Dr. Snehanshu Pal

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Associate Professor,
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Department of Metallurgy and Materials Engineering,

Indian Institute of Engineering Science and Technology, Government of India, Shibpur, Howrah-711103, West Bengal, India

Website : http://www.snehanshuresearchlab.org/index.html Publon Profile : https://publons.com/researcher/1330336/snehanshu-pal

Google Scholar Profile: https://scholar.google.co.in/citations?user=1asrimkAAAAJ& hl=en

PROFILE SUMMARY

| Research Areas: | Computational Materials Engineering, Metallurgical Process Modeling and Materials Informatics |
|---|--|
| RESEARCH PROFILE KEYWORDS: | Atomistic Simulations, Density Functional Theory based simulation Of Energy Materials, Materials Informatics, Steel Making Process, Molecular Dynamics Simulation, Deformation of Metals, Density Functional Theory, |
| | Grain Boundary Engineering. |
| BOOKS PUBLISHED AS AUTHOR: | Three (3) |
| BOOK PUBLISHED AS EDITOR: | One (1) |
| SCI JOURNAL ARTICLE PUBLISHED: | One hundred sixteen (116) |
| Doctoral Students Supervised: | Eleven (11) |
| MASTER STUDENTS (M. TECH) SUPERVISED: | Sixteen (16) |
| SPONSOR RESEARCH PROJECTS: | Five (5) |
| Consultancy Research Project: | Two (2) |
| Research/Teaching Experience: | More than Ten years |
| INDUSTRIAL EXPERIENCE (STEEL INDUSTRY): | More than Three Years |
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EDUCATION

| 2009-2013 | Ph.D. Metallurgical and Materials Engineering, Indian Institute of Technology, Kharagpur, India Research Topic: Atomistic Simulations of Methane Hydrates and Inhibitor Design |
|-----------|--|
| 1998-2002 | B.E. Metallurgical and Materials Engineering, First Division, Bengal Engineering college (Deemed University), Shibpore, Howrah, India (currently known as Indian Institute of Engi- neering Science and Technology, Shibpur Howrah, India). |

Research /Academic Experience

| Sept.2023- Present | Associate Professor, Department of Metallurgy and Materials Engineering, Indian Institute of Engineering Science and Technology, Shibpur-711103,India Research Area: Computational Materials Engineering, Material Informatics, Process Modeling |
|---------------------|---|
| Mar.2023- Sept.2023 | Associate Professor, Department of Metallurgical and Materials Engineering, National Institute Of Technology , Rourkela-769008,India Research Area: Computational Materials Engineering, Material Informatics, Process Modeling |
| Feb.2014- Mar.2023 | Assistant Professor, Department of Metallurgical and Materials Engineering, National Institute Of Technology , Rourkela-769008,India Research Area: Computational Materials Engineering, Material Informatics, Process Modeling |
| Sept.2013- Feb.2014 | Post-Doctoral Fellow, Materials Science and Engineering, the Pennsylvania State Uni- versity, United States of America(USA) Research Area: Computer modeling of heat transfer, material flow in welding process |

INDUSTRIAL EXPERIENCE

| Mar 2006 - July 2009 | Organization: Steel Authority of India Limited, Government of India, India |
|----------------------|---|
| | Department: Steel Melting Shop of Rourkela Steel Plant, Rourkela, Odisha, India Designation: Junior Manager (Operation) – Shift in-charge |

RESEARCH INVESTIGATOR OF SPONSORED PROJECTS

| Principal Investigator | 1.Investigation of solidification process and prediction of microstructure during secondary cooling in continuous casting of plain carbon steel to estimate the porosity fraction and carbon segregated by multi scale simulation (cellular automata and phase field modeling techniques). Funding Agency: Department of Science and Technology (DST), Government of India, State Committee on Science and Technology, Belarus. Total Project Value: INR 8.83 lakhs Present Status: Completed |
|------------------------|--|
| | 2.The effect of shock wave, moisture and sea water on de- bonding of multilayer in FRP composite systems -Experimental and multi-scale modeling based investigation Funding Agency: Naval Research Board (NRB), DRDO, Govern- ment of India Total Project Value: INR 19.932 lakhs Present Status: Completed |

Research Investigator of Sponsored Project

| Co-Principal Investigator | 3.Digitization of steel microstructure images, modelling of plain carbon steel microstructure evolution during heat treatment using cellular automata and phase field modeling methods, and development of a software tool for providing guidance in designing heat treatment process using machine learning based classification techniques Funding Agency: Department of Science and Technology, Government of India Total Project Value: INR 18.546 lakhs Present Status: Completed 4.Characterization and numerical simulation of brazed joint - ceramic ring of HVB (High Voltage Bushing) Funding Agency:Board of Research in Fusion Science and Technology (BRFST), BRNS, Government of India Total Project Value: INR 25.64 lakhs Present Status: Completed |
|---------------------------|--|
| | 5.Failure analysis and Cost estimation for AC submerged arc furnace. Funding Agency:SARAF Agencies pvt. ltd. Total Project Value: INR 3.00 lakhs Present Status: Completed |

| Principal Investigator | Optimizing minor constituents in blast furnace slag to oper- ate 19-22 percentage slag Alumina Funding Agency: Tata Steel Ltd. Total Project Value: INR 19.90 lakhs Present Status: Completed |
|------------------------|--|
| Principal Investigator | 2. Investigation on Hydrogen Diffusion in High Entropy Alloy Funding Agency: CSIR- Indian Institute of Petroleum Total Project Value: INR 3.00 lakhs Present Status: Completed |

