Subhasis Roy, Ph.D.,
Raman Postdoc Fellow (Ohio, USA), Postdoc (SKKU, South Korea)
Assistant Professor, Department of Chemical Engineering
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A nano-science and technology professional with 15 years of research and academic experience.

Area of Research Interest:

1. Energy applications of nanotechnology
2. Advanced Photovoltaics
3. Energy Storage Systems
4. Thin Films, Sub-micro, and nanostructures, composites
5. Photocatalyst for water splitting
6. Fuel Cell and Hydrogen Energy
7. Ferroelectric, Magnetic, and Multiferroic sensor
8. Electrical & Electronic Ceramics

Collaborative, interdisciplinary research focused on solving fundamental and practical engineering problems to develop novel devices and systems for energy and environmental technology applications that provide higher energy efficiencies, better performance, and lower costs. Efforts go beyond fundamental research and cover technology transfer, education & outreach, and business acceleration efforts:

Current status

Assistant Professor, Department of Chemical Engineering, University of Calcutta, Kolkata, India

Educational Qualification

- 2012: PhD in Materials Science, Indian Institute of Technology Kharagpur, India
- 2006: M. Tech in Energy Science and Technology, Jadavpur University, India
- 2004: B.Tech in Chemical Engineering, Vidyasagar University, India

Professional and research experience

- 2013-till date: **Assistant Professor**, Department of Chemical Engineering, University College of Science and Technology, University of Calcutta

- 2016- 2017: **Postdoctoral Research** Raman Fellow, Ohio University, USA (research on "metal oxide hybrid perovskite photoelectrode for efficient photoelectrochemical water splitting" CEER, Russ College of Engineering, USA)

- 20th Aug. 2013- 15th Nov. 2013: **Research Associate**, Indian InstituteofScience Education & Research (IISER), Kolkata. (research on "Photonic and magnetic interactions of nanoparticles inside carbon nanotubes channels")

- 2012- 2013: **Postdoctoral Researcher**, Sungkyunkwan University, South Korea (Research on "perovskite-based solar cell")

Summary of Industrial Experience interaction:

- Consolidated Fibres and Chemicals LTD‟ (Polymer industry). Haldia, Purba Medinipur, West Bengal (one month trainee)
- "East India Pharmaceuticals Works LTD‟.Kolkata, West Bengal (one month

trainee) Other

- One year research experience on **Nanofabricated** PEMFC fuel cell in National Chemical Laboratory, Pune, India (July 2005-April 2006)

LIST OF PUBLICATIONS AND PRESENTATIONS

Peer-Reviewed Journal:

2025

(1) Jyoti Bhattacharjee, **Subhasis Roy**, Abdul Aziz Shaikh, Artificial Intelligence and Machine Learning for the Optimization of Photocatalytic Performance, **Energy 360**, elsevier 2025,100027, ISSN 2950-4872, https://doi.org/10.1016/j.energ.2025.100027

(2) Jyoti Bhattacharjee, **Subhasis Roy**, Abdul Aziz Shaikh, Preetam Datta, Efficient fabrication and characterization of doped nanocomposites for thermoelectric materials, **Nano Trends**, Volume 10, 2025, 100109, ISSN 2666-9781,https://doi.org/10.1016/j.nwnano.2025.100109.

(3) Aspects of Energy Efficiency and Execution of Modern Technologies for Achieving Net Zero, Debdutta Mandal, **Subhasis Roy**, Jyoti Bhattacharjee, Debarati Mitra, **Graduate Journal of Interdisciplinary Research, Reports & Reviews**, Vol. 02, No.03 (2024), pp.150-163, https://doi.org/10.5281/zenodo.15087049,

(4) Jyoti Bhattacharjee, **Subhasis Roy**, A comprehensive review on integrated photo rechargeable batteries- supercapacitors, and their techno-economic feasibility, **Journal of Photochemistry and Photobiology**, Elsevier, Volume 25, 2025, 100257, ISSN 2666-4690, https://doi.org/10.1016/j.jpap.2024.100257.

(5) Jyoti Bhattacharjee, **Subhasis Roy**, Advanced Techniques Using Ionic Liquids for Efficient Separation of Sugar Alcohols. **Innov Discov**, 2025; 2(1): 3. DOI: 10.53964/id.2025003.

2024

(6) Bhakta, D., Gayen, D., Bhattacharjee, J., Chatterjee, R., Dastidar, P., & , **Subhasis Roy** (2024). Repurposing Industrial and Agricultural Wastes as Sustainable Alternatives in Photovoltaic Cells and Dye Degradation. In ChemistrySelect (Vol. 9, Issue 38). Wiley. https://doi.org/10.1002/slct.202403145 **(IF 2.1)**

(7) Contemporary approaches to enhancing the efficiency of ionic liquids in the separation of sugar alcohols", In Innovation Discovery. Innovation Forever Publishing Group Limited.

(8) Bhattacharjee, J., & **Subhasis Roy** (2024). Fine Chemical Engineering, "Molybdenum Oxide in Electrochromic Devices: Innovations, Applications, and Market Potential (accepted)

(9) Synthesis of Thermoelectric Nanocomposites by Incorporating Reduced Graphene Oxide, Archives of Advanced Engineering, 2024, pp 1–11 DOI: 10.47852/bonviewAAES42023514, Jyoti Bhattacharjee and **Subhasis Roy**

(10) Bhattacharjee, J., & **Subhasis Roy** (2024). Synergistic insights: electro-organic photocatalysis and nanostructures. In Chemical Papers (Vol. 78, Issue 15, pp. 8077–8105). Springer Science and Business Media LLC. https://doi.org/10.1007/s11696-024-03657-2

(11) Jyoti Bhattacharjee, **Subhasis Roy**, Nature-Inspired Catalysts: A New Era for Water-Splitting Technology, Material Science Research India ISSN: 0973-3469, Vol.21, No.(2) 2024, https://doi.org/10.13005/msri/210201

(12) Bhattacharjee, J., & **Subhasis Roy** (2024). A review on photocatalysis and nanocatalysts for advanced organic synthesis. In Hybrid Advances (Vol. 6, p. 100268). Elsevier BV. https://doi.org/10.1016/j.hybadv.2024.100268

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(14) Jyoti Bhattacharjee, **Subhasis Roy** (2024) Understanding Global Climatic Shifts- A Comprehensive Review. Journal of Chemistry & its Applications. Volume 3(4): 1-11, DOI: doi.org/10.47363/JCIA/2024(3)133. ISSN: 2754-6675 **(IF 0.35)**

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(38) Ratiometric pH Sensing, Photophysics, and Cell Imaging of Nonaromatic Light-Emitting Polymers , Joy Sankar Deb Roy, Deepak Chowdhury, MD Hussain Sanfui, Nadira Hassan, Manas Mahapatra, Narendra Nath Ghosh, Swapan Majumdar, Pijush Kanti Chattopadhyay**, Subhasis Roy**, and Nayan Ranjan Singha, ACS Appl. Bio Mater. 2022, 5, 6, 2990–3005, https://doi.org/10.1021/acsabm.2c00297 **(IF 3.25)**

(39) Emerging semiconductors and metal-organic compounds related photocatalysts for sustainable hydrogen peroxide production, Yang Ding, Soumyajit Maitra, Daniel Arenas Esteban, Sara Bals, Henk Vrielinck, , **Subhasis Roy** , Tarek Barakat , 2022, Matter- cell press Volume 5, Issue 7, 6 July 2022, Pages 2119-2167**.(IF 19.6)**

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(42) Light-Emitting Redox Polymers for Sensing and Removal-Reduction of Cu(II): Roles of Hydrogen Bonding in Nonconventional Fluorescence Joy Sankar Deb Roy, Mousumi Deb, MD Hussain Sanfui, Shrestha Roy, Arnab Dutta, Pijush Kanti Chattopadhyay, Narendra Nath Ghosh, **Subhasis Roy**, and Nayan Ranjan Singha: ACS Appl. Polym. Mater. 2022, 4, 3, 1643–1656 **(IF 4.089)**

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Bao-Lian Su, Journal of Energy Chemistry 70 (2022) 236–247, ISSN 2095-4956 **(IF 9.676)**

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(45) Swastik Paul, Souhardya Bera, Rishav Dasgupta, Shibsankar Mondal, **Subhasis Roy**, Review on the recent structural advances in open and closed systems for carbon capture through algae, Energy Nexus,Volume 4,2021, 100032,ISSN 2772-4271.

(46) "Simulated Performance Studies of Thin Film Perovskite Solar Cell". Shyamal Datta & **Subhasis Roy** , Journal of The Institution of Engineers (India): Series C vol. 103, pp.189–195 (2021) **(IF 1.676)**.

(47) "Solvothermal Etching-Assisted Phase and Morphology Tailoring in Highly Porous $CuFe_2O_4$ Nanoflake Photocathodes for Solar Water Splitting", Soumyajit Maitra, Subhan Pal, Toulik Maitra, Somoprova Halder, and **Subhasis Roy,** *Energy & Fuels*, ACS, Vol 35 (17), pp 14087-14100, 2021 (IF **3.421**).

