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Light show

The cover image offers a night-time view of Earth, capturing human activity across the eastern hemisphere of the planet through the emissions of artificial light. Derived from satellite images taken daily over the past decade, the image maps the dynamics of the human night-time activities, with golden areas experiencing brightening, purple areas featuring dimming, and white areas experiencing both. This changing footprint is explored in this week's issue by Tian Li, Zhe Zhu and colleagues. The researchers reveal that, rather than being a story of universal — show all

Cover image: Michala Garrison/NASA Earth Observatory.

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‘Net zero’ isn’t madness: the staggering economic costs of climate change

The landmark Stern Review, published 20 years ago, laid bare the economic cost of climate inaction. A fracturing political consensus now risks accruing even heftier bills for future generations.

Editorial
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Brain organoids are a transformative technology – but they need regulation

The potential benefits of organoids for fundamental research and medicine are huge. Efforts to establish proper boundaries for their use should be supported.

World View

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The Moon belongs to all of us – not just countries that can afford to reach it

As humanity blasts off into a new space race, we need a model of exploration that emphasizes stewardship of other worlds, not exploitation.

Moriba Jah

World View
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Is social media addictive? Why a formal diagnosis is still out of reach

Limited methods and a lack of guidance around diagnostic criteria mean that many scientists are reluctant to use the term addiction.

Dar Meshi

Research Highlights

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These advanced solar cells have an antique source: old bullets

Lead recycled from centuries-old ammunition provides raw materials for perovskite solar cells.

Research Highlight
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A solar system is born

Astronomers have spotted a second planet taking shape from the material orbiting a young star — only the second such example known.

Research Highlight
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Regular physical activity in midlife cuts risk of early death

Study of more than 11,000 women found that only a few hours of moderate-to-vigorous activity per week had a strong effect.

Research Highlight
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Ashes from Pompeii shed light on rituals in ancient Rome

Residues show that residents of Pompeii burnt resins imported from thousands of kilometres away.

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News in Focus

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Lift off! Artemis II mission sends humans to the Moon – opening a new era of exploration

The astronauts will fly by the far side of the Moon in the coming days, taking in views never seen by the human eye.

Alexandra Witze

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Major conference catches illicit AI use – and rejects hundreds of papers

The papers' watermarks allowed organizers to detect use of large language models in peer review.

Elizabeth Gibney

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Trump’s new science advisers include 12 technology chiefs – and one academic

Sparse academic presence on the US President's Council of Advisors on Science and Technology reflects a focus on technology and industry.

Dan Garisto

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Quantum simulations verified by experiments for the first time

Physicists cross-checked quantum computer predictions against experimental data about materials' properties.

Davide Castelvecchi

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Eye drops made from pig semen deliver cancer treatment to mice

Minuscule particles with the ability to cross hard-to-penetrate barriers can be loaded with drug treatments to target intractable diseases.

Rachel Fieldhouse

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See the intricate worlds of parasites and algae – March’s best science images

The month's sharpest science shots, selected by *Nature*'s photo team.

Miryam Naddaf & Fred Schwaller

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First atlas of brain organization shows development over a lifetime

Scans of more than 3,500 people allow scientists to draw up a guide to the brain areas that work together from birth to 100 years old.

Gemma Conroy

Features

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Mini models of the human brain are revealing how this complex organ takes shape

Lab-grown organoids are turbo-charging the study of human brain development and disease.

Alison Abbott

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This method to reverse cellular ageing is about to be tested in humans

A burgeoning field is launching its first clinical trial to find out whether dialling back cell development can safely refresh aged tissues and organs.

Heidi Ledford

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Books & Arts

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‘Yes, we can’: a blueprint for a clean economy and healthy society

As oil and gas markets face crisis, an influential economist sets out a path to a more efficient, prosperous and sustainable world.

Andrew Macintosh

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Giants of the deep and the wonder of space: Books in Brief

Andrew Robinson reviews five of the best science picks.

Andrew Robinson

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Anthony Leggett obituary: physicist who brought quantum theory to the macro world

The polymath also trained as a philosopher and won a Nobel prize for his theory of superfluids.

