

# Kaushal Kishore Memorial Award Lectures 2025

## AWARD LECTURE 1

### Smart Polymeric Surfaces with Rewritable and Liquid-Selective Wettability

by

**Prof. Uttam Manna**  
IIT, Guwahati, India

Date: December 16, 2025 | Time: 9.40 am

Venue : MACRO-2025 at Staudinger Hall  
IIT Kharagpur Research Park, Newtown, Kolkata

## AWARD LECTURE 2

### Facile Photopolymerization Towards Smart Injectable Ink for 3D Printing Applications

by

**Prof. Sanjib Banerjee**  
IIT Bhubaneswar, India

Date: December 16, 2025 | Time: 10.10 am

Venue : MACRO-2025 at Staudinger Hall  
IIT Kharagpur Research Park, Newtown, Kolkata

Organized by:



The Society for Polymer Science, India

## AWARD LECTURE 1

### Abstract

The nature-inspired wettabilities that either extremely repelled or allowed effortless sliding of different liquids (oil/water) in air or underwater are with immense potential for various prospective applications. In common practice, essential chemistry and appropriate topography that conferred the special liquid wettabilities were mostly and generally achieved by associating delicate chemistry. Eventually, the synthesized materials suffered from poor durability issues. In the literature, very few designs are capable of providing durable bio-inspired wettability—but fabrication processes remain generally complex. Moreover, the integration of various other relevant physical properties with such durable liquid wettability is highly challenging to achieve. Hence, design of robust bio-inspired liquid wettability following a simple fabrication process that would allow to integrate different and relevant physical properties is utmost important for various fundamental and applied contexts. Related to this, recently, our research group has extended 1,4-conjugate addition reactions between amine and acrylates at ambient conditions for systematic and orthogonal tailoring of topography and surface free energy to derive a range of functional materials embedded with a wide range of bio-inspired wettability having immense potential in a wide range of applications related to environment, health and energy.<sup>1,10</sup> In this lecture, I will reveal fundamental parameters that control slippery property on solid surface and strategy for developing smart polymeric surfaces with rewritable and liquid-selective wettability.<sup>2</sup>

### References:

- Chittaranjan Mishra, Debasmita Sarkar, Nishanta Barman, Saurav Kumar, Mizuki Tenjimbayashi\* and Uttam Manna\*, "Modulating Coalescence Timing of Liquid Marbles via Wettability Adaptation" *Advanced Materials*, 2025, 2420342.
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### About the speaker

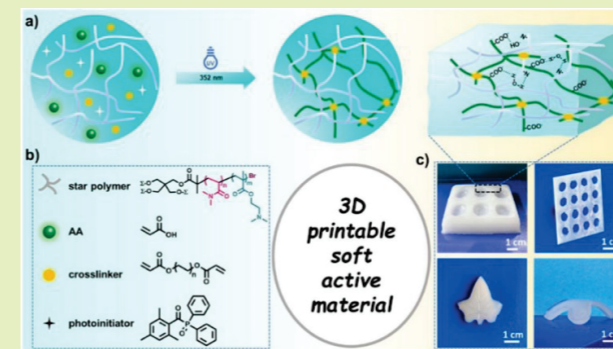
Dr. Uttam Manna is a Professor in the Department of Chemistry and the Centre for Nanotechnology at the Indian Institute of Technology Guwahati, where he leads the Bio-Inspired Polymeric Materials Laboratory. His research centers on the design of nature-inspired polymeric materials and functional surfaces, particularly in the areas of liquid wettability control, smart and durable polymer coatings, and interfacial materials for applications in energy, environment, and healthcare. He has made notable contributions to super-repellent and slippery surfaces, oil–water separation, water harvesting, and advanced functional coatings. Dr. Manna's work has received wide recognition, earning him several prestigious honors including the CRSI Bronze Medal, INSA Young Scientist Award, Humboldt Research Fellowship, and fellowship of the Royal Society of Chemistry (FRSC), highlighting his impact in polymer and materials science at both national and international levels.



## AWARD LECTURE 2

### Abstract

Current advanced 3D printing necessitates functional inks capable of rapid, mild fabrication. On the other hand, photopolymerization-based strategies offer a versatile platform for designing advanced materials with precise spatiotemporal control. We introduce a facile photopolymerization strategy for synthesizing novel smart injectable inks, overcoming limitations of conventional materials. The formulated inks exhibit rapid photo-crosslinking, shear-thinning behavior, and tunable mechanical properties, enabling high-resolution printing with structural fidelity. Moreover, the system demonstrates responsiveness to external stimuli, broadening its utility in biomedical scaffolds, soft electronics, and personalized devices. This approach provides a scalable and sustainable pathway to next-generation printable materials, bridging the gap between functional design and practical applications in additive manufacturing.



