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Science-Switzerland, October – November 2023

News on Swiss science, technology, education and innovation

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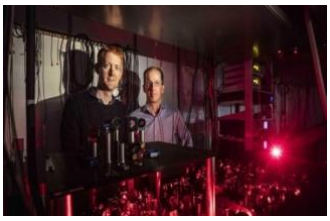
Groundbreaking Neuroprosthesis Treatment for Parkinson's Disease

(University of Lausanne, November 08, 2023)

Lead neuroscientist Grégoire Courtine and neurosurgeon Jocelyne Bloch from EPFL, CHUV, and University of Lausanne, paved the way for a remarkable advance in the treatment of Parkinson's Disease. Fueled by the support of the DETECH Foundation and the SUVA, they have successfully developed a neuroprosthesis that rectifies the walking difficulties typical with Parkinson's Disease. Through a tried-and-true experiment, a considerable stride was made towards unravelling the condition's enigma. Using targeted spinal stimulations that adjust in real time to the patient's movements, Marc's ability to walk was restored without issues or falls. Beyond its implications for Parkinson's, this pioneering breakthrough holds immense potential for treating paralysis, tetraplegia, strokes and training a new pool of health professionals and engineers in these innovative therapeutic modalities.
/web/2023/03-231108-c7

Two Projects Launched to Connect Error-corrected Qubits

(EPFL, November 02, 2023)



ETH Zurich, in conjunction with the University of Innsbruck, has launched two major research projects under the auspices of Professor Andreas Wallraff. Collaborating with teams from renowned institutions and industry partners such as MIT, Forschungszentrum Jülich, the University of Sherbrooke in Canada, Zurich Instruments, and Atalantic Quantum, the collective goal is to entangle two logical qubits and then transfer the quantum state of one to the other. Using superconducting components (ETH Zurich) and ion traps (University of Innsbruck), these projects are fueled by a generous $40 million funding from IARPA over the coming four years. Success in these groundbreaking research could set the stage for powerful quantum computers capable of addressing complex tasks beyond the reach of existing computing methods.
/web/2023/05-231102-d2

Instrument from the University of Bern flies to the Moon

(University of Bern, November 11, 2023)

The University of Bern is building upon a long tradition of pioneering space exploration under the establishment of the Center for Space and Habitability (CSH) and the National Center of Competence in Research (NCCR) PlanetS. Guided by Prof. Dr. Johannes Geiss of the University of Bern's Physics Institute, the team is continuing the trajectory set by the historic Solar Wind Composition (SWC) experiment, a centerpiece of the Apollo missions. Underpinning this cutting-edge research initiative is the Laser Ionization Mass Spectrometer (LIMS) instrument. Built at the University of Bern, LIMS advances the chemical analysis of lunar rocks and could be instrumental in future missions aimed at life detection. This synthesis of academic and industrial knowledge fosters a dynamic exchange of technological innovation, contributing to Switzerland's competitive advantage and seeding potential breakthroughs in various markets.
/web/2023/07-231111-cb

1. Policy

Why Business Should Embrace Digital Responsibility

(ETH Zurich, November 09, 2023)

In a thought-provoking take on data protection and cybersecurity, doctoral student Tomoko Yokoi at the Chair of Technology and Innovation Management at ETH Zurich, conveys why businesses should embrace an ethos of "Digital Responsibility". Yokoi's research indicates that businesses showcasing strong data protection measures and sturdy cybersecurity actions garner significantly more public trust. Throughout her work, Yokoi addresses the EU regulations in place that direct Switzerland's new Federal Act on Data Protection, causing a greater focus on compliance within companies. She further delineates potential risks brought about by emerging digital technologies like artificial intelligence and data analytics. By prioritizing data privacy, the research suggests, businesses can stimulate trust and generate positive outcomes. Iconic companies such as Apple, Die Mobiliar, and Weleda are commendable examples of this approach to digital responsibility.
/web/2023/01-231109-4a

Improving Mobility with Data Sharing

(University of Basel, November 01, 2023)

In a collaborative endeavor, the University of Basel and two leading tech and mobility consulting firms have shed light on how to better utilize mobility data. Led by Dr. Apollo Dauag from the Faculty of Law, the research provides fresh insights on prerequisites for improved data utilization, with the successful release of their report in September 2023. The report highlights ten potential pathways and the necessary steps to establish a data-sharing platform that could generate value across the board. Dr. Dauag emphasizes how this proposed platform could award competitive advantages to companies whilst delivering enhanced, personalized services to travelers. This pioneering work could also lay the groundwork for analogous ventures into other domains like agriculture and healthcare.
/web/2023/01-231101-8f

A Super-model to Guide Policy Makers

(University of Geneva, November 07, 2023)

A dynamic interdisciplinary team from the University of Geneva and the Institute for Environmental Sciences, guided by Associate Professor Evelina Trutnevyte, has accomplished a potent revelation in the realm of energy transition. Harnessing varying perspectives, this exploration successfully birthed a comprehensive model to aid, inform, and shape effective decision-making by policy makers. The extensive research broached numerous energy technologies and included analyses from countries across Europe. Augmenting the value of their project, the team made their insightful projections and subsequent updates available to the public. With their work now published in the PNAS Nexus, they have bridged diverse sectors to illuminate actionable pathways towards a sustainable future.
/web/2023/01-231107-2c

The University of Lucerne Embraces Transparency in Research

(University of Lucerne, November 17, 2023)

Exciting news from the University of Lucerne! The institution has just released its Open Science Policy, an initiative designed to foster research transparency and accessibility. Developed by representatives across all faculties, this policy aligns with the National Open Access Strategy and National Strategy for Open Research Data by Swiss Universities. The policy underscores the importance of open access publications, responsible use of research data, and encouragement of open educational resources and free licenses for computer program codes. With the policy set to go into effect in 2024, its implementation is supervised by University faculties, university leadership, and the Open Science department of the Central and University Library in Lucerne.
/web/2023/01-231117-27

2. Education

Introducing A New CAS in the Repairability of Buildings and Products

(ETH Zurich, November 23, 2023)

The Continuing Education program at ETH Zurich, under the leadership of Professor Silke Langenberg from the Institute for Manufacturing Technologies, is rolling out their new Certificate of Advanced Studies (CAS) in Repair and Maintenance. The course has been specifically designed for professionals ranging from architects and civil engineers to environmental scientists. The program places a strong emphasis on enacting practical, efficient repair concepts and identifying the critical factors for repairability of products and structures. Students will have the unique opportunity to collaborate on a model repair project based on a real-life laboratory building due for refurbishment. This pivotal research initiative not only elevates the participants' skill level but also supports the development of sustainable, aesthetic, and fair repair concepts, thereby echoing ETH Zurich's commitment to promoting sustainable solutions.
/web/2023/02-231123-fa

3. Life Science

Exploring the Complex Protein Network in Gene Regulation

(EPFL, October 03, 2023)

In a collaboration between EPFL (Ecole Polytechnique Federale de Lausanne), RIKEN Center for Biosystems Dynamics, EPFL Institute of Bioengineering, and National Center of Neurology and Psychiatry (NCNP) in Japan, lead scientist Daniel B. Constam, alongside first author Benjamin Rothé, have made fundamental discoveries in the regulation of gene expression, specifically involving BICC1 - a critical player in organ development. Their meticulous investigation unraveled the roles of two proteins, ANKS3 and ANKS6, in the binding regulation of BICC1 mRNA. The team uncovered a dynamic protein network where ANKS3, ANKS6, and BICC1 interact, engaging multiple contact points in what can be imagined as a complex molecular dance. This breakthrough opens up significant new research directions, especially in leveraging this switch in cilia for the management of chronic disorders including polycystic kidney diseases and nephronophthisis.
/web/2023/03-231003-8a

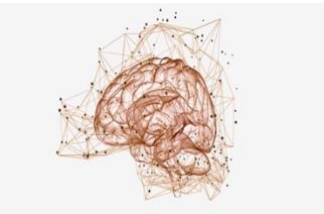
Key Insight into Parkinson's Disease Progression Revealed

(EPFL, October 03, 2023)

A novel collaborative study between the Bertarelli Platform for Gene Therapy headed by Bernard Schneider and the lab of Anders Meibom at EPFL has revealed a pivotal discovery concerning the progression of Parkinson's Disease. Led by Sofia Spataro, their research has shown how alpha-synuclein, a culprit in Parkinson's Disease, disrupts metabolic processes within neurons. This study employed leading-edge imaging techniques, namely NanoSIMS and stable isotope labeling, teamed with electron microscopy, which allowed the team to observe and visualize metabolic activity at an unprecedented level of resolution. With the prospective swell of Parkinson's Disease patients to 14 million by 2040, these insights could be instrumental in developing new therapeutic approaches.
/web/2023/03-231003-6f

Brain Signals for Good Memory Performance Revealed

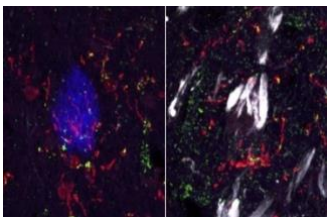
(University of Basel, October 04, 2023)



The University of Basel and University Psychiatric Clinics Basel led a landmark project aimed at enhancing the understanding of individual memory performance. The study, headed by Professors Dominique de Quervain, Andreas Papassotiropoulos and Dr. Léonie Geissmann, successfully identified functional brain networks associated with memory performance. The study involved identifying the memorization capabilities of nearly 1,500 young adults using MRI scans. After observing a series of images and recalling as many as possible, interesting correlations between brain activities and memory capabilities were discovered. The findings not only highlighted how memory performance differs among individuals, but also established links between biological characteristics like genetic markers and brain signals, opening up intriguing avenues for future research.
/web/2023/03-231004-c5

Marker for Brain Inflammation Finally Decoded

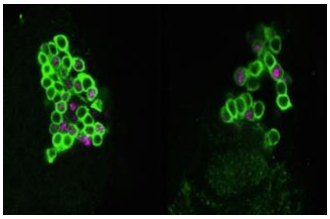
(University of Geneva, October 04, 2023)



In a ground-breaking study, Senior Clinical Associate Stergios Tsartsalis, alongside his team from the University of Geneva (UNIGE), Imperial College London, University Hospitals of Geneva (HUG), and Amsterdam UMC, have reshaped the understanding of a critical protein marker used in medical imaging to visualize cerebral inflammation. Relying on state-of-the-art neuroimaging techniques, and backed by robust funding from the Swiss National Science Foundation and the Prof Dr Max Cloëtta Foundation, the team discovered that a high prevalence of this protein in the brain coincides with increased inflammatory cells but does not indicate their hyperactivity. This significant finding refines our understanding of microglia's role in neuroinflammation and has transformative implications for future research direction and imaging methodologies.
/web/2023/03-231004-af

Parkinson's: Are our Neurons more Vulnerable at Night?

