

Technology Roundup

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PAKISTAN SCIENTIFIC AND TECHNOLOGICAL INFORMATION CENTRE



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Forthcoming Tech Events

In Vitro Assays in Microbiology

International Conference on Waste
Business and Management

International Conference on CPEC,
Sustainable Tourism Development
for Women Empowerment in Pakistan

5th International Conference on
Emerging Trends in Bioinformatics
and Biosciences

Poultry Science Conference

Tech Summit 23

2nd International Conference on
Emerging Trends in Science and

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Tech & Trade Offers



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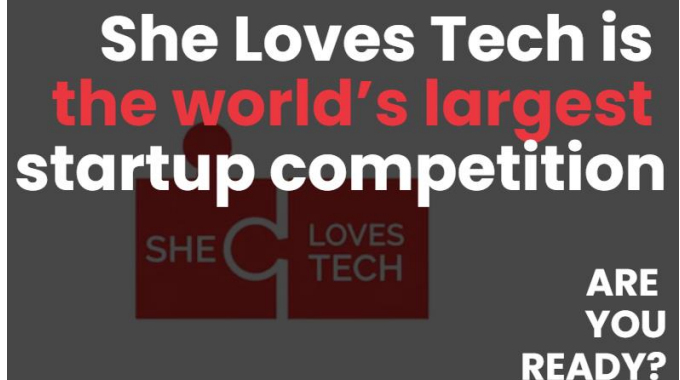
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She Loves Tech 2023

"She Loves Tech" is the world's largest startup competition for women and technology. She Loves Tech aims to be a worldwide platform with a strong dedication to bridge the funding disparity for female entrepreneurs. We provide the much-needed global platform and a stage for entrepreneurs to showcase, provide access to funding opportunities, and equipping them with skills and resources to take their business to the next level. The platform hosts the most extensive startup competition for women and technology on a global scale with the mission to identify and expedite the most exceptional entrepreneurs and cutting-edge technologies and to create a profound and positive impact. The primary objective of "She Loves Tech" is to facilitate access to over US\$1 billion in capital for businesses led by women by 2030. Registration for the Global Startup Competition is now open.



COMSATS and Azerbaijan Forge ICT Cooperation

H.E. Rashad Nabiyeu, the Minister for Digital Development and Transport of Azerbaijan, during an official visit to Pakistan visited the COMSATS Secretariat, and had a bilateral meeting with Ambassador. Dr. Mohammad Nafees Zakaria, the Executive Director of COMSATS. They discussed various technology projects for cooperation, focusing on IT and digitalization. Additionally, during his



visit, the Minister witnessed the signing of a Memorandum of Understanding between COMSATS and the Innovation and Digital Development Agency (IDDA) of Azerbaijan. The MoU focuses on an ICT and Technology Training Program aimed at skill development. The event was graced by Ambassadors, diplomats from COMSATS' Member States, along with numerous renowned technology experts and innovators from Pakistan, associated with COMSATS' affiliates and partner organizations.

PITB's E-Fertilizer System Benefits Farmers

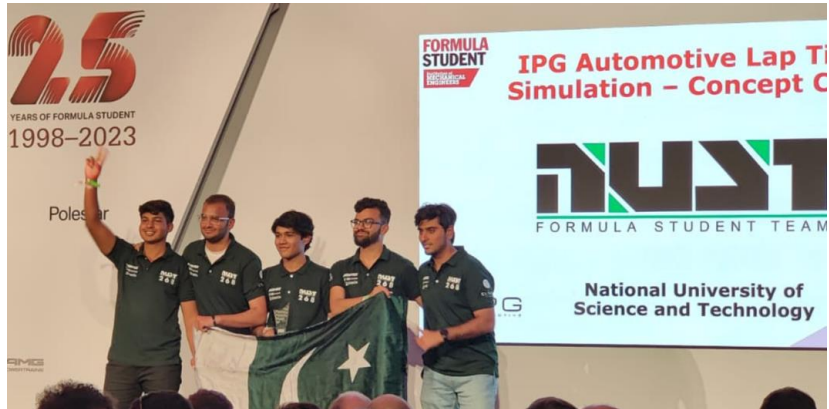
The e-Fertilizer Distribution System, a joint effort of PITB and Punjab Agriculture Department, streamlines fertilizer purchase for agriculture staff, dealers, and farmers. It fetches farmer's data from the e-Gardawri database, allocating quota based on their land and



crops. This system ensures fair and efficient fertilizer distribution, saving time and costs.

