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02-day

# ‘International Conference on Multidisciplinary Research and Innovations in Engineering (MRIE- 2023)

(28<sup>th</sup> July 2023 – 29<sup>th</sup> July 2023)





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## ***A Brief Report***

On

International conference

of

Multidisciplinary Research and Innovations in Engineering

Organized by

**School of Engineering and Technology**

**K.R. MANGALAM UNIVERSITY**

Sohna Road, Gurugram

Venue : A 213

K.R MANGALAM University  
Gurugram, India



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## Preface and Acknowledgements:

On behalf of the School of Engineering and Technology, we welcome to the official conference report of the **International Conference of Multidisciplinary Research and Innovations in Engineering (MRIE2023)**. This report aims to provide a comprehensive overview of the significant events, research presentations, and key takeaways from the conference. MRIE-2023 was a remarkable gathering of researchers, scholars, industry experts, and professionals from diverse engineering disciplines and backgrounds. The conference served as a platform for sharing knowledge, exploring interdisciplinary collaborations, and promoting advancements in technology and sustainable development.

In this report, we have endeavored to capture the essence of the conference and its impact on the engineering community. From enlightening keynote addresses to thought-provoking research paper presentations, and engaging panel discussions, the conference offered a wealth of opportunities to learn, network, and grow both professionally and academically. Moreover, the report highlights the outcomes and potential implications of the conference, shedding light on how it contributed to the advancement of multidisciplinary research and innovation.

Our sincere gratitude goes out to all those who contributed to the success of MRIE-2023, including the organizing committee, the reviewers, the presenters, the ICT Academy, the Department of Defence (DRDO), Samatrix, Shyam Steels, and every individual who participated in the conference. The preparation and successful execution of MRIE-2023 would not have been possible without the collective efforts and support of numerous individuals and organizations. We extend our heartfelt appreciation to everyone who played a role in making this conference a resounding success.

First and foremost, we express our deepest gratitude to the esteemed keynote speakers who graciously shared their knowledge and expertise, setting the tone for the conference and inspiring all participants.



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We are immensely thankful to the research presenters for their valuable contributions, as they showcased the latest research findings and advancements in various engineering disciplines. Their dedication to producing high-quality research papers enriched the conference's academic content. The conference owes its success to the diligent efforts of the organizing committee, whose meticulous planning and execution ensured a seamless and enriching experience for all attendees. Our heartfelt appreciation goes to the reviewers and members of the scientific committee, who painstakingly assessed the submitted papers and provided constructive feedback to the authors, ensuring the selection of the most outstanding works for presentation.

We are also indebted to the generous sponsors DRDO, ICT Academy, and SAMATRIX whose support made it possible to organize this conference and offer numerous opportunities to participants.

Special thanks are extended to the participants who actively engaged in the discussions, workshops, and networking sessions, making the conference an intellectually stimulating and collaborative event.

*Lastly, we express our gratitude to K R Mangalam University for their warm hospitality and for providing a vibrant backdrop to the conference.*

On the whole, the success of MRIE-2023 would not have been possible without the dedication, enthusiasm, and collaboration of all involved parties. We look forward to continued engagement and further advancements in multidisciplinary research and engineering innovation in the future.

### **Convener-MRIE-2023**

***Dr. Vineet Dahiya (Associate Professor-EEE)***

***Dr. Shweta Bansal (Associate Professor-CSE)***

***C. No. (9354709157)***

***Dr. Surender Kumar Yadav (Associate Professor-M.E.)***

**K R Mangalam University, Gurugram**



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# Multidisciplinary Research and Innovations in Engineering-2023

The International Conference of Multidisciplinary Innovations and Research in Engineering (MRIE2023) had a primary objective of creating a global platform for researchers, academicians, industry experts, and professionals from various engineering disciplines. The conference aimed to encourage interdisciplinary collaboration and facilitate meaningful interactions among participants. By showcasing cutting-edge research, innovations, and developments in engineering, MRIE2023 aspired to serve as a repository of contemporary engineering knowledge and practices.