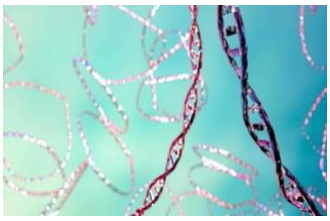
(University of Geneva, October 04, 2023)



Pioneering research conducted at the University of Geneva (UNIGE) by the team of Associate Professor Emi Nagoshi from the Department of Genetics and Evolution in the Faculty of Science and Michaëla Dorcikova, has led to a significant breakthrough in our understanding of Parkinson's disease. This research has zeroed in on the correlation between human circadian cycles and the onset of Parkinson's disease Using fruit flies as a model system and exposing them to oxidative stress at varied times, the team noted an amplified sensitivity in these flies' neurons during the night, causing an accumulation of destroyed dopaminergic neurons. This discovery indicates that the circadian rhythm could influence the onset and progression of Parkinson's disease, potentially leading to future exploration into its role in other diseases.
/web/2023/03-231004-66

Discovery of New Cellular Compartment at ETH Zurich

(ETH Zurich, October 04, 2023)



A breakthrough in cellular biology was recently made by an industrious team of researchers at ETH Zurich, driven by Professor Ralf Kroschewski. They've identified an uncharted compartment within cell plasma, termed the exclusome, which intriguingly, houses extra-chromosomal DNA, including plasmids and telomeric rings. This constitution within the exclusome shapes our understanding, offering valuable insights into which forms of DNA are classified 'worthy' of being enveloped within a nuclear framework. With an efficient research roadmap to demystify key aspects of this exclusive compartment, including analyzing the shifts at the plasmid DNA level, Prof. Kroschewski's team aims to deepen our grasp of how cells manage extra-chromosomal DNA - offering potential ramifications on our knowledge in areas such as cancer research.
/web/2023/03-231004-ef

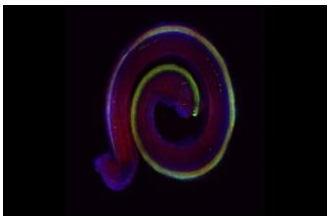
New Findings on Mate Choice in Fruit Flies: A Pathway to Understand Evolution

(University of Zurich, October 04, 2023)

In an insightful study led by Prof. Dr. Stefan Lüpold, from the Department of Evolutionary Biology & Environmental Studies at the University of Zurich in partnership with Concordia University, researchers have yielded fascinating findings regarding mate choice in fruit flies. Their work has shed new light on the role of both genetic quality and compatibility in the reproductive process. The researchers made novel use of fluorescently labeled sperm to track the entire reproductive process, providing insight from sperm within the female reproductive tract to paternity outcomes. The research implies that the importance of genetic quality and compatibility varies across different stages. These findings could influence our understanding of the evolution of male sexual traits and population variation, extending beyond just the realm of fruit flies.
/web/2023/03-231004-1b

New Findings Pave the Way for Hearing Loss Therapies

(University of Basel, October 10, 2023)



Scientists from the University of Basel and University Hospital Basel, Dr. Maurizio Cortada and Professor Michael N. Hall, have reported a groundbreaking breakthrough in understanding hearing loss. Their study unveils a crucial signaling pathway, the mTORC2, that significantly influences auditory sensory cells within our inner ear. The team conducted their research by removing a key gene in this signaling pathway in the inner ear hair cells of mice. The result was a gradual loss of hearing in these animals. A detailed analysis revealed that without the mTORC2 signaling pathway, these sensory hair cells lost their sensors, with notable reduction in both their length and the number of synapses that signal to the auditory nerve. They also established a link between decreased production of essential proteins in this pathway and age, which might be a contributing factor to hearing loss. This research opens avenues for potential hearing loss therapies.
/web/2023/03-231010-23

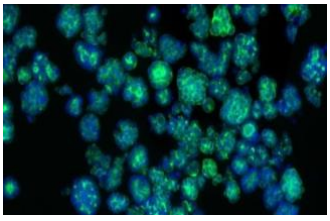
Increased Deep Sleep Benefits Heart

(ETH Zurich, October 10, 2023)

Embarked upon by researchers at the Interdisciplinary Centre for Sleep Medicine at University Children's Hospital Zurich, the Department of Neurology at University Hospital Zurich, and a team led by Dr. Sabrina Huwiler from ETH Zurich, the SleepLoop project represents a transformative wave in cardiovascular health. Using targeted stimulation with brief tones during deep sleep, the research exhibited an enhanced contraction-relaxation skill in the heart, leading to improved blood circulation efficiency. This crucial finding can potentially transform both treatment in diseases and performance in competitive sports, expediting recovery after rigorous workouts. With future plans to explore potent stimulation methods for cardiovascular health, Dr. Huwiler is also pushing boundaries by seeking grants and founding EARDREAM, a startup that carries the potential to revolutionize sleep and cardiovascular health.
/web/2023/03-231010-5f

Metabolite Drives Tumor Development

(University of Basel, October 11, 2023)



The Biozentrum, University of Basel, headed by Professor Michael N. Hall, recently conducted a study uncovering a crucial component in metabolic rewiring of liver cancer cells. The path-breaking research found that high levels of the amino acid arginine lead to metabolic reprogramming, subsequently eliciting tumor growth. Using sophisticated tumor organoids as a model, the research focused on understanding the metabolic shifts within liver cancer. Instead of entirely depleting arginine, it was suggested to target the specific arginine-binding factor, avoiding any unwanted side effects. This metabolic variance can serve as early-stage cancer detection biomarkers, heightening the prospects of successful treatment and enhancing patient survival. As one of the most crucial research outcomes in recent times, this could significantly improve liver cancer treatment methodologies.
/web/2023/03-231011-d6

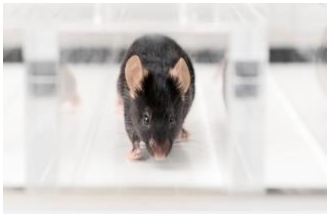
Understanding Cichlid Species Evolutionary Burst in Lake Victoria

(Eawag, October 12, 2023)

Ground-breaking research led by fish biologist Ole Seehausen from Eawag and the University of Bern has unlocked the mystery of rapid cichlid species evolution in Lake Victoria, boasting over 500 species in merely 16,000 years. This unexpected swift biodiversity illustrates an urgent need to protect not just individual species, but entire "species swarms". The research, documented in Science and Nature journals, indicates that this secular evolution ensued through repeated cycles of fusion and diversification. Despite the potential loss of certain specialized species during catastrophes, a substantial part of their genomes subsisted amongst the few survivor populations. This vital discovery underscores the importance of biodiversity conservation and highlights the necessity to safeguard species swarms.
/web/2023/03-231012-f3

New Technique Revolutionizes Muscle Disease Research

(University of Basel, October 13, 2023)



An exciting scientific breakthrough has been achieved by the team at the University of Basel, led by Professor Markus Rüegg. They have developed a revolutionary CRISPR/Cas9-based method for studying muscle diseases that could significantly enhance our understanding and treatment of neuromuscular disorders. The research leverage the CRISPR/Cas9 system and adeno-associated viral vectors to bring about alterations in muscle fibers. This innovative approach allows for a rapid and more efficient study of gene function in muscle fibers, reducing the number of experimental animals required. This development may ultimately speed up research and advance therapeutic approaches for muscle disorders. Published in Nature Communications, this study represents a significant advance in muscle research.
/web/2023/03-231013-cc

Innovative Device to Treat Lymphedema: Promising Results in Preliminary Study

(University of Lausanne, October 17, 2023)

At the University of Lausanne (UNIL) and University of Lausanne Hospital (CHUV), led by Professor Lucia Mazzolai, a new study evaluating a pioneering device designed to treat and relieve lymphedema is underway. This implantable device, acting as an artificial drain for damaged or missing lymphatic vessels and driven by an external pump, yields highly encouraging results in its preliminary phase. The device, employed by CHUV's Heart and Vessels Department, utilizes a mini-invasive technique to reduce surgical risks and foster speedy recovery. Preliminary results of this groundbreaking study were presented at the European Vascular Medicine Congress in Milan recently. This is a huge leap towards improving quality of life for cancer survivors struggling with lymphedema, as the innovative device aids in the reduction of limb swelling.
/web/2023/03-231017-61

Decoding the Axolotl: A New Path for Limb Regrowth

(EPFL, October 18, 2023)

Scientists from EPFL and TU Dresden, headed by Can Aztekin, an Early Independent Research Scholar (ELISIR) at EPFL's School of Life Sciences, in collaboration with Tatiana Sandoval-Guzmán's group at TU Dresden, have unlocked the secrets behind the remarkable limb regrowth mechanism of the axolotl. The team began by creating a "gene-expression atlas" from various species, including humans, mice, chickens, frogs, and the axolotl. Comparing these gene expression profiles during limb development and regeneration, they identified similarities between axolotl and AER cells (a structure crucial for limb development in other vertebrates). This landmark discovery opens new doors to the potential of human regenerative medicine.
/web/2023/03-231018-d8

The Encounters Between Neanderthals and Sapiens as Told by Their Genomes

(University of Geneva, October 19, 2023)

A groundbreaking study at the University of Geneva (UNIGE), led by Mathias Currat, a Senior Lecturer in the Department of Genetics and Evolution at the Faculty of Science, explores the intricate encounter between Neanderthals and modern humans. The team has used computer simulations and genomic data to reveal that our modern genomes carry significant evidence of influence from Neanderthals. Through the study, using the analysis of the genomes of Neanderthals and Sapiens, they discovered that the encounter between the two species was quite complex and left its mark on us in a way previously overlooked. This research is profoundly relevant as it enhances our comprehension of human history and broadens the scope of understanding about the Neanderthal impact on our contemporary society.
/web/2023/03-231019-74

Better cancer diagnosis thanks to digital 3D images

(ETH Zurich, October 27, 2023)

Francesca Catto and Robert Axelrod from ETH Zurich, in collaboration with other universities, have broken new grounds in the world of cancer diagnosis and treatment. They have successfully studied the role of Notch ligand Dll4, and its influence on cell recruitment to aortic clusters, limiting the generation of blood stem cells. The research, a result of meticulous study and high-precision procedure, particularly affects the field of cancer diagnosis, and has the potential to enhance treatment methodologies significantly. The breakthrough is the crux of their soon-to-be-launched start-up, aiming to incorporate this discovery into a product that will herald a new era in cancer diagnosis, making the process more reliable and digitally advanced. Their main objective remains advancing cancer treatment and learning from the journey.
/web/2023/03-231027-a5

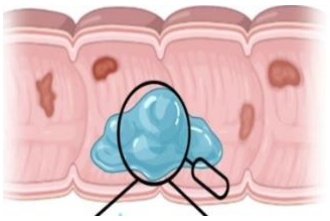
New Methods for Effective Transport of Large Genes in Gene Therapy

