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## RESEARCH AREAS:

- ✓ **Broad Domain:** Thermal Fluid Science & Engineering (in Mechanical Engineering)
- ✓ **Sub Domain:**
  - Reactive and multiphase flows
  - Viscoelastic flows
  - Hydromagnetic flows and electromagnetohydrodynamics
  - Microscale transport and nanofluidics
  - Projectile dynamics

## PUBLICATIONS:

### JOURNAL PUBLICATIONS:

Total	SCI	Non-SCI
129	105	24

- **2023**

1. Influence of multi-walled carbon nanotubes on the solidification process of an Al-12%Si alloy, Anuruddha Majumder, Dipankar Chatterjee, Sambhunath Nandy (**Materials Today Communications**, Accepted, 2023).
2. On the Primary Silicon Precipitation during the Eutectic Al-Si Liquid to Solid Transformation, Anuruddha Majumder, **Dipankar Chatterjee**, Sambhunath Nandy (**Modelling and Simulation in Materials Science and Engineering**, vol. 31, pp. 075004, 2023).
3. Mixed Convective Flow Past Reverse Doublet Like Rotating Side by Side Cylinders, NVV Krishna Chaitanya, **Dipankar Chatterjee** (**Heat transfer Engineering**, Accepted, 2023).
4. The role of cross thermal buoyancy on flow transition around side by side cylinders at low Reynolds numbers, Krishna Chaitanya NVV, **Dipankar Chatterjee**, Bittagopal Mondal (**Journal of Thermal Analysis and Calorimetry**, vol. 148, pp. 2933, 2023).
5. Efficacy of Transverse Magnetic Field towards Suppressing Nanofluidic Flow Instabilities over Bluff Objects, Sourav Garai, Dipankar Chatterjee, Bittagopal Mondal (**Journal of Magnetism and Magnetic Materials**, vol. 571, pp. 170582, 2023).

6. Influence of inter-layer rotation in parallel deposition strategies on the microstructure, texture, and mechanical behaviour of Inconel-625 during directed energy deposition, Yoshit Tiwari, Manidipto Mukherjee, **Dipankar Chatterjee**, Manivannan R. (**Materials Characterization**, vol. 197, pp. 112711, **2023**).
7. Effect of rotation and cross thermal buoyancy on the nanofluidic transport around a circular cylinder, Sourav Garai, **Dipankar Chatterjee**, Bittagopal Mondal (**Physics of Fluids**, vol. 35, pp. 022011, **2023**).
8. Mixed Convective Transport around Counter Rotating Tandem Cylinders at Low Reynolds Number, Krishna Chaitanya NVV, **Dipankar Chatterjee** (**Heat Transfer Engineering**, vol. 44, pp. 479-501, **2023**).
9. A comparative evaluation of the microstructural characteristics of L-DED and W-DED processed 316L stainless steel, Tishta Das, Manidipto Mukherjee, **Dipankar Chatterjee**, Sudip K. Samanta, Aditya K. Lohar (**CIRP Journal of Manufacturing Science and Technology**, vol. 40, pp. 114-128, **2023**).
10. Effect of base fluids on the initiation of vortex shedding for nanofluid flow over a circular object, Sourav Garai, Bittagopal Mondal, **Dipankar Chatterjee** (**Journal of Fluids Engineering - Transactions of the ASME**, vol. 145, pp. 024501 (7 pages), **2023**).
11. Effect of cross thermal buoyancy on Cu-H<sub>2</sub>O nanofluid flow over bluff objects at low Reynolds numbers, Sourav Garai, Chandan Kumar, **Dipankar Chatterjee**, Bittagopal Mondal (**Journal of Nanofluids**, vol. 12, pp. 1017–1029, **2023**).
12. Effect of Porosity and Transverse Magnetic Field on the Wake Separation and Detachment around a Porous Square Cylinder, Chandan Kumar, **Dipankar Chatterjee**, Bittagopal Mondal (**Transport in Porous Media**, vol. 146, pp. 805-825, **2023**).
13. Mixed convective flow past counter-rotating side-by-side cylinders at low Reynolds number, Krishna Chaitanya NVV, **Dipankar Chatterjee** (**Numerical Heat Transfer Part A-Applications**, vol. 83, pp. 141-159, **2023**).

- **2022**

14. Effect of Transverse Magnetic Field on Wake dynamics around a Heated Porous Circular Cylinder, Chandan Kumar, **Dipankar Chatterjee**, Bittagopal Mondal (**Heat Transfer**, vol. 51, pp. 7929-7954, **2022**).
15. Controlling flow separation around tandem circular cylinders using transverse magnetic field, Krishna Chaitanya NVV, **Dipankar Chatterjee** (**Meccanica**, vol. 57, pp. 1913-1935, **2022**).
16. Effect of blockage on fluid flow past a square cylinder at low Reynolds numbers, Krishna Chaitanya NVV, **Dipankar Chatterjee** (**Sadhana**, vol. 47, pp. 4 (15 pages), **2022**).
17. Triggering vortex shedding for the free stream flow of nanofluids around bluff objects, Sourav Garai, **Dipankar Chatterjee**, Bittagopal Mondal (**Journal of Fluids Engineering - Transactions of the ASME**, vol. 144, pp. 034502 (7 pages), **2022** ).
18. Analysis of the Thermo-fluidic Transport around Counter-Rotating Tandem Circular Cylinders, **Dipankar Chatterjee**, Krishna Chaitanya NVV, Bittagopal Mondal

([Proceedings of the Institution of Mechanical Engineers, Part C: Journal of Mechanical Engineering Science](#), vol. 236, pp. 3418–3433, 2022).