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(49) "Superior light absorbing CdS/vanadium sulphide nanowalls@TiO2 nanorod ternary heterojunction photoanodes for solar water splitting" , Soumyajit Maitra,, Somoprova Halder, Toulik Maitra, **Subhasis Roy**, *New Journal of Chemistry*, RSc, Vol 45 (16), 7353-7367, 2021. (IF **3.591**).

(50) "Research on dye sensitized solar cell: A review highlighting the progress in India", Journal of Physics: Energy, , K. Mukherjee S. Bera , D. Sengupta, **Subhasis Roy**, *Journal of Physics: Energy*, IOP science Volume 3, Number 3 pp 032013, 2021. (IF **7.528**)

(51) "Blending of Dielectric Perovskite with Electron Transport Materials: A Case Study towards Improving Bio-Molecular Devices for Energy Harvest", K. Mukherjee, **Subhasis Roy**, Argha Dey, Shyamal Datta, Sk. Abdul Moyez, Abhijit Kamila, *ECS Journal of Solid State Science and Technology*, Vol 10 (1), 013003, 2021. (IF **2.142**)

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27. **Supercapacitor electrodes: A mini review,** Rajeev Ranjan, **Subhasis Roy**, GAA 2020 & Indo American Multidisciplinary Web Conference on Arts, Science, Engineering, and Technology IAMWCASET-2020 proceedings, 31st August 2020. Page-89-93,ISBN -978-81-945642-4-9.

28. "**Simulated performance studies of thin film perovskite solar cell.**" Shyamal Datta, **Subhasis Roy** Conference: Proc. ICESD 2020_038 , ISBN 978-93-83660-56-8. 2020.

29. **"Optimization of TiO_2/ $KMnO_4$ composites with natural dyes for solar cell Application**" Shyamal Datta, **Subhasis Roy**, 2nd International Conference on Advances in Bioprocess Engineering and Technology 2020 (ICABET 2020) on January 20-22, 2020, Page - O-93

30. **"Performance enhancement of Dye-sensitized solar cell using extracted photosensitized organic molecules in addition with dielectric nanomaterial**" Argha Dey, **Subhasis Roy** and Sourav Mondal, 2nd International Conference on Advances in Bioprocess Engineering and Technology 2020 (ICABET 2020) on January 20-22, 2020, Page - O-96.

31. **"Simulated performance studies of thin film perovskite solar cell, International Conference on Energy and Sustainable Development"** Shyamal Datta, **Subhasis Roy**, Jointly

organized by Jadavpur University and The Institution of Engineers, India February 14- 15, 2020.

32. "**Synthesis and Characterization of Nanomaterials for Photoelectrochemical application**" **Subhasis Roy** on 10th January, 2020 in "International Conference on Chemistry for Human Development (ICCHD- 2020) in collaboration with „University of Calcutta" and "Heritage Institute of Technology" during January 9-11, 2020 in Calcutta, IL-63, Page-136

33. **"Nickel Doped Molybdenum Oxide Thin Film Counter Electrodes as a Low-Cost Replacement for Platinum in Dye Sensitized Solar Cells"** Soumyajit Maitra , Subhan Pal , Shyamal Datta , **Subhasis Roy**, 3rd International Conference on Solar Energy Photovoltaic from 19th December 2019 to 21st December 2019 at KIIT Deemed University, Bhubaneswar, India,from 19th – 21th December 2019, Page- 0608

34. **"Titanium dioxide and $KMnO_4$ composite film on FTO glass as a working electrode for solar cell application" Young**. **Scientists' conference**. **Subhasis Roy** 5-7 NOVEMBER, Indian International Science Festival-2019. BISWA BANGLA CONVENTION CENTRE. KOLKATA. Ministry of Science and Technology, India.

35. **"Integrated Metal Oxide Hybrid Perovskite Photoelectrode for Efficient Photoelectrochemical Water Splitting"** Gerardine G. Botte, **Subhasis Roy**, 231st Electrochemical Society Meeting New Orleans, LA,USA, May 28- Jun 1, AI 1439, 2017 DOI: 10.1149/ma2017-01/30/1426Part of ISSN: 2151-2043

36. **"Fabrication of Lead (Pb) free $CH_3NH_3SrICl_2$ based thin film perov-skite solar cell at ambient condition"** Subhan Kumar Pal , Sk Abdul Moyez, Sneha Mukherjee , **Subhasis Roy**, Emerging Trends for Sustainable Development, 2019 (ICETSD '19) 05-06 th March, 2019, Page 61-64

37. "**Synthesis and Characterization of the Organo-Lead Halide- Based Perovskite Solar cell**", Abhishek Dhar, Argha Dey , **Subhasis Roy**, Sharmistha Paul, 24th West Bengal State Science and Technology Congress, 2017, Presidency Division, NITTTR, Kolkata, India, 28th February/ 1st March, pp-117, 2017 (Awarded first prize).

38. "**Optimization of Pb-Sn Based perovskite Solar cells**", Abhinanda Sengupta, Sk Abdul Moyez, Asit Baran Biswas, Bhaskar Chandra Das, **Subhasis Roy**, CHEMCON 2016**,** Chennai Regional Centre of IIChE, Chennai, Tamilnadu during 27-30 December, 2016, T-43, PP.1244. (Awarded 2nd best prize)

39. "**Fabrication of Environmental Friendly Perovskite Solar Cells by Partial Replacemnet of Lead with Tin**", International symposium on semiconductor material and devices (ISSmd - 4), Abhinanda Sengupta, Sk Abdul Moyez, Bhaskar Chandra Das, **Subhasis Roy,** School of Materials Sciences & Nanotechnology Jadavpur University, Kolkata, during 8–10 Mar 2017.

40. "**Combined Organic-Perovskite Solar Cell Fabrication as conventional Energy substitute**" Argha Dey, **Subhasis Roy**, 2nd International Conference on Solar Energy Photovoltaic, ICSEP 2016, held at School of Electronic Engineering, KIIT University, Bhubaneswar, Odisha, 17 -19 December 2016, P-0207, pp 73.

41. "**Fabrication and study of Perovskite-based Solar Cell as an Alternative Sources of Energy**", Abhishek Dhar, Argha Dey, **Subhasis Roy**, Sharmistha Paul, 1st Regional Science &

Technology Congress-2016, Presidency Division, NITTTR, Kolkata,India, November 13-14,pp-158, 2016 (Awarded first prize).

42. "**Tailoring the surface morphology with annealing temperature of the lead-free perovskite solar cell, $CH_3NH_3SnCl_3$ and its relation to the cell performance**". Sk Abdul Moyez, **Subhasis Roy**, 2nd International Conference on Solar Energy Photovoltaic, ICSEP 2016, , held at School of Electronic Engineering, KIIT University, Bhubaneswar, Odisha, 17 - 19 December 2016, P-0212, pp 27.

43. **"Studies on the Perovskite-based Solar Cell as Energy Harvesting Substitute"** Argha Dey, Sk.Abdul Moyez, Asim Kumar Hajra, **Subhasis Roy** at National Conference on Recent Trends in Functional Materials in Relation to Nanomaterials and Nanotechnology (RTFMNN).Organized by Department of Chemistry, St. Paul"s Cathedral Mission College, Kolkata, India. February 4-5, 2016.

44. **"Nano Bio-synthesis of Anthocyanin and Chlorophyll for Dye Sensitized Solar Cells Application" Sk.** Abdul Moyez, Argha Dey**, Subhasis Roy** at International Conference on Advances in Bioprocess Engineering and Technology (ICABET 2016). Organized by Department of Chemical Engineering and Department of Biotechnology, Heritage Institute of Technology, Kolkata, India. January 20-22, pp-155, 2016.

45. **"Synthesis of Natural Dyes to Repalce the Organic Dyes for the Fabrication of Dye-Sensitized Solar Cell"** Sk. Abdul Moyez, Argha Dey, Sanjoy Maity, **Subhasis Roy** at National Conference on Recent Trends in Functional Materials in Relation to Nanomaterials and Nanotechnology (RTFMNN). Organized by Department of Chemistry, St. Paul"s Cathedral Mission College, Kolkata, India. February 4-5, pp-69, 2016.

46. **"Biomolecules Combined Hybrid Perovskites for Energy Efficient Solar Cell"** Argha Dey, Milan Kumar Mandal, Sk.Abdul Moyez, **Subhasis Roy** at International Conference on Advances in Bioprocess Engineering and Technology (ICABET 2016). Organized by Department of Chemical Engineering and Department of Biotechnology, Heritage Institute of Technology, Kolkata, India. January 20-22, , 2016.

47. "**Ferroelectric and Magnetic Behaviors of $CoFe_2O_4/Pb_{0.85}La_{0.15}TiO_3$ nano-Composite Thin Films Synthesized By Sol-Gel Precursor Hybrid Processing Route**", **Subhasis Roy** and S.B. Majumder , at International Conference on Nano Science and Technology (ICONSAT), IIT Bombay, Mumbai, India, February 17-20, FM-62, 2010.

48. **"Flexible Solid-state Dye-sensitized Solar Cells Based on ITO Nanowire Arrays"**, Gill Sang Han, **Subhasis Roy**, Sangwook Lee, Jun-Hong Noh, Hyun Suk Chung, Hyun Suk Jung, MRS Spring Meeting at the Moscone, West Convention Center, April 1-5, 2013.

