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Outlines of Triangular Contest for PEC Chairman Appear on Horizon

Three contestants of Engr. Haroon in National Engineers likely to step back



By Manzoor Shaikh
 Backstage exchanges with several engineers stalwarts around the country suggest that the National Engineers—the alliance ruling Pakistan Engineering Council (PEC)—has lately been successful in creating a common ground for selecting a consensus candidate for the forthcoming PEC Elections 2024. And as it appears, Engr. Najeeb Haroon, the incumbent chairman of the council is most likely to be picked up as the top candidate of the alliance.

Contd on page 2

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- Christopher Reeve

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Outlines of Triangular Contest for PEC Chairman Appear on Horizon

The constructors of the alliance included the National Engineers formed by Engr. Abdul Qadir Shah, leading National Engineers Welfare Association (NEWA) with his most critical support of Engr. Mukhtiar Shaikh—the man who he {Engr. Abdul Qadir Shah} has developed a love-hate relationship with—Engr. Najeeb Haroon, a breakaway patron-in-chief of the Professional Excellence Group (PEG), now led by Engr. Waseem Nazir, who had almost broken a deal with NEWA before aligning with Engr. Najeeb Haroon and Ashfaq Shah, the leader of the Contractors Association of Pakistan (CAP). In Punjab, the Pakistan Engineers Congress had also aligned it with the National Engineers that won the seat next to chairman after Engr. Imtiaz Shah-led group parted ways on the issue of the distribution of seats in the Governing Body of the council at the eleventh hour.

The alliance remains as same as it was in 2021 at the eve of elections but the power plays. Neither Engr. Najeeb Haroon, the then lone man nor NEWA are the same, both partners have their own strengths and weaknesses, and they have driven the council all along with having an edge of the former over the latter for his incontestable powers as the chairman. Also, both have gained as well as lost ground during the last two-plus years of the council's rule. But have minimum options, Engr. Haroon has no other better allies than the Shah-Shaikh group and they {NEWA} have no leader of national stature. Both have a good sense to lose if they broke away—the situation which glued them with each other despite many issues developed between them. NEWA which ardently opposed the appointment of an advisor to the chairman in the council has now embraced it to maintain its share in the council no matter at the cost of overlapping of the ToRs of many committees it formed to spearhead important tasks of the council.

But the question is how Engr. Abdul Qadir Shah, who was set in mind to contest at all costs this time round, Engr. Arif Zahid Arif who merged his KP-based organization in NEWA so that his dream came true and Engr. Niaz Akhtar, who must be tired of being number two, will step down?

Engr. Shah's resolve, as engineers' circles claim has received an unwelcome response from his own house at Sukkur. His younger brother Syed Khurshed Shah whose supply line has been instrumental for him and his engineer-cum politician son are likely to take responsibility to convince him to step down. Almost everyone in NEWA has started believing the House of Shahs will do it successfully and also who played his part to get it done.

Additionally, almost everyone in NEWA believes Engr. Shah could never be a hot candidate in Punjab, housing the largest number of engineers in Pakistan in the backdrop of political support in the largest province of Pakistan where his brother's party has miserably failed to revive its support base. In this scenario, the Pakistan Engineering Congress (PEC)'s support will not do any good to Engr. Shah. Instead, the congress would love to retake the post of Senior Vice Chairman of the council under Engr. Haroon.

Then what about resourceful Engr. Zahid Arif? Let's think about some possible deal. Engr. Zahid Arif can be elected as chairman if the system adopts the turn system which the Act & Bylaws Committee of the council has proposed. Now, he can be lured if the alliance agrees to adopt and confirm the proposed turn system and decides to implement it from PEC Election 2027. Zahid Arif who is the central leader of NEWA has already said he would follow the collective decisions of his organization.

If Engr. Shah and Engr. Arif are

Contd on page 5

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"When you aim for perfection, you find out it is a moving target."
- George Fisher

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‘China lends over \$21 bn more than previously thought to Pakistan’

China in the past 20 years lent about \$ 21 billion more than previously thought to Pakistan, Nikkei Asia reported, citing a study revealed this week. According to the study, Pakistan has the biggest China-funded energy portfolio in the world.

AidData, a research institute at William and Mary University in the US, said that Pakistan's cumulative public debt exposure to China from 2000 to 2021 was \$ 67.2 billion. The number sur-

passed the \$ 46 billion recorded for the same period in the World Bank's International Debt Statistics on the basis of voluntary disclosures from Pakistan, Nikkei Asia reported.

with 80 per cent of its lending involving nations facing financial distress. Pakistan, home to BRI project's flagship China-Pakistan Economic Corridor (CPEC), is a prime example. Pakistan is third-largest recipient of Chinese loans, after Russia and Venezuela, according to the data. Pakistan, which has been facing a political crisis and heavy inflation, obtained a \$ 3 billion standby arrangement from the International Monetary Fund in 2023 to avoid a debt default.

The AidData report has calculated that public and publicly guaranteed debt (PPG), including loans for which the central government or its agencies are liable

public policy postdoctoral fellow at the Harvard Kennedy School's Ash Center, stressed that AidData uses a broader-than-usual definition of PPG debt, causing larger figures for some countries, according to Nikkei Asia report.

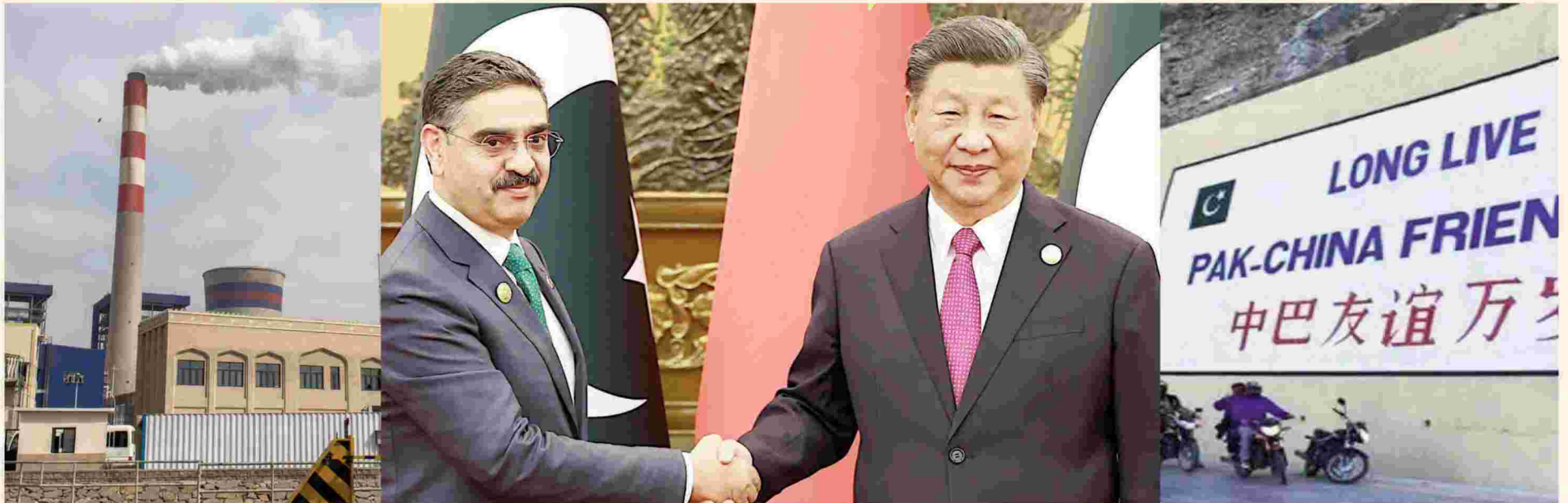
Defending the method used by AidData, Bradley Parks stressed that China's loans to Pakistan often enter the front door as short-term debts with maturity of a year or less. However, they exit the back door as long-term debts, the report said.

He said, "Rolling over debts with [maturities] of 12 months or less, year after year, is effectively a loophole in international reporting rules that allows

government's focus on addressing the country's crippling power shortages.

Stella Hong Zhang said that even though "China's priority was in the connectivity projects." However, Pakistan's government wanted much of the initial CPEC funding in the energy sector. In recent years, Pakistan has struggled to pay its power bills to China. The data in the report has direct relevance to Pakistan's election set to be held next year.

Of the total finance of \$ 67.2 billion, \$ 36 billion was accumulated under the Nawaz Sharif-led PML-N government, which was in power from 2013 to 2017. Sharif recently returned from years of



for repayment. For the study, the research lab used what it calls the Tracking Under-reported Financial Flows (TUFF) methodology, drawing on 147,703 sources in more than 12 languages.

Speaking to Nikkei Asia, Bradley Parks, the executive director of AidData and an author of the report, said that the institute uses the Organisation for Economic Cooperation and Development's definition of an "official sector" creditor, which encompasses any lender that is majority-owned by the government of the creditor country.

However, Stella Hong Zhang, a China

governments to underreport their true levels of public debt exposure to China," Nikkei Asia reported.

A major portion - \$ 28.4 billion of China's loan to Pakistan was in the energy sector, according to the data found by AidData. Experts think Pakistan sought China's support in energy sector, accumulating the largest amount of Chinese energy financing of any country.

Ammar A Malik, a senior research scientist at AidData and co-author of the report, said that China's loan to Pakistan in the energy sector was a direct response to Pakistan Democratic Movement (PDM)

self-imposed exile in London to help the party in its campaign for elections, apparently with the tacit support of Pakistan's military, according to Nikkei Asia report.

