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PROFESSIONAL EXPERIENCE

Designation	Year	Department	Institution
Assistant Professor	December 2018 - Present	Chemical Engineering	IIT Kharagpur
Project Engineer	August 2018 - November 2018	Chemical Engineering	IIT Kanpur

EDUCATION

Degree	Specialization	Year	Institution	CGPA
Doctor of Philosophy	Heterogeneous Catalysis, Density Functional Theory	July 2013 - June 2018	IIT Kanpur	10.00
Master of Technology	Chemical Engineering	July 2011 - May 2013	IIT Kanpur	10.00
Bachelor of Engineering	Chemical Engineering	July 2007 – May 2011	Jadavpur University	9.09

TEACHING RESPONSIBILITIES

Subject as Instructor	Chemical Reaction Engineering, Petroleum Refinery Engineering, Computer Aided Process Engineering
Subject as Tutor	Engineering Thermodynamics (NPTEL)
Laboratory as Instructor	Fuel, Fluid Flow, Process Equipment Design, Reaction Engineering

RESEARCH STUDENTS' GUIDANCE

Curriculum	Number	Graduated	On-going
Postdoctoral fellow	1	-	1
Doctor of Philosophy	5	0	5 (two are PMRF)
Master of Technology	18	16	2
Bachelor of Technology 5 Yr	16	15	1
Bachelor of Technology 4 Yr	13	11	2

RESEARCH INTERESTS
Heterogeneous catalysis, DFT and Machine Learning in catalysis, Process modelling and simulation

ACADEMIC ACHIEVEMENTS
PROJECTS as PI/Co-PI

1. Title: Development of low temperature, stable and active catalysts for Sabatier Reaction by benchmarking to Ru/γ-Al2O3, Total Cost – 24.24 Lakhs, Sponsor: ISRO, Department of Space, Government of India *(July 2025 – June 2027,* Status - *Running)*, **Role: PI**

2. Title: Advanced mechanistic understanding to enable low pressure methanol synthesis catalysis from CO_2 hydrogenation combining in-situ experiments, computations, and fixed bed reactor model, Total Cost – 82 Lakhs, Sponsor: ANRF-DST, Government of India *(Submitted – July 2025),* **Role: PI**

3. Title: Integrating Biotechnological interventions to capture and utilization of CO2 from biogas: Harnessing Algal Cultivation, photocatalytic CO2 conversion to mixed alcohol, Total Cost – 149

Lakhs, Sponsor: DBT-BIRAC, Government of India *(Submitted – April 2025, Status – Under review),* **Role: Co-PI**

4. Title: Enhancing algal productivity and CO_2 sequestration via CRISPR-mediated carbonic anhydrase knockout and optimized cultivation strategies to surpass biomass accumulation limits, Total Cost – 150 Lakhs, Sponsor: DBT, Government of India *(Submitted – March 2025, Status – Under review),* **Role: Co-PI**

5. Title: Synthesis, Characterization and ab-initio modelling of nutrient loaded biochar for soil and wastewater application, Total Cost – 39 Lakhs, Sponsor: DST, Government of India *(Submitted - July 2024, Status – Under review),* **Role: Co-PI**

6. Title: Biogas conversion to produce C_2 hydrocarbons – CO_2 Oxidative coupling of Methane over basic oxide catalyst, Total Cost – 57 Lakhs, Sponsor: MNRE, Government of India *(Submitted - July 2022, Status – Under review),* **Role: Co-PI**

7. Title: Development of SiO_2 supported Fe catalyst for CO_2 methanation: A combined investigation using DRIFTS and DFT, (2020-2022), Total Cost – 33 Lakhs, Sponsor: SERB, Department of Science and Technology, Government of India (December 2020 – November 2022, Status - *Completed*), **Role: PI**

8. Title: Development of efficient catalyst using transition metals for CO2 hydrogenation, (2019-2022), Total Cost - 28 Lakhs, Sponsor: SRIC, IIT Kharagpur (October 2019 – September 2022, Status - *Completed*), **Role: PI**

SCIENTIFIC & INDUSTRIAL COLLABORATION

Memorandum of Understanding (MoU) was established with Prof. (Dr.) Manju D Tanwar, Chief Scientist and Head R&D, Organic Recycling Systems Limited, Navi Mumbai, and Prof. Koustuv Ray, Department of Chemical Engineering, IIT Kharagpur, April 2025 – March 2030.