49. **"Development of an Automated Gas Sensing Measurement System Using Semiconducting Oxides as Sensing Material",** K. Mukherjee, K. K. Bhargav, **Subhasis Roy**, A. P. Gour and S.B. Majumder, at International Conference on Hi-Tech, Materials Science Centre, IIT Kharagpur., February 11- 13, 2009.

50. **"Electrical and Magnetic Properties of Sol-Gel Synthesized $CoFe_2O_4/Pb_{0.85}$ $La_{0.15}$ TiO_3 Composite Thin Films", Subhasis Roy**, and S.B. Majumder, at International Conference on Electroceramics (ICE) – 2009, University of Delhi, New Delhi, India, December13-17, 2009.

51. **"Synthesis and Characterization of $CoFe_2O_4/Pb_{0.85}La_{0.15}TiO_3$ Composite Thin Films", Subhasis Roy**, and S.B. Majumder, at International Symposium on Microwave and Optical

Technology (ISMOT)-2009, Hotel Ashok, New Delhi, India, December 16 – 19, 2009.

52. **"Analysis of Deposition and Dewetting Characteristics of Polyaniline (PANI) Films using Langmuir Blodgett Technique"**, S. Manigandan, **Subhasis Roy**, Saikat Chakraborty, Saibal Ganguly, and Kajari Kargupta, CHEMCON, Kolkata, December 27-30, 2007.

53. **"Wet chemical synthesis of electro-ceramic thin films", Subhasis Roy** and S.B. Majumder, at National Conference on Recent Advances in Innovative Materials (RAIM-2008), NIT, Hamirpur, February 16-17, 2008.

54. **"Dielectric and Magnetic Properties of Flexible PVDF: $CoFe_2O_4$ Composites," Subhasis Roy**, and S.B. Majumder at National Seminar on Ferroelectric & Dielectrics (NSFD-15), Schoolof Physics & Material Science, Thapar University, Patiala- 147004, India, November 6-8, 2008.

55. **Enhanced-Light-Harvesting ITO Nanowire Arrays for Efficient Solid-State Dye-Sensitized Solar Cells,** Gill Sang Han, Sangwook Lee, Jun-Hong Noh, **Subhasis Roy**, Hyun Suk Jung, 7th International Conference on Surfaces, Coatings and Nanostructured Materials (NANOSMAT)" held in Prague, Czech Republic, September 18-21 2012.

56. **Efficiency enhancement of perovskite $CH_3NH_3PbCl_3$ based chlorophyll dye sensitized thin film solar cells,** Argha Dey, **Subhasis Roy**, Bhaskar Chandra Das at 70th Annual Session of Indian Institute of Chemical Engineers CHEMCON – 2017. Organized by Indian Institute of Chemical Engineers, Haldia Regional Centre & Department of Chemical Engineering, Haldia Institute of Technology, Haldia, West Bengal, India. December 27 – 30, pp 12, 2017.

57. **Efficiency and Stability Enhancement of Caesium Based Perovskite Quantum Dot Solar Cell,** Sneha Mukherjee, Sk Abdul Moyez, **Subhasis Roy**, International Conference on Nanotechnology (ICNT - 2018), Department of Fire and Safety Engineering, Institute of Fire and Safety Engineering, Haldia, India, November 16-17, 2018, page 73.

58. **Cationic replacement of lead (Pb) to improve environmental stability of perovskite based solar cells**, Subhan Pal, SK Abdul Moyez, **Subhasis Roy**, International Conference on Nanotechnology (ICNT - 2018), Department of Fire and Safety Engineering, Institute of Fire and Safety Engineering, Haldia, India, November 16-17, 2018, page 74.

INVITED LECTURES DELIVERED

Abroad :

1. Invited talk on " **Harnessing Nanomaterials for Solar-Driven Photoelectrochemical Water Splitting: Chemistry for a Sustainable Future**" International Conference on Chemistry for Human Development (ICCHD-2025) in collaboration with University of Calcutta, Biswa Bangla Biswabidyalay and Luminescent Organic Consortium of India during January 4-6, 2025 in Calcutta, India

2. Invited talk on "**Engineered perovskite nanomaterials for energy device applications**" 1st International Conference on Advanced Materials and Manufacturing (ICAMM-2024), 18-19th December, 2024; JISIASR, JIS University, WB, India Kolkata, West Bengal, India.

3. Invited talk on "**Nanomaterials for Solar-Driven Hydrogen Production: Emerging Trends to**

Revolutionize the Indian Chemical Industry" 61st Annual Convention of Chemists and international conference on "**Emerging Trends in Chemistry to Revolutionise Indian Chemical Industries for Viksit Bharat@ 2047**" taking place at JECRC University, Jaipur, Rajasthan during December 19-21, 2024

4. Invited talk on Functional Nanomaterials for Solar-Driven Hydrogen Production at "**Functional Nanomaterials for Solar-Driven Hydrogen Production**", at 2nd Global Conference for Decarbonization of Energy and Materials (GCDEM 2024), Singapore November 26– 30, 2024, the NTU@One-North, Singapore,

5. Invited talk on "**Functional Nanomaterials for Energy Device Engineering**" International Conference on Advanced Nanomaterials for Sustainability (ICANS- 2024), 17-19 October 2024 at Amal Jyothi College of Engineering (Autonomous), Kanjirappally, Kerala, India

6. Invited talk **on "Photovoltaic : From Basics to Breakthroughs"** Summer School Titled "Nanoscience and Nanotechnology: Fundamentals, Instrumentation and Applications" at CRNN University of Calcutta 24th July, 2024

7. Invited talk **on "Architecture of inorganic-organic hybrid perovskites for enhanced stable photovoltaic performance" in 2nd International Conference on Recent Trends in Materials Science & Devices 2023 (**ICRTMD 2023), Technical Sat Kabir Institute of Technology and Management, Jhajjar, Haryana, India, 30th Dec, 2023 , organized by Research Plateau Publishers in association with Sat Kabir Institute of Technology & Management,Bahadurgarh, Haryana, India.

8. Invited Speaker at International Summit on Metallurgical Engineering and Mineral Processing (ISMEMP2024) which will be held during November 04-06, 2024 in Vancouver, Canada

9. Invited talk on "**Architecture of inorganic-organic hybrid perovskites for enhanced stable photovoltaic performance**" , 2nd International Conference on Recent Trends on Materials Science & Devices 2023 (ICRTMD-2023) 29 - 31 December

10. Invited talk on "**Perovskite Nanomaterials for eco-friendly and stable solar cell applications**" World Summit on Sustainable Materials December 05-06, 2022 London, UK "Latest Innovations in material science for a sustainable world".

11. Invited talk on "**Thin Films Perovskite Nanomaterials for solar cell applications**" International Online Conference on Energy Sciences (ICES 2021), Organized by, Oman & Wroclaw University of Technology, Wroclaw, Poland,and Mahatma Gandhi University, P.D Hills P.O, Kottayam Kerala, India & National University of Science and Technology December 10, 2021.

12. Speaker of Session—**HYDROGEN GENERATION AND STORAGE Mechanics**, UK Aberdeen 9-12 july, 2018.

13. Invited talk on "**Integrated Metal Oxide Hybrid Perovskite Photoelectrode for Efficient Photoelectrochemical Water Splitting**" 231st Electrochemical Society Meeting, New Orleans, LA,USA, Jun 1, 2017, DOI: 10.1149/ma2017-01/30/1426Part of ISSN: 2151-2043.

14. Invited talk on **Functionalized Nanomaterials and its Applications,** NEFES 2020 November 3-6, 2020, Online Conference, Beijing.

15. Invited talk on "**Design, Synthesis and Characterization of Functionalized Nanomaterials and its Applications**" Department of Chemical and Biomolecular Engineering, Stocker Center 181,1 Ohio

University, Athens , USA, 23rd January 2017.

16. Invited talk on "**Functionalized Nanomaterials and its Applications**" (FES2554) Thursday Afternoon, November 5,2020 Beijing in The 5th International Conference on New Energy and Future Energy Systems (NEFES 2020).

17. Invited talk on "**Hybrid Materials**", Department of Materials Science and Engineering, Seoul National University, South Korea under Professor Ki-Bum Kim group, 12th May, 2013.

India :

18. Keynote talk in **International Hybrid Conference on Advanced Nanomaterials for Sustainability** (ICANS 2024), held on 17-19 October 2024 organised in Amal Jyothi College of Engineering, Kerala, India.
19. Invited talk on "**Functionalized Nanomaterials Based Devices for Energy-Related Applications**" International Hybrid Conference on Nano Structured Materials and Polymers (ICNP 2023) May 12-14, 2023, School of Energy Materials (SEM) Mahatma Gandhi University, P.D Hills P.O, Kottayam Kerala, India

20. Invited talk on '**Nanomaterials based devices for renewable energy applications**' One day State Level Seminar "Chemistry for Sustainable Future"11th May, 2013, organized by Department of Chemistry in collaboration with IQAC, Rammohan College,

21. Keynote Lecture on "**Construction and Demolition Waste Management and Recycling: Challenges and Opportunities**" at the National Workshop on "The utilization of local and recyclable waste materials in construction: present scenario and future scope" organized by our institute (JISIASR Kolkata), supported by Accelerate Vigyan Program under Karyashala Scheme, SERB, Govt. of India. The workshop will be held at JISIASR from January 09 to January 15, 2023

22. Invited talk on "**Affordable and Clean Energy**" an International online conference on the Role of Basic Sciences for Sustainable Development in connection with UNESCO's year of Basic Sciences for Sustainable Development. ICBSSD – 2022, 16-17 Dec, 2022, Organized by Department of Basic Sciences & Center for Nanoscience and Technology Amal Jyothi College of Engineering, Kanjirappally Koovappally P.O, Kottayam & Mahatma Gandhi University P.D Hills P.O, Kottayam Kerala, India & Gdansk University of Technology Poland.