Malik, who leads the Chinese Development Finance Program at AidData, said that the PML-N in Pakistan has always been the most forceful in claiming credit for bringing Chinese funding in Pakistan. Meanwhile, former Pakistan PM Imran Khan has been reputed for causing friction with China. Despite all this, China has been providing billions in funds to Pakistan in the past 20 years. NA/BS/ERMD

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The New Show in the Market International Expo PAK-INDUSTRIA will be held in May, 2024

Directors of Pak Event and Exhibition Mr. Muhammad Hasan Masood and Mr. Umeer Qutbuddin met with President Karachi Chamber of Commerce and Industry (KCCI) Mr. Iftikhar Ahmed

will be held on May 22, 23 and 24, 2024 at Karachi Expo Center. This exhibition is being organized to promote "Made in Pakistan" products.

Companies doing business in the Civil, Mechanical, Electrical and HVACR sector will participate in PAK-INDUSTRIA and give solutions to industry, con-

cal teams of industries will be invited. This exhibition will be very helpful for those who want good suppliers, stockiest and vendors for good quality equipment and services. This exhibition will play a very important role in introducing domestic and foreign products.

The organizers inform the KCCI team that a large



Sheikh, Senior Vice President Mr. Altaf A. Ghaffar, Vice President Mr. Tanveer Bari and other managing committee members. In this meeting, Mr. Hasan gave information about the international exhibition PAK-INDUSTRIA (Pakistan Industrial Trade Fair) which

sultants and contractors. The event organizers are welcoming manufacturers, importers, stockiests and suppliers to exhibit their products and services. PAK-INDUSTRIA exhibition will provide an excellent platform for all entrepreneurs who believe in "Made in Pakistan".

Maintenance and techni-

number of foreign delegates are also invited and hopefully they will attend the show. The exhibition will be covered in all mediums of media i.e. print, electronic and social media.

Iftikhar Ahmad Sheikh, President, KCCI and his team assure their cooperation and best wishes for the exhibition. ■

NESPAK to design first Smart Education City in Karachi

NESPAK has been awarded a prestigious consultancy services project for the feasibility study and design of Pakistan's first Smart Education

This pioneering initiative is based on advanced Smart & Safe City concepts. The primary objective of the project is to establish governance processes that leverage technology and digital systems to manage city-wide resources in real-time through the Command & Control Centre.

ing, smart waste bins, traffic management, variable message signs, public address, solar power, EV charging stations, visitors management, GPON service, BMS/PSIM, air quality monitoring, temperature monitoring, humidity monitoring, access control for paid park-



City in District Malir, Karachi by the Board of Investment, Government of Sindh, it was stated by Mr. Zargham Eshaq Khan, MD NESPAK.

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The key systems integrated into this project encompass seamless Wi-Fi connectivity, intelligent access control for the Command & Control Centre building, video surveillance, under-vehicle surveillance, automated number plate and face recognition, smart park-

ing, baggage scanning, Command & Control Center operations, and SCADA systems related to stormwater, sewerage water, and water consumption.

This endeavor is a groundbreaking initiative in Pakistan, and the city will be named the Smart Education City. The project is being executed by the New Ventures Division of NESPAK. ■

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"You don't learn to walk following rules. You learn by doing? and falling over."

- Richard Branson

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A delegation of the Constructors Association of Pakistan (CAP) under the leadership of Naeem Kazmi, Vice President, CAP met with Engr. Syed Hassan Askari, member of the Rates Standing Committee. Raza Ali Abdi, Saeed Mughal, Shaikh Ismail Azeem, Hyder Kazmi, and Tanveer Ahmed were part of the delegation.

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"Life is a gift and it offers us the privilege, an opportunity and responsibility to give something back by becoming more."

Tony Robbins

ENGINEERING REVIEW

KE claims investing Rs150 m in rehabilitation works

Committed to transparency, responsible practices, and building a sustainable energy future, K-Electric has unveiled its Sustainability Report 2023.

Themed "Powering Possibilities", the report illustrates the ongoing efforts of the organization in setting targets and executing interventions that ensure progress towards the company's sustainable future.

At this occasion, Moonis Alvi, Chief Executive Officer, KE said, "The energy sector faces its own trilemma - Sustainability, particularly Climate Change, Affordability, and Energy

Security - to achieve sustainable goals and striking the right balance between these elements is imperative for the effective functioning of the energy ecosystem. As we navigate through these difficult times, the responsibility we have towards our customers, shareholders, the environment, and the communities we serve drives our actions. This report highlights our progress, challenges, and our ambitious vision for a sustainable future." The report contains information about KE's operations from the company's Fiscal Year 2023, from July 01, 2022 to June 30, 2023 and includes both quantitative data and qualitative insights. With reference to the Global Reporting Initiative (GRI) Standards, KE's commitment and efforts have been showcased under 11 of the 17 UN Sustainable Development Goals (SDGs) in the report. The SDGs broadly include 'Good Health and Well-Being', 'Quality Education', 'Gender Equality', 'Clean Water and Sanitation', 'Clean Energy', 'Economic Growth', 'Industry, Innovation, Infrastructure', 'Reduced Inequalities', 'Sustainable Cities & Communities', 'Responsible Consumption', and 'Climate Action'. During FY 23, KE has achieved an impressive 23% reduction in greenhouse gas emissions compared to FY 22, a success attributed to the integration of highly efficient energy generation. Towards sustainable cities

and communities, KE has invested around PKR 150 million in rehabilitation works. By introducing several key environment-friendly initiatives such as Hara Qadam and conversion of customers towards paperless billing, KE has saved over 4,000 trees, 94,000 kg of waste, and 200 million liters of water. -- PR



and communities, KE has invested around PKR 150 million in rehabilitation works. By introducing several

key environment-friendly initiatives such as Hara Qadam and conversion of customers towards paperless

billing, KE has saved over 4,000 trees, 94,000 kg of waste, and 200 million liters of water. -- PR

WAPDA claims saving Rs 50 billion through hydel gen increase

The Water and Power Development Authority (WAPDA) provided over 15 billion units of hydel electricity to the national grid from July to September 2023, registering an increase of 1.788 billion units.

The increase in hydel power generation helped the national exchequer save

Rs 50 billion, which, otherwise, would have been spent in generating the same quantum of electricity through expensive imported residual furnace oil (RFO), official sources told APP on Wednesday. They said improved hydrology, efficient operation and maintenance of WAPDA's hydel power stations and resumption of elec-

tricity generation from the Neelum Jhelum Hydel Power Station in August 2023 were the major contributing factors for increase in the hydel power generation during the said period. Giving the break-up, the sources said the Tarbela Hydel Power Station contributed 6839.27 million units, Tarbela 4th Extension 2859.67 million units, Ghazi Barotha 2229.24 million units, Mangla 1113.45 million units, Neelum Jhelum 707.62 million units, Warsak 317.66 million units and Chashma Hydel

Power Station 270.27 million units. Some 664.97 million units were cumulatively generated by other hydel power stations of WAPDA, they said. "The WAPDA's hydel generation is the most affordable and environment-friendly electricity in the country, as its generation cost stands at about Rs. 3.51 per unit, against the uniform national average determined tariff, which is Rs. 42.95 per unit for the consumers above 700 units," the sources said. At present, WAPDA owns and operates as many as 22 hydel power stations including Neelum Jhelum. WAPDA is vigorously implementing a least-cost energy generation plan to double its installed power generation capacity from 9500 MW to about 19500 MW by 2029 with phased completion of the under-construction mega projects including Diamer Basha Dam, Mohmand Dam, Dasu Hydropower Project and Tarbela 5th Extension Project etc.-- APP



tricity generation from the Neelum Jhelum Hydel Power Station in August 2023 were the major contributing factors for increase in the hydel power generation during the said period. Giving the break-up, the sources said the Tarbela Hydel Power Station contributed 6839.27 million units, Tarbela 4th Extension 2859.67 million units, Ghazi Barotha 2229.24 million units, Mangla 1113.45 million units, Neelum Jhelum 707.62 million units, Warsak 317.66 million units and Chashma Hydel

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Outlines of Triangular Contest for PEC Chairman Appear on Horizon

Contd from page 1 addressed smoothly then why should Engr. Akhtar push himself to the loneliness in the province where two giants—Engr. Jawed Saleem Qureshi and Engr. Waseem Nazir, of them former claimed to be the largest

party of engineers and the latter bagged the highest number of votes—are housed. So it's not better to wait till Engr. Haroon's possible second tenure is finished, enjoy the clout in the council and get elected his men outside the ambit of the National

Engineers Panel? Resultantly, the engineers in Pakistan will see a triangular contest in PEC Election 2024 with one difference that Engr. Haroon and Engr. Nazir will find Engr. Jawed Saleem Qureshi instead of Engr. Jabbar Rana. ■

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MEMORIAL TRIBUTE

In Memoriam:

Prof. Dr. Haroon Jangda

March 20, 1942 – November 08, 2023

By Prof Dr Abdul Waheed Bhutto

It is with heavy hearts that we bid farewell to a towering figure of knowledge, an inspiring educator, and a cherished member of our community, Prof.

Dr. Haroon Jangda, who peacefully departed on November 08, 2023.