(University of Zurich, October 27, 2023)

The University of Zurich is making its mark in gene therapy advancements, with a team led by Professor Elvir Becirovic unearthing a more efficient and flexible gene transfer method. They have termed the method REVeRT (reconstitution via mRNA trans-splicing), and it paves the way for assembling split gene fragments at the transcript level. Tested in both cell cultures and animal models for ophthalmologic treatments, this novel method demonstrates greater efficiency with fewer side effects than previous approaches, showing promise for addressing hereditary macular degeneration. Moreover, REVeRT's flexibility extends its potential beyond ophthalmologic applications to other genetic or acquired diseases and can be applied to gene therapy studies using CRISPR/Cas genome editing.
/web/2023/03-231027-97

Treating the Inflamed Intestinal Wall Locally

(University of Bern, October 27, 2023)



A team headed by Professors Philippe Krebs and Paola Luciani, with Dr. Simone Aleandri of the University of Bern, has pioneered a lipid gel for targeted drug delivery. This temperature-triggered and in-situ-forming gel is designed to release pharmaceuticals to specific regions over a fixed period, enhancing potency and safety in treating chronic inflammatory bowel diseases, specifically ulcerative colitis. The gel's localized and sustained drug dispersion could replace conventional therapies, promising fewer side-effects. This work, financed by the University of Bern's Innovation Office, Swiss National Science Foundation, Bern University Research Foundation, and a "Seal of Excellence Fund" (SELF), resonates with the university's goal of fostering innovation that improves patient health while reducing potential risks.
/web/2023/03-231027-f2

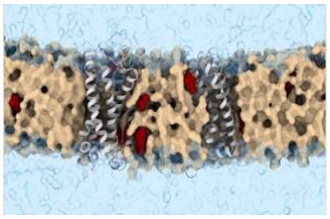
Reducing Anxiety and Stress with Pupil Feedback

(ETH Zurich, October 31, 2023)

In a groundbreaking study led by Professor Nicole Wenderoth from ETH Zurich, University of Zurich, University Hospital Zurich, and the University of Zurich Hospital of Psychiatry, it was discovered people can manage their brain's arousal levels through mental activation and relaxation techniques using biofeedback. The innovative project investigated the connection between pupil size and arousal, using 27 participants trained to adjust their pupils' size via mental activities such as focused breathing and visualizations. The research compellingly indicates that those who controlled their pupils efficiently saw significant alterations in their pulse compared to the control group, suggesting valuable implications for the treatment of stress and anxiety disorders. Subsequently, an ETH spin-off, Mindmetrix, has already been founded to commercialize this promising technology. This impactful research is integral to the "Stress" flagship project of the "Hochschulmedizin Zurich" research initiative.
/web/2023/03-231031-9b

New Receptor Structures Discovered to Design Drugs

(University of Lugano, November 03, 2023)



In a groundbreaking publication in Nature Communications, Professor Vittorio Limongelli and his dedicated team from the Euler Institute at the Università della Svizzera italiana bring to light the discovery of dimeric structural organization of certain receptors – a key drug target in pharmacology. These receptors, known as G-protein-coupled receptors (GPCRs), regulate numerous vital body-functions and are primarily located in the cell membrane. Through an in-depth study of these GPCRs, the researchers identified differences in drug and protein binding states, which could be regulated via dimerization. This crucial discovery potentially revolutionizes the design of drugs, allowing for improved pharmacological activity and reduced toxicity. It signifies a leap forward in pharmaceutical research, especially regarding drugs for HIV, cancer, and immune-inflammatory diseases.
/web/2023/03-231103-60

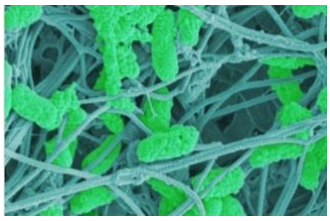
Phosphorous - Too Much in Lakes, Too Little in the Soil

(Swiss National Science Foundation, November 03, 2023)

An international study led by Martin Grosjean, Director of the Oeschger Centre for Climate Change Research at the University of Bern, has achieved a significant advance in our understanding of the global phosphorus cycle. Collaborating with researchers from the UK and China, this group has painted a detailed picture of phosphorus kinetics throughout the last few millennia. The comprehensive research involved studying sediments from 108 lakes globally. The team discovered a significant increase in phosphorus entry into lakes dating back to the Bronze Age due to deforestation and greater land utilization. More alarmingly, this influx amped up sixfold since the pre-industrial era due to industrialization and phosphorous fertilizers usage, posing a threat to future food security. With an estimated 2.7 billion tonnes of phosphorous stored in lake sediments around the world, this study raises a flag on environmental integrity.
/web/2023/03-231103-22

Innovative Probiotic Bandage Improves Healing of Chronic Wounds

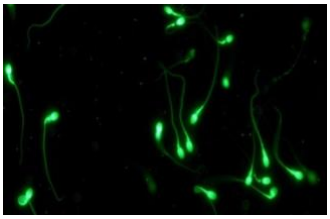
(EMPA, November 03, 2023)



An innovative wound bandage using live probiotic bacteria has been developed by a research team from Empa's "Biointerfaces" laboratory in Saint-Gall, led by Qun Ren and Zhihao Li. They collaborated with Robert Langer from MIT and Katharina Maniura from Empa. The biocompatible dressing drastically reduced the number of Pseudomonas aeruginosa pathogens by an impressive 99.999%, leveraging a 3-dimensional wound model. Generating an acidic environment beneficial for chronic wounds, the probiotic bacteria within the dressing could also stimulate the production of immune system messengers. This remarkable breakthrough paves the way for advanced wound healing treatments, demonstrating how harnessing nature holds great promise for medical science.
/web/2023/03-231103-87

Mobile Phone Use May Affect Semen Quality

(University of Geneva, November 01, 2023)



The University of Geneva (UNIGE) and the Swiss Tropical and Public Health Institute (Swiss TPH) have collaboratively released a compelling study exploring the link between mobile phone use and sperm concentration. Under the guidance of lead researcher Professor Serge Nef from the Department of Genetic Medicine and Development at the UNIGE Faculty of Medicine, the research delves into data collected from over 2,800 Swiss men aged 18 to 22. The study provides a fascinating insight, indicating a potential correlation between frequent mobile phone usage and a decrease in sperm concentration. To further validate this association, a new and more extensive study, funded by the Federal Office for the Environment, has commenced in 2023. The study aims to determine the exact measurement of exposure to electromagnetic waves in relation to male fertility. Using a specially designed mobile phone application, data collection is underway. The researchers are currently seeking new study participants, while continuing to examine the mechanism behind these preliminary findings.
/web/2023/03-231101-7b

Poison Dart Frogs: Personality Determines Reproductive Strategies

(University of Bern, November 09, 2023)

A groundbreaking study led by Professor Eva Ringler at the University of Bern's Institute of Ecology and Evolution has revealed significant findings about the Allobates femoralis species of poison dart frogs. The research has disclosed a fascinating association between personality traits and reproductive success in these unique creatures. Through strategic behavioral experiments conducted in both field and lab settings, the team found that specific personality traits can substantially influence the components of reproductive success within this species. Published in the prestigious Proceedings of the Royal Society B and Evolutionary Ecology, this work provides invaluable insight into how genetic factors may limit behavioral variation among species.
/web/2023/03-231109-1b

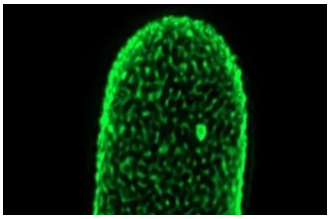
Why We Do Not All Develop Post-traumatic Stress Disorder

(EPFL, November 09, 2023)

Groundbreaking research from EPFL (École polytechnique fédérale de Lausanne), led by Carmen Sandi and Simone Astori and in collaboration with King's College London, has unveiled just how post-traumatic stress disorder (PTSD) development is impacted by glucocorticoids, the stress-triggered hormones produced by our bodies. This study, funded by multiple research institutions, such as the SNSF Swiss National Science Foundation Foundation, the EU 7th Framework Programme for Research, and ERA-NET Neuron, shows a unique link between decreased hormonal stress response and PTSD symptoms. Harnessing a genetically selected rat model which mimics an individual with a stunted cortisol response, the team applied an array of investigative techniques including MRI scanning, fear-based associative tests, sleep pattern recording, and brain activity measurement. The outcome? A direct correlation was found between reduced glucocorticoid responsiveness, incapacity to suppress fearful memories, and heightened susceptibility to PTSD developments. This revelation underlines the significance of understanding individual variances in glucocorticoid levels in response to stress, propelling future advancements in PTSD prevention and treatment strategies.
/web/2023/03-231109-d2

Understanding Plant Architecture for a More Sustainable Agriculture

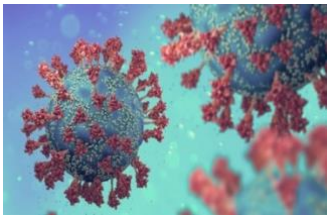
(University of Lausanne, November 14, 2023)



A recent scientific breakthrough at the University of Lausanne (UNIL) fundamentally changes our understanding of plant growth and durability. Led by Professor Julia Santiago Cuellar, the research unravels the complex architecture of plants and their survival mechanisms, increasing the potential for the development of more resilient crops. In the study published in Science, the team, including researchers Herman Höfte and Kalina Haas from INRAE, used thale cress (Arabidopsis thaliana) as a model and applied an array of research techniques such as biochemical, genetic, and microscopic analyses. They found a complex of proteins activated by the plant yields a robust web-like structure, delivering strength to the plant while maintaining growth and development. This critical discovery paves the way for fostering more resilient crops, and by extension, promoting food security, reducing agricultural environmental impact, and contributing to a more sustainable future.
/web/2023/03-231114-de

How the SARS-CoV-2 Virus Makes Itself More Infectious

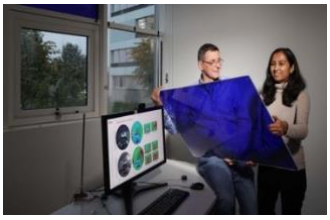
(EPFL, November 17, 2023)



A high-powered research team from EPFL's School of Life Sciences, led by Francisco S. Mesquita and Laurence Abrami, made significant strides regarding the behaviors of the SARS-CoV-2 virus. The researchers dove into the intricate workings of the virus's notorious Spike protein, a key component it uses to invade and infect human cells. Their diligent study revealed a cunning strategy the virus employs—manipulating host cells, particularly an enzyme known as ZDHHC20, to amplify Spike's cell invasion capabilities. This research, published in Nature Communications, uncovered how the virus co-opts a pre-existing cell damage response pathway to generate more infectious viruses. These insights not only shed light on SARS-CoV-2's infective tactics but also trigger critical thoughts on similar strategies in other viruses, paving the way for potential treatments.
/web/2023/03-231117-0d

Is There a Physiological Explanation Behind Experiencing Glare?

