

# Technology Roundup

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- 4<sup>th</sup> International Conference on Distance Education and E-Learning
- International Conference on Emerging Trends in Physics 2024
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## Tech & Trade Offers

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### Pakistan's Landmark Tight Gas Production Kicks Off

OGDCL has started commercial production of tight gas from its Nur West Well-1 in Sindh's Sujawal district. This new source of gas is a boost for Pakistan, which heavily depends on imported petroleum. The production follows the introduction of the Tight Gas (Exploration & Production) Policy 2024, which provides a 40% price premium to encourage investment in unconventional gas reserves. The well, drilled to 2,975 meters, currently produces 1.5 million standard cubic feet per day (MMSCFD) of gas at 1050 PSI, and has been integrated into the Sui Southern Gas Company Limited (SSGCL) network. Initial tests were unsuccessful due to the tight formation, but hydraulic fracturing has enabled viable production. OGDCL, holding a 100% stake in the lease, continues to lead in exploring unconventional gas resources. The discovery of tight gas from Nur West Well-1 offers several benefits for Pakistan. It reduces reliance on imported petroleum, saving foreign exchange and enhancing energy security. By integrating the gas into the Sui Southern Gas Company Limited (SSGCL) network, it strengthens the national infrastructure and improves energy access. The project also creates jobs, stimulates investment, and showcases advanced hydraulic fracturing technology that could be applied to other reserves.



### Chinese Firm to Build Solar Panel Plant in Punjab

A major advancement in Punjab's renewable energy sector is underway as a Chinese company is set to establish a new facility focused on the manufacturing and assembly of solar panels. The contract was formalized by Chaudhry Shafay Hussain, Minister for Industries, Commerce & Investment, and Alex Heng, the President of the Chinese firm. The new facility will not only be the province's first dedicated solar panel manufacturing plant but will also feature an advanced solar panel testing laboratory. This lab will be designed to ensure the highest quality and efficiency of the solar panels produced, further boosting the region's capabilities in renewable energy technology. The establishment of this plant is expected to bring multiple benefits to Punjab, including job creation, technological advancement, and a significant boost to the local economy. It also represents a key step towards Punjab's broader goals of sustainable development and energy diversification, reflecting a strong commitment to embracing clean energy solutions and reducing reliance on traditional power sources.



### Nationwide Rollout of E-Procurement System

The Public Procurement Regulatory Authority (PPRA) is implementing an e-procurement system across 27 ministries and 280 public departments in Pakistan to boost transparency and cut public spending. The 'E-Pak Acquisition and Disposal System,' supported by the World Bank, aims to streamline procurement through a unified digital platform offering e-payment solutions. Since March 2023, 8,500 government employees and suppliers have been trained. Key updates include 25 amendments to the Procurement Rules 2004, improved bidding documents, and help desks for technical support. Around 13,000 suppliers have registered with the system at no cost.



The initiative has also been extended to Punjab, Sindh, and Khyber Pakhtunkhwa, with Punjab already implementing it. The Finance Ministry and Cabinet Division are instrumental in supporting this initiative, following the Prime Minister's directives. This nationwide e-procurement system will boost transparency, cut costs, and improve efficiency by centralizing and automating procurement processes. It will reduce administrative expenses, ensure regulatory compliance, and enhance supplier access leading to better data management and more effective, accountable public procurement.

### 11-Year-Old Robotics Prodigy Muhammad Hasnain from Karachi

Eleven-year-old Muhammad Hasnain from Karachi has created an AI assistant robot named "Muhammad Ali," showcasing his impressive skills in technology. Hasnain's robotics journey began two years ago with a course at the Imam Hussain Institute. His AI assistant is the result of his summer project, blending his interests in robotics and game development. The robot, activated by voice commands, listens, processes, and responds much like a human. Hasnain demonstrated the capabilities of his robot by providing a recipe for chai. Hasnain also explained that Muhammad Ali can assist with tasks such as opening websites, creating shopping lists, and even switching to solar power, all based on his programming. Though the robot's head is still being finished with a 3D printer, Hasnain has built the robot entirely on his own. His talent has also attracted the attention of university students seeking his help. With aspirations in robotics and game development, Hasnain is a beacon of hope and innovation for the nation. This achievement serves as an inspiring example for young innovators, showing the potential of early engagement in technology and robotics and highlights the practical application of robotics and programming skills, emphasizing the value of hands-on learning.





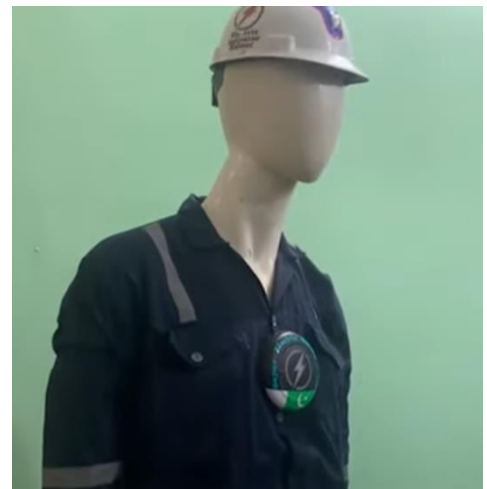
### NUST Hosts FICS 2024 Grand Finale and Awards Ceremony

