Curriculum Vitae

Dr. Pradyut Sengupta
Principal Scientist
Pyrometallurgy & Materials Engineering Department
CSIR – Institute of Minerals and Materials Technology, Bhubaneswar
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Educational Qualifications

- **Ph.D., Metallurgical & Materials Engineering,** *Indian Institute of Technology Kharagpur*
  - **CPI: 9.73/10**
  - **Thesis Title:** Synthesis and characterization of ZrB_2-SiC based composites for ultra-high temperature structural applications
  - **Supervisors:** Prof. Indranil Manna, Prof. Suddhasatwa Basu and Prof. Rahul Mitra

- **M. Tech, Materials Science & Engineering,** *Indian Institute of Technology Kanpur*
  - **CPI: 9.75/10, Departmental Rank: 1**
  - **Thesis Title:** Oxidation of graphite and its protection
  - **Supervisor:** Prof. Kantesh Balani
  - **Awards:** B.C. Rama Naidu Gold Medal, Academic Excellence Award

- **B. Tech,** *West Bengal University of Technology*
  - **CPI: 9.61/10, Departmental Rank: 2**
  - **Award:** Silver Medal

Awards/Honors

- **Young Engineers Award 2023–24** in Metallurgical & Materials Engineering by the Institution of Engineers (India)
- **American Ceramic Society Journal Symposium Award** from the American Ceramic Society
- **Top Cited Article Award** from Wiley
- **IIM A.K. Bose Gold Medal** for the best M. Tech thesis from the Indian Institute of Metals
- **B. C. Rama Naidu Gold Medal**, IIT Kanpur
- **Academic Excellence Award**, IIT Kanpur
- **Silver medal**, West Bengal University of Technology
- Selected for **National Merit Scholarship**, Govt. of India

Educational Achievements

- Received **"Excellent grade"** (the highest grade) in all core courses during PhD coursework at IIT Kharagpur
- Secured **"Departmental Rank 1"** in M. Tech Materials Science & Engineering Department at IIT Kanpur
- Achieved **"A grade"** (the highest grade) in 7 subjects (out of 8) during course work at IIT Kanpur
- Received **"MHRD Scholarship"**, Govt. of India for pursuing Postgraduate education at IIT Kanpur
- Secured **CPI 10** in 10-point scale in 2nd and 3rd Semesters M. Tech at IIT Kanpur
- Scored **CPI 10** and **9.94** in 10-point scale in 3rd and 6th Semesters of B. Tech in 2008
- Received medal & certificate from **Directorate of Employees' Association,** Govt. of West Bengal

Publications

Book chapters

1. Ajit Panigrahi, **Pradyut Sengupta**, Tapas Kumar Bhanj, High entropy alloys as an alternative to nickel base superalloys, Rajendrachari, S. (Ed.), ***Handbook of High Entropy Alloys*****,** (2025). Handbook of High Entropy Alloys: Fundamentals to Applications (1st ed.). CRC Press. https://doi.org/10.1201/9781003664093

2. Mayadhar Debata, **Pradyut Sengupta**, Shuvam Mandal, Deepak Adhikari, Consolidation of Tungsten-Heavy Alloys. In: Rajendrachari, S. (eds) ***Mechanically Alloyed Novel Materials, Processing, Applications, and Properties***, Chapter 10, pp. 235–256, Springer, Singapore. https://doi.org/10.1007/978-981-97-6504-1_10
3. Mayadhar Debata, **Pradyut Sengupta**, Shuvam Mandal, Ajit Panigrahi, Suddhasatwa Basu, Various Conventional and Advanced Sintering Methods to Consolidate Powders, ***Powder Metallurgy and Additive Manufacturing: Fundamentals and Advancements***, Edited By Shashanka Rajendrachari, Debasis Chaira, ASM International, 2024, pp 73–113. https://doi.org/10.31399/asm.tb.pmamfa.t59400073
4. **P. Sengupta**, I. Manna (2022) Advanced High-Temperature Structural Materials in Petrochemical, Metallurgical, Power, and Aerospace Sectors—An Overview. In: Bhattacharjee, D., Chakrabarti, S. (eds) ***Future Landscape of Structural Materials in India***, Chapter 5, pp. 79–133, Springer, Singapore. https://doi.org/10.1007/978-981-16-8523-1_5

