

# Dr. Prashant Kumar

Assistant Professor

Department of Chemical Engineering

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## EDUCATION

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- **Indian Institute of Technology Kharagpur, India**  
Doctor of Philosophy (Ph. D.), Chemical Engineering, 2016-2023  
Thesis: Spray cooling of hot steel plate with nanofluid and enhanced-temperature coolant  
Adviser: Prof. Sudipto Chakraborty
- **Indian Institute of Technology Kharagpur, India**  
Master of Technology (M. Tech.), Chemical Engineering, 2014-2016  
CGPA: 9.01/10.0 [Distinction]  
Thesis: Preparation and characterization of alumina supported Ni-Co catalysts  
Adviser: Prof. Siddhartha Sengupta
- **Maulana Azad National Institute of Technology Bhopal, India**  
Bachelor of Technology (B. Tech.), Chemical Engineering, 2009-2013  
CGPA: 7.39/10.0  
Thesis: Modelling and simulation of isomerization process in refinery industry using ASPEN PLUS software  
Adviser: Prof. Bharat Modhera

## PROFESSIONAL EXPERIENCE

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- **K. K. Wagh Institute of Engineering Education and Research Nashik**  
Assistant Professor, Department of Chemical Engineering, January 2023–present

## RESEARCH INTERESTS

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- Inverse Heat Conduction Analysis
- Nanoparticle synthesis
- Nanofluid synthesis
- Molecular Dynamic Simulation

## RESEARCH PUBLICATIONS

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### *Journal Articles/Book Chapter*

**J6.** Suparna Bhattacharyya, Deviprasanna Mohanty, **Prashant Kumar**, Suman Kalyan Das, Prasanta Sahoo, Surjya K. Pal, Sudipto Chakraborty, “*A corrosion and tribo-failure analysis of Ni-P-Cu coated mild steel (AISI-1040) at varied copper concentration*”, Engineering Failure Analysis, **Elsevier**, DOI: 10.1016/j.engfailanal.2023.107063

**J5. Prashant Kumar**, Chandan Kumar Chaurasia, Sudipa Das, Suparna Bhattacharyya, Sudipto Chakraborty, “Spray cooling investigation of very-hot AISI 304 steel plate with mono and mixed SiO<sub>2</sub>, CuO nanofluid”, Heat and Mass Transfer, **Springer**, DOI: 10.1007/s00231-023-03345-z

**J4.** Paras, Kushal Yadav, **Prashant Kumar**, Dharmasanam Ravi Teja, Sudipto Chakraborty, Monojit Chakraborty, Soumya Sanjeeb Mohapatra, Abanti Sahoo, Mitch M. C. Chou, Chi-Te Liang, and Da-Ren Hang, “A Review on Low-Dimensional Nanomaterials: Characterization and Applications”, Nanomaterials, **MDPI**, MDPI, DOI:10.3390/nano13010160

**J3.** Samarshi Chakraborty, **Prashant Kumar**, Sudipto Chakraborty, “Nanofluids Long-term Stability Challenges and Guidelines”, **Royal Society of Chemistry**, DOI: 10.1039/9781839166457-00071

**J2. Prashant Kumar**, Paras, Suparna Bhattacharyya, Sudipto Chakraborty, “Investigation of spray cooling in an inclined nozzle-plate configuration with varying coolant temperature”, Experimental Heat Transfer, **Taylor Francis**, DOI: 10.1080/08916152.2022.2088895

**J1. Prashant Kumar**, Sudipto Chakraborty, “Experimental investigation of hot AISI 304 steel plate with very-high mass-flux varying water temperature spray”, Heat Transfer, **Wiley**, DOI: 10.1002/htj.22344

### **Conference Proceedings**

**CP1. Prashant Kumar**, Sudipto Chakraborty, “Rice-husk-derived silica nanoparticles using optimized titrant concentration for the one-step nanofluid preparation”, **Springer**, DOI: 10.1007/978-981-19-7264-5\_24

## **CONFERENCE PARTICIPATION**

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**C7.** Co-authored paper on “Nanofluids for ultrafast cooling of steel” for **76<sup>th</sup> Annual Technical Meeting 2022** organized by Indian Institute of Metallurgy, Hyderabad, India from 13-19 November 2022.