Philip Stamp

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Why the US needs a unified, mission-based strategy for health innovation

A goal-driven approach to medical research and development in the United States would address unmet medical needs, reduce costs and improve the reach of treatments.

Victor J. Dzau, Melissa H. Laitner ... Alex M. Helman

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Don’t rush use of lymphatic surgery in Alzheimer’s disease

Jinru Zhang & Zhanao Liu

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AI and the human mind: only one is a black box

Alfredo Vannacci

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Representation without power in science isn’t equity

Richa Chaudhary & Varun Chaudhary

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Engaging the head and the heart: why scientists turn to poetry

Some researchers use verse to visualize complex problems or translate the wonders of science for wider audiences.

Josie Glausiusz

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How DNA forensics is transforming studies of ancient manuscripts

Scientists are exposing the biological information hidden in ancient parchments without leaving a mark.

Marla Broadfoot

Collection: NatureTech

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Mix-and-match synthesis of 3D small molecules

Chemistry that forms an omnipresent type of carbon–carbon bond enables the modular synthesis of 3D organic molecules — a boon for drug discovery and materials design.

Huyen N. Nguyen & Daniel J. Blair

News & Views
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Gut microbes affect cognition during ageing

As mice age, changes in the microorganisms in their guts contribute to cognitive decline by altering signalling between the gut and brain.

Yi-Ting Cheng & Sarkis K. Mazmanian

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High-precision measurement of the *W* boson’s mass lends weight to the standard model

The latest value for the mass of a fundamental particle called the *W* boson is consistent with the standard model of particle physics, challenging a previous anomalous result.

Mika Anton Vesterinen & Hang Yin

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How an all-female fish species defies evolutionary expectations

Asexual reproduction should be an evolutionary dead end. A study of asexual fish shows that a genetic 'copy and paste' helps to overcome the predicted costs of asexuality.

Waldir M. Berbel-Filho

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100 years of synthetic fuels

The Fischer–Tropsch synthesis shaped history by providing a way of making liquid fuels from coal. It is now causing a stir again as a route to sustainable fuels.

Ferdi Schüth

News & Views
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Data from smart watches reveal early signs of insulin resistance

Patterns in continuous data from wearable devices could reveal early metabolic dysfunction long before routine clinical tests detect it.

Christopher M. Hartshorn

Perspective

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Metabolomics across scales: from single cells to population studies

This Perspective reviews the potential and the challenges of metabolomics approaches, encompassing both single-cell and population-scale metabolomics.

Theodore Alexandrov & Nicola Zamboni

Articles

Article
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08 Apr 2026

High-precision measurement of the W boson mass with the CMS experiment

The CMS experiment at CERN reports one of the highest-precision measurements of the W boson mass, finding it in line with standard model predictions and at odds with recent anomalous measurements.

V. Chekhovsky, A. Hayrapetyan ... D. Druzhkin

Article
Open Access
08 Apr 2026

High-precision calculation of the quark–gluon coupling from lattice QCD

Large-scale lattice quantum chromodynamics simulations enable a model-free, highly precise determination of the strong coupling constant α_s, reducing theoretical uncertainty and improving precision tests of particle physics.

Mattia Dalla Brida, Roman Höllwieser ... Rainer Sommer

Article
01 Apr 2026

Moiré engineering of Cooper-pair density modulation states

Researchers created a moiré superlattice in Sb_2Te_3/FeTe bilayers, producing spatially modulated superconducting gaps directly imaged with Josephson scanning tunnelling microscopy and spectroscopy, tunable by replacing Sb_2Te_3 with Bi_2Te_3.

Zihao Wang, Bing Xia ... Cui-Zu Chang

Article
01 Apr 2026

Stoichiometric FeTe is a superconductor

Analysis of FeTe films grown using molecular-beam epitaxy and annealed under a Te flux post-growth shows that stoichiometric FeTe is inherently a superconductor, contradicting the long-held view that it is an antiferromagnetic metal.

Zi-Jie Yan, Zihao Wang ... Cui-Zu Chang

Article
01 Apr 2026

Nanoscale transfer-printed full-colour ultrahigh-resolution quantum dot LEDs

A dual-action force dynamics strategy using a hard silicon template as a nanoimprinting stamp combined with inverted transfer printing is described for the manufacture of high-performance full-colour ultrahigh-resolution quantum dot light-emitting diodes (LEDs) for active-matrix displays, while revealing electric-field reconstruction in nanoscale arrays and introducing dielectric matching to mitigate field concentration and performance degradation.

