

CURRICULUM VITAE

Shamik CHOWDHURY, Ph.D.

Assistant Professor (Grade I) & Research Coordinator
School of Environmental Science and Engineering
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Indian Institute of Technology Kharagpur
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EDUCATION

2017 **Ph.D. in Environmental Engineering**
National University of Singapore (NUS), Singapore
2011 **M.Tech. in Biotechnology (GOLD MEDALIST)**
National Institute of Technology Durgapur (NITD), India
2009 **B.Tech. in Biotechnology**
West Bengal University of Technology (WBUT), India

PROFESSIONAL EXPERIENCE

03/2019–Present **Assistant Professor**, School of Environmental Science and Engineering,
Indian Institute of Technology Kharagpur (IIT Kgp)
09/2020–Present **Research Coordinator**, School of Environmental Science and Engineering
(SEnVSE), IIT Kgp
08/2020–Present **Subject Coordinator (Environmental Science)**, Department of Civil
Engineering (CEE), IIT Kgp
01/2019–02/2019 **Research Fellow**, Department of Civil & Environmental Engineering, NUS
06/2017–12/2018 **Research Fellow**, Centre for Advanced 2D Materials, NUS
01/2017–05/2017 **Research Associate**, Centre for Advanced 2D Materials, NUS

HONORS AND AWARDS

2016 **Green Talents Award**, Federal Ministry of Education and Research, Germany
2015 **Research Project of the Year Award**, Institution of Chemical Engineers
2015 **Sustainable Technology Award**, Institution of Chemical Engineers
2013 **President's Graduate Fellowship**, NUS
2011 **Institute Gold Medal**, NITD

RESEARCH GRANTS

2021–2024 **Principal Investigator (PI)**, "Stimuli responsive artificial leaves for selective
solar fuel production," Department of Science & Technology, Ministry of
Science & Technology, Govt. of India (~₹ 30 Lacs)
2021 **PI**, "Studies on the impacts of AgNPs-H₂O₂ (KLAR-1000) application on
different commonly found bacteria in water and food," Zelence Industries Pvt.
Ltd., Science and Technology Entrepreneurs' Park, IIT Kgp (~₹ 0.5 Lacs)
2019–2022 **PI**, "Novel mixed-dimensional photocatalysts for elimination of common
pharmaceuticals for elimination of common pharmaceuticals and personal care

- products from wastewater treatment plant effluents," Sponsored Research & Industrial Consultancy, IIT Kgp (~₹ 23 Lacs)
- 2020–2023 **Co-Principal Investigator (Co-PI)**, "Demonstration of sustainable mitigation for groundwater arsenic in arsenic-polluted Gangetic River aquifers of Bihar, Uttar Pradesh and West Bengal, India," Department of Science & Technology, Ministry of Science & Technology, Govt. of India (~₹ 311 Lacs)
- 2020–2023 **Co-PI**, "Effective treatment of wastewater effluents by a fluidized bed membrane bioreactor with low membrane fouling," Department of Science & Technology, Ministry of Science & Technology, Govt. of India (~₹ 49 Lacs)

SELECTED JOURNAL PUBLICATIONS

Reviews

1. Pan, S., Goudoulas, T. B., Jeevanandam, J., Tan, K. X., **Chowdhury, S.**, & Danquah, M. K. (2021). "Therapeutic applications of metal and metal-oxide nanoparticles: dermato-cosmetic perspectives." *Frontiers in Bioengineering and Biotechnology*, 9, 724499.
2. **Chowdhury, S.**, & Pan, S. (2020). "Graphene-based macromolecular assemblies for scavenging heavy metals." *ChemistryOpen*, 9, 1065–1073
3. **Chowdhury, S.**, & Balasubramanian, R. (2017). "Three-dimensional graphene-based macrostructures for sustainable energy applications and climate change mitigation." *Progress in Materials Science*, 90, 224–275
4. Balasubramanian, R., & **Chowdhury, S.** (2015). "Recent advances and progress in the development of graphene-based adsorbents for CO₂ capture." *Journal of Materials Chemistry A*, 3, 21968–21989.
5. **Chowdhury, S.**, & Balasubramanian, R. (2014). "Graphene/semiconductor nanocomposites (GSNs) for heterogeneous photocatalytic decolorization of wastewaters contaminated with synthetic dyes: A review." *Applied Catalysis B: Environmental*, 160–161, 307–324.
6. **Chowdhury, S.**, & Balasubramanian, R. (2014). "Recent advances in the use of graphene-family nanoadsorbents for removal of toxic pollutants from wastewater." *Advances in Colloid and Interface Science*, 204, 35–56.

