



UMT

UMT RESEARCH NEWSLETTER

Research Innovation and Knowledge Impact

Volume 1 Issue 1

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MESSAGE FROM VICE PROVOST RESEARCH

It is with great pleasure that I welcome you to the inaugural issue of *UMT RESEARCH NEWSLETTER: Research Innovation and Knowledge Impact*. This publication reflects UMT's enduring commitment to research that is rigorous in method, relevant in purpose, and meaningful in its contribution to society.

At UMT, we view research as more than an academic requirement, it is a driver of innovation, a catalyst for evidence-based solutions, and a bridge between knowledge and impact. Across our Schools and research units, our faculty, students, and collaborators continue to advance research and innovation that addresses real-world challenges, strengthens industry linkages, and contributes to national and global development agendas.

Launching this newsletter is an important step

toward strengthening the visibility of these efforts. By sharing research achievements, grants and collaborations, publications, commercialization milestones, and emerging opportunities, we aim to recognize excellence, encourage interdisciplinary engagement, and inspire a culture of continuous inquiry and improvement.

PROF. DR. SAMMIA SHAHID

Vice Provost Research





UMT SUBMITS 37 RESEARCH PROPOSALS TO PUNJAB HIGHER EDUCATION COMMISSION (PHEC) FOR STRATEGIC R&D CLUSTERS

The University of Management and Technology (UMT) has submitted 37 research project proposals to the Punjab Higher Education Commission (PHEC) in response to a province-wide initiative aimed at establishing collaborative Research and Development (R&D) Clusters across universities in Punjab. The initiative, announced by Prof. Dr. Iqrar Ahmad Khan, Chairperson PHEC, seeks to integrate the research strengths of higher education institutions by bringing together leading researchers to address key

societal and technological challenges through collaborative research.

UMT's submissions span multiple strategic research areas including Artificial Intelligence, Climate Change, Water Management, Food Security, Health, Energy, and Public Policy. Following the submission, PHEC organized a consultative meeting on 4–5 August 2025, where principal investigators presented their research ideas and institutional strengths. The proposed projects highlight UMT's commitment to interdisciplinary research and its role in contributing innovative solutions for sustainable development and policy advancement in Punjab and beyond.



UMT SECURES FOUR COLLABORATIVE R&D CLUSTER PROJECTS UNDER PHEC INITIATIVE

The University of Management and Technology (UMT) has secured participation in four collaborative Research and Development (R&D) Cluster projects funded by the Punjab Higher Education Commission (PHEC) under the ODP Scheme FY 2025–26. The selected clusters fall under the thematic areas of Public Policy & Economic Development, Water, Food & Nutrition, and Renewable Energy, where UMT will collaborate with leading universities across Punjab to conduct multidisciplinary research addressing national development priorities. Each cluster is supported by PHEC funding of up to PKR 10 million to facilitate collaborative research activities and generate impactful outcomes.

In the Public Policy & Economic Development cluster,

led by Beaconhouse National University, Lahore, UMT collaborates with Punjab University, Bahauddin Zakariya University, and The University of Faisalabad. The Water cluster, led by Muhammad Nawaz Sharif University of Agriculture, Multan, includes University of Agriculture Faisalabad, University of Engineering and Technology Taxila, Government College University Faisalabad, and UMT.

In the Food & Nutrition cluster, University of Agriculture Faisalabad serves as the lead institution, collaborating with Punjab University, University of Home Economics Lahore, University of Sargodha, and UMT.

Similarly, the Renewable Energy cluster, led by University of Engineering and Technology Taxila, includes Punjab University, Information Technology University Lahore, University of Agriculture Faisalabad (Punjab Bioenergy Institute), and UMT.



UMT SUBMITS 61 PROJECTS AND STARTUPS FOR DISPLAY AT PINTECH 2026

The University of Management and Technology (UMT) will showcase its research and innovation capabilities at the 4th Punjab Innovation and Technology Expo (PINTECH) 2026 & 11th Invention to Innovation Summit, scheduled to be held on April 7–8, 2026 at Quaid-e-Azam Campus, University of the Punjab, Lahore. Organized by the Punjab Higher Education Commission (PHEC) in collaboration, University of the Punjab, the event serves as a premier provincial platform for universities to present innovative research projects, technological solutions, and entrepreneurial ventures.