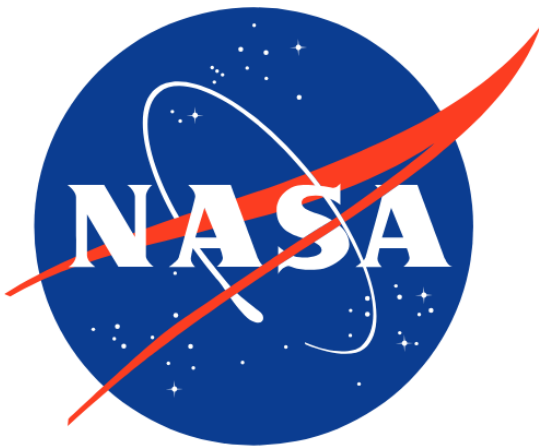
NUST Excels in Formula Electric Racing at FSUK

The Formula Electric Racing team from Pakistan Navy Engineering College, which is a respected part of the National University of Sciences & Technology (NUST), made a significant impact during their participation in the prestigious Formula Student UK 2023 event held at the Silverstone Circuit. In the intense competition, this team stood out as the exclusive representative from Pakistan and the entire South Asian region within the FS Class. In this class, participating



teams showcase cars of their own creation, demonstrating their design and construction skills. In the midst of the assembly of over 100 teams worldwide, the Formula Electric Racing-NUST team showcased extraordinary dedication and proficiency, achieving praiseworthy standings in diverse events held during the competition. A notable accomplishment for the team was their attainment of the 5th position in the Cost Event, surpassing over 100 competing teams.

NASA Invites Pakistani Student for Inventing Anti-Sleep Glasses



Bisma Salangi, a Pakistani student, has brought honor to our country with her remarkable invention, acknowledged by the National Aeronautics and Space Administration (NASA). This 13-year-old prodigy in the field of computers has designed special anti-sleep spectacles, aimed at preventing drivers from dozing off while driving vehicles. Her innovation is a significant contribution to the global endeavors of reducing traffic accidents and enhancing road safety.

The anti-sleep glasses are equipped with advanced technology that can identify signs of tiredness by tracking various indicators like steering patterns, lane deviations, and driver behavior. Once the glasses detect any indication that the driver might be falling asleep, they promptly issue a warning. This is made possible through sophisticated algorithms that analyze crucial factors such as eye movement and facial expressions.

Coventry University and NUST Launched Two New Scientific Labs

Coventry University collaborated with the National University of Sciences and Technology (NUST) to establish cutting-edge laboratories for the Internet of Things (IoT) and Human-Robot Interaction (HRI) in Pakistan. Led by Professor Ajmal Khan, Dean of NUST School of Electrical Engineering and Computer Science, the IoT facility is dedicated to develop innovative solutions for local challenges and



contributing to societal progress by leveraging state-of-the-art technology to achieve unprecedented levels of performance. The HRI laboratory, spearheaded by Professor James Brusey, Co-Director at Coventry University's Centre for Computational Science and Mathematical Modelling (CSM), is exclusively focused on comprehending, designing, and assessing robotic systems intended for collaboration with, or usage by, individuals. Under the guidance of Professor Javaid Iqbal, who serves as the Dean of NUST School of Mechanical and Manufacturing Engineering, the HRI facility also endeavors to harness advanced techniques such as artificial intelligence and computer modeling to enhance the synergy between humans and machines, thus optimizing their collaboration. As part of the new collaborative efforts between Coventry University and NUST, a significant initiative is the Master Student Placements Program. This program will facilitate NUST students to engage in three-month research placements at CSM during autumn 2023.