Born on March 20, 1942, Dr. Haroon Jangda's life was a testament to an insatiable thirst for wisdom. His academic journey culminated in a Ph.D. in Chemical Engineering from Sheffield University in the United Kingdom, a profound reflection of his unwavering passion and dedication to his field. Originating from Bantwa, a serene town in Kathiawar within the former district of Gujarat, India, his life bore the imprints of diverse experiences and deep roots.

In his formative years, Dr. Jangda's life was shaped by humble beginnings. Growing up with a sister and

a brother, education held a special place in their hearts. Dr. Jangda's educational odyssey began at Madrassa-e-Islamia School in Karachi for matriculation, progressing to D.J. Government Science College for intermediate studies. The late 1950s witnessed his academic zenith with a BSc (Hons) from Karachi University. Awarded the Dawood Foundation Merit Scholarship for overseas studies, he embarked on a transformative academic journey in England, attaining both his Master's and Ph.D. degrees in Chemical Engineering from Sheffield University.

In 1964, a profound and enduring connection was established when Dr. Jangda lent his expertise to a project at Dawood Jute Mills in East Pakistan. This marked the inception of an extraordinary partnership with the Dawood family, who held him in high esteem. Later, in 1970, he became an indispensable figure at Dawood College, assuming the position of the

head of the Chemical Engineering department in 1972. He held this role until 1998,



when he stepped down due to health challenges. Despite this change, he remained dedicated to the institution, continuing his association as a professor until his final moments.

In the 1990s, he was given the opportunity to serve as the principal of the

college, a gesture he graciously declined. His rationale was rooted in the belief

extraordinary journey. His impact transcended the academic realm, leaving an indelible mark on the communities he touched. His legacy embodies knowledge, commitment, and an enduring connection with the Dawood family—a legacy that will resonate through the ages.

The Department of Chemical Engineering at Dawood College boasts a rich history, being one of the pioneering institutions to introduce the Bachelor of Engineering program in Chemical Engineering in 1964. Dr. Haroon's extensive industry network played a pivotal role in benefiting students over the years. His ability to coordinate expert assistance for final-year student projects, arrange industrial internships, guide graduates into industry roles, and help fresh graduates secure employment set him apart. His unparalleled connection with industry professionals earned him the reputation of a father figure in the Karachi

chemical industry.

He assumed the role of mentor for nearly every faculty member within the University. His unwavering alignment with the University's objectives made him a reliable source of support for the Chief Executive whenever required. His distinguished and amiable personality was widely acknowledged.

As an educator, Dr. Jangda's influence knew no bounds. His teaching style seamlessly combined wisdom and warmth, leaving an enduring mark on his students. His dedication to excellence and his eagerness to provide guidance and mentorship endeared him to all as a beloved teacher and mentor.

Beyond his scholarly pursuits, Dr. Haroon Jangda was renowned for his kindness, benevolence, and genuine desire to assist others. His influence extended beyond the classroom, touching the lives of numerous individuals fortunate enough

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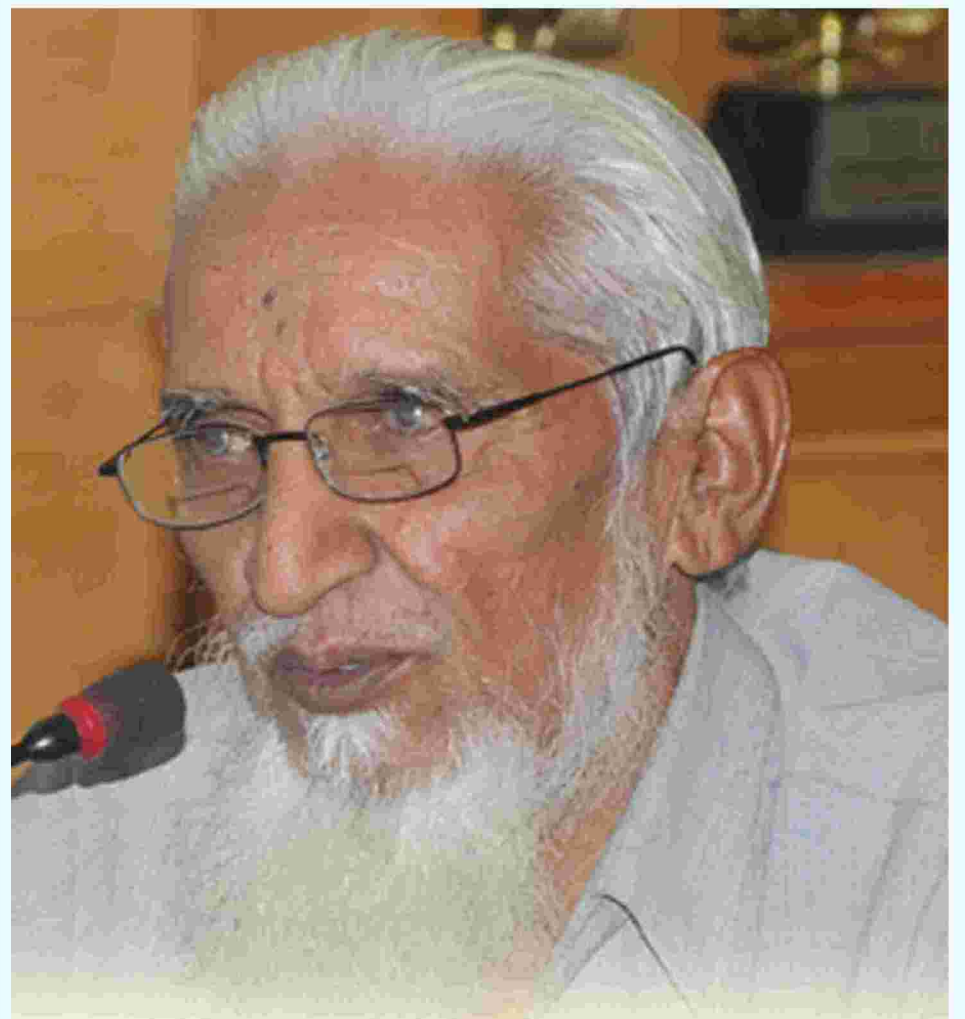
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FORTNIGHTLY
ENGINEERING REVIEW
The voice of engineers

'Global Leader Panel Discussion: Charting STEM Career' at MUET Jamshoro 70 pc females in STEM not contributing due to different reasons

Striking balance between professional work and the family; extremely difficult to give 100 percent either side

By Prof. Dr. Khadija Qureshi

A group of highly regarded women engineers working with leading engineering universities and organizations around the world came to a consensus during a panel discussion at Mehran University of Engineering & Technology, Jamshoro that it is almost impossible to strike a balance between professional work and the family and thus it turns extremely difficult to give 100 percent either side.

They talked about



The panelists included Dr. Mamiko Reeves, International Programs Strategist, Northwood University, Midland, Michigan, United States, Dr. Alex Lockwood, Strategic Content Integrator for NASA's Science Mission Directorate, Dr. Alberta Adjebeng Biritwum-Nyarko, Director, Policy Planning Monitoring & Evaluation,

pool is needed. Women Engineer Development Committee (WEDC) of the Pakistan Engineering Council contributes to a diverse and innovative engineering workforce.

The panel discussion started with the sharing of the journeys of the panelists and how they could manage to reach these leadership positions. They emphasized

Contd on page 9



launching proper training for women so that they took active participation in working committees, created resilience and assertiveness, and have potential work-from-home opportunities to balance family needs and thus reduce stress.

Titled as 'Global Leader Panel Discussion: Charting STEM Career' was part of the International Women Engineers Conference, organized by the Women Engineers Development Committee (WEDC) of the Pakistan Engineering Council (PEC) held at Mehran University of Engineering and Technology Jamshoro.

Division, Ghana Health Service Headquarters, Shelley J. Bausch, Senior Vice President, Global Industrial Coatings and Prof. Dr. Khadija Qureshi, Convener, Women Engineer Development Committee, PEC, Chairperson, Department of Chemical, Engineering, Mehran University of Engineering & Technology Jamshoro. Dr. Mamiko Reeves moderated the session.

They were of the view that engineering plays an important role in solving global challenges, and driving innovations for its continuous success a diversified

Prof. Dr. Haroon Jangda

to know him.

Dr. Jangda is survived by his family, who will eternally cherish his memory as a beloved family member and a respected scholar.

Prof. Dr. Haroon Jangda's legacy in the realm of Chemical Engineering, and his profound impact on the lives of those he taught and mentored for more than five decades at Dawood University, will continue to inspire and influence generations to come.

In his revered memory, we reflect on the words of the great educator, "Because chemical engineering is con-

cerned with large-scale plants, it is important that chemical engineering candidates have an appreciation of the scale and complexity of modern plants before they graduate."

As we bid adieu to an extraordinary educator, mentor, and scholar, we pay homage to Prof. Dr. Haroon Jangda's legacy, extending our deepest condolences to his family and all who admired and respected him. His absence is deeply felt, but his memory will forever be cherished.

The writer is Pro VC of DUET, Karachi

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Variants of Electrospray Ionization

Engr. Dr. Muhammad Nawaz Iqbal

Electrospray ionization mass spectrometry or, less frequently, electrospray mass spectrometry are the two names for ESI-based mass spectrometry.