(EPFL, November 17, 2023)



Researchers from the Laboratory of Integrated Performance in Design (LIPID) at EPFL recently led a path-breaking study exploring the physiological reasons behind experiencing glare. The research, spearheaded by Marilyne Andersen, Jan Wienold and first author Sneha Jain, delves into assessing indoor glare risks to facilitate healthier, more sustainable and comfortable environments. The study, recently published in Scientific Reports, unveils that a higher density of macular pigment in the eye can reduce the perception of glare from blue daylight, yet this isn't the case for neutrally colored daylight. This key discovery holds the potential to revolutionize metrics predicting glare situations in office environments, thereby enhancing occupant comfort.
/web/2023/03-231117-20

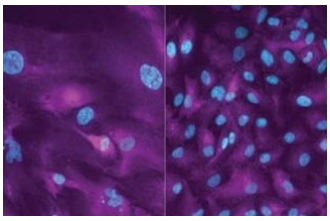
Excessive Fluid Consumption: Habit or Hormonal Disorder?

(University of Basel, November 17, 2023)

At the University of Basel, a consequential study on excessive fluid consumption was spearheaded by Professor Mirjam Christ-Crain and PD Dr. Julie Refardt. Working alongside numerous national and international centers, they made a key discovery to discern between "harmless" forms of fluid consumption and vasopressin deficiency—a condition that can lead to health complications. The research team compared two testing methods: a novel salt infusion test that stimulates vasopressin release, and an arginine infusion test. The concise study revealed the salt infusion method to be superior, delivering accurate diagnoses for over 95% of patients tested, while the arginine approach only retained around 75% accuracy. Thus, they proposed the salt infusion test as the new gold standard to differentiate between polydipsia (excessive thirst) and vasopressin deficiency.
/web/2023/03-231117-9e

Unveiling Cancer Cells' Vulnerability: A Study on Uncontrolled Growth

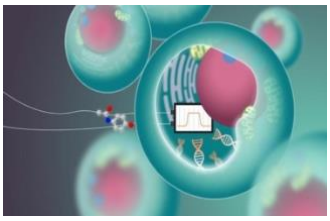
(ETH Zurich, November 20, 2023)



Under the leadership of Professor Gabriel Neurohr from the Institute of Biochemistry at ETH Zurich, a vital breakthrough has been accomplished in cancer cell research. The team discovered a significant weakness in cancer cells: uncontrolled growth. This uncontrolled growth makes these cells sensitive to division inhibitors, opening new potential avenues for more effective cancer treatments. The research was primarily conducted using cell cultures with complementary studies from three other international research groups. The findings confirmed that when cancer cells exceed their normal size, their function becomes impacted. Based on this crucial insight, the team is planning further investigations using organoids and tissue samples. They also aim to explore various combinations of division inhibitors and other medications in forthcoming clinical studies.
/web/2023/03-231120-ae

A Bandpass Filter for Synthetic Biology

(EPFL, November 20, 2023)



At EPFL, Prof. Bruno Emanuel Ferreira De Sousa Correia, leading the Laboratory of Protein Design & Immunoengineering (LPDI), steered the creation of a biological sensor devised to respond promptly to cellular environmental shifts. The team, using computational models based on the structure of folded proteins, engineered the protein formation by manipulating its DNA and amino acid arrangement. This pioneering structure was then tested successfully in cell cultures. Essentially, it could function like an electronic bandpass filter, adjusting insulin delivery based on blood sugar levels, making diabetes management less dependent on regular monitoring. This research is an essential pillar for the future of synthetic biology, providing valuable assets, and forming newer and more efficient clinical solutions.
/web/2023/03-231120-8f

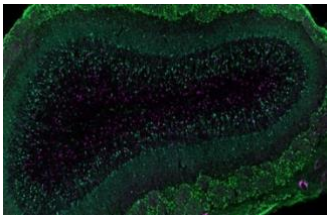
Revolutionizing Medicine through Biological Computing Machines in the Blood

(EPFL, November 23, 2023)

A revolutionary leap towards future medicine has been achieved by an international team led by Haitham Al Hassanieh, the head of the Laboratory of Sensing and Networking Systems in EPFL's School of Computer and Communication Sciences (IC). Teaming up with fellow researchers from EPFL and varying universities worldwide, they've developed 'MoMA' - a Molecular Multiple Access protocol that facilitates multiple transmitters within a molecular network. This breakthrough research significantly paves the way for exploiting nanotechnology in medicine, enabling biosensors to gather and process data, creating nanoscale Labs-on-a-Chip for in-body medical testing, designing biological nanobots for pathogen detection, and propelling nanorobots for directional drug delivery and therapy. Furthermore, MoMA will turn deployable molecular networks into a practical reality, and it has already been successfully trialed through diffusion and fluid dynamics modelling.
/web/2023/03-231123-96

Pregnancy Remodels the Brain: Stem Cells Shape the Sense of Smell in Mothers

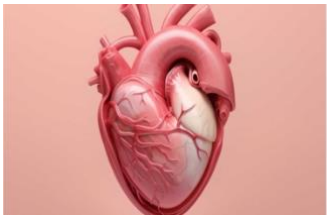
(University of Basel, November 24, 2023)



A recent research venture by the University of Basel, guided under the leadership of Professor Fiona Doetsch, has offered groundbreaking insights into how distinct pools of stem cells within an adult brain activate during pregnancy. Illustrated through experimentation on mice, the study revealed these stem cells give birth to precise types of olfactory bulb neurons, aiding mothers in recognizing their offspring by scent—a crucial biological function in the animal kingdom. This research establishes that stem cell recruitment in expecting mothers prepares the brain for the specific needs of motherhood, and influences how we understand brain plasticity. Beyond modification of synaptic connections between resident neurons, plasticity also depends on the selective and transient recruitment of distinct adult neural stem cell pools. Professor Doetsch's team intends to further explore what signals trigger this transient recruitment during pregnancy in their upcoming studies.
/web/2023/03-231124-bd

Previously Unknown Protein Plays a Key Role in Congenital Malformation of the Heart

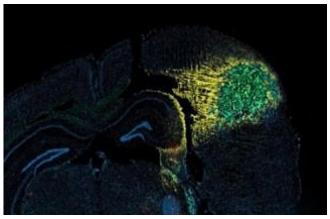
(ETH Zurich, November 25, 2023)



A ground-breaking research led by Professor Ursula Quitterer at ETH Zurich has taken a fresh approach to understanding heart malformations. By conducting meticulous experiments on genetically modified mice, the research team analyzed the role of the largely unexplored protein, Bublin coiled-coil protein (BBLN). The team shed new light on the complexities of a malformed heart by studying the interactions of BBLN. Moreover, they have embarked on a quest for substances that could manipulate these interactions. This extraordinary research holds great promise for individuals affected by the tetralogy of Fallot, providing a beacon of hope for better treatments. Their findings have been published in Nature Cardiovascular Research.
/web/2023/03-231125-26

Treating Tumors with Engineered Dendritic Cells

(EPFL, November 27, 2023)



A research team from EPFL, UNIGE, and The German Cancer Research Center, guided by Professor Michele De Palma of EPFL, has made substantial progress in cancer research. The focus of their study was a unique immunotherapy that omits the necessity of knowing a tumor's antigenic composition. Utilizing modified dendritic cells (CD), derived from blood and bone marrow, that produced two immune-stimulatory molecules (IL-12 and FLT3L), they achieved anti-tumor responses in mice with tumors. This research may lead to groundbreaking clinical applications of immunotherapy in battling cancer, and potentially changing the face of cancer treatment as we know it.
/web/2023/03-231127-b9

Sophisticated Swarming: Bacteria Support Each Other Across Generations

(University of Basel, November 28, 2023)

A novel study helmed by Professor Knut Drescher at the Biozentrum of the University of Basel, and first author Hannah Jeckel, has successfully investigated the complexities of bacterial swarm communities. The breakthrough lies in integrating advanced microscopy technologies, metabolite analyses, and robotic sampling to simultaneously measure gene expression and track the behavior of individual bacterial cells across space and time. The research revealed how bacteria cooperate and interact across generations—forming intricate three-dimensional structures and showcasing the dynamism within bacterial communities. This pivotal work has broken new ground with a unique technique that captures comprehensive spatio temporal data of a multicellular process with unprecedented precision, ensuing indispensable impacts for the survival and understanding of bacterial communities.
/web/2023/03-231128-11

4. Nano / Micro Technology / Material Science

Innovating Battery Technology with Affordable and Efficient Materials

(EMPA, November 09, 2023)

Scientists at the Functional Inorganic Materials Group, led by Dr. Kostiantyn Kravchyk and Prof. Dr. Maksym Kovalenko at Empa, have made noteworthy strides in battery technology, crucial for the transition to renewable energy. The team centered their efforts to developing new materials that make batteries more effective, affordable, and speedier. Using cheap iron instead of pricier cobalt in the cathode, Kravchyk's team created a scalable, easily available process for fabricating bilayer membranes. The team manipulated their iron(III) hydroxyfluoride to sport a specific crystalline structure, containing internal channels that conduct lithium ions. This breakthrough research holds significant implications for the stationary storage of renewable energy, allowing for more cost-effective solutions.
/web/2023/04-231109-8f

5. Information & Communications Technology

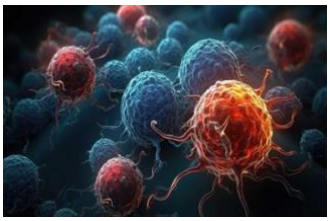
Enhancing AI Robustness for More Secure and Reliable Systems

(EPFL, October 03, 2023)

Researchers from École Polytechnique Fédérale de Lausanne (EPFL) and the University of Pennsylvania (UPenn) under the leadership of Professor Volkan Cevher from the Laboratory for Information and Inference Systems at EPFL, have pioneered a revolutionary approach to enhance the performance of machine learning models, especially deep neural networks. Their method deviates from the conventional zero-sum game approach, employing a continuously adaptive attack strategy, rendering AI models more robust and reliable. This groundbreaking strategy, which clinched the Best Paper Award at the 2023 International Conference on Machine Learning, is far-reaching. It can enhance AI-powered systems across various sectors, including video content protection, autonomous vehicles, and surveillance - making AI technologies not just smarter, but also safer and more reliable.
/web/2023/05-231003-3f

Machine Learning Enhances Precision in Drug Effect Modelling for Cells

(ETH Zurich, October 11, 2023)