Memorandum of Understanding (MoU) was established with Professor Dr.-Ing. Robert Güttel, Institute of Chemical Engineering, Ulm University, Germany and Prof. Koustuv Ray, Department of Chemical Engineering, IIT Kharagpur, January, 2023 – December 2027.

LIST OF PUBLICATIONS:

1. *"Green graphitic-carbon bridged Ag2S/g-C3N4 S-scheme photocatalyst for tetracycline degradation in water with antimicrobial activity: From synthesis to commercialization prospect",* P A Taksal, S Arasavilli, B K Das, **K Ray**, S Chowdhury, J Bhattacharya; *Separation and Purification Technology*, *361(3) (2025), 131610*.

2. *"Enhanced visible light photocatalytic degradation of oxytetracycline through sugarcane bagasse biochar supported layered WS2 type-II staggered heterojunction: Towards performance, degradation pathway, toxicity, and life cycle assessment",* S Chauhan, R Bhar, **K Ray**, S Chowdhury, M M Ghangrekar, B K Dubey; *Environmental Research*, *271(2025), 121100*.

3. *"Understanding the role of Mn in Ni-Mn/Al_2O_3 and Ni_3Fe-Mn/Al_2O_3 catalysts for enhanced CO_2 methanation activity",* J K Prabhakar, R Kumar, **K Ray**, P A Apte, G Deo; *Journal of Environmental Chemical Engineering*, *13(1) (2025), 115233*.

4. *"An energy-efficient Aspen Plus model for H_2-rich syngas production via ethanol dry reforming: A Thermodynamic analysis",* S Senapati, **K Ray**, N C Pradhan; *International Journal of Hydrogen Energy, 98 (2025), 1107-1118.*

5. "*Accelerating catalytic experimentation of water gas shift reaction using machine learning models*", Sathish K C and **K Ray**; *Chemical Engineering Research and Design, 212 (2024), 472–484.*

6. "*CO_2 hydrogenation on ruthenium: comparative study of catalyst supports"*, G Baade, J Friedland, **K Ray**, R Güttel; *RSC Sustainability, 2 (2024), 3826-3834.*

7. "*Addition of CuO to form CuO/TiO2 and CuO/ZnO heterojunctions for photocatalytic CO2 conversion to methanol*", S K Sahoo, Athira P, **K Ray**, D Pandey; *Chemical Physics Letters, 856 (2024), 141678–141687*.

8. "*Benchmarking potential catalysts and choice of descriptor for CO_2 methanation using transition metal based catalysts*", R Kumar, Athira P, J K Prabhakar, S C Nayek, P A Apte, G Deo, **K Ray**; *Applied Catalysis A: General*, *687 (2024), 119957-119970*.

9. "*Machine Learning-enhanced optimal catalyst selection for Water-Gas Shift reaction*", R Golder, S Pal, Sathish K C, **K Ray**; *Digital Chemical Engineering, 12 (2024), 100165–100175*.

10. "*The pivotal role of oxygen vacancy and surface hydroxyl in the adsorption and activation of CO_2 on ceria-zirconia mixed oxide*", P P Singh, A P, S Kamaliny, **K Ray**, S Sengupta; *Molecular Catalysis, 555 (2024), 113855–113867*.

11. "*Selective photo-reduction of CO_2 to methanol using Cu-doped 1D-Bi_2S_3/rGO nanocomposites under visible light irradiation*", A Mandal, S Maitra, S Roy, B Hazra, **K Ray**, K Kargupta; *New Journal of Chemistry, 47 (2023), 1422–1434*.