23. Invited talk on "**Chemical Approaches Toward Eco-friendly and Stable of Perovskite Based Thin Films Solar Cells**" in "International Conference on Recent Trends in Chemical Sciences-2022(RTCS-2022) 59th Convention of Chemists (ACC-2022) of Indian Chemical Society is being organised at the Department of Chemistry &Biology, Indian Institute of Technology (ISM) Dhanbad , Jharkhand during December 16-18, 2022.

24. Invited talk on **perovskite solar cell** in the International Online Conference on Nanomaterials (ICN-2022) held at Mahatma Gandhi University, Kottayam, Kerala, India. from 12th -14th , August 2022.

25. Invited talk on **Functionalized hybrid perovskite for energy application** (Invited) One Day webinars on Recent Advances in Renewable Energy and Materials for Sustainable Energy: Future Prospect, organized by The Institution of Engineers (India) Durgapur Local Centre under the aegis of Mechanical Engineering Division Board, 4th August, 2022.

26. Invited talk on **Functionalized hybrid perovskite solar cell** (Invited) Inter/Multidisciplinary Refresher

Course Research Methodology in Science and Technology, and Sustainable Development in Science and Technology February 07-22, 2022. Sponsored by UGC- Human Resource Development Centre, and organized by the University of Calcutta.

27. Invited talk on **Functionalized hybrid perovskite-type fascinating nanomaterials for energy applications** (Invited)Webinar Internship Course on Emerging Trends in Nanomaterials for Different Device Architectures (ETNDDA-2021) Indian Chemical Society, 27th Nov,2021

28. **Functional Nanomaterials in Energy Devices**" 6th seminar of Webinar series organized by Calcutta University Chemical Engineering Alumni Association (CUChEAA) on 31.01.2021

29. Invited talk on **Functionalized Nanomaterials and its Applications for Energy Devices,**Contai Polytechnic, Department of Chemical Engineering India, 14th October, 2020.

30. Invited talk on "**Synthesis and Characterization of Nanomaterials for Photoelectrochemical application**" on 10th January, 2020 in "International Conference on Chemistry for Human Development (ICCHD- 2020) in collaboration with „University of Calcutta" and "Heritage Institute of Technology" during January 9-11, 2020 in Calcutta

31. Invited talk on as an external expert in the refreshers Course on „Avant-grade theoretical modeling and state of the art experimental techniques in Nanoelectronic devices". held between 10th to 21st December 2019 in nanotechnology at JIS College of Engineering Kalyani. The talk was on "**Low Dimensional Nanoelectronic Devices for Clean Energy Applications**" on 18th December 2019.

32. Invited talk on "**'Application of Chemical Engineering on Natural Resources"** Applications Department of Chemical Engineering, IGIT-Sarang ,workshop on 'Application of Chemical Engineering on Natural Resources' during 16-21 July, 2018.

33. Invited talk on "**Characterization of Functionalized Nanomaterials**" Department of Chemical engineering, IIT Kharagpur, 9th October, 2017

ACADEMIC DISTINCTIONS, HONOURS AND AWARDS

International:

1. **Young Scientist** awarded in 2nd Global Conference for Decarbonization of Energy and Materials (GCDEM 2024), the NTU@One-North, Singapore 2024
2. **Chairing** a Technical Session at 2nd Global Conference for Decarbonization of Energy and Materials (GCDEM 2024), Singapore November 26– 30, 2024, the NTU@One-North, Singapore
3. **Excellence Teaching Higher Education Award** 2024- European Council for Higher Education and Accreditation, 2B Old Birley Street, Hulme, Manchester M15 5RG, United Kingdom held during 12th Indo American International Conference on Multidisciplinary Research on dated 26th May 2024.
4. Certificate recognition of the review contributed to ACS Journal, 2025.
5. European Excellence Award 2023- European council for higher education and accreditation
6. **Chairing a** Technical Session at ICRTMD 2023 Technical Sat Kabir Institute of Technology and Management, Jhajjar, Haryana, India, 30th Dec, 2023.

7. **Certificate of Recognization** for the award of excellent Research, Europian Council of Higher Education and Accreditation (Manchester , UK)
8. **Chairing a session** on International Hybrid Conference on Nano Structured Materials and Polymers (ICNP 2023) May 12-14, 2023, School of Energy Materials (SEM) Mahatma Gandhi University, P.D Hills P.O, Kottayam Kerala, India
9. Recognition of the review contributed Chemical Engineering Journal 2022 Elsevier
10. Recognition of the review contributed Optical Materials Elsevier, July 2022
11. Recognition of the review contributed Diamond and Related Materials 2022 Elsevier
12. Recognition of the review contributed International Journal of Hydrogen Energy May 2022
13. Bharat Vikas Award 2022.
14. Leading educationalist of India, 2023
15. **Chairing a session** on at the International Online Conference on Nanomaterials (ICN-2022) held at Mahatma Gandhi University, Kottayam, Kerala, India, 12th-14th, August 2022.
16. **Chairing a session** Invited talk on "Affordable and Clean Energy" an International online conference on the Role of Basic Sciences for Sustainable Development in connection with UNESCO's year of Basic Sciences for Sustainable Development. ICBSSD - 2022 Organized by Department of Basic Sciences & Center for Nanoscience and Technology Amal Jyothi College of Engineering, Kanjirappally Koovappally P.O, Kottayam & Mahatma Gandhi University P.D Hills P.O, Kottayam Kerala, India & Gdansk University of Technology Poland
17. Acted as the **Judge** for the International Research Scholars' Meet in the celebration of the 99th Foundation Day Celebration of the Indian Chemical Society in association with the Department of Chemistry, University of Calcutta, Kolkata on May 09, 2022.
18. **Recognition of the review contributed** Materials Chemistry and Physics 2017 **Elsevier**
19. **Recognition of the review contributed** Materials Today: Proceedings 2018 **Elsevier**
20. **Recognition of the review contributed** Environmental Technology & Innovation 2019 Elsevier
21. **INDIA Prime Top 100 Professors** & Teachers award 2021
22. Acted as the **Judge** for the Research Scholars & Faculty Members Competition Session in the Celebration of the 160th Birth Anniversary of Acharya Prafulla Chandra Ray organized by the Indian Chemical Society, Kolkata during, August 01-08, 2021.
23. **Chairing a session** on Renewable Energy Innovations in Sustainable Energy and Technology conference (ISET India2020) organized by Rajiv Gandhi Institute of Petroleum Technology (RGIPT) Dec 03-04, 2020
24. **"Distinguished Scientist Award"** " Elsevier SSRN Research Award 2020"

25. **Venus International Research Awards** (VIRA) 2016 Outstanding Scientist for Initiatives,iscoveries, and Developments in the discipline of Nanoscience and Nanotechnology.

26. **Chairing sessions** " International Online Conference on Energy Sciences (ICES 2021), Organized by Mahatma Gandhi University, P.D Hills P.O, Kottayam Kerala, India & National University of Science and Technology, Oman & Wroclaw University of Technology, Wroclaw, Poland December 10, 2021

27. **Chairing a session** on Information optimization and computing in International conference on Smart and Intelligent Learning for information optimization (CONSILIO - 2019) organized by the Department of Computer Science and Engineering, MGM College of Engineering and Technology, Noida, Uttar Pradesh, India during June 08-09, 2019.

28. **Honorable Jury**, South Asian Education Awards-2018

29. **Membership** of Royal Society of Chemistry for the Year 2018 (655023)(MRSC)

30. **Travel grant award** from "ECS Physical and Analytical Electrochemistry Division" to assist with the cost of attending the 231st ECS Meeting, May 28-Jun 1, 2017, New Orleans, LA.USA for inviting talk.

31. **Recognized Reviewer** status in Environmental Technology & Innovation, Elsevier 2019.

32. **Outstanding reviewer** status in Material Chemistry and Physics journal,Elsevier 2017.

33. **Recognized Reviewer** status Materials Today: Proceedings, 2019

34. "**Best Faculty Award (Male)"** by "International Academic and Research Excellence Awards"

35. **Recognized Reviewer** status in Material Science Research India (MSRI) journal, 2017.