ACHIEVEMENTS

Ranked 30th (all India rank) in Graduate Aptitude Test in Engineering (GATE) 2009

| Subject No. | Subject Name | L-T-P |
|-------------|--|-------|
| MM611 | Process Modelling for Steel Industry | |
| MM6311 | Metallurgical Thermodynamics and Kinetics | 3-0-0 |
| MM2302 | Transport Phenomenon | 3-0-0 |
| MM472 | Thermodynamic Modeling of Metallic systems | 0-0-3 |
| MM305 | Steel Making | 3-0-0 |
| MM426 | Secondary Steel Making | |
| MM274 | AtomisticModellingof Materials Laboratory | 0-0-3 |
| MM476 | Computational Modeling of Process Metallurgy | |
| | Laboratory | |
| MM494 | Seminar and Technical Writing – II | 0-0-0 |

COURSES TAUGHT AS COURSE TEACHER

SUPERVISED PH.D. THESIS WORKS AS A SINGLE/SOLE SUPERVISOR (TOTAL NO. 4)

| Dermon | Title of Theorie | Name of the Stu |
|--------------|---|--------------------|
| Degree and | litle of linesis | Name of the Stu- |
| year | | dent |
| Ph.D. (2019) | Molecular Dynamics Simulation Based Study for | Dr. Md. Meraj |
| Degree | Creep Deformation Behaviour of Nanocrystalline | |
| awarded | Nickel and Nickel-Zirconium Alloys (Obtained Insti- | |
| | tute Gold Medal for the best Ph.D.Thesis of 2019-20 | |
| | in National Institute of Technology Rourkela , India) | |
| Ph.D. (2021) | Molecular Dynamics Simulation Of Deformation Be- | Dr. K. Vijay Reddy |
| Degree | haviour During Nanoscale Rolling | |
| awarded | | |
| Ph.D. (2023) | Molecular dynamics simulation of deformation be- | Dr. S. Mishra |
| Degree | havior of Al90Sm10 metallic glass and Al-Al90Sm10 | |
| awarded | crystalline-amorphous nanolaminate | |
| Ph.D. (2024) | Study of radiation damage in metallic systems using | Dr. M. Manna |
| Degree | molecular dynamics simulations nanolaminate | |
| awarded | | |

SUPERVISED PH.D. THESIS WORKS AS A JOINT SUPERVISOR (TOTAL NO. 7)

| Degree and | Title of Thesis | Name of the Stu- |
|--------------|---|------------------|
| year | | dent |
| Ph.D. (2018) | Fabrication of Nano-Y2O3 Dispersed Tungsten Alloys | Dr. A. Patra |
| Degree | by Mechanical Alloying Followed by Conventional | |
| awarded | and Spark Plasma Sintering | |
| Ph.D. (2020) | Laser weld-brazing of aluminum alloy | Dr. N. Chary |
| Degree | (AA6082/AA5083) and galvanized interstitial free | |
| awarded | steel with an emphasis on fatigue and corrosion | |
| | study | |
| Ph.D. (2021) | Investigation of Deformation Behavior of High En- | Dr. D. Mishra |
| Degree | tropy Alloy Coated FCC Metallic Systems under | |
| awarded | Nanoindentation using Molecular Dynamics Simula- | |
| | tion | |
| Ph.D. (2022) | Refinement and Processing of Steel Microstructure | Dr. A Panda |
| Degree | Images Facilitating Automated Heat Treatment Pro- | |
| awarded | cess Prediction | |
| Ph.D. (2023) | Molecular dynamics simulation of deformation Be- | Dr. P N Babu |
| Degree | havior of nanocrystalline Al and CNT reinforced | |
| awarded | nanocrystalline Al nanocomposites | |
| Ph.D. (2023) | The effect of shock wave, moisture and sea water on | Dr. S. Gupta |
| Degree | de-bonding of multilayer in FRP composite systems | |
| awarded | experimental and multi-scale modeling based inves- | |
| | tigation | |
| Ph.D. (2024) | Design of Oxygen Donor Ligands for Selective Sepa- | Dr. A. Pati |
| Degree | ration of Lanthanides | |
| awarded | | |