12. *"Modelling of Anaerobic Digester for the conversion of Organic Waste into Hydrogen & Methane"*, S K Sahoo, **K Ray**; M*aterials Today: Proceedings, 72 (2023), 299-305*.

13. *"Density Functional Theory Insights on Photocatalytic Ability of CuO/TiO_2 and CuO/ZnO",* B Singha, **K Ray**; *Materials Today: Proceedings, 72 (2023), 451-458*.

14. *"$NaBH_4$-Assisted Synthesis of B–(Ni–Co)/$MgAl_2O_4$ Nanostructures for the Catalytic Dry Reforming of Methane",* Md. Shakir, M Prasad, **K Ray**, S Sengupta, A Sinhamahapatra, S Liu, H B Vuthaluru; *ACS Applied Nano Materials, 5 (2022), 10951-10961*.

15. *"Ni/$Ce_xZr_{1-x}O_2$ catalyst prepared via one-step co-precipitation for CO_2 reforming of CH_4 to produce syngas: Role of oxygen storage capacity (OSC) and oxygen vacancy formation energy (OVFE)",* M Prasad, **K Ray**, A Sinhamahapatra, S Sengupta; *Journal of Materials Science*, *57 (2022) 2839-2856*.

16. **"***Activity and stability descriptors of Ni based alloy catalysts for dry reforming of methane: A density functional theory study***", K Ray**, A S Sandupatla, G Deo; *International Journal of Quantum Chemistry, 121:e26580 (2021) 1-7*.

17. "*Thermodynamic equilibrium analysis on oxidative dehydrogenation of propane using CO_2: finding a suitable reactant ratio for propylene formation*", A Pattnaik, S Sehgal, G Kumar, **K Ray,** D Pandey; *Journal of the Indian Chemical Society, 97 (2020) 1-5*.

18. *"Oxidative dehydrogenation of propane over alumina supported vanadia catalyst - Effect of carbon dioxide and secondary surface metal oxide additive",* A S Sandupatla, **K Ray**, P Thaosen, C Sivananda, G Deo; *Catalysis Today, 354 (2020) 176-182*.

19. *"Developing descriptors for CO_2 methanation and CO_2 reforming of CH_4 over Al_2O_3 supported Ni and low-cost Ni based alloy catalysts",* **K Ray**, R Bhardwaj, B Singh and G Deo; *Physical Chemistry Chemical Physics, 20 (2018) 15939-15950*.

20. *"Promotion of Unsupported Nickel Catalyst using Iron for CO_2 Hydrogenation Reaction",* D Pandey, **K Ray**, R Bhardwaj, S Bojja, K V R Chary and G Deo; *International Journal of Hydrogen Energy, 43 (2018) 4987-5000*.

21. *"A potential descriptor for the CO_2 hydrogenation to CH_4 over Al_2O_3 supported Ni and Ni-based alloy catalysts",* **K Ray** and G Deo; *Applied Catalysis B: Environmental, 218 (2017) 525-537*.

22. "*Reforming and Cracking of CH_4 over Al_2O_3 supported Ni, Ni-Fe and Ni-Co catalysts*", **K Ray,** S Sengupta and G Deo; *Fuel Processing Technology, 156 (2017) 195-203*.

23. "*The effects of modifying the Ni/Al_2O_3 catalyst with cobalt on the catalytic reforming of CH_4 with CO_2 and cracking of CH_4 reactions*", S Sengupta, **K Ray** and G Deo; *International Journal of Hydrogen Energy, 39 (2014) 11462-11472*.

CONFERENCE/WORKSHOP/SYMPOSIUM:

1. G. Vishnu Tej, **Koustuv Ray**, "Spearheading machine learning innovations to optimize proton exchange membrane fuel cells", presented and received Best Poster Presenter Award in **National Symposium on Shaping the Energy Future: Challenges & Opportunities (SEFCO-2025)**, CSIR - Indian Institute of Petroleum Dehradun, India, April, 2025.