- 2021

19. A multi-physics way to investigate some aspects of melt pool during laser substrate interaction in laser metal deposition process, Piyush Pant, **Dipankar Chatterjee**, ([Transactions of the Indian Institute of Metals](#), vol. 74, pp. 2843–2852, 2021).
20. Hydrodynamic Analysis of a Life Saver Device Against water, **Dipankar Chatterjee**, Sudip Kumar Samanta (BCREC Engineering Science Transaction, vol. 2, pp. 22-29, 2021).
21. Influence of counter rotation on fluid flow and heat transfer around tandem circular cylinders at low Reynolds number, Krishna Chaitanya NVV, **Dipankar Chatterjee** ([Journal of the Brazilian Society of Mechanical Sciences and Engineering](#), vol. 43, pp. 357:1-16, 2021).
22. The role of cross thermal buoyancy in initiating vortex shedding behind a permeable square cylinder at low Reynolds numbers, Chandan Kumar, **Dipankar Chatterjee**, Bittagopal Mondal ([Journal of Porous Media](#), vol. 24, pp. 65-84, 2021).
23. On the disappearance of the steady wake region behind porous objects under free stream flow at low Reynolds numbers, **Dipankar Chatterjee**, Chandan Kumar ([Journal of Fluids Engineering - Transactions of the ASME](#), vol. 143, pp. 114501(6 pages), 2021).
24. Experimental and Numerical Analysis of the Powder Flow in a Multi-Channel Coaxial Nozzle of a Direct Metal Deposition System, Piyush Pant, **Dipankar Chatterjee**, Titas Nandi, Sudip Samanta, A.K. Lohar ([Journal of Manufacturing Science and Engineering Trans ASME](#), vol. 143, pp. 071003 (9 pages), 2021).
25. Estimation of critical rotation rates for suppression of steady separation bubble behind a circular cylinder, **Dipankar Chatterjee**, Saurav Garai ([Sadhana](#), vol. 46, pp. 1-7, 2021).

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26. Prediction of clad characteristics using ANN and combined PSO-ANN algorithms in laser metal deposition process, Piyush Pant, **Dipankar Chatterjee**, ([Surfaces and Interfaces](#), vol 21, pp. 100699, 2020).
27. On the effectiveness of a "Tractor mounted road sanitizing unit" designed to combat COVID-19 spread, **Dipankar Chatterjee**, Samik Dutta, Bittagopal Mondal, Harish Hirani ([Journal of The Institution of Engineers \(India\): Series C](#), vol. 101, pp. 1093-1098, 2020).

28. A comparative study on the evolution of compressible vortex ring generated from a short driver section shock tube, Santanu Dey, T. Murugan, **Dipankar Chatterjee** (**Fluid Dynamics Research**, vol. 52, pp. 055504, **2020**).
  29. Blast wave interaction with generic objects and the measurement of blast wave reattachment distances, Santanu Dey, Murugan Thangadurai, **Dipankar Chatterjee** (**Journal of The Institution of Engineers (India): Series C**, vol. 101, pp. 747-760, **2020**).
  30. Convective transport around two rotating tandem circular cylinders at low Reynolds numbers, **Dipankar Chatterjee**, Krishna Chaitanya (**Sadhana**, vol. 45, pp. 107-1-14, **2020**).
  31. A bottom-up approach to experimentally investigate the deposition of austenitic stainless steel in laser direct metal deposition system, Piyush Pant, **Dipankar Chatterjee**, Sudip Samanta, A.K. Lohar (**Journal of the Brazilian Society of Mechanical Sciences and Engineering**, vol. 42, pp. 88 (1-10), **2020**).
- **2019**
    32. Statistical modelling and optimization of clad characteristics in laser metal deposition of austenitic stainless steel, Piyush Pant, **Dipankar Chatterjee**, Titas Nandi, Sudip Samanta, A.K. Lohar, Anirban Changdar (**Journal of the Brazilian Society of Mechanical Sciences and Engineering**, vol. 41, pp. 283(1-10), **2019**).
    33. Aerodynamic influence of added surfaces on the performance characteristics of a sports car, Murugan Thangadurai, Rajesh Kumar, Subhas Chandra Rana, **Dipankar Chatterjee** (**Journal of The Institution of Engineers (India): Series C**, vol. 100(3), pp. 411-421, **2019**).
    34. Mixed convective transport around staggered rows of square cylinders, **Dipankar Chatterjee**, Bittagopal Mondal (**Journal of Advanced Thermal Science Research**, vol. 6, pp. 10-18, **2019**).
    35. Assessment of mixture and Eulerian multiphase models in predicting the thermo-fluidic transport characteristics for fly ash-water slurry flow in straight horizontal pipeline, Bibhuti Bhusan Nayak, **Dipankar Chatterjee** (**Heat Transfer Engineering**, vol. 40, pp. 679-692, **2019** ).
  - **2018**
    36. Thermal performance of solar air heater having absorber roughened by chamfered-square elements, Man Singh Azad, **Dipankar Chatterjee**, Apurba Layek, Dilip Kumar Biswas (**American Journal of Renewable and Sustainable Energy**, vol. 4(2), pp. 24-32, **2018**).