**C6. Prashant Kumar**, Sudipto Chakraborty, “Rice-husk derived Silica nanoparticles using optimized titrant concentration for the one-step nanofluid preparation”, in **Chemical Engineering Congress (CHEMCON) 2021**, 26 - 30 December 2021, Bhubaneswar, India (Virtual Edition).

**C5.** Attended virtual conference on **Advances in Colloidal and Polymeric systems (ACAPS-2020)** organized by Colloids and Polymers Research Group, School of Chemical Engineering, VIT, Vellore, India, 22 August 2020.

**C4.** Co-authored paper on “An experimental overview of different Ultrafast cooling techniques for low carbon steel (AISI 304)” in **Proceedings of International Conference on Energy and Sustainable Development**, jointly organized by Jadavpur University and The Institution of Engineers, India on 14- 15 February 2020.

**C3. Prashant Kumar**, Sudipto Chakraborty, “Bulk Synthesis of Quasi-Carbon Dot Via Two Step-Method from Rice Husk”, in **AICHE Annual Meeting 2019**, 10-15 November 2019, held at the Hyatt Regency Orlando in Orlando, Florida, USA.

**C2. Prashant Kumar**, Siddhartha Sengupta, “Preparation and Characterization of alumina supported Ni-Co catalysts”, in **Chemical Engineering Congress (CHEMCON) 2015**, 27-30 December 2015, held at IIT Guwahati, Guwahati, India.

**C1. Prashant Kumar**, Bharat Modhera, “Study of heat transfer augmentation techniques” in National conference on **Recent Advancements in Chemical Engineering** on 4 February 2012, held at North Maharashtra University Jalgaon, Maharashtra, India.

## TEACHING EXPERIENCE

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- Data Science and Artificial Intelligence (309351),
- Transport Phenomena (309350),
- Chemical Engineering Thermodynamics (309344),
- Petroleum Refining (409344),
- Chemical Process Synthesis (409345),
- Mass Transfer – I Lab (309341),
- Computer Aided Chemical Engineering - II (409347)

## OTHER ACADEMIC ACTIVITIES

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### Seminar Coordinator

- Third year student project seminar coordinator for academic year 2023-2024 in Chemical Engineering Department at KKWIEER.
- Final year student project seminar co-coordinator for academic year 2023-2024 in Chemical Engineering Department at KKWIEER.

### Project Guidance

- Seminar guide to two groups of third year engineering student for academic year 2023-2024 in Chemical Engineering Department at KKWIEER.
- Seminar guide to three groups of final year engineering student for academic year 2023-2024 in Chemical Engineering Department at KKWIEER.

## SKILLS AND INTERESETS

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- **Programming Languages:** Python,
- **Analytical Instruments:** Fourier Transform Infrared Spectroscopy, XRD, FESEM, DLS, UV-vis spectrophotometer, Optical Microscope,
- **Software Packages:** MATLAB, Inkscape, GIMP, JMP, ASPEN, ANSYS, Photoshop
- **Interests:** Travelling, Sudoku playing, Exercise (Jogging), Reading Books and Novel

## ACHIEVEMENTS

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- Qualified All India Engineering Entrance Examination (AIEEE) 2009
- Qualified Graduate Aptitude Test in Engineering (GATE) 2014
- Scholarship from Ministry of Human Resource Development (MHRD) for Ph.D. in Chemical Engineering (2016-2021)
- Scholarship from Ministry of Human Resource Development (MHRD) for M.Tech. in Chemical Engineering (2014-2016)
- Travel grant from IIT Kharagpur for full financial assistance for the AIChE Annual Meeting 2019 in Orlando, Florida, USA. (10-15 November 2019)