SUPERVISED M. TECH THESIS WORKS (TOTAL NO. 16)

| | 1 | |
|--|--|--|
| Degree | Title of Thesis | Name of the Stu- |
| and year | | dents |
| of degree | | |
| awarded | | |
| M.Tech | Optimizing minor constituents in blast slag to op- | Mr. Devi Dutta |
| (2023) | erate 19-22 percentage slag Alumina using material | Biswajeet |
| | informatics approach | |
| M.Tech | Evaluation of structural properties and thermoelec- | Mr. Ginnarapu |
| (2022) | tric properties of quaternary oxides. | Shivakrishna |
| M.Tech | Investigation of molecular interaction of protein | Mr. Saurav Singh |
| (2022) | with hydroxyapatite surface using atomistic scale | |
| | computational modelling technique. | |
| M.Tech | Molecular Dynamic Simulation of Mechanical Be- | Mr. Pragyan |
| (2022) | haviour of Magnesium during Nano-indentation and | Goswami |
| | Ballistic Penetration | |
| M.Tech | Molecular Dynamic Simulation of Nano Scale Friction | Mr. Roshan Ku- |
| (2020) | Stir Welding | mar Jha |
| M.Tech | Modelling of trajectory of steel droplet and determi- | Mr. Prabhash Ku- |
| (2019) | nation of residence time in slag during steel refining | mar |
| | process using CFD | |
| M.Tech | Modeling of solidification process and estimation of | Mr. Gaddam |
| (2018) | carbon segregation occurred during secondary cool- | Vishal |
| | ing stage of continuous casting process of plain car- | |
| | bon steel | |
| - | | |
| M.Tech | Optimization of Ferrochrome Addition Using Multi- | Mr.Kishore Ku- |
| M.Tech (2018) | Optimization of Ferrochrome Addition Using Multi- Objective Evolutionary and Genetic Algorithms for | Mr.Kishore Ku- mar Behera |
| M.Tech (2018) | Optimization of Ferrochrome Addition Using Multi- Objective Evolutionary and Genetic Algorithms for Stainless Steel Making via AOD Converter | Mr.Kishore Ku- mar Behera |
| M.Tech (2018) M.Tech | Optimization of Ferrochrome Addition Using Multi- Objective Evolutionary and Genetic Algorithms for Stainless Steel Making via AOD Converter Mechanical performance evaluation of woven and | Mr.Kishore Ku- mar Behera Mr. Yogesh |
| M.Tech (2018) M.Tech (2017) | Optimization of Ferrochrome Addition Using Multi- Objective Evolutionary and Genetic Algorithms for Stainless Steel Making via AOD Converter Mechanical performance evaluation of woven and unidirectional GFRP composite through numerical | Mr.Kishore Ku- mar Behera Mr. Yogesh Shamsundar |
| M.Tech (2018) M.Tech (2017) | Optimization of Ferrochrome Addition Using Multi- Objective Evolutionary and Genetic Algorithms for Stainless Steel Making via AOD Converter Mechanical performance evaluation of woven and unidirectional GFRP composite through numerical simulation | Mr.Kishore Ku- mar Behera Mr. Yogesh Shamsundar Mhetre |
| M.Tech (2018) M.Tech (2017) M.Tech | Optimization of Ferrochrome Addition Using Multi- Objective Evolutionary and Genetic Algorithms for Stainless Steel Making via AOD Converter Mechanical performance evaluation of woven and unidirectional GFRP composite through numerical simulation Finite Element Analysis for adhesive bonding | Mr.Kishore Ku- mar Behera Mr. Yogesh Shamsundar Mhetre Mr. Bansal Darji |
| M.Tech (2018) M.Tech (2017) M.Tech (2017) | Optimization of Ferrochrome Addition Using Multi- Objective Evolutionary and Genetic Algorithms for Stainless Steel Making via AOD Converter Mechanical performance evaluation of woven and unidirectional GFRP composite through numerical simulation Finite Element Analysis for adhesive bonding strength of steel and FRP composite joint | Mr.Kishore Ku- mar Behera Mr. Yogesh Shamsundar Mhetre Mr. Bansal Darji VinayKumar |
| M.Tech (2018) M.Tech (2017) M.Tech (2017) M.Tech | Optimization of Ferrochrome Addition Using Multi- Objective Evolutionary and Genetic Algorithms for Stainless Steel Making via AOD Converter Mechanical performance evaluation of woven and unidirectional GFRP composite through numerical simulation Finite Element Analysis for adhesive bonding strength of steel and FRP composite joint The Influence of Chromium Amount, Casting Speed | Mr.Kishore Ku- mar Behera Mr. Yogesh Shamsundar Mhetre Mr. Bansal Darji VinayKumar Mr. Ritesh Padhi |
| M.Tech (2018) M.Tech (2017) M.Tech (2017) M.Tech (2016) | Optimization of Ferrochrome Addition Using Multi- Objective Evolutionary and Genetic Algorithms for Stainless Steel Making via AOD Converter Mechanical performance evaluation of woven and unidirectional GFRP composite through numerical simulation Finite Element Analysis for adhesive bonding strength of steel and FRP composite joint The Influence of Chromium Amount, Casting Speed and Superheat on The Columnar to Equiaxed Transi- | Mr.Kishore Ku- mar Behera Mr. Yogesh Shamsundar Mhetre Mr. Bansal Darji VinayKumar Mr. Ritesh Padhi |
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| M.Tech (2018) M.Tech (2017) M.Tech (2017) M.Tech (2016) | Optimization of Ferrochrome Addition Using Multi- Objective Evolutionary and Genetic Algorithms for Stainless Steel Making via AOD Converter Mechanical performance evaluation of woven and unidirectional GFRP composite through numerical simulation Finite Element Analysis for adhesive bonding strength of steel and FRP composite joint The Influence of Chromium Amount, Casting Speed and Superheat on The Columnar to Equiaxed Transi- tion and Metallurgical Length for Continuously Cast Ferritic Stainless Steels | Mr.Kishore Ku- mar Behera Mr. Yogesh Shamsundar Mhetre Mr. Bansal Darji VinayKumar Mr. Ritesh Padhi |
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| M.Tech (2018) M.Tech (2017) M.Tech (2017) M.Tech (2016) M.Tech (2016) | Optimization of Ferrochrome Addition Using Multi- Objective Evolutionary and Genetic Algorithms for Stainless Steel Making via AOD Converter Mechanical performance evaluation of woven and unidirectional GFRP composite through numerical simulation Finite Element Analysis for adhesive bonding strength of steel and FRP composite joint The Influence of Chromium Amount, Casting Speed and Superheat on The Columnar to Equiaxed Transi- tion and Metallurgical Length for Continuously Cast Ferritic Stainless Steels Dynamic process modeling of stainless steel making through AOD converter | Mr.Kishore Ku- mar Behera Mr. Yogesh Shamsundar Mhetre Mr. Bansal Darji VinayKumar Mr. Ritesh Padhi Mr. Jagdish Nayak |
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| M.Tech (2018) M.Tech (2017) M.Tech (2017) M.Tech (2016) M.Tech (2016) M.Tech (2016) | Optimization of Ferrochrome Addition Using Multi- Objective Evolutionary and Genetic Algorithms for Stainless Steel Making via AOD Converter Mechanical performance evaluation of woven and unidirectional GFRP composite through numerical simulation Finite Element Analysis for adhesive bonding strength of steel and FRP composite joint The Influence of Chromium Amount, Casting Speed and Superheat on The Columnar to Equiaxed Transi- tion and Metallurgical Length for Continuously Cast Ferritic Stainless Steels Dynamic process modeling of stainless steel making through AOD converter Prediction of microstructure for heat treatment pro- cess in dual phase steels using Cellular Automata | Mr.Kishore Ku- mar Behera Mr. Yogesh Shamsundar Mhetre Mr. Bansal Darji VinayKumar Mr. Ritesh Padhi Mr. Jagdish Nayak Mr. Vijay Reddy |
| M.Tech (2018) M.Tech (2017) M.Tech (2017) M.Tech (2016) M.Tech (2016) M.Tech (2016) M.Tech | Optimization of Ferrochrome Addition Using Multi- Objective Evolutionary and Genetic Algorithms for Stainless Steel Making via AOD Converter Mechanical performance evaluation of woven and unidirectional GFRP composite through numerical simulation Finite Element Analysis for adhesive bonding strength of steel and FRP composite joint The Influence of Chromium Amount, Casting Speed and Superheat on The Columnar to Equiaxed Transi- tion and Metallurgical Length for Continuously Cast Ferritic Stainless Steels Dynamic process modeling of stainless steel making through AOD converter Prediction of microstructure for heat treatment pro- cess in dual phase steels using Cellular Automata Numerical Study of Post Welds Residual Stress and | Mr.Kishore Ku- mar Behera Mr. Yogesh Shamsundar Mhetre Mr. Bansal Darji VinayKumar Mr. Ritesh Padhi Mr. Jagdish Nayak Mr. Vijay Reddy Mr. Bhardwaj |
| M.Tech (2018) M.Tech (2017) M.Tech (2017) M.Tech (2016) M.Tech (2016) M.Tech (2016) M.Tech (2016) | Optimization of Ferrochrome Addition Using Multi- Objective Evolutionary and Genetic Algorithms for Stainless Steel Making via AOD Converter Mechanical performance evaluation of woven and unidirectional GFRP composite through numerical simulation Finite Element Analysis for adhesive bonding strength of steel and FRP composite joint The Influence of Chromium Amount, Casting Speed and Superheat on The Columnar to Equiaxed Transi- tion and Metallurgical Length for Continuously Cast Ferritic Stainless Steels Dynamic process modeling of stainless steel making through AOD converter Prediction of microstructure for heat treatment pro- cess in dual phase steels using Cellular Automata Numerical Study of Post Welds Residual Stress and Creep Behavior of Inconel 718 and 316 Stainless Steel | Mr.Kishore Ku- mar Behera Mr. Yogesh Shamsundar Mhetre Mr. Bansal Darji VinayKumar Mr. Ritesh Padhi Mr. Jagdish Nayak Mr. Vijay Reddy Mr. Bhardwaj Ravindra Giriraj |
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SUPERVISED B. TECH THESIS WORKS (TOTAL NO. 21)

