

nature communications vs science advances

nature communications vs science advances is a comparison frequently considered by researchers, academics, and institutions when deciding where to publish their scientific findings. Both journals are reputable and well-regarded in the scientific community, offering a platform for high-quality research across various disciplines. This article explores the key differences and similarities between Nature Communications and Science Advances, focusing on aspects such as scope, impact factor, editorial policies, open access models, and audience reach. Understanding these factors is crucial for authors aiming to maximize the visibility and impact of their work. The discussion also addresses the submission process, peer review standards, and publication speed to help researchers make an informed choice. Below is an organized overview of the main sections covered in this article.

- Overview of Nature Communications and Science Advances
- Scope and Subject Areas
- Impact Factor and Reputation
- Open Access and Publication Models
- Editorial and Peer Review Process
- Audience and Visibility
- Submission Guidelines and Publication Speed

Overview of Nature Communications and Science Advances

Nature Communications and Science Advances are prominent open access journals published by two of the most prestigious scientific organizations. Nature Communications is published by the Nature Publishing Group, part of Springer Nature, while Science Advances is produced by the American Association for the Advancement of Science (AAAS). Both journals aim to disseminate groundbreaking scientific research to a broad international audience, promoting transparency and accessibility in science. They cover multidisciplinary topics, but each has distinct features and editorial focuses that influence their appeal to different research communities.

History and Publisher Background

Nature Communications was launched in 2010 and has rapidly grown to become one of the leading open access journals in the natural sciences. It leverages the strong brand recognition of the Nature family of journals, known for rigorous peer review and high editorial standards. Science Advances, introduced in 2015, represents the AAAS's commitment to open access publishing, aligning with the Society's mission to advance science globally. Both journals maintain high standards while adapting to the evolving landscape of scientific communication.

Scope and Subject Areas

When evaluating nature communications vs science advances, understanding the scope and subject coverage is essential. Both journals publish multidisciplinary research but emphasize slightly different fields and types of studies.

Nature Communications Scope

Nature Communications covers a wide array of scientific disciplines including biology, chemistry, physics, earth sciences, and health sciences. Its scope extends to applied sciences and interdisciplinary research, accommodating studies that bridge traditional scientific boundaries. The journal prioritizes novel research with significant scientific advances and broad interest.

Science Advances Scope

Science Advances also embraces a broad multidisciplinary approach, publishing research in life sciences, physical sciences, social sciences, and engineering. It particularly encourages submissions that demonstrate transformative concepts, innovations, and comprehensive studies with implications across multiple fields. Science Advances often highlights research with societal relevance and interdisciplinary collaboration.

Impact Factor and Reputation

The impact factor is a key metric often used to compare scientific journals. It reflects the average number of citations received by articles published in a given journal and serves as an indicator of influence within the scientific community.

Nature Communications Impact

Nature Communications consistently ranks among the top-tier open access journals with a high impact factor, reflecting its strong citation record and reputation for publishing influential research. Its affiliation with the Nature brand enhances its prestige, attracting high-quality submissions worldwide.

Science Advances Impact

Science Advances has rapidly increased its impact factor since inception, establishing itself as a leading open access journal. Its impact factor remains competitive, reflecting the quality and significance of published articles. The journal's association with AAAS and Science magazine contributes positively to its reputation.

Open Access and Publication Models

Both journals operate under open access models, ensuring that published research is freely accessible to the global scientific community and the public. However, their specific policies and fees may differ.

Open Access Policies

Nature Communications follows a fully open access publishing model under a Creative Commons license, allowing authors to retain copyright while enabling wide dissemination. Article processing charges (APCs) apply and vary depending on the article type and author institution.

Science Advances Open Access Model

Science Advances also operates as a fully open access journal with similar Creative Commons licensing. APCs are charged to support the publication process and maintain accessibility. Both journals provide waivers and discounts under certain conditions to support researchers from low-income regions.

Comparison of Publication Fees

- Nature Communications generally charges higher APCs reflecting its Nature brand value.
- Science Advances offers competitive APCs that may be more accessible to some researchers.
- Both journals encourage institutional agreements and funding support for open access publishing.