FICS 2024, NUST's premier initiative for social entrepreneurship, marked its 11th Grand Finale with international participation from Turkiye and Azerbaijan. Out of more than 800 project submissions, Team Harassment Defender was named the national winner, while Team ABC from Azerbaijan received the Global Champion Award. The event was honored by Mr. Mohyuddin Ahmed Wani, Secretary of the Ministry of Federal Education & Professional Training, as the chief guest, alongside Lt Gen (Retd) Engr Javed Mahmood Bukhari, Rector of NUST, and esteemed ambassadors and educationists from Azerbaijan, Turkiye, and Brunei Darussalam. Supported by a diverse array of industry partners, FICS 2024 offered seed funding and cash prizes to recognize and encourage outstanding projects. FICS is privileged to have the support of a wide range of industrial partners who provide seed funding and cash prizes for promising projects.



### Pakistani Engineer Designs Cutting-Edge Anti-Electricity Suit for Worker Safety

A Pakistani engineer has innovated an anti-electricity suit designed to enhance worker safety. Mumtaz Ahmad embarked on this project six years ago after encountering images of workers who had suffered fatal electric shocks while on duty. Driven by a commitment to humanitarian causes, Ahmad devoted years of research and development to create this advanced protective dress. The suit is equipped with cutting-edge technology that alerts users of nearby electrical hazards. It features a comprehensive detection system that identifies electrical sources from all directions and notifies the wearer through a combination of blinking lights and audible alarms. The integrated helmet further enhances safety by detecting electrical sources in upward direction, proving invaluable for workers who climb electric poles. Constructed with specialized wires, antennas, and receivers, the suit provides robust protection against electrical hazards. Currently, the cost of producing each suit is approximately PKR 35000, though the price can be reduced with bulk production. The detection capability varies based on the voltage of the electrical current and the distance from the source. This suit boosts worker confidence and ensures robust protection in high-voltage environments.



### Yutong to Build EV Bus Manufacturing Plant in Karachi

Yutong, a global leader in bus manufacturing, has announced its intention to establish a manufacturing facility in Karachi. This decision follows a significant meeting between Sindh's Senior Minister, Sharjeel Inam Memon, and Yutong Middle East CEO Robin. Construction of the plant is scheduled to commence in the upcoming quarter and is anticipated to be completed within the next year. Yutong plans to manufacture both intra-city electric and hybrid diesel buses at this facility, aiming to meet the rising demand for environment friendly public transportation solutions in Karachi and potentially throughout Pakistan. The establishment of the Yutong plant is set to make a substantial positive impact on Karachi's economy. Local industries are expected to see heightened demand for components and materials essential for bus production. Moreover, the plant will generate a multitude of skilled job opportunities for residents of Karachi, thereby bolstering the local labor market.



(Meta AI imagined image).

### Farmdar from Pakistan has Launched a New Fintech Startup in Brazil

Farmdar, an agri-tech startup from Pakistan, has announced the launch of AgromAI, a new fintech venture based in Brazil. This new enterprise represents a significant expansion into a new industry and geographical market. AgromAI will harness artificial intelligence (AI) and geospatial data to offer innovative financial services tailored to Brazil's agricultural sector. According to Farmdar's co-founder and CEO, AgromAI will provide detailed, farm-level intelligence to help financial institutions and will insurer better management and response to these climate-related risks. By improving risk management through advanced data analytics, AgromAI aims to boost productivity and growth within Brazil's significant agricultural sector. The launch of AgromAI highlights the potential for Pakistani technology on the global stage, with the company proud to export AI and data-driven solutions developed by Pakistani engineers. Brazil's agricultural sector is a major component of its economy, valued at over \$170 billion, with the crop insurance market alone exceeding \$9 billion annually. AgromAI's entry into this market represents a strategic opportunity to leverage cutting-edge technology in a critical economic area.



### Pakistan's Premier International Date Festival Set for October

Pakistan is set to host its first international date festival in October, following a recent agreement between the Trade Development Authority of Pakistan (TDAP) and the Embassy of the United Arab Emirates (UAE). The festival aims to spotlight the country's date industry, which, despite significant imports from the Middle East has substantial domestic production. Major date-producing regions in Pakistan include Khairpur in Sindh and Turbat and Panjgur in Balochistan, which offer significant export potential and could generate substantial revenue. The agreement, facilitated by TDAP Chief Executive Zubair Motiwala and the UAE Embassy, was announced by the UAE Consulate in Karachi. UAE envoy to Pakistan, Hamad Obaid Al-Zaabi, emphasized that the festival would feature international participation and hoped it would boost the export of Pakistani dates, benefiting the national economy. The event will also serve as a platform for various business figures to showcase different types of dates and production techniques, fostering stronger economic ties between the UAE and Pakistan.