Lihua Lin, Jie Wang ... Fushan Li

Article
18 Feb 2026

Stereospecific alkyl–alkyl cross-coupling of boronic esters

Stereospecific coupling of boronic esters catalysed by a copper acetylide complex provides simplification of the synthesis of chiral building blocks for complex molecules.

Xieyang Zhang, Kyle T. Palka ... James P. Morken

Article
25 Mar 2026

Decadal-scale droughts disrupted the African Humid Period in the Sahara

Sedimentary time-series data of Lake Yoa in Chad covering the past 10.25 thousand years (kyr) show that the mid-Holocene African Humid Period experienced several decadal-scale droughts, caused by sudden inputs of freshwater into the North Atlantic.

Florence Sylvestre, Martin Melles ... Stefan Kröpelin

Article
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18 Mar 2026

Observing the tidal pulse of rivers from wide-swath satellite altimetry

Data from the recently launched SWOT satellite, a wide-swath satellite altimeter, have been used to map tidal dynamics for thousands of coastal rivers and to document the factors controlling the inland extent of tides.

M. G. Hart-Davis, D. Scherer ... F. Seitz

Article
Open Access
08 Apr 2026

Satellite imagery reveals increasing volatility in human night-time activity

Daily satellite data reveal that Earth's artificial lights at night are highly volatile, with frequent brightening and dimming between 2014 and 2022.

Tian Li, Zhuosen Wang ... Zhe Zhu

Article
Open Access
25 Mar 2026

Disequilibrium response to tapping crustal magma reveals storage conditions

Magma drilling data from Krafla volcano, Iceland, are used to reconstruct in situ lithostatic magmatic conditions using disequilibrium simulations that provide a method for improving the understanding of magma storage conditions and evolution.

Janine Birnbaum, Fabian B. Wadsworth ... Yan Lavallée

Article
Open Access
18 Feb 2026

The natural architecture of oyster reefs maximizes recruit survival

Survival of reef-building oysters peaks at specific combinations of fractal dimension and height that reduce predation, showing how optimal three-dimensional habitat geometry can guide more effective ecosystem restoration.

Juan R. Esquivel-Muelbert, Luisa Fontoura ... Melanie J. Bishop

Article
11 Mar 2026

Gene conversion empowers natural selection in a clonal fish species

Analysis of the asexually reproducing Amazon molly *Poecilia formosa* and its sexually reproducing progenitors *Poecilia mexicana* and *Poecilia latipinna* reveals that it maintains a divergent mutational landscape and has evaded functional mutational decay via gene conversion.

Edward S. Ricemeyer, Nathan K. Schaefer ... Wesley C. Warren

Article
18 Feb 2026

Oxygen metabolism in descendants of the archaeal-eukaryotic ancestor

Sequencing of marine sediments finds 136 newly identified Heimdallarchaeia and several novel lineages, and indicates that Heimdallarchaeia evolved distinct metabolic capabilities from other Asgardarchaeota, in conditions that may have given rise to early eukaryotes.

Kathryn E. Appler, James P. Lingford ... Brett J. Baker

Article
Open Access
18 Feb 2026

The political effects of X’s feed algorithm

Among users initially on a chronological feed, 7 weeks of exposure to X's algorithmic feed in 2023 shifted political attitudes and account-following behaviour in a more conservative direction compared with those remaining on a chronological feed, whereas switching the feed setting in the opposite direction, from algorithmic to chronological, had no effect.

Germain Gauthier, Roland Hodler ... Ekaterina Zhuravskaya

Article
11 Feb 2026

Striatum-wide dopamine encodes trajectory errors separated from value

Cue-evoked striatal dopamine release in mice encodes bidirectional trajectory errors, spatially and temporally separated from value coding, reflecting the relationship between the speed and direction of ongoing movement relative to optimal goal trajectories.

Eleanor H. Brown, Yihan Zi ... Mark W. Howe

Article
Open Access
11 Feb 2026

Astrocytes enable amygdala neural representations supporting memory

Astrocytes in the basolateral amygdala dynamically track fear state and support fear memory retrieval and extinction.

