. On December 9, 1906, The New York Times confidently declared, "There Is Life on the Planet Mars". Because astronomer Percival Lowell convinced everyone he had found it. Mars mania grabbed the public's attention and hasn't let go since. We asked author David Baron why.

What intrigued you about the 19th-century obsession with Mars and its alleged inhabitants?

It all started with memories from my childhood. Back in the 1960s, Martians seemed to be everywhere – in Saturday morning cartoons, TV sitcoms, comic books, sci-fi novels. As an adult,

I grew curious about the origins of our cultural infatuation with Mars, and that led me to delve into history. When I started reading newspapers from the late 19th and early 20th centuries, I couldn't believe what I discovered. Such staid newspapers as The New York Times and Wall Street Journal printed enthusiastic articles proclaiming the existence of a Martian civilization. It was like seeing history reflected in a funhouse mirror. I couldn't quite comprehend what I was reading. My goal in writing the book was to understand how this belief in Martians took hold of the public imagination. Even Alexander Graham Bell said he saw "no escape from the conviction that Mars is inhabited by a highly civilized and intelligent race of beings."

Why do you think Mars held such a fascination in the fin-de-siècle?

Today we remember that era as a glamorous one – it was America's Gilded Age, after all – but many people at the time had grown pessimistic about humanity. A gaping chasm divided the rich from the poor. Violent labor unrest roiled the country. Anarchism was on the rise, leading to terrorist attacks in Europe and political assassinations on both sides of the Atlantic. The public yearned to believe that a better world was possible. The Martian civilization offered hope. According to the theory promulgated by American astronomer Percival Lowell, the Martians had constructed a

worldwide irrigation network that enabled them to survive on a planet that was running out of water. This meant that Mars was a unified world, working together as one. Indeed, Lowell said Mars had evolved beyond war. Who wouldn't want to believe in that?

Who was the most interesting person to write about in the book?

There are many quirky, brilliant characters in my book – including H. G. Wells, Percival Lowell, and the French astronomer/novelist/philosopher Camille Flammarion – but the most fascinating individual would have to be Nikola Tesla. Tesla was a genius inventor and a tragic visionary. He hoped, through his work, to promote global harmony and move the Earth closer to the state of societal perfection achieved by the Martians. In 1899, Tesla detected mysterious radio signals that he was convinced came from Mars, and he proposed a scheme to send messages back. This became his obsession – to establish communication with the Martians. That dream eventually bankrupted him, but he never gave up on it.

You traveled quite a bit for this work. What's your favorite location and what did you see there?

The most unusual place I visited for *The Martians* was an abandoned mining settlement in Chile's Atacama Desert. In 1907, Percival Lowell funded an audacious scientific expedition there. He paid an American astronomer to transport a 7-ton telescope from Massachusetts to that mining camp, where the equipment was used to take thousands of photographs of the Red Planet that supposedly proved the existence of the Martian irrigation canals. When I went to the Atacama, I found the spot where the telescope had been erected and gazed into the desert. Mirages danced on the horizon. It was a potent reminder of how easily the eye can be deceived. What we think we see in the distance – water in a desert, or canals on Mars – may turn out to be nothing more than dazzling illusion. ☀