36. **Certificate of Recognization** valued reviewer & has contributed to the quality and success of the International Journal of Engineering Research & Technology (IJERT) during the year 2017**.**

37. **Certificate of Recognization -**Certified Microsoft Innovative Educator 2021

38. **Fellow, Indian Chemical Society**

39. **Fellow,** International Society for Research and Development (ISRD) 2017

40. **International Research Excellence Awards** 2021 - CPACE (Center for Professional Advancement) -Materials Science –

41. International Awards - 2021. **Distinguished Assistant Professor**

National :

42. Best-Papers-Recommended_ISET2020 "PbS Nanoparticle Sensitized Fe-Doped Mesoporous

TiO_2 Photoanodes for Photoeletrochemical Water Splitting in Sustainable Energy and Technology" conference (ISET India2020) organized by Rajiv Gandhi Institute of Petroleum Technology (RGIPT) Dec 03-04, 2020

43.

44. Acted as the Judge for the Research Scholars & Faculty Members Competition Session in the Celebration of the 160th Birth Anniversary of Acharya Prafulla Chandra Ray organized by the Indian Chemical Society, Kolkata during August 01-08, 2021.

45. Acted as judge in International Conference on Recent Trends in Chemical Sciences-2022(RTCS-2022) 59th Convention of Chemists (ACC-2022) of Indian Chemical Society is being organised at the Department of Chemistry &Biology, Indian Institute of Technology (ISM) Dhanbad , Jharkhand during December 16-18, 2022

46. **Teachers Associateship for Research Excellence (TARE)** by the Science and Engineering Research Board, 2018.

47. **Innovation Ambassador**, MHRD IIC Council, Calcutta University

48. **Teaching Excellence Awards 2019**

49. **Membership** of The National Academy of Sciences, India (NASI) for the Year 2019(MASc)

50. **UGC-Raman** Post-Doctoral Fellowship for 2015-16.

51. **Fellow**, Indian Chemical Society 2019

52. Certificate of appreciation **TEACHER INNOVATION AWARD (ZIIEI),** 30th September 2019

53. „**Adarsh Vidya Saraswati Rashtriya Puraskar (A National Award of Excellence-2019)**", a distinction of being one of the Best Teachers in the country for the noble work done in the interest of students, teachers, and the entire education fraternity.

54. **Recognized Reviewer** status in "Construction and Building Materials", Elsevier, 2016.

55. Awarded 2nd prize on a research paper entitled **Efficiency and Stability Enhancement of Caesium Based Perovskite Quantum Dot Solar Cell** presented by student Sneha Mukherjee in International Conference on Nanotechnology (ICNT - 2018), Department of Fire and Safety Engineering, Institute of Fire and Safety Engineering, Haldia, India, November 16-17, 2018

56. Awarded first prize for an outstanding paper in 1st Regional Science & Technology Congress-2016, Presidency Division, NITTTR, Kolkata, India, November 13-14,2016, on "**Fabrication and study of Perovskite-based Solar Cell as an Alternative Sources of Energy**" .

57. **Recognized Reviewer** status in "Construction and Building Materials", Elsevier, 2014.

58. **DST Young Scientist** awarded in Fast Track scheme 2013.

59. **Postdoctoral fellowship**, Sungkyunkwan University, South Korea, 2012.

60. ***MHRD*** Scholarships for M.Tech study.

61. Qualified GATE 2003 and 2005 in Chemical Engineering.

Extension and dissemination activities (public / popular lectures/ talks/ seminars etc organized

- Coordinator Webinar on "IoT based Smart System for Protection of Green Environment and Sustainable Agriculture" November 3, 2020, MHRD-IIC, University College of Science and Technology, University of Calcutta

- Couese coordinator Inter/Multidisciplinary Refresher Course on Research Methodology in Science and Technology, and Sustainable Development in Science and Technology February 07-22, 2022, sponsored by UGC- Human Resource Development Centre, and organized by the Department of Chemical Engineering, University of Calcutta.

- Couese coordinator of 40 lectures on Webinar Internship Course on Emerging Trends in Nanomaterials for Different Device Architectures (ETNDDA-2021) Indian Chemical Society, 15 Sep.-28th Nov,2020.

- Development of e-learning delivery process/material - Internship course module on Emerging Trends in Nanomaterials for Different Device Architectures**,** e-tests, Functionalized Nanomaterials and its Applications http://www.academicconf.com/video?confname=nefes2020)

ATTENDED WORKSHOPS/SHORT TERM COURSES

1. 7 Days Online Workshop on Research Methodology and Publication Ethics" organized by Star International Foundation for Research and Education on 05.03.2025 - 11.03.2025.

2. "Successfully completed a 5-day online hands-on training on Nanomaterials and Nanodevices using RESCU (DFT+DFPT) and NanoDcal (DFT+NEGF) solvers, with a 4-month software license

3. provided."

4. Participated One Week in the "National Level Faculty Development Programme on Transforming Education for Sustainable Development : A Roadmap for Implementing NEP 2020 and SDGs in Higher Education Institutions",Date: 21 – 27 January, 2025 (Seven Days) jointly organized by Jharkhand Rai University, Ranchi, India;Balurghat B.Ed. College, West Bengal, India in association with 'Research Culture Society'.

5. One Week FDP/ Training Program on "Process Optimization" from October 14–18, 2024, organized by Department of Chemical Engineering, UPL University of Sustainable Technology in association with IIChE Student Chapter- SRICT,

6. Two days seminar on Celebrating the Legacy of Satyendra Nath Bose: 130th Birth Anniversary & Centenary of Bose-Einstein Statistics Organized by Vivekananda Vijnan Mission (VVM), West Bengal Chapter of Vijnana Bharati (VIBHA) March 8-9, 2025, IIT Kharagpur Research Park, Kolkata, West Bengal

7. One-day National Webinar on **"Circular Economy approach for Mitigation of Plastic Waste:**

Challenges, Opportunities and Future Prospects" being organized by the Indian Institute of Chemical Engineers Amaravati Regional Centre (IIChE ARC) **on 7th October 2024,** hosted by National Institute of Technology Andhra Pradesh (NIT AP), Tadepalligudem

8. Five Days International Faculty Development Programme on "Emerging Technologies and Innovations: Pioneering Environmental Sustainability (ETIPES-2K24)", organized by Department of Chemical Engineering, K. K. Wagh Institute of Engineering Education and Research, Nashik from 30/09/2024 to 04/10/2024.

9. Faculty Development Program "Innovating Hospitality: Integrating AI, Sustainability, and Technology for a Future-Ready Industry September 9 - 12, 2024, The Neotia University, Kolkata

10. Data Science vs Machine Learning vs Artificial Intelligence, Scalar masterclass, 15th Oct. 2024

11. Faculty Development Program FACULTY DEVELOPMENT PROGRAM ON AI IN TEACHING, LEARNING AND RESEARCH: EMERGING TRENDS from September 6 - 11, 2024, SHRI VAISHNAV VIDYAPEETH VISHWAVIDYALAYA

12. 5 Days Online Bootcamp on Machine Learning using Python for Beginners held from July 29, 2024, to August 2, 2024. Certificate ID: JAP24067, Japture

13. Faculty Development Programme "Quantum Enabled Science and Technology-QUEST-2024" (May 20 - 24, 2024) Jointly organized by CENTRE FOR TRAINING & LEARNING, NIT Warangal & Dept. of Physical Sciences, KITS Warangal.

14. Faculty Development Program on "Innovations in High-Performance Materials for Sustainable Energy and Environmental Impacts" 29th April – 4th May 2024, VRIT HYDERABAD College of Engineering for Women (Autonomous), Hyderabad, Telangana, India

15. Successful participation in a Five-day online Faculty Development Program on "Sustainable Nanomaterials Engineering for Environmental Applications" organized by Physics division, Department of Basic Sciences & Humanities in collaboration with Centre for Nanotechnology, Indian Institute of Technology Guwahati under INUPi2i program from 22 - 26 April, 2024.

16. SERB SSR two-day workshop on "Recent Topics in Scientific Advances and Research Innovations" organized by IIT Roorkee on 9-10 March 2024

17. Shri Vaishnav Institute of Forensic Science, Shri Vaishnav Vidyapeeth Vishwavidyalaya is Organizing Faculty Development Programme on "Humanitarian Forensics " from 25th April to 26th April 2024

18. One-week online FDP on "Empowering Educators: AI Tools for Engineering and Technology (AITET-2024)", organized by Department of Chemical Engineering, Chaitanya Bharathi Institute of Technology (A), Hyderabad, during 29th January 2024 - 2nd February 2024.

19. 5-day Online Faculty Development Programme on "Modelling, All ML in Chemical Engineering and Bioengineering" organised by the Department of Chemical Engineering, Coimbatore Institute of Technology, Coimbatore from 05-02-2024 to 09-02-2024.

20. Online non-credit course "Machine Learning-Fundamentals and Applications" authorized by IIPE and offered through IIPE Outreach organized by Indian Institute of Petroleum and Energy Visakhapatnam, 31-January-2024.

21. NEP 2020 Orientation & Sensitization Programme under Malaviya Mission Teacher Training Programme (MM-TTP) of University Grants Commission (UGC) Organized by (University/ College) MM-TTC, University of Calcutta from 03.01.2024 to 11.01.2024.