High-speed Internet Introduced in Swat

StormFiber, a renowned fiber-broadband provider, has announced its expansion to the city of Swat. Swat is renowned for its breathtaking natural beauty and rich cultural heritage. Recognized as the "Switzerland of Pakistan," Swat has now become an integral part of StormFiber's digital network as 23rd city to benefit



from its cutting-edge connectivity services. Successfully bringing 100% fiber-optic internet coverage to the hilly region of Swat, showcases StormFiber's strong dedication to advanced digital transformation across the country. The reliable and high-speed broadband ensures continuous connectivity, becoming essential for Swat's influencers, entrepreneurs, and talented individuals. This empowers them to connect globally and seize opportunities. This contemporary gateway has the capacity to reshape education, industry, and tourism for the local residents in the region.

COMSATS and Carol Technology to Collaborate for Technology-driven Initiative

The Commission on Science and Technology for Sustainable Development in the South (COMSATS) signed a Memorandum of Understanding with Carol Technology. The objective of this agreement is to enable collaborative research and development initiatives focused on technological progress. COMSATS is an intergovernmental organization comprising of 27 developing countries, with a primary focus on promoting the development of science and technology in its member states. On the other hand, Carol Technology is committed to providing advanced technical expertise, a skilled team, and specialized knowledge to take an active role in collaborative research projects that cater to the specific requirements of industries and academia. It stands as a pioneering entity in Pakistan that introduced the utilization of Unmanned Aerial Vehicles (UAVs) for inspecting wind turbines.



Advanced Freezing Technology to Enhance Mango Export

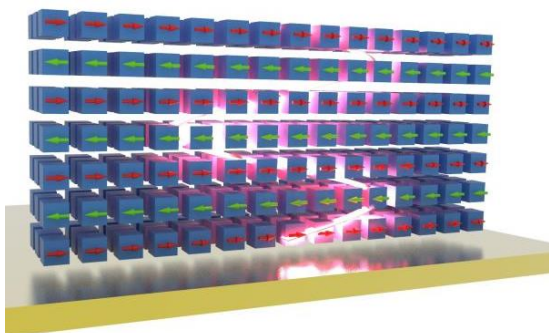
Pakistani mango exporters are aiming to increase their mango sales in China by adopting innovative methods. They are exploring new approaches to extend the shelf life and maintain the flavor of the mangoes. In the year 2022, the quantity of mangoes exported to China was minimal. One contributing factor to this was the limited freshness retention, making it challenging to transport them over



longer distances. To address this issue, two Pakistani companies have introduced a solution by implementing a freezing technique for mangoes. This freezing technology extends the mangoes shelf life to as long as a year while preserving their taste. Additionally, it aids in reducing the expenses associated with transporting them over long distances. The freezing process selectively freezes only the edible portions, making it a more efficient and cost-effective approach. The mangoes can be frozen within a matter of minutes.

Trapping Light inside a Magnet

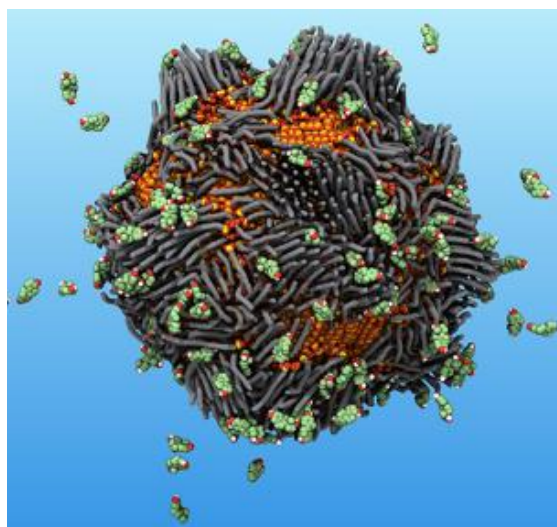
Research led by Vinod M. Menon and his team at The City College of New York reveals that confining light within magnetic materials could significantly enhance their intrinsic properties. Strong optical reactions within magnets play a pivotal role in advancing magnetic lasers, magneto-optical



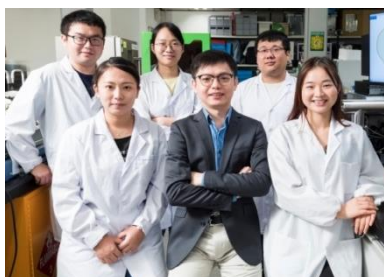
memory devices, and novel quantum transduction applications. The researchers outlined the characteristics of a layered magnet that accommodates tightly bound excitons, which are quasiparticles known for their robust optical interactions. This unique property allows the material to independently capture light. Their experiments demonstrate that the material's optical reactions to magnetic influences are significantly more potent, surpassing those found in conventional magnets by several orders of magnitude.