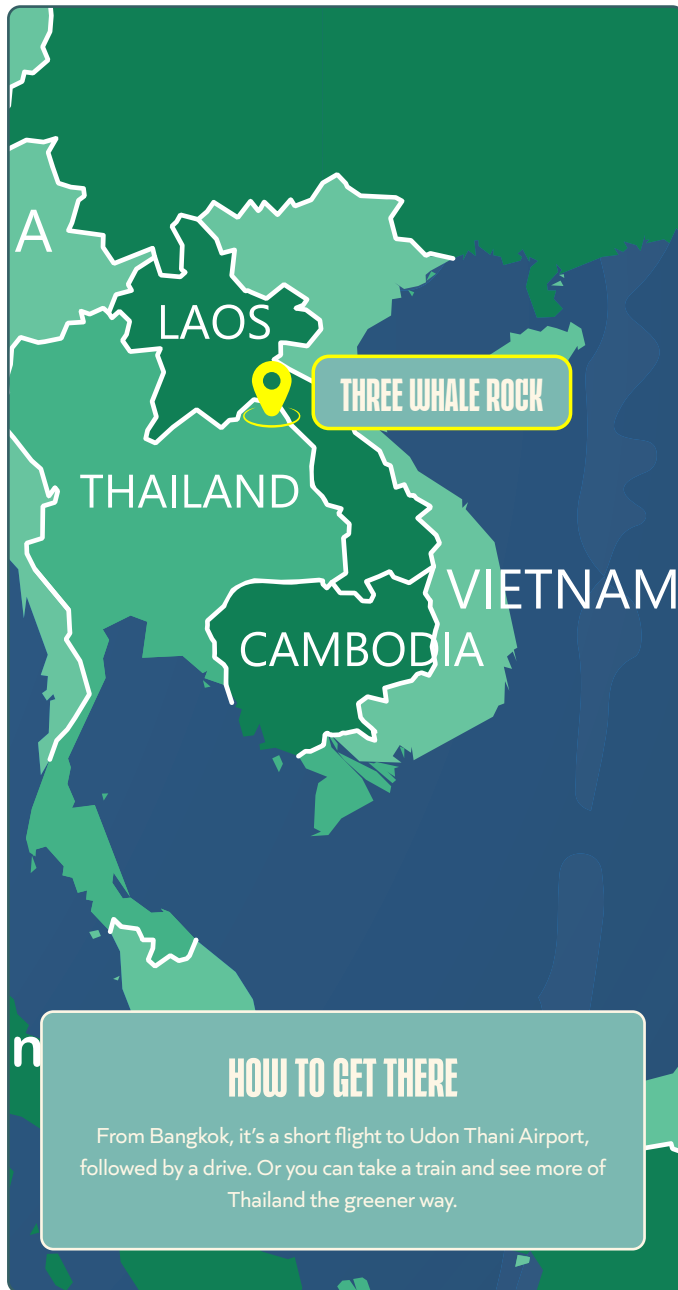
The Martians: The True Story of an Alien Craze that Captured Turn-of-the-Century America is published by WW Norton and is available now.

WHERE ON EARTH

Ancient cetaceans breach this forest canopy in Thailand. Known as Hin Sam Wan, or Three Whale Rock, it's thought to have formed around 75 million years ago when tectonic activity forced sedimentary rock to crack and lift. Wind and rain have shaped that rock into the family of whales it appears like today.

By Rachael Funnell

THREE WHALE ROCK



Welcome to Hin Sam Wan! Not a dinosaur island, but giants do roam here (well, perhaps we should say swim). From the ground, Thailand's Phu Sing Forest Park looks like just that – a forest. But take to the skies and something else entirely emerges from the trees.

Hin Sam Wan means Three Whale Rock, and it pretty much hits the nail on the head. Rock formations that formed 75 million years ago jut out from between the trees, creating a trio of mountainous cetaceans you can walk along. It can be visited via a network of trails, making for a hike to remember as you ride through the forest on the backs of whales. There are nine different routes to reach them, leading you past waterfalls as you journey through an ecosystem that's home to endangered Pu Lu turtles that have long tails and massive heads.

You'll need to dedicate a few hours to the hike, but your reward is views of the dense and sprawling forest, Mekong River, and mountains of Laos. Not to mention a sunrise that emerges from a sea of fog, and a sunset that paints Hin Sam Wan in golden light.

At one point, these rocks were sandy deposits that, over time and under pressure, cemented and formed solid rock. Then, as the Khorat Plateau experienced tectonic uplift, the crust rose up, exposing sedimentary rock to the sky. It would've looked very different in its infancy, but over time, winds and rains eroded the rock, smoothing it off until it took on its whale-like form.

That's thought to have occurred around 75 million years ago, meaning Hin Sam Wan was just starting out when Chicxulub brought the age of dinosaurs to an end (**or did it?**). It would've seen the last of the dinosaurs, fossils of which have been discovered in uplifted sedimentary rocks dating back to the Cretaceous and Cenozoic.

These days, the closest you're getting to those ancient beasts is the region's birds, including some very impressive species. Scan the treetops and you just might see the **blue-naped pitta**, which is only found in this region, as well as the short-tailed parrotbill and rufous-throated fulvetta. Whales *and* dinosaurs? Can't beat that. 🌟

LEARN

BORN

Book by Lucy Inglis

This sweeping history of childbirth explores the experience of pregnancy, the act of childbirth, and the fight for reproductive autonomy throughout history. – **Available now.**

WATCH

FRANKENSTEIN

Movie from Netflix

It's alive! Guillermo del Toro's reimagining of Mary Shelley's tale of one man and his dream of creating a pal out of a few loose body parts.