Research Articles

7. Venna, S., Sharma, H. B., Reddy, H. P., **Chowdhury, S.**, Dubey, B. K. (2021). "Landfill leachate as an alternative moisture source for hydrothermal carbonization of municipal solid wastes to solid biofuels." *Bioresource Technology*, 320, 124410.
8. Verma, R., Chakraborty, I., **Chowdhury, S.**, Ghangrekar, M. M., Balasubramanian, R. (2020). "Nitrogen and sulfur codoped graphene macroassemblies as high-performance electrocatalysts for the oxygen reduction reaction in microbial fuel cell." *ACS Sustainable Chemistry & Engineering*, 8, 16591–16599.
9. Jiang, Y., **Chowdhury, S.**, & Balasubramanian, R. (2020). "Efficient removal of bisphenol A and disinfection of waterborne pathogens by boron/nitrogen codoped graphene aerogels via the synergy of adsorption and photocatalysis under visible light" *Journal of Environmental Chemical Engineering*, 8, 104300.
10. Jiang, Y., **Chowdhury, S.**, & Balasubramanian, R. (2019). "Nitrogen and sulfur codoped graphene aerogels as absorbents and visible light-active photocatalysts for environmental remediation applications." *Environmental Pollution*, 534, 574–585.
11. Jiang, Y., **Chowdhury, S.**, & Balasubramanian, R. (2019). "New insights into the role of nitrogen-bonding configurations in enhancing the photocatalytic activity of nitrogen-doped graphene aerogels." *Journal of Colloid and Interface Science*, 534, 574–585.

12. **Chowdhury, S.**, Jiang, Y., Muthukaruppan, S., & Balasubramanian, R. (2018). "Effect of boron doping level on the photocatalytic activity of graphene aerogels." *Carbon*, 128, 237–248.
13. Jiang, Y., **Chowdhury, S.**, & Balasubramanian, R. (2017). "Nitrogen-doped graphene hydrogels as potential adsorbents and photocatalysts for environmental remediation." *Chemical Engineering Journal*, 327, 751–763.
14. **Chowdhury, S.**, & Balasubramanian, R. (2016). "Holey graphene frameworks for highly selective post-combustion carbon capture." *Scientific Reports*, 6, 21537.
15. **Chowdhury, S.**, & Balasubramanian, R. (2016). "Highly efficient, rapid and selective CO₂ capture by thermally treated graphene nanosheets." *Journal of CO₂ Utilization*, 13, 50–60.
16. **Chowdhury, S.**, & Balasubramanian, R. (2016). "Three-dimensional graphene-based porous adsorbents for postcombustion CO₂ capture." *Industrial & Engineering Chemistry Research*, 55, 7906–7916.
17. **Chowdhury, S.**, Parshetti, G. K., & Balasubramanian, R. (2015). "Post-combustion CO₂ capture using mesoporous TiO₂/graphene oxide nanocomposites." *Chemical Engineering Journal*, 263, 374–384.
18. Parshetti, G. K., **Chowdhury, S.**, & Balasubramanian, R. (2015). "Biomass derived low-cost microporous adsorbents for efficient CO₂ capture." *Fuel*, 148, 246–254.
19. Parshetti, G. K., **Chowdhury, S.**, & Balasubramanian, R. (2014). "Hydrothermal conversion of urban food waste to chars for removal of textile dyes from contaminated waters." *Bioresource Technology*, 161, 310–319.
20. Parshetti, G. K., **Chowdhury, S.**, & Balasubramanian, R. (2014). "Plant derived porous graphene nanosheets for efficient CO₂ capture." *RSC Advances*, 4, 44634–44643.
21. Sinha, K., **Chowdhury, S.**, Das Saha, P., & S. Datta. (2013). "Modeling of microwave-assisted extraction of natural dye from seeds of *Bixa orellana* (Annatto) using response surface methodology (RSM) and artificial neural network (ANN)." *Industrial Crops and Products*, 41, 165–171.
22. Chakraborty, S., **Chowdhury, S.**, & Das Saha, P. (2013). "Artificial neural network (ANN) modeling of dynamic adsorption of crystal violet from aqueous solution using citric-acid-modified rice (*Oryza sativa*) straw as adsorbent." *Clean Technologies and Environmental Policy*, 15, 225–264.
23. **Chowdhury, S.**, & Das Saha, P. (2013). "Artificial neural network (ANN) modeling of adsorption of methylene blue by NaOH-modified rice husk in a fixed-bed column system." *Environmental Science and Pollution Research*, 20, 1050–1058.
24. **Chowdhury, S.**, Chakraborty, S., & Das Saha, P. (2013). "Response surface optimization of a dynamic dye adsorption process: A case study of crystal violet adsorption onto NaOH-modified rice husk." *Environmental Science and Pollution Research*, 20, 1698–1705.
25. **Chowdhury, S.**, & Das Saha, P. (2013). "Adsorption of malachite green from aqueous solution by NaOH-modified rice husk: Fixed-bed column studies." *Environmental Progress and Sustainable Energy*, 32, 633–639.
26. **Chowdhury, S.**, Chakraborty, S., & Das Saha, P. (2013). "Removal of crystal violet from aqueous solution by adsorption onto eggshells: Equilibrium, kinetics thermodynamics and artificial neural network modeling." *Waste and Biomass Valorization*, 4, 655–664.
27. Das Saha, P., Chakraborty, S., & **Chowdhury, S.** (2012). "Batch and continuous (fixed-bed column) biosorption of crystal violet by *Atrocarpus heterophyllus* (jackfruit) leaf powder." *Colloids and Surfaces B: Biointerfaces*, 92, 262–270.
28. **Chowdhury, S.**, & Das, P. (2012). "Utilization of a domestic waste – eggshells for removal of hazardous malachite green from aqueous solutions." *Environmental Progress and Sustainable Energy*, 31, 415–425.