Emphasizing innovation, the conference sought to inspire creative thinking among attendees, encouraging them to explore novel approaches and solutions in their respective fields. Furthermore, MRIE-2023 focused on addressing global challenges, including climate change, sustainable development, energy efficiency, and urbanization, by examining the role of engineering in finding sustainable solutions to these pressing issues.

Promoting sustainability was a key aspect of the conference, with a strong emphasis on eco-friendly practices and the incorporation of sustainability principles in engineering designs and solutions. Through knowledge exchange, the conference aimed to foster a culture of sharing and learning, allowing participants to benefit from each other's experiences, methodologies, and best practices. A vital goal of MRIE2023 was to support young researchers and students, providing them with opportunities to present their work, interact with established professionals, and nurture the next generation of engineering talent. By bridging the gap between academia and industry, the conference aimed to facilitate collaborations that could lead to the practical application of research findings and the development of innovative engineering solutions in the real world.



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Furthermore, MRIE2023 aimed to facilitate the publication and dissemination of valuable research findings in prestigious journals and conference proceedings, contributing to the enrichment of the academic literature in engineering. The conference also fostered cultural exchange and networking, providing participants with a platform to build lasting connections that extended beyond the event itself, encouraging future collaborations and partnerships.

### **Theme/Topics of the conference:**

- Technology Innovation in Information Technology;
- Computer Engineering;
- Information Technology;
- Data mining & Data Science;
- Deep Learning technologies.
- Computer Networking;
- Cloud Computing.
- Block Chain;
- Artificial Intelligence;
- Soft Computing;
- Software & Systems Engineering;
- Computational Intelligence;
- Computer Vision and Machine Learning;
- Information Engineering;
- Technology Innovation in Electrical and Electronics;
- Robotics & IoT;
- Acoustical engineering;
- Manufacturing engineering;
- Thermal engineering;
- Vehicle engineering;
- Power plant engineering;
- Industrial plant engineering;
- Energy engineering;
- Power engineering;
- Optical engineering;
- Computational Biology;
- Biomolecular engineering;
- Materials engineering;
- Molecular engineering;
- Process engineering;
- Environmental engineering;



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- Geotechnical engineering;
- Structural engineering;
- Agriculture Engineering;
- Space Engineering;
- Applied Engineering;
- Biotechnology & Biomedical Engineering
- Nuclear Engineering;
- Textile Engineering;
- Social Engineering;
- Supply Chain Engineering;

### **Inaugural Function (Inaugural Address, and Keynote Sessions):**

#### ***International Conference of Multidisciplinary Innovations and Research in Engineering (MRIE2023) - Day 1***

The Inaugural Function of the **International Conference of Multidisciplinary Research and Innovations in Engineering (MRIE2023)** was a grand and momentous event that marked the commencement of this prestigious conference. Held on 28<sup>th</sup> July 2023 at A block- 213, the function brought together esteemed dignitaries, keynote speakers, organizers, researchers, and delegates to celebrate the spirit of innovation and collaboration in engineering.

The inaugural session of the International Conference of Multidisciplinary Innovations and Research in Engineering (MRIE2023) commenced at 10:00 AM with the Lamp Lightning ceremony, graced by the Guest of Honor, keynote speakers, the Vice Chancellor, and other esteemed members on the dais. The conference's program chair, Dr. Pankaj Agarwal, Dean of the School of Engineering and Technology (SOET), took the stage at 10:05 AM to provide an overview of the conference.

At 10:15 AM, Prof. C.S. Dubey, Vice Chancellor of K.R. Mangalam University, addressed the audience, sharing his vision for the conference and highlighting the importance of multidisciplinary research in engineering.



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**Launch of Conference Proceedings:** During the Inaugural Function, the official conference proceedings, containing all accepted papers, were launched and made available to all participants. This marked the formal beginning of the scientific sessions, where researchers presented their work and findings.