ESI is referred to as a "soft ionization" approach because there is hardly any fragmentation. Although the molecular ion (or more precisely, a pseudo molecular ion) is almost always detected, this can be helpful because very little structural information can be gleaned from the straightforward mass spectrum. Electrospray is used to disperse the liquid containing the target analytes into a fine aerosol. The usual solvents for electrospray ionization are made by combining water with volatile organic molecules since the ion production requires considerable solvent evaporation (e.g. methanol acetonitrile). Compounds that improve conductivity, such as acetic acid, are typically added to the solution to reduce the initial

droplet size. Additionally, these species serve as a source of protons to speed up the ionization process. In addition to the high temperature of the ESI source, large-flow electrosprays can benefit from the nebulization of a

hydrogen nucleus is removed. Multiple-charged ions, such $[M + nH]^{n+}$, are frequently seen. Numerous charge states can exist in massive macromolecules, creating a distinctive charge state envelope. Because of the signifi-

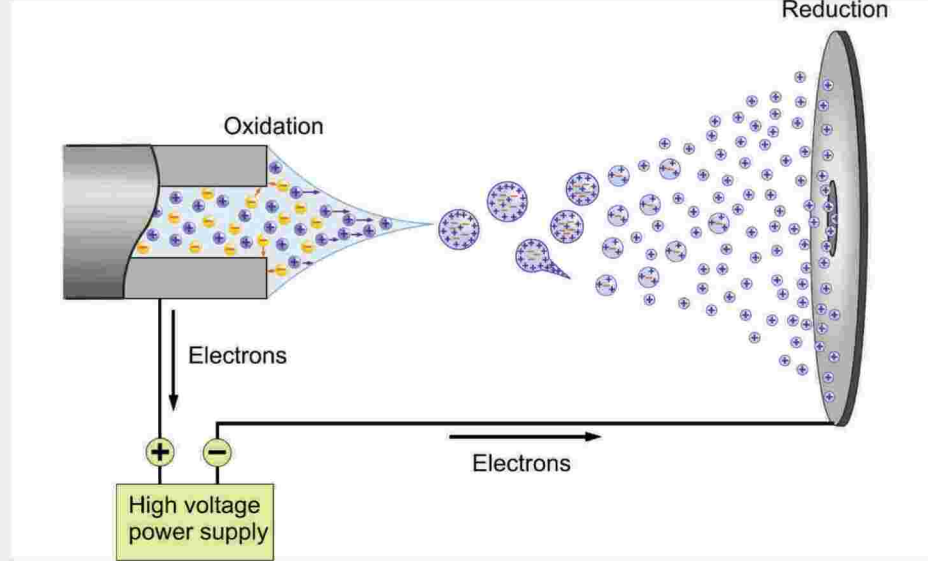
cantly smaller initial droplets created by the electrosprays when they are operated at low flow rates, ionization efficiency is increased. Significant sensitivity gains could be achieved with lower flow rates, as low as 200 nL/min, according to a 1993 study by

less than 25 nL/min.

In a two-step procedure called laser-based electrospray-based ambient ionization, material from a sample is desorbed or ablated using a pulsed laser, and then a plume of that material interacts with an electrospray to produce ions. The sample substance is deposited on a target close to the electrospray for ambient ionization. Material from the sample is ejected from the surface and into the electrospray, which creates highly charged ions, when the laser desorbs or ablates it. These include laser ablation electrospray ionization, matrix-assisted laser desorption electrospray ionization, and electrospray laser desorption ionization. The study of noncovalent gas phase interactions also makes use of electrospray ionization. It is believed that noncovalent compounds from the liquid phase can be transferred into the gas phase using the electrospray method without affecting the non-covalent interaction. When analyzing ligand substrate complexes by ESI-MS or nanoESI-MS, issues such non-specific inter-



actions have been found. Investigating the relationships between enzymes and medications that function as their inhibitors is a fascinating example of this. ESI has been employed in competition experiments between STAT6 and inhibitors to screen for potential novel medication candidates. Smaller droplets are produced and only a few microliters of a sample are consumed during nano-electrospray ionization. The reduced electrospray droplet size made it possible to perform successful desolvation and ion production at low flow rates, which was a specific advantage of operating at low pressure. ■



heated inert gas like nitrogen or carbon dioxide.

The ions detected by mass spectrometry may be quasimolecular ions, which are denoted $[M + H]^+$ when a hydrogen cation is added, $[M + Na]^+$ when a sodium ion is added, or $[M H]$ when a

hydrogen nucleus is removed. Multiple-charged ions, such $[M + nH]^{n+}$, are frequently seen. Numerous charge states can exist in massive macromolecules, creating a distinctive charge state envelope. Because of the signifi-

cantly smaller initial droplets created by the electrosprays when they are operated at low flow rates, ionization efficiency is increased. Significant sensitivity gains could be achieved with lower flow rates, as low as 200 nL/min, according to a 1993 study by

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BISMILLAH HIR REHMAN NIR RAHEEM

Story of prophet Moses and Al-Khidr (Surah Kahf)

By Muhammad Tariq Haq | ESL

Reality is often veiled from the eyes
 -- Story of Moses and Al Khidr exemplifies

Musa was directed by God to a person possessing deep insight
 -- he ranked very high in God's sight

To strive for knowledge that otherwise could not be acquired
 -- But Khidr actions left Moses worried and surprised

Despite his words to patiently walk alongside
 -- Moses couldn't keep quiet

Al Khidr, at first, spoiled the boat on which the life of the deprived relied
 -- Why, Moses protested and inquired?

Then Al Khidr took the life of an innocent child
 -- Moses was very annoyed

At another site, despite appetite food to them was not supplied
 -- Yet Al Khidr set right a wall about to fall, without a price

Moses again raised a voice
 -- At this point, they said to each other goodbye

But before that Al Khidr clarified
 -- What he had done and WHY

Boat was spoiled to save it from a ruthless king of a nearby tribe
 -- Otherwise he would have acquired it and left it's owners high and dry

Child was killed because his parents were nice and upright
 -- God decided to reward them with a better child than the one who died

And at the same time raise the rank of the parents high
 -- to which they could not rise otherwise

The wall which had collapsed was set right
 -- Because underneath it, a great treasure lied

It belonged to orphans whose noble parents had expired
 -- Will of God was that they find it when they grow up and become wise

So whatever our God decides even if it is by us, disliked
 -- There is a divine reason which leaves a believer's heart satisfied

The best treasure we leave behind for our child is a good, honest life
 -- It's blessings are enjoyed even after our demise

Wealth and sons are the charms of this worldly life
 -- Good deeds are the only ones which eternally survive

70 pc females in STEM not contributing due to different reasons

Contd from page 7
 the challenges of balancing work and family, discussing their commitment to caring for both their families and professional roles. Early experiences in taking care of younger siblings were highlighted as formative. The panelists addressed the importance of promoting healthy relationships within working teams, effective interactions with women in various positions, and the development of a nurturing culture to support one another in organizations. While talking about balancing work and family, the panelists said that it is quite difficult rather impossible to give 100 percent to both.

Panelists were asked about the values they would like to impart through their work, and they underscored commitment, teamwork, creating a friendly workplace culture, integrity, adaptability, honesty, effective coordination, respect for coworkers, and encouragement of those striving for the organization's success. They also empha-

sized the idea that a leader's success lies in building other leaders. As per the recent survey, 30 percent of women in STEM are employed whereas 20 percent are unemployed and 50 percent are not working or taking part in any activity due to various reasons. Collectively, 70% of

ment for daily progress, and the significance of both formal and informal mentoring. They stated that mentoring is very important and it gives important life lessons also.

Regarding opportunities to change things for women in work organizations, the panelists supported proper training for women, active

participation in working committees, resilience and assertiveness, potential work-from-home opportunities to balance family needs and reduce stress, and the encouragement of the younger generation to gain skills,

seek opportunities, and inspire leaders to recognize their potential.

It's high time academicians, government and industry can work together to develop strategies to help demystify engineering making it more accessible to women and young people and empowering them to realize their potential in the field of engineering. ■



females in STEM are not contributing due to different reasons. There is a high need for improvement and working for the empowerment of these ladies so effective output should be obtained for the women in STEM.

The panelists recommended mentoring as crucial for women's career development and higher education, the importance of doing good and being good, self-assess-

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MUET GOES GLOBAL: Role of Digital Twin in Industry 4.0

Prof. B.S Chowdhry attends 26th Strategic Workshop (SW'23), Dubrovnik Croatia

Towards Advancement of Collaborative Technological Education: Role of Digital Twin in Industry 4.0 as an example was the title of the invited talk of Prof Bhawani Shankar

Chowdhry. In his presentation, he reviewed several collaborative projects and their outcome in terms of

human resource development in emerging technologies. He mentioned that progressed manufacturing strategies are revolutionizing the industry and transforming the way products are designed, produced, and delivered.

With the advent of the 4th Industrial Revolution whereby creating a virtual replica connected to the physical asset, digital twins give smart manufacturers the real-time insights they need to make production decisions quickly.

Digital twin has become

the basis for the planning, simulation, and validation of manufacturing processes from an early planning phase to the virtual commissioning of the production line as a pillar of Industry 4.0 in education and such practice has taken deep roots in the academia and industry of developed nations. The technology readiness level is such that there is going to be a huge gap in a recession-hit world where the modern world

of AR/VR technology through training, seminars, conferences, and a graduate degree program that will especially benefit countries like Pakistan and third-world countries to overcome the challenges of 4th industrial revolution for less developed nations are the objectives of CATCH-VR. Pakistan is a developing country and has been going through an economic crunch for a long time that has deeply affected

country and has been going through an economic crunch for a long time that has deeply affected developmental projects. The country's prosperity is based on skill development through basic education, aided by industrial development. As mentioned earlier, Virtual Reality (VR) has been used by developed countries all over the world in their education systems and industries as an alternative way to make educational and industrial systems more sustainable.