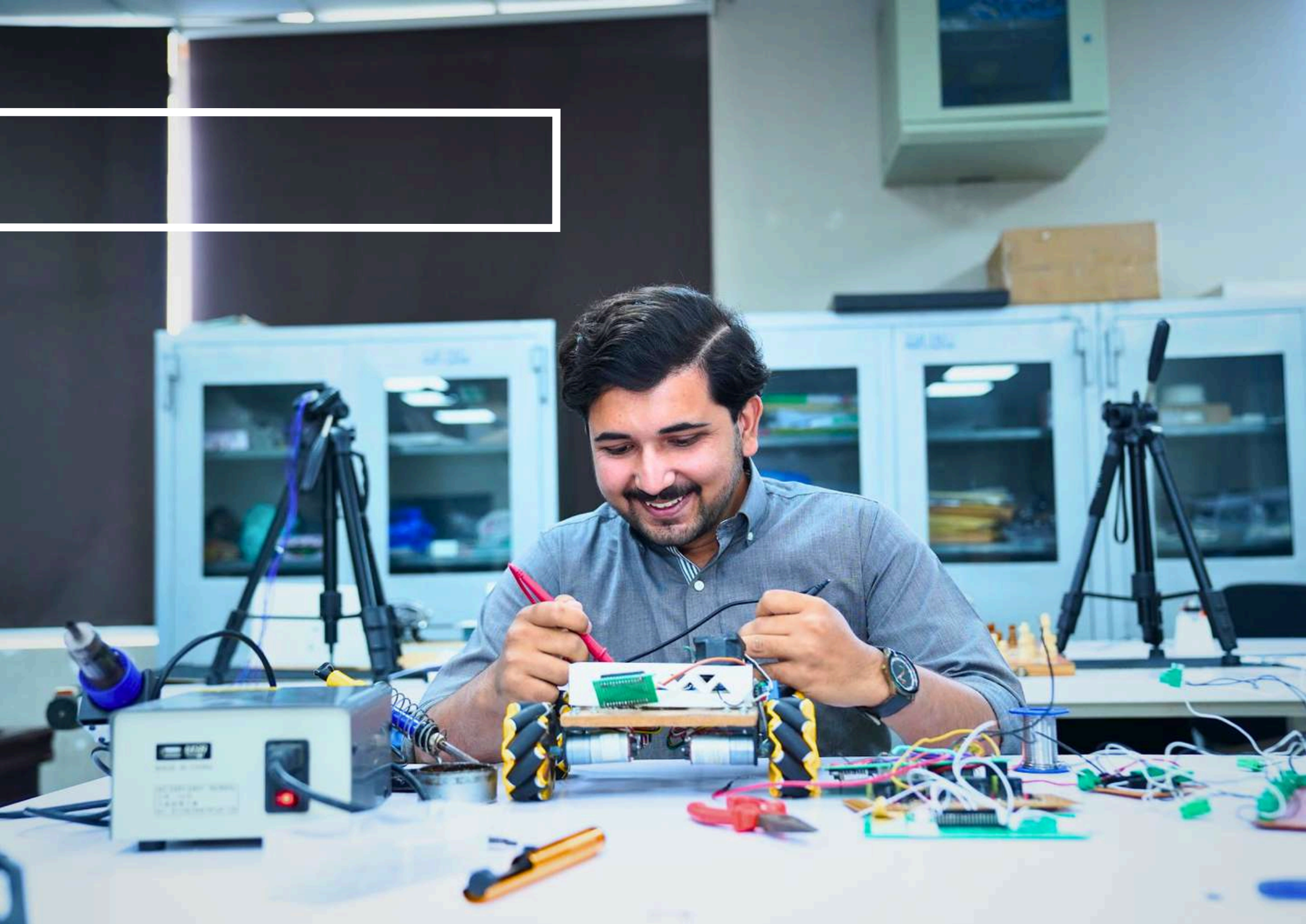
For this prestigious event, UMT through ORIC has

submitted a total of 61 innovative projects and startups, including 18 research projects and 43 startups developed by faculty members and students across various schools of the university.