The inaugural function also provided an opportunity to recognize and express gratitude to the conference sponsors, whose generous support contributed to the success of MRIE-2023. The organizing committee members were acknowledged for their dedicated efforts in planning and executing the conference.

After the formal proceedings, participants engaged in a cultural exchange during a networking reception with high tea. Delegates from, the Department of Science and Technology (DRDO), IIT Delhi, Delhi University, and ICT Academy along with other organizations had the chance to interact, share experiences, and learn about each other's cultures, fostering a sense of camaraderie and international cooperation.

The conference then proceeded with a captivating session by Keynote Speaker Prof. B. Chandra, an Adjunct Professor at IIT Delhi. His topic, "Applications of Data Science," explored the diverse applications of data science across various fields, including healthcare, finance, and technology. After this enlightening session, the attendees had a short tea break to rejuvenate.

The keynote speaker, Prof. B. Chandra, Adjunct Professor at IIT Delhi, delivered a compelling session on the "Applications of Data Science." In her presentation, Prof. Chandra provided a comprehensive overview of the diverse and transformative applications of data science across various domains.

She began by elucidating the fundamental concepts of data science, including data collection, cleaning, analysis, and interpretation. Prof. Chandra highlighted the significance of data-driven decision-making and how data science techniques enable businesses and organizations to extract valuable insights from large datasets. Throughout the session, Prof. Chandra delved into real-world



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case studies and examples that demonstrated the broad spectrum of data science applications. She discussed how data science is revolutionizing industries such as healthcare, finance, marketing, and manufacturing. Moreover, he showcased the role of data science in addressing societal challenges, including urban planning, environmental conservation, and disaster management.

Prof. Chandra also emphasized the impact of data science in engineering and technological advancements. She discussed the integration of data science with emerging technologies such as artificial intelligence, the Internet of Things (IoT), and machine learning, showcasing how these interdisciplinary collaborations can lead to groundbreaking innovations.

The audience was captivated by Prof. Chandra's expertise and the practical insights she shared throughout the session. Attendees gained a deeper understanding of the vast potential of data science in driving evidence-based decision-making and enhancing various aspects of engineering and technology.

The session continued with an address by the Chief Guest, S.K Varshney, Adviser/Scientist G, representing the Department of Science & Technology, Government of India. Mr. Varshney's speech focused on the role of research and innovation in driving progress in the engineering domain.

The conference resumed with another compelling Keynote Session at 11:15 AM, featuring Prof. P.S. Grover, an esteemed ex-Head/Dean/Director of Delhi University and Director General of GGS Indraprastha University, Delhi. His talk focused on "Harnessing Artificial Intelligence for Multidisciplinary Research and Social Good," illustrating how AI can positively impact various research areas and contribute to societal well-being.

Dr. Shyam Sunder Agrawal Sir, the Director-General of KIIT College of Engineering, Gurgaon, who is a world-renowned scientist in the area of Acoustic Speech and Communication also delivered an enlightening session on Natural Language Processing (NLP). In his presentation, Dr.



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Agarwal explored the field of NLP, which focuses on enabling computers to understand, interpret, and generate human language.

He began by providing an overview of the foundational concepts in NLP, including text processing, linguistic analysis, and language modeling. Dr. Sunder then delved into the various applications of NLP, ranging from sentiment analysis and language translation to chatbots and voice assistants. Throughout the session, Dr. S.S. Agarwal showcased state-of-the-art NLP techniques and discussed their practical implementations in different industries. He highlighted the challenges and opportunities in NLP research and how it can revolutionize communication and interaction between humans and machines.

The audience was captivated by Dr. Sunder's expertise and enthusiasm, as he demonstrated the potential of NLP to transform industries, such as healthcare, finance, and customer service. His session left attendees with a deeper understanding of NLP's significance in advancing engineering and technology, and it inspired them to explore its potential applications in their own research and projects.