Prof. Chowdhry also chaired the panel discussion "Future Global Strategies & Project Proposal Discussions". Prof Peter Lindgren mentioned challenges especially Startups and Small and medium-sized businesses (SMEs) - when it comes to designing, reengineering, developing, implementing, measuring, and comprehending which Circular and Sustainable Business Model (CSBM) to choose and operate. He talked about the transition towards a circular

economy which will have not only have great environmental impact but also a major economic and social impact.

Gaining a thorough and better understanding of the parameters of this new framework and the interrelationships between Business Models holds significant value in achieving conceptual clarity within what CSBM archetype and strategy to choose and how advanced technology can support this evolution. He emphasized the need to establish business model centers in Asian universities particularly India and Pakistan for identifying and solving the local issues.

Prof Fang Chang Kuo discussed about Signature-Based Random Access Procedure for 5G Massive

Machine-Type Communications, he mentioned that his Institute of Information Industry closely works with industry in several research areas. He also discussed collaborative programs such as the joint masters (1+1) program.

Finally, it was concluded that we may have one meeting either at MFU Thailand or UAE to carry out a signing ceremony of CGC with two universities in Pakistan and one university in UAE. In addition, partner universities will prepare proposals to participate in forthcoming CBHE calls in the diversified areas of food security, Wind power condition monitoring, and water-related problems to be solved by applying advanced ICT/IOT-based technologies. ■



فلسطینی عوام سے اظہارِ یکجہتی، یو آئی ٹی یونیورسٹی کے طلبہ کی امدادی مہم

جامعہ یو آئی ٹی کے طلبہ کی فلسطینی بھائیوں سے اظہارِ یکجہتی، موجودہ حالات کی پیش نظر طلبہ نے امدادی تحریک لگایا جس میں فلسطینی بھائیوں کی مدد کے لئے چندہ جمع کیا گیا۔ اس مہم میں یو آئی ٹی یونیورسٹی کے طلباء و طالبات، انتظامیہ اور اساتذہ نے بڑھ چڑھ کر حصہ لیا۔ ایک ہفتے کی امدادی مہم میں تقریباً 3 لاکھ روپے کی رقم جمع کی گئی۔ جمع ہونے والی رقم کو انجمنیت فاؤنڈیشن کے سپرد کر دیا گیا۔

واکس جاسٹر یو آئی ٹی یونیورسٹی نے تمام طلبہ کو اسرائیل کی طرف سے مظلوم فلسطینیوں پر ڈھائے جانے والے ظلم و ستم کے حوالے سے آگاہ کیا اور تمام فلسطینی عوام کی زیادہ سے زیادہ مدد کرنے کی گزارش بھی کی۔ ■

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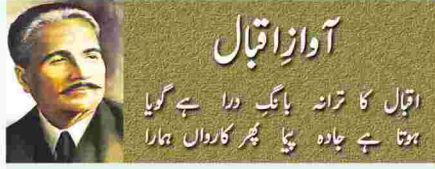
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اے ہمالہ کوئی بازی گاہ ہے تو بھی جسے
دست قدرت نے بنایا ہے عناصر کے لئے
ہائے کیا فرط طرب میں جھومتا جاتا ہے ابر
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تو زمیں پر اور پہنائے فلک تیرا وطن
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ابر کے ہاتھوں میں رہوار ہوا کے واسطے
تازیانہ دے دیا برق سر کوہسار نے

نکلے نکلے کر کے ہیں۔ ہندوستان کے نقشہ پر مسلم ہندوستان
اور ہندو ہندوستان پہلے ہی سے موجود ہیں نہ معلوم اس کے متعلق
اتنا دایا کیوں کیا جاتا ہے۔ وہ ملک ہے کہاں جس کے نکلے نکلے
کیے جائیں گے؟ اور وہ قوم کہاں ہے جس کی قومیت فنا کی جائے کوہے؟
وہ طاقت جس کے قبضہ قدرت میں آج ہندوستان ہے وہ
انگریزوں کی طاقت ہے اور یہ جو ایک خیال دماغوں میں بیٹھ گیا
ہے کہ ہندوستان ایک متحدہ ملک ہے اور اس کی اپنی حکومت ہے وہ
صرف اس وجہ سے ہے کہ انگریز اس سارے ملک پر حکمران ہیں۔
(مسلم لیگ کانفرنس، بمبئی، 26 مئی 1940ء)



فرمانِ قائد اعظم

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اصول اور تفصیلات

گاندھی جی کہتے ہیں: "ہندوستان کو جیتنے کی نکلے نکلے کیا جا رہا ہے۔"
راج گوبال چاریہ کہتے ہیں: "بچے کے نکلے نکلے کے چاند ہے جسے"
قدرت نے پہلے ہی سے ہندوستان کو تقسیم کر رکھا ہے اور اس کے

مصنوعی ذہانت اور کوانٹم کمپیوٹنگ

ڈاکٹر عطاء الرحمن

مدد دے گا، جس کے نتیجے میں توانائی کی کارکردگی اور قابل تجدید توانائی میں اضافہ
ہوگا۔ اس ٹیکنالوجی کی بدولت عالمی زرعی پیداوار پر بھی بہت بڑا اثر پڑے گا۔
موسم کے انداز، مٹی کے حالات، اور فصل کی جینیات کا تجزیہ کرنے کے لیے AI
الگورتھم (Algorithm) کا استعمال کیا جائے گا، جبکہ QC بڑے پیمانے پر
معلومات کی فراہمی پر تیزی سے کارروائی کریگا، جس سے فصل کی پیداواری
صلاحیت اور وسائل کے انتظام میں بہتری آئے گی۔ اس طرح کاشتکاری کی
ٹیکنیکوں کو درست طریقے سے استعمال کیا جائے گا، جس میں ہدف شدہ آبپاشی،
کھاد کا موثر استعمال، اور کیڑے مار ادویات کا مناسب انتظام شامل ہوگا۔ AI
الگورتھم کے ساتھ QC کی مربوط معلومات کی وجہ سے، ماحولیاتی نظام، جنگلی
حیات کی آبادی، اور آلودگی کی سطحوں کی حقیقی وقت (Real Time) میں
نگرانی ممکن ہو جائے گی، اس طرح مناسب مقدار میں استعمال میں سہولت ہو
جائے گی۔ صنعتوں میں بھی شاندار تبدیلیاں آئیں گی۔ تیار کردہ مصنوعات کے
معیار کو انسانی شمولیت کے بغیر نئی سے قابو کیا جائے گا، کیونکہ AI الگورتھم بے
ضابطگیوں کا پتہ لگانے، ممکنہ خرابیوں کی پیش گوئی کرنا اور معیار کے معائنہ کے
طریقہ کار کو بہتر بنانے کیلئے QC کی صلاحیتوں کو استعمال کرتے ہوئے نقائص
سے پاک اعلیٰ معیار کی مصنوعات کی پیداوار کو یقینی بنائے گا اور فضلہ
(Wastages) کی مقدار کو بھی انتہائی کم کر دے گا۔

مصنوعی ذہانت (AI) اور کوانٹم کمپیوٹنگ (QC) ٹیکنالوجی کے تحت جنگیں
بھی مکمل انقلاب سے گزر رہی ہیں، وہ ممالک جن کے پاس زیادہ طاقتور AI نظام کی
مدد سے چلنے والے زیادہ طاقتور اور بہتر نیٹ ورک والے کوانٹم کمپیوٹرز ہوں گے وہ
آسانی سے دشمن کی طاقتوں کو زیر کر سکیں گے۔ اس نظام کا فوجی معمولات، انٹیلی
جنس اکٹھا کرنے، خود مختار نظام، سائبر سیکورٹی (Cyber Security) اور
فیصلہ سازی پر بہت گہرا اثر پڑے گا۔ جن ممالک نے ان ٹیکنالوجیوں میں اعلیٰ سطح پر
مہارت حاصل کی وہ رفتار، کارکردگی، درستی اور موافقت کے لحاظ سے اہم فوائد
حاصل کر سکیں گے، جو جنگ کے مستقبل کو تشکیل دینے کیلئے اہم ہیں۔ QC کی عملی
طاقت AI الگورتھم کی ہم آہنگی اور موافقت کی صلاحیت کے ساتھ مل کر ڈرونز
(Drones) یا روبوٹک (Robotic) نظام کے خود مختار جھنڈ بنانے میں
سہولت فراہم کرے گی، جس سے بہتر ہم آہنگی کی کارروائیوں کو قابل بنایا جائے
گا۔ QC کی منفرد خصوصیات کوانٹم کرپٹوگرافی کے ذریعے خفیہ کاری
(Security) کے طریقوں کو مضبوط بنا سکتی ہیں۔ کوانٹم کی ڈسٹری بیوشن (Key
Distribution) (QKD Quantum) پر ڈوٹو کوانٹم مظاہر کا استعمال
کرتے ہوئے، حساس فوجی مواصلات اور معلومات کی رازداری اور سہولت کو یقینی
بنانا محفوظ مواصلاتی چینل فراہم کر سکتے ہیں۔ AI اور QC مل کر فوجی فیصلہ
سازوں کو علمی مدد فراہم کر سکتے ہیں۔