The submissions include 53 undergraduate-level and 8 graduate-level innovations, reflecting strong student engagement in research and entrepreneurship.

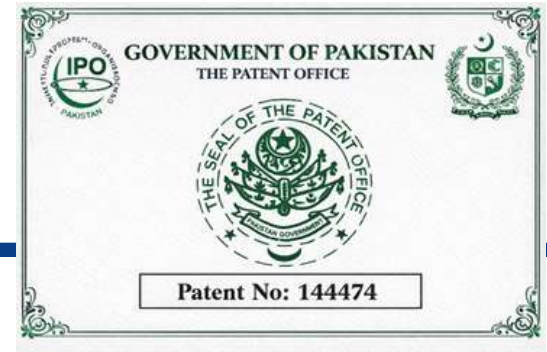
School-wise contributions include 13 submissions from the Centre for Entrepreneurship and Innovation (CENTIN), 11 from the School of Systems and Technology (SST), 7 each from the School of Engineering (SEN), School of Health Sciences (SHS), and School of Pharmacy (SPH), 6 from the School of Architecture and Planning (SAP), 4 from the School of Sciences (SSC), and 3 each from the Institute of Aviation Studies (IAS) and the School of Design and Textile (SDT). These submissions highlight the diversity of UMT's innovation ecosystem and its commitment to fostering research-driven solutions and entrepreneurial initiatives.





GRANTED PATENT FOR SUSTAINABLE ETHYLENE OXIDE PRODUCTION TECHNOLOGY

Researchers from the University of Management and Technology (UMT) have been granted a patent on 11 February 2026 for their invention titled “**An Apparatus for Production of Ethylene Oxide from Ethyl Alcohol**”. The invention was developed by Dr. Sohail Nadeem, Dr. Ayesha Mohy ud Din, Dr. Toheed Akhtar, Dr. Mohsin Javed, and Dr. Tahir Mushtaq, representing the Department of Chemistry, School of Science, and the Department of Informatics and Systems, School of Systems and Technology. The patented technology introduces an innovative apparatus designed to efficiently produce ethylene oxide from ethyl alcohol, utilizing a controlled multi-stage reaction process involving catalytic conversion and optimized heat management.



The apparatus integrates advanced reaction chambers, purification mechanisms, and catalytic systems to enhance the selectivity and productivity of ethylene oxide while minimizing environmental pollutants and by-products. By leveraging renewable feedstocks and improving energy efficiency, the invention offers a cost-effective and environmentally sustainable method for producing ethylene oxide—an important industrial chemical used in pharmaceuticals, polymers, and sterilization processes. This achievement reflects UMT’s growing commitment to research commercialization, innovation, and sustainable technological development.

This patent is granted for a period of twenty (20) years from the filing date, i.e., 12 September 2023, in accordance with the applicable patent laws of Pakistan.

FILING OF PATENT AND RESPONSES ON MULTIPLE IP APPLICATIONS TO IPO PAKISTAN

The University of Management and Technology (UMT) continues to strengthen its intellectual property portfolio with the filing of a new patent application and the progression of several IP registrations at the Intellectual Property Organization (IPO) Pakistan. A patent titled “Design and Fabrication of a Multi-Spindle Drilling Apparatus for Simultaneous Brush Hole Formation” was filed on 27 February 2026 by Ahad Hanif, Lecturer, Department of Mechanical Engineering, School of Engineering, through Office of Research Innovation and Commercialization (ORIC). The invention introduces a multi-spindle drilling mechanism designed to enhance productivity and accuracy in sweep brush manufacturing by enabling the simultaneous drilling of multiple holes, significantly reducing production



time and improving precision in brush block preparation.

In addition to this patent filing, UMT has also filed responses to the IPO Pakistan regarding several intellectual property applications submitted by ORIC. These include industrial design applications for an Engine Turbocharger, Wind Tunnel, and Aspirator, developed by Dr. Irsa Talib from the Department of Mechanical Engineering, School of Engineering.