| Degree and year | Title of Thesis | Name of the Stu- dents |
|--------------------|--|---------------------------|
| B.Tech (2023) | Financial Spectrum of Boeing 737 and its Depen- dence on Component-wise Material Selection. | Aayush Dinesh Kandpal |
| B.Tech (2023) | A Molecular Dynamics Study of Shock Induced Viscosity of Fe-Cr Alloys using Green Kubo rela- tion and its Dependence on Temperature. | Shantanu Khawas |
| B.Tech (2023) | Machine learning based phase prediction model for multi-principal element alloys and web based application development. | Neeraj Kumar |
| B.Tech | Interfacial diffusion behaviour bimetallic sys- | Sudeeksha Van- |
| B.Tech (2022) | Dynamic assessment of grain boundary, solute and dislocation interaction in FCC metal | Tapashree Pradhan |
| B.Tech (2022) | Effect of Grain Boundary and Interficial Energy Anisotropy on Ternary Phase Separation | Abhinav Roy |
| B.Tech (2021) | Simplementation of machine Learning for coor- dinating among process variable, composition and turn down Temperature for Basic Oxygen Steel making process. | Suraj Hansdah |
| B.Tech (2021) | Study of Dislocation Precipitate Interaction in Ni-Al System Through Molecular Dynamic Sim- ulation. | Nichenametla Jai Sai |
| B.Tech (2021) | Ab-initio prediction and analysis of novel do Heusler alloys. | Adesh Rohan Mishra |
| B.Tech | Molecular Dynamics simulation-based study on the shock response of Ni bicrystals | Tanmay Konnur |
| B.Tech (2020) | Study of Fluid Flow Behaviour in Secondary Steel making using computational fluid dynam- ics | Dibya Ranjan Sa- hoo |
| B.Tech (2019) | Study of creep behavior of Ni62Nb38 metallic glass | B Anjali |
| B.Tech (2019) | Creep-ratcheting interaction study of nanocrystalline nickel using atomistic simula- tion | Sushrita Dash |
| B.Tech (2019) | Evolution of dislocation density in the Ni(metal) -NiTi(metallic glass) interface with the variation in interfacial area and size of the sample | Priyansha Nikita |
| B.Tech (2018) | Influence of Dislocation density and grain size on precipitation kinetics in P92 grade steel | Karanam Gururaj |
| B.Tech (2018) | Influence of specimen size and strain rate on tensile deformation and fracture behavior of single-layer Silicene | B.S.K. Gargeya |