The technical sessions commenced at around 12:00 and extended until 1:30 PM, providing a platform for researchers to present their papers and share their findings with the audience. Following the intellectually stimulating sessions, participants enjoyed a well-deserved lunch break from 1:30 PM to 2:00 PM. The conference reconvened with Technical Session II from 2:00 PM to 4:00 PM, continuing the exploration of cutting-edge research and innovations in engineering. Scholars and experts from various disciplines shared their work, fostering collaboration and knowledge exchange among the attendees. On the first day, 15 research papers were presented online and offline.



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## ***International Conference of Multidisciplinary Innovations and Research in Engineering (MRIE2023) - Day 2***

The second day of the International Conference of Multidisciplinary Innovations and Research in Engineering (MRIE2023) commenced with great enthusiasm and anticipation. The morning began with a highly anticipated session by the esteemed keynote speaker, Prof. Dr. Lawrence Wasserman from Fortech International Ltd, USA. The session, titled "Principles of Managing Innovation in Your Organization," took place from 9:30 AM to 10:00 AM. Prof. Wasserman shared his insights and expertise on effectively managing innovation within organizations, providing valuable strategies and principles for fostering a culture of innovation.

Following the engaging keynote session, attendees took a short tea break at 10:00 AM, providing an opportunity for networking and discussions. Energized and inspired, participants then proceeded to Technical Session-III, which began at 10:15 AM and extended until 12:30 PM. This session featured presentations from researchers and scholars across various engineering disciplines. They showcased their latest research findings and innovations, fostering knowledge exchange and stimulating intellectual discussions.

The conference paused for a lunch break from 1:00 PM to 1:30 PM, during which participants had the chance to interact informally and forge new connections with fellow researchers and professionals. The vibrant atmosphere of the conference venue facilitated meaningful discussions and collaborations during the break.

The afternoon resumed with Technical Session-IV at 1:30 PM, continuing the exploration of cutting-edge research and advancements in engineering. Scholars and experts presented more than 25 papers on a diverse range of topics, reflecting the interdisciplinary nature of the conference.

The highlight of the day was the much-anticipated Valedictory Session, which took place from 2:45 PM to 3:15 PM. This session marked the conclusion of the conference and provided an opportunity to acknowledge and celebrate the contributions of all participants. The conference



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organizers, along with distinguished guests, delivered closing remarks, expressing their gratitude to the keynote speakers, presenters, attendees, and sponsors for their invaluable support and participation.

The Valedictory Session also featured the recognition and presentation of awards to outstanding researchers and presenters for their exceptional contributions. The awards ceremony added a sense of accomplishment and inspiration, motivating researchers to continue their pursuit of excellence in their respective fields.

As the Valedictory Session drew to a close, participants left with a sense of fulfillment and enriched knowledge gained from the two-day conference. The event successfully achieved its objectives of promoting multidisciplinary research, encouraging innovation, and fostering collaboration among researchers and professionals from across the globe.

Attendees departed with renewed enthusiasm, eager to apply the learnings and insights gained from MRIE2023 in their future research endeavors and engineering practices. The conference's impact would undoubtedly extend far beyond its conclusion, leaving a lasting legacy in the field of engineering and inspiring further advancements in the years to come.

### **Recommendations for the International Conference of Multidisciplinary Innovations and Research in Engineering (MRIE2023):**

*Continued Emphasis on Multidisciplinary Research:* The conference should continue to prioritize and encourage multidisciplinary research. This approach fosters innovative solutions and allows researchers to explore new avenues for tackling complex global challenges.

*Diversity and Inclusivity:* The organizing committee should strive to promote diversity and inclusivity in all aspects of the conference, including speakers, presenters, and attendees. Encouraging participation from underrepresented groups and regions can enrich the conference experience and facilitate a broader exchange of ideas.



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*Interactive Workshops and Tutorials:* Expand the offering of hands-on workshops and tutorials on emerging technologies and methodologies. These interactive sessions provide valuable practical knowledge to attendees and foster a deeper understanding of cutting-edge tools.