29. **Chowdhury, S.,** Mishra, R., Kushwaha, P., & Saha, P. (2012). "Removal of safranin from aqueous solutions by NaOH-treated rice husk: Thermodynamics, kinetics and isosteric heat of adsorption." *Asia-Pacific Journal of Chemical Engineering*, 7, 236–249.
30. **Chowdhury, S.,** Mishra, R., Saha, P., & Kushwaha, P. (2011). "Adsorption thermodynamics, kinetics and isosteric heat of adsorption of malachite green onto chemically modified rice husk." *Desalination*, 265, 159–168.
31. Chakraborty, S., **Chowdhury, S.,** & Das Saha, P. (2011). "Adsorption of crystal violet from aqueous solution onto NaOH-modified rice husk." *Carbohydrate Polymers*, 86, 1533–1541.
32. **Chowdhury, S.,** Chakraborty, S., & Saha, P. (2011). "Biosorption of basic green 4 from aqueous solution by *Ananas comosus* (pineapple) leaf powder." *Colloids and Surfaces B: Biointerfaces*, 84, 520–527.
33. **Chowdhury, S.,** & Das Saha, P. (2011). "Biosorption kinetics, thermodynamics and isosteric heat of sorption of Cu(II) onto *Tamarindus indica* seed powder." *Colloids and Surfaces B: Biointerfaces*, 88, 697–705.
34. **Chowdhury, S.,** & Saha, P. (2011). "Adsorption thermodynamics and kinetics of malachite green onto Ca(OH)₂-treated fly ash." *Journal of Environmental Engineering*, 137, 388–397.
35. **Chowdhury, S.,** & Saha, P. (2010). "Sea shell powder as a new adsorbent to remove basic green 4 (malachite green) from aqueous solutions: Equilibrium, kinetic and thermodynamic studies." *Chemical Engineering Journal*, 164, 168–177.
36. Saha, P., **Chowdhury, S.,** Gupta, S., & Kumar, I. (2010). "Insight into adsorption equilibrium, kinetics and thermodynamics of malachite green onto clayey soil of Indian origin." *Chemical Engineering Journal*, 165, 874–882.

EDITED BOOKS

1. **Chowdhury, S.,** & Balasubramanian, R. (2021). *Graphene-based 3D Macrostructures for Clean Energy and Environmental Applications*. London, United Kingdom: The Royal Society of Chemistry.