### Pakistani Engineer Creates Fastest Car Engine at Koenigsegg

Hassan Javed, a Pakistani engineer working with Koenigsegg, has made history by developing the world's fastest car engine through his outstanding engine calibration expertise. This remarkable achievement not only marks a significant milestone in the automotive industry but also brings great pride to his home country. Koenigsegg, the renowned Swedish luxury sports car manufacturer, is celebrated for its cutting-edge high-performance vehicles. Hassan's groundbreaking work will be a key component in their newest model, which is set to challenge and potentially surpass the current record for the fastest production car. This accomplishment further cements Koenigsegg's reputation as a trailblazer in innovative engineering and high-speed performance. Hassan Javed's development of the world's fastest car engine boosts Pakistan's national pride and global reputation. It inspires young engineers, opens doors for international collaborations, and could lead to more support for local engineering education. While direct economic impacts may be limited, the broader benefits of enhanced national branding and increased interest in Pakistani talent offer long-term advantages.





### Pakistan Launches 'Beep Pakistan' and E-Office Web Version

Ministry of IT and Telecommunication has launched "Beep Pakistan," the nation's first communication application, along with the new Web version of E-Office. The launch event, featured a presentation on the app's capabilities, which include secure messaging, document sharing, and audio/video conferencing, with all data securely hosted within Pakistan. The Beep Pakistan application, developed by the National Information Technology Board (NITB), aims to streamline communication and enhance operational efficiency in government organizations. The app will initially be available to government officials after a one-month testing period, with plans to open it to the general public in one year if successful. Beep Pakistan is designed to transform digital communication within government offices and to improve productivity through advanced e-governance practices. The ceremony underscored the Ministry of IT's commitment to the Digital Pakistan vision and efforts to bridge the digital divide. Beep Pakistan and the E-Office Web version will streamline government communication, enhance security, and boost productivity, advancing Pakistan's digital transformation goals.



### New Industrial Estate for Gujrat

Provincial Minister of Industry and Commerce Chaudhry Shafay Hussain chaired a meeting in the Industries and Commerce Department's committee room to discuss the colonization and development of 23 small industrial estates across Punjab. During the meeting, it was decided that a new industrial estate would be established on non-agricultural land in Gujrat. The minister directed the Gujrat district administration to identify a suitable location within the next four days, emphasizing that the site should be near existing electricity transmission and gas pipelines. He highlighted that the new estate would benefit industrialists and boost economic activities, creating new employment opportunities in Punjab. The government is implementing a robust strategy to accelerate industrialization in the province. MD PSIC Sidra Younas, Senior Economic Advisor Javed Iqbal, and Irrigation officers were present, with ADCR Gujarat joining via video link. The new industrial estate in Gujrat will boost economic growth, create jobs, and support local industry. By choosing sites with existing utilities, the project ensures reliable infrastructure and promotes balanced regional development.



### Air-to-Water Tech: A Game-Changer for Clean Drinking Water

Clean drinking water is essential for life, yet climate change is making traditional sources like rainfall and rivers less reliable. To address this challenge, Aquaria Technologies, a San Francisco-based company founded in 2022, is innovating with atmospheric water generators (AWGs) that extract moisture from the air to provide affordable, clean water. Aquaria's technology includes the Hydrostation, a stand-alone outdoor unit capable of producing up to 132 gallons (500 liters) of water daily, ideal for high-demand settings like parks or construction sites. Additionally, their Hydropixel indoor unit can generate up to 24 gallons (91 liters) of water per day and is known for its high energy efficiency, using only 1.25 kWh per gallon. The company's larger-scale Hydropack and Hydropack X systems offer even greater capacity, with the latter producing up to 264 gallons (1,000 liters) per day, potentially supplying entire communities. Aquaria's systems are designed to be energy-efficient, especially when powered by renewable sources like solar energy, which could reduce the cost of water significantly. Aquaria's devices are equipped with advanced filtration and UV sterilization to ensure water safety and meet high standards.



### New Synthesis Method Enhances Sustainable Manufacturing

Researchers at Rice University have introduced a revolutionary technique called flash-within-flash Joule heating (FWF), which has the potential to significantly enhance the synthesis of high-quality solid-state materials. This method offers a cleaner, faster, and more sustainable alternative to traditional, energy-intensive synthesis processes. Unlike conventional methods, which are slow and generate harmful byproducts, FWF allows for the rapid production of diverse compounds on a gram scale within seconds, while cutting energy use, water consumption, and greenhouse gas emissions by over 50%. This new method utilizes an outer flash heating vessel filled with metallurgical coke and a semiclosed inner reactor containing target reagents. This setup generates intense heat of around 2,000 degrees Celsius, enabling the rapid conversion of reagents into high-quality materials. FWF's ability to produce over 20 unique, high-purity materials makes it ideal for manufacturing advanced semiconductors such as molybdenum diselenide and tungsten diselenide, which are difficult to synthesize with traditional methods. The FWF technique does not require conductive agents, thus reducing impurities and byproducts.





### Self-Watering and Self-Feeding Smart Soil

A newly developed soil technology can capture moisture from the air to keep plants hydrated and regulate the release of fertilizer for a steady supply of nutrients. This innovative smart soil system relies on a hydrogel material created by researchers. Experiments with this hydrogel-infused soil showed that it produced larger, healthier plants compared to traditional soil, while using less water and fertilizer. This advanced gel technology can ease the workload for farmers by reducing the need for frequent irrigation and fertilization. Moreover, it is adaptable to a variety of climates, from dry regions to more temperate areas. This new generation of hydrogels presents a promising solution for addressing water scarcity and improving nutrient efficiency in sustainable agriculture. Experimental results showed that plants grown in hydrogel-enhanced soil experienced a 138% increase in stem length compared to those in traditional soil. Additionally, the modified soil achieved around 40% water savings, drastically reducing the need for frequent irrigation while supporting strong crop growth. Initially focusing on calcium-based fertilizers, the project will advance with plans to integrate various types of fertilizers and conduct extended field tests.