*Industry-Academia Collaboration:* Strengthen the collaboration between academia and industry by incorporating industry experts as keynote speakers and offering panel discussions on bridging the gap between research and practical applications.

*Student Participation and Support:* Create specific opportunities for students to showcase their research and participate actively in the conference. Offer scholarships or reduced registration fees to attract and support student researchers.

*Special Tracks and Sessions:* Introduce special tracks or sessions dedicated to specific trending topics in engineering and technology. This approach will allow in-depth discussions and presentations on emerging research areas.

*Publication Opportunities:* Strengthen partnerships with reputed journals and publishers to ensure high-quality publication opportunities for selected conference papers. Encourage presenters to submit extended versions of their work for review and publication.

*Virtual Participation:* Continue to offer virtual participation options for those unable to attend in person. This inclusionary approach allows a broader global audience to engage with the conference.

*Sustainability Practices:* Implement sustainable practices in conference organization, such as reducing paper usage, promoting eco-friendly event venues, and encouraging attendees to adopt sustainable travel options.

*Post-Conference Networking and Collaboration:* Facilitate post-conference networking and collaboration opportunities through online platforms or forums. This will enable attendees to stay connected, share ongoing research, and initiate joint projects.



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In conclusion, the International Conference of Multidisciplinary Innovations and Research in Engineering (MRIE2023) was a resounding success, bringing together brilliant minds from diverse engineering disciplines to share knowledge, insights, and breakthroughs. The conference served as a melting pot of ideas, sparking collaborations that transcend borders and disciplines. The sessions by esteemed keynote speakers, thought-provoking technical presentations, and interactive workshops showcased the latest advancements in engineering and technology.

We extend our heartfelt gratitude to all participants, speakers, presenters, and sponsors for their valuable contributions in making MRIE2023 a memorable and enriching event. The passion for innovation and commitment to sustainable development displayed by the attendees exemplify the spirit of engineering excellence.

As we bid farewell to this edition of MRIE, we look forward to the continued growth of multidisciplinary research, fostering a better and more interconnected world through engineering ingenuity. May the knowledge gained and connections made during this conference continue to drive positive change and inspire impactful solutions for the challenges that lie ahead.

Until we meet again at the next MRIE conference, let us carry the spirit of collaboration and innovation with us on our respective journeys, united in our pursuit of a brighter and sustainable future through engineering innovation.

### **Some of the memorable moments from MRIE\_2023**



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Figure 1 Dry Run for MRIE2023 on 27 July 2023



Figure 2 Pre Conference Preparations 28 July 2023



Figure 3 Dr Pankaj Agarwal (DEAN SOET) Addressing the Audience



Figure 4 VC Sir Addressing the Audience



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Figure 5 Dr Pankaj Agarwal presenting a token of respect to P. S Grover Sir



Figure 6 Dr Shweta Bansal presenting a token of respect to B Chandra Ma'am



Figure 7 Dr. C. S. Dubey (VC K R MANGALAM UNIVERSITY) presenting a token of respect to S. Varshney Sir



Figure 8 Varshney Sir's Session



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**Figure 9 Diya Lighting**



**Figure 10 Launch of conference Proceedings**



**Figure 11 Dr Shyam Sunder Sir with attendees**



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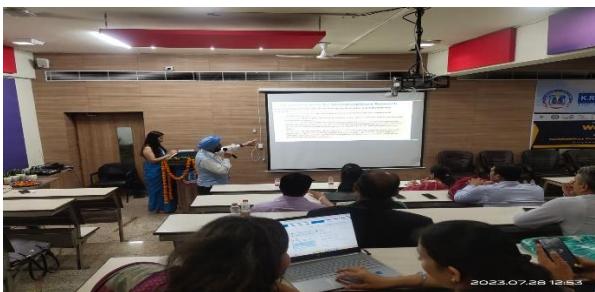