BOOK CHAPTERS

1. **Chowdhury, S.,** & Balasubramanian, R. (2021). "Graphene-based macroassemblies as highly efficient and selective adsorbents for postcombustion CO₂ capture." In S. Chowdhury, R. Balasubramanian (Eds.), *Graphene-based 3D Macrostructures for Clean Energy and Environmental Applications* (pp. 384–395). London, United Kingdom: The Royal Society of Chemistry.
2. **Chowdhury, S.,** & Pan, S. (2021). "Biomass-derived microporous adsorbents for selective CO₂ capture." In S. Das, H. R. Dash (Eds.), *Microbial and Natural Macromolecules: Synthesis and Applications* (pp. 661–679). London, United Kingdom: Academic Press.
3. **Chowdhury, S.,** Pan, S., Balasubramanian, R., & Das, P. (2019). "Date palm based activated carbon for the efficient removal of organic dyes from aqueous environment." In Mu. Naushad, E. Lichtfouse (Eds.), *Sustainable Agriculture Reviews 34: Date Palm for Food, Medicine and the Environment* (pp. 247–263). Cham, Switzerland: Springer.
4. **Chowdhury, S.,** Pan, S., Balasubramanian, R., & Das, P. (2019). "Three-dimensional graphene-based macroscopic assemblies as superabsorbents for oils and organic solvents." In Mu. Naushad (Ed.), *A New Generation Material Graphene: Applications in Water Technology* (pp. 43–68). Cham, Switzerland: Springer.
5. **Chowdhury, S.,** Balasubramanian, R., & Das, P. (2015). "Novel carbon-based nanoadsorbents for removal of synthetic textile dyes from wastewaters." In S. K. Sharma (Ed.), *Green Chemistry for Dyes Removal from Wastewater: Research Trends and Applications* (pp. 35–82). Hoboken, USA: John Wiley & Sons, Inc.
6. **Chowdhury, S.,** & Balasubramanian, R. (2014). "Graphene and related nanomaterials for environmental remediation." In B. T. Edwards (Ed.), *Graphene: Mechanical Properties, Potential*

Applications and Electrochemical Performance (pp. 149–217). Hauppauge, USA: Nova Science Publishers, Inc.

7. Saha, P., & **Chowdhury, S.** (2011). "Insight into adsorption thermodynamics." In M. Tadashi (Ed.), *Thermodynamics* (pp. 349–364). Rijeka, Croatia: InTech.

REFERRED CONFERENCE PAPER

1. **Chowdhury, S.**, Misra, R., Kushwaha, P., & Saha, P. (2010). "Study of the adsorption isotherms for removal of safranin from aqueous solutions using treated rice husk by linear and non-linear methods." In *Chemeca 2010: Engineering at the Edge* (pp. 2057-2066). Barton, Australia: Engineers Australia.

INVITED PRESENTATIONS

- | | |
|---------|---|
| 12/2020 | "Graphene-Based 3D Macrostructures for Sustainable Energy and Environment", Department of Chemical Engineering, <i>Malaviya National Institute of Technology Jaipur</i> , India |
| 12/2020 | "Plant Derived Nanomaterials for Sustainable Urbanization", Department of Biotechnology and Medical Engineering, <i>National Institute of Technology Rourkela</i> , India |
| 01/2020 | "Sustainable Utilization of Food Waste", Department of Metallurgical & Materials Engineering, <i>National Institute of Technology Durgapur</i> , India |
| 10/2018 | "Decarbonizing Energy and the Graphene Revolution", Department of Chemical Engineering, <i>Indian Institute of Technology Kanpur</i> , India |

RESEARCH PERSONNEL SUPERVISED/CO-SUPERVISED

Doctoral Candidate(s)