An interdisciplinary amalgamation of expertise from ETH Zurich, the University of Zurich, and the University Hospital Zurich has led to an innovative leap in cellular biology research. Spearheaded by Charlotte Bunne and entailing key contributions from Professor Lucas Pelkmans and Gabriele Gut, the team has advanced a machine learning approach to model and forecast cellular alterations and drug effects with unprecedented precision. The team amalgamated single-cell RNA data from public databases and applied novel machine learning algorithms. They found that understanding individual cell variations can do more to facilitate advancements in more effective cancer treatments. This method allows for a highly nuanced response rather than relying on broader statistical averages, leading to a more effective targeting of tumour cells while leaving healthy cells intact.
/web/2023/05-231011-04

Quotebank: A New Tool Shows the Decline of Political Tone in the US

(EPFL, October 24, 2023)

A team led by Robert West at Ecole Polytechnique Fédérale de Lausanne (EPFL) has developed a groundbreaking interface known as Quotebank. This innovative tool allows anyone to delve into and analyze political discourse in the United States, offering a new way of understanding the evolving landscape of American politics. Utilizing 235 million unique quotes from 127 million online articles, coupled with a machine learning algorithm, Quotebank accurately attributes quotes to likely speakers. Notably, researchers secured a subset of 24 million quotes by 18,627 US politicians. This groundbreaking tool fosters transparency and accountability in political discourse and has the potential to serve as a constant barometer for monitoring the state of democracy and information structures.
/web/2023/05-231024-40

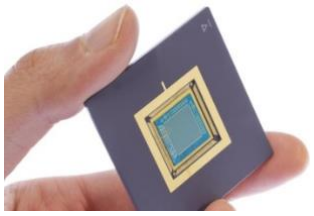
Asynchronous Consensus Protocols: A Breakthrough in Distributed Systems

(EPFL, October 25, 2023)

EPFL's DEDIS laboratory, under the leadership of Professor Bryan Ford from the School of Computer and Communication Sciences, has taken a tremendous leap in the area of distributed systems. They have successfully rolled out a novel distributed algorithm named 'QuePaxa'. It provides effective solutions to daunting performance and reliability issues evident in most currently-implemented consensus protocols. QuePaxa, being a part of asynchronous consensus protocols, is notable for its invulnerability to leader failures and denial of service attacks. Beyond strengthening resilience, it amplifies efficiency under normal circumstances in comparison with previous asynchronous protocols. This indicates significant implications for distributed systems which need to maintain and update several data copies, even in the event of partial machine failure.
/web/2023/05-231025-07

Redefining Energy Efficiency in Data Processing

(EPFL, November 15, 2023)



A team from the Laboratory of Nanoscale Electronics and Structures (LANES) at EPFL's School of Engineering, led by Andras Kis, has achieved a major scientific leap. They have developed the world's first large-scale in-memory processor using 2D semiconductor materials, a development that could significantly reduce the energy footprint of the ICT sector. This ground-breaking was accomplished by peeling off a single monolayer of MoS2, a semiconductor material, from a crystal using Scotch tape and optimizing this process to cover entire wafers with a uniform layer of MoS2. The process is compatible with industry-standard tools, paving the way for mass production and the creation of exceedingly compact devices. Funded by the EU, this project speaks highly of Swiss-EU scientific collaboration, notably in context of the European Chips Act.
/web/2023/05-231115-b5

Internet Use as Everyday Religion on the Rise, Cyborgization Still in its Early Stages

(University of Zurich, November 17, 2023)

Research from the University of Zurich's Institute of Communication, under the leadership of Professor Michael Latzer, has shone a revealing light on our nuanced relationship with the digital realm. As part of the World Internet Project (WIP), the 2022 study utilized a representative online survey of 1,008 internet users, conducted by gfs.bern and spearheaded by team members Noemi Festic, Kiran Kappeler and Céline Odermatt. The revealed insights include a high consciousness of risk among internet users relating to cybercrime and privacy issues. Interestingly, the study noted that younger populations and men are more likely to have faith in digital technology as a solution to society quandaries. These findings emphasize the importance of comprehending societal digitalization implications and raise a call for elevated digital technology regulations.
/web/2023/05-231117-80

6. Energy / Environment

Why the Tropics are so Rich in Species

(Swiss Institute for Forest, Snow and Landscape Research (WSL), October 04, 2023)

A new study led by Marco Túlio Pacheco Coelho, and collaborated on by Catherine Graham from the Swiss Federal Institute for Forest, Snow and Landscape Research (WSL), reveals a fresh perspective on understanding the biodiversity on our planet. The research team took a novel approach in cataloging the distinct climatic conditions across the globe. Through the analysis of the geographical size and isolation of regions with identical climate conditions, they discovered that warmth and humidity are vital for high biodiversity, however the isolation of such regions - or the geography of the climate - is twice as significant. This groundbreaking research provides fresh insight into the global species richness patterns, offering a compelling explanation for the profuse biodiversity found in the tropics.
/web/2023/06-231004-a0

Heavy Trucks Likely Not Zero-emission in the Near Future

(ETH Zurich, October 11, 2023)

A study led by Professor Tobias Schmidt at ETH Zurich, has unveiled how technologies in truck transport are likely to evolve by 2035. Their research model—which incorporates different weight classes, driving profiles, historical data, and economies of scale—highlights the challenges for green technologies in competing with traditional diesel or liquified natural gas (LNG) transport. The team's findings clearly indicate that without political intervention, decarbonization of heavy goods transport may remain unrealized. Their model took into account the conversion costs involved when switching to new, greener technology from established ones, this makes the new technology seem less attractive. Insightful as they are essential, these findings underscore the importance of understanding these issues to make green technologies competitive and reduce emissions from the truck transport sector.
/web/2023/06-231011-bf

Paving the Way for Sustainable Construction with Clay

(EMPA, October 17, 2023)

Ellina Bernard from Empa, has been awarded a grant from the Swiss National Science Foundation (FNS) to progress her noteworthy project, "Decrypting the Role of Magnesium in Terrestrial Materials for Durable Construction". The primary focus is to harness the inherent potency of clay for creating robust construction materials. Through innovative lab experiments, Bernard's team has achieved compression resistance up to 15 megapascals with varying clay combinations, and an impressive 20 megapascals with clay and cement. The long-term durability of these materials is now under analysis, with potential to create new standards for the use of clay within the construction industry. This could represent a pivotal stride towards a more sustainable world.
/web/2023/06-231017-e9

ETH Zurich Researchers Discover One of the World's Darkest Rivers

(ETH Zurich, October 19, 2023)

Researchers from ETH Zurich, under the guidance of Professor Johan Six, have discovered one of the world's darkest rivers, the Ruki, nested quietly in the Congo Basin. The team embarked on a water analysis journey to understand this extensive drainage area, which turned out to be more effective than gathering multiple location samples. Through thorough analysis, it was unveiled that the Ruki is among the rivers with the highest levels of Dissolved Organic Carbon (DOC) in the globe. It remarkably contains four times the organic carbon compounds found in Congo's and 1.5 times that of the Rio Negro's in the Amazon. Furthermore, it sheds light on how peat bogs in the Congo Basin store around 29 billion tonnes of carbon, offering climate benefits when kept wet. As a research project since 2008, this fascinating breakthrough adds significant understanding to the carbon cycle in the Congo Basin.
/web/2023/06-231019-f5

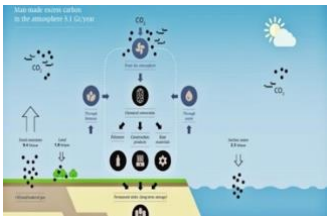
Photovoltaics in the Alps Generate up to Four Times more Electricity

(ZHAW, October 19, 2023)

Over the past five years, a forward-thinking research endeavor led by Jürg Rohrer at the Zurich University of Applied Sciences (ZHAW) has been dissecting the potential of photovoltaics in the alps. This study revealed alpine solar panels' impressive capacity to generate up to four times more electricity during winter than their counterparts in the midland. While this finding strongly recommends alpine solar arrays as an excellent supplement to the photovoltaic expansion in the midland, it cautions against a total replacement strategy due to looming needs for augmented photovoltaics over the coming decade. Currently, the ZHAW team is delving into the impact of distance between modules on electricity production from large-scale alpine facilities, promising more insights by 2024.
/web/2023/06-231019-10

"Mining the Atmosphere": Pioneering CO2 Reduction Initiative

(EMPA, October 19, 2023)



Leading the charge in the fight against climate change, Empa, the Swiss Federal Laboratories for Materials Science and Technology, has launched an ambitious initiative called "Mining the Atmosphere". This groundbreaking project is aimed at reducing the excess CO2 in our atmosphere, averting irreversible climate alterations. Through a series of professional and public events, the initiative centers on developing an innovative global economic model that recycles excess CO2 into valuable materials. These materials have the potential to replace traditional construction materials and petroleum products. The team's comprehensive research not only includes developing a sustainable energy system and resilient batteries for electromobility uses but also analyzes and recycles used batteries. This groundbreaking initiative carries immense potential to prevent an irreversible climate catastrophe and steer us towards a sustainable future.
/web/2023/06-231019-af

Diversity of Toxins from Cyanobacteria is Underestimated

(Eawag, October 19, 2023)

Under the Eawag Partnership Programme (EPP), a novel research project helmed by Elisabeth Janssen from Eawag, in collaborations with the School of Pharmaceutical Sciences, Universität São Paulo, and Brasilien, has led to the creation of a public database of secondary metabolites from cyanobacteria dubbed “CyanoMetDB”. Funded by EPP, and designed to enhance scientific capacity in underdeveloped nations, the research delved deep into studying the metabolic products of cyanobacteria. They compiled over 2,400 substances in their pioneering database, expanding annually with around 100 new entries. This research is of paramount importance due to the rise in cyanobacteria blooms anticipated with global warming, particularly in Swiss lakes.
/web/2023/06-231019-8d

Pioneering CO2 Trapping in Cement-Based Materials

(EMPA, October 19, 2023)

An intriguing scientific partnership has formed between Empa, ETH Zurich, Eawag, and the Paul Scherrer Institute. These collaborative efforts spearheaded by Dr. Andreas Leemann from the Empa's Concrete and Asphalt group, have been progressing the DemoUpCARMA project, an initiative centered around the capturing and trapping of carbon dioxide in cement-based materials. Initial findings denote that carbon-enriched, recycled materials can lessen overall CO2 emissions by a substantial 13%. Further exploration includes the investigation of CO2 transport and permanent storage in Icelandic geological reservoirs. Funded by the Federal Office of Energy (OFEN) and the Federal Office of the Environment (OFEV), this ground-breaking research proposes extensive implications for reducing our impact on the environment and promoting sustainability within the construction industry.
/web/2023/06-231019-de