37. Numerical Simulation of Gas-Bubble Formation through Two Adjacent Submerged Orifices, Vijay Kumar Prasad, **Dipankar Chatterjee**, Satya Prakash Singh (**Sadhana**, vol. 43(11), pp. 171 (1-15), **2018**).
  38. Numerical visualization of blast wave interacting with objects, Santanu Dey, Murugan Thangadurai, **Dipankar Chatterjee** (**Journal of Applied Fluid Mechanics**, vol. 11(5), pp. 1201-1206, **2018**).
  39. Steady mixed convection in power-law fluids from a heated triangular cylinder, Satish Kumar Gupta, Sudipta Ray, **Dipankar Chatterjee** (**Heat Transfer Engineering**, vol. 39(11), pp. 957-976, **2018**).
  40. Numerical Investigation of Transient MHD Mixed Convection in a Ventilated Cavity Containing Two Heated Circular Cylinders, **Dipankar Chatterjee**, Ramgopal Mishra (**Heat Transfer Engineering**, vol. 39(12), pp. 1052-1066, **2018**).
- **2017**
    41. Convective heat transfer in slurry flow in a horizontal Y-shaped branch pipe, Bibhuti Bhusan Nayak, **Dipankar Chatterjee** (**Powder Technology**, vol. 318, pp. 46-61, **2017**).
    42. Computational modeling of gas-bubble formation through a single submerged orifice, Vijay Kumar Prasad, Satya Prakash Singh, **Dipankar Chatterjee** (**International Journal of Fluid Mechanics Research**, vol. 44(6), pp. 533-551, **2017**).
    43. A comparison of numerical strategies for modeling the transport phenomena in high energy laser surface alloying process, **Dipankar Chatterjee** (**Frontiers in Mechanical Engineering: Thermal and Mass Transport**, vol. 3, pp. 1-7, **2017**).
    44. Rotation induced flow suppression around two tandem circular cylinders at low Reynolds number, **Dipankar Chatterjee**, Krishan Gupta, Virendra Kumar, Sachin Abraham Varghese (**Fluid Dynamics Research**, vol. 49(4), pp. 045503-1-17, **2017**).
    45. MHD Natural Convection in a Square Enclosure with Four Circular Cylinders Positioned at Different Rectangular Locations, **Dipankar Chatterjee**, Satis Kumar Gupta (**Heat Transfer Engineering**, vol. 38(17), pp. 1449-1465, **2017**).
    46. Numerical investigation of convective heat transfer in pipeline flow of multi-sized mono dispersed fly ash-water slurry, Bibhuti Bhusan Nayak, **Dipankar Chatterjee** (**International Journal of Heat and Mass Transfer**, vol. 108, pp. 1802-1818, **2017**).
    47. Numerical prediction of flow and heat transfer characteristics of water-fly ash slurry in an 180° return pipe bend, Bibhuti Bhusan Nayak, **Dipankar Chatterjee**, Amar Nath Mullick (**International Journal of Thermal Sciences**, vol. 113, pp. 100-115, **2017**).
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48. Unsteady CFD simulation of 3D AUV hull at different angles of attack, Sudipta Ray, **Dipankar Chatterjee**, Sambhunath Nandy (**Journal of Naval Architecture and Marine Engineering**, vol. 13, pp. 111-123, **2016**).
49. Numerical simulation of convective transport of fly ash-water slurry in horizontal pipe bends, Bibhuti Bhusan Nayak, **Dipankar Chatterjee**, Amar Nath Mullick (**Multiphase Science and Technology**, vol. 27(2-4), pp. 159-186, **2016**).
50. Thermo-magneto-convective transport around a square cylinder in a square duct under strong axial magnetic field, **Dipankar Chatterjee**, Satish Kumar Gupta (**Journal of Applied Fluid Mechanics**, vol. 9(7), 2167-2175, **2016**).
51. Numerical Investigation of the Water Droplet Transport in a PEM Fuel Cell with Serpentine Flow Channel, Bittagopal Mondal, **Dipankar Chatterjee** (**Journal of Applied Fluid Mechanics**, vol. 9(3), pp. 1057-1071, **2016**).
52. Effect of Prandtl number and rotation on vortex shedding behind a circular cylinder subjected to cross buoyancy at subcritical Reynolds number, **Dipankar Chatterjee**, Chiranjit Sinha (**International Communications in Heat and Mass Transfer**, vol. 70, pp. 1-8, **2016**).
53. Influence of aiding buoyancy on the suppression of flow separation for power-law fluids around a circular object, Satish Kumar Gupta, Sudipta Ray, **Dipankar Chatterjee** (**Heat Transfer Engineering**, vol. 37 (15), pp. 1267-1279, **2016**).
54. Magnetoconvective Transport in a Lid-Driven Square Enclosure with Two Rotating Circular Cylinders, **Dipankar Chatterjee**, Pabitra Halder (**Heat Transfer Engineering**, vol. 37(2), pp. 198-209, **2016**).
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55. Numerical analysis of convective transport of fly ash-water slurry through a horizontal pipe, Bibhuti Bhusan Nayak, Satish Kumar Gupta, **Dipankar Chatterjee**, Amar Nath Mullick (**Journal of Computational Multiphase Flows**, vol. 7(2), pp. 79-96, **2015**).
56. Convective transport around rows of square cylinders arranged in a staggered fashion at moderate Reynolds number, **Dipankar Chatterjee**, Satish Kumar Gupta (**Numerical Heat Transfer Part A-Applications**, vol. 68 (4), pp. 388-410, **2015**).
57. Magneto-convective transport of nanofluid in a vertical lid-driven cavity including a heat conducting rotating circular cylinder, Suraj Bansal, **Dipankar Chatterjee** (**Numerical Heat Transfer Part A-Applications**, vol. 68(4), pp. 411-431, **2015**).
58. MHD flow and heat transfer behind a square cylinder in a duct under strong axial magnetic field, **Dipankar Chatterjee**, Satish Kumar Gupta (**International Journal of Heat and Mass Transfer**, vol. 88, pp. 1-13, **2015**).