(Meta AI imagined image).

### Innovative Cotton Quality Model to Assist Farmers

Researchers have developed the world's first cotton quality module, a key addition to the GOSSYM forecasting tool that enables better monitoring of cotton crop quality under varying environmental conditions. This new module integrates with GOSSYM, a computer application that simulates cotton plant growth and yield based on selected weather, soil, and management strategies. Originally created in the 1980s, GOSSYM now includes this advanced module to predict not only crop growth and yield but also fiber quality. The module incorporates factors such as temperature, rainfall, and soil nutrient quality to assess cotton fiber quality accurately. It has been tested on 40 of the most commonly grown cotton varieties, making it a comprehensive tool for farmers and researchers. This module will be freely accessible to users managing 74 million acres of cotton worldwide and will aid in understanding how climate change impacts cotton quality. The ability to predict these changes is crucial for building resilience in the face of climate variability.



### Japan Railway Utilizing Giant Robots for Maintenance Operations

Japan Railway West (JR West) has introduced a new addition to its maintenance team, a robotic maintenance worker. As the largest rail operator in western Japan, maintaining the integrity of its tracks is crucial for West Japan Railway Company. Created through collaboration between JR West, Nippon Signal, and the Shiga Prefecture-based robotics firm Jinki Ittai (also known as Man-Machine Synergy Effectors Inc), the new unit named the Multifunctional Railway Heavy Equipment represents an evolution from its previous rail-specific design to a more versatile truck-based system. The robot features a torso connected to a crane-like arm that extends to perform tasks at heights reaching up to 12 meters above ground level.



Its arms are capable of handling and maneuvering equipment weighing up to 40 kilograms. JR West aims to achieve three primary objectives through the deployment of these robots: enhanced productivity, minimized worker risk, and a more adaptable workforce. Operating the robots requires significantly less physical strength compared to manual labor, enabling older or less physically capable employees to effectively undertake maintenance tasks.

### Innovative Battery Recycling Method

Researchers have pioneered a novel approach to extract purified active materials from battery waste, potentially revolutionizing the cost-effective separation and recycling of valuable battery components crucial for sustainable electric vehicle (EV) production.

Unlike conventional methods that rely on energy-intensive thermal or chemical processes, their innovative technique utilizes magnetic properties for efficient material separation and purification. Termed solvent-free flash Joule heating (FJH), this method rapidly heats battery waste to 2,500 Kelvin within seconds,



transforming it into substances with magnetic shells and stable core structures, thus enabling effective purification through magnetic separation. Throughout the process, the cobalt-based battery cathodes, commonly found in electric vehicles (EVs) and known for their significant financial, environmental, and social costs, unexpectedly exhibited magnetism within the outer spinel cobalt oxide layers, facilitating straightforward separation. The researchers' method achieved an impressive battery metal recovery rate of 98%, while preserving the integrity of the battery structure.

### Fish School Enhance Movement Efficiency through Visual Selection and Focus

Schools of fish demonstrate remarkable coordination, executing complex maneuvers without collisions and without a designated leader. This collective behavior has intrigued researchers at Tohoku University, who have developed a simulation model to delve into the dynamics of fish schooling. Their model focuses on how fish utilize visual cues to selectively attend to nearby, swiftly moving peers. By mimicking these behaviors in simulations, the researchers aim to uncover the underlying mechanisms that drive such synchronized movements in schools of fish. Researchers emphasize that fish have a wide field of view and can detect numerous individuals within their school. Recent experimental findings suggest that rather than monitoring every nearby fish, each individual fish selectively tracks a specific peer's movements. This selective decision-making process enables fish to maintain cohesion within the school while avoiding collisions.



(Meta AI imagined image).

### A Cool Solution

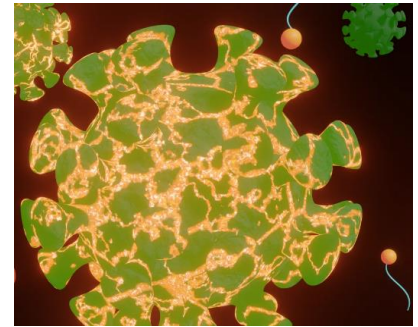
Artificial intelligence (AI) is a major focus right now, and so is the challenge of cooling the data centers that support this technology. As AI-driven devices and computers become increasingly common, maintaining the proper temperature in data centers is becoming more demanding. Researchers are working on a cutting-edge cooling system aimed at significantly reducing energy use. Efficient cooling is essential to prevent overheating and component failure, making energy-efficient data centers crucial for the future of AI. These data centers are large facilities packed with servers that process and store data, acting as key hubs for the infrastructure behind websites, mobile apps, and cloud services. Currently, cooling methods involve either air-moving fans or liquid systems that transfer heat away from computer racks. Researchers are developing a two-phase cooling system that manages heat from server chips through phase change, boiling a liquid into vapor in a thin, porous layer. This system operates passively, using no energy when minimal cooling is required. Even when actively cooling with a pump, it consumes very little energy. This design allows for very efficient heat transfer with low thermal resistance, and includes a mechanical pump that activates only when additional heat absorption is needed.