2. Rahul Kumar, Sunil Kumar Sahoo, Jitendra Kumar Prabhakar, Athira P, Arun Kumar Gupta, **Koustuv Ray**, "Integrated parametric, kinetic and mechanistic study of CO_2 methanation over γ-Al_2O_3 supported Ni-Fe and Rh catalysts", presented in "**International Conference on Sustainable Energy and Advance Materials (ICSEAM-2025)**, UIET, School of Engineering and Technology, CSJMU Kanpur, Kanpur, India, April, 2025.

3. Rahul Kumar, Sharon K. Thomas, Sudhir C. Nayak, Siddhartha Sengupta, **Koustuv Ray**, "Microkinetic modelling on Ni(111) for methane cracking and experimental insights to dry reforming of methane using Ni/Al_2O_3 catalyst", presented and received Best Poster Presenter Award in "**An International Conference on ENVIRONMENTAL CHALLENGES, OPPORTUNITIES AND SUSTAINABLE SOLUTIONS**, Centre for the Environment, IIT Guwahati, Guwahati, India, December, 2024.

4. Snigdha Senapati, Narayan C. Pradhan, **Koustuv Ray**, "Cobalt and CeO_2 Modified Ni/Al_2O_3 Catalyst for Steam Reforming of Ethanol", presented in **AIChE Annual Meeting**, San Diego, CA, United States of America, October, 2024.

5. Athira P, **Koustuv Ray**, "Effect of d-electrons on activation of CO_2 using metal and metal alloys: A First-principles study", presented in Indo-UK Workshop on **Waste derived carbon applications in Remediation, Energy and Sequestration: Opportunities and Learning (W-CARESOL),** Department of Environmental Science and Engineering, IIT Bombay, Mumbai, India, August, 2024.

6. Sunil Kumar Sahoo, Chanchal Sharma, **Koustuv Ray**, "Catalytic Way of Oxidative Propane Dehydrogenation: A Thermochemical Route of CO_2 Conversion", presented in Indo-UK Workshop on **Waste derived carbon applications in Remediation, Energy and Sequestration: Opportunities and Learning (W-CARESOL),** Department of Environmental Science and Engineering, IIT Bombay, Mumbai, India, August, 2024.

7. Sathish Kumar C, **Koustuv Ray**, "Prediction on catalytic activity and stability for water gas shift reaction using machine learning models", presented in **Challenging Applications of Chemical Engineering,** IIChE – Bhubaneswar Regional Centre & CSIR-Institute of Minerals & Materials Technology, Bhubaneswar, India, March, 2024.

8. Snigdha Senapati, **Koustuv Ray**, Narayan C. Pradhan, "Thermodynamic Equilibrium Analysis of Oxidative Dry Reforming of Ethanol for Syngas Production", presented in **CHEMCON**, Heritage Institute of Technology, Kolkata, India, December 2023.

9. Parna Pramanik, Rahul Kumar, **Koustuv Ray**, "Effect of Process Parameters on the Activity of Supported Ni, Ni-Fe and Rh catalysts in Sabatier Reaction", presented in **CHEMCON**, Heritage Institute of Technology, Kolkata, India, December 2023.

10. Göran Baade, Athira P, **Koustuv Ray**, Robert Güttel, "CO2 Hydrogenation towards Hydrocarbons on Ruthenium: Potential Catalyst Candidates", presented in **14th ECCE and 7th ECAB**, Berlin, Germany, September 2023.

11. Athira P, Göran Baade, Robert Güttel, **Koustuv Ray**, "First-principles based adsorption study of CO_2 on metallic and carbidic iron surfaces", presented in **14th ECCE and 7th ECAB**, Berlin, Germany, September 2023.

12. Mohd. Arif, Rahul Kumar, **Koustuv Ray**, "A Comparison between Sol-Gel and Impregnation Methods for Al_2O_3 Supported Ni and Ni-Fe Alloy Catalyst on CO_2 Methanation", presented in **CHEMCON**, Harcourt Butler Technical University Kanpur, Uttar Pradesh, India, December 2022.