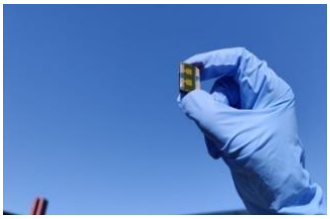
Generating Clean Electricity with Chicken Feathers

(ETH Zurich, October 25, 2023)

Researchers at ETH Zurich and EPFL, under the guidance of Prof. Raffaele Mezzenga from ETH Zurich, have made a breakthrough in fuel cell technology. They have ingeniously repurposed chicken feathers into a keratin-based membrane, capable of facilitating efficient water splitting in pure water. The execution of this novel approach involved the development and patenting of a proton-permeable membrane derived from chicken feathers, used in fuel cells to enable particle migration between the anode and cathode. As an ecologically-friendly alternative, this technology fights against CO2 release and toxic substance use, thus dramatically reducing our carbon footprint. The team is currently exploring potential investors and industry partnerships to further develop and commercialize this game-changing technology. This innovative approach broadens the horizons for sustainable energy and beckons a future fortified by hydrogen as a green-energy source.
/web/2023/06-231025-fa

New Design Solves Stability and Efficiency of Perovskite Solar Cells

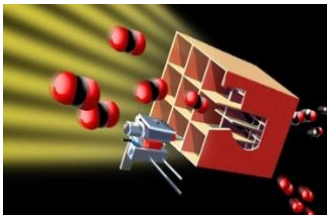
(EPFL, October 27, 2023)



In a pivotal multi-university collaboration, Ecole Polytechnique Federale de Lausanne (EPFL), along with researchers from the University of Toronto, Peking University, University of Kentucky, and North Carolina State University, have achieved a game-changing breakthrough in perovskite solar cells. This significant advancement includes introducing a molecule known as 3-mercaptopropionic acid (3-MPA) into the solar cells' self-assembled layer. The clever implementation of 3-MPA successfully counteracts molecular agglomeration, a pervasive issue in solar cell engineering where molecules clump together instead of spreading out evenly. This innovative measure significantly enhances the efficiency and longevity of these solar cells. The research was conducted under the financial support of multiple global and national funding agencies.
/web/2023/06-231027-cb

3D Printed Reactor Core Makes Solar Fuel Production More Efficient

(ETH Zurich, October 27, 2023)



A team of researchers, spearheaded by Professor André Studart and Professor Aldo Steinfeld, at ETH Zurich have achieved a breakthrough in green technology. They have developed an innovative 3D printing process to create ceramic structures with hierarchically ordered geometries. These structures are integral parts of a solar reactor, which uses sunlight, water, and CO2 to manufacture carbon-neutral liquid fuels like solar kerosene. This reactor leverages an extrusion-based 3D printing process, paired with a unique type of ink, to form a porous ceramic structure with hierarchically channelled topology. This arrangement allows for efficient absorption of solar radiation throughout the volume, improving fuel generation. Funded by the Swiss Federal Office of Energy, this development holds enormous potential for the future of fuel production, paving the way for the creation of carbon-neutral liquid fuels from sunlight and air.
/web/2023/06-231027-19

Emissions Reduction in Cement Production

(ETH Zurich, November 11, 2023)

ETH Zurich's Department of Civil, Environmental and Geomatic Engineering (D-BAUG) in collaboration with EPFL, under the leadership of Professor Franco Zunino, have made substantial steps towards reducing the carbon footprint of cement production. The pivotal project, known as UGC, has successfully produced a cement formula with 50% clinker and combined calcined clay and limestone, resulting in a reduction of up to 40% in CO2 emissions. The research offers the industry a practical, quantifiable strategy to tailor low-carbon concrete compositions to particular markets. This is crucial in the context of combating climate change. Moreover, the team has developed three LC3-based concretes, where a decreased cement content led to an increase in compressive strength — a commendable advancement for the field.
/web/2023/06-231111-31

Using Noble Gases to Track Groundwater Flows

(Eawag, November 11, 2023)

A first-of-its-kind breakthrough has been made by the Swiss Federal Institute of Aquatic Science and Technology (Eawag) in understanding the process of river cut healing. This study was driven by a team of researchers including Matthias Brennwald and Rolf Kipfer. Their innovative approach includes a new method of labeling water with noble gases and analyzing it promptly during ongoing geochemical or geophysical processes. This novel method offers numerous advantages over traditional processes, including non-disruption of the water's biological activity and taste, rapid analysis, and its applicability to complex situations. Eawag team, utilizing a mobile mass spectrometer, successfully applied this method to examine the self-healing process of a cut in the Alpine Rhine. Their findings brought insights into how channelized rivers can be widened without causing lasting damages, bringing significant implications for sustainable river management.
/web/2023/06-231111-85

Diverse Forests Hold Huge Carbon Potential, as Long as We Cut Emissions

(ETH Zurich, November 14, 2023)

Led by Professor Thomas Crowther, a team of numerous scientists from ETH Zurich have made a significant stride in identifying the potential of global forests in carbon sequestration. According to the research published in Nature, the quantified realistic global forest carbon potential stands at approximately 226 Giga-tonnes (Gt) of carbon. The groundbreaking study integrated field measurements and satellite data to evaluate the capacity of global forests to draw down excess anthropogenic carbon. Emphasizing the necessity of encouraging community-centered initiatives promoting biodiversity, the researchers' findings are paramount for climate and biodiversity targets. This underscores the urgency of forest conservation, restoration, and sustainably sound management in battling the ongoing climate change.
/web/2023/06-231114-64

Natural Coasts Protect Against Tropical Cyclones

(ETH Zurich, November 17, 2023)

A study led by Sarah Hülsen and co-authored by Chahan M. Kropf from the Swiss Federal Institute of Technology (ETH), in cooperation with The Nature Conservancy and the World Wide Fund for Nature, has shed light on how natural coasts can act as protection against devastating tropical cyclones, under current and future climate change. By integrating satellite imagery, storm track models, and field measurements, they discovered that intact coastal habitats significantly mitigate cyclone impacts. This underscores the urgency for preserving these habitats and promoting initiatives such as mangrove reforestation. The potential for enhancing cyclone protection is particularly noteworthy in the Pacific and Caribbean island states.
/web/2023/06-231117-8c

Revolutionizing Energy Storage with Water-based Flow Batteries

(EMPA, November 17, 2023)

Dr. David Reber from Swiss Federal Laboratories for Materials Science and Technology (Empa) and the University of Colorado Boulder, is spearheading a research project aimed at developing enhanced water-based flow batteries. The primary goal, boosting energy density, is being strategically tackled through ingenious materials design, such as incorporating a chelate in the dissolved storage material. This research explores a multi-armed organic molecule that encases a metal ion, bringing about significant possibilities in augmenting renewable energy storage, particularly in urban areas. Funding for this groundbreaking four-year project has been committed by the Ambizione grant—paving the way for substantial changes to energy storage and distribution.
/web/2023/06-231117-28

Groundbreaking Eco-friendly Cement Developed by EPFL

(EPFL, November 22, 2023)

An extraordinary achievement in material science is on the horizon, all thanks to Professor Karen Scrivener and her team from EPFL's Laboratory of Construction Materials. They have developed a game-changing material that could revolutionize the cement industry. By modifying existing practices, enhancing efficiency, and recycling materials, the researchers have produced a new cement formulation that could potentially slash up to 80% of emissions from cement and concrete production, which currently account for 8% of global emissions. The team advocates for public-private collaboration to facilitate a transition to net-zero emissions in the construction sector and real solutions at scale.
/web/2023/06-231122-d8

New Technology Can Collect CO2 from a Truck's Exhaust Pipe

(EPFL, November 23, 2023)

EPFL spin-off Qaptis has paved a path towards a greener future with an innovation that captures CO2 directly from a truck's exhaust pipe. With successful transfer of lab technology to industry, this modular device is adaptable to different types of trucks. Funded by business angels and venture capitalist groups, Qaptis' technology is not just innovative but is generating real-world data through testing with a local freight carrier. The captured CO2 has potential uses, such as in food production, fertilizer, energy, building materials, and synthetic fuels. This exciting technology stands to help companies achieve the IPCC's net-zero emission target by 2050.
/web/2023/06-231123-8b

Unveiling the Mechanisms of Peatlands: A Key Step toward Sustainability

(EPFL, November 24, 2023)

A team of researchers from across Europe and Western Siberia, led by Alexandre Buttler, a professor and former director of the Laboratory of Ecological Systems at EPFL, have made significant strides in understanding the mechanics of peatlands. The team's dual-pronged approach encompassed both short-term experimentation and long-term observation, factoring in elements above and below ground. These insights into peatland functioning provide a scientific basis for their sustainable management. Published in the Global Change Biology journal, these novel findings have caught the attention of the domain-relevant scientific community, resulting in an invitation for comment by David Johnson for the September 2023 volume.
/web/2023/06-231124-ff

7. Engineering / Robotics / Space

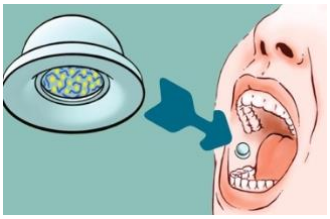
Next-Gen Laser Technology Developed at EPFL

(EPFL, October 03, 2023)

Hillary Sanctuary, along with her team at Ecole Polytechnique Fédérale de Lausanne (EPFL) led by Antoine Delgoffe of Galatea Lab, has made a significant scientific breakthrough in laser technology. They have successfully crafted a femtosecond laser made of glass, boasting high power output and extreme pulse precision. This pioneering research involved using a commercial femtosecond laser to intricately etch grooves into a glass sheet, allowing for accurate placement of core laser components. Not only does this development present a more stable and hassle-free alignment, it's also set to be spun-off by a company named Cassio-P, led by Delgoffe. This signifies considerable advancement in laser technology, funded by the European Research Council and EPFL.
/web/2023/07-231003-21

How a Suction Cup Delivers Medications to the Bloodstream

(ETH Zurich, October 03, 2023)



Bringing innovative solutions to medical treatment, a team of researchers led by Professor Jean-Christophe Leroux at ETH Zurich, including Nevena Paunović and David Klein Cerrejon, have developed a unique transdermal drug delivery system - a suction cup designed to administer medications via the cheek's mucosal lining. The initiative is now pursued by their start-up Transire Bio, aiming to bring this advanced product to the healthcare market. Measuring around 10mm in diameter and 6mm in height, the suction cup serves as a gentler alternative to needles. Funded by the Hauser-Stiftung and the ETH Foundation Pioneer Fellowship Programme, the project depicts a promising shift in medication delivery, potentially alleviating millions from the fear and discomfort linked with injections.
/web/2023/07-231003-f5

Ultrathin Films Achieve Record Hydrogen Separation

(EPFL, October 10, 2023)