Figure 12 Session by P S Grover sir



Figure 13 High Tea



Figure 14 valedictory Session



Figure 15 conference proceedings MRIE2023



Figure 16 valedictory Session



Figure 17 valedictory Session



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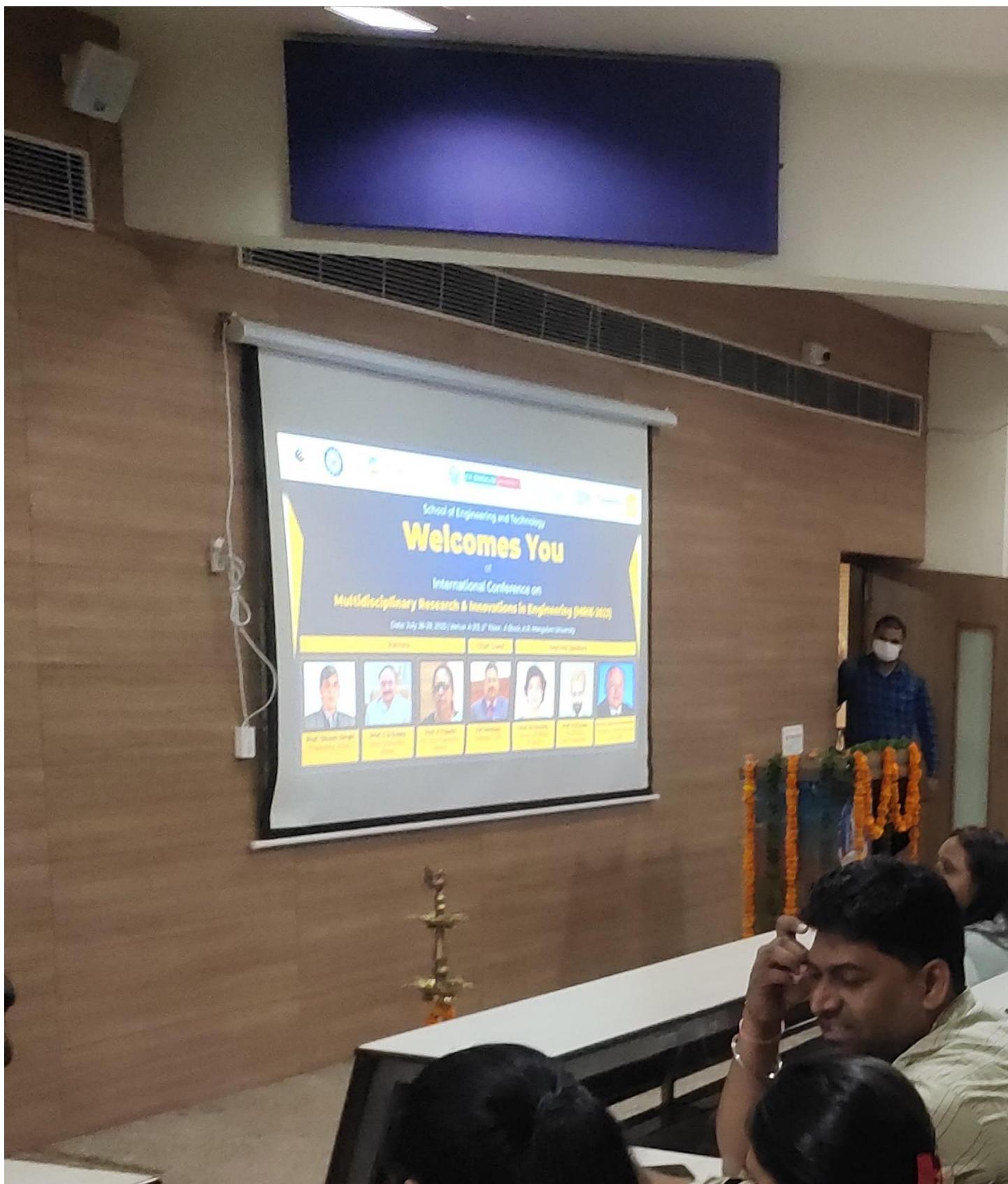




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