Not a surgery the world is ready for, but we have found **two new ways to bring hearts back from the dead.** – **Available November 7.**



LISTEN

SEARCHING FOR NESSIE: IFLSCIENCE TAKES ON CRYPTOZOOLOGY

Podcast from IFLScience

What happens when you send four skeptical IFLScience team members to the Scottish Highlands in search of the infamous Loch Ness monster? We delve into the mystery, history, and psychology of everyone's favorite cryptid. Did we find it? You'll have to listen to find out in this "IFLScience Investigates" bonus Halloween special. – **Available Oct 30.**

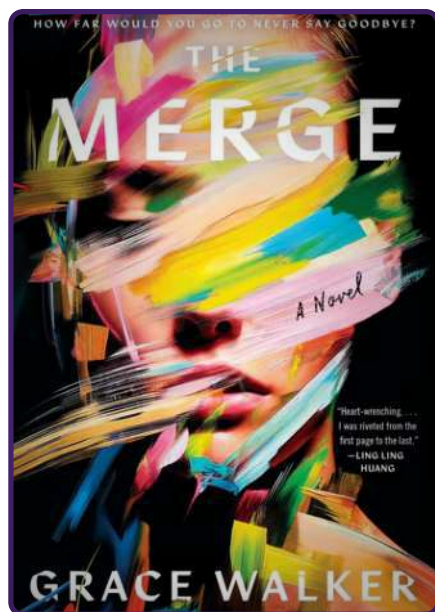
READ

THE MERGE

Book by Grace Walker

Laurie is facing an uncertain future. Diagnosed with Alzheimer's at 65, her daughter Amelia signs them up to take part in the world's first experimental merging process. Laurie's consciousness is transferred into Amelia's healthy body, and they join a growing cohort of merge participants at The Village, but all is not as it seems. Walker's sci-fi vision is beyond the realms of modern-day technology, but did you know that **many neuroscientists think** that we might one day be able to upload consciousness?

– **Available November 11.**



EXPLORE

GEMINI AND MERCURY REMASTERED

Book by Andy Saunders

When people think of NASA, despite all the work it does monitoring the Earth's climate and exploring the bodies of the Solar System, most people's minds go to the Apollo era, when the US space agency repeatedly put humans on the Moon. But Apollo was not the agency's first steps into space, as **newly restored photos** from the pre-Apollo era show. Imaging specialist Andy Saunders, notable for being the person to **find astronaut Alan Shepard's lost golf ball on the Moon**, has carefully restored images from these earlier missions in Gemini and Mercury Remastered. – **Available now.**

COMMISERATE

PLURIBUS

Series from Vince Gilligan and Apple TV

The most miserable person on Earth must save the world from happiness. That's it.

That's all anyone is saying about this sci-fi drama. Intrigued?

Us too. – **Available November 7.**

REMEMBER

THE BOOK OF MEMORY

Book by Mark Rowlands

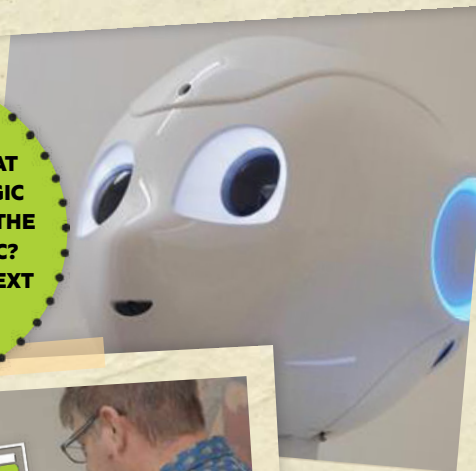
Ever formed a memory of something you weren't really there for? It's just one of the curious ways that what we think we know can be **distorted**, a topic Rowlands explores in depth in this fascinating exploration of the brain. – **Available now.**

Off To See A Magician About A "Mind-Reading Robot"



Rachael Funnell with Dr Gustav Kuhn, Director of the MAGIC Lab

WANT TO SEE WHAT HAPPENS IN A MAGIC LAB AND EXPLORE THE SCIENCE OF MAGIC? JOIN US FOR THE NEXT CURIOUS LIVE.