Peer-reviewed journals

1. Deepak Adhikari, Ashirbad Nayak, Suvam Sarthak Tripathy, Alok Kumar Prusty, Tapas Kumar Sahoo, Mayadhar Debata*, **Pradyut Sengupta***, Systematic investigation of microstructural evolution and mechanical properties of Y_2O_3 and/or graphene-reinforced W-3.5Ni-1.5Fe heavy alloys, ***Journal of Alloys and Compounds***, Volume 1059, 2026, 187173, ISSN 0925-8388, https://doi.org/10.1016/j.jallcom.2026.187173 (*Corresponding Author)
2. Deepak Adhikari, Suvam Sarthak Tripathy, Suresh Chandra Adhikari, Ashirbad Nayak, Alok Kumar Prusty, Tapas Kumar Sahoo, Mayadhar Debata*, **Pradyut Sengupta***, The effect of ZrB_2, Y_2O_3, and/or graphene nanoplatelet incorporation on densification, microstructural evolution, and compressive deformation of W-0.7Ni-0.3Fe alloys, ***International Journal of Refractory Metals and Hard Materials***, Volume 138, 2026, 107694, ISSN 0263-4368, https://doi.org/10.1016/j.ijrmhm.2026.107694 (*Corresponding Author)
3. Deepak Adhikari, **Pradyut Sengupta**, Mayadhar Debata, Synergistic effect of NiB/Co variation on microstructural evolution, shape distortion, mechanical, and thermal properties of 90W-10(NiB-Co) alloys, ***International Journal of Refractory Metals and Hard Materials***, Volume 135, 2026, 107511, ISSN 0263-4368, https://doi.org/10.1016/j.ijrmhm.2025.107511
4. **Pradyut Sengupta**, Shuvam Mandal, B. Sai Charan, Deepak Adhikari, Harish C. Kaushik, Ajit Panigrahi, Manoj Kumar, Deepak K. Pattanayak, Satya P. Mohapatra & Mayadhar Debata, Unveiling the Effect of Low-Cycle Fatigue on Additively Manufactured AlSi10Mg Component: Insights into Microstructure and Mechanical Properties, ***Journal of Materials Engineering and Performance*** (2025). https://doi.org/10.1007/s11665-025-12277-0
5. Ajit Panigrahi, **Pradyut Sengupta**, R. Sakthivel, Synergistic Effect of Ball Milling and Heat Treatment for Synthesis of Magnetite from Blue Dust, ***Metallurgical & Materials Transactions B*** (2025). https://doi.org/10.1007/s11663-025-03802-6
6. Deepak Adhikari, **Pradyut Sengupta**, Ajit Panigrahi, Surojit Gupta, Alina Sahoo, Mayadhar Debata, Synergistic effect of Cr_2AlC MAX phase incorporation on microstructural parameters and distortion prevention of 90W–6Ni–2Fe–2Co heavy alloys. ***Journal of Materials Science,*** 60, 15782–15801 (2025). https://doi.org/10.1007/s10853-025-11289-4
7. Deepak Adhikari, Pratyush Ranjan, **Pradyut Sengupta**, Debasis Chaira, Mayadhar Debata, Comparative study on densification, microstructure, hardness, and compressive strength of ZrB_2 and NiB-incorporated 90W-6Ni-4Co and 90W-6Ni-2Fe-2Co alloys, ***Materials Today Communications***, 2025, 112957, ISSN 2352-4928, https://doi.org/10.1016/j.mtcomm.2025.112957
8. **Pradyut Sengupta**, Deepak Adhikari, Aakshara Sai Satapathy, Jyotirmayee Sahoo, Sunanda Behera, Mayadhar Debata, Understanding the effect of NiB/Co ratio on densification, distortion and compressive deformation of 90W-xNiB-2Fe-(8 – x)Co heavy alloys, ***International Journal of Refractory Metals and Hard Materials***, Volume 132, 2025, 107265, ISSN 0263-4368, https://doi.org/10.1016/j.ijrmhm.2025.107265
9. D. Adhikari, **P. Sengupta**, A. Panigrahi, S. Bajpai, S. Gupta, M. Debata, (2024), Effect of High-Energy Ball-Milling Duration on Densification, Microstructure, and Mechanical Properties of Cr_2AlC-Dispersed 90W-6Ni-2Fe-2Co Heavy Alloys. ***Advanced Engineering Materials,*** 2400852. https://doi.org/10.1002/adem.202400852
10. Navin Kumar, **Pradyut Sengupta**, Subhra Ranjan Das, Suraj Kumar Sahu, Santanu Pahari, and Ajit Panigrahi. Phase and Microstructure Evolution in SPS-Processed CoCrFeMnNi High Entropy Alloy: Effects of Heat Treatment and Oxidation. Metall Mater Trans A (2025). https://doi.org/10.1007/s11661-025-07917-y
11. **Pradyut Sengupta**, Deepak Adhikari, Aakshara Sai Satapathy, Jyotirmayee Sahoo, Sunanda Behera, Mayadhar Debata, Understanding the effect of NiB/Co ratio on densification, distortion and compressive deformation of 90W-xNiB-2Fe-(8 – x)Co heavy alloys, ***International Journal of Refractory Metals and Hard Materials***, Volume 132, 2025, 107265, ISSN 0263-4368, https://doi.org/10.1016/j.ijrmhm.2025.107265