### New Fast Technique for Assessing Virus Infectivity

A new technique capable of quickly identifying whether a virus is infectious or non-infectious could transform how we respond to future pandemics. Known as FAIRY (Fluorescence Assay for Viral Integrity), this assay can evaluate viruses against antiviral agents in just minutes, quickly assessing the effectiveness of measures such as disinfectants that disrupt the infection chain. On average, a new virus with pandemic potential emerges every four years, and many known viruses could potentially cross species barriers. Currently, there is no available assay that identifies whether a sample contains intact or non-intact viruses, and thus whether it is infectious or non-infectious, without the weeks-long process of cell cultivation. FAIRY is a straightforward, cost-effective assay that utilizes ready-made consumables and can quickly screen multiple disinfectants and viruses on a single microplate to evaluate their ability to neutralize viral infectivity. The method employs a dye that typically penetrates viruses through pores in their protein shell. This dye is attached to a larger molecule to prevent penetration; however, when it binds to viral DNA or RNA, it emits a fluorescent signal. The resulting assay indicates whether the virus is intact and thus infectious, or if it is not.



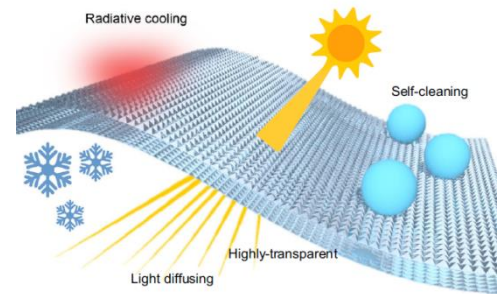
### A Better Way to Make RNA Drugs

The Wyss Institute has developed a novel enzymatic synthesis method that enhances RNA therapeutic capabilities and eliminates the toxic byproducts associated with traditional chemical synthesis. RNA therapies provide several benefits compared to conventional small molecule drugs. They can target nearly any genetic component within cells and assist in directing gene editing tools, such as CRISPR, to their specific targets. The potential of RNA therapies is currently constrained by the growing global demand, which surpasses the industry's ability to produce RNA at scale. A new RNA synthesis process addresses this issue by expanding the design space for RNA therapeutics and enabling rapid scale-up beyond what traditional chemical methods can achieve. This innovative method produces RNA with efficiency and purity comparable to existing industry standards, but uses water and enzymes instead of toxic solvents and explosive catalysts. It can accommodate all common molecular modifications found in current RNA drugs and has the potential to support novel RNA chemistries for emerging therapies. This capability is crucial for developing effective drug platforms, as FDA-approved RNA drugs often include modified nucleotides to enhance stability or introduce new functions.



### Groundbreaking Building Material for Sustainable Building Solutions

Researchers at the Karlsruhe Institute of Technology (KIT) have developed a groundbreaking transparent metamaterial for energy-efficient light and temperature regulation in buildings. This innovative polymer-based material allows sunlight to penetrate, maintains a comfortable indoor climate without additional energy, and features a self-cleaning mechanism akin to a lotus leaf. The material, known as Polymer-based Micro-Photonic Multi-Functional Metamaterial (PMMM), could potentially replace glass components in walls and roofs. The PMMM comprises microscopic silicone pyramids approximately ten micrometers in size, about one-tenth the thickness of a human hair. This unique design enables the material to diffuse light, self-clean, and provide radiative cooling while maintaining high transparency. A key advantage of the PMMM is its ability to efficiently radiate heat through the Earth's long-wave infrared transmission window, allowing heat to escape into the cold expanse of space. This enables passive radiative cooling without the need for electricity.



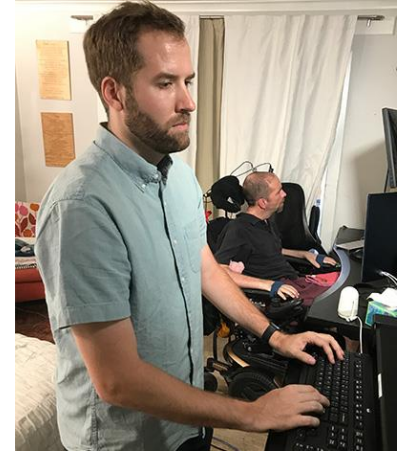
### Revitalizing Amazonian Business with a New Socio-Bioeconomic Model

To protect the Amazon and support its communities, a shift is needed from environmentally harmful production to a socio-bioeconomy (SBE) model that emphasizes sustainable practices and community support. This model promotes eco-friendly tourism and the sustainable harvesting of plant products, aiming to improve livelihoods while preserving ecosystems. Policy changes are crucial, including redirecting subsidies from large-scale agribusinesses to smaller-scale, sustainable initiatives, enhancing infrastructure, and creating public procurement programs that support local producers. The success of Veja, a French footwear brand sourcing responsibly harvested rubber from Amazonian farmers, illustrates how integrating sustainability into business can be effective. To realize these changes, there must be a significant increase in social mobilization, technology, and infrastructure investments, coupled with policy reforms to ensure long-term benefits for both conservation and economic development. The socio-bioeconomy (SBE) model benefits Amazonian people by creating sustainable economic opportunities, improving health and education, and preserving culture. It supports environmental protection, enhances food security, and builds community resilience. Overall, it promotes a just and sustainable development approach.