ہماری مسلح افواج کو ہماری جامعات کے تحقیقی مراکز کے ساتھ ہاتھ ملانے کی
ضرورت ہے تاکہ وہ نئی نسل کی جنگ کا مقابلہ کر سکیں۔ چیٹ جی بی ٹی، بنگ
(Bing) اور اس طرح کے دوسرے اوزار کی آمد نے ہمیں مستقبل کی جھلک فراہم کی
ہے۔ ذہین مشینیں اکثر شعبوں میں انسانوں کی جگہ لے لیں گی۔ پاکستان سیاسی اور
مالی انتشار کی دلدل میں پھنسا ہوا ہے اور ہمارے لیڈران ان پیش رفتوں سے غافل
ہیں۔ مستقبل ہمارا صرف اس صورت میں سنور سکتا ہے جب ہم ان طاقتوں اور
مواقعوں کو بروئے کار لائیں جو ان پیش رفتوں کے ذریعے ہمارے سامنے ہیں۔

مصنوعی ذہانت (Artificial Intelligence) اور کوانٹم کمپیوٹنگ
(Quantum Computing) ٹیکنالوجی کے دو تیزی سے ترقی کرنے
والے شعبے ہیں جن میں انقلاب برپا کرنے کی بے پناہ صلاحیت موجود ہے۔ ان دو
جدید ٹیکنالوجیوں کا ایک دوسرے کیساتھ ملاپ ہونا، یعنی مصنوعی ذہانت (AI) جس کا
تعلق سافٹ ویئر سے ہے جبکہ دوسری کوانٹم کمپیوٹنگ (QC) کا ہارڈ ویئر سے تعلق،
ہماری زندگی کے تقریباً ہر پہلو کو بدل دیگا، جسکے اثرات ادویات، انجینئرنگ،
ماحولیات، زراعت، صنعتی پیداوار، شہری ترقی، سائنسی تحقیق، کائنات کے بارے
میں ہماری سمجھ بوجھ اور جنگوں کے مستقبل میں غرض ہر پہلو میں جلد نظر آئیں
گے۔ کوانٹم کمپیوٹرز عام کمپیوٹرز سے بنیادی طور پر مختلف انداز میں کام کرتے ہیں۔
روایتی کمپیوٹرز (Bits) کو ڈیٹا کی اپنی بنیادی اکائی کے طور پر استعمال کرتے
ہیں، اور وہ سیریل پروسیسنگ میں بائینری کوڈ (Binary code) (0 یا 1) کے
استعمال پر انحصار کرتے ہیں۔ کوانٹم کمپیوٹرز، اسکے برعکس، کیوبٹس (Qubits) کو
ڈیٹا کی اکائی کے طور پر استعمال کرتے ہیں۔ کیوبٹس ایک ہی وقت میں متعدد
حالات میں موجود ہو سکتے ہیں، جو انہیں روایتی تیز ترین کمپیوٹرز سے کہیں زیادہ
طاقتور بناتے ہیں۔ نتیجے کے طور پر، ایک کوانٹم کمپیوٹر وہ مسائل چنہنٹوں میں حل کر
سکتا ہے جسے حل کرنے میں تیز ترین اعلیٰ کمپیوٹرز ہزاروں سال لگیں گے۔

2019ء میں، سائبر سیکورٹی (Sycamore) نامی کوانٹم کمپیوٹر نے ایک کام
200 سیکنڈ میں مکمل کیا جسے گوگل (Google) نے دعویٰ کیا کہ اسے مکمل کرنے
میں ایک جدید ترین سپر کمپیوٹر کو 10000 سال لگیں گے۔ کوانٹم کمپیوٹرز کو اب
ہزاروں کیوبٹس (Qubits) کے ساتھ ڈیزائن کیا جا رہا ہے، جسکے نتیجے میں انکے
کام کر سکیں رفتار میں غیر معمولی اضافہ ہوگا۔ کچھ ہی عرصے میں کوانٹم کمپیوٹرز کے
چھوٹے ماخذ تجارتی طور پر دستیاب ہو جائیں گے۔ آئیے چند مثالوں پر غور کریں۔
سرطان کی مختلف اقسام کے علاج کی تلاش کئی دہائیوں سے محدود کامیابی کیساتھ
جاری ہے۔ AI اور QC کا انضمام ادویات کی دریافت کے عمل میں انقلاب برپا
کر سکتا ہے، اور انکی افادیت کا اندازہ لگا سکتا ہے۔ AI، جب QC کی طاقت
کیساتھ مل جاتی ہے، تو طبی تصویر ٹیکنالوجی (Imaging Technology) (Medical)
(Medical) کو بھی بہتر بنا سکتی ہے، جس سے سرطان، قلبی حالات، اور اعصابی
عوارض جیسی بیماریوں کی تیز اور زیادہ درست تشخیص ممکن ہو سکتی ہے۔ یہ مجموعہ
بیماریوں کے جینیاتی رجحانات کو معلوم کرنے کیلئے وسیع جینیاتی معلومات
(Genomic Datasets) کا تجزیہ کر کے جینیاتی صلاحیت میں ردوبدل
کر سکتا ہے۔ اس ٹیکنالوجی کی بدولت مختلف پودوں اور جانوروں کی انواع کے
جینوم کے بارے میں زیادہ سے زیادہ تفہیم اور جینوم کی ساخت اور کام کی صلاحیت
کے ساتھ تعلق میں معلومات، لیبارٹری میں ہماری ضروریات کے مطابق مختلف
انواع کی "تخلیق" میں انتہائی مددگار ثابت ہوگا۔ AI اور QC کا امتزاج مادی
سائنس (Material Science) اور نینو ٹیکنالوجی

(Nanotechnology) میں بھی پیشرفت کو تیز کر سکتا ہے، اس طرح
برقیات (Electronics)، توانائی ذخیرہ کرنے اور بائیو ٹیکنالوجی جیسے شعبوں
میں انقلاب برپا کر سکتا ہے۔
اس سے ذہین مشینوں (Machine Intelligence) کی نشوونما پر بھی
اثر پڑے گا جو پیچیدہ کاموں کو درستی اور موافقت کے ساتھ انجام دینے کی صلاحیت
رکھتی ہیں۔ ریوانائی کے گرڈز (Grids) اور ذخیرہ اندوزی (Storage) میں

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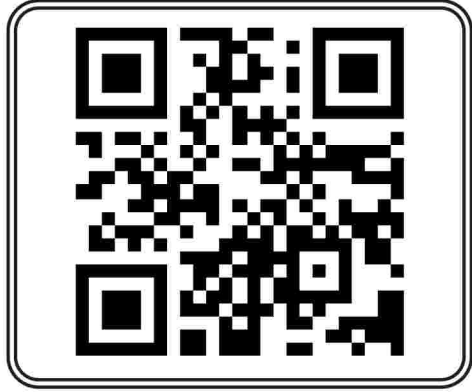
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کنسٹرکٹرز ایسوسی ایشن آف پاکستان حکومت سندھ کی جانب سے لوکل گورنمنٹ کو فنڈز کی فراہمی میں تاخیر پر تشویش کا اظہار

پبلک پریورمنٹ ریگولیٹری اتھارٹی کے اعتراضات کے باوجود کاموں کو اپوارڈ کرنا اور موصول ہونے والے کاموں کی ایس پی پی آر اے سے ان کے درست اور جائز ہونے اور ان منصوبوں میں ایس پی پی آر اے کے خلاف دوزیوں کے خدشات اور ساتھ ہی غیر قانونی ریوائرز اور ایکسٹنشن کے ذریعے فیورٹ کنسٹریکٹرز کو نوازنا شامل ہے۔

اجلاس میں اداروں کی معلومات جمع کر کے اس میں ملوث افسران اور عملے کے خلاف حکم جاتی کارروائی عمل میں لائی جائے اور جن کاموں کی SPPRA آئی ڈی درست ہے منصوبے تکمیل اور تکمیل شدہ مراحل میں ہیں ان کی ادائیگیاں فوری طور سے جاری کی جائیں فیصلہ کیا گیا ہے کہ ایسوسی ایشن کا وفد سیکریٹری پی این ڈی اور سیکریٹری فنانس سے ملاقات کر کے کنسٹریکٹرز کو درپیش مشکلات سے آگاہ کرے گا۔

کنسٹرکٹرز ایسوسی ایشن آف پاکستان کے سندھ چیمبر کی کور کمیٹی کے اجلاس وائس چیئرمین سندھ نعیم کاظمی کی زبردست منعقد ہوا جس میں کور کمیٹی کے ممبران سید رضا علی عابدی، سعید مغل، انجینئر عبدالجبار شیخ، شیخ اسماعیل عظیم، اسلم مغل، حیدر کاظمی، تنویر احمد، انجینئر عبدالصمد، عابد برنی، اور دیگر کنسٹریکٹرز نے شرکت کی اس اجلاس میں حکومت سندھ کی جانب سے لوکل گورنمنٹ، کے ڈی اے، کے ایم سی اور ایجوکیشن ورکس کے اداروں کو فنڈز کی ریلیز میں تاخیر پر تشویش کا اظہار کیا گیا۔