### References:

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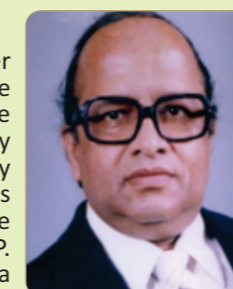
### About the speaker

Sanjib Banerjee is an Associate Professor in the Department of Chemistry, IIT Bhubaneswar. He received his MSc degree in Organic Chemistry at the University of Calcutta (India), PhD in Polymer Chemistry at Indian Association for the Cultivation of Science and postdoctoral training at the University of Massachusetts Lowell (2013-2015) and University of Montpellier II (Ecole Nationale Supérieure de Chimie de Montpellier), France (2015-2016). After a brief stay at Solvay Research & Innovation Centre, Vadodara, India and CSIR-NIIST, Thiruvananthapuram, India, he moved to IIT Bhubaneswar where he worked as Assistant Professor from 2017-2021. He is the recipient of numerous awards, including SERB-Ramanujan Fellowship-2016, SERB-Early Career Research Award-2019, RSC-Molecular Systems Design & Engineering Outstanding Reviewer 2019, RSC-Polymer Chemistry Emerging Investigator-2020, Wiley-Next Generation of Polymer Researchers-2022, Chemical Research Society of India (CRSI)-Bronze Medal for the year 2024, RSC-Polymer Chemistry Pioneering Investigators-2025. He is currently serving as an Editor of Elsevier-Materials Today Communications journal.



### About Professor Kaushal Kishore

Kaushal Kishore was one of the outstanding Polymer Scientists of our country. He was a professor at the department of Inorganic and Physical Chemistry at the Indian Institute of Science, Bangalore, till his untimely demise in 1999 at the age of 56. Kishore received his early education in chemistry from Lucknow University and his Ph.D. from the Gorakhpur University under the guidance of the distinguished physical chemist, Professor R. P. Rastogi. After a brief stint at Gorakhpur University as a lecturer, he moved to the Department of Inorganic and Physical Chemistry, at the Indian Institute of Science, as an Assistant Professor in 1974; he rose through the academic ladder to become a



full professor in 1984 and served as the head of the department during the years 1994-1998.

Kishore's formal training was in thermodynamics and combustion chemistry. His early work in collaboration with scientists at ISRO and DRDO led to several novel discoveries that shed light on the role of different components in solid propellants; one of the very significant findings was that the polymeric binders generated polyperoxides during aging and combustion, which in turn accelerated the combustion process. With this insight, he soon discovered a unique phenomenon that he termed "autopyrolysis", which catapulted him into fame. He contributed immensely to the field of polyperoxides, both in terms of understanding its formation and exploiting their potential for a variety of applications. Thus, in his early work, he brought to bear upon the phenomenon of combustion his deep understanding of chemical thermodynamics to formulate, quantify and provide a detailed mechanistic insight into this incredibly complex process. His early work on combustion steered him to several other important problems, namely flame retardancy, which led him to define a new dimensionless quantity he termed "Flammability Index", design of new additives that would retard/inhibit the flammability of polymeric materials, probing the molecular underpinnings of "plasticization", with a primary focus on the effect of molecular architecture on plasticizing efficacy. During his last years he studied a broad class of polymers he termed "weak-link" polymers; these were analogous to polyperoxides, such as polydisulfides and polyselenides; his main interest was to understand the degradation mechanism of these weak link polymers.

Kishore's work was always characterized by its ingenuity, depth and simplicity of analysis. He saw science in everything and had a strong conviction and motivation to understand all phenomena he observed at the microscopic and, if possible, at a molecular level. His solid foundation in chemical thermodynamics brought to polymer chemistry a much-needed "thermodynamic bias" – a term he often used to characterize his work. Using numerous tools, starting from thermal analytical methods, rheological measurements, NMR and computational methods, he attacked problems with passion and a characteristic zeal – which often culminated in nailing the issue on the head. His students and coworkers remember him with great fondness – for he was not only their research guide but also their friend and a confidant.

Recognition for his achievements came in many forms. Professor Kishore was awarded the Bhatnagar prize in 1988, was elected to the Fellowship of the Indian Academy of Sciences in 1991 and later to that of the Indian National Science Academy in 1999. Kishore served on several important decision-making bodies in the country – various assessment committees, research councils of national laboratories and in many others.

### About Kaushal Kishore Memorial Award

The Kaushal Kishore Memorial Award was instituted in 2014 to recognize young outstanding polymer scientists of our country who have made outstanding research contributions and have demonstrated the potential to become global leaders in their chosen fields of research. The corpus fund for this award was donated to the Society for Polymer Science (India) after the successful conduct of the FAPS-MACRO 2013 conference in Bangalore. The award is open to researchers, under 45 years of age, who are working in India and will be awarded biannually during the MACRO conference held under the auspices of SPSI. The award will carry a cash prize of Rs 100,000, along with a citation.

### Prof. K. Kishore Memorial Award Winners of The Society for Polymer Science, India

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|------|--|
| 2014 | 1) Dr. M. Jayakannan, IISER, Pune            |
|      | 2) Dr. Satish A. Patil, IISc, Bangalore      |
| 2017 | 1) Prof. Suhrit Ghosh, IACS, Kolkata         |
|      | 2) Prof. Rabibrata Mukherjee, IIT, Kharagpur |
| 2018 | 1) Dr. E. Bhoje Gowd, CSIR NIIST, Trivandrum |
|      | 2) Prof. Priyadarsi De, IISER, Kolkata       |
| 2020 | 1) Dr. Samir H. Chikkali, CSIR-NCL, Pune     |
|      | 2) Prof. Suryasarathi Bose, IISc, Bangalore  |
| 2023 | 1) Prof. Leena Nebhani, IIT Delhi, New Delhi |
|      | 2) Prof. Ashish Pal, INST, Mohali            |