Furthermore, two trademark applications, “EnablyHub” and “Herssentials,” developed by Sonia Ashfaq Gondal from the School of Pharmacy, have also progressed through the review process. These developments highlight UMT’s growing commitment to innovation, technology development, and the protection of intellectual property across engineering, healthcare, and digital innovation domains.

MOU WITH AIR PHARMACEUTICALS (PVT) LTD TO STRENGTHEN RESEARCH AND INDUSTRY COLLABORATION

The Office of Research, Innovation and Commercialization (ORIC), University of Management and Technology (UMT), in collaboration with the Department of Chemistry, School of Sciences, signed a Memorandum of Understanding (MoU) with Air Pharmaceuticals (Pvt.) Limited on 28 January 2026. The agreement aims to strengthen collaboration between academia and industry by promoting joint initiatives in research, innovation, and academic engagement.

Through this partnership, both institutions seek to foster knowledge exchange, collaborative research projects, and technological development in areas related to pharmaceutical sciences and applied chemistry. The MoU reflects UMT's continued commitment to building strong industry linkages that support scientific advancement, practical learning opportunities, and impactful research outcomes benefiting both academia and the pharmaceutical sector.

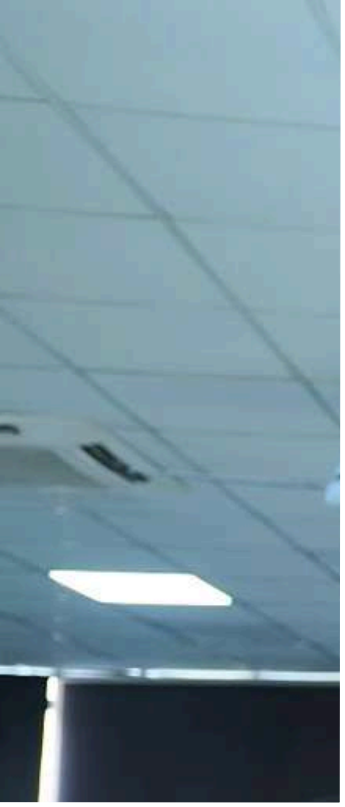


MOU WITH SHAHEED BENAZIR BHUTTO UNIVERSITY, NAWABSHAH TO STRENGTHEN RESEARCH COLLABORATION

The University of Management and Technology (UMT) has signed a Memorandum of Understanding (MoU) with Shaheed Benazir Bhutto University (SBBU), Nawabshah, to enhance collaboration in research and academic activities. The agreement establishes a framework for joint research initiatives, collaborative grant applications, faculty engagement, and the exchange of academic expertise between

the two institutions. Under the partnership, both universities will work together to organize research seminars, workshops, and scholarly activities aimed at strengthening research capacity and promoting a vibrant academic culture.