13. Athira P., Aditya S. Sandupatla, **Koustuv Ray**, "First-principles based study on adsorption and activation of oxides of carbon on Ni and Ni-alloy catalysts", **6th National Symposium on Shaping the Energy Future: Challenges & Opportunities**, CSIR - Indian Institute of Petroleum Dehradun, India, August, 2022.

14. Sunil K Sahoo, Mohd. Arif, **Koustuv Ray**, "Modelling of Anaerobic Digester for the conversion of Organic Waste into Hydrogen & Methane", **International Conference on Novel Materials and Technologies for Energy and Environment,** Hyderabad, India, February, 2022.

15. Biplab Singha, **Koustuv Ray**, "Density Functional Theory Insights on Photocatalytic Ability of CuO/TiO_2 and CuO/ZnO", **International Conference on Novel Materials and Technologies for Energy and Environment,** Hyderabad, India, February, 2022.

16. Manohar Prasad, **Koustuv Ray**, Siddhartha Sengupta, "Oxygen vacancy formation in Zr -doped Ceria support for DRM reaction: A density functional theoretical study", **CHEMCON**, CSIR-IMMT, Bhubaneswar, India, December, 2021.

17. Mohd. Arif, Rahul Kumar, **Koustuv Ray**, "A Comparison between Sol-Gel and Impregnation Methods for Al_2O_3 Supported Ni and Ni-Fe Alloy Catalyst on CO_2 Methanation", presented in **CHEMCON**, Harcourt Butler Technical University Kanpur, Uttar Pradesh, India, December 2022.

18. Athira P., Aditya S. Sandupatla, **Koustuv Ray**, "First-principles based study on adsorption and activation of oxides of carbon on Ni and Ni-alloy catalysts", **6th National Symposium on Shaping the Energy Future: Challenges & Opportunities**, CSIR - Indian Institute of Petroleum Dehradun, India, August, 2022.

19. Sunil K Sahoo, Mohd. Arif, **Koustuv Ray**, "Modelling of Anaerobic Digester for the conversion of Organic Waste into Hydrogen & Methane", **International Conference on Novel Materials and Technologies for Energy and Environment,** Hyderabad, India, February, 2022.

20. Biplab Singha, **Koustuv Ray**, "Density Functional Theory Insights on Photocatalytic Ability of CuO/TiO_2 and CuO/ZnO", **International Conference on Novel Materials and Technologies for Energy and Environment,** Hyderabad, India, February, 2022.

21. Manohar Prasad, **Koustuv Ray**, Siddhartha Sengupta, "Oxygen vacancy formation in Zr -doped Ceria support for DRM reaction: A density functional theoretical study", **CHEMCON**, CSIR-IMMT, Bhubaneswar, India, December, 2021.

22. Goutam Deo, **Koustuv Ray**, Aditya S Sandupatla, Siddhartha Sengupta, Sudhir C Nayak, Puneet K Chaudhary, Neeraj Koshta, "Good Catalyst Better Catalyst for the CO_2 Reforming of CH_4: A Bit of Science and Engineering for This Catalytic Reaction", **North American Catalysis Society Meeting, NAM-26**, Chicago, June, 2019.

23. **Koustuv Ray**, Siddhartha Sengupta and Goutam Deo, "Correlating catalytic activity with electronic proeprty for CO_2 reforming of CH_4 over Ni nad Ni-based alloy catalysts", **Asia-Pacific Congress on Catalysis, APCAT-7**, Mumbai, India, January 2017.

24. Devendra Verma, **Koustuv Ray** and Goutam Deo, "Kinetic modeling of CO_2 methanation over Ni/Al_2O_3 and $Ni\text{-}Fe/Al_2O_3$" presented in **CHEMCON-2016**, IIT-M, CHENNAI, A.C. TECH, ANNA UNIVERSITY, CLRI (CSIR), Chennai, India, December 2016.