22. Participated in "Workshop on Interpretation of Instrumental Methods (WIIM-2024)" organiszed by Department of Chemistry & International Research Centre Sathyabama Institute of Science and Technology (Deemed to be University) in association with CSIR-National Metallurgical Laboratotry, CSIR-Madras Complex, th th during 08 to 11 January 2024

23. Inter/Multidisciplinary Refresher Course in Environmental Studies, organized Online by the UGC-Human Resource Development Centre (HRDC/MMTTC), University of Calcutta, in the Department of Home Science, University of Calcutta during December 08-21, 2023

24. Three Day International Virtual Workshop On RESEARCH WRITING, GRANT WRITING AND IMPACT PUBLICATIONS IN THE AGE OF ARTIFICIAL INTELLIGENCE, Jointly Organized by Lavender Literary Club, India, Cape Comorin Trust, India, Malaysian Industrial Relations & Human Resource Association (MIRHA), Malaysia from 29 – 31 October 2023.

25. 7 days workshop on Artificial Intelligence (AI) Tools for research papers and thesis writing, Aug 20- Sep 24, 2023.NEHUS, Ministry of MSME, India.

26. Two-Week Online National Faculty Development Program on "Possibilities and Potentials of National Education Policy 2020 (NEP 2020)" organized by Internal Quality Assurance Cell (IQAC), The Neotia University in collaboration with Guru Angad Dev Teaching Learning Centre, a Centre under PMMMNMTT, Ministry of Education, Government of India held from 20th June to 03rd July 2023.

27. Participate in conference 10th international Conference on multidisciplinary Research and Modarn education.28th May, 2023.

28. One Week Online Workshop on Statistical Data Analysis using R during April 21-27,2023, organised by Science Tech Institute (Run by MKS Educational Society), Lucknow, UP India. During the live class his/her attendance was 75-100 percent and whose Credit Hours is 3.5.

29. IP Awareness/Training program under NATIONAL INTELLECTUAL PROPERTY AWARENESS MISSION on April 06,2023.

30. "National Science Day " theme "Global Science for Global Wellbeing" on 20th – 22nd February, 2023 organized by Department of Physics, Chemistry, Mathematics & Bio-technology Koneru Lakshmaiah Education Foundation (KLEF), Guntur, Andhra Pradesh, India- 522302

31. International Conference on Chemical Engineering Innovations & Sustainability, Jadavpur University (ICEIS2023) February 26- 27, 2023

32. Participated in a Five-Day International Faculty Development program (online) on Engineering Materials & Catalysis during 26th - 30th December, 2022 organized by Chemistry Division, Department of Basic Science and Humanities, GMR Institute of Technology, Rajam.

33. IIC advance level training.Govt. of India

34. Participation in 7-Days FDP on Computational Chemistry of Materials: Molecule, Solids, Nanoparticles and Biological Activity starting from 21th November 2022
35. One week Training Program on "Petroleum Rock-fluid characterization and its application: Theoretical and experimental approach" 20th-26th June 2022, organised by Department of Petroleum Engineering IIT(ISM) Dhanbad

36. Participated in the Pacific Rim International Conference on Superconducting Materials: Fundamentals and Applications – PRISM held on September 22-23, 2022

37. Five day Online National Conference on "Emerging Trends in Physical Sciences" (ETPS-2021) organized by the Department of Physics, ICFAI University Tripura, Date: 27th September to 01st October, 2021.

38. FDP , KEYWAY RESEARCH, 13/05/2020

39. Attend the exciting AICTE Sponsored Online Short Term Training Programme on 'Recent Trends in Emerging Devices and Nnaotechnology'-Phase I (RTEDN1-21), being organised by the Department of Physics, National Institute of Science and Technology Berhampur from 1 Jun to 6th Jun 2021.
40. RSC Desktop Lectureship series March 25, 2021

41. "Virtual InternshipProgram on Spectroscopy" from 23.08.2021
to 27.08.2021. Organized by Department of Analytical Chemistry, University of Madras, Guindy Campus, Chennai &Abinnovus Consulting Pvt. Ltd

42. Participated in Online One Week Faculty Development Program on "Innovations in Applied Research for Science and Technology" organized by Department of Basic Science And Humanities, KDKCE Nagpur in association with Indian Association for Radiation Protection (IARP), Luminescence Society of India (LSI) & Society for Technologically Advanced Material of India (STAMI) from 11th to 18th October 2021.

43. Indo-Korean Joint Online International Workshop on "Advanced Functional Materials" (July 15-16, 2021)

44. 5-day online FDP on the theme "Inculcating Universal Human Values in Technical Education" organized by All India Council for Technical Education (AICTE) from 20th December, 2021 to 24 th December, 2021, F.No AICTE/FDP-SI/OnlineWorkshop/201/109192

45. Webinar design patent, 20/05/2022

46. webinar conducted by NBA jointly with MAKAUT, WB on "Outcome Based Education and Accreditation" for the Engineering Colleges of West Bengal on 15th December, 2020

47. IIC Innovation Ambassador Training Program on 6-7th March 2020 at IISER, Kolkata.

48. TEQIP-III Sponsored Short-Term Online Course on Nanostructured Materials for Energy, Environment and Healthcare Applications" IIT Delhi, New Delhi. 9th – 13th November 2020

49. Virtual Conference on Materials for Energy Harvesting and Catalysis 1-3 May, 2020 organized by Tata Institute of Fundamental Research (TIFR), Mumbai, and Indian Institute

of Science Education and Research (IISER), Kolkata.

50. Elite Certificate of Swayam CBT proctored examination on Academic Writing course

51. 5 days International E-Workshop on Principles and Applications of Analytical Instruments for Analysis of Organic/Inorganic molecules from 25 to 29th August 2020 jointly organized by Department of Chemistry & Department of Botany, Govt. R. R. M.
P.G. College, Surajpur (C.G.) and Department of Chemistry, Govt. Shivnath Science College, Rajnandgaon (C.G.), India 25-08-2020 to . 29-08-2020

52. Webinar on "Indian Citation Index" on 13-05-2020.

53. National Level Webinar on "Research Capability Building - A Strategy to Promote Research Culture in Higher Education". organized by Bhavan's Vivekananda College of Science, Humanities, and Commerce 12-14 May,2020

54. Virtual Conference on "Materials for Energy Harvesting and Catalysis"

    1st- 3rd May 2020

55. Two Days Online International Training on Research Manuscript Drafting and Publishing TORMP 2020 May 16-17, 2020

56. Webinar on Research Publication: Skills, Ethics, and Misconducts on 15.05.2020 organized by Department of Chemistry, Kumaraguru College of Technology, Coimbatore.

57. A National Webinar on " NO LOCK-DOWN FOR SOLAR ENERGY " organized by Department of Physics, Dr.MGR Educational and Research Institute, Adayalampattu Phase II Campus, Chennai on 15th May 2020.

58. Online faculty development IPR AWARENESS PROGRAM 13th May 2020

59. International Webinar, DOCTRINA-5 organized by Department of Chemistry & IQAC of Sir Syed College on 26-05-2020. The speakers are Dr. Mangala Sunder Krishnan, HOD, Department of Chemistry, IIT, Madras.

60. One week Faculty Development Program titled"Manufacturing and Analysis of Advanced Materials and Engineering Structure" organized by Department of Aeronautical Engineering, MLR Institute of Technology from 26-05-2020 to 30-05-2020.

61. Taking research forward during the pandemic, 20th May 2020.

62. Online FDP IPR awareness 13th May 2020.

63. International Webinar on "Nano-Structured thin films for Multifunctional Applications"

organised by the Departments of Chemistry, Physics & Electronics, on 11th June 2020.

64. Webinar on „Research Paper Development for Quality Journals" held on 14 June, 2020.

65. Webinar on Recent Advance of Chemical Science, JB Institute of Engineering and Technology 25-26 June 2020

66. Five-days Webinar Series on "Advances in Materials Science and Technology (WSAMST-2020)" held during 22-26 June 2020 by the Department of Applied Sciences and Humanities (Physics), School of Engineering, University of Petroleum and Energy Studies, Dehradun.

67. Online workshop on "Materials Processing and Technology" conducted by Department of Physics and Chemistry, Mahatma Gandhi Institute of Technology (MGIT), Hyderabad 27 June 2020.

68. 5 day webinar on Nanotechnology Driven Engineered Materials (NDEM-2020) 29 June 03 July 2020.

69. Online One Week Faculty Development Program on MOODLE from 23-29 May 2020 organized by Willingdon College, Sangli in association with Spoken Tutorial IIT, Bombay.

70. One day e-Conference on Perovskite Solar Cell , 30.06.2020.

71. webinar on „Perovskite Nanocrystals: Photoluminescence and Charge Carrier Dynamics", organized by the Dept. of Chemistry, School of Basic and Applied Sciences, Adamas University, dated 04.07.2020.

72. SRCW Webinar for Research Scholars organized by the Research & Development Cell of Sri Ramakrishna College of Arts & Science for Women, Coimbatore from 11.05.2020 to 15.05.2020.

73. UGC-HRDC Refresher Course(Inter-Disciplinary) in Chemical sciences, Engg. & Technology University of Calcutta, during Aug. 26- Sep 9, 2019

74. Summer School Titled "Advanced School on Nanoscience and Nanotechnology" at CRNN University of Calcutta during July 07-13, 2019

75. Attend Half day awareness program on Chemical Weapon Convention 28th January 2019 at Dr. HL Roy Bulding, IICHE auditorium, Jadavpur.