‘Smart Rust’ and Magnets that Purify Water

Researchers have created unique iron oxide nanoparticles, referred to as "smart rust," which have the remarkable capability to actively purify their surroundings. "Smart rust" possesses the ability to attract a wide range of substances, such as oil, nano- and microplastics, and even the herbicide glyphosate. The specific substances it attracts depend on the type of coating applied to the particles. Furthermore, due to the nanoparticles' magnetic properties, they can be effortlessly extracted from water using a magnet, along with the pollutants they have captured. Presently, the research team has made modifications to these particles, enabling them to effectively capture estrogen hormones that could pose a threat to aquatic ecosystems. The "smart rust" is not only cost-effective but also environmentally safe and capable of being recycled. Researchers have showcased its effectiveness in tackling various types of contaminants, highlighting the significant potential of this approach to substantially enhance water treatment methods.



Photocatalytic System Converts Carbon Dioxide to Valuable Fuel



A collaborative research group comprising members from the City University of Hong Kong has recently unveiled an enduring artificial photocatalytic mechanism surpassing the efficiency of natural photosynthesis. This innovative system emulates the functions of a chloroplast, akin to those found in nature, effectively transforming

carbon dioxide within water into methane, a valuable and efficient fuel source, through the utilization of light. This breakthrough holds immense potential and may play a pivotal role in advancing the objective of achieving carbon neutrality.

Earthquake Detection and Categorization through Fiber Optic Cables

Long fiber optic cables traverse through many regions, supplying the population with internet access. Beneath the surface, these cables possess an unexpected additional capability to detect and measure seismic activity. To employ a fiber optic cable as a seismometer, laser emitters are positioned at one end of the cable, projecting light beams through the elongated, delicate glass strands constituting the cable's core. Within the glass, minuscule imperfections exist, reflecting a tiny fraction of the light back to the source, where it gets documented. In this manner, each flaw serves as a traceable point along the fiber optic cable, typically situated just below the surface. When seismic waves traverse the ground, the cable undergoes slight movements, altering the light's travel time to and from these points. Thus, the imperfections spanning the cable's length function akin to numerous individual seismometers, enabling seismologists to monitor the movement of seismic waves.



Promising New Method for Precise Soil Carbon Estimates



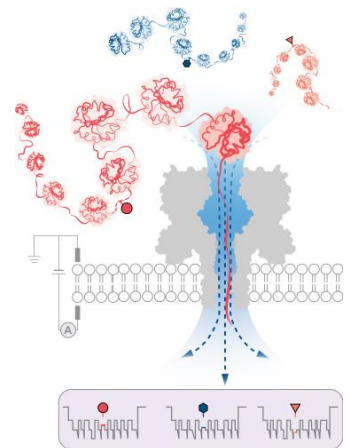
Earth's soil contains significant reservoirs of carbon, surpassing the carbon content found in the atmosphere. A considerable proportion of this carbon within the soil exists in an organic state, known as soil organic carbon (SOC), where carbon molecules are bonded together. Nevertheless, historical agricultural practices have considerably depleted SOC through the release of carbon dioxide into the atmosphere, thereby contributing to the ongoing issue of climate change.

For effective monitoring and sustainable management of SOC reserves within agricultural landscapes, the development of a precise measurement technique is imperative. Regrettably, the current methodologies employed to accurately assess SOC levels demand substantial resources and incur high costs. In a recent research endeavor documented in the *Geoderma* journal, experts from the Agroecosystem Sustainability Center (ASC) and ACES researchers have explored an innovative sampling approach with the aspiration of enhancing the precision in estimating SOC reservoirs.

