



# 7<sup>th</sup> Regional Science & Technology Congress, 2025

*Region: 6*

*Organized by*  
Presidency University, Kolkata  
*In collaboration with*  
Department of Science and Technology and Biotechnology,  
Government of West Bengal

## **Abstract Volume**

**17th - 18th January 2025**

## 7<sup>TH</sup> REGIONAL SCIENCE & TECHNOLOGY CONGRESS, 2025

### MESSAGE FROM MIC

উজ্জল বিশ্বাস  
(ভারপ্রাপ্ত মন্ত্রী)  
বিজ্ঞান ও প্রযুক্তি এবং জৈবপ্রযুক্তি দপ্তর  
পশ্চিমবঙ্গ সরকার  
বিজ্ঞান চৈতন্য ভবন  
২৬/বি, ডিডি লেক, সেক্টর - ১, সল্টলেক  
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MESSAGE

Department of Science & Technology and Biotechnology, Government of West Bengal organises West Bengal State Science and Technology Congress to provide a forum for Scientific Research especially for young scientists and to synergise new ideas with societal needs. State level programme will be participated by the best participants of six Regional Science & Technology Congresses to be held across the State in collaboration with various colleges and universities as a precursor of the programme.

Presidency University, Kolkata has taken a leading responsibility for hoisting the 7<sup>th</sup> Regional Science and Technology Congress, Region-6 on 17<sup>th</sup> and 18<sup>th</sup> January, 2025. I would also extend my heartfelt gratitude to the organisers.

I take this opportunity to welcome all the participants to 7<sup>th</sup> Regional Science & Technology Congress to be held at Presidency University, Kolkata and wish the event a resounding success.

  
(Ujjal Biswas) S  
Minister-in-Charge  
Department of Science & Technology  
and Biotechnology  
Government of West Bengal

To,

Dr. Soumendu Chatterjee, Professor  
Nodal Officer, 7th Regional Science and Technology Congress  
Region 6 (KMC area)  
Presidency University, Kolkata

## SPECIAL LECTURES

### Keynote Address

**Title of the Talk : Why Some Scientists Believe the Future of Medicine Lies in Creating Digital Twins?**

**Professor Peter Coveney**

*Professor of Physical Chemistry*

*University College London*

*United Kingdom*

### Prof. P.C. Mahalanobis Memorial Lecture

**Title of the Talk : A tribute to the father of Indian Statistics: Prof. Prasanta Chandra**

**Mahalanobis**

**Professor Syamal Roy**

*ICMR Emeritus Scientist*

*Infectious Diseases and Immunology*

*CSIR- Indian Institute of Chemical Biology, Kolkata*

### Sir J. C. Bose Memorial Lecture

**Title of the Talk : We Came Out And Saw That We Were Not Alone. And When?**

**Professor Partha Pratim Majumder**

*National Science Chair, Govt. of India &*

*Distinguished Professor and Founding Director National Institute of Biomedical Genomics, Kalyani*

### Sir C. V. Raman Memorial Lecture

**Title of the Talk : Malaria, a re-emerging threats: need for the identification of new antimalarial drug target and drug**

**Professor Uday Bandyopadhyay**

*J C Bose National Fellow and Former Director*

*Bose Institute, Kolkata*

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## DEW ENABLED UAV BASED PRECISION AGRICULTURE FOR CROP MONITORING & MANAGEMENT

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The agricultural sector is shifting towards cutting-edge technologies to meet the difficulties of rising global food demand, resource scarcity, and environmental sustainability. As a game-changing solution, precision agriculture uses technological breakthroughs to improve farming methods and increase sustainability. This paper proposes UAV-based intelligent precision agriculture, a novel framework that combines machine learning, image processing, and the Internet of Things (IoT) for sensing and performing crop recommendations. Dew nodes are embedded with sensors to measure soil temperature, pH, nitrogen, phosphorus, potassium (NPK), and moisture levels. Data is assembled from dew nodes by UAV fitted with Raspberry Pi units, which allow data to be transmitted wirelessly to an IoT platform without constant internet connectivity. Based on soil and ecological information, ensemble machine learning models predict the best crop varieties with 98.82% accuracy. The system automates irrigation based on real-time soil moisture readings, ensuring optimal water usage, which improves farming and solves the agricultural system's water crisis by minimising water waste.

Additionally, a YOLO v9 model allows for the real-time detection of pests, weeds, and plant diseases from crop photos captured by dew node cameras, allowing for early intervention. The proposed paper enriches decision-making with valuable insights, encourages sustainable farming practices, and improves resource efficiency. Experimental results demonstrate the value of the proposed research, with 95.10% accuracy in detecting plant diseases, 99.4% in detecting pests, and 86.8% in detecting weeds. As a result, farmers are given access to adaptive management techniques, agricultural output rises, and environmental impact is reduced.