12. D. Adhikari, **P. Sengupta**, A. Panigrahi, S. Bajpai, S. Gupta, M. Debata, Effect of High-Energy Ball-Milling Duration on Densification, Microstructure, and Mechanical Properties of Cr_2AlC-Dispersed 90W-6Ni-2Fe-2Co Heavy Alloys. ***Advanced Engineering Materials,*** 2024, 2400852. https://doi.org/10.1002/adem.202400852
13. Navin Kumar, **Pradyut Sengupta**, Manoj Kumar, Mayadhar Debata, Shubhra Bajpai, Debidutta Debasish, Ajit Panigrahi, Microstructure, thermal expansion, and high-temperature oxidation behavior of spark plasma sintered AlCoCrSiNi high entropy alloy, ***Materials Today Communications***, Volume 40, 2024, 110063, ISSN 2352-4928, https://doi.org/10.1016/j.mtcomm.2024.110063
14. Deepak Adhikari, **Pradyut Sengupta**, Mayadhar Debata, Systematic investigation of microstructure, distortion, mechanical and thermal properties of NiB and ZrB_2-modified 90W-6Ni-4Co alloys, ***International Journal of Refractory Metals and Hard Materials,*** Volume 122, 2024, 106739, ISSN 0263-4368, https://doi.org/10.1016/j.ijrmhm.2024.106739
15. S. Mandal, **P. Sengupta**, S. Sahu, M. Debata, S. Basu, Effect of severe plastic deformation and magnetic field-assisted heat treatment on the magnetic properties of equiatomic FeNi alloy, ***Bulletin of Materials Science,*** 47, 181 (2024). https://doi.org/10.1007/s12034-024-03279-0
16. Shuvam Mandal, Manoj Kumar, **Pradyut Sengupta**, Ajit Panigrahi, Mayadhar Debata, Chandradas Shamili, Kuzhichalil Peethambharan Surendran, Indranil Manna, and Suddhasatwa Basu, Laser Melting of Mechanically Alloyed FeNi: A Study of the Correlation between Microstructure and Texture with Magnetic and Physical Properties, ***ACS Omega*** (2024) https://doi.org/10.1021/acsomega.4c00601
17. **P. Sengupta**, I. Manna, Role of TiC and WC Addition on the Mechanism and Kinetics of Isothermal Oxidation and High-Temperature Stability of ZrB_2–SiC Composites. ***High Temperature Corrosion of Materials***. (2024). https://doi.org/10.1007/s11085-024-10234-1
18. A. Salian, **P. Sengupta**, I.V. Aswath, A. Gowda, S. Mandal, A review on high entropy silicides and silicates: Fundamental aspects, synthesis, properties. ***International Journal of Applied Ceramic Technology*** (2023); 20, 2635–2660. https://doi.org/10.1111/ijac.14422
19. Shuvam Mandal, Ajit Panigrahi, Ashutosh Rath, Matthias Bönisch, **Pradyut Sengupta**, Mayadhar Debata, and Suddhasatwa Basu, Formation of $L1_0$ Ordering in FeNi by Mechanical Alloying and Field-Assisted Heat Treatment: Synchrotron XRD Studies, ***ACS Omega***, (2023), https://doi.org/10.1021/acsomega.2c07869
20. Shuvam Mandal, **Pradyut Sengupta**, Sarathi Dey, Manoj Kumar, Suddhasatwa Basu, Mayadhar Debata, Effect of Y_2O_3, La_2O_3 and ZrO_2 dispersoid addition on ultra-high temperature stability of 95W–3.5Ni–1.5Fe heavy alloy, ***International Journal of Refractory Metals and Hard Materials***, 113 (2023) 106195. https://doi.org/10.1016/j.ijrmhm.2023.106195
21. **Pradyut Sengupta**, Suddhasatwa Basu, Indranil Manna, Effect of TiC Reinforcement on Densification, Structural Evolution and High-Temperature Oxidation Behaviour of ZrB_2-20 vol pct SiC Composite, ***Metallurgical and Materials Transactions A*** (2023) 54, 1252–1270. https://doi.org/10.1007/s11661-023-06982-5
22. **Pradyut Sengupta**, Suddhasatwa Basu, Indranil Manna, Comparative evaluation of TiC and/or WC addition on microstructure, mechanical properties, thermal residual stress and reciprocating wear behaviour of ZrB2–20SiC composites, ***Journal of Materials Science*** (2023) 58, 420–442. https://doi.org/10.1007/s10853-022-08021-x
23. Shuvam Mandal, Mayadhar Debata, **Pradyut Sengupta** and Suddhasatwa Basu, (2022): $L1_0$ FeNi: a promising material for next generation permanent magnets, ***Critical Reviews in Solid State and Materials Sciences*** (DOI: https://doi.org/10.1080/10408436.2022.2107484)
24. Jugalraj Panda, **Pradyut Sengupta**, Phase and microstructural evaluation of MgTiO3 synthesized by reaction milling in high-energy planetary ball mills, Indoceram of AIPMA, 2022, Vol. 9, No. 2, 23 – 31
25. Ajit Panigrahi, Tarini S. Acharya, **Pradyut Sengupta**, Deepak Kumar, Lingaraj Sarangi, Navin Kumar, Debidutta Debasish, Satyam Suwas, Suddhasatwa Basu, Mayadhar Debata, Microstructure and mechanical properties of novel tungsten heavy alloys prepared using FeNiCoCrCu HEA as binder, ***Materials Science & Engineering A*** 832 (2022) 142451 (DOI: https://doi.org/10.1016/j.msea.2021.142451)
26. **P. Sengupta**, S. Basu, I. Manna, Structure–property correlation in a novel ZrB_2–SiC ultrahigh-temperature ceramic composite with Al-alloy sinter additive, ***Journal of Materials Science,*** (2021), 56, 19029–19046 (DOI: https://doi.org/10.1007/s10853-021-06427-7)
27. **P. Sengupta**, P. Meher, A. Panigrahi, S. Mandal, S. Basu, M. Debata, Microstructure, distortion characteristics and mechanical behaviour of NiB modified 90W-6Ni-4Co heavy alloys, ***Journal of Alloys and Compounds***, (2021) Volume 887, 161404. (DOI: https://doi.org/10.1016/j.jallcom.2021.161404)
28. **P. Sengupta**, M. Debata, The Effect of H2 and Air Treatment on the Elimination of Excess Carbon from TiC, ***Indoceram of AIPMA***, (2021) Volume 8 (1), 1 – 8
29. **P. Sengupta**, S.S. Sahoo, A. Bhattacherjee, S. Basu, I. Manna, Effect of TiC addition on structure and properties of spark plasma sintered ZrB_2–SiC–TiC ultrahigh temperature ceramic composite, ***Journal of Alloys and Compounds***, (2020) 156668. (DOI: https://doi.org/10.1016/j.jallcom.2020.156668)