Nanopore Tech Achieves Protein Variant Detection Breakthrough

While human cells possess around 20,000 genes responsible for encoding proteins, the observed protein count within cells surpasses this figure significantly, exceeding 1,000,000 distinct structures. These variations arise due to post-translational modifications (PTMs), a process occurring subsequent to protein transcription from DNA. PTMs introduce structural alterations like the attachment of chemical groups or carbohydrate chains to the constituent amino acids forming proteins. This leads to numerous potential adaptations for a single protein chain.

Unveiling this variability holds the potential to reveal a plethora of valuable insights that might completely transform our comprehension of cellular processes. To surmount this challenge, a group of scientists under the guidance of researchers from the Department of Chemistry at the University of Oxford has effectively created a technique for analyzing proteins utilizing nanopore-based sensing technology. In this method, a controlled flow of water is employed to capture and unravel three-dimensional proteins, converting them into linear chains that are then threaded through tiny pores, designed to accommodate only individual amino acid molecules. Distinctive alterations in structure are discerned by assessing alterations in an electrical current passed through the nanopore. Diverse molecules induce specific disturbances in the current, thereby bestowing them with a distinct signature.



3D Display Could Bring Touch to Digital World

Engineers at the University of Colorado Boulder (CU Boulder) have developed a 3D morphing display using a grid of pliable robotic "muscles." These muscles create raised patterns when subjected to external pressure. A group of researchers organized 100 Hydraulically Amplified Self-Healing Electrostatic (HASEL) actuators in a grid formation.

These accordion-shaped actuators respond to electric current by moving fluid within them, leading to expansion and the creation of pop-up effects. Brian Johnson, a former researcher at CU Boulder, explained that the actuators incorporate magnetic sensors to detect pressure. This feature enables users to use magnetic wands to draw on the surface of the display. The prototype display



also boasts a faster operation compared to similar smart tablets, with each robot muscle capable of activating up to 50 times per second.

Creating a 'Chemistry Assistant' from ChatGPT

Creating novel materials needs substantial time and efforts. However, scientists hold optimistic prospects that artificial intelligence (AI) could eventually alleviate a significant portion of this workload. In a recent research article, a group of researchers guided an established AI model named ChatGPT to undertake a particularly labor-intensive assignment, scouring



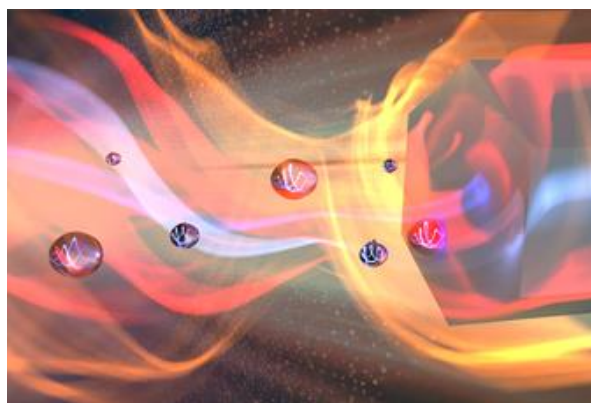
through scientific literature. Using the information acquired, they subsequently developed another tool, a model designed to anticipate experimental outcomes. The team utilized prompts to guide ChatGPT through three processes aimed at identifying and summarizing experimental details in scientific papers. The prompts were meticulously designed to reduce the occurrence of model-generated responses (hallucination) and to optimize the quality of the generated responses.

For analyzing text from scientific papers, the team directed ChatGPT using prompts, guiding it through three processes to identify and summarize experimental details in the manuscripts. The researchers designed these prompts meticulously to reduce the model's tendency to generate fictitious responses (hallucination) and to ensure the highest quality responses. Unlike previous AI-based endeavors, this approach doesn't necessitate coding expertise, and scientists can alter its focus by adjusting the language in the prompts. The researchers have named this system the "ChatGPT Chemistry Assistant." They believe it holds potential for diverse fields of chemistry as well.

Physicists of University of Jyväskylä Show Sound Transmission through Vacuum

Physicists associated with the Nanoscience Center at the University of Jyväskylä in Finland, have proved that under specific circumstances, sound can indeed be effectively transmitted through a vacuum region.

