SCIENCE FLASH NEWS

No. 4/2026
April

Light can now be shaped in empty space, and it could simplify sensing and boost data links

Scientists at the University of East Anglia have uncovered a hidden property of light that allows it to twist, spin and behave differently—without mirrors, materials or special lenses. In a breakthrough that could transform medical testing, data transmission and future quantum technologies, researchers from the UK and South Africa have shown that light can be "programmed" simply by exploiting its natural geometry.

The discovery overturns decades of scientific thinking and reveals that light can develop chiral behavior—meaning it can act like a left or right hand—while traveling freely through space. This, the team says, could ultimately lead to a world where light carries information, probes biology, manipulates matter and protects quantum signals. The research is published in the journal *Light: Science & Applications*.

Chirality, or "handedness," is a crucial concept in science. Many molecules, including those used in medicines, come in left- and right-handed forms that look almost identical but can behave very differently inside the human body.

To tell them apart, scientists often use special forms of light that spin either clockwise or anticlockwise. Until now, creating and controlling this kind of light required carefully engineered surfaces, exotic materials or extreme focusing using powerful lenses.

But the new study shows that none of that is necessary.

https://phys.org/news/2026-04-space-boost-links.html

A mechanical blue LED: Stretching GaN shifts light from UV to blue without changing chemistry

A research team from the Faculty of Engineering at the University of Hong Kong (HKU) has successfully used mechanical stretching technology to dynamically control the emission color of gallium nitride (GaN) material from ultraviolet (UV) to blue light. This technological breakthrough provides a new semiconductor material control solution for future advanced power transistors, optoelectronic components, radio frequency components, and micro-LED displays.

The findings have been published in *Physical Review X* in a paper titled "Deep Elastic Strain Engineering of Free-Standing GaN Microbridge."

Led by Professor Yang Lu from the Department of Mechanical Engineering, the team utilized micro-nano processing technology to fabricate single-crystalline GaN material into tiny bridge-like structures.

Through precise mechanical stretching, the material achieved an elastic deformation of up to 6.8%, with a tensile strength of approximately 11 GPa. This demonstrates the extraordinary elastic deformation capability brought by the size effect, offering broad prospects for deep strain engineering.

This physical stretching not only did not damage the material but also successfully shifted the emission color of GaN from the originally invisible ultraviolet light to a visible blue light.

https://phys.org/news/2026-04-mechanical-blue-gan-shifts-uv.html

Why dolphins swim so fast: The secrets of hidden whirlpools

Dolphins are famous for their speed and agility in the water, but what exactly allows them to swim so effectively? Scientists have been asking this question for years, hoping to learn how to optimize propulsion in fluids from these elegant creatures.

When a dolphin swims, it flaps its tail up and down in a kicking motion. This motion pushes water backward, generating a turbulent flow filled with swirling currents of many different sizes. Until now, it has been difficult to determine how these complex motions conspire to propel the dolphin forward.

Supercomputers reveal hidden water patterns

"Our goal is to understand which parts of the turbulent flow help dolphins swim so quickly," says lead author Yutaro Motoori. "Using a supercomputer, we can simulate and decompose the flow to determine which components play dominant roles."

In an article published in *Physical Review Fluids*, researchers from The University of Osaka have uncovered a key part of the answer: large, powerful vortices created by the movement of the dolphin's tail. The research team used large-scale numerical simulations to visualize the dynamics of these vortices across a wide range of conditions, quantifying their effect on propulsion.

https://phys.org/news/2026-04-dolphins-fast-secrets-hidden-whirlpools.html

Deep under Antarctic ice, a long-predicted cosmic whisper finally breaks through in 13 strange bursts

A detector buried deep in Antarctic ice has captured the first experimental evidence of a predicted but never-before-seen phenomenon: radio pulses generated when high-energy cosmic rays slam into the ice sheet and trigger particle cascades inside it. Through results published in *Physical Review Letters*, astronomers of the Askaryan Radio Array (ARA) Collaboration have validated a key technique, which they hope will eventually allow them to detect some of the rarest and most energetic particles in the universe.

