भारतीय प्रौद्योगिकी संस्थान खड़गपुर

INDIAN INSTITUTE OF TECHNOLOGY KHARAGPUR

ভারতীয় প্রযুক্তিবিদ্যা প্রতিষ্ঠান খড়গপুর

राष्ट्र सेवार्थ समर्पित

DEDICATED TO THE SERVICE OF THE NATION

1951

PLATINUM JUBILEE NATIONAL CONFERENCE ON

ADVANCED CATALYSIS FOR SUSTAINABLE CHEMICAL MANUFACTURING (ACSCM 2027)

From Atomic Precision to Industrial Application

16–17 FEBRUARY 2027



Atomic Design



Green Processes



Industrial Scale

ORGANISED BY

Department of Chemical Engineering

Indian Institute of Technology Kharagpur

Venue: S. N. Bose Auditorium, IIT Kharagpur

West Bengal, India

DISCOVER | DESIGN | DELIVER

HOST INSTITUTION

About IIT Kharagpur

Established in 1951 as India's first IIT, the **Indian Institute of Technology Kharagpur** is a premier centre of technological education, pioneering research, and interdisciplinary innovation. With a rich legacy of academic excellence and a vision for global impact, the Institute advances scientific discovery and nurtures future technology leaders. Its distinguished faculty, state-of-the-art characterization and pilot infrastructure, and strong industrial partnerships foster cross-disciplinary collaboration—translating fundamental knowledge into technological breakthroughs and scalable solutions for national and global challenges.

Catalysis Ecosystem at IIT KGP: With **more than 20 faculty members** actively engaged in catalysis research across Chemical Engineering, Chemistry, Energy, and Materials Science, IIT Kharagpur possesses a vibrant research ecosystem driving sustainable manufacturing, clean energy, and environmental remediation.

Why Join Us? — Key Objectives

01. Connect with Global Experts & Industry Leaders

02. Aims to Bridge the Gap between Lab-to-Plant



03. Explore AI & Digitalization in Catalysis

04. Accelerate the Net-Zero & Circular Economy Transition

05. Build Collaborations & Drive Sustainable Innovation

RATIONALE & STRATEGIC VISION

About the Conference (ACSCM 2027)

Advanced Catalysis for Sustainable Chemical Manufacturing (ACSCM 2027) brings together leading academic researchers, industrial experts, national laboratories, policymakers, startups, and young scientists working across catalysis, sustainable chemical transformations, reactor engineering, and digitalization.

Why Now? More than 85–90% of industrial chemical processes rely on catalysts, making catalysis an essential pillar for India's transition toward decarbonization, green hydrogen infrastructure, CO_2 utilization, biomass valorization, and circular carbon technologies. This conference is organized as a dedicated national catalysis conference at IIT Kharagpur after nearly two decades; ***ACSCM 2027 revitalizes the Institute's national leadership in catalytic science and engineering***.

Aims to bridge the lab-to-industry gap by addressing challenges in catalyst stability, reactor integration, scale-up, and techno-economic feasibility.

Who Should Attend?

Target Participants Across the Ecosystem:

Academicians & Faculty	Industry & R&D Experts	Scholars & Startups
Leading investigators in catalysis & chemical engineering	Refining, petrochemicals, green energy & process technologists	Ph.D./M.Tech. scholars, postdocs, deep-tech startups & policymakers

Conference Reach

Target Audience : 200+	Branding Across Different Platforms	Expected social imprints: 20,000+

SCIENTIFIC & TECHNOLOGICAL TRACKS

Major Thematic Areas

THEME 01 • ATOMIC PRECISION

Molecular-Level Design of Heterogeneous Catalysts

Focus on designing catalysts at the molecular level with tailored active sites

- ✓ Active Site Engineering & Single-Atom Catalysts (SACs)
- ✓ Surface Science & Adsorption Phenomena
- ✓ Structure–Activity–Selectivity Relationships
- ✓ *In Situ* & *Operando* Spectroscopy, DFT & Multiscale Modelling for Catalyst Design



THEME 03 • INDUSTRIAL TRANSLATION

From Laboratory Discovery to Industrial Deployment

Bridging the critical translation gap between academic discovery and commercial plants:

- ✓ Catalyst Scale-Up & Pilot Plant Validation:
- ✓ Reactor–Catalyst Integration & Reactor Design
- ✓ Kinetics & Transport Limitations in Industrial Systems
- ✓ Process Intensification & Modular Reactors
- ✓ Techno-Economic Analysis (TEA) & Life-Cycle Assessment (LCA

THEME 02 • HETEROGENEOUS & HOMOGENEOUS GREEN CATALYSIS

Catalysis for Sustainable Chemical Transformations

Encompassing both Heterogeneous and Homogeneous catalytic pathways for environmentally friendly chemical processes:

- ✓ CO_2 Utilization & Hydrogenation
- ✓ Biomass Valorization & Waste-to-Chemicals
- ✓ Plastic Upcycling & Circular Carbon Economy
- ✓ Green Hydrogen & Power-to-X Technologies
- ✓ Low-Carbon Ammonia & Methanol Synthesis
- ✓ Liquid Organic Hydrogen Carriers (LOHC) & Chemical Looping
- ✓ Plasma Catalysis & Alkane Valorization

THEME 04 • NEXT-GEN COMPUTATION & AUTOMATION

Digitalization & Artificial Intelligence in Catalysis

Exploring the transformative role of AI, machine learning, and digital tools across catalysis research:

- ✓ Data-Driven Catalyst Discovery: Mining
- ✓ Machine Learning for Catalyst Screening:
- ✓ High-Throughput Experimentation
- ✓ Digital Twins for Catalytic Reactor
- ✓ Real-time process monitoring, hybrid physics–ML reactor models, and predictive maintenance.

Program Description & Conference Structure

Plenary & Keynote Lectures

- 3 Plenary Speakers & 14 Keynote Speakers from premier Institutes & industry

High-Level Panel Discussion

- Strategic Panel Discussion on lab-to-plant translation

Technical Sessions

- 4 Sessions featuring 20+ Presentation



Dedicated Poster Session

- 1 Interactive Poster Session for Ph.D./M.Tech. scholars & young scientists

Connect with Global Pioneers, Engage with Industry Leaders, and Build Lasting Professional Networks.

AT A GLANCE

Proposed Conference Structure

Parameter	ACSCM 2027 Specification
Conference Dates	16–17 February 2027
Conference Venue	S. N. Bose Auditorium, IIT Kharagpur
Session Format	4 Technical Sessions, 1 Poster Session & 1 Panel Discussion
Featured Speakers	3 Plenary Speakers, 14 Keynote Speakers
Participants	✓ Faculty members ✓ industrial researchers ✓ Scientists, startups ✓ Research scholars & students (UG/PG)

DELIVERABLES & VISION



Expected Outcomes & National Impact

ACSCM 2027 is designed to

- ✓ Strengthened Academia–Industry Partnerships
- ✓ Joint National R&D Proposals.
- ✓ Centralized Catalysis Characterization Facility
- ✓ Talent & Career Development

IMPORTANT DATES:

Abstract Submission Opens on: 25th Nov 2026
Abstract submission Closes on: 20th Dec 2026
Abstract Acceptance Notification: 30th Dec 2026
Registration Opens on : 25th Nov 2026

Organizing Committee

Patrons

Prof. Narayan Chandra Pradhan
Prof. Sirshendu De

Technical Advisory

Prof. Sudipto Chakraborty
Prof. Madhusudan Sau
Prof. Sonali Sengupta
Prof. Rabibrata Mukherjee

Faculty Conveners

Dr. Koustuv Ray | Dr.. Nikita Dewangan | Dr. Bhaskar Bhaduri |Dr. Ananta Kumar Sarkar | Dr. Suverna Trivedi| Dr. Sudip Das | Dr. Namrata D. Gaikwad| Dr.Nikita Saxena

Registration Link: https://erp.iitkgp.ac.in/CEP/courses.htm

Registration Fees:

INR 4000 for Faculty/Academicians /Post Docs
INR 1534 for students (UG/PG/RS)
INR 8000 for Industry

Steps to register: Click on above link → Login → search ADVANCED CATALYSIS FOR SUSTAINABLE CHEMICAL MANUFACTURING (left bottom corner) → choose program → fill details → REGISTER → APPROVAL → pay fees