In a recent scientific publication, they have demonstrated that in certain scenarios, a sound wave can effectively traverse or "tunnel" across a vacuum gap between two solid materials, particularly if those materials exhibit piezoelectric properties. In



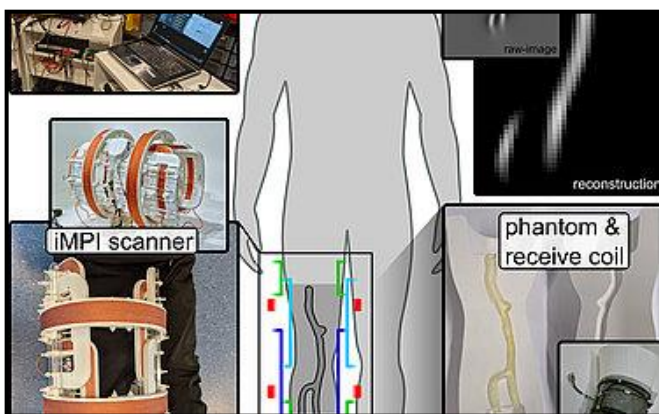
piezoelectric materials, vibrations or sound waves induce an electrical response, and given that an electric field can exist even within a vacuum, it becomes possible for these sound waves to be transmitted across the gap. This phenomenon occurs when the gap's dimensions are smaller than the wavelength of the sound wave. Notably, this effect is not confined solely to the audible range of frequencies (Hz-kHz), but extends to ultrasound (MHz) and hypersound (GHz) frequencies as well. The key stipulation is that the vacuum gap's size must decrease as the frequencies increase.

Innovative Technology Enables Fast and Reliable Development of Diagnostic Tests

A research group showcased a new method that enables them to create quicker and more precise diagnostic tests for disease detection, water quality monitoring, and environmental pollutant identification. The innovative "protein nano-switch" approach offers a substantial boost to the speed and efficacy of creating analogous diagnostics. This is achieved through a reduction in time requirements and an augmentation of success rates. This method involves the customization of proteins to emulate ON/OFF switches, triggered by specific targets. To illustrate the efficacy of this technology, the team directed their attention to a cancer chemotherapy drug characterized by its toxicity and the need for continuous monitoring to safeguard patient well-being.



A New Technology for a Brief Glimpse into the Human Body



The iMPI scanner offers novel insights into the human body. Through this integrated imaging technique, you can observe a narrowing within a blood vessel, captured using conventional X-rays, the scanner itself and a merged combination of both methodologies. A collaborative group comprising physicists and medical practitioners from Julius-Maximilians-Universität Würzburg

(JMU) has achieved a significant milestone by adapting an additional imaging technology for human application—one that is devoid of radiation. This technology is known as Magnetic Particle Imaging (MPI). The team has designed a portable scanner that allows the visualization of various dynamic processes within the human body, including blood flow.

New Technology Maps Rapid Electrical Signals in Plants



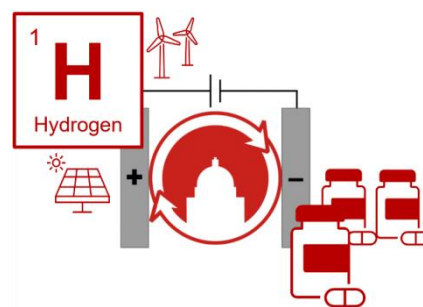
impulses, the question arises, do plants, devoid of a nervous system, also possess electrical signals? Indeed, plants do generate electrical signals in response to stimuli such as touch and stress factors, including wounds inflicted by herbivores and damages to their roots. Unlike animals, which can physically relocate, plants confront stressors in the very location they are rooted in. Recognizing the significance of comprehending how plants

react to stress, Eleni Stavrinidou, who serves as an Associate Professor in the Department of Science and Technology at Linköping University (LiU) and leads the Electronic Plants group, emphasizes the potential of this novel technology to make notable contributions within this realm of research. The recently devised measuring apparatus comprises an extremely thin film embedded with electrodes.