25. **Koustuv Ray**, Aditya Sandupatla, Smita R. Biswal and Goutam Deo, "Steps towards understanding the improved activity of some Ni-based bimetallic catalysts", **252nd ACS National Meeting,** Philadelphia, USA, August 2016.

26. **Koustuv Ray** and Goutam Deo, "Steps towards understanding the improved activity of some Ni-based bimetallic catalysts", **2016 CAMD Summer School on Electronic Structure Theory and Materials Design,** DTU Physics, DTU, Lyngby, Denmark, August 2016.

27. **Koustuv Ray**, Smita Ranjan Biswal and Goutam Deo, "Density Functional Theory and Molecular Dynamics studies of Ni based alloys", **68th Annual Session of Indian Institute of Chemical Engineers CHEMCON-2015**, Guwahati, India, December 2015.

28. **Koustuv Ray**, Dharmendra Pandey, Bahadur Singh, Rajendra Prasad and Goutam Deo, "A Computational Approach to Understand the Promotional Effect in Ni-Fe Bimetallic Catalyst", 1**2th European Congress on Catalysis – EuropaCat-XII,** Kazan, Russia, August 2015.

29. Goutam Deo, Siddhartha Sengupta, Dharmendra Pandey and **Koustuv Ray**, "Promotion of the Ni/Al_2O_3 catalyst by Co and Fe for: (i) reforming of CH_4 with CO_2, (ii) cracking of CH_4 and (iii) CO_2 hydrogenation", **University of Queensland – India Workshop on Applications of Nanotechnology and Catalysis in Clean Energy, Biofuels, Chemicals and Hydrogen Generation**, Brisbane, Australia, November 2013.

30. **Koustuv Ray**, Siddhartha Sengupta and Goutam Deo, "Catalytic activity of alumina supported Ni-based bimetallic catalysts for reactions involving CH_4 and CO_2", **2nd International Conference on Materials for Energy, ENMAT II,** Karlsruhe, Germany, May 2013.

31. Siddhartha Sengupta, **Koustuv Ray** and Goutam Deo, "Promotion of the Ni/Al_2O_3 Catalyst for the Reforming of CH_4 with CO_2 and Cracking of CH_4", **21st National Symposium on Catalysis-2013,** IICT, Hyderabad, India, February 2013.

32. **Koustuv Ray**, Siddhartha Sengupta and Goutam Deo, "Striking aspects of Al_2O_3 supported Ni-Co bimetallic catalyst", **65th Annual Session of Indian Institute of Chemical Engineers CHEMCON-2012**, Jalandhar, India, December 2012.

INVITED LECTURE/PANEL DISCUSSION:

1. Delivered an Invited Lecture using online platform on **"Catalytic conversion of CO2 and CH4 by developing low-cost transition metal based alloy catalysts"** during an International Conference on "Air Quality, Waste Management, and Health: The Triple Nexus for Progress and Sustainable Development, ICPSD-2025", **DIT University, Dehradun, March, 2025**

2. Delivered an Invited Lecture on "**Bringing rationality into design aspects of materials by the use of computational modelling: Examples with catalysts and biochar**" during "W-CARESOL 2.0", workshop organized by **EnReST Lab, ESED and Bio-Hydrogen Lab, DESE, Indian Institute of Technology Bombay, Mumbai, March, 2025.**

3. Delivered an Invited Lecture on "**Importance of computational catalysis for catalyst screening and formulations in CO_2 utilization reactions"** during "Sustainable Horizons: Exploring Carbon Capture and Valorization", a IGSTC sponsored workshop organized by Circular Engineering Research Group (CERG), Department of Civil Engineering, **Indian Institute of Technology Kharagpur, Kharagpur, February, 2025**.