59. Convective transport around a rotating square cylinder at moderate Reynolds numbers, **Dipankar Chatterjee**, Satish Kumar Gupta (**Numerical Heat Transfer Part A-Applications**, vol. 67 (12), pp. 1386-1407, **2015**).
  60. Forced convection heat transfer in power-law fluids around a semicircular cylinder at incidence, Satish Kumar Gupta, Sudipta Ray, **Dipankar Chatterjee** (**Numerical Heat Transfer Part A-Applications**, vol. 67, pp. 952-971, **2015**).
  61. Investigation of Mixed Convection in a ventilated cavity in the presence of a heat conducting circular cylinder, Satish Kumar Gupta, **Dipankar Chatterjee**, Bittagopal Mondal (**Numerical Heat Transfer Part A-Applications**, vol. 67 (1), pp. 52-74, **2015**).
  62. Influence of an adiabatic square cylinder on hydrodynamic and thermal characteristics in a two-dimensional backward-facing step channel, **Dipankar Chatterjee**, Amrita Sengupta, Nandini Debnath, Sudipta De (**Heat Transfer Research**, vol. 46(1), pp. 63-89, **2015**).
  63. Mixed convection heat transfer from an equilateral triangular cylinder at low Reynolds numbers, **Dipankar Chatterjee**, Bittagopal Mondal (**Heat Transfer Engineering**, vol. 36(1), 123-133, **2015**).
  64. Effect of thermal buoyancy on fluid flow and heat transfer across a semicircular cylinder in cross flow at low Reynolds numbers, **Dipankar Chatterjee**, Bittagopal Mondal (**Numerical Heat Transfer Part A-Applications**, vol. 67(4), pp. 436-453, **2015**).
  65. Numerical study of the laminar flow past a rotating square cylinder at low spinning rates, **Dipankar Chatterjee**, Satish Kumar Gupta (**Journal of Fluids Engineering - Transactions of the ASME**, vol. 137(2), pp. 021204, **2015**).
  66. Dynamic behavior of flow around rows of square cylinders kept in staggered arrangement, **Dipankar Chatterjee**, Gautam Biswas (**Journal of Wind Engineering and Industrial Aerodynamics**, vol. 136, pp. 1-11, **2015**).
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    67. Hydromagnetic Mixed Convective Transport in a Non-isothermally Heated Lid-Driven Square Enclosure including a Heat Conducting Circular Cylinder, **Dipankar Chatterjee**, Satish Kumar Gupta (**Industrial and Engineering Chemistry Research**, vol. 53(51), pp. 19775–19787, **2014**).
    68. Cold flow simulation in underground coal gasification (UCG) cavities, **Dipankar Chatterjee**, Satish Kumar Gupta, Chebolu Aravind, Rakesh Roshan (**Journal of Advanced Thermal Science Research**, vol. 1(1), pp. 15-24, **2014**).

69. Influence of thermal buoyancy on boundary layer separation over a triangular surface, **Dipankar Chatterjee**, Sudipta Ray ([International Journal of Heat and Mass Transfer](#), vol. 79, pp. 769-782, 2014).
70. Wall confined flow and heat transfer around a square cylinder at low Reynolds and Hartmann numbers, **Dipankar Chatterjee**, Kanchan Chatterjee, Bittagopal Mondal, Nirmal Baran Hui ([Heat Transfer-Asian Research](#), vol. 43, pp. 459-475, 2014).
71. Transient mixed convection heat transfer around three isothermal square cylinders in cross-flow at low Reynolds numbers, **Dipankar Chatterjee**, Shyama Prasad Das ([Journal of Energy, Heat and Mass Transfer](#), vol. 36, pp. 1-19, 2014).
72. Unconfined hydromagnetic flow and heat transfer around a circular cylinder at low Reynolds numbers, **Dipankar Chatterjee**, Kanchan Chatterjee, Bittagopal Mondal, Nirmal Baran Hui ([CFD Letters, Archived](#), 2014).
73. MHD mixed convection in a lid-driven cavity including heat conducting circular solid object and corner heaters with Joule heating, Sudipta Ray, **Dipankar Chatterjee** ([International Communications in Heat and Mass Transfer](#), vol. 57, 200-207, 2014).
74. Dual role of thermal buoyancy in controlling boundary layer separation around bluff obstacles, **Dipankar Chatterjee** ([International Communications in Heat and Mass Transfer](#), vol. 56, 152-158, 2014).
75. Mixed convective transport in a lid-driven cavity containing a nanofluid and a rotating circular cylinder at the center, **Dipankar Chatterjee**, Satish Kumar Gupta, Bittagopal Mondal ([International Communications in Heat and Mass Transfer](#), vol. 56, 71-78, 2014).
76. Computational investigation of transport processes during high energy materials processing application using a hybrid lattice Boltzmann model, **Dipankar Chatterjee** ([International Journal of Thermofluid Science and Technology](#), vol. 1 No. 2 pp. 52-65, 2014).
77. Impact of transverse shear on vortex induced vibrations of a circular cylinder at low Reynolds numbers, Satya Prakash Singh, **Dipankar Chatterjee** ([Computers and Fluids](#), vol. 93, pp. 61-73, 2014).
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81. Hydromagnetic Mixed Convective Transport in a Vertical Lid-Driven Cavity including a Heat Conducting Rotating Circular Cylinder, **Dipankar Chatterjee**, Bittagopal Mondal, Pabitra Halder ([Numerical Heat Transfer Part A-Applications](#), vol. 65(1), pp. 48-65, **2014**).
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83. Magneto hydrodynamic flow and heat transfer around a circular cylinder in an unconfined medium, Satish Kumar Gupta, **Dipankar Chatterjee**, Bittagopal Mondal ([International Journal of Advancements in Mechanical and Aeronautical Engineering](#), vol. 1(1), pp. 102-106, **2014**).
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87. Unconfined flow and heat transfer around a square cylinder at low Reynolds and Hartmann numbers, **Dipankar Chatterjee**, Kanchan Chatterjee ([International Journal of Fluid Mechanics Research](#), vol. 40, pp. 71-90, **2013**).
88. Unsteady mixed convection heat transfer from tandem square cylinders in cross flow at low Reynolds numbers, **Dipankar Chatterjee**, Bittagopal Mondal ([Heat and Mass Transfer](#), vol. 49, pp. 907-920, **2013**).
89. MHD Mixed Convection in a Lid-Driven Cavity including a Heated Source, **Dipankar Chatterjee** ([Numerical Heat Transfer Part A-Applications](#), vol. 64, pp. 235-254, **2013**).