Editorial and Peer Review Process

The quality of peer review and editorial oversight plays a critical role in the credibility and scientific rigor of published articles. Both Nature Communications and Science Advances

emphasize thorough peer review but have distinct editorial workflows.

Nature Communications Editorial Process

Nature Communications employs a team of professional editors with expertise across scientific disciplines who manage the initial screening and peer review. The journal uses a single-blind peer review system and emphasizes constructive feedback to improve manuscript quality. Editorial decisions are based on originality, significance, and methodological rigor.

Science Advances Peer Review

Science Advances utilizes academic editors and peer reviewers drawn from the scientific community to evaluate submissions. The journal employs a double-blind or single-blind review process depending on discipline and editorial discretion. Transparency and fairness are prioritized, with the aim to expedite publication without compromising quality.

Audience and Visibility

The reach and audience engagement of a journal affect how widely research findings are disseminated and cited. Both Nature Communications and Science Advances have global readerships but target somewhat different audiences.

Nature Communications Readership

Nature Communications attracts a broad international audience including academic researchers, industry professionals, and policymakers. Its strong emphasis on multidisciplinary and high-impact research ensures visibility across scientific domains. The journal's integration with Nature's platform enhances discoverability.

Science Advances Audience

Science Advances targets a similarly broad audience with a focus on scholars interested in innovative and interdisciplinary research. Its affiliation with the AAAS and the flagship Science magazine provides additional exposure through various media and outreach channels, increasing article visibility among scientists and the public.

Submission Guidelines and Publication Speed

Understanding submission requirements and timelines is important for authors when choosing between nature communications vs science advances.

Nature Communications Submission Process

Nature Communications requires manuscripts to adhere to strict formatting and ethical guidelines. The submission process is managed through an online portal, with initial editorial screening typically completed within weeks. The overall time from submission to publication can range from several weeks to a few months depending on revisions.

Science Advances Submission and Review Timeline

Science Advances also offers an online submission system with clear guidelines for authors. The journal emphasizes rapid peer review and publication, often achieving shorter turnaround times compared to some traditional journals. Authors benefit from transparent communication and editorial support throughout the process.

Summary of Key Submission Factors

- Both journals require adherence to high ethical standards and data transparency.
- Nature Communications may have longer review times due to high submission volume.
- Science Advances focuses on expediting the review process while maintaining quality.
- Authors should carefully review each journal's specific guidelines to ensure compliance.

Frequently Asked Questions

What are the main differences between Nature Communications and Science Advances?

Nature Communications is a multidisciplinary journal published by Nature Research that covers a broad range of natural sciences, while Science Advances is an open-access journal published by the American Association for the Advancement of Science (AAAS) that also covers a wide array of scientific disciplines. Both emphasize high-quality, impactful research but have different editorial scopes and publication processes.

Which journal has a higher impact factor: Nature Communications or Science Advances?

As of recent metrics, Nature Communications typically has a higher impact factor

compared to Science Advances, reflecting its established reputation and wide readership. However, impact factors can vary yearly, so it's important to check the latest Journal Citation Reports for current figures.

Are Nature Communications and Science Advances both open access journals?

Yes, both Nature Communications and Science Advances are fully open access journals, meaning all published articles are freely available to read and download without subscription fees.

Which journal is more suitable for interdisciplinary research: Nature Communications or Science Advances?

Both journals are well-suited for interdisciplinary research, as they cover a broad range of scientific fields. However, Nature Communications is known for a strong emphasis on multidisciplinary studies across the natural sciences, whereas Science Advances also includes broader scientific areas and often publishes studies with societal impact.

How do the peer review processes of Nature Communications and Science Advances compare?

Both journals implement rigorous peer review processes involving expert reviewers to ensure the quality and validity of published research. Nature Communications tends to have a slightly more selective review process due to its high submission volume, while Science Advances emphasizes rapid and transparent peer review to facilitate timely publication.

What are the publication fees for Nature Communications and Science Advances?

Publication fees for both journals vary but generally range from approximately \$5,000 to \$6,000 USD for open access publication. Exact fees depend on factors like article length and supplementary materials. Authors should consult the journals' websites for the most up-to-date fee information.

Can submitting to Nature Communications or Science Advances enhance the visibility of my research?