EPFL, in joint efforts with Johns Hopkins University, King Abdullah University of Science and Technology, Soochow University, and the U.S. Department of Energy, has set a new record in hydrogen separation. Led by Professor Kumar Varoon Agrawal, the team successfully fabricated macroscopically uniform two-dimensional (2D) films with a record-breaking thinness of 2 nanometers. Capitalizing on an innovative crystallization method, they meticulously aligned ultra-dilute precursor mixtures with the underlying crystalline substrate. This process enabled the creation of these ultrathin films on a scalable level, covering hundreds of square meters. Published in Nature Materials, these pioneering results are a significant stride towards efficient and cost-effective hydrogen separation, paving the way for further applications in the field.
/web/2023/07-231010-2b

ETH Zurich Takes on World Solar Challenge

(ETH Zurich, October 13, 2023)

Under the leadership of Nicole Davidson, a tenacious team of students from ETH Zurich has taken up the challenge of driving 3,000 kilometers across the Australian outback in a car powered solely by solar energy. More impressively, they've engineered this innovative vehicle themselves! This is all set to take place from October 22 to 29 during the annual World Solar Challenge, a competition known for pushing the realm of potential for renewable energy systems in automobiles. In often blistering heat up to 50 degrees Celsius in the driver's cabin, this challenge not only tests the limits of solar-powered vehicles but also the resilience and ingenuity of their creators. As ETH Zurich enters this contest for the very first time, it marks a crucial stride in promoting the expansion of renewable energy technology. Let's cheer on our future innovators as they forge ahead towards a more sustainable future!
/web/2023/07-231013-cd

Pioneering Advances Towards a New Era of Visual Prostheses

(University of Fribourg, October 16, 2023)

A joint research team led by Professor Gregor Rainer, from the University of Fribourg in Switzerland, along with Chinese and American collaborators, have achieved a significant breakthrough that could herald a new era of prosthetic vision. They demonstrated in their research on small mammals, specifically tupaias, the ability to generate visual perceptions without relying on retinal stimulation. This groundbreaking achievement involved activating the neurons in the animals using focussed light pulses, due to the tupaias' developed visual system, akin to humans. The potential implications of this discovery extend to bettering the quality of life for individuals, especially in aging societies, through the development of more advanced and effective prosthetic vision. The innovative findings of this study were published in the scientific journal eLife.
/web/2023/07-231016-51

Non-invasive Deep Brain Stimulation Enhances Motor Learning

(EPFL, October 25, 2023)

A far-reaching study led by Maximilian J. Wessel and Elena Beanato from University of Surrey in collaboration with various institutions, discovered that a unique technique, termed as "transcranial temporal interference electrical stimulation" (tTIS) enhances motor skill learning, especially in healthy older subjects. This promising approach paves a novel direction in non-invasive neuromodulation in humans by targeting deep structures within the neural framework. The study engaged computational modeling, fMRI evaluations, and behavioral assessments, to ascertain the effects of tTIS. The exploration involved applying electrical pulses in a specific theta burst pattern, resulting in fortified activity within the brain's striatum and its allied motor network. The marked improvement in motor performance offers insight into this method's potential for enhancing learning within populations marked by impaired motor functionalities.
/web/2023/07-231025-68

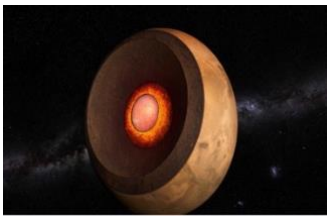
Robotic Arm Inspired by Elephant Trunk

(EPFL, October 27, 2023)

Hailing from EPFL's CREATE lab, Professor Josie Hughes and first authors Qinghua Guan and Francesco Stella have made a significant stride in the field of robotics. They have successfully designed a robotic arm with soft mechanics, inspired by the resilient yet malleable structure of an elephant's trunk. Using advanced computer modeling, the team shaped a robotic arm with precise geometric configuration, optimal workspace, and the compliancy crucial for safe human interaction. Beyond simply mimicking the softness and flexibility, this groundbreaking research may steer modern robotics away from rigid mechanics, paving the way for human-friendly robotics. With a patent already in place for the commercial soft manipulator, Helix Robotics, a joint start-up between EPFL and TU Delft, is now positioned at the forefront of this exciting development.
/web/2023/07-231027-6b

Mystery of the Martian Core Solved

(ETH Zurich, October 27, 2023)



Pioneered by Professor Dongyang Huang at ETH Zurich in collaboration with partners such as France's Centre National d'Études Spatiales (CNES), the German Aerospace Center (DLR), and Lockheed Martin Space, an important research feat has been accomplished. Using data from NASA's InSight mission, the research team has managed to unveil secrets about the Martian core, previously unattained. The team employed quantum-mechanical calculations executed at the Swiss National Supercomputing Centre (CSCS) in Lugano, Switzerland to probe the attributes of various alloys, leading to an extraordinary discovery. What was initially believed to be an outer liquid iron core is in fact the deepest part of the mantle. This broadens our understanding of Martian composition and structure, shedding light on the history and evolution of the red planet.
/web/2023/07-231027-2a

Unveiling the Best Electric Drive Units for Wheelchairs

(Bern University of Applied Sciences, November 03, 2023)

In an effort led by Professor Sebastian Tobler, the SCI Mobility Laboratory at Bern University of Applied Sciences has carried out a notable comparison study of three different electric drive units for wheelchairs. This breakthrough study meticulously evaluated emergency brake efficacy, crash avoidance, lateral acceleration, incline performance, and stability across the units. Their detailed report presents pivotal findings that empower individuals with limited mobility to make informed decisions in selecting the most suitable wheelchair equipment. This research fills a critical gap, providing much-needed transparency and guidance in the realm of mobility aids.
/web/2023/07-231103-46

Advancing Surgical Precision with Robotics

(University of Zurich, November 09, 2023)

The FAROS project team, under the leadership of spinal specialist and medical director of Balgrist University Hospital, Prof. Mazda Farshad of the University of Zurich, is revolutionizing the landscape of surgical interventions. Collaborating with researchers from KU Leuven (Belgium), Sorbonne University (France) and King's College London (UK), this multinational team is developing modern robots to serve as precise assistants in the operating theater. With a generous grant of nearly 3 million euros from the European Commission's Horizon 2020 research and innovation program, the project is geared towards harnessing these robots in surgical operations, particularly in areas demanding utmost precision. This development, fueled by the symbiotic collaboration among research specialists and clinicians at Balgrist University Hospital, is showing immense promise.
/web/2023/07-231109-ee

Advancing Surgical Precision with Robotics

(University of Zurich, November 10, 2023)

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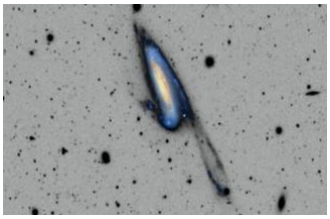
/web/2023/07-231110-ee

One Step Closer to Unveiling Dark Matter Mysteries

(EPFL, November 11, 2023)



The ARRAKHIS Consortium, predominantly led by Spain and Switzerland, has recently cleared the mission definition review stage of a significant project. With the scientific lead held by EPFL and Professor Pascale Jablonka at the helm, the mission seeks to demystify the elusive concept of dark matter and is set for launch in 2030. To establish the feasibility of the mission, an exhaustive study is being carried out, culminating in a scrutiny by independent experts. If deemed viable, ESA's Science Program Committee will receive a recommendation. Professor Jablonka's expertise in dark matter, galaxy evolution, image processing, and numerical simulations will significantly contribute to the mission. The quest to make the "invisible visible" promises to augment our cosmic understanding.
/web/2023/07-231111-d4

3D Printing Revolution: Printing Robots with bones, Ligaments, and Tendons

(ETH Zurich, November 17, 2023)

The brains from MIT spin-off, Inkbit, and ETH Zurich have made strides in 3D printing technology, under the able leadership of lead researcher, Thomas Buchner. Their novel technology utilizes slow-curing polymers, which ensures perfection in printing accuracy and efficiency, carving the path for breakthrough applications like 3D printing of robots with bones, ligaments, and tendons. The innovative technology optimizes the 3D printing process by considering surface irregularities when printing the next layer, rather than simply smoothing out uneven layers. This gives way to applications beyond just 3D printing, enabling a more accurate creation of complex structures. Inkbit aims to leverage this technology in their 3D printing services and printer sales, while ETH Zurich continues to explore new horizons.
/web/2023/07-231117-32

Autonomous Excavator Builds a Six-metre-high Dry-stone Wall

(ETH Zurich, November 24, 2023)

A collaboration of researchers at ETH Zurich, including Gramazio Kohler Research, the Robotics Systems Lab, Vision for Robotics Lab, and the Chair of Landscape Architecture, have made a remarkable leap in construction automation. They've successfully utilized an autonomous excavator to build a massive dry stone wall — six metres high and sixty-five metres long. Through sensor technology, the excavator mapped the construction site and located on-site building blocks. An intelligent algorithm then determined the optimal position for each stone. The autonomous machine impressively placed 20 to 30 stones per consignment, achieving this feat in a digitally planned and autonomously excavated park. This key development is significant as dry stone walls are resource-efficient, utilizing locally sourced materials which are low in embodied energy.
/web/2023/07-231124-a3

8. Physics / Chemistry / Math

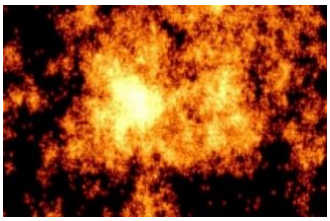
Pioneering Earthquake and Tsunami Forecasting with Fiber-Optic Networks

(ETH Zurich, November 23, 2023)

A revolutionary method for earthquake and tsunami forecasting has been developed by Dr. Andreas Fichtner at ETH Zürich and a team of experts from the Swiss Federal Institute of Metrology (METAS). This groundbreaking approach harnesses the power of existing fibre-optic infrastructure to measure minimal pressure changes at monumental depths, significantly improving the accuracy of seismic event forecasting. Their technique has demonstrated the ability to precisely pinpoint an earthquake's location, depth, and magnitude, facilitating comprehensive tsunami warnings and enhancing earthquake detection in less developed regions. This innovative initiative, which originated in a conversation between ETH and METAS specialists, was made possible by ETH's funding for independent research and is set to redefine our understanding of seismology.
/web/2023/08-231123-c7

Unraveling the Mysteries of Glassy Liquids

(EPFL, October 12, 2023)