90. Mixed convection heat transfer past in-line square cylinders in a vertical duct, **Dipankar Chatterjee**, Md. Raja (**Thermal Science**, vol. 17, pp. 567-580, **2013**).
  91. Unsteady forced convection heat transfer over semicircular cylinder at low Reynolds numbers, **Dipankar Chatterjee**, Bittagopal Mondal, Pabitra Halder (**Numerical Heat Transfer Part A-Applications**, vol. 63, pp. 411-429, **2013**).
  92. Wall bounded flow and heat transfer around a circular cylinder at low Reynolds and Hartmann numbers, **Dipankar Chatterjee**, Kanchan Chatterjee (**Heat Transfer - Asian Research**, vol. 42, pp. 133-150, **2013**).
  93. Mixed convection heat transfer from tandem square cylinders for various gap to size ratios, **Dipankar Chatterjee**, Bittagopal Mondal (**Numerical Heat Transfer Part A-Applications**, vol. 63, pp. 101-119, **2013**).
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    95. Forced Convection heat transfer from an equilateral triangular cylinder at low Reynolds numbers, **Dipankar Chatterjee**, Bittagopal Mondal (**Heat and Mass Transfer**, vol. 48, pp. 1575-1587, **2012**).
    96. A lattice Boltzmann model for high energy materials processing application, **Dipankar Chatterjee** (**International Journal for Multiscale Computational Engineering**, vol. 10(3), pp. 229-247, **2012**).
    97. Lattice Boltzmann simulation of heat conduction problems in non-isothermally heated enclosures, Bittagopal Mondal, **Dipankar Chatterjee** (**Heat Transfer-Asian Research**, vol. 41(2), pp. 127-144, **2012**).
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    99. Mixed convection heat transfer from an in-line row of square cylinders in cross-flow at low Reynolds number, **Dipankar Chatterjee**, Gautam Biswas, Sakir Amiroudine (**Numerical Heat Transfer Part A-Applications**, vol. 61, pp. 891-911, **2012**).
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  108. Numerical investigation of mixed convection heat transfer past five in-line square cylinders, Md. Raja, **Dipankar Chatterjee** (**International Journal of Advances in Thermal Sciences and Engineering**, vol. 2, pp. 35-39, **2011**).
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113. Effect of aiding/opposing buoyancy on two-dimensional laminar flow and heat transfer across a circular cylinder, Gurunath Gandikota, Sakir Amiroudine, **Dipankar Chatterjee**, Gautam Biswas (**Numerical Heat Transfer Part A-Applications**, vol. 58: 5, pp. 385-402, **2010**).
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115. Numerical simulation of flow past row of square cylinders for various separation ratios, **Dipankar Chatterjee**, Gautam Biswas, Sakir Amiroudine (**Computers and Fluids**, vol. 39, pp. 49-59, **2010**).
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#### **IPR DETAILS:**

##### **PATENTS:**

1. Hydraulic power driven tractor front mounted Mentha reaper, Bittagopal Mondal, Ajay Yadav, Ramesh K Srivastava, Avik Chatterjee, **Dipankar Chatterjee**, Filed in India, File No. 202211019405, Date of Filing: 30.03.2022.
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2. Engineering Drawings of 1kW Subsea Thruster, Chandan Har, Srinivasa Reddy N, Sumit Kumar, Srinivasan A, **Dipankar Chatterjee**, Ref. 019CR2022, Date of Filing: 25.05.2022.

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4. An integrated approach towards design and development of a community level household Effluent Treatment (ET) plant for agricultural purposes, Priyabrata Banerjee, Harish Hirani, Udayan Mondal, Arabinda Sarkar, **Dipankar Chatterjee**, Ref. 011CR2021, Date of Filing: 07.10.2021.

### **TECHNOLOGY/PRODUCT/PROCESS/SOFTWARE/DESIGN DEVELOPMENT:**

1. **Community level household Effluent Treatment (ET) plant for agricultural purposes:** The present invention is an inexpensive and eco-friendly solution towards the sewage water treatment and this ultimately leads to the decrease of grey water burden along with conservation of fresh water. A complete operational plant has been developed and is currently under operation.
2. **Hydraulic power driven tractor front mounted Mentha reaper:** The apparatus so developed is extremely useful for cutting medicinal plants such as Mentha. The system is demonstrated and operational.
3. **Autonomous Underwater Vehicle (AUV) for operation at a sea depth of 500m:** The indigenously developed AUV was demonstrated successfully at a sea depth of 300m.
4. **A straw management system for fitting as a combine harvester sub-system:** This development is useful for farmers to adopt conservation agriculture practice of no-till seeding of wheat.
5. **Subsea thruster:** A 1kW sub sea thruster is developed having five blades and incorporated with Kort nozzle, which helps in achieving high performance propulsion system for under water applications. The thruster could achieve very high torque and thrust force which is unique in its class.
6. **A lab scale pilot plant to demonstrate underground coal gasification (UCG) process:** The pilot plant is developed at CSIR-CIMFR under the mega project "CoalGasUrja". A 3-D numerical simulator which is capable of addressing the entire underlying physical processes of UCG including gasification, combustion and cavity growth is also developed.
7. **A software to predict the external aerodynamics of the mortar system:** The robust software can predict the range, elevation, drift and several other related parameters for a guided projectile (mortar).
8. **Smart glasses to detect sleep and drowsiness while driving:** A prototype is developed that alerts the driver when sleeping. The developed prototype uses infrared sensors that send signals to the processing unit and activating the alert system while sleeping. Additionally, the system is also fitted with Bluetooth technology that sends an alert message to the Bluetooth terminal on the device when connected.