اجلاس کو بتایا گیا کہ حکومت سندھ پلاننگ اینڈ ڈیولپمنٹ نے سندھ کے تمام بلدیاتی اداروں سے جاری تکمیل شدہ اور زیر تکمیل اسکیموں کی تفصیلات طلب کیں جس میں بہت سے متعلقہ ادارے تفصیلات جمع کروانے میں دلچسپی نہیں لے رہے جس کی وجہ سے بالآخر اس اجلاس کو بتایا گیا کہ اداروں کی دلچسپی نہ لینے کی وجوہات سندھ

قابل تجدید قدرتی گیس کے فروغ کا ایم او یو طے پایا گیا

سوئی سدرن آلٹرنیٹ انرجی اور پاکستان مشین ٹول فیکٹری نے مفاہمتی یادداشت پر دستخط کر دیے

ذخیرہ کرنے کی صلاحیتوں کے ساتھ کونکے سے گیس (سی 12 ایل) کی تبدیلی کے ساتھ ساتھ گرین ہائیڈروجن کی پیداوار جیسے دور رس اقدامات کرنا بھی شامل ہیں۔

مفاہمت نامے کا مقصد یہ ہے کہ پاکستان مشین ٹول فیکٹری فضلے کے مواد کو ٹیپ کر کے ہائیڈروجن/ہائیڈروجن پیدا کرے گا اور ہائیڈروجن پلانٹس کے ذریعے قابل تجدید قدرتی گیس پیدا کی جائے گی، یہ ماحول دوست گیس بعد میں ایس ایس جی سی۔ اے ای کی جانب سے خریداری کے لیے دستیاب کرائی جائے گی، جو اس کے بعد تیسرے فریق کے اداروں کو اس کی مقامی تقسیم کی گئی ہے۔

کے چیلنجز سے نبرد آزما ہونا تھا، کمپنی کا بنیادی مشن متبادل توانائی کے منصوبوں پر توجہ مرکوز کرنا ہے، جس میں قابل تجدید اور ماحول دوست ایندھن کے منصوبوں جیسے ہائیڈروجن اور ہائیڈروجن پلانٹس، تھرمل توانائی پر مبنی بجلی کی پیداوار شامل ہیں لیکن یہ صرف ان تک محدود نہیں ہے بلکہ ان میں کاربن کی سچر اور

میجر جنرل عابد ممتاز ملک (ریٹائرڈ) نے سوئی سدرن گیس کمپنی کے ہیڈ آفس میں منعقدہ ایک سادہ مگر پروقار تقریب میں مفاہمت کی یادداشت پر دستخط کیے۔ سوئی سدرن گیس کمپنی (ایس ایس جی سی) کا ایک ذیلی ادارہ، ایس ایس جی سی اے ای 2022 میں قائم کیا گیا تھا جس کا بنیادی مقصد ملک میں توانائی

سوئی سدرن آلٹرنیٹ انرجی (پرائیویٹ) لمیٹڈ (SSGC-AE) اور پاکستان مشین ٹول فیکٹری (PMTF) نے قابل تجدید قدرتی گیس کے گرین مالکپور "کو کارآمد بنانے کیلئے مفاہمت کی یادداشت (ایم او یو) پر دستخط کیے، ایک اسٹریٹجک اقدام کے طور پر پاکستان مشین ٹول فیکٹری، سوئی سدرن گیس کمپنی۔ اے ای کو ایک قابل تجدید قدرتی گیس ہائیڈروجن ہائیڈروجن فراہم کرے گی۔ یہ کاوش پائیدار توانائی کے صلے کے ساتھ مستقبل میں ایندھن کی فراہمی کو یقینی بنائے گی، سوئی سدرن گیس۔ اے ای کے چیئرمین عمران نیازی اور پاکستان مشین ٹول فیکٹری کے



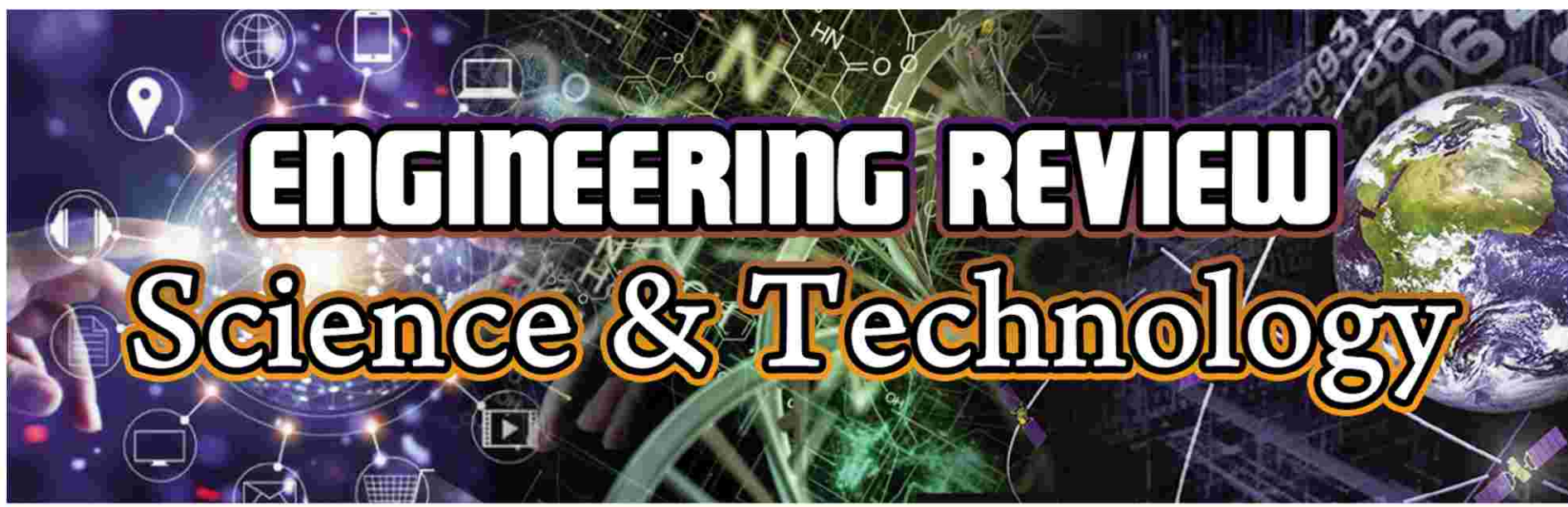



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ENGINEERING REVIEW

Science & Technology

AI faces look more real than actual human face

White faces generated by artificial intelligence (AI) now appear more real than human

ple. The same wasn't true for images of people of colour.

The reason for the discrepancy is that AI algorithms are trained disproportionately on white faces, Dr Amy Dawel, the senior author of the paper,

are being used to create professional-looking headshots. When used for people of colour, the AI is altering their skin and eye colour to those of white people."

One of the issues with AI 'hyper-realism' is that

"This means people who are mistaking AI imposters for real people don't know they are being tricked."

The researchers were also able to discover why AI faces are fooling people.

rely on these physical cues for long. AI technology is advancing so quickly that the differences between AI and human faces will probably disappear soon."

The researchers argue this trend could have

and civil society can identify issues before they become a major problem," Dr Dawel said.

Raising public awareness can also play a significant role in reducing the risks posed by the technology, the researchers argue.



faces, according to new research led by experts at The Australian National University (ANU).

In the study, more people thought AI-generated white faces were human than the faces of real peo-

said.

"If white AI faces are consistently perceived as more realistic, this technology could have serious implications for people of colour by ultimately reinforcing racial biases online," Dr Dawel said.

"This problem is already apparent in current AI technologies that

people often don't realise they're being fooled, the researchers found.

"Concerningly, people who thought that the AI faces were real most often were paradoxically the most confident their judgements were correct," Elizabeth Miller, study co-author and PhD candidate at ANU, said.

"It turns out that there are still physical differences between AI and human faces, but people tend to misinterpret them. For example, white AI faces tend to be more in-proportion and people mistake this as a sign of humanness," Dr Dawel said.

"However, we can't

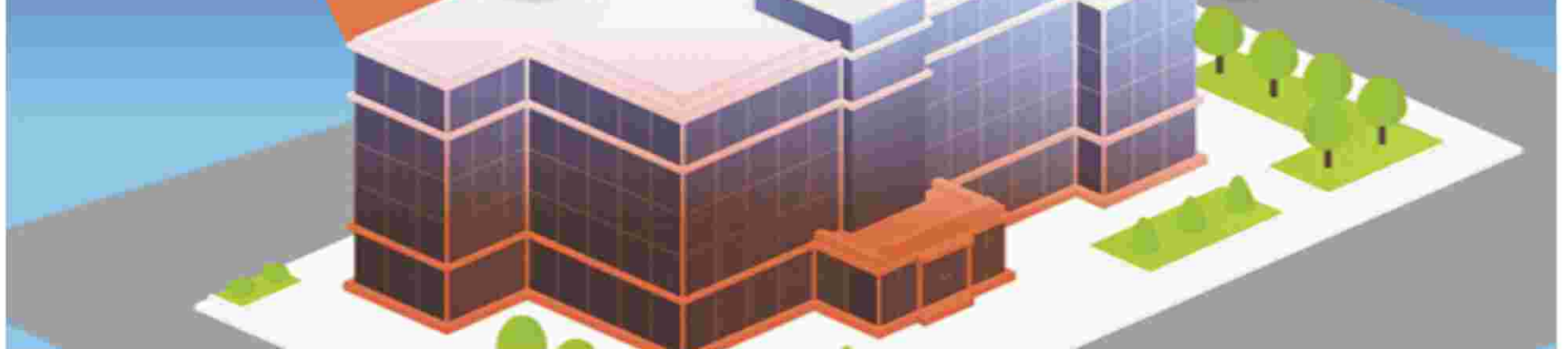
serious implications for the proliferation of misinformation and identity theft, and that action needs to be taken.