SUPERVISED B. TECH THESIS WORKS (TOTAL NO. 21) CONTINUED..

| Degree and year | Title of Thesis | Name of the Stu- dents |
|--------------------|---|---------------------------|
| B.Tech (2017) | Attempt to identify strategy for micro struc- ture modelling of low carbon steel | Mr.Ankit Surana |
| B.Tech (2017) | The influence of void and porosity on defor- mation behaviour of nanocrystalline Ni under tensile followed by compressive loading | Mr.Kumar Kris- hanjeet |
| B.Tech (2017) | Microstructure prediction during Inter Critical Heating and Subsequent Cooling of Low Car- bon Steel | Mr.Ayush Poddar |
| B.Tech (2016) | Process For Extraction of Titanium Oxide From Ilmenite Ore by Application of Coke | Mr.Anurag Mishra |
| B.Tech (2015) | Density Functional Theory Based Investigation of 1- Butyl-3-Methylidazolium as a Potential Methane Hydrate Inhibitor | Mr.Satyam Choudhury |

Referee or Reviewer for the Journals

- 1. Computational Material Science
- 2. Steel Research International
- 3. Acta Materilia
- 4. Journal of Materials Engineering and Performance
- 5. Intermetallics
- 6. Engineering Computation
- 7. Journal of Materials Science and Technology
- 8. Materials Chemistry and Physics
- 9. International Journal of Mechanical Sciences
- 10. Journal of Alloys and Compounds
- 11. Journal of Material Research and Technology
- 12. Nature Communications
- 13. Modelling and Simulation in Materials Science and Engineering
- 14. Machine Learning: Science and Technology
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- 17. Journal of Molecular Modeling
- 18. Materials Letters
- 19. Journal of Physics: Condensed Matter
- 20. Journal of Applied Physics
- 21. Sadhana
- 22. Emergent Materials
- 23. International Journal of Energy Research
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- 28. Engineering Failure Analysis

- 29. Journal of Materials Research
- 30. Signal Processing: Image Communication
- 31. Journal of Institute of Engineers(India): Series C
- 32. Materials & Design
- 33. Applied Physics A
- 34. The European Physical Journal B
- 35. Chemical Engineering Science
- 36. Journal of Computational Design and Engineering
- 37. Journal of Materials Science
- 38. Physica Scripta

INVITED TALK/LECTURE

1. Themed Tech Talk on "Scope of Interdisciplinary Research" by **Snehanshu Pal (Invited Speaker)** on December 17th 2018 organised by Intelligent Systems Research Group, School of Computer Science, UPES, Dehradun (India)

2. Lecture on "Advancement in Steel Making: Industrial Prospective" by **Snehanshu Pal (Invited Speaker)** on October 1st 2018 in the workshop titled "Advancement in Iron and Steel Making: Industrial Prospective" organised by Department of Metallurgical and Materials Engineering, OPJU, Raigarh (India)