An international collaboration, led by Professor Matthieu Wyart from EPFL and involving Max Planck Institute, ENS, Université Grenoble Alpes, and the Center for Systems Biology Dresden, has resulted in a transformative scaling theory. The study offers a new understanding of the growth of the dynamical correlation length evident in glass-forming liquids, which is associated with thermal avalanches. Through broad and intricate numerical simulations, the teams successfully corroborated their theory's capacity to describe the observed dynamics in these liquids. The study also elucidates the Stokes-Einstein breakdown phenomenon - wherein the liquid's viscosity and particle diffusion become unconnected. Enabled by support from the Simons Foundation and the Swiss National Science Foundation, this research represents a vital step towards a nuanced understanding of these complex systems.
/web/2023/08-231012-f6

An Electrical Switch to Control Chemical Reactions

(University of Geneva, October 13, 2023)

In a collaborated effort led by full professor Stefan Matile at the Department of Organic Chemistry, part of the National Centre of Competence in Research (NCCR) Molecular Systems Engineering, the University of Geneva (UNIGE) has made a groundbreaking discovery. The research hails a breakthrough in the world of chemistry, revealing an unprecedented way to control and expedite a chemical reaction using an external electric field like a 'switch'. The research was conducted from various perspectives such as medical, scientific, economic, legal, and societal. Applying this switch-like property, the team was able to initiate the environmental-friendly synthesis and easier external control of chemical reactions. This pivotal discovery could greatly simplify the manufacturing process of drugs, polymers, agrochemicals, pigments, and fragrances, making it altogether easier and more precise.
/web/2023/08-231013-f6

Strange Magnetic Material Could Make Computing Energy-efficient

(EPFL, November 02, 2023)

In a cutting-edge international collaboration led by Professors Hugo Dil from EPFL, Gunther Springholz at Johannes Kepler University Linz, and Jan Minár at the University of West Bohemia, fascinating new properties have been discovered within the multiferroic Manganese-doped Germanium Telluride (Mn-doped GeTe). Known for its distinct ferroelectric and magnetic properties, Mn-doped GeTe also displays a magnetic order, termed a ferrimagnet, which itself manifests as a correlated spin glass. Possessing local magnetic moments in a glassy state, this research could revolutionise energy-efficient computing. Additionally, it offers profound insights into the collective behavioural patterns found within multiferroic materials. Backed by an assortment of international funders, including the Swiss National Science Foundation and Austrian Science Funds, the scope of this research could extend implications throughout scientific and technological realms.
/web/2023/08-231102-04

Unveiling a New Type of Magnetism in Triangular Moiré Materials

(ETH Zurich, November 17, 2023)

Exciting breakthrough in the world of physics has been made by ETH Zurich research team led by Professor Atac Imamoğlu, including PhD student Livio Ciorciaro, post-doc Tomasz Smolenski. They have unveiled a new type of kinetic magnetism in triangular moiré materials, which cannot be explained by traditional exchange interaction. Conducting a unique experiment, the team layered two distinct semiconductor materials and created a large lattice constant by applying an electric voltage. The material behaved as a ferro-magnet when each site of the moiré lattice was filled with exactly one electron. This outcome propels our understanding of magnetism to new heights and promises a fresh perspective on semiconductor research.
/web/2023/08-231117-b5

AI Assists in Developing New Drugs

(ETH Zurich, November 25, 2023)

Kenneth Atz and Professor Gisbert Schneider from the Institute of Pharmaceutical Sciences at ETH Zurich have made an impressive leap in pharmaceutical development, utilizing an Artificial Intelligence (AI) model. The model enables the identification of feasible borylation sites on new molecules, expediting the development process of potent pharmaceutical variants. The team used 1,380 borylation reactions from 38 rigorously selected papers to train the AI model. This model, through its precise predictions, enabled Roche Pharma Research and Early Development to identify viable sites for introducing additional active groups, thus reducing the number of lab experiments needed. The researchers are eyeing further potential activations and functionalizations, underpinning the immense potential of public-private partnerships in Switzerland's pharmaceutical innovation scheme.
/web/2023/08-231125-45

10. Economy, Social Sciences & Humanities

The Emotional Function of Dreams is Not the Same Everywhere

(University of Geneva, October 16, 2023)

In a groundbreaking study, researchers from the University of Geneva (UNIGE) and the University of Toronto, led by Lampros Perogamvros, a group leader in the Departments of Psychiatry and Basic Neurosciences at UNIGE, have explored the content of dreams across different cultures. Drawing comparisons between the dreams of the BaYaka and Hadza communities in Africa with various Western groups, their research uncovered fascinating, culturally-influenced differences. The study, conducted in environments as diverse as the Democratic Republic of Congo, Tanzania, Switzerland, Belgium, and Canada, discovered that the dreams of the BaYaka and Hadza were laced with danger but invariably presented ways of dealing with these threats. Western dreams, conversely, were intense but lacked this problem-solving component, often leaving the dreamer without resolution. This potentially indicates a deficiency in the adaptive function of dreaming in people with social anxiety or frequent nightmares.
/web/2023/10-231016-af

12. General Interest

Revolutionizing Pregnancy Care and Newborn Health with Smart Textile Tech

(CSEM, October 17, 2023)

The Newlife Project, funded by Key Digital Technologies Joint Undertaking and the European Union's Horizon Europe research and innovation program, represents a groundbreaking initiative to transform prenatal care and neonatal health. This awe-inspiring project involves collaboration between esteemed institutions, CSEM SA, the Inselspital, University Hospital Bern, and several other partners. They have successfully developed a reliable long-term monitoring system for brain activity that can be utilized at home. Through this novel smart textile technology, the project anticipates reducing the stagnant preterm birth rate, as per reports from the World Health Organization, UNICEF, and the Partnership for Maternal, Newborn, and Child Health. In addition to this, the Newlife project plans to increase prenatal diagnostic preciseness, aiming to decrease infant mortality rates.
/web/2023/12-231017-3c

Adding Years to Life and Life to Years

(University of Zurich, October 27, 2023)

Professor Heike Bischoff-Ferrari from the University of Zurich (UZH), together with Professor Edouard Battegay, and the University of Toulouse, have embarked on innovative research in the burgeoning field of geroscience. Their quest to unravel the biological intricacies of aging places the focus on recognizing biomarkers that unravel epigenetic and cellular variables, which aid in understanding biological protective mechanisms and the aging process. Noteworthy is the launch of DO-HEALTH, the largest study on aging; it monitors 2,157 elders from five countries, scrutinizing their organ function and lifestyle factors. This valuable exploration aims to not only decelerate the biological aging process, but also discover personalized risk profiles and custom treatment methods. Seeded with CHF 10 million granted by French President Emmanuel Macron, this research paves the way for a future where energetic centenarians enjoy the beauty of mountain footpaths.
/web/2023/12-231027-df

Solutionism - The New Spirit of Digital Capitalism

(University of Basel, November 01, 2023)

Oliver Nachtwey, an Economic Sociologist at the University of Basel, teamed up with Timo Seidl from the University of Vienna to decipher the influence of 'solutionism' in the modern world. They unearthed compelling evidence that 'solutionism', which represents the perspective of finding a technological and profitable solution for every problem, is today's most profound entrepreneurial reference among tech elites, specifically on the West Coast. In their research, Nachtwey and Seidl employed a machine-learning algorithm to scrutinize speeches, book contributions, and articles from two significant sources; Silicon Valley and the Harvard Business Review. The analysis exhibited how 'solutionism' is shaping the latest era of digital capitalism. Published in 'Theory, Culture & Society', these critical findings provide a powerful commentary on the escalating sway of tech-minded solutionism in today's digital-driven business realm.
/web/2023/12-231101-80

13. Calls for Grants/Awards

Advancing Biology and Sustainable Energy: Two ERC Grants Awarded

(ETH Zurich, October 30, 2023)

Researchers at ETH Zurich, Elly Tanaka and Barbara Treutlein, in collaboration with Kevin Briggman from Max Planck Institute Bonn, have been awarded an ERC Synergy Grant of 12.75 million Euros. Their project, "AxoBrain", will leverage Tanaka's expertise in axolotl biology and Treutlein's grounding in single-cell technologies and neuroscience to uncover mechanisms controlling the axolotl's regeneration process, while Briggman will contribute his knowledge in computational neuroscience. Meanwhile, Nicolas Noiray from the Department of Mechanical and Process Engineering leads another project, "HYROPE", with the aim of developing hydrogen and ammonia-burning gas turbine technologies. These zero-carbon turbines could revolutionize aviation and electric power generation. Both these significant breakthroughs bode well for mitigating the climate emergency.
/web/2023/13-231030-e3

Open Science Prize Awarded to Data Analysis Project at the University of Lucerne

(University of Lucerne, November 03, 2023)

Prof. Dr. Alrik Thiem, Dr. Lusine Mkrtchyan and Zuzana Sebechlebská, from the University of Lucern, in recognition of their groundbreaking project, CORA, were awarded the Open Science Prize at this year's Open Science Week. Project CORA, a data analysis endeavour, showcases the potential of open-source software in enhancing scientific research. Broadly, it enables the discernment of intricate cause-and-effect relationships inherent within data sets. A profound embodiment of the principles of open science, their work paves the way for reinforcing transparency, fostering innovation, and fortifying collaborations within the science community.
/web/2023/13-231103-c6

Upcoming Science and Technology Related Events

European Conference on Electrical Engineering & Computer Science
December 21-23, 2023
http://www.elecs.org/index.html#
Electronics & Electrical Goods, IT, Web
Bern

Rocky Worlds
January 8-12, 2024
https://zurich2024.rockyworlds.org/
Scientific, Research & Development, Travel, Tourism, Sport & Lifestyle
ETH Zurich

19th Women's Health Congress
January 10-11, 2024
https://is.gd/Q3SrJk
Life Sciences, Health Care & Medical, Pharmaceutical & Biotechnology
University Hospital CHUV, Lausanne

Belonging & Connecting Annual Meeting
January 10-11, 2024
https://is.gd/pZOZij
Human Resources, Education & Training
OST Campus, St. Gallen

International Conference on Dependability and Software Engineering
January 11-12, 2024
https://is.gd/oZSeeE
IT, Web & Electronic
Online, Zurich

SSB+RM Young Scientists Symposium
January 12, 2024
https://ssbrm.ch/
Life Sciences, Health Care & Medical, Pharmaceutical & Biotechnology
ETH Zurich

GU Cancer Forum 2024
January 13 & 16, 2024
https://is.gd/LmwSnn
Life Sciences, Health Care & Medical
Belvoir Park, Zurich (Jan 13)
Hôtel Alpha Palmiers, Lausanne (Jan 16)

ESHLT Meeting
January 16-19, 2024
http://www.eshlt.org/
Life Sciences, Health Care & Medical
Hotel Regina, Wengen

GPPS Forum
January 17-18, 2024
https://gpps.global/gpps-energy-forum24/
Power, Renewable & Storage Energy
ETH Central Campus, Zurich

International Conference on Network Security & Applications
January 20-21, 2024
https://ccseit2024.org/cnsa/index
IT, Web & Electronic
Zurich

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