Curriculum Vitae

Dr. Manoj Kumar

Senior Scientist, Pyrometallurgy and Materials Engineering Department
CSIR-Institute of Minerals and Materials Technology, Bhubaneswar, Odisha, India-751013
Phone: 0674-237-9228 (office); (+91) 9494064036 (Mob)
email: manojkr.iitkgp@gmail.com , manojkumar.immt@csir.res.in

EDUCATION

Academic Qualification	Institute	Year
Ph. D. in Metallurgical & Materials Engineering	Indian Institute of Technology (IIT), Kharagpur, India	2025
B.Tech and M.Tech (Dual Degree) in Metallurgical & Materials Engineering	Indian Institute of Technology (IIT), Kharagpur, India	2010-15
Class XII (CBSE)	Jawahar Vidya Mandir, Shyamali, Ranchi, Jharkhand	2010
Class X (CBSE)	Jawahar Navodaya Vidyalaya, Chatra, JH	2008

Work Experience

Senior Scientist, CSIR-IMMT Bhubaneswar, Odisha, India *(January 2025 to present)*
Scientist, CSIR-IMMT Bhubaneswar, Odisha, India *(January 2021 to 2025)*
Assistant Professor, AcSIR, Ghaziabad, U.P., India *(May 2024 to present)*
Visiting Researcher (University of Warwick, United Kingdom) *(July – September 2019)*
Assistant Professor, VFSTR University, Guntur, A.P., India *(June 2015- July 2016)*

Awards and Recognitions

Lord Bhattacharya fellowship from University of Warwick, U.K. (2019)
Best Oral Presentation Award by Indian Thermal Spray Association at NTSC (2025)
Best Oral Presentation Award by Indian Institute of Metal at IIM-ATM (2024)
Best Poster Presentation Award by Indian Institute of Metal at IIM-ATM (2023)
Special Mention Award at ICME conference organised by IIT Kanpur (2017)

Publications in International Journals

1. **M. Kumar**, J. D. Majumdar, and I. Manna, "Phase evolution, densification behaviour and thermal and mechanical properties of Gd_2O_3 co-doped Y_2O_3 stabilised ZrO_2," *Journal of Alloys and Compounds,* 2025. 1022:179851. https://doi.org/10.1016/j.jallcom.2025.179851
2. **M Kumar**, J D Majumdar, I Manna, "Gradation of Microstructure, Phase Aggregate, and Mechanical Properties with Vertical Depth of Surface Alloyed or Melted Zone

Synthesized by Laser Surface Alloying or Melting of Inconel 718," *Journal of Materials Science,* 2024. https://doi.org/10.1007/s10853-024-10424-x

3. N Kumar, P Sengupta, **M Kumar**, M Debata, S Bajpai, D Debasish, A Panigrahi, "Microstructure, thermal expansion, and high-temperature oxidation behavior of spark plasma sintered AlCoCrSiNi high entropy alloy", (2024) Mater Today Commun 40:110063. https://doi.org/10.1016/j.mtcomm.2024.110063
4. S Mandal, **M Kumar**, P Sengupta, A Panigrahi, M Debata, C Shamili, K P Surendran, I Manna, S Basu, "Laser Melting of Mechanically Alloyed FeNi: A Study of the Correlation between Microstructure and Texture with Magnetic and Physical Properties", *ACS Omega,* 2024, 9 (13), pp. 15650-15662, https://doi.org/10.1021/acsomega.4c00601
5. **M Kumar**, J D Majumdar, I Manna, "Development of Gd_2O_3 doped yttria stabilized zirconia based thermal barrier coating for improved high temperature oxidation and erosion resistance," *Ceramics International,* 2023, Vol. 49, pp. 38081–38093, https://doi.org/10.1016/j.ceramint.2023.09.138
6. S Mandal, P Sengupta, S Dey, **M Kumar**, S Basu, M Debata, "Effect of Y_2O_3, La_2O_3 and ZrO_2 dispersoid addition on ultra-high temperature stability of 95W–3.5 Ni–1.5 Fe heavy alloy" International Journal of Refractory Metals and Hard Materials, 2023, Vol. 113, pp. 106195. https://doi.org/10.1016/j.ijrmhm.2023.106195
7. **M Kumar**, G Gibbons, A Das, I Manna, D Tanner, H R Kotadia, "Additive manufacturing of Aluminium alloy 2024 by laser powder bed fusion: Microstructural evolution, defects and mechanical properties," *Rapid Prototyping Journal,* 2021, Vol. 27 No. 7, pp. 1388-1397, https://doi.org/10.1108/RPJ-10-2020-0241.
8. **M Kumar**, M Das, J D Majumdar, I Manna, "Development of graded composition and microstructure on Inconel 718 by laser surface alloying with Si, Al and ZrB_2 for improvement in high temperature oxidation resistance," *Surf. Coatings Technol.*, 2020, vol. 402, pp. 126345. https://doi.org/10.1016/j.surfcoat.2020.126345
9. A Meharwal, **M Kumar**, S K Karak, J D Majumdar, I. Manna, "High Temperature Oxidation Study of Nano-Y_2O_3 Dispersed Ferritic Alloys Synthesized by Mechanical Alloying and Sintering," *Metall. Mater. Trans. A*, 2020, Vol.51, pp. 5257–5267. https://doi.org/10.1007/s11661-020-05918-7

Book Chapter

1. **M Kumar**, J D Majumdar, H J Fecht, I Manna, "Laser-Assisted Additive Manufacturing of Ni-Based Superalloy Components," in *Metallurgy in Space: Recent Results from ISS*, Springer Nature, 2022, pp. 499–521. https://doi.org/10.1007/978-3-030-89784-0_22

List of Conferences

International:

1. **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 2023 (PM 23)*, organized by PMAI, March 12-15, 2023 at Mumbai.