4. Delivered an Invited Lecture on "**Catalytic processes using CO_2 for the chemical value chain: Catalyst formulation by developing structure-activity relationships**" during "Conference on Advances in Catalysis for Energy and Environment (CACEE-2024)", organized by **Tata Institute of Fundamental Research Mumbai, Bombay, December, 2024**

5. Delivered an Invited Lecture on "**Catalytic structure-activity relationships using First-principles calculation for reactions involving Greenhouse gases"** during "Waste derived carbon applications in Remediation, Energy and Sequestration: Opportunities and Learning (W-CARESOL)", workshop jointly organized by **EnReST Lab, ESED, Indian Institute of Technology Bombay and University of Leeds, IIT Bombay, Mumbai, August, 2024**.

6. Delivered an Invited Talk on "**Catalytic processes using CO_2 for the chemical value chain: Catalyst development for Methanation and Propane ODH reactions**" during *Carbon Management in Chemical Industry*, a IGSTC sponsored workshop jointly organized by **Indian**

Institute of Technology Bombay & BASF, BASF Innovation Campus, Mumbai, February, 2024.

7. Delivered an Invited Talk on "**Catalytic activity-property relationship with First-principles based surface adsorption and activation calculation**" during *5th Indo-German Workshop on Advances in Materials, Reaction, and Separation Processes,* organized by **Indian Institute of Technology Kharagpur, Kharagpur, February, 2024**.

8. Co-chaired a Panel Discussion Session on "**Contemporary Challenges and Emerging Trends in Energy and Environment Research**" during *International Conference on Novel Materials and Technologies for Energy and Environment (NMTE2A),* organized by **Birla Institute of Technology & Science, Pilani - Hyderabad Campus, February, 2022**.

9. Delivered a talk entitled as "**In-silico characterization of bimetallic catalysts for energy and environmental application**" during an *Online Workshop on Synthesis, Characterization and Performance of Advanced Materials (SCPAM – 2021)*, organized by **National Institute of Technology Bhopal, India, May 2021**.

JOURNAL ARTICLES and PMRF Students REVIEWED:

Year	**Journal, PMRF evaluation**
2025	Applied Catalysis A: General, Research on Chemical Intermediates, Chemistry – An Asian Journal, Energy & Fuels, Indian Chemical Engineer
2024	Industrial & Engineering Chemistry Research, Fuel, ACS Applied Materials & Interfaces, ACS Catalysis, PMRF evaluation
2023	Chemical Engineering Research and Design, PMRF evaluation
2022	Molecular Catalysis
2021	Applied Surface Science
2020	Applied Surface Science, Process Safety and Environmental Protection

ACADEMIC RESPONSIBILITIES

1. Faculty Advisor/Course Coordinator, Chemical Engineering, July 2022 – June 2028.
2. Co-Professor in-Charge, Department Research Facility, July 2022 – September 2023.
3. Laboratory In-Charge (Fluid Flow), January 2021 – June 2025.
4. Research Scholar Coordinator, Centre for Theoretical Studies, December 2019 – December 2020.

ADMINISTRATIVE RESPONSIBILITIES

1. Member, Departmental Academic Committee (UG), January 2024 – June 2025.
2. Assistant Warden, LLR Hall of Residence, January 2023 – June 2025.
3. Advisor, Chemical Engineering Association, March 2022 – June 2025.
4. Member, Departmental Purchase Committee, January 2021 – June 2025.

SKILLS

EXPERIMENTAL TECHNIQUES: BET Surface Area, Pulse Chemisorption, X-Ray Diffraction, Temperature Programmed Reaction Studies (TPR, TPD, TPH, TPO), Spectroscopy (FTIR, Raman, UV-Vis-NIR), High temperature fixed bed reaction operation and *in-situ* (DRIFTS) reaction studies, Gas Chromatography (TCD, FID)

COMPUTATIONAL TECHNIQUES: Density Functional Theory calculations, Process Modelling, Microkinetic Modelling and Simulation

SOFTWARE/PACKAGES: MATERIALS STUDIO, VASP, MATLAB, ASPEN Plus