### Brain-Computer Interface Restores Speech for ALS Patient

A groundbreaking Brain-Computer Interface (BCI) developed by researchers has made a significant advancement in communication for individuals with severe speech impairments. This innovative technology allows a man with ALS to speak with up to 97% accuracy by translating his brain signals into spoken words. Implanted in the patient's brain, the BCI detects neural signals related to speech attempts and converts them into text, which is then spoken aloud by a computer. This new system offers real-time, near-error-free communication, surpassing previous technologies that struggled with high error rates. By restoring effective communication, the BCI significantly enhances interaction with family and caregivers, improving quality of life and reintegrating individuals into social activities. This achievement represents a major step forward in neuroprosthetics and provides renewed hope for those with debilitating conditions.



### Uncovering Rare Earth Elements in Coal Mining Operations

Recent research led by the University of Utah has revealed elevated levels of rare earth elements (REEs) in coal mines situated along the Uinta coal belt in Colorado and Utah. This finding indicates that these mines, traditionally associated with fossil fuel extraction, might also provide a valuable secondary resource stream for critical minerals essential for the transition to renewable energy and advanced technologies. The research, conducted in collaboration with the Utah Geological Survey and Colorado Geological Survey focuses on the potential of extracting REEs from fine-grain shale units found above and below coal seams. This research addresses the pressing issue of dependency on foreign sources for these vital materials, proposing a novel approach to utilize existing mining infrastructure for additional resource recovery. The study, published in *Frontiers in Earth Science*, lays the groundwork for a proposed \$9.4 million federal grant to further investigate and develop these domestic sources of rare earth elements. Discovering rare earth elements (REEs) in coal mines offers several benefits. It could increase the domestic supply of these crucial minerals, reducing dependence on foreign sources and supporting the renewable energy sector. Utilizing existing mining operations for REE extraction can enhance economic viability, create new jobs, and promote sustainable practices by minimizing the need for new mining projects and reducing environmental impact.





### Decaffeination Process for Preserving Flavor in Coffee

The aroma of freshly brewed coffee is a beloved start to the day for many, though some prefer decaf to avoid caffeine-related issues. Chemists use decaffeination processes to remove caffeine while preserving flavor, starting with green, unroasted beans since using roasted beans would alter the coffee's taste and aroma. The carbon dioxide method, utilizes high-pressure CO<sub>2</sub> to extract caffeine from moistened beans. The CO<sub>2</sub> dissolves the caffeine, which is then filtered out, leaving minimal residue and retaining most of the flavor. This method is widely used for commercial coffees. The Swiss water process, involves soaking beans in hot water to dissolve both caffeine and other compounds. The water, rich in caffeine and flavor, is filtered through activated charcoal to remove the caffeine. The flavor-saturated water is reused to decaffeinate new batches of beans, preserving 94% to 96% of the flavor and avoiding chemicals. Techniques like the Swiss water process help retain flavor despite the loss of some compounds. Thus, decaf provides a flavorful alternative without the caffeine.



### Innovations in Bio-Based Ice Cream Packaging and Flexographic Printing

Sustainable packaging innovations help reduce plastic use and carbon footprints by incorporating recyclable and compostable materials. They improve convenience with user-friendly designs, enhance storage and transport efficiency, and lower costs. Additionally, these advancements boost brand image by demonstrating environmental responsibility and appealing to eco-conscious consumers. The ice cream industry is making strides in sustainable packaging, with recent innovations focusing on bio-based materials and advanced printing techniques. Companies are developing recyclable ice cream packaging using 95% renewable materials and advanced water-based coatings. This packaging aims to replace plastic with paper-based solutions, offering improved sustainability without compromising functionality. Another Ice cream company introduced new single-serve Twist pints made from recyclable materials and designed for better storage efficiency. These pints also enhance recyclability compared to traditional packaging. A new innovative flexographic printing, using eco-friendly materials to create high-quality, recyclable packaging is among the top. This approach emphasizes reducing carbon footprint and enhancing visual appeal while remaining functional and easy to open.



### Eco-Friendly Textiles Initiative

The International Labour Organization (ILO) office in Turkey has joined EkoDoku Women Sustainable Living Cooperative to advance eco-friendly textiles and address the drawbacks of fast fashion. With US government support, the ILO is helping EkoDoku develop collections using nature-based fabrics. The initiative started with an ‘Eco Dyeing and Printing Workshop’, where cooperative members learned natural dyeing, woodblock printing, and batik techniques. It aims to create jobs and improve formal employment for marginalized groups, including Syrians and host communities. The ‘HarmonyUnity’ collection supports sustainable living and global unity, reflecting the ILO’s focus on decent work and social protection through cooperatives that foster formal employment and support women’s rights in textiles. The project highlights innovative technology in sustainable textile production, featuring nature-based fabrics, plant-based dyes, and traditional printing methods. These practices promote environmental sustainability by reducing synthetic material use and minimizing waste.