Yes, publishing in either Nature Communications or Science Advances can significantly enhance research visibility due to their strong reputations, broad readership, and open access policies, which facilitate wide dissemination and citation of published work.

Additional Resources

1. *Nature Communications: Bridging Disciplines in Scientific Research*

This book explores the multidisciplinary approach of Nature Communications, highlighting how it integrates various scientific fields to foster collaborative research. It delves into the journal's role in disseminating high-impact studies that span biology, chemistry, physics, and earth sciences. Readers gain insights into the editorial standards and the journal's commitment to open access.

2. *Science Advances and the Evolution of Open Science*

Focusing on Science Advances, this book examines the journal's contribution to advancing open science and promoting transparency in research. It discusses the journal's scope across diverse scientific domains and its emphasis on rapid dissemination of groundbreaking discoveries. Case studies illustrate how Science Advances has influenced scientific communication and collaboration.

3. *Comparative Analysis of Nature Communications and Science Advances*

This comprehensive analysis compares the editorial policies, impact, and scientific breadth of Nature Communications and Science Advances. The book provides a detailed look at submission processes, peer review rigor, and publication speed. It also evaluates the journals' influence on shaping contemporary scientific discourse.

4. *Open Access Publishing: Nature Communications vs. Science Advances*

This book investigates the open access models employed by Nature Communications and Science Advances. It outlines the benefits and challenges of open access publishing, including funding mechanisms and accessibility. The discussion includes how these journals contribute to democratizing scientific knowledge.

5. *Impact and Innovation in Nature Communications*

Highlighting groundbreaking research published in Nature Communications, this book showcases innovative studies that have advanced their respective fields. It features interviews with authors and editors to provide behind-the-scenes perspectives. The narrative emphasizes the journal's role in fostering scientific innovation.

6. *Science Advances: Accelerating Scientific Discovery*

This volume focuses on the mission of Science Advances to speed up the dissemination of scientific findings. It discusses technological advancements in publishing, such as enhanced digital platforms and multimedia integration. The book also addresses how Science Advances maintains quality while prioritizing rapid publication.

7. *Editorial Perspectives: Nature Communications and Science Advances*

Providing insights from editors of both journals, this book sheds light on decision-making processes and strategic directions. It covers topics such as handling controversial research, ensuring reproducibility, and maintaining ethical standards. The editors share their visions for the future of scientific publishing.

8. *Trends in Multidisciplinary Research: Insights from Nature Communications*

This book surveys emerging trends and hot topics in multidisciplinary research featured in Nature Communications. It highlights how the journal encourages cross-disciplinary collaboration to solve complex scientific problems. Examples from recent publications illustrate the dynamic nature of contemporary science.

9. *Future Directions in Scientific Publishing: Lessons from Science Advances*

Focusing on the evolving landscape of scientific publishing, this book uses Science Advances as a case study to explore future trends. Topics include artificial intelligence in peer review, data sharing policies, and the role of preprints. The book offers predictions and recommendations for enhancing the impact and accessibility of scientific literature.

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nature communications vs science advances: New Directions in Science and Environmental Communication: Understanding the Role of Online Video-Sharing and Online Video-Sharing Platforms for Science and Research Communication Joachim Allgaier, Asheley R. Landrum, 2022-02-11

nature communications vs science advances: Inherently Disruptive DTRA Chemical and Biological Technologies Department, 2021-01-29 This is the official eBook publication of the Defense Threat Reduction Agency's (DTRA) Chemical and Biological Technologies Department, in its role as the Joint Science and Technology Office (JSTO). The DTRA-JSTO eBook outlines the mission, strategy, and capabilities of DTRA-JSTO as part of the DoD's Chemical and Biological Defense Program (CBDP). By navigating this eBook, scientists, researchers, military personnel, among others will learn about the CBDP and DTRA-JSTO's role in supporting disruptive scientific and technical advancement to protect the U.S. warfighter and its allies.