**MODEL/PROTOTYPE/PILOT PLANT/DEMONSTRATION UNITS CREATED FOR DISPLAY/DEPLOYMENT:**

1. Community level household Effluent Treatment (ET) plant
2. Tractor front mounted Mentha reaper
3. Autonomous Underwater Vehicle (AUV) (500 m depth of operation)
4. Straw management system for fitting as a combine harvester sub-system
5. 1 kW Subsea thruster with 1500 m depth rating
6. Lab scale pilot plant to demonstrate underground coal gasification (UCG) process
7. Smart Glasses for Sleep Detection

**DISSERTATIONS SUPERVISED:**

**PhD**

1. **Dr. Kanchan Chatterjee, "Hydromagnetic Flow and Heat Transfer around Bluff Obstacles at Low Reynolds Numbers"**, National Institute of Technology, Durgapur, October, 2013.
2. **Dr. Bibhuti Bhusan Nayak, "Numerical Study on the Thermo-Fluidic Transport of Fly Ash-Water Slurry in Horizontal Pipelines"**, National Institute of Technology, Durgapur, April, 2018.
3. **Dr. Santanu Dey, "Experimental and Numerical Studies on Shock Tube Flows and its Interaction with Objects"**, AcSIR, November, 2019.
4. **Dr. Krishna Chaitannya, "Influence of Rotation on the Hydrodynamic and Thermal Instabilities around a pair of Circular Cylinders Subjected to Cross Flow at Low Reynolds Numbers"**, AcSIR, July, 2023
5. **Dr. Chandan Kumar, "Thermo-Magneto-Convective transport around stationary/rotating porous bluff obstacles at low Reynolds numbers"**, AcSIR, Aug, 2023
6. **Saurav Garai**, Pursuing PhD @ AcSIR (Registered), Topic: "Thermo-Magneto-Convective transport of nano-fluids around stationary/rotating solid bluff objects at low Reynolds numbers".
7. **Om Prakash Pandit**, Pursuing PhD @ AcSIR (Registered), Topic: "Numerical Simulation of Two Dimensional Visco-Elastic Flow Past a Circular Cylinder at low Reynolds Number".

8. **Yoshit Tiwari**, Pursuing PhD @ AcSIR (Registered), Topic: "Effect of deposition path strategies on the metallurgical and mechanical properties of Ni-Based super-alloys manufactured by Wire Arc Additive Manufacturing".
9. **Sourabh Khambra**, Pursuing PhD @ AcSIR (Registered), Topic: "Study of the interior ballistic processes and external aerodynamics of a guided projectile system".
10. **Anuruddha Majumder**, Pursuing PhD @ AcSIR (Registered), Topic: "A Study on the Effect of Multi Wall CNT in Eutectic Or Near Eutectic Al-Si alloy solidification through Melting-Casting Route".
11. **Ruchika Dhayni**, Pursuing PhD @ AcSIR (Registered) Topic: "Development of A356-rGO Composite Using a Novel Modified Shearing Cooling Roll (SCR) Process".
12. **Debdip Chakraborty**, Pursuing PhD @ AcSIR (Registered), Topic: "Studies on Some Aspects of Semi-Solid Metal Processing through Shearing Cooling Roll Technique".
13. **Shilpi Pratim Dutta**, Pursuing PhD @ AcSIR (Registered, **Jan 2023**), Topic:
14. **Balaji Chandrakanth**, Pursuing PhD @ AcSIR (Registered), Topic:

### **M-TECH**

1. Debabrata Das, "**Designing a Simulation Model for Hydro-pneumatic Suspension System**", National Institute of Technology, Durgapur, **2013**.
2. Ramgopal Mishra, "**Numerical Investigation of Transient Mixed Convective Transport in a Square Enclosure Containing Heated Cylinders**", National Institute of Technology, Durgapur, **2016**.

### **TALKS DELIVERED:**

1. Towards modeling the interior ballistic processes of a guided projectile system, **Dipankar Chatterjee**, **Keynote Speaker & Invited talk in the 3rd Energy System Modeling and Optimization Conference, NIT Durgapur, December 5-7, 2022**.
2. Ballistics of a Guided Projectile, **Dipankar Chatterjee**, **Lecture on the occasion of Training and Workshop under SSR Scheme of SERB Sponsored Project organized by CSIR-CMERI, November 29, 2022**.
3. The art of Presentation of your Research Findings - Publication/IPR, **Dipankar Chatterjee**, Keynote Address in the DST-SERB sponsored Workshop named "KAARYASHALA", July, 26, **2022**, CSIR-CMERI, Durgapur.
4. The Role of Thermal Buoyancy, Rotation and Magnetic Field in Controlling Boundary Layer Separation around Bluff Objects, **Dipankar Chatterjee**, **Keynote Speaker & Invited talk for the Virtual International Conference on Technological Advancements in Mechanical Engineering (ICTAME 2022), AMET University, April 22-23, 2022**.