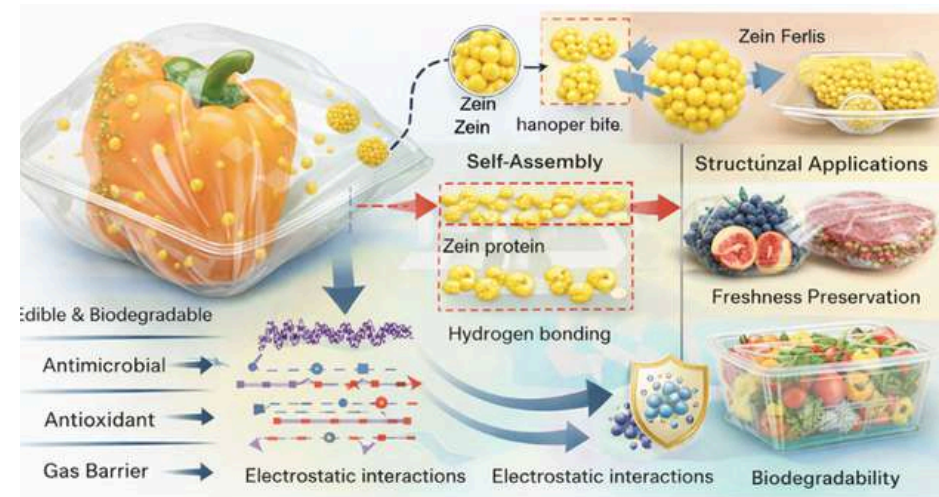
UMT FACULTY PUBLISH HIGH-IMPACT RESEARCH IN LEADING INTERNATIONAL JOURNALS

The University of Management and Technology (UMT) continues to demonstrate strong research performance, with 172 publications indexed in Scopus, including several articles published in high-impact factor international journals. Faculty members from multiple schools have contributed to impactful research across fields such as food science, artificial intelligence, physics, environmental engineering, and computational biology.

Article Title

Zein Nanoparticles in Emerging Food Packaging: Mechanistic Insights into Self-Assembly, Structural Driving Forces, and Functional Applications. (Impact

Factor: 15.4)



This research was contributed by Ashraf, J., Zhang, J., Tufail, T., Virk, M. S., Yuling, M., Awais, M., and Xu, B., with Dr. Zahoor Ahmed, Assistant Professor in the Department of Human Nutrition and Dietetics, School of Food and Agricultural Sciences (SFAS), UMT, as a contributing author. Published in Trends in Food Science & Technology, the study explores the potential of zein nanoparticles as innovative materials for next-generation food packaging. The research provides mechanistic insights into nanoparticle self-assembly, structural interactions, and functional applications that can enhance food preservation, improve packaging performance, and

support the development of sustainable packaging technologies.

Article Title

The Intersection of Artificial Intelligence and Assistive Technologies in the Diagnosis and Intervention of Mental Health Conditions. (Impact Factor: 13.9)

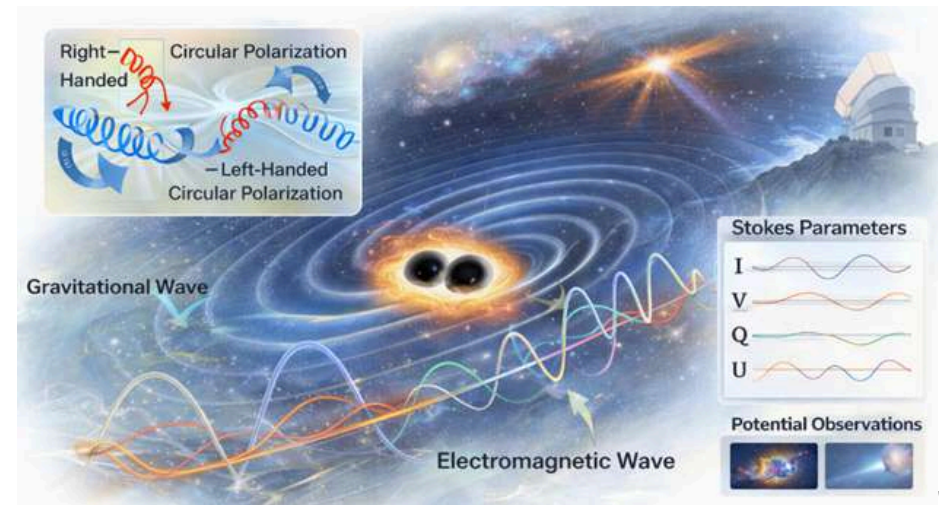


The article was authored by Abrar, M., Khalid, S., and Ullah, R., with Dr. Sohail Khalid, Professor in the Department of Computer Science, School of Systems and Technology (SST), UMT, as a leading contributor. Published in Artificial Intelligence Review, the study examines how artificial intelligence integrated with

assistive technologies can improve the diagnosis, monitoring, and treatment of mental health conditions. The research highlights emerging digital tools that support early detection, personalized interventions, and improved mental health care delivery.