3. Talk on "Quality Assessment through Information and Modeling for Composite Materials" by **Snehanshu Pal (Invited Speaker)** on Workshop 17th- 18th May 2018 organised by Tata Steel, Jamshedpur (India)

4. "Creep Behaviour Study of Nano-crystalline Stainless Steel and Nano-crystalline Nickel Join Using Molecular Dynamics Simulation" By Md. Meraj and **Snehanshu Pal (Keynote Speaker and Corresponding Author)**, 4th International Conference on Thermo-mechanical Simulation and Processing of Steels (Simpro'2016), February 10th- 12th 2016, RDCIS, SAIL, Ranchi (India)

5. Lecture on "Application of Computational Materials Engineering on Materials Characterization and Property Evaluation" by **Snehanshu Pal (Invited Speaker)** in Technical Education Quality Improvement Programme (TEQIP-II) sponsored Workshop on "Advanced Techniques in Materials Characterization" on 22nd- 23rd January 2016 organized Department of Metallurgical Engineering, NIT Raipur

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3. "Molecular Dynamics for Materials Modeling: A Practical Approach using LAMMPS Platform", **Snehanshu Pal**, K. Vijay Reddy ISBN: 9781032347196 , CRC Press, Boca Raton, USA, **2024**.

2. "Molecular Dynamics Simulation of Nanostructured Materials An Understanding of Mechanical Behavior", **Snehanshu Pal**, Bankim Chandra Ray, ISBN: 9780367029821, CRC Press, Boca Raton, USA, **2020**.

1. "Process Modeling for Steel Industry", **Snehanshu Pal**, Anshuman Patra, Prabodh Ranjan Padhee, ISBN : 9789385909399, I.K. International Publishing House Pvt. Ltd, India, **2018**.

BOOK PUBLISHED AS EDITOR(TOTAL NO. 1)

1. "Processing and Characterization of Materials", **Dr.Snehanshu Pal**, Dr. Debdas Roy, Dr. Sudip Kumar Sinha, ISBN: 9789811639364,Springer Nature, Singapore Pte Ltd.,**2021**.

PUBLISHED BOOK CHAPTER

1. Book chapter title "Dynamic Structural Evolution of Nanocrystalline Aluminum During Ratcheting Deformation" by P. Narendra Babu, K. V. Reddy and **Snehanshu Pal** of the Book, titled "Nano Scaled Structural Problems: Static and Dynamic Behaviors", Chapter no. 6, ISBN: 9780735422865006, AIP Publishing (2021).

2. Book chapter title "Creep Behaviour Study of Nano-crystalline Stainless Steel and Nanocrystalline Nickel Join Using Molecular Dynamics Simulation" by Md. Meraj and **Snehanshu Pal** of the Book, titled "Thermo-Mechanical Simulation and Processing of Steels", Chapter no. 14, ISBN: 978-93-85919-86-2, Viva Books Private Limited (2016).

3. Book chapter title "CFD Modeling of Fluid Flow Behavior and Bath Surface Deformation in LD Converter" by T. K. Kundu and **Snehanshu Pal** of the Book, titled "CFD Modeling and Simulation in Materials Processing", Chapter no. 38, ISBN: 978-1-1182-9615-8, Wiley online library (2012).

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2023:

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107. "Investigation on wear-resistance of nanocrystalline Pt-Au by molecular dynamics simulations", T. Pradhan, **S. Pal (Corresponding Author)**, C. Deng,**Tribology International** Vol. 189, pp. 108966 (2023)

106. " A molecular dynamic simulation-based study on nanoscale friction stir welding between copper and aluminium", R. K. Jha, K. V. Reddy, **S. Pal**, **Molecular Simulation**, pp. 1-12 (2023)

105. "Correlation and Prediction of Molten Steel Temperature in Steel Melting Shop Using Reliable Machine Learning (RML) Approach ", M. K. Singh, A. Choudhury, D. Uikey, **S. Pal,Transaction of the Indian Institute of Metals** Vol. 76, pp. 3365–3377 (2023)

104. "Unveiling the effect of interface on torsional behavior of crystalline Al-Al90Sm10 metallic glass nanolaminates ", S. Mishra, **S. Pal (Corresponding Author)**, **Philosophical Magazine** Vol. 103, pp. 1-24 (2023)

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97. "Investigation of point defect evolution and Voronoi cluster analysis for magnesium during nanoindentation.", P. Goswami, **S. Pal**, M. Gupta, **Journal of Magnesium and Alloys** Vol. 11, pp. 1029-1042 (2022)

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87."Atomistic Insight into the Texture Weakening and Shear-Shuffle Twinning Mechanism During Cold-Rolling of Magnesium", K. V. Reddy, **S. Pal (corresponding author), JOM** Vol.74, pp.1387–1394 (2022)

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10. "The Effect of Temperature on Creep Behaviour of Porous (1 at.percent) Nano Crystalline Nickel". M. Meraj and **S Pal (Corresponding Author), Transactions of the Indian Institute of Metals**, Vol. 69, pp. 277-282 (2016)

9. "Electrophoretic deposition of Cu-SiO2 coatings by DC and pulsed DC for enhanced surface mechanical properties", H.S. Maharana, S. Lakra, **S. Pal**, and A. Basu, **Journal of Materials Engineering and Performance**, Vol. 25, No. 1, pp. 327- 337(2016)