76. Attend stakeholder's Workshop on 12th February 2020 - AICTE Auditorium, New Delhi

77. One day National Seminar "Advanced Materials and Devices with emphasis on nanotechnology for green Energy" organized by Bidhan Chandra College, Rishra, January 31st , 2019.

78. "Workshop on MOOC with MOODLE", e-content development and Open Educational Resources", from 10th & 11th May, 2018, held at Centre for Research in Nano Science and Nanotechnology (CRNN) Salt Lake City, Kolkata, University of Calcutta Campus.

79. Three weeks Refresher Course on ICT , Academic Staff College, UGC-Human Resource Development Centre Jadavpur University , December 1, 2017 to December 22, 2017

80. TEQIP II sponsored workshop under advanced pedagogy on "recent advancement in energy harvesting and water treatment technologies", June 13-17, 2016, Chemical Engineering Department, Jadavpur University.

81. Entrepreneurship Development Program on "Solar Energy" at Hotel Inn, 17 Rafi Ahmed kidwal Road Kolkata 700013 organized by KVIC, Ministry of MSME (Govt. of India) March 12-13, 2016.

82. Faculty Development Programme on "Pedagogy Accreditation Research and Entrepreneurship" 25th -27th May, 2016, held at CSDEC, IEI, Shimla-02

83. "Solid and surface CAD modelling with CAM applications in CNC machining " at I.I.T. Kharagpur, Central workshop and instruments service section, February 09-13,2015.

84. "Orientation Programme 112", Academic Staff College, University of Calcutta December 01-30, 2015

85. Short Term Course on "Bioremediation of Industrial Wastes for a Greener World" December 8-12, 2014, at NIT Durgapur.

86. "Author Wokshop jointly organized by Spinger and University of Calcutta", 20th November,2014, at University of Calcutta.

87. "Industrial Academia workshop on Recent Trend in Petroleum Exploration Technology" organized by ONGC Academy oil and natural Gas corporation Limited, 10th Februry to 14th February, 2014 at Kolkata.

88. Nano-materials and Devices for Energy Application" at "International Conference on nano Nano Science and Technology 2010" at I.I.T. Bombay, Mumbai, INDIA , 17th February, 2010.

89. "Mechatronics using LabVIEW" under Technical Education Quality Improvement Programme(TEQIP), at Bengal Engineering & Science University, Shibpur,27-28 th March 2009.

SPONSORED R&D PROJECTSEXECUTED

Project title	Funding Agency	Amount in Rs.	Duration in years	Period Year to Year
Fabrication of solid state desensitized solar cells and their performance **(PI) (*Sole)***	Science and Engineering Research Board (SERB) under DST Fast Track scheme	24,70,000/-	3 years	2014-2017
Multidimensional Hematite Structure for Efficient Hydrogen Generation**(PI) (*Sole)***	UGC under Raman Fellowship scheme	25,13,752/-	1 year	2016-2017
Mentor of the project Synthesis, characterization, and structure-property correlation of functional nanomaterials based QD hybrid solar cells (Mentor)	MANF, UGC	17,07,000/-	5 years	2015-2019
Optical Spectroscopy to Optimize the Composition of Hybrid Perovskite for Photoluminescence, Photovoltaic and Photocatalysis Applications**(PI)** with collaboration of the Bose Institute, Kolkata	Science and Engineering Research Board (SERB) under Teachers Associateship for Research Excellence (TARE)	18,00,000/-	3.5 years	2018-2022
Engineering of hybrid organic–inorganic perovskite materials for highly efficient photoelectrochemical cells (**PI**) with collaboration of the University of British Columbia , Canada and Jadavpur University	Department of Science and Technology, Ministry of Science and Technology,India funding through "Mission Innovation Programme"	52,72,696/-	3 years	2019-2022
Experimental investigation of solar-driven self-powered seawater photo-electrocatalytic hydrogen production using nano-hybrid materials (PI)	Scheme for Transformational and Advanced Research in Sciences (STARS-2) by Ministry of Education, Govt. of India for promoting translational India-centric research in sciences implemented and	39,71,200/-	3 years	2023-2026

	managed by Indian Institute of Science (IISc), Bangalore			
Mentor of the project The project entitled "Adsorptive Removal of Dyes Using Green Low Cost Bioadsorbents"(Mentor)	WISE-KIRAN Division, TPN: 104832	23,76,000/-	4 years	2024-2028
Physico-chemical investigation of natural resource derived homoeopathic medicines and its therapeutic effects (Co-PI)	CENTRAL COUNCIL FOR RESEARCH IN HOMOEOPATHY, NEW DELHI	44,60,000/-	2 years	2025-2027

ACADEMIC/ ADMINISTRATIVE ACTIVITIES

1. Invigilator SET' 23, 17th December, 2023
2. PhD admission Committee member, Department of Chemical Engineering, University of Calcutta
3. Convener of Departmental Committee, Chemical Engineering, University of Calcutta, 2022 and 2013
4. DSC member, Center for Interdisciplinary Sciences, JIS Institute of Advanced Studies and Research (JISIASR), JIS University.
5. PEPSC 2023 Technical Program Committee held in Hangzhou, China during Nov. 24-26, 2023
6. TPC member of the 2024 Asia Conference on Electrical and Power Engineering (ACEPE 2024) in Suzhou, China during July 19-21, 2024.
7. TPC member of 2024 International Conference on Power Electronics and Energy System

(ICPEES 2024) will take place in Kuala Lumpur, Malaysia during March 1-3, 2024.

8. TPC member of 2023 Power Electronics and Power System Conference (PEPSC 2023), inHangzhou, China during Nov. 24-26, 2023 PEPSC 2023 Technical Program Committee
9. TPC member of The 12th Spring World Congress on Engineering and Technology (SCET 2023) will be held on April 21-23, 2023 in Kunming, China
10. TPC member of 3rd International Conference on New Energy Research and Applications (ICNERA 2022) will take place in Shanghai, China from May 27 to 29, 2022.
11. Organizing Committee member ICAIES-2021 International Conference on Artificial Intelligence and Energy System 12-13 June, 2021 Jaipur, India.
12. External Expert member for DSC committee JIS UNIVERSITY for PhD scholars
13. External Expert member for the SkillX and practical viva voce end-examination held in online mode on JIS UNIVERSITY, July 19, 20, and 22 -2021
14. External Expert member for the practical viva voce examination held in online mode on April 09-2021 from 11.30 am as Introduction to Polymer Science and Technology, and Basic Polymer Chemistry
15. International Scientific Committees member 6th International Conference on Education Reform and Modern Management (ERMM2021), Beijing, Chaina, April-11-12, 2021.
16. Organized Webinar on "IoT based Smart System for Protection of Green Environment and Sustainable Agriculture" November 3, 2020 from MHRD-IIC-Section of University College of Science and Technology, University of Calcutta
17. Program Committee member 3rd International Conference on Metal Material Processes and Manufacturing (ICMMPM2020) held in Singapore 22-23 June 2020.
18. Convener of Departmental Committee, Chemical Engineering, University of Calcutta, 2014-2016.
19. Expert for Poster Evaluation at "International Conference on Emerging Technologies for Sustainable Development- ICETSD 19; 5th & 6th March 2019; GCELT, Kolkata, India
20. TPC member of International Conference on New Energy Research and Applications (ICNERA 2021) will take place in Sanya, China during July 8-10, 2021
21. TPC member of 6th International Conference on Education Reform and Modern Management (ERMM2021), which will be held on April 11-12, 2021 in Beijing, China
22. Technical program committee *(*TPC*)* member of 2nd International Conference on Advanced Material Research and Processing Technology (AMRPT2020), which will be held on November 22-23, 2020, Beijing, China.
23. IGEN NLL Campaign Ambassador 2020
24. .Technical program committee *(*TPC*)* member of International Conference on Materials in Civil Engineering (MICE 2020) will be held on October 23-25, 2020, in Sanya, China.