Article Title

Gravitational Waves and Electromagnetic Coupling: Circular Polarization and Observable Effects. (Impact Factor: 7.8)

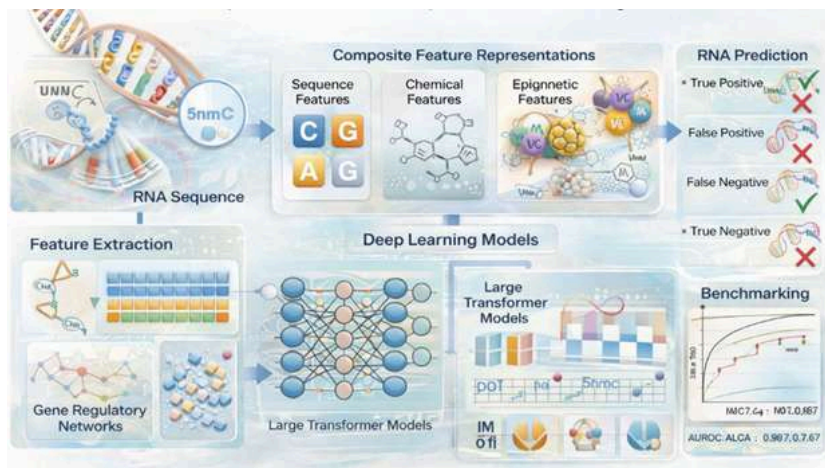


This research was conducted by Manzoor, R., Siddiq, A., Shabir, S., Kamal, A., and Gudekli, E., including

Dr. Rubab Manzoor, Saher Shabir, and Arsal Kamal from the Department of Mathematics, School of Sciences (SSC), UMT. Published in Fortschritte der Physik, the research investigates the interaction between gravitational waves and electromagnetic fields, focusing on circular polarization effects and their potential observational signatures. The findings contribute to a deeper understanding of astrophysical phenomena and theoretical physics related to gravitational wave propagation.

Article Title

Deep Learning Based Prediction of RNA 5hmC Modifications Using Composite Feature Representations and Comparative Benchmarking with Transformer Models. (Impact Factor: 6.1)



The research was conducted by Attique, M., Khan, Y. D., Alturise, F., and Alkhalifah, T., including Muhammad Attique and Dr. Yaser Daanial Khan from the Department of Computer Science, School of Systems and Technology (SST), UMT. Published in BioData Mining, the study presents advanced deep learning models for predicting RNA modifications associated with gene regulation. The research introduces composite feature representations and benchmarking against transformer-based models to improve the accuracy of computational predictions in bioinformatics.

Article Title

Polyester Waste Activated Carbon Assisted Micropollutant Methylene Blue and Congo Red Dyes Removal from Wastewater: RSM Modeling, Kinetics, Mechanism, and Reusability Study. (Impact Factor: 6.0)



This article was authored by Asif, F. R., Bibi, B., Yasir, M., Khan, I. A., Gul, J., Irfan, M., and Sedlarik, V., including Imran Ahmad Khan from the School of Design and Textile (SDT), UMT. Published in the Journal of Industrial and Engineering Chemistry, the research focuses on the use of activated carbon derived from polyester waste to remove harmful dyes such as methylene blue and Congo red from wastewater. The study demonstrates an environmentally sustainable approach for wastewater treatment through efficient adsorption and reusability mechanisms.

Article Title

Dual-Function Oxygen-Vacancy-Rich $Zn_{0.98}Co_{0.02}O/GGAC/\gamma-Al_2O_3/CeO_2/\alpha-MoO_3$ Heterojunction with Minimal Metal Leaching for PMS-Driven 17 α -Ethinylestradiol Degradation and CO₂-to-CH₄ Conversion. (Impact Factor: 6.0)



This research was conducted by Farooq, U., Noor, H., Khan, M. E., Khan, F., Alfifi, F., Ali, S. K., and Khamaj, A., including Umar Farooq from the Department of Chemistry, School of Sciences (SSC), UMT. Published in the Journal of Industrial and Engineering Chemistry, the study introduces a novel catalytic heterojunction system designed for environmental remediation and energy conversion. The catalyst enables efficient degradation of environmental pollutants while simultaneously supporting carbon dioxide conversion processes, offering innovative solutions for sustainable environmental and energy technologies.





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