8. "Surface-Mechanical Properties of Electrodeposited Cu-Al2O3 Composite Coating and Effects of Processing Parameters". HS Maharana, A Ashok, **S Pal**, A Basu, **Metallurgical and Materials Transactions A**, 47A, pp. 388–399 (2016)

7. "Effect of basicity, Al2O3 and MgO content on the characteristic temperatures of the CaO-MgO-SiO2-Al2O3 high alumina quaternary slag system". T. Trinath, N. Yedla, S. Sarkar, **S Pal, Metallurgical Research Technology**, Vol. 113(5), pp. 501 (2016)

6. "Experimental and atomistic simulation based study of W based alloys synthesized by mechanical alloying" A. Patra, M. Meraj, S. Pal, N. Yedla and S.K. Karak, S. Pal, **International Journal of Refractory Metals and Hard Materials**, Vol. 58, pp. 57-67 (2016)

2015:

5."Asymmetry in steel welds with dissimilar amounts of sulfur", H. L. Wei, **S. Pal**, V. Manvatkar, T. J. Lienert, and T. DebRoy. **Scripta Materialia**, Vol. 108, pp. 88- 91 (2015)

4. "The effect of nano-void on deformation behaviour of Al-Cu intermetallic thin film compounds", N. Yedla, M. Meraj, P. Gupta, V. Sarat, A. J. Kabi and **S Pal (Corresponding Author), Metallurgical Research Technology**, Vol. 112, pp. 505 (2015)

2014:

3. "Design of methane hydrate inhibitor molecule using Density Functional Theory." **S** Pal (Corresponding Author) and T. K. Kundu, Journal of Cluster Science, Vol. 2, pp. 551-563(2015)

2013:

2. "Pentagonal dodecahedron methane hydrate cage and methanol system - an Ab initio study" by **S Pal (Corresponding Author)**, T. K. Kundu, **Journal of Chemical Science**, Vol. 125, pp. 379–385 (2013)

1. "DFT based inhibitor and promoter selection criteria for pentagonal dodecahedron methane hydrate cage" **S Pal (Corresponding Author)**, T. K. Kundu, **Journal of Chemical Science**, Vol. 125, pp. 1259 -1266 (2013)

CONFERENCE PRESENTATIONS

1. "An anomaly in creep property dependence on grain size for ultrafine grain nanocrystalline Nickel at higher creep temperature", Md. Meraj (Presenter), Snehanshu Pal, 2nd International Conference on Science and Engineering of Materials (ICSEM-2018), January 6-8, 2018, Sharda University (India).

2. "Effect of temperature on creep behavior of nanocrystalline Ni having multimodal grain distribution with pre- existing crack", Md. Meraj (Presenter), Snehanshu Pal, The 9th International Conference on Materials for Advanced Technologies (ICMAT-2017), June 18-23, 2017, Suntec Exhibition Center (Singapore).

3. "Analysis of deformation behaviour of Al-Ni-Co thin film during nanoindentation: A Molecular Dynamics study", K. Vijay Reddy (Presenter), Snehanshu Pal, 17th International Conference on Thin Films (ICTF-2017), November 13-17, 2017, CSIR-National Physical Laboratory, New Delhi (India).

4. "Molecular Dynamics simulation based study of the tensile loading behaviour of Silicene", B.S.K. Gargeya (Presenter), Snehanshu Pal, International Conference on Nanotechnology: Ideas, Innovations Initiatives (ICN:3I-2017), December 6-8, 2017, Indian Institute of Technology Roorkee (India).

5. "An atomistic simulation based investigation on the influence of Zr addition on deformation behavior of nanocrystalline Ni", Md. Meraj (Presenter), B.S.K. Gargeya, K. Vijay Reddy, Snehanshu Pal, 10th International Conference on Precision, Meso, Micro and Nano Engineering (COPEN 10), December 7-9, 2017, Indian Institute of Technology Madras (India).

6. "The Effect of Temperature on Creep Behaviour of Porous (1 at.Crystalline Nickel", M. Meraj (presenter) and S. Pal (Corresponding Author), 7th International Conference on Creep, Fatigue and Creep - Fatigue Interaction (CF-7)-2016, January 19-22, 2016, Indira Gandhi Centre for Atomic Research Kalpakkam (India).

7. "Deformation of Ni20W20Cu20Fe20Mo20 high entropy alloy for tensile followed by compressive and compressive followed by tensile loading: A molecular dynamics simulation based study", M. Meraj (presenter) and S. Pal (Corresponding Author), 5th National Conference on Processing Characterization of materials 12-13th December, 2015 National Institute of Technology, Rourkela (India).