nature communications vs science advances: *Science Breakthroughs to Advance Food and Agricultural Research by 2030* National Academies of Sciences, Engineering, and Medicine, Division of Behavioral and Social Sciences and Education, Board on Environmental Change and Society, Health and Medicine Division, Food and Nutrition Board, Division on Earth and Life Studies, Water Science and Technology Board, Board on Life Sciences, Board on Atmospheric Sciences and Climate, Board on Agriculture and Natural Resources, Committee on Science Breakthroughs 2030: A Strategy for Food and Agricultural Research, 2019-04-21 For nearly a century, scientific advances have fueled progress in U.S. agriculture to enable American producers to deliver safe and abundant food domestically and provide a trade surplus in bulk and high-value agricultural commodities and foods. Today, the U.S. food and agricultural enterprise faces formidable challenges that will test its long-term sustainability, competitiveness, and resilience. On its current path, future productivity in the U.S. agricultural system is likely to come with trade-offs. The success of agriculture is tied to natural systems, and these systems are showing signs of stress, even more so with the change in climate. More than a third of the food produced is unconsumed, an unacceptable loss of food and nutrients at a time of heightened global food demand. Increased food animal production to meet greater demand will generate more greenhouse gas emissions and excess animal waste. The U.S. food supply is generally secure, but is not immune to the costly and deadly shocks of continuing outbreaks of food-borne illness or to the constant threat of pests and pathogens to crops, livestock, and poultry. U.S. farmers and producers are at the front lines and will need more tools to manage the pressures they face. *Science Breakthroughs to Advance Food and Agricultural Research by 2030* identifies innovative, emerging scientific advances for making the U.S. food and agricultural system more efficient, resilient, and sustainable. This report explores the availability of relatively new

scientific developments across all disciplines that could accelerate progress toward these goals. It identifies the most promising scientific breakthroughs that could have the greatest positive impact on food and agriculture, and that are possible to achieve in the next decade (by 2030).

nature communications vs science advances: *A European Public Investment Outlook*
Floriana Cerniglia, Francesco Saraceno, 2020-06-12 This outlook provides a focused assessment of the state of public capital in the major European countries and identifies areas where public investment could contribute more to stable and sustainable growth. A European Public Investment Outlook brings together contributions from a range of international authors from diverse intellectual and professional backgrounds, providing a valuable resource for the policy-making community in Europe to feed their discussion on public investment. The volume both offers sector-specific advice and highlights larger areas which should be prioritized in the policy debate (from transport to social capital, R&D and the environment). The Outlook is structured into two parts: the chapters of Part I respectively explore public investment trends in France, Germany, Italy, Spain and Europe as a whole, and illuminate how the legacy of the 2008 Global Financial Crisis is one of insufficient public investment. Part II investigates some areas into which resources could be channelled to reverse the recent trend and provide European economies with an adequate public capital stock. The essays in this outlook collectively foster a broad approach to and definition of public investment, that is today more relevant than ever. Offering up a timely and clear case for the elimination of bias against investment in European fiscal rules, this outlook is a welcome contribution to the European debate, aimed both at policy makers and general readers.

nature communications vs science advances: *To Govern the Globe* Alfred W. McCoy, 2021-11-16 In a tempestuous narrative that sweeps across five continents and seven centuries, this book explains how a succession of catastrophes—from the devastating Black Death of 1350 through the coming climate crisis of 2050—has produced a relentless succession of rising empires and fading world orders. During the long centuries of Iberian and British imperial rule, the quest for new forms of energy led to the development of the colonial sugar plantation as a uniquely profitable kind of commerce. In a time when issues of race and social justice have arisen with pressing urgency, the book explains how the plantation's extraordinary profitability relied on a production system that literally worked the slaves to death, creating an insatiable appetite for new captives that made the African slave trade a central feature of modern capitalism for over four centuries. After surveying past centuries roiled by imperial wars, national revolutions, and the struggle for human rights, the closing chapters use those hard-won insights to peer through the present and into the future. By rendering often-opaque environmental science in lucid prose, the book explains how climate change and changing world orders will shape the life opportunities for younger generations, born at the start of this century, during the coming decades that will serve as the signposts of their lives—2030, 2050, 2070, and beyond.