30. **P. Sengupta**, A. Panigrahi, B. Indoria, P. Meher, T.S. Acharya, S. Basu, and M. Debata, Substitution of Ni with NiB prevents shape distortion of liquid phase sintered 90W–6Ni–2Fe–2Co heavy alloys, ***Journal of Alloys and Compounds***, Volume 840, 5 November 2020, 155785 (DOI: https://doi.org/10.1016/j.jallcom.2020.155785)
31. S. Mandal, V. V. Das, M. Debata, A. Panigrahi, **P. Sengupta**, A. Rajendran, D. K. Pattanayak, S. Basu, "Study of pore morphology, microstructure, and cell adhesion behaviour in porous Ti-6Al-4V scaffolds," ***Emergent Materials*** (2019) 2:453–462 (DOI: https://doi.org/10.1007/s42247-019-00055-3)
32. P. Pujar, B. Gupta, **P. Sengupta**, D. Gupta, S. Mandal, Sodium ion incorporated alumina - A versatile anisotropic ceramic, ***Journal of the European Ceramic Society***, 39 (2019) 4473–4486. (DOI: https://doi.org/10.1016/j.jeurceramsoc.2019.08.001)
33. Arjak Bhattacharjee, Rubia Hassan, Anshul Gupta, Madhu Verma, Prem Anand Murugan, **Pradyut Sengupta**, Matheshwaran Saravanan, Indranil Manna, Kantesh Balani, Effect of Zn and Co doping on antibacterial efficacy and cytocompatibility of spark plasma sintered hydroxyapatite, ***Journal of the American Ceramic Society*** (2020), 103, 4090-4100 (DOI: https://doi.org/10.1111/jace.17077)
34. A. Bhattacharjee, A. Gupta, M.P. Anand, **P. Sengupta**, A. Pandey, T.K. Bhattacharya, Adsorption effect of Zn^{+2} and Co^{+2} on the antibacterial properties of SiC-porcelain ceramics, ***International Journal of Applied Ceramic Technology***, 2019, 17, Pages 327-332 (DOI: https://doi.org/10.1111/ijac.13303)
35. **P. Sengupta**, A. Bhattacharjee, H.S. Maiti, Zirconia: A Unique Multifunctional Ceramic Material, ***Transactions of the Indian Institute of Metals***, 2019, Volume 72, 1981–1998 (DOI: https://doi.org/10.1007/s12666-019-01742-9)
36. A. Bhattacharjee, A. Gupta, M. Verma, P.A. Murugan, **P. Sengupta**, S. Matheshwaran, I. Manna, Kantesh Balani, Site-Specific Antibacterial Efficacy and Cyto/Hemocompatibility of Zinc Substituted Hydroxyapatite, ***Ceramics International***, Volume 45, Issue 9, 15 June 2019, 12225-12233 (DOI: https://doi.org/10.1016/j.ceramint.2019.03.132)
37. **P. Sengupta**, I. Manna, Advanced High-Temperature Structural Materials for Aerospace and Nuclear Power Applications – A Critical Review, ***Transactions of the Indian Institute of Metals***, Vol. 72, 2019, 2043 – 2059 (DOI: https://doi.org/10.1007/s12666-019-01598-z)
38. **P. Sengupta**, M. Debata, Effect of partial and full substitution of Ni with NiB on densification, structure and properties of 90W-6Ni-2Fe-2Co heavy alloys, ***Journal of Alloys and Compounds***, 2019, Volume 774, 145-152, (DOI: https://doi.org/10.1016/j.jallcom.2018.09.368)
39. **P. Sengupta**, M. Debata, K. Jayasankar, Properties of Immiscible Cu-20 wt. % Mo Alloy Prepared by High Energy Ball Milling and Cold Isostatic Pressing, ***Transactions of Powder Metallurgy Association of India***, 2017, Vol. 43, No. 2, pp. 25-32.
40. M. Debata, T.S. Acharya, **P. Sengupta**, P.P. Acharya, S. Bajpai and K. Jayasankar, Effect of High Energy Ball Milling on Structure and Properties of 95W-3.5Ni-1.5Fe Heavy Alloy, ***International Journal of Refractory Metals and Hard Materials***, 2017, Volume 69, pp 170-179 (DOI: https://doi.org/10.1016/j.ijrmhm.2017.08.007)
41. **P. Sengupta**, Ariharan S, A. Nisar, A. Agnihotri, N. Balaji, S.T. Aruna and Kantesh Balani, Dual-Layer Oxidation-Protective Plasma-Sprayed SiC-ZrB_2/Al_2O_3-Carbon Nanotube Coating on Graphite, ***Journal of Thermal Spray Technology***, 2017, Volume 26, Issue 3, pp 417–431 (DOI: https://doi.org/10.1007/411666-016-0508-3)

Conference Proceedings (Publication/ Poster Presentation)

1. Ashirbad Nayak, Suvam Sarthak Tripathy, Deepak Adhikari, Mayadhar Debata, **Pradyut Sengupta**, "The Significance of Y_2O_3 and ZrB_2 Incorporation on Microstructure and Mechanical Properties of 99W-0.7Ni-0.3Fe Heavy Alloys," Materials Research Scholars' Conclave 2025, September 5, 2025, CSIR – IMMT Bhubaneswar (**Best Poster Award**)
2. Sakti Prasad Swain, Suresh Chandra Adhikari, Deepak Adhikari, Mayadhar Debata, S.K. Pradhan, **Pradyut Sengupta**, Rasmiranjan Sahoo, Nilrudra Mandal, "A Systematic Investigation of Phase and Microstructure of Modified Ti-Al Intermetallics Synthesized by Mechanical Alloying and Hot Pressing," Materials Research Scholars' Conclave 2025, September 5, 2025, CSIR – IMMT Bhubaneswar
3. Navin Kumar, Mayadhar Debata, Manoj Kumar, **Pradyut Sengupta**, Ajit Panigrahi, "Comparative Study of Microstructure and Mechanical Properties of AlCoCrSiNi and FeCoCrMnNi High Entropy Alloys Processed via Conventional and Spark Plasma Sintering," ***Transactions of PMAI***, Vol. 49, December 2024, pp. 21 – 31
4. Manoj Kumar, **Pradyut Sengupta**, Ajit Panigrahi and Mayadhar Debata, "Development of Laser Processed Composite Coating for Improved Mechanical and Thermal Properties of Ni-base Superalloy," NMD-ATM 2023, Bhubaneswar, 22nd – 24th November 2023, KIIT Bhubaneswar