With a thickness akin to that of plastic wrap employed for food covering, this film conforms to the curvature of the plant's lobes. In their experimentation, the researchers delicately probed a sensory hair and harnessed approximately 30 electrodes to gauge the signal within the lobe. Concurrently, they captured the plant's movements on video to facilitate the correlation between the recorded electrical signal and the subsequent closure of the Venus Flytrap.

Innovative Method Demonstrates Hydrogen-Electricity Combination for Pharmaceutical Drug Synthesis

In response to the global demand for more environment friendly methods of chemical production, a recent study conducted by researchers at the University of Wisconsin–Madison highlights a promising avenue. This involves the adaptation of hydrogen fuel cell technologies, offering a potential solution to achieve greener chemical manufacturing processes. The current research addresses



an additional challenge by utilizing electricity. A significant advancement in drug synthesis necessitates substantial amounts of zinc metal for electron generation. However, working with zinc poses complications and results in the generation of substantial environmentally harmful waste. The researchers drew inspiration from hydrogen fuel cells, which employ hydrogen gas as the electron source for electricity generation. The process under investigation requires an eco-friendly supply of electrons. This can be achieved through the utilization of renewable electricity, resulting in minimal waste generation. The endeavor to establish a hydrogen-based method for pharmaceutical production resonates with the growing enthusiasm for a "hydrogen economy."

SOURCES AND IMAGE CREDITS

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FORTHCOMING TECH EVENTS

PAKISTAN

- In Vitro Assays in Microbiology
September 5 – 6, 2023, NUST, Islamabad
<https://nust.edu.pk/events/in-vitro-assays-in-microbiology/>
- International Conference on Waste Business and Management
September 12 – 13, 2023, Quaid i Azam University, Islamabad
<https://qau.edu.pk/events/international-conference-on-waste-business-management/>
- International Conference on CPEC, Sustainable Tourism Development for Women Empowerment in Pakistan
September 14 – 15, 2023, Karakoram International University, Gilgit
<https://fjwu.edu.pk/fjwu-events/international-conference-on-cpec-sustainable-tourism-development--for-women-empowerment-in-pakistan/>
- 5th International Conference on Emerging Trends in Bioinformatics and Biosciences
September 14 – 16, 2023, Hazara University, Mansehra
<https://hu.edu.pk/public/bioinformatics/>
- Poultry Science Conference
September 21 – 23, 2023, University of Veterinary & Animal Sciences, Lahore
<http://aims.uvas.edu.pk/LAMS/login.aspx>
- Tech Summit 23
September 29 – October 1, 2023, Expo Center, Johar Town, Lahore
<https://techsummit23.com/>
- 2nd International Conference on Emerging Trends in Science and Technology (ICETST, 2023)
October 2 – 6, 2023, Fatima Jinnah Women University, Rawalpindi
<https://fjwu.edu.pk/icetst/>
- 5th International Conference on Innovative Biological and Public Health Research (IBPHR-2023)
October 11 – 12, 2023, Government College University, Lahore
<https://gcu.edu.pk/upcoming-event.php?pg=IBPHR>
- 21st International and 33rd National Chemistry Conference
October 23 – 25, 2023, Quaid i Azam University, Islamabad
<https://qau.edu.pk/events/21st-international-1st-inter-islamic-33rd-national-chemistry-conference/>
- 1st International Conference on Climate-Induced Natural Disaster and Mitigation
October 30 – 31, 2023, Karakoram International University, Gilgit
<https://www.kiu.edu.pk/upcoming-event/1st-international-conference-on-climate-indiced-natural-disasters-and-mitigation>
- 18th International Conference on Emerging Technologies (ICET 2023)
November 6 – 7, 2023, National University of Computer and Emerging Sciences, Peshawar
<https://www.icet.org.pk/2023/index.php>
- 2nd International Conference Revamped Scientific Outlook of 21st Century, 2023
November 15th, 2023, Rawalpindi Women University, Rawalpindi
<https://conf-fs2023.rwu.edu.pk/>
- Conference on Architecture – History, Theory & Practice (CArch 2023)
November 16 – 17, 2023, NED University of Engineering and Technology, Karachi
<https://carch.neduet.edu.pk/>
- 1st International Conference on Communication Networks & Embedded Systems 2023
December 5 – 6, 2023, Pak-Austria Fachhochschule: Institute of Applied Sciences and Technology, Haripur
<https://paf-iaast.edu.pk/event/1st-international-conference-on-communication-networks-embedded-systems-2023/>