nature communications vs science advances: *Remote Sensing Handbook, Volume I*
Prasad S. Thenkabail, 2024-11-29 Volume I of the Six Volume Remote Sensing Handbook, Second Edition, is focused on satellites and sensors including radar, light detection and ranging (LiDAR), microwave, hyperspectral, unmanned aerial vehicles (UAVs), and their applications. It discusses data normalization and harmonization, accuracies, and uncertainties of remote sensing products, global navigation satellite system (GNSS) theory and practice, crowdsourcing, cloud computing environments, Google Earth Engine, and remote sensing and space law. This thoroughly revised and updated volume draws on the expertise of a diverse array of leading international authorities in remote sensing and provides an essential resource for researchers at all levels interested in using remote sensing. It integrates discussions of remote sensing principles, data, methods, development, applications, and scientific and social context. FEATURES Provides the most up-to-date comprehensive coverage of remote sensing science. Discusses and analyzes data from old and new generations of satellites and sensors. Provides comprehensive methods and approaches for remote sensing data normalization, standardization, and harmonization. Includes numerous case studies on advances and applications at local, regional, and global scales. Introduces advanced methods in

remote sensing such as machine learning, cloud computing, and AI. Highlights scientific achievements over the last decade and provides guidance for future developments. This volume is an excellent resource for the entire remote sensing and GIS community. Academics, researchers, undergraduate and graduate students, as well as practitioners, decision-makers, and policymakers, will benefit from the expertise of the professionals featured in this book, and their extensive knowledge of new and emerging trends.

nature communications vs science advances: *Climate Change 2021 – The Physical Science Basis* Intergovernmental Panel on Climate Change (IPCC), 2023-07-26 The Working Group I contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) provides a comprehensive assessment of the physical science basis of climate change. It considers in situ and remote observations; paleoclimate information; understanding of climate drivers and physical, chemical, and biological processes and feedbacks; global and regional climate modelling; advances in methods of analyses; and insights from climate services. It assesses the current state of the climate; human influence on climate in all regions; future climate change including sea level rise; global warming effects including extremes; climate information for risk assessment and regional adaptation; limiting climate change by reaching net zero carbon dioxide emissions and reducing other greenhouse gas emissions; and benefits for air quality. The report serves policymakers, decision makers, stakeholders, and all interested parties with the latest policy-relevant information on climate change. Available as Open Access on Cambridge Core.

nature communications vs science advances: Soft Electronics for Diagnosis, Therapy, and Integrated Systems Xinge Yu, Jiyu Li, Ya Huang, Enming Song, 2025-08-22 Overview of cutting-edge soft electronics technologies and their clinical and biomedical applications in fields including bioimaging and drug delivery *Soft Electronics for Diagnosis, Therapy, and Integrated Systems* summarizes soft bio-integrated electronics in three parts: soft sensors for diagnosis, soft electronics for therapy, and soft systems for interaction, reviewing the latest state-of-the-art research and comprehensively covering topics from device design strategies and materials processing methods to fabrication techniques and electrical measurements. This book provides information on a wide variety of applications, including flexible sensors for disease diagnosis, flexible electrode for noninvasive brain-computer interface, invasive electrodes, mechanical sensors (transducers) for motion detection of human and organs, smart optoelectronics in health monitoring and human machine interactions, non-invasive detection of bio-analytes, biosensors for blood microbe and virus diagnosis, sensors for bioimaging, self-powered sensors, electrical stimulation, phototherapy, drug delivery, thermotherapy, feedback technology, and soft robots. Written by a team of highly qualified authors and contributed to by experts in their respective fields, *Soft Electronics for Diagnosis, Therapy, and Integrated Systems* discusses sample topics such as: Island bridge structure-curved lines in flexible sensor mechanics, covering 2D and 3D spiral interconnects as well as 2D fractal structures Ocular wearable sensors, covering contact lens sensors, capsule-based tear sensors, wearable eyepatches, and eyeglass sensors Materials and structures of soft sensors, covering nanomaterials, liquid conductors, elastomers, hydrogels, and textiles, as well as serpentine, mesh, and coiled structures Fundamentals of photodetectors, covering performance parameters, quantum dots, and perovskites and other organic materials Describing both theory and application, *Soft Electronics for Diagnosis, Therapy, and Integrated Systems* is an excellent and up-to-date reference on the subject for materials scientists, electronics engineers, biotechnologists, and developers and other professionals in the sensor industry.