## INDUSTRIAL/VOCATIONAL TRAINING

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Underwent industrial training in Polypropylene unit at **IOCL, Panipat, Haryana**

- 30 days training from 28 May 2012 to 22 June 2012
- Exposed to basics of Naphtha Cracker and associated units
- Key Learning – Study of various parameters variation along the flash pipe of Polypropylene unit

Underwent industrial training in **CIPET, Bhopal, Madhya Pradesh**

- 15 days training 29 November 2011 to 16 December 2011 in testing and manufacturing process
- Key Learning – Injection moldings, Extrusion moldings, Blow moldings

## MISCELLANEOUS

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### Linguistic Proficiency

English (Read, Write, Speak)

Hindi (Read, Write, Speak)

Bengali (Elementary)

Marathi (Elementary)

### Short Term Training/Workshops/Seminars /Faculty Development Program/Webinars/Symposium

#### *Short Term Training*

**STT1.** Undergone Innovation Ambassador (IA) training ‘**Foundation Level**’ (Total 15 Sessions of 30 contact hours) conducted in online mode by MoE’s innovation cell & AICTE during the IIC calendar year 2022-23.

#### *Workshops*

**WS2.** Attended author workshop on “**How to Write and Publish Scientific Articles and Manuscripts**” jointly organized by IIT Kharagpur and Springer Nature on 27 February 2018.

**WS1.** Attended workshop on “**Publishing in Academic Journals: An author’s Workshop**” jointly organized by Central Library, IIT Kharagpur and Taylor & Francis Group on 18 September 2019.

#### *Webinars*

**W7.** Attended webinar on “*The Choice of the correct mounting method – the chemistry has to be right*” organized by QATM on 28 November 2023.

**W6.** Attended webinar on “*Emerging Technologies*” organized by IntechOpen on 21 November 2023.

**W5.** Attended webinar on “*Mass Production and Industrial Applications of Different Nanoparticles*” organized by MDPI under Nanomanufacturing 2023 Webinar Series on 26 April 2023.

**W4.** Attended webinar on “*Everything about open access publishing-researchers perspective*” organized by Wiley on 5 October 2021.

**W3.** Attended webinar on “*Bibliometrics-Measuring the impact of research*” organized by Wiley on 28 September 2021.

**W2.** Attended webinar on “*The publishing process-complete journey of an article*” organized

by Wiley on 21 September 2021.

**W1.** Attended webinar on “*Attracting Grants and Funds for Research*” organized by Wiley on 14 September 2021.

### ***Faculty Development Program***

**FDP2.** Attended three days faculty development program organized by Department of Chemical Engineering, KKWIEER Nashik on “*Hands on training on Ansys Fluent*” from 22-24 February 2023.

**FDP1.** Attended six days faculty development program organized by Idea Lab, KKWIEER Nashik on “*Advanced Manufacturing*” from 12-17 June 2023.

### ***Mini symposium***

**MS1.** Attended online mini symposium on “**Best Practices in Industry – Academia Collaboration**” organized by IUCEE in association with the Association of the Managements of Un-aided Engineering Colleges (Mah.) on 26-27 May 2023.

## **EXTRA-CURRICULAR ACTIVITIES**

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- Served as co-coordinator in departmental fest CHEMICARNIVAL organized by the Chemical engineering department, NIT Bhopal during 15-16 October 2011
- Served as Executive member of IICHE, student chapter Bhopal (2011-2012)
- Served as volunteer in a short-term course on “Green catalysis for industrial applications” organized by Chemical engineering department, NIT Bhopal during 07-11 May 2012

## **SERVICE**

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- Referee, *PLOS ONE*

## **REFERENCES**

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Prof. Sudipto Chakraborty  
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Department of Chemical Engineering,  
Indian Institute of Technology Kharagpur,  
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Prof. Siddhartha Sengupta  
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Department of Chemical Engineering,  
Indian Institute of Technology  
(Indian School of Mines) Dhanbad,  
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