Dr Gustav Kuhn and "Pepper"

SUBSCRIBE FOR UPDATES ON THE UPCOMING EVENT.

What constitutes a normal Monday as a writer for IFLScience? For Rachael Funnell, that meant magic robots.

"She's called Pepper," I texted my friend on the train. "Obviously."

"What do you mean?" she replied, not picking up what I was putting down. "You can't just tell me you're going to meet a mind-reading robot and expect that to make sense."

I suppose it's the effect of being in this job for over five years, not to notice just how weird it can get sometimes. In preparation for IFLScience's next CURIOUS Live event, in which we dive into the Science of Magic, I was enjoying the very scenic 3-hour journey from London to Plymouth to visit the University's Magic Lab. Dr Gustav Kuhn had agreed to spend the day with us, sharing some of the antics they get up to in a lab that tries to explain the unexplainable.

It was a hell of a day to be back on campus for someone who graduated over 10 years ago. It was the first day of term, and it took a minute to track down Kuhn and several more to find IFLS videographer Dom among the sea of fresh faces and backpacks.

Kuhn led us up a labyrinth of stairs (why are all universities built like that?) until we stepped into a dark office. The first thing I noticed was the disembodied head. Then the fake arm. And, at last, there she was: Pepper bowed in the corner without a flicker of life behind her round, black eyes.

In his 1962 book *Profiles of the Future: An Inquiry into the Limits of the Possible*, science fiction writer Arthur C Clarke laid out his "Three Laws" about humans' ability to predict and understand the future. The third, and perhaps the most widely cited, states that: "Any sufficiently advanced technology is indistinguishable from magic". That's what Pepper was scripted to embody: a technology that could blow the planet-sized mind of a modern human.

How did she do this? By "reading your mind" and guessing the number in your head after rolling some dice. The catch? There was more to her performance than met the eye.

As for the performance Pepper put on for me? Well, she was invented back in 2014, so "advanced" might not be the word for it these days. That said, you're going to love seeing why Kuhn said, "forget animals or children, never work with robots". 🌟



2-8

POLAR BEAR WEEK

Each year, Polar Bears International draws attention to the threats polar bears face in a warming Arctic, at the time of the annual gathering of polar bears near Churchill, Canada.

5

SUPERMOON

10

WORLD SCIENCE DAY FOR PEACE AND DEVELOPMENT

World Science Day for Peace and Development highlights the importance and relevance of science in our daily lives and the need to engage the wider public in debates on emerging issues.

12

NORTHERN TAURIDS PEAK



28

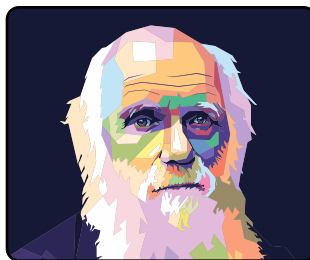
RED PLANET DAY



24

EVOLUTION DAY

November 24 is the 130th anniversary of the publication of *On the Origin of Species* by Charles Darwin in 1895 – an apt day to celebrate the theory of evolution.



24

NEW WHOS PODCAST EP!

In this latest offering from IFLScience's **We Have Questions**, host Tom Hale discusses divining the future from... sheep liver.



23

FIBONACCI DAY

A Fibonacci sequence is a series of numbers where each number is the sum of the two before it e.g., 1,1,2,3 – write that as a date and you get 11/23 or November 23.

18-24

WORLD AMR AWARENESS WEEK

Antimicrobial resistance (AMR) is one of the biggest current threats to global health. This week-long campaign aims to raise awareness of AMR and promote action to combat it.

18

INTERNATIONAL DAY OF LGBTQIA+ PEOPLE IN STEM

2025

NOVEMBER

Polar bears, peace, and Pride all take center stage in November, as do recycling, evolution, and everyone's favorite Red Planet.

15

AMERICA RECYCLES DAY

Millions of Americans come together for America Recycles Day, which is all about spreading the word on how recycling helps us reduce waste.