nature communications vs science advances: *Coded Optical Imaging* Jinyang Liang, 2024-03-19 This book provides a comprehensive survey of coded optical imaging. Illustrated with 386 figures, it takes readers from the fundamental concepts and theories to the latest research and applications in this field. It can be used in graduate-level courses in optics and photonics. It can also benefit scientists and engineers in optical imaging, computer graphics, and other related disciplines. This book starts from a brief history of coded optical imaging and key operations in its data acquisition and image reconstruction. It then presents the latest progress in technological

development and applications in the areas of biomedicine, materials science, industrial inspection, optical physics, imaging science, information theory, and more. Chapters describe the most representative techniques, exposing readers to key research themes, including: · Optical signal encoding · Image reconstruction techniques · Compressed sensing · Artificial intelligence · Metasurface · Structured light · Lensless imaging · Holography · Tomography · Light-field imaging · Ultrafast imaging · Hyperspectral imaging · Polarization imaging · Super-resolution imaging

nature communications vs science advances: Van der Waals Heterostructures Zheng Zhang, Zhuo Kang, Qingliang Liao, Yue Zhang, 2022-10-31 Van der Waals Heterostructures A comprehensive resource systematically detailing the developments and applications of van der Waals heterostructures and devices Van der Waals Heterostructures is essential reading to understand the developments made in van der Waals heterostructures and devices in all aspects, from basic synthesis to physical analysis and heterostructures assembling to devices applications, including demonstrated applications of van der Waals heterostructure on electronics, optoelectronics, and energy conversion, such as solar energy, hydrogen energy, batteries, catalysts, biotechnology, and more. This book starts from an in-depth introduction of van der Waals interactions in layered materials and the forming of mixed-dimensional heterostructures via van der Waals force. It then comprehensively summarizes the synthetic methods, devices building processes and physical mechanism of 2D van der Waals heterostructures, and devices including 2D-2D electronics, 2D-2D optoelectronics, and mixed dimensional van der Waals heterostructures. In Van der Waals Heterostructures, readers can expect to find specific information on: The current library of 2D semiconductors and the current synthesis and performances of 2D semiconductors Controllable synthesis and assemble van der Waals heterostructures, physics of the van der Waals interface, and multi-field coupling effects 2D-2D electronics, 2D-2D optoelectronics, mixed dimensional van der Waals heterostructures, and van der Waals heterostructure applications on energy conversion Insight into future perspectives of the van der Waals heterostructures and devices with the detailed effective role of 2D materials for integrated electrical and electronic equipment

nature communications vs science advances: Transfer Printing Technologies and Applications Changhong Cao, Yu Sun, 2024-01-26 Transfer printing (TP) is a class of techniques for the deterministic assembly of disparate micro/nanomaterials into functional devices, and has become an emerging suite of technologies for micro/nanofabrication. Systems enabled by transfer printing range from complex molecular-scale materials, to high-performance hard materials, to fully integrated devices. A variety of sub-techniques for different purposes have grown significantly in the past decade, leading to non-conventional electronics, optoelectronics, photovoltaics, and photonics, and enabling the development of non-planar and flexible electronics. Highlights breakthrough results and systems enabled by novel TP techniques. Highlights breakthrough results and systems enabled by novel TP techniques. Transfer Printing Technologies and Applications is a complete guide to transfer printing techniques and their cutting-edge applications. The first section of the book provides a solid grounding in transfer printing methods and the fundamentals behind these technologies. The second part of the book focuses on state-of-the-art applications enabled by transfer printing techniques, including areas such as flexible sensors, flexible transistors, wearable devices, thin film-based energy systems, flexible displays, microLED-based displays, metal films, and more. A concluding chapter addresses current challenges and future opportunities in this innovative field. Highlights breakthrough results and systems enabled by novel TP techniques. Highlights breakthrough results and systems enabled by novel TP techniques. This book is of interest to researchers and advanced students across nanotechnology, materials science, electrical engineering, mechanical engineering, chemistry, and biomedicine, as well as scientists, engineers, and R&D professionals involved with nanomaterials, micro- or nano-fabrication, microelectromechanical systems (MEMS), display technology, biotechnology, and devices. Highlights breakthrough results and systems enabled by novel TP techniques. Highlights breakthrough results and systems enabled by novel TP techniques. Highlights breakthrough results

