Bishwaprit Mitra

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Profile. Final-year B.Tech student in Metallurgical & Materials Engineering with research experience in alloy design, nanomaterials synthesis, microstructural characterization, and computational materials studies. Interested in advanced structural materials, high-entropy alloys, and functional nanomaterials. Seeking research internships and graduate research opportunities in materials science.

Research Interests

- Alloy design and high-entropy alloys for structural applications
- Microstructure–property relationships in advanced alloys
- Mechanical and thermal behavior of multi-component systems
- Nanomaterials and conductive inks for flexible electronics

Research Experience

- **Research Intern**, Materials Science Centre, IIT Kharagpur (Jan 2026–Jun 2026)
  Advisor: Dr. Shibayan Roy (shibayan@matsc.iitkgp.ac.in)
  - Refractory high-entropy alloy design for structural applications
  - Phase stability analysis and microstructural characterization
  - Mechanical property evaluation of multi-component alloys
- **Undergraduate Thesis**, NIT Durgapur (Jan 2025–Dec 2025)
  Advisor: Dr. Manab Mallik (mmallik.mme@nitdgp.ac.in)
  - Synthesis and characterization of chemically reduced silver nanoparticles
  - In-depth research on silver nanoparticle systems for flexible electronics applications
  - Structural and optical characterization using XRD, SEM, and UV–Vis spectroscopy
  - Manuscript submitted to *ChemNanoMat* (Wiley): *"Chemically Reduced Silver Nanoparticles for Flexible Electronics"*
- **Summer Research Intern**, DMRL–DRDO (May 2025–Jul 2025)
  Advisor: Dr. Rajdeep Sarkar (rajdeep.sarkar@gmail.com)
  - Microstructural characterization of a high-entropy alloy
  - Phase fraction analysis and grain morphology evaluation
- **Vocational Intern**, Tata Steel Ltd. (May 2024–Jun 2024)
  Supervisor: Mr. Radha Raman Abhyuday (rr.abhyuday@tatasteel.com)
  - CO_2 reduction strategies in blast furnace operations
  - Alternative burden materials and carbon optimization approaches
- **Independent Computational Study (Self-Learning)**, NIT Durgapur (Dec 2024–Present)
  - Attempted simulation of Ag nanoparticle thermal stabilization using LAMMPS
  - Set up basic simulation environments and boundary conditions independently
  - Performed RDF analysis for structural correlation studies
  - Self-learned **JMatPro** for basic phase diagram generation and property prediction

Publications & Presentations

- *Innovative Pathways for CO_2 Reduction in Ironmaking*, Springer ICST 2024 (Accepted, Best Paper 2nd). DOI: Pending
- *Synthesis and Characterization of Silver Nanoparticles for Flexible Electronics Applications*, Oral Presentation, IC3MI Conference, December 5–6, 2025
- *Chemically Reduced Silver Nanoparticles for Flexible Electronics*, ChemNanoMat (Wiley), Manuscript submitted

Education

- **B.Tech in Metallurgical & Materials Engineering**, NIT Durgapur (2022–2026)
  CGPA: 7.86/10 (till 7th semester) — SVMCM Merit Scholarship
- Higher Secondary (WBCHSE): 91.6%, Merit Rank: 3rd in school
- Secondary (WBBSE): 85.4%, Merit Rank: 1st in school

Technical Skills

- Characterization (Medium): XRD, SEM, EDS, UV–Vis, Metallography
- Computational Tools (Basic–Practical): LAMMPS, Atomsk, Packmol
- Materials Software (Basic): JMatPro, Thermo-Calc
- Data & Analysis: OriginPro, Excel, Python (basic)
- Focus Areas: Alloy design, high-entropy alloys, nano-inks, phase analysis

Soft Skills

- Adaptable and flexible to work in new research environments
- Good scientific communication and presentation skills
- Enthusiastic learner with strong self-learning ability
- Comfortable working independently as well as in research teams

Workshops & Training

- Spark plasma sintering and cryogenic milling (CalNano)
- Standardization and quality control (BIS Club)

Achievements

- Best Paper Award (2nd), ICST 2024
- Oral Presenter, IC3MI Conference 2025
- Top-150 Nationwide, IET India Scholarship 2025
- SVMCM Merit Scholarship

Languages English (very good) — Hindi (proficient) — Bengali (native) — German (A1)

Hobbies Cricket, badminton, travelling

References

- Dr. Manab Mallik — Assistant Professor, NIT Durgapur (Undergraduate Thesis Supervisor)
  Email: mmallik.mme@nitdgp.ac.in
- Mr. Radha Raman Abhyuday — Head, Blast Furnace Operations, Tata Steel
  Email: rr.abhyuday@tatasteel.com
- Dr. Rajdeep Sarkar — Scientist, DMRL–DRDO
  Email: rajdeep.sarkar@gmail.com