- | | |
|--------------|---|
| 2019–Present | Chinmayee DAS, SEnvSE, IIT Kgp |
| 2020–Present | Mario VINO LINCY, SEnvSE, IIT Kgp |
| 2020–Present | Tajamul SHAFI, SEnvSE, IIT Kgp |
| 2021–Present | Aakash HOSSAIN, SEnvSE, IIT Kgp |
| 2020–Present | Thulluru LAKSHMI PATHI, SEnvSE, IIT Kgp |
| 2019–Present | Naseeba PARVEEN, SEnvSE, IIT Kgp |
| 2020–Present | Sahil CHAUHAN, SEnvSE, IIT Kgp |
| 2020–Present | Arasavilli SRIJA, SEnvSE, IIT Kgp |
| 2020–Present | Tridip BHOWMIK, SEnvSE, IIT Kgp |
| 2021–Present | Prakash Ajay TAKSAL, SEnvSE, IIT Kgp |
| 2021–Present | Debanjali DEY, Department of Biotechnology, IIT Kgp |

Master's Student(s)

- | | |
|-----------|--|
| 2019–2020 | Rajneesh VERMA, CEE, IIT Kgp |
| 2019–2020 | Saikrishna VENNA, Department of Chemical Engineering, NIT Warangal |

THESIS EXAMINATION AND DEFENSE COMMITTEE

Ph.D. Dissertation Scrutiny Committee

- | | |
|--------------|---|
| 2019–Present | Swati DAS, P.K. Sinha Centre for Bioenergy and Renewables (PKSCBR), IIT Kgp |
| 2019–Present | Santosh KUMAR, PKSCBR, IIT Kgp |
| 2019–Present | Azhan AHMAD, CEE, IIT Kgp |
| 2019–Present | Rajshri CHAURASIA, CEE, IIT Kgp |
| 2019–Present | Anu VERMA, SEnvSE, IIT Kgp |
| 2019–Present | Soham HALDER, SEnvSE, IIT Kgp |

2019–Present	Monali PRIYADARSHINI, SEnvSE, IIT Kgp
2020–Present	Anjaly P. THOMAS, CEE, IIT Kgp
2020–Present	Debasish PAL, CEE, IIT Kgp
2020–Present	Rishi SHANDILYA, CEE, IIT Kgp
2020–Present	Suryansu KAR, CEE, IIT Kgp
2020–Present	Anwesha MUKHOPADHYAY, SEnvSE, IIT Kgp
2020–Present	Ashish SRIVASTAVA, SEnvSE, IIT Kgp
2020–Present	Naragam BHANU SREE, SEnvSE, IIT Kgp
2020–Present	Rishabh RAJ, SEnvSE, IIT Kgp
2020–Present	Vishal Kumar PARIDA, SEnvSE, IIT Kgp
2020–Present	Arun Kumar T, SEnvSE, IIT Kgp
2021–Present	Samrat SANTRA, SEnvSE, IIT Kgp
2021–Present	Shraddha YADAV, SEnvSE, IIT Kgp
2021–Present	Umesh Kumar SINGH, SEnvSE, IIT Kgp
2021–Present	Mahendra MULKALWAR, SEnvSE, IIT Kgp
2021–Present	Satvik ANSHU, School of Energy Science and Engineering, IIT Kgp
2021–Present	Anil, CEE, IIT Kgp
2021–Present	Rajasrshi BHAR, CEE, IIT Kgp
2021–Present	Akash RAWAT, SEnvSE, IIT Kgp
2021–Present	Namrat MISHRA, SEnvSE, IIT Kgp
2021–Present	Anurag TRIPATHI, School of Water Resources, IIT Kgp

TEACHING EXPERIENCE

2021	Lecturer , "Solid Waste Management" (graduate), IIT Kgp
2020	Lecturer , "Environmental Chemistry & Microbiology" (graduate), IIT Kgp
2019–Present	Co-Lecturer , "Engineering Drawing and Computer Graphics" (undergraduate), IIT Kgp
2019–Present	Lecturer , "Environmental Science" (undergraduate), IIT Kgp
2018–2019	Graduate Tutor , "Global Environmental Issues" (undergraduate), School of Continuing and Lifelong Education, NUS
2014–2016	Teaching Assistant , "Global Environmental Issues" (undergraduate), Faculty of Engineering, NUS

PROFESSIONAL MEMBERSHIPS

2012–Present	Life Associate Member, The Institution of Engineers (India)
2012–Present	Life Member, The Indian Science Congress Association
2012–Present	Life Member, The Biotech Research Society (India)
2012–Present	Life Member, Society for Biotechnologists (India)
2012–Present	Life Member, Institute of Science, Education and Culture (India)
2012–Present	Life Member, Forum of Scientists, Engineers & Technologists (India)