and systems enabled by novel TP techniques. Highlights breakthrough results and systems enabled by novel TP techniques. Highlights breakthrough results and systems enabled by novel TP techniques. - Examines a range of transfer printing technologies and their specific features for different applications - Highlights breakthrough results and systems enabled by novel TP techniques - Offers an insightful outlook into trends and future directions in each sub-area of transfer printing

nature communications vs science advances: Artificial Intelligence for Scientific Discoveries

Raban Iten, 2023-04-11 Will research soon be done by artificial intelligence, thereby making human researchers superfluous? This book explains modern approaches to discovering physical concepts with machine learning and elucidates their strengths and limitations. The automation of the creation of experimental setups and physical models, as well as model testing are discussed. The focus of the book is the automation of an important step of the model creation, namely finding a minimal number of natural parameters that contain sufficient information to make predictions about the considered system. The basic idea of this approach is to employ a deep learning architecture, SciNet, to model a simplified version of a physicist's reasoning process. SciNet finds the relevant physical parameters, like the mass of a particle, from experimental data and makes predictions based on the parameters found. The author demonstrates how to extract conceptual information from such parameters, e.g., Copernicus' conclusion that the solar system is heliocentric.

nature communications vs science advances: *The Secret Science of Baby* Michael Banks, 2022-12-06 What stops pregnant women from falling over all the time? What makes infant cries so captivating? How do sperm swim? The Secret Science of Baby answers these questions and many more, revealing the fascinating physics behind conception, birth, and babyhood. Parents and parents-to-be are bombarded with information, from what to expect to what to do (and not to do) when it happens. But what they may not realize is that from the chemistry of pregnancy tests to the vacuum physics of breastfeeding, there is fascinating science at the heart of every aspect of creating and raising a new human. Written by science journalist Michael Banks, *The Secret Science of Baby* won't tell you how to raise a perfect violin-playing, mandarin-speaking toddler, but it will shed a new light on how and why things happen as they do—from conception and pregnancy to cooing and pooing. Exploring the hidden physics behind uterine contractions, the fluid dynamics of diapers, and more, both parents and curious non-parents (who, after all, were once babies themselves) will gain a fresh perspective on the infant universe . . . and the thrilling science that makes it possible. In these pages, readers will discover: The physics of the playground and common toys—from the swing to the Slinky What it really means to sleep like a baby The surprising shared vocal cord features of lions and (human) infants The miracle of a baby's first breath and how surface tension provided the key to helping preemies breathe Banks draws from his own experience, interviews with scientists, and the latest research (including some involving conception inside an MRI machine) to offer a book that focuses on “how?” rather than “how-to.” The result is an illuminating and hilarious journey through the everyday science of making, baking, and bringing up baby.

nature communications vs science advances: *Becoming Nature Positive* Marco

Lambertini, Joseph W. Bull, Leroy Little Bear, Harvey Locke, Eva Zabey, Dorothy Maseke, Carlos Manuel Rodríguez, 2025-06-02 As humanity sits at an existential crossroads, this book introduces the need to build a nature-positive future to secure the functioning and stability of Earth systems essential to the survival and wellbeing of present and future human generations as well as the rest of Earth's amazing diversity of life. Alongside the change in climate, a more silent but equally terrifying crisis is unfolding: the loss of nature and biodiversity. These twin crises are in fact interconnected. After decades of ignoring our impacts on the natural world, we are beginning to realise that nature conservation is a security issue for humanity, and an imperative for intersectional and intergenerational justice. For these reasons, we must embrace a transition from a nature-negative to a nature-positive society, one that ensures human development and addresses today's inequality, while conserving, restoring and sustainably benefiting from nature's resources and services. A Nature Positive future is one with more nature than today: more forests, more fish, more pollinators, more soil biodiversity, with benefits for the Planet and for us. In this book we

define what becoming Nature Positive means from a variety of perspectives, what it takes to deliver it and why it is possible and, most importantly, necessary. This book is essential reading for those concerned with conserving nature and securing a safe future for humanity in the face of climate breakdown, biodiversity loss, and ecological collapse. The future can be bright. The choice is ours.