5. Lattice Boltzmann Modelling: An alternative to conventional CFD, **Dipankar Chatterjee**, **Presentation by Foreign Participants** in the **International Training Workshop on 'Use of Analytical & Modeling Tools Tailored to Country Needs'**, Organized by NAM S&T Centre and the Academy of Scientific Research and Technology(ASRT) of Egypt, **April 6-7, 2022** (Virtual Mode).
6. Thermo-hydrodynamics around bluff bodies: CFD simulation, **Dipankar Chatterjee**, **Webinar** Organized by Mechanical Engineering Department, Sanaka Educational Trust's Group of Institutions, Durgapur, **March 02, 2022** (Virtual Mode).
7. "Ethics in Scientific Publication", **Invited lecture** by **Dipankar Chatterjee** on 26/07/2021 at CSIR-CMERI (Virtual Mode).
8. Controlling Boundary Layer Separation: Suppression and Triggering of Vortex Shedding around Bluff Objects, **Dipankar Chatterjee**, **Keynote Address** in the **IEEE sponsored National Conference on Emerging Trends on Sustainable Technology and Engineering Applications (NCETSTEA 20)** at **B.C.Roy Engineering College, Durgapur, February 07-08, 2020**.
9. Control of Boundary Layer Separation around Bluff Obstacles, **Dipankar Chatterjee**, **Keynote Address** in **Energy System Modeling and Optimization Conference (ESMOC 2013)**, **December 9-11, 2013, NIT Durgapur, India**.
10. Mathematical Modeling and Numerical Simulation of High Power Laser Assisted Manufacturing Processes, **Dipankar Chatterjee**, **Expert Lecture** under the aegis of TEQUIP II project, **September 23, 2013, Indian School of Mines University, Dhanbad, India**.
11. Influence of thermal buoyancy on vortex shedding behind bluff obstacles, **Dipankar Chatterjee**, **January 16, 2013, IIT Kharagpur, India**.
12. (a) Bluff body hydrodynamics: CFD simulation (b)Lattice Boltzmann method: an alternative to conventional CFD, **D. Chatterjee**, **Invited Speaker** for the refresher course on **"Recent Advances and Trends in Applications of Computational Fluid Dynamics (CFD) in Engineering"**, **June 18-July 7, 2012, Jadavpur University, Kolkata, India**.
13. Research Methodology: A Journey into Science, Engineering & Technology, **Dipankar Chatterjee**, **Keynote Address** in the **Workshop on "Research Competency"**, **Bankura Unnayani Institute of Engineering (BUIE)**, **September 22, 2012, Bankura, India**.
14. Application of CFD for bluff body flow simulation, **Dipankar Chatterjee**, **Keynote Address** in the **Workshop on "Computational Fluid Dynamics and its Application"**, **Birbhum Institute of Engineering & Technology (BIET)**, **November 4, 2012, Suri, Birbhum, India**.
15. Lattice Boltzmann Method: Towards an advanced modeling strategy for high energy material processing applications, **D. Chatterjee**, **Symposium on Transport Phenomena and its Impact on Advanced Material Processing Technologies**, **December 8-9, 2009, CMERI, Durgapur, India**.



## **JOURNAL EDITORSHIP**

- ✓ **Associate Editor** of "**Frontiers in Mechanical Engineering (Thermal and Mass Transport)**", 2015.
- ✓ **Associate Editor** of "**Journal of Advances in Mechanical Engineering and Science**", 2015.
- ✓ **Editorial Board Member** of "**Journal of Advanced Thermal Science Research**", 2014.
- ✓ **Editorial Board Member** of "**International Journal of Thermofluid Science and Technology**", 2013.

## **AWARDS & HONOURS:**

- Featured in the **World Ranking of top 2% Scientist** with the subject (Mechanical Engineering) by the Stanford University, **2019-20, 2020-21, 2021-22, 2022-23 (Consecutively for four successive years)**.
- **Aerospace Engineering Division Prize** by IEI 2021 for the paper entitled "Blast Wave Interaction with Generic Objects and the Measurement of Blast Wave Reattachment Distances" (published in the Series C Journal of IEI, Vol. 101, Issue 5).
- "Best Paper of the Session Award" for the paper entitled "Influence of Cross Thermal Buoyancy on Vortex Shedding around Side by Side Cylinders at Low Reynolds Numbers" presented in 48th National Conference on Fluid Mechanics and Fluid Power, December 27-29, 2021, BITS Pilani, Pilani, India.
- **Visiting Faculty** at National Institute of Technology Durgapur 2015.
- Recipient of the **Metallurgist for the year 2011-12** by Indian Institute of Metals Durgapur Chapter for the Contribution in "Computational Fluid Dynamics in Materials Processing Applications", 2012.
- Selected in the **Marquis Who's Who** in the World 2010.
- Recipient of the **Post Doctoral Fellowship** from Arts et Métiers Paris Tech, France-2008.
- Recipient of the **GATE** (Graduate Aptitude Test in Engineering) Fellowship-1996.
- Recipient of the **National Merit Scholarship**, 1989.
- Recipient of the **Merit Certificate of All India Science Talent Search Examination (AISTSE)**-1986.

## **SPONSORED PROJECTS:**

Sl. No.	Title of the Project	Budget	Duration	Funding Agency	Current Status
1.	Two-layer electroosmotic flows in microchannels under time periodic electrical fields [Project No. <b>OLP160612</b> ]  <b>Role: Principal Investigator</b>	36.56 Lacs	3 years	CSIR-CMERI	<b>Successfully Completed</b>  Start date: 15/06/2010 End date: 14/06/2013
2.	Computational modelling of transport phenomena in high energy materials processing application: large eddy simulation and parallelization [Project No. <b>GAP097412</b> ]  <b>Role: Principal Investigator</b>	19.709 Lacs	3 years	DST	<b>Successfully Completed,</b>  Start date: 19/09/2011 End date: 31/03/2014
3.	Development of underground coal gasification technology in India(CoalGasUrja) (Mathematical Modelling and Simulation Studies of Underground Coal Gasification (UCG) Process) [Project No. <b>ESC0302</b> ]  <b>Role: Project Leader from CSIR-CMERI</b>	85.90 Lacs	5 Years	CSIR (Under 12th Five Year Plan)  Nodal Lab: CSIR-CIMFR	<b>Successfully Completed</b>  (Start Date: 01/04/2012, End Date: 31/03/2017)
4.	Study of the dynamics of gas-bubble in a flowing liquid environment [Project No. <b>OLP160712</b> ]  <b>Role: Co-Investigator</b>	34.20 Lacs	3 Years	CSIR-CMERI	<b>Successfully Completed</b>  Start date: 15/06/2010 End date: 14/06/2013
5.	Numerical study of water droplet mobility in serpentine gas flow channel of PEM fuel cell [Project No. <b>OLP161212</b> ]  <b>Role: Co-Investigator</b>	24.00 Lacs	3 Years	CSIR-CMERI	<b>Successfully Completed</b>  Start date: 01/04/ 2011 End date: 31/03/2014
6.	Computational modelling of fluid flow and heat transfer around fixed and/or moving objects [Project No. <b>OLP201112</b> ]  <b>Role: Co-Investigator</b>	28.95 Lacs	3 Years	CSIR-CMERI	<b>Successfully Completed</b>  Start date: 10/03/ 2011 End date: 09/03/2014