Flashes in the ice

In 1962, Soviet physicist Gurgen Askaryan predicted that high-energy particles passing through a dense material should produce a distinctive burst of radio waves. When such a particle strikes an atom, it triggers a cascade of secondary particles that sweeps up electrons from the surrounding material, creating a negatively charged shower front that radiates at radio frequencies.

https://phys.org/news/2026-04-deep-antarctic-ice-cosmic-strange.html

Particle thought to break physics followed rules all along, research reveals

A tiny discrepancy in particle physics has loomed for decades as an exciting possible crack in one of science's most successful theories, hinting at unknown forces or quantum objects. Now, an international team led by a Penn State physicist has published the most precise study yet to reveal the discrepancy was a fluke in calculation, not nature.

More than half a century of measurements of a fundamental property of the muon—the more massive, short-lived cousin of the electron—did not line up with theoretical predictions, raising hopes that new physics might be behind the unexplained inconsistency.

In a paper published in the journal *Nature*, a team led by a Penn State researcher describes one of the most precise calculations ever performed in particle physics, showing that the Standard Model—the theory describing the known building blocks of matter—still holds.

"There were many calculations in the last 60 years or so, and as they got more and more precise they all pointed toward a discrepancy and a new interaction that would upend known laws of physics," said Zoltan Fodor, distinguished professor of physics at Penn State and lead author of the study.

https://phys.org/news/2026-04-particle-thought-physics-reveals.html

Classical physics can explain quantum weirdness, study shows

When you throw a ball in the air, the equations of classical physics will tell you exactly what path the ball will take as it falls, and when and where it will land. But if you were to squeeze that same ball down to the size of an atom or smaller, it would behave in ways beyond anything that classical physics can predict.

Or so we've thought.

MIT scientists have now shown that certain mathematical ideas from everyday classical physics can be used to describe the often weird and nonintuitive behavior that occurs at the quantum, subatomic scale.

In a paper appearing today in the journal *Proceedings of the Royal Society A Mathematical Physical and Engineering Science*, the team shows that the motion of a quantum object can be calculated by applying an idea from classical physics known as "least action." With their new formulation, they show they can arrive at exactly the same solution as the Schrödinger equation—the main description of quantum mechanics—for a number of textbook quantum-mechanical scenarios, including the double-slit experiment and quantum tunneling.

Such mysterious phenomena, that could only be understood through equations of quantum mechanics, can now also be described using the team's new classical formulation. In essence, the researchers have built an exact mathematical bridge between the classical, everyday physical world and the world that happens at dimensions smaller than an atom.

https://phys.org/news/2026-04-classical-physics-quantum-weirdness.html

Stretching and squeezing diamond opens new path for ultra-precise quantum sensors

Researchers have discovered a new way to tune the quantum properties of tiny defects in diamond—by gently stretching or compressing the crystal. These findings could pave the way for next-generation sensors that can detect pressure, temperature, and other physical changes with unprecedented precision.

Defects in diamond, known as "color centers," are increasingly used in quantum technologies, including ultra-sensitive sensors and emerging quantum communication systems. Among them, the silicon-vacancy (SiV) center stands out for its exceptionally stable and bright light emission, making it a promising building block for quantum devices.

Probing defects under mechanical strain

An international research team led by scientists from the Singapore University of Technology and Design (SUTD) and Yangzhou University, China, investigated how these SiV centers respond when the surrounding diamond lattice is compressed or stretched.

Using advanced computational modeling, the team systematically explored how the atomic structure and optical signals of the defect evolve under different mechanical conditions. The research is published in the journal *Applied Physics Letters*.

https://phys.org/news/2026-04-diamond-path-ultra-precise-quantum.html

Thank you

Edited by

Adrian-Sorin Gruia, Ph.D