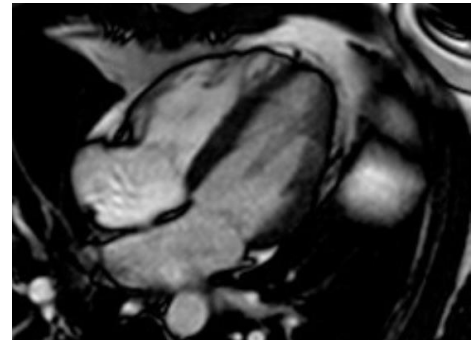
### Handheld 3D Scanner for Precision Mapping

GeoCue has introduced the TrueView Go, it’s a first handheld 3D mapping scanner, designed to streamline site mapping as users walk. This innovative device uses a GNSS Smart Antenna and high-precision LiDAR sensors to transmit 3D images to a tablet, with models available in 16-channel and 32-channel configurations. The scanner allows instant adjustments and complete coverage of indoor and outdoor areas. It is effective even in environments with weak or no GNSS signals and can remotely measure inaccessible locations by collecting reference points without direct contact. The TrueView Go features an intuitive “ready, set, go!” operation, making it user-friendly for various applications, including surveying, construction, and building information modeling (BIM). It is accompanied by GeoCue’s LP360 Land software, which provides tools for quality assurance, 3D point cloud processing, and visualization, utilizing SLAM (simultaneous localization and mapping) for improved data accuracy. According to Vincent Legrand, GeoCue’s VP of Global Sales, this scanner represents a major advancement beyond traditional drone LiDAR systems, offering greater accessibility, affordability, and ease of use.



### New MRI Technique Predicts Heart Failure Risk Accurately

Recent research from the University of East Anglia (UEA) and Queen Mary University of London has revealed that MRI scans could potentially replace invasive heart tests by accurately estimating internal heart pressures, which are crucial in predicting heart failure. This groundbreaking study highlights how MRI-derived pressure measurements can forecast the likelihood of developing heart failure, offering a less invasive alternative to current diagnostic methods. The research, involving over 39,000 participants from the UK Biobank, identified key risk factors for elevated heart pressure, including advanced age (over 70), high blood pressure, obesity, and male gender. Key investigators of this emphasized that MRI can reliably predict heart failure risk, with participants exhibiting higher heart pressures detected by MRI facing a significantly increased risk of developing the condition over six years. Previous studies had already shown that MRI techniques could estimate heart pressures and their association with heart failure symptoms, but this study confirms their predictive capability in a broader population context. The research also introduced a new model combining identified risk factors to enhance individual risk prediction, which could lead to earlier prevention and treatment of heart failure. This advancement aligns with the broader goal of improving heart health management through non-invasive methods.



### Deep Martian Oceans Found

The reservoir, located between 11.5 and 20 kilometers (7 to 13 miles) beneath the surface, could potentially cover the entire planet with a layer of water 1 to 2 kilometers deep. While this discovery is significant for understanding Mars' geological history and water cycle, the reservoir's depth makes it impractical for future human colonization efforts. However, it offers a promising location to search for signs of life and contributes valuable insights into the planet's climate evolution. Researchers, from UC San Diego and Michael Manga from UC Berkeley, used a mathematical model of rock physics to interpret the seismic data. Their analysis suggests that the water is stored in fractured igneous rock, akin to Earth's granite. Although the exact conditions for life are still unknown, the presence of water in this deep, rocky layer suggests that Mars' water did not entirely escape into space but rather migrated underground. The Insight mission provided crucial data on Mars' crust, mantle, and core, helping scientists understand the planet's past water distribution and its potential for supporting life.





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**FORTHCOMING TECH EVENTS****PAKISTAN**