INTERNATIONAL

- Small Business Expo 2023
September 6th, Los Angeles
<https://www.thsmallbusinessexpo.com/city/los-angeles/>
- 8th International Conference on Accelerating Biopharmaceutical Development (AccBio 2023)
September 6 – 8, 2023, Cambridge, USA
<https://www.aiche.org/sbe/conferences/accelerating-biopharmaceutical-development-abd/2023?gclid>
- 25th International Conference on Engineering and Product Design Education
September 7 – 8, 2023, Barcelona, Spain
<https://epde.info/2023/>
- International Conference on Quantum, Atomic and Molecular Physics, QuAMP 2023
September 7 – 8, 2023, Glasgow, UK
<https://iop.eventsair.com/quamp2023>
- 7th International Conference on Engineering Technology and Innovation (ICETI 2023)
September 13 – 17, 2023, Belgrade, Serbia
<https://www.iceti.org/>
- 4th International Conference on Advances in Software Engineering (ASOFT 2023)
September 15 – 17, 2023, Copenhagen, Denmark
<https://csity2023.org/asoft/index>
- EV Charging Infrastructure 2023
September 18 – 19, 2023, Toronto, Canada
<https://www.canada.evcharging-infrastructure.com/>
- 16th International Congress on the Chemistry of Cement 2023
September 18 – 22, 2023, Bangkok, Thailand
<https://www.iccc2023.org/>
- 27th International Conference on Science, Technology and Innovation Indicators, 2023
September 27 – 29, 2023, Leiden, Netherlands
<https://www.sti2023.org/>
- International Conference on Computer Vision
October 2 – 6, 2023, Paris, France
<https://iccv2023.thecvf.com/>
- International Conference on Medical Education 2023
October 7 – 10, 2023, Baku, Azerbaijan
<https://icme-riphah.org/>
- 5th Nuclear Forensics Conference (NuFor)
October 10 – 12, 2023, London, UK
<https://iop.eventsair.com/nufor2023>
- 9th International Conference on Engineering and Emerging Technologies (ICEET 2023)
October 27 – 28, 2023, Istanbul, Turkey
<https://iceet.net/>
- 3rd International Conference on Basic Sciences and Technology (ICBAST)
November 16 – 19, 2023, Antalya, Turkey
<https://www.2023.icbast.net/>
- International Conference on Bioinspired and Biobased Chemistry & Materials
December 12 – 14, 2023, NICE, France
<https://iupac.org/event/nice-winter-2023/>

TECH AND TRADE OFFERS

Next Links

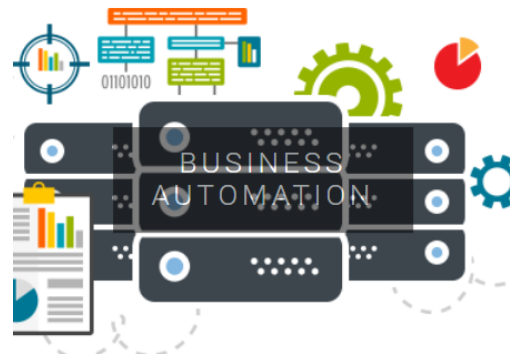
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Next Links is an IT & Telecommunication company that offers services covering all the IT & Telecommunication life cycle. When you work with Next Links we put ourselves into your structures, making sure we understand the way you work and want us to work, helping us gain a stronger and more strategic partnership. Whatever your requirements may be, Next Links will have the answer to your analysis. We make ourselves distinctive by providing trustworthy brands, innovative consultancy, and cheap solutions. We have a dedicated well equipped, highly skillful and experienced team who is able to bring an idea to a product level. Our Slogan describes what we want to achieve “Catch Excellence by Chasing Perfection” At Next Links our team work faster than our competitors.

That trims valued time off your project and keeps costs low, while enhancing product quality, reliability and security.

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- Workflow solutions
- Cyber security
- IT equipment supply
- Information and Communication technology
- Surveillance
- Mobile applications
- Software development



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