25. Technical program committee *(*TPC*)* member of 2019 International Conference on AdvancedEducation, Management, and Humanities held in Wuhan, China, during July 19-21, 2019 (AEMH2019).
26. Technical program committee *(*TPC*)* member of The 12th Asia-Pacific Power and Energy Engineering Conference (APPEEC 2020) April 24-26, 2020 Xi'an, China
27. Technical Program Committee and Advisory committee member for International Conference on Emerging Techniques in Engineering and Education (ICETEE-2020) in Jaipur (India) during 22-23 Feb. 2020 and in Bangkok (Thailand) during 13-14 June, 2020.
28. MoE-Stars Grant writing , Dec 8, 2020.
29. Technical program committee *(*TPC*)* member of 2019 International Conference on Management, Economics and Social Science (ICMESS2019) during August 30- 31, 2019, in Changsha, China.
30. Technical program committee *(*TPC*)* member of 5th International Conference on Science, Engineering and Environment SEE-Bangkok 2019, Thailand, November 11-13, 2019
31. Technical program committee *(*TPC*)* member of 4th International Conference on Mechanical Structures and Smart Materials (4th ICMSSM2018) during September 22-23, 2018 in Shenzhen, China.
32. Technical program committee *(*TPC*)* member of 2018 the 6th International Conference on Mechanical Engineering, Materials Science and Civil Engineering during December 21-22, 2018 in Xiamen, China
33. Technical program committee *(*TPC*)* member of 2nd International Conference on Advances in Management Science and Engineering (AMSE2018) during June 24-25, 2018, Xi'an, China.
34. Technical program committee *(*TPC*)* member of 3rd International Conference on Automation, Mechanical and Electrical Engineering (AMEE2018) will be held in Shanghai, China during July 22-23, 2018.
35. Technical program committee *(*TPC*)* member of 4th International Conference on Science, Engineering and Environment during November 12-14, 2018 in SEE-NAGOYA 2018, Japan.
36. Technical program committee *(*TPC*)* member of International Conference on Materials, Sensors and Smart Manufacturing (MSSM2018) September 16th and 17th 2018 in Xiamen China.
37. Technical program committee *(*TPC*)* member of 8th International Conference on Advanced Computer Control (8th ICACC2018) during May 17-18, 2018 in Bangkok, Thailand.
38. Technical program committee *(*TPC*)* member of International Conference on Electrical, Control and Mechanical Engineering (ECME2018), which will be held on April 22-23, 2018, Beijing, China.
39. Technical program committee *(*TPC*)* member of 3rd International Conference on Chemistry and

Biochemical Engineering (CHEMBIO2018) May 29-31, 2018 Hangzhou, ChinaActed as a reviewer for the 3rd International Conference on New Energy and Future Energy System (NEFES 2018), August 21st - 24th, 2018, Shanghai, China

40. Acted as a reviewer for the 3rd Renewable Energy Sources - Research and Business (RESRB-2018), June 18-20 2018, Brussels, Belgium
41. Technical program committee *(*TPC*)* member of International Conference on Mechanical, Automation and Applied Mechanics, which will be held on in. (MAAM2018) February 7-8, 2018, , Wuhan, China Organizing Committee.
42. Technical program committee *(*TPC*)* member of the 2nd International Conference on Environmental Research and Public Health (ICERP2017) Oct. 20 - 22, 2017, Shenzhen, China Organizing Committee.
43. Technical program committee *(*TPC*)* member of 9th International Conference on Environmental Pollution and Public Health (EPPH 2017), Hangzhou, Chinah, Jun. 16-18, 2017.
44. Technical program committee *(*TPC*)* member of 3rd Annual 2017 International Workshop on Material Science and Engineering (IWMSE2017), Guangzhou, Guangdong, China, September 8-10, 2017.
45. Technical program committee *(*TPC*)* member of 2017 2nd International Conference on Materials Engineering and Industrial Applications (MEIA2017) is going to be held in Phuket, Thailand during August 6-7, 2017
46. Technical program committee *(*TPC*)* member of Third International Conference on Science, Engineering & Environment (SEE2017) will be held in University of Southern Queensland (USQ), Springfield Campus, Brisbane, Australia (SEE-USQ) Nov. 13-16, 2017
47. Working as a member of departmental sub-committees of Calcutta University.
48. Ph.D Scholar"s Representative in Materials ScienceCentre, IIT Kharagpur,2009-2012.
49. Editor, Research Scholar"s magazine, Materials Science Centre, IIT Kharagpur, 2009-2011.
50. Research Programme Advisory Committee Member, IIT Kharagpur, 2009-2012.
51. Department Academic Advisory Committee member, IIT Kharagpur, 2009-2012.

COLLABORAIONS

- Department of Chemistry University of British Columbia, Canada
- University of Namur, Namur, Belgium
- Ohio University (USA), Center for Electrochemical Engineering Research (CEER), USA :
- Sungkyunkwan University, School of Advanced Materials Science and Engineering, Sungkyunkwan University (SKKU), Suwon, Korea (South Korea)

- Department of Materials Engineering, KU Leuven, KasteelparkArenberg 44 Bus 2450, 3001Heverlee-Leuven, Belgium.
- Department of Mechanical Engineering, Indian Institute of Technology, Delhi, Hauz Khas, New Delhi 110016, India.
- School of Chemical Engineering, Fuzhou University, Fuzhou-350116, China.
- Department of Science and Technology, Government of West Bengal, Vigyan Chetana Bhaban, Saltlake, Kolkata.
- Department of Physics, Jadavpur University, Jadavpur, Kolkata 700032, India
- Material Science Centre, IIT Kharagpur
- Chemical Engineering, Jadavpur University, Jadavpur, Kolkata 700032
- Ton Duc Thang University, Ho Chi Minh City, Vietnam
- Department of Physics, Bose Institute, 93/1, A P C Road, Kolkata-700009, India

COURSES TAUGHT (2013-TILL NOW) AND TEACHINGTUTORIAL

Undergraduate :
Theory Subject:

- Material Science & Material of Construction (BChE-106)
- Energy Sources & Utilization (BChE-105)
- Chemical Technology I (BChE-104 &204)
- Chemical Technology II (BChE-204)
- Polymer Engineering (BChE-601)
- Separation Processes II (ChE 502)
- Nanotechnology (BChE 804)
- Petroleum Refinery (PECE 603)

Laboratory:

- Mass transfer lab (BChE-407)
- Fluid Mechanics lab (BChE-207)
- Fuel Technology lab (BChE-109)
- Instrumentation & Control and Mechanical Operation Laboratory (PCIM 802)

Graduate :
Theory Subject:

- Petrochemicals and Petroleum Refining (MChE 142)
- Specialization - Petrochemicals and Petroleum Refinery Engineering: Petroleum Geology, Petroleum Economy,Safety and Environment (MChE–152)

- Petrochemicals and Petroleum Refinery Engineering:Refinery Engineering (MChE–232)

Laboratory:

- Environmental Engineering Lab (MChE-254)

Knowledge and Technology Translation and Facilities developed

Facilities developed

(1) Low-cost solar simulator for measuring solar Cell's parameters (CU)

(2) Sol-gel ceramic thin film synthesis and electrical characterization facilities (CU)

(3) Electrochemical water splitting set up(CU)

(4) Low-cost ferroelectric traser using sawyer tower circuit with Labview interfacing (in IIT KGP)

(5)Photo catalysis reactor set up(CU)

(6) Super capacitor fabrication and characterization set-up(CU)

(7) Thermoelectric fabrication and module set-up

Research Guidance as Supervisory

Total B.Tech project completed : 25

Ongoing / Submitted M.Tech Thesis:

Sl. No	Scholar Name	Thesis Title	Status	Complete in Year
1	Poulomi Karan	Controlled Processing of Nanorod–Based Materials and Nanostructured Film for Solar Cell Application	completed	2015
2	Sanjoy Maity	Lead Free Hybrid Perovskites for Solar Cell Application	completed	2016
3	Sneha Mukherjee	Development of new material for energy conversion	Completed	2019
4	Subhan Kumar Pal	Mesoporous thin film for hybrid perovskite solar cell	Completed	2019
5	Shyamal Datta	Study of combined hybrid thermoelectric devices in photovoltaic in order to increase efficiency	Completed	2020
6	Rajeev Ranjan	Fabrication of Lead-Less Halide Perovskite Solar Cells	Completed	2021
7	Arnab Biswas	Synthesis and characterization of lead-free methylammonium (MA) iodide based electroactive materials for renewable energy systems	Completed	2022
8	Sowmik Maji	Cellulose paper based flexible symmetrical supercapacitor	Completed	2023
9	Rituparna Roy	Fabrication of perovskite solar cell with extracted indium tin oxide from the waste mobile screen in replacement of FTO glass	Completed	2023

10	Suman Das	Fabrication and Characterization of Flexible Solar Cells Utilizing ITO-PET Substrates	Completed	2024
11	Mustafijur Rahaman	Advance technique for liquid-liquid separation	Completed	2025

Ongoing / Submitted Ph. D. Thesis

Sl. No	**Scholar Name**	**Ph.D. Registration Number**	**Thesis Title**	**Status**	**Complete in Year**
1	Argha Dey, (Principal Supervisor)	4822 / Ph.D. (Tech.) Proceed / 2016 Dated : 14 / 07 / 2016	Fabrication of Solid-State Dye-Sensitized Solar Cells and Study of their performance	Awarded	2023
2	Sk. Abdul Moyez (Principal Supervisor)	4824/ Ph.D.(Tech .)Proceed/2 016	Analysis of Perovskite Based Thin Films for Solar Cells Application	Awarded	2022
4	Madhushree Mitra (Principal Supervisor)	(Ph.D. Registration No.: 03482/Ph.D.(Tech.)Proceed/2020 Dated 14th October 2020)	"C–C/ N–C/ O–C Coupled Synthesis of Advanced Multifunctional Multipolymers for Sensing and Pollutant Removing Applications".	Awarded	2023
3	Joy Sankar Deb Roy (Principal Supervisor)	(Ph.D. Registration No.: 03541/Ph.D. (Tech.) Proceed/2020 Dated 14th October 2020)	"Solution Phase Synthesis of Multifunctional Fluorescent Polymers for Sensing and Exclusion of Pollutants".	Awarded	2024