- International Conference on Emerging Technologies: Innovations for Sustainable Development Goals (ISDG)  
September 9 – 11, Bahrain, Swat  
<https://www.uoh.edu.pk/news-events.php?id=MTgwOA==#gsc.tab=0>
- 2<sup>nd</sup> International Conference on Climate-Induced Natural Disaster And Mitigation  
September 25 – 26, Karakoram International University, Gilgit  
<https://iccindm.kiu.edu.pk/>
- 4<sup>th</sup> International Conference on Distance Education and E-Learning (4<sup>th</sup> ICDEEL-2024)  
September 25 – 26, International Islamic University, Islamabad  
<https://www.iiu.edu.pk/seminars-conferences/4th-icdeel-2024/>
- International Conference on Emerging Trends in Physics 2024 (ICETP24)  
October 8 – 9, The University of Lahore, Lahore  
<https://uol.edu.pk/event/international-conference-on-emerging-trends-in-physics-2024-icetp24/>
- 2<sup>nd</sup> AUSOM International Research Conference (AIRC)  
October 9 – 10, Air University, Islamabad  
<https://portals.au.edu.pk/AIRC/>
- 1<sup>st</sup> International Conference on advances in Mechanical, Materials, Mechatronics and Energy Engineering (ICAME-24)  
October 17 – 18, University of Engineering and Technology, Taxila  
<https://web.uettaxila.edu.pk/icame2024>
- 3<sup>rd</sup> International Conference on Contemporary issues in Management and Administrative Sciences  
November, Lahore College for Women University, Lahore  
<https://lcwu.edu.pk/news-aug2020/4125-3rd-international-conference-on-contemporary-issues-in-management-and-administrative-sciences.html>
- 8<sup>th</sup> International Conference On Health Professions Education  
November 5 – 7, The University of Lahore, Lahore  
<https://uol.edu.pk/event/8th-international-conference-on-health-professions-education/>
- 3<sup>rd</sup> International Conference of Sciences on "Revamped Scientific Outlook of 21<sup>st</sup> Century, 2024"  
November 14<sup>th</sup>, Rawalpindi Women University, Rawalpindi  
<https://conf-fs2023.rwu.edu.pk/>
- 3<sup>rd</sup> International Nursing Research Conference 2024  
November 15 – 16, Liaquat University of Medical & Health Sciences, Jamshoro  
<https://www.lumhs.edu.pk/nrcon2024/>
- 2<sup>nd</sup> International Conference & Expo on Plant Sciences, Plant Biodiversity and Food Security in the Wake of Climate Change (PBFS-CC 2024)  
November 19 – 21, PMAS-Arid Agriculture University, Rawalpindi  
<https://www.uaar.edu.pk/index.php#>
- 3<sup>rd</sup> International Conference on Emerging Trends in Electrical, Control & Telecommunication Engineering (ELECTE'24)  
November 26 – 27, The University of Lahore, Lahore  
<https://uol.edu.pk/event/2024-3rd-international-conference-on-emerging-trends-in-electrical-control-and-telecommunication-engineering-etecte24/>
- Role of Artificial Intelligence in Access to Justice in Pakistan: Shaping the Future of Law, Peace, and Equality  
December 3 – 4, Bahauddin Zakariya University, Multan  
<https://www.iiu.edu.pk/wp-content/uploads/2024/05/iri-international-conference-02052024.pdf>
- Conference for Quality and Innovation in Higher Education (F2F&ODL) CQIHE  
December 4 – 5, Faisal Mosque Campus, International Islamic University, Islamabad

<https://www.iiu.edu.pk/seminars-conferences/conference-for-quality-and-innovation-in-higher-education/>

- SAAP IX Biennial Conference, Physiology with Interdisciplinary Integration  
December 6 – 8, The University of Lahore, Lahore  
<https://uol.edu.pk/event/saap-ix-conference-in-december-2024/>
- 1<sup>st</sup> Business Research International Conference on Life Sciences  
December 19<sup>th</sup>, University of Veterinary and Animal Sciences, Lahore  
<https://uvas.edu.pk/NEWS/2024/August/Call%20for%20Papers.pdf>

### **INTERNATIONAL**

- Global Summit on Polymer Science and Composite Materials (GSPSCM2024)  
September 16 – 18, Prague, Czech Republic  
<https://polymersciencesummit2024.com/>
- International Conference on Multimedia Computing, Communication, and Applications  
September 17 – 20, Valencia, Spain  
<https://mcna-conference.org/2024/>
- WATER AI 2024  
September 18 – 19, California, USA  
<https://www.water-ai-summit.com/>
- Intelligent Automation Conference 2024  
October 1 – 2, Amsterdam, Netherlands  
<https://intelligentautomation-conference.com/europe/>
- 5<sup>th</sup> International Seminar on Fundamental and Application of Chemical Engineering (ISFACHe) 2024  
October 1 – 2, Surabaya, Indonesia  
<https://elib.its.ac.id/conf/isfache/>
- 5<sup>th</sup> International Conference on Building Science, Technology and Sustainability (ICBSTS 2024)  
October 15 – 18, Lisbon, Portugal  
<https://www.icbsts.org/>
- 10<sup>th</sup> IUPAC International Conference on Green Chemistry (10<sup>th</sup> ICGC)  
October 18 – 22, Beijing, China  
<https://www.greeniupac2024.org/>
- Greenhouse Gas Control Technologies (GHGT) Conference  
October 20 – 24, Alberta, Canada  
<https://ghgt.info/>
- Optical Latin America Optics and Photonics Conference  
November 10 – 14, Puerto Vallarta, Mexico  
[https://www.optica.org/events/topical\\_meetings/latin\\_america\\_optics\\_and\\_photonics\\_conference/](https://www.optica.org/events/topical_meetings/latin_america_optics_and_photonics_conference/)
- International Congress on Engineering and Information  
November 21 – 23, Taipei, Taiwan  
<https://iceai.org/>
- 9<sup>th</sup> International Neonatology Association Conference  
December 5 – 8, Berlin, Germany  
<https://worldneonatology.com/2024/>



## TECH AND TRADE OFFERS

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- Coding Masters
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TOMORROW**



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## *Desi White Meat*

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Our farmers honour natural systems and farm in ways that increase bio-diversity and regenerate the land, having a positive impact. We believe all farming should be like this so eating meat doesn't cost the earth.

We believe in giving natural feed to our fish and chicken and ensure animals are raised to our strict standards which prohibit antibiotics and preservatives. Nor do we allow the industry-standard use of hormones in fish and chicken.

### Our courses

- Guinea Fowl
- Fish Fillent
- Duck
- Desi Egg
- Desi Chicken
- Butterfly Prawn
- Tilapia
- Tilapia Fillent



### Contact us

#### Address:

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**Office:** Plot no 7, Sector 7a Korangi industrial area Karachi.

**Phone:** +92 337 4632800  
+92 213 5121605

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