5. Navin Kumar, **Pradyut Sengupta**, Manoj Kumar and Ajit Panigrahi, "Investigation of Phase, Microstructure, Thermal Stability and Oxidation Behavior of AlCoCrSiNi High Entropy Alloys for High Temperature Applications," NMD-ATM 2023, Bhubaneswar, 22nd – 24th November 2023, KIIT Bhubaneswar (**Best Poster Award**)
6. Deepak Adhikari, **Pradyut Sengupta** and Mayadhar Debata, "The Combined Effect of NiB ad ZrB_2 Addition on Phase, Microstructure and Mechanical Behavior of Liquid Phase Sintered 90W-6Ni-4Co Heavy Alloys," NMD-ATM 2023, Bhubaneswar, 22nd – 24th November 2023, KIIT Bhubaneswar (**Best Poster Award**)
7. Satya Mohapatra, Mayadhar Debata, **Pradyut Sengupta**, "Evaluation of Microstructure and Mechanical Properties of Additively-manufactured Aluminum Alloy Automotive Component," International Conference on Automotive Materials & Manufacturing 2023, Organized by ARAI, 31st May – 2nd June 2023, Pune, India
8. Debidutta Debasish, Ajit Panigrahi, **Pradyut Sengupta**, Shubhra Bajpai, "Erosive wear characteristic of Mo-TiN composite coatings on turbocharger compressor wheel using Taguchi experimental design," ***Materials Today: Proceedings***, 2022, ISSN 2214-7853, https://doi.org/10.1016/j.matpr.2022.06.114
9. B. Bhoi, **P. Sengupta**, A. Panigrahi, P.K. Behera, P. Rajput, "Sustainable Utilization of Chromite Overburden through Pyrometallurgical Processing in Hydrogen Plasma Smelting Reactor," National Symposium on Integrated Development of Mines & Mineral Based Industries with Waste Management (IDMIWM – 2018), December 14–15, 2018, pp. 208–215
10. **P. Sengupta**, M. Debata, "Comparative Evaluation of Density, Microstructure, and Nano-mechanical Properties of 95W-3.5Ni-1.5Fe (wt.%) Heavy Alloys Prepared from Un-milled and Ball-milled Powders", NMD-ATM, November 14–16, 2018, Kolkata, India
11. A. Das, S. Bajpai, **P. Sengupta**, P.K. Parida, M. Debata, A. Dasgupta, "Structural Studies of Y-Ti-O Complex Oxide Synthesized by Mechanical Milling," International Conference on Microscope and XXXIX Annual Meeting of Electron Microscope Society, July 18–20, 2018, Bhubaneswar, India
12. **P. Sengupta**, M. Debata, K. Jayasankar, "Properties of Immiscible Cu-20 wt.% Mo Alloy Prepared by High Energy Ball Milling and Cold Isostatic Pressing," Trans. PMAI (ISSN 0377-9416), Vol. 43, No. 2, Dec. 2017, pp. 26 – 32.
13. A. Bhattacharjee, T. Baikie, **P. Sengupta**, A. Pandey, T.J. White, I. Manna, K. Balani, "Crystal Chemistry of Transition Metal Doped Apatites and Their potential as Antibacterial Agents," NMD-ATM, November 11–14, 2017, Goa, India (**Best Poster Award**)

Technical talks

1. **Pradyut Sengupta**, "Laser-Based Additive Manufacturing of Alloys: Science, Defects and Design Opportunities," **META TALK 2.0, Indian Institute of Metals Students' Chapter, NIT Durgapur**, February 28, 2026 (**Invited**)
2. **Pradyut Sengupta**, "Translational Research and Industrial Innovation: Case Studies from Materials Science and Engineering" **International Faculty Development Programme (FDP) on: "Research and Industry Interface: Innovation to Applications"**, Shri Guru Ram Rai University (SGRRU), Dehradun, February 13, 2026 (**Invited**)
3. **Pradyut Sengupta**, "Laser–Material Interaction and Additive Manufacturing of Metals: Fundamentals and Applications," **IIW-IEM Student Chapter** (2025 – 2026) Seminar, February 3, 2026 (**Invited**)
4. **Pradyut Sengupta**, Ashirbad Nayak, Deepak Adhikari, Shuvam Mandal, Ajit Panigrahi, Manoj Kumar, Mayadhar Debata, "Interface-Engineered Oxide/Boride Dispersed Tungsten Alloys for High-Temperature and Extreme Environment Applications," **International Conference on Frontiers in Surface Engineering and Additive Manufacturing (FSEAM 2026)**, January 21 – 23, 2026, IIT Kharagpur, India (**Invited**)
5. **Pradyut Sengupta**, "Consolidation techniques in powder metallurgy: from fundamentals to industrial practice," **CSIR – Skill Development Training Program on Powder Metallurgy Processing and Characterization of Materials**, August 12, 2026, CSIR – IMMT
6. **Pradyut Sengupta**, Sk. Sayeed Ahmed, Deepak Adhikari, and Mayadhar Debata, "Microstructural and Performance Evaluation of SLM-Processed and Heat-Treated AlSi10Mg," **International Conference On Materials, Manufacturing & Management for Industry 4.0 (IC3MI - 25)**, December 5 – 6, 2025, Department of Production and Industrial Engineering, BIT Mesra, Ranchi (**Invited**)
7. **Pradyut Sengupta**, Shuvam Mandal, Deepak Adhikari, Ajit Panigrahi, Manoj Kumar, Deepak K. Pattanayak, Satya P. Mohapatra, Jagdish Arora, Mayadhar Debata, "Insights into the structure and properties of Al-alloy components prepared

by powder metallurgy and additive manufacturing routes," **International Conference on Mining, Minerals, Metals & Materials (IC4M-2025)**, CSIR – IMMT Bhubaneswar, January 22 – 24, 2025