Olena Bukalo, Ruairi O'Sullivan ... Andrew Holmes

Article
Open Access
11 Mar 2026

Intestinal interoceptive dysfunction drives age-associated cognitive decline

Age-related microbiome changes increase medium-chain fatty acid-producing bacteria, driving GPR84-mediated myeloid inflammation, impaired vagal signalling and hippocampal dysfunction; targeting this gut–brain pathway restores memory in aged mice.

Timothy O. Cox, Ashwarya S. Devason ... Christoph A. Thaiss

Article
Open Access
16 Mar 2026

Insulin resistance prediction from wearables and routine blood biomarkers

A machine-learning model that integrates data from wearable devices (such as smartwatches) with blood biomarkers and demographic data can predict whether someone has insulin resistance, enabling timely lifestyle interventions to prevent progression to type 2 diabetes.

Ahmed A. Metwally, A. Ali Heydari ... Javier L. Prieto

Article
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25 Feb 2026

CLCC1 promotes hepatic neutral lipid flux and nuclear pore complex assembly

CRISPR–Cas9 screening identifies CLCC1 as a factor that increases neutral lipid flux to prevent hepatic steatosis and promotes nuclear pore complex assembly by promoting membrane bending and fusion.

Alyssa J. Mathiowetz, Emily S. Meymand ... James A. Olzmann

Article
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25 Feb 2026

CLCC1 governs ER bilayer equilibration to maintain lipid homeostasis

Phospholipid scrambling at the endoplasmic reticulum is essential for establishing a dynamic equilibrium to maintain cellular homeostasis.

Lingzhi Wu, Jianqin Wang ... Xiao-Wei Chen

Article
Open Access
04 Feb 2026

Single-molecule dynamics of the TRiC chaperonin system in vivo

Single-particle tracking experiments in intact cells reveal dynamic co- and post-translational interactions of the TRiC–PFD chaperonin complex with client proteins during in vivo protein folding.

Rongqin Li, Niko Dalheimer ... F. Ulrich Hartl

Article
04 Feb 2026

$\mathrm{PtdIns(3,5)P_2}$ is an endogenous ligand of STING in innate immune signalling

Phosphatidylinositol 3,5-bisphosphate is a ligand of STING and, together with cGAMP, induces STING activation and innate immune responses.

Jay Xiaojun Tan, Bo Lv ... Zhijian J. Chen

Article
04 Feb 2026

Regulation of STING activation by phosphoinositide and cholesterol

Phosphatidylinositol phosphates together with cholesterol bind at the interface between STING dimers, directly promoting high-order oligomerization.

Jie Li, Jay Xiaojun Tan ... Xiao-chen Bai

Article
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04 Feb 2026

Cleavage of mRNAs by a minority of pachytene piRNAs improves sperm fitness

Most pachytene PIWI-interacting RNAs (piRNAs) have no biological function; however, a small population enhances sperm fitness, which has led to their persistence in mammalian evolution.

Katharine Cecchini, Mina Zamani ... Ildar Gainetdinov

Article
Open Access
04 Feb 2026

Chemical capture of diazo metabolites reveals biosynthetic hydrazone oxidation

An approach to discover reactive diazo-based metabolites by capture based on their reactivity coupled to mass spectrometry revealed two previously unknown diazo-containing compounds produced by the human lung pathogen *Nocardia ninae* using novel biosynthetic chemistry.

Katarina Pfeifer, Devon Van Cura ... Emily P. Balskus

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Amendments & Corrections

Author Correction
24 Mar 2026

Author Correction: 7-Dehydrocholesterol is an endogenous suppressor of ferroptosis

Florencio Porto Freitas, Hamed Alborzinia ... José Pedro Friedmann Angeli

Author Correction
20 Mar 2026

Author Correction: A PP1–PP2A phosphatase relay controls mitotic progression

Agnes Grallert, Elvan Boke ... Iain M. Hagan

Retraction
Open Access
25 Mar 2026

Retraction Note: Multisensory learning binds neurons into a cross-modal memory engram

Zeynep Okray, Pedro F. Jacob ... Scott Waddell

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