2. 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 2023 (PM 23)*, organized by PMAI, March 12-15, 2023 at Mumbai.
3. **Manoj Kumar** "Development of intermetallic and graded composite coating over Ni-base superalloy by laser material processings" *International Conference on Materials Science and Mechanical Engineering (ICMSME 2023)*, organised by Department of Mechanical Engineering of Regent Education and Research Foundation, Barrackpore, West Bengal, January 19-20, 2023. Keynote speech (virtual mode)
4. **Manoj Kumar**, Jyotsna Dutta Majumdar, Indranil Manna, "Development of Graded Composition and Microstructure on Inconel 718 by Laser Surface Alloying with Si, Al and ZrB_2 for Improved High Temperature Oxidation Resistance", International Conference on Laser Assisted Material Processing (LAMP 2022), organised by IIT Kharagpur, August 29-31, 2022. (virtual mode)
5. **M. Kumar**, P. Meher, S. Mandal, P. Sengupta, A. Panigrahi, M. Debata, "Combined effect of NiB, Fe_3Al and ZrB_2 on densification, distortion behaviour and mechanical properties of W-Ni-Fe alloys", *International Conference on Powder Metallurgy 2022 (PM 22)*, organized by PMAI, April 18-20, 2022. (virtual mode)
6. **Manoj Kumar**, J. Dutta Majumdar and I. Manna*; *Laser aided surface engineering and additive manufacturing of metallic systems.* 26th International Symposium on Metastable, Amorphous and Nanostructured Materials (ISMANAM-2019) at Chennai, India, (2019)
7. **Manoj Kumar**, J. Dutta Majumdar and I. Manna; *Studies on electron beam surface melting of medium carbon steel*. Presented at International Conference on Materials Engineering (ICME), IIT Kanpur, India, (2017) –**Special Mention Award**
8. **Manoj Kumar** and J. Dutta Majumdar; *Studies on electron beam surface melting of medium carbon steel.* Presented at International Conference on Advanced Materials and Materials Processing (ICAMMP), IIT Kharagpur, India, (2016)
9. **Manoj Kumar** and J. Dutta Majumdar; *Process Parameter Optimization of Electron Beam Surface Melting of Medium Carbon Steel and Ti-6Al-4V.* Presented at 3rd International Conference on Laser and Plasma Application in Materials Science (LAPAMS), Kolkata, India, (2015)

National:

1. **Manoj Kumar**, J. Dutta Majumdar and I. Manna; *Development of Rare-earth doped yttria stabilized zirconia for advanced thermal barrier coating to improve thermal and mechanical performance.* Presented at 2nd National Thermal Spray Conference (NTSC) at Bhubaneswar, (2025) –**Best Oral Presentation Award**

2. **Manoj Kumar**, J. Dutta Majumdar and I. Manna; *Rare-earth doped yttria stabilized zirconia as thermal barrier coating material for improved performance.* Presented at

62nd National Metallurgists' Day (NMD) and the 78th Annual Technical Meeting (ATM) at Bangaluru, India, (2024) –**Best Oral Presentation Award**

3. **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.* Presented at 61st National Metallurgists' Day (NMD) and the 77th Annual Technical Meeting (ATM) at Bhubaneswar, India, (2023) –**Best Poster Presentation Award**
4. **Manoj Kumar**, J. Dutta Majumdar and I. Manna; *Development of Ceramic Matrix Composite (CMC) Coating by Laser Cladding.* Presented at 60th National Metallurgists' Day (NMD) and the 76th Annual Technical Meeting (ATM) at Hyderabad, India, (2022)
5. **Manoj Kumar**, J. Dutta Majumdar and I. Manna; *Development of Composite Thermal Barrier Coating (C-TBC) by HVOF and Plasma Spraying Methods.* Presented at 56th National Metallurgists' Day (NMD) and the 72nd Annual Technical Meeting (ATM) at Kolkata, India, (2018)
6. **Manoj Kumar**, J. Dutta Majumdar and I. Manna; *Study on Electron Beam Surface Melting of Medium Carbon steel and Ti-6Al-4V*. Presented at 55th National Metallurgists' Day (NMD) and the 71st Annual Technical Meeting (ATM) at BITS Pilani- KK Birla, Goa Campus, India, (2017)

Member of Professional Bodies/Societies

- Life Member, Indian Institute of Metals (IIM) (Member ID: LM01- 59116)
- Life Member, Powder Metallurgy Association of India (PMAI) (Member ID: L01050)
- Life Member, Indian Institute of Welding (IIW) (Member ID: BBSR/M/R-14362/L)
- Life Member, Indian Thermal Spray Association (ITSA) (Member ID: ITSA/LM/39)
- Life Member, Tribology Society of India (TSI) (Member ID: 6229)
- Member, The American Ceramic Society (ACerS) (Member ID: 2016128)