17

LEONIDS

Active from November 6-30, the Leonids meteor shower will peak on November 17. It is usually one of the most prolific annual showers – expect to see fast, bright meteors at a rate of around 15 an hour.

ARE YOU DRAWN TO THE DARKER OR LIGHTER SIDE OF SCIENCE?

Choose how you end each issue. For those who prefer the darker side, Holly Large explores how AI might actually be funnier than humans. If you like your science lighter, discover how researchers found out that elephants really do know we're looking at them.



EXPLORE YOUR SIDE ON FACEBOOK

AI IS... FUNNIER THAN US?

Humor is an inherently human thing, right? Something like an artificial intelligence (AI) chatbot couldn't possibly be funny on purpose – it only ever seems to be amusing (alongside a healthy dose of concerning) when it goes wrong, like when it tells people that hippos **can be trained as surgeons**.

Or so we might assume. Scientists have been beavering away trying to determine if AI can be trained to be funny, and perhaps concerningly for anyone with hopes and dreams of making a living from stand-up comedy, this time, AI really might be coming for your job.

In one **study**, researchers asked large language model ChatGPT 3.5 to produce headlines in a style akin to that of satirical news website The Onion, and then had 217 students from the University of California assess them for funniness in comparison to real headlines from the site. They found that, on average, the AI-generated headlines were perceived to be similarly funny to the real ones.

It's not the only study that's generated such results either. In a study published **earlier this year**,

award-winning late-night comedy TV writer Joe Toplyn went head-to-head with Witscript, a generative AI system that writes original jokes. There was an added layer of jeopardy here; Toplyn was the one who created Witscript. Would the AI student out-funny the teacher?

Using a script in which half the jokes were written by Toplyn and the other by Witscript, stand-up comics performed them in front of a live audience. In the background, Toplyn and neuroscientist Ori Amir (who's studied the neural basis of a sense of humor) recorded the set, and then measured the length and loudness of laughter after each joke.

It's not the most reliable measure in the world; as Toplyn and Amir acknowledge in their paper, **laughter is contagious**, so some of the audience might be laughing simply because other people are, rather than actually finding the joke funny.

Still, the results aren't to be sniffed at – especially because AI appears to have come out on top. Not only did the AI-generated jokes generally perform at a similar level to those written by Toplyn, but some of them also ranked higher in laughter levels. The funniest joke of them all? Again, written by Witscript.

Maybe the AI wars won't be fought in weapons development after all – they'll be in the comedy club.

GAZING AT ELEPHANTS

It's unsurprising that most of what we know about elephant communication revolves around sound and chemical cues – you can't really ignore the big ol' ears and trunks and just how sensitive they are. The mystery that remains, however, is how well they're able to understand visual cues, and one question in particular that has intrigued researchers is whether or not they can recognize when humans are looking at them.

When it comes to African bush elephants (*Loxodonta africana*), scientists figured out back in **2014** that the answer was "yes". They found that when a human's face and body was oriented towards an elephant, elephants made a gesture with their head and trunk meaning "human, give me a snack" significantly more than if the person was turned away.

A more recent **study** sought to find out if the same could be said for Asian elephants (*Elephas maximus*); though both species are part of the elephant family, they diverged from each other on the evolutionary tree millions of years ago, belong to different genera, and show some behavioral and cognitive differences.

To discover the answer, a team of researchers carried out a similar food-requesting task with 10 captive female Asian elephants living at a site belonging to the Golden Triangle Asian Elephant Foundation in Thailand.

Each elephant underwent four experimental sessions, with days-long breaks in between. In each one, they experienced a human experimenter oriented in four positions: with both their body and face turned away from the elephant; their body away but face towards; their body towards but faced away; and both body and face turned towards the elephant. The team also had a "baseline" condition in which there was no human present.

During each of these sessions and conditions, the research team monitored how often the elephants gestured to the human for food – and they found that seeing a human's face was key.

"We were surprised to find that the elephants did not gesture simply because a human was present," said study author Hoi-Lam Jim in a **statement**. Instead, like their cousins, the elephants gestured the most when both the experimenter's body and face were turned towards them.

This suggests that these elephants know when we're looking and paying attention to them, and understand the importance of what that means – the chance to be given a nice, tasty snack.



The **Darker** Side of Science



THE **LIGHTER** SIDE OF SCIENCE