8. Mayadhar Debata, Deepak Adhikari and **Pradyut Sengupta**, "The effect of binder modification on densification, microstructure, distortion characteristics and mechanical properties of 90W-6Ni-2Fe-2Co heavy alloys" **International Conference on Mining, Minerals, Metals & Materials (IC4M-2025)**, CSIR – IMMT Bhubaneswar, January 22 – 24, 2025
9. **Pradyut Sengupta**, Deepak Adhikari, Ajit Panigrahi, Mayadhar Debata, "Role of MAX phase on the development of newer tungsten alloys with superior microstructure and mechanical properties," **39th National Convention of Chemical Engineers and National Seminar on R&D activities in Mineral, Chemical, Metallurgical Industries for Today's Society**, IEI, Odisha State Centre, Bhubaneswar, November 9 – 10, 2024
10. **Pradyut Sengupta**, Deepak Adhikari, Ajit Panigrahi, Mayadhar Debata, Manoj Kumar, Ramaswamy Sakthivel, "Development of Cr_2AlC MAX phase incorporated novel tungsten alloys for strategic applications," **International Conference on Process & Product Innovations in Metal Production** in **14th International Exhibition and Conference on Minerals, Metals, Metallurgy & Materials (MMMM)**, Yashobhoomi, Dwarka, India International Convention & Expo Centre (IICC), New Delhi, September 27 – 29, 2024
11. Deepak Adhikari, Shuvam Mandal, **Pradyut Sengupta**, B. Sai Charan, Ajit Panigrahi, Manoj Kumar, Deepak K. Pattanayak, Satya P. Mohapatra and Mayadhar Debata, "Evaluation of Microstructure and Properties of 3D-Printed AlSiMg Components Subjected to Shock Absorption Test," **12th International Bauxite, Alumina & Aluminium Conference & Exhibition**, IBAAS-IIM 2024, BITS Pilani K K Birla Goa Campus, September 25-27, 2024
12. **Pradyut Sengupta**, "Design and Development of Intermetallics and Composites by Powder Metallurgy Route for High-Temperature Strategic Applications," **BIS-Academia Workshop on Technical Advancements and Role of Standardization in Powder Metallurgical Processes & Products**, August 30, 2024, IIT Kanpur (**Invited**)
13. **Pradyut Sengupta**, "Conventional and advanced consolidation techniques for powder metallurgy processing of materials and overview of various applications," **CSIR – Skill Development Training Program on Powder Metallurgy Processing and Characterization of Materials**, August 21 – 23, 2024, CSIR – IMMT
14. **Pradyut Sengupta**, "Development of Novel Alloys and Composites by Powder Metallurgy and Additive Manufacturing for Industrial Applications," **One Month Professional Training Program for GETs of Hindalco Industries Limited**, Recent Trends on Mineral Characterisation, Beneficiation, Metallurgy and Materials Development, July 15, 2024, CSIR – IMMT
15. Deepak Adhikari, **Pradyut Sengupta**, Mayadhar Debata, "The effect of NiB and Co content on the structure-property evolution of liquid phase sintered tungsten heavy alloys," **National Symposium of Research Scholars on Metallurgy and Materials**, March 10, 2024, IIT Kanpur
16. Deepak Adhikari, **Pradyut Sengupta**, Deepak K. Pattanayak, Mayadhar Debata, "The role of ZrB2 and NiB on densification, phase, microstructure, and mechanical properties of 90W-6Ni-4Co heavy alloys" ," **International Conference on Powder Metallurgy & Particulate Materials 2024 (PM 24),** February 25 – 28, 2024, Pune
17. Navin Kumar, **Pradyut Sengupta**, Manoj Kumar and Ajit Panigrahi, "Oxidation Behavior of AlCoCrSiNi High Entropy Alloy Processed by Spark Plasma Sintering," **International Conference on Powder Metallurgy & Particulate Materials 2024 (PM 24),** February 25 – 28, 2024, Pune
18. **Pradyut Sengupta**, "Design and Development of Advanced Structural Materials Using Powder Metallurgy – A Few Case Studies," SERB Accelerate Vigyan Sponsored High-end Workshop on **Powder metallurgy based Research for Advancements In Science and Engineering** (PRAISE 2024), January 25, 2024 at CSIR – IMMT Bhubaneswar (**Invited**)
19. **Pradyut Sengupta**, "Structure-Property Relationship in Novel Tungsten Alloys for Strategic Applications", Presentation to Research Council, CSIR – IMMT during 59th Research Council Meeting, July 7 – 8, 2023
20. Navin Kumar, **Pradyut Sengupta**, Manoj Kumar, Mayadhar Debata and Ajit Panigrahi, "Thermal stability and oxidation behavior of spark plasma sintered AlCoCrSiNi high entropy alloy", **International Conference on Powder Metallurgy & Particulate Materials 2023 (PM 23)**, organized by PMAI, March 12-15, 2023, at Hotel Lalit, Mumbai.
21. Manoj Kumar, **Pradyut Sengupta**, Ajit Panigrahi and Mayadhar Debata, "Development of microstructurally, compositionally and functionally graded composite coating over Ni-base superalloy by laser cladding", **International Conference on Powder Metallurgy & Particulate Materials 2023 (PM 23)**, organized by PMAI, March 12-15, 2023, at Hotel Lalit, Mumbai.

22. **P. Sengupta**, "Development of Intermetallics and Composites for High-temperature Strategic Applications," **International Conference on Materials Science and Mechanical Engineering (ICMSME 2023)**, organized by RERF Group of Institutions, Barrackpore, West Bengal, India during January 19 – 20, 2023 (**Keynote Speaker**)
23. **P. Sengupta**, A. Panigrahi, M. Debata, S. Bajpai, M. Kumar, "Indigenously developed iron aluminide powder for high-temperature coating application in iron & steel and power sectors," **National Conference on Meeting Iron Ore, Coal, Refractory and other Raw Material Requirements for Iron & Steel Industries**, organized by Steel & Metallurgy at Vivanta Bhubaneswar on January 6, 2023.
24. **P. Sengupta**, "Advanced materials for high-temperature structural and strategic applications – an overview and our efforts," **40th Research café** at CSIR – IMMT Bhubaneswar on August 30, 2022
25. **P. Sengupta**, S. Basu, I. Manna, "Densification, structure evolution and mechanical properties of ZrB_2-SiC-TiC composite," **International Conference on Powder Metallurgy & Particulate Materials (PM' 22)**, April 2022
26. A. Panigrahi, **P. Sengupta**, M. Kumar, N. Kumar, M. Debata, "Mechanical Properties of Tungsten Heavy Alloys Processed Using FeNiCoCrCu HEA as Binder", **International Conference on Powder Metallurgy & Particulate Materials (PM' 22)**, April 2022
27. A. Panigrahi, M. Debata, **P. Sengupta**, "Effect of milling & sintering temp on the microstructure & mech properties in multicomponent FeNiCoCrCu alloy" APMA 2019 **(5th International Conference on Powder Metallurgy in Asia)**, February 19 – 21, 2019, Pune, India
28. M. Debata, **P. Sengupta**, A. Panigrahi, S. Basu, "Study of densification behaviour, phase, and microstructure of NiB-modified 90W-6Ni-2Fe-2Co heavy alloys," APMA 2019 **(5th International Conference on Powder Metallurgy in Asia)**, February 19 – 21, 2019, Pune, India
29. A. Das, S. Bajpai, **P. Sengupta**, M. Debata, K. Jayashankar, A. Dasgupta, "Microstructural Characterization of Y-Ti-O Dispersed Ferritic Steel Powder," **3rd International Conference on Advanced Materials & Manufacturing Processes for Strategic Sectors** (ICAMPS 2018), October 25 – 27, 2018, Thiruvanantapuram, Kerala, India.
30. A. Bhattacharjee, A. Gupta, P. Murugan, **P. Sengupta**, S. Matheshwaran, I. Manna, Kantesh Balani, "Antimicrobial Property of Zn Doped Hydroxyapatite", Surface Properties of Biomaterials, **Materials Science & Technology** 2018, Columbus, OH, USA, Oct. 14-18, 2018.
31. **P. Sengupta**, M. Debata, S.K. Singh and P.K. Mishra, "Effect of CNT Addition on Structure and Properties of SiC-20 wt.% ZrB_2 Composites for Thermal Protection System," **WWMMI**, March 9 – 10, 2018, CSIR-IMMT
32. A. Panigrahi, **P. Sengupta**, A. Patra, M. Debata, "Development of Multicomponent FeNiCoCrCu High Entropy Alloys Processed by Mechanical Alloying and Sintering," **NMD-ATM**, November 11-14, 2017, Goa, India
33. **P. Sengupta**, A. Panigrahi, S. Bajpai and M. Debata, "Plasma Spray Coating of Mechanically Alloyed Iron Aluminide," **NMD-ATM**, November 11-14, 2017, Goa, India
34. **P. Sengupta**, M. Debata, K. Jayasankar, "Properties of Immiscible Cu-20 wt.% Mo Alloy Prepared by High Energy Ball Milling and Cold Isostatic Pressing," **International Conference on Powder Metallurgy & Particulate Materials** (PM' 17), February 20-22, 2017, New Delhi, India
35. S. Ariharan, **P. Sengupta**, A. Agnihotri, N. Balaji, S.T. Aruna, Kantesh Balani, "Oxidation and Protection of Graphite", **6th Asian Thermal Spray Conference**, November 24-26, 2014, Hyderabad, India
36. **P. Sengupta**, N. Balaji, S.T. Aruna, M.K. Samal, D. Sathiyamoorthy, Kantesh Balani, "Oxidation of Plasma Sprayed SiC/Al_2O_3 Coatings on Graphite Substrate", **Carbon Materials** 2012, November 1-3, 2012, Bhaba Atomic Research Centre, Mumbai, India