"AI technology can't become sectioned off so only tech companies know what's going on behind the scenes. There needs to be greater transparency around AI so researchers

"Given that humans can no longer detect AI faces, society needs tools that can accurately identify AI imposters," Dr Dawel said.

"Educating people about the perceived realism of AI faces could help make the public appropriately sceptical about the images they're seeing online." ■

'Cooling glass' blasts building heat into space



University of Maryland researchers aiming to combat rising global temperatures have developed a new "cooling glass" that can turn down the heat indoors without electricity by drawing on the cold depths of space.

The new technology, a microporous glass coating described in a paper published in the journal *Science*, can lower the temperature of the material beneath it by 3.5 degrees Celsius at noon, and has the potential to reduce a mid-rise apartment building's yearly carbon emissions by 10%, according to the research team led by Distinguished University Professor Liangbing Hu in the Department of Materials Science and Engineering.

The coating works in two ways: First, it reflects up to 99% of solar radiation to stop buildings from absorbing heat. More intriguingly,

it emits heat in the form of longwave infrared radiation into the icy universe, where the temperature is generally around -270 degrees Celsius, or just a few degrees above absolute zero.

In a phenomenon known as "radiative cooling," space effectively acts as a heat sink for the buildings; they take advantage of the new cooling glass design along with the so-called atmospheric transparency window -- a part of the electromagnetic spectrum that passes through the atmosphere without boosting its temperature -- to dump large amounts of heat into the infinite cold sky beyond. (The same phenomenon allows the earth to cool itself, particularly on clear nights, although with much less intense emissions than those from the new glass developed at UMD.)

"It's a game-changing technology that simplifies how we keep buildings cool and energy-efficient," said Assistant Research Scientist Xinpeng Zhao, the first author of the study.

"This could change the way we live and help us take better care of our home and our planet."

Unlike previous attempts at cooling coatings, the new UMD-developed glass is environmentally stable -- able to withstand exposure to water, ultraviolet radiation, dirt and even flames, enduring temperatures of up to 1,000 degrees Celsius. The glass can be applied to a variety of surfaces like tile, brick and metal, making the technology highly scalable and adoptable for wide use.

The team used finely ground glass particles as a binder, allowing them to avoid polymers and enhance its long-term durability outdoors, Zhao said. And they chose the particle size to maximize emission of infrared heat while simultaneously reflecting sunlight.

The development of the cooling glass aligns with global efforts to cut energy consumption and fight climate change, said Hu, pointing to recent reports that this year's Fourth of July fell on what may have been the hottest

day globally in 125,000 years.

"This 'cooling glass' is more than a new material -- it's a key part of the solution to climate change," he said. "By cutting down on air conditioning use, we're taking big steps toward using less energy and reducing our carbon footprint. It shows how new technology can help us build a cooler, greener world."

Along with Hu and Zhao, mechanical engineering Professor Jelena Srebric and Professor Zongfu Yu from the Department of Electrical and Computer Engineering at the University of Wisconsin-Madison are co-authors of this study, contributing their expertise on building CO₂ savings and structure design, respectively.

The team is now focusing on further testing and practical applications of their cooling glass. They are optimistic about its commercialization prospects and have created the start-up company CeraCool to scale up and commercialize it. -- SD

Earth's surface water dives deep, transforming core's outer layer

A few decades ago, seismologists imaging the deep planet identified a thin layer, just over a few hundred kilometers thick. The origin of this layer, known as the E prime layer, has been a mystery -- until now.

An international team of researchers, including Arizona State University scientists Dan Shim, Taehyun Kim and Joseph O'Rourke of the School of Earth and Space Exploration, has revealed that water from the Earth's surface can penetrate deep into the planet, altering the composition of the outermost region of the metallic liquid core and creating a distinct, thin layer. Illustration of silica crystals coming out from the liquid metal of the Earth's outer core due to a water-induced chemical reaction.

Their research was recently published in *Nature Geoscience*.

Research indicates that over billions of years, surface water has been transported deep into the Earth by descending, or subducted, tectonic plates.

Upon reaching the core-mantle boundary, about 1,800 miles below the surface, this water triggers a profound chemical interaction, altering the core's structure.

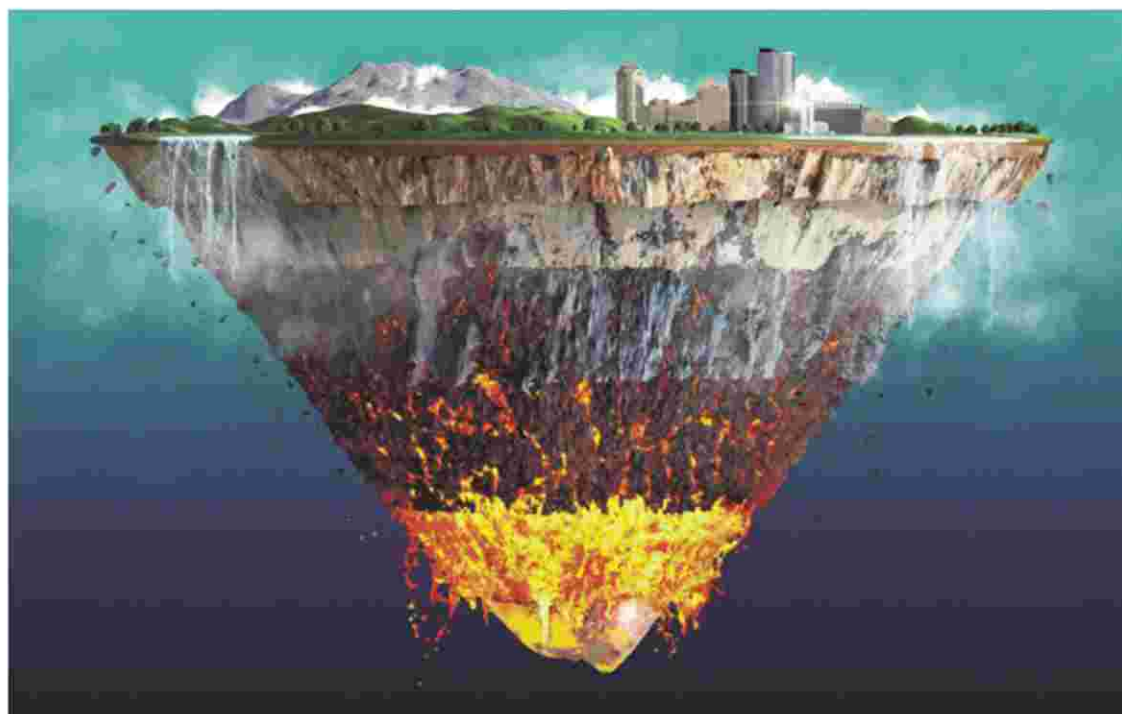
Along with Yong Jae Lee of Yonsei University in South Korea, Shim and his team have demonstrated through high-pres-

sure experiments that subducted water chemically reacts with core materials. This reaction forms a hydrogen-rich, silicon-depleted layer, altering the topmost outer core region into a film-like structure. Additionally, the reaction generates silica crystals that rise and integrate into the mantle. This modified liquid metallic layer is predicted to be less dense, with reduced seis-

mic velocities, in alignment with anomalous characteristics mapped by seismologists.

water meets the core, a chemical exchange occurs to form a hydrogen-rich layer in the topmost outer core and dense silica in the bottom of the mantle. Image courtesy Yonsei University

"For years, it has been believed that material exchange between Earth's core and mantle is small. Yet, our recent high-pressure experiments reveal a different story.



mic velocities, in alignment with anomalous characteristics mapped by seismologists.

Illustration of Earth's interior revealing subducting water and a rising plume of magma. At the interface where subducting

We found that when water reaches the core-mantle boundary, it reacts with silicon in the core, forming silica," said Shim. "This discovery, along with our previous observation of diamonds forming from water reacting with carbon in iron liquid

under extreme pressure, points to a far more dynamic core-mantle interaction, suggesting substantial material exchange."

This finding advances our understanding of Earth's internal processes, suggesting a more extensive global water cycle than previously recognized. The altered "film" of the core has profound implications for the geochemical cycles that connect the surface-water cycle with the deep metallic core.

This study was conducted by an international team of geoscientists using advanced experimental techniques at the Advanced Photon Source of Argonne National Lab and PETRA III of Deutsches Elektronen-Synchrotron in Germany to replicate the extreme conditions at the core-mantle boundary.

Members of the team and their key roles from ASU are Kim, who began this project as a visiting PhD student and is now a postdoctoral researcher at the School of Earth and Space Exploration; Shim, a professor at the School of Earth and Space Exploration, who spearheaded the high-pressure experimental work; and O'Rourke, an assistant professor at the School of Earth and Space Exploration, who performed computational simulations to comprehend the formation and persistence of the core's altered thin layer. Lee led the research team from Yonsei University, along with key research scientists Vitali Prakapenka and Stella Chariton at the Advanced Photon Source and Rachel Husband, Nico Giordano and Hanns-Peter Liermann at the Deutsches Elektronen-Synchrotron. -- SD