8. "Multiphase Computational Fluid Dynamics (CFD) modeling study of slopping behavior during basic oxygen steel making (BOS) process", S. Pal (presenter and Corresponding Author), V. Kumari, R. Kumar and N. Yedla, KomPlasTech 2015- XXII International Conference Computer Methods in Materials Technology - January 11 -14, 2015, Krynica-Zdrój (Poland)

9. "Molecular Dynamics Studies on the Prediction of Interface Strength of Cu (metal)-CuZr (metallic glass) Metal Matrix Composites", N. Yedla (presenter), R. Nalla, S. Pal, P. Gupta and M. Meraj, 8th International Conference on Materials for Advanced Technologies of the Materials Research Society of Singapore IUMRS – International Conference in Asia (ICMAT2015 IUMRS-ICA2015), 28 June - 3 July 2015, Suntec (Singapore).

10. "Theoretical study of methanol as inhibitor and cyclopentane as stabilizer of dodecahedron methane hydrate cage." S. Pal (presenter and Corresponding Author), and T. K. Kundu. In IOP Conference Series: Materials Science and Engineering, vol. 73, no. 1, p. 012081. IOP Publishing, 2015.

11. "Density Functional Theory Study of Methane Encapsulation in Different Clathrate Hydrate Cage Structure" by S. Pal (presenter and Corresponding Author) ,and T. K. Kundu International Conference on Advances in Materials and Materials Processing (ICAMMP) 2011 Oral Presentation Volume (2011)

12. "Comparative Stability Analysis of Different Methane Hydrates Structures Using Density Functional Theory" by S. Pal and T. K. Kundu, NMD ATM 2011

13. "Fluid Flow Behavior of LD Converters Using Different" - e Turbulence Model" By T. K. Kundu , S. Pal (presenter and Corresponding Author) ,NMD ATM 2010 Page 77 (2010)

14. "ANN Modeling For Prediction of Phosphorus, Carbon And Temperatures in LD Converter" by T. K. Kundu, S. Pal (presenter and Corresponding Author) ,NMD ATM 2010 Poster Volume, pp. 77 (2010)

PROFESSIONAL MEMBERSHIP

1. Life member in The Indian Institute of Metals (Membership No. LM55478)

2. Life member in Institution of Engineers (Membership No. AM1707232)

WORKSHOP ATTENDED

4

| 1st - 5th July 2014 | Faculty Development Program in Pedagogy and E-learning Tech- nology National Institute Of Technology , Rourkela,India |
|-----------------------|--|
| ith - 5th August 2015 | National Workshop on Technology Enabled Learning (TECHEL - 2015) Organized by A N Khosla Centre for Technology Learning, Na- tional Institute of Technology, Rourkela,India |

TEAM PLAYER AND LEADERSHIP SKILL

1. Organized National Conference of Processing Characterization Materials (NCPCM) 2014 conference seminar as a co-convener and treasurer in Metallurgical and Materials Engineering Department of National Institute of Technology Rourkela, India.

2. Organized Research Scholar Day 2011 conference seminar as a convener in Metallurgical and Materials Engineering Department of Indian Institute of Technology Kharagpur, India.

Administrative Responsibilities

•Member of Institute Academic Program Oversight Committee - National Institute of Technology Rourkela (August'2016 – going on)

•Faculty Coordinator - Student Council Centre, National Institute of Technology Rourkela (July'2018 – going on)

•Faculty Advisor for B. Tech students of Metallurgical and Materials Engineering Department, National Institute of Technology Rourkela (July'2014 – going on)

•Worked as an Assistant Warden for a hostel having 1200 boarders in National Institute of Technology Rourkela (July'2015 – June'2017)

•Professor -in -Charge for Departmental Website of Metallurgical and Materials Engineering Department, National Institute of Technology Rourkela (July'2015 - June'2017)

•Member of disciplinary committee of Institute Hall Management Centre - National Institute of Technology Rourkela (August'2016 – June'2017)

•Member of purchase committee of Institute Hall Management Centre - National Institute of Technology Rourkela (August'2015 – June'2016)

TECHNICAL SKILLS

| Programming Languages | FORTRAN, C, C++, Matlab,Python |
|---|--|
| Data Science: | Material Informatics , Machine Learning and Deep Learning |
| Operating System: | Windows and Linux |
| Atomistic and Molecular Simulation Packages: | Gaussian 09, Lammps |
| Computational Fluid Dynamics Package: | Ansys Fluent |
| Knowledge of Metallurgical Process : | Steel making process, Continuous casting process Microstructure Modeling, Welding Technology, and Failure Anal- ysis |

Short Term courses

| Date | Торіс | Туре |
|-----------------|--|------------|
| 18-20 Dec 2020 | Conference on Processing and Characterization of | Conference |
| | Materials (CPCM 2020) | |
| 14-18 June 2021 | A Five Day Online AICTE Training and Learning (ATAL) | Workshop |
| | Academic FDP Program On "Cultivating Excellence in | |
| | Implementation of Computational Science for Scien- | |
| | tific and Technological Innovations" | |
| 22-26 Sep 2020 | Molecular Modelling of Materials and Biological | Workshop |
| | Macro Molecules | |
| 01-05 Nov 2017 | 5 Day Workshop on Computational Techniques and | Workshop |
| | Mathematical Modelling (CTMM-17) for Academia | |
| | and Industry | |

DECLARATION

I declare that all the information of my resume is correct as per my knowledge.

(Dr. Snehanshu Pal)