Conferences/Workshops Organized

1. Co-Chairman, Editorial Committee, **28th International Conference on Non-ferrous Metals – 2024** (ICNFM – 2024), 12 – 13 July, 2024 at CSIR – IMMT Bhubaneswar
2. Member, Organizing Committee, SERB Accelerate Vigyan Sponsored High-end Workshop on **Powder metallurgy based Research for Advancements In Science and Engineering** (PRAISE 2024), January 22 – 27, 2024 at CSIR – IMMT Bhubaneswar
3. Member, Publication & Souvenir Committee, NMD-ATM 2023, 22 – 24 November, 2023
4. Organized Metal Quiz Competition 2023 for +2 Science students on 6 August 2023 at CSIR-IMMT

5. Member, Organizing Committee, Two-days' Workshop and Training Program on **"Advances in Corrosion Technology and Prevention (ACTP 2023)"**, 20 – 21 July 2023, CSIR-IMMT
6. Member, Organizing Committee, **"Recent Advancements in Iron & Steel Industries and Emerging Areas"** (RAISE 2023), 24 February 2023, CSIR-IMMT
7. Attended workshop on **"Additive Manufacturing of Metals: Current Issues & Way Forward"** organized by Indo-German Science Technology Centre (IGSTC) during 4–6 February, 2019 at CSIR-NML, Jamshedpur
8. Attended one-day workshop on **"R&D Opportunities in Defense Sector"** at CSIR-IMMT, Bhubaneswar, India, on August 2, 2018
9. Attended one-day pre-conference workshop of EMSI-2018 on **"Electron Probe Micro-Analyzer (EPMA)"** at CSIR-IMMT, Bhubaneswar, India on July 17, 2018
10. Arranged laboratory visit and exhibition of CSIR technologies under "**Mining, Minerals, Metal and Materials Theme"** for general public during 9 – 11 October, 2017 on the eve of CSIR – foundation day
11. Organized visit of Members of Parliament at AMT Dept., CSIR-IMMT on August 24, 2017
12. Organized Odisha National TV program on **"Green steel"** at CSIR-IMMT on May 22, 2017
13. Organized laboratory visit at Advanced Materials Technology Dept., on occasion of foundation day of CSIR IMMT on April 13, 2017
14. Arranged laboratory visit at CSIR-IMMT on December 22, 2016 (~120 participants)
15. Presented exhibit model of **"Green Steel (An environment friendly approach to steel making)"** at ***2nd India International Science Festival (IISF) 2016*** organized at CSIR National Physical laboratory, New Delhi, under the aegis of Ministry of Science & Technology, Ministry of Earth Sciences, Department of Science & Technology and Council of Scientific & Industrial Research during December 7-11, 2016. Around 10000 students, faculty members and researchers from all over India participated in the mega event.
16. Organized one-day national workshop on ***"Plasma Processing of Minerals and Materials"*** at CSIR IMMT on October 21, 2016 (~100 participants) as transport and technical committee member
17. Attended national workshop on ***"Advanced Coating Technology – Opportunity for Indian Industries"*** on February 25-26, 2016 at CSIR IMMT
18. Organized ***Laboratory visit*** for CSJMU B. Tech students at IIT Kanpur on behalf of IIM Kanpur Chapter in March 2013. A total of 36 students participated in the event and visited Transmission Electron Microscopy, Physical Metallurgy, Powder Metallurgy, X-Ray Diffraction units of IIT Kanpur
19. Organized one-day workshop on **"*Virtual Laboratory on Material Response to Microstructural, Mechanical, Thermal and Biological Stimuli"*** for students on October 13, 2012 at IIT Kanpur, India, under the aegis of *Ministry of Human Resource and Development*, Government of India, National Mission on Education through Information and Communication Technology (~ 40 participants)
20. Organized **"*N.K Batra Metals & Materials Quiz*"** held at IIT Kanpur on 19th August, 2012 (~100 participants)
21. Organized one-day workshop on **"*Virtual Laboratories"*** under the aegis of *Ministry of Human Resource and Development*, Government of India, National Mission on Education through Information and Communication Technology (*NMEICT*) on February 4, 2012 at IIT Kanpur, India (over 160 participants)

Services rendered to the institute

- **Supervisor,** written test of CSIR-Combined Administrative Services Exam (CASE) 2023
- **Member,** *Organizing Committee*, One Week One Lab Program, September 11 – 16, 2023, CSIR – IMMT
- **Member,** *Poster Committee*, Materials Theme, One Week One Lab Program, CSIR – IMMT
- **Member,** *Organizing Committee*, Advances in Corrosion Technology and Prevention, July 20 – 21, 2023, CSIR – IMMT
- **Member**, *Screening Committee* for the recruitment of Jr. Secretariat Assistant at CSIR–IMMT Bhubaneswar
- **Member,** *Selection Committee* of Recruitment of various Project Staffs, 2019 – Present
- **Member,** *Local Purchase Committees*, CSIR-IMMT
- **Member,** *Jigyasa Program*, CSIR – IMMT
- **Convener,** *Departmental Meeting*, Advanced Materials Technology Department, CSIR-IMMT
- **Convener**, *Departmental Seminar Series*, Advanced Materials Technology Department, CSIR-IMMT

Services rendered outside the institute

- **Member,** Powder Metallurgical Materials and Products Sectional Committee, MTD 25, Bureau of Indian Standards (BIS), June 2022 – Present
- **Member,** Metallography and Heat-Treatment Sectional Committee, MTD 22, , Bureau of Indian Standards (BIS), June 2025 – Present
- **Member,** *Publication & Souvenir Committee*, IIM NMD-ATM 2023 conference
- **Executive committee member,** Indian Institute of Metals (IIM) Bhubaneswar Chapter, FY 2024 – 25
- **Treasurer,** Indian Institute of Metals (IIM) Bhubaneswar Chapter, FY 2023 – 24
- **Joint Treasurer,** Indian Institute of Metals (IIM) Bhubaneswar Chapter, July 2022 – September 2023
- **Member,** Awards Committee, Indian Institute of Metals (IIM) Bhubaneswar Chapter
- **Coordinator**, Technical session on "*Computational Fluid Dynamics*," CHEMCON-2021 conference
- **Member**, *Publication & Souvenir Committee*, CHEMCON-2021 conference
- **Session Chair**, Technical session on "*Additive Manufacturing Session*", International Conference on Powder Metallurgy & Particulate Materials (PM' 22), April 2022
- Mentor, **IITK Alumni Mentorship Programme,** IIT Kanpur
- Member, **Students' Discipline, Anti-Ragging** and **Timetable Committee**, Glocal University
- Served as **Vice-Chairman** of Material Advantage, IIT Kanpur Chapter for the year 2012-13
- Worked as **Creative Head** of Indian Institute of Metals Kanpur, Student Chapter for the year 2012-13

Training/Mentoring

1. Mentored *Mr. Debashis Sarangi,* 3rd yr. B. Tech student of Dept. of Materials & Metallurgical Engineering, IGIT Sarang, during May-July 2025
2. Mentored *Mr. Suvam Sarthak Tripathy,* 3rd yr. B. Tech student of Dept. of Materials & Metallurgical Engineering, NIT Durgapur, during May-July 2025
3. Mentored *Mr. Suresh Chandra Adhikari,* 3rd yr. B. Tech student of Dept. of Materials & Metallurgical Engineering, NIT Durgapur, during May-July 2025
4. Mentored *Ms. Baishakhi Guru*, 3rd yr. B. Tech student of Dept. of Materials & Metallurgical Engineering, VSSUT Burla, during May-July 2024
5. Mentored *Ms. Payal Sahoo*, 3rd yr. B. Tech student of Dept. of Materials & Metallurgical Engineering, IGIT, Sarang, during May-July 2024
6. Mentored *Ms. Jyotirmoyee Sahu*, 3rd yr. B. Tech student of Dept. of Materials & Metallurgical Engineering, IGIT, Sarang, during May-July 2023
7. Mentored *Ms. Sunanda Behera*, 3rd yr. B. Tech student of Dept. of Materials & Metallurgical Engineering, IGIT, Sarang, during May-July 2023
8. Mentored *Mr. Sarathi Dey*, 3rd yr. B. Tech student of Dept. of Materials & Metallurgical Engineering, NIT Durgapur, during May-July 2021
9. Mentored *Mr. Pankaj Agarwal*, 3rd yr. B. Tech student of Dept. of Ceramic Engineering, NIT Rourkela, during May-July 2021
10. Mentored *Mr. Siba Sundar Sahoo*, 3rd yr. B. Tech student of Dept. of Materials & Metallurgical Engineering, IIT Kharagpur, during November-December, 2017
11. Mentored *Mr. Prayas Kumar Behera*, final yr. M.Sc. student of Dept. of Geology, D.D. College Keonjhar, during December 2017-January 2018
12. Mentored *Ms. Sonali Patra*, final yr. B. Tech student of Dept. of Materials & Metallurgical Engineering, IGIT, Sarang during May-July, 2017
13. Mentored 1 Post graduate and 6 Undergraduate students at Glocal University, Saharanpur during 2013-14
14. Mentored Mr. Chanakya Grolia, final year B. Tech student, Dept. of Materials Sc. & Engg, IIT Kanpur, during 2012-13
15. Served as a Teaching Assistant in **TA-201** (2nd yr. UG core course) at IIT Kanpur in 2012-13 2nd semester
16. Served as a Teaching Assistant in **Physical Metallurgy Lab** (4th yr. Undergraduate lab course in Materials & Metallurgical Engineering) in 2012-13 1st semester at IIT Kanpur

17. Served as a Teaching Assistant in **Solar Energy Technologies** (1st yr. Postgraduate elective course in Materials Science & Engineering) in 2011-12 2nd semester at IIT Kanpur

Professional Affiliations

Name of Professional body	Year of Membership
Indian Institute of Metals (IIM)	Life Member, since 2017 (LM 56358)
Powder Metallurgy Association of India (PMAI)	Life Member, since 2017 (L00863)
The Institution of Engineers (India)	Associate Member, since 2023 (AM3072714)

Review Activities

- Journal of Alloys and Compounds
- Surface & Coating Technology
- International Journal of Refractory Metals and Hard Materials
- Advanced Engineering Materials
- Ceramics International
- Scientific Reports
- Materials Today Proceedings
- CHEMCON conference proceedings