7.	Modelling Fish Locomotion in Turbulent Vortices [Sanction Letter No. <b>IIT/SRIC/ME/INV/2013-14</b> Under <b>ESC 0113</b>  <b>Role: Co-Investigator</b>	18.00 Lacs	3 years	CSIR- CMERI	<b>Successfully Completed</b>  (Start Date: 05/10/2013, End Date: 04/10/2016)
8.	Rheo Pressure Die casting of JIS ADC 12 Aluminium alloy [Project No. <b>SSP121712</b>  <b>Role: Co-Project Leader</b> from 03.02.2015	26.10 Lacs	15 Months	M/S Sona Koyo Steering Systems Ltd., Gurgaon	<b>Successfully Completed</b>  (Start Date: Nov. 2014, End Date: Sep 2016)
9.	Autonomous underwater robotics (UnWar) [Project No. <b>ESC0113</b>  <b>Role: Team Member</b>	4000.93 Lacs	5 Years	CSIR (Mega Project Under 12th Five Year Plan) Nodal Lab: CSIR-CMERI	<b>Successfully Completed</b>  (Start Date: 01/04/2012, End Date: 31.03.2017)
10.	Exploring depth of available Groundwater in 51 plots of different mouza under Jamuria, Kulti, Salanpur and Barabani [Project No. <b>TSP1058</b>  <b>Role: Co-Project Leader</b>	28.69 Lacs	1 Year	ADDA	<b>Successfully Completed</b> (Start Date: 01/07/2016, End Date: 01/07/2017)
11.	Conducting Step Drawdown Well Pumping Test, Aquifer Performance Test and check for quality of water in four plots at Bijoy Nagar Mouza under Jamuria P.S. [Project No. <b>TSP1074</b>  <b>Role: Co-Project Leader</b>	17.96 Lacs	6 Months	Housing Department Government of West Bengal	<b>Successfully Completed</b> (Start Date: 27/01/2017, End Date: 27/01/2018)
12.	Conduction of step draw down well pumping test, aquifer performance test and check for quality of water at two locations (Plot no. 2330) of Daskeyari Mouza under Barabani PS, Asansol  [Project No. <b>TSP1101</b>  <b>Role: Team member</b>	10.26 Lacs	1 Year	Housing Department Government of West Bengal	<b>Successfully Completed</b> (Start Date: 18/07/2017, End Date: 18/07/2018)

13.	Design of hydraulic components of smart vertical submersible pump [Project No. <b>GAP215112</b> ]  <b>Role: Co-Project Leader</b>	22.50 Lacs	2 Years	DHI	<b>Successfully Completed</b>  Start Date: 06/02/2017  End Date: 30/04/2019
14.	Static & Modal Analysis and Validation of FEA Report of Impeller  [Project No. <b>TSP1168</b> ]  <b>Role: Project Leader</b>	1.51 Lacs	3 Weeks	MaxFlow Fans Manufacturing Pvt. Ltd.	<b>Successfully Completed</b>  Start Date: 07/02/2019  End Date: 01/03/2019
15.	Twinning on Capacity Building to Transform Metal Industry Development Institute (MIDI), Ethiopia-CSIR-CMERI  [Project No. <b>SSP223812</b> ]  <b>Role: Project Leader &amp; Lab Coordinator</b>	610 Lacs	3 Years	MIDI, Addis Ababa, Ethiopia	<b>Ongoing</b>  Start Date: 01/04/2018  End Date: To be revised
16.	Centre For Precision & Conservation Farming Machinery [Design and development of straw management system for combine harvester to evenly spread loose residues] [Project No. <b>GAP026712</b> ] <b>Role: Co-Project Leader</b> from 09.05.2019	1258.45 lakh	10 years	DST, GOI	<b>Successfully Completed</b>  Start Date: 08/01/2009  End Date: 31/03/2021
17.	Design and Development of a 1 kW Subsea Thruster with 1500 m Depth Rating [Project No. <b>OLP231012</b> ] <b>Role: Team Member (Leader, CFD)</b>	45.0 Lakh	1 Year	CSIR-CMERI	<b>Successfully Completed</b>  Start Date: 23.06.2020  End Date: 31.12.2021
18.	Design, Drawing and Model Analysis of 60 mm mortar [Project No. <b>SSP233112</b> ] <b>Role: Team Member (Leader, CFD)</b>	60.77 Lakh	18 Months	GSF, Cossipore	<b>Successfully Completed</b>  Start Date: 28.10.2020  End Date: 27.04.2022

19.	Analysis of the interior ballistic processes and external aerodynamics of a guided projectile system [Project No. <b>GAP235312</b> ] <b>Role: Principal Investigator</b>	26.