nature communications vs science advances: Chiral Matter - Proceedings Of The Nobel Symposium 167 Egor Babaev, Dmitri Kharzeev, Mats Larsson, Alexander Molochkov, Vitali Zhaunerchyk, 2023-02-13 A geometric figure has chirality, or handedness, if its mirror image cannot be brought to coincide with itself. The concept of chirality was instrumental in establishing the tetrahedral valences of the carbon atom, and has continued to play a key role in chemistry and molecular biology ever since. The fact that living organisms use only one of two mirror isomers of such molecules as amino acids and sugars, that is, the question of the origin of homochirality of the molecular basis of life, remains an unsolved problem of the same dignity as the origin of dark matter and dark energy. The increasing importance of chirality and topology in condensed matter physics and chemistry, and the production of new states of matter in heavy-ion collisions, have brought the concept of chirality into physics and cosmology in a tangible way while at the same time expanded the physics/chemistry interface. The book is the first to address all aspects of chirality in a single volume.

nature communications vs science advances: Quantum Dot Optoelectronic Devices Peng Yu, Zhiming M. Wang, 2020-04-16 This book captures cutting-edge research in semiconductor quantum dot devices, discussing preparation methods and properties, and providing a comprehensive overview of their optoelectronic applications. Quantum dots (QDs), with particle sizes in the nanometer range, have unique electronic and optical properties. They have the potential to open an avenue for next-generation optoelectronic methods and devices, such as lasers, biomarker assays, field effect transistors, LEDs, photodetectors, and solar concentrators. By bringing together leaders in the various application areas, this book is both a comprehensive introduction to different kinds of QDs with unique physical properties as well as their preparation routes, and a platform for knowledge sharing and dissemination of the latest advances in a novel area of nanotechnology.

nature communications vs science advances: Future Humans Scott Solomon, 2016-10-25 An evolutionary biologist provides surprising insights into the changing nature of Homo sapiens in this "important and an entertaining read (Choice). In *Future Humans*, evolutionary biologist Scott Solomon draws on recent discoveries to examine the future evolution of our species. Combining knowledge of our past with current trends, Solomon offers convincing evidence that evolutionary forces are still affecting us today. But how will modernization—including longer lifespans, changing diets, global travel, and widespread use of medicine and contraceptives—affect our evolutionary future? Solomon presents an entertaining and accessible review of the latest research on human evolution in modern times, drawing on fields from genomics to medicine and the study of our microbiome. Drawing together topics ranging from the rise of online dating and Cesarean sections to the spread of diseases such as HIV and Ebola, Solomon suggests that we are entering a new phase in human evolutionary history—one that makes the future less predictable and more interesting than ever before.

nature communications vs science advances: Solution-Processed Organic Light-Emitting Devices Guohua Xie, 2023-08-29 *Solution-Processed Organic Light-Emitting Devices* provides a comprehensive reference on the principles and advances in materials design, device structures, and processing technologies of organic light-emitting diodes (OLEDs). Most importantly, the book analyses the dynamics of thin-film growth from solutions such as solvent orthogonalization, coffee-ring effects, and interfacial adhesion. Exciton generation and utilization, host-guest energy transfer, and interfacial interaction in the solution-processed films are considered with the material and device design to maximize the electroluminescent performance of OLEDs. The book reviews the materials, devices, and technologies dedicated to solution-processed thin-film devices, which are not only applicable to OLEDs but may be adapted to other emerging

semiconducting devices due to the similarity in methods (for instance, quantum-dot LEDs and solar cells, and perovskite-based LEDs/photovoltaics/detectors). This book is suitable for researchers in academia and industry working in the materials science and engineering, chemistry, and physics disciplines. - Discusses the most relevant and emerging solution-processable materials for OLED applications - Reviews device engineering to address defects, charge transport, and exciton generation in fabricated solution-processable thin films - Provides the methods to grow multilayered thin films from solutions with organic semiconductors, with particular attention to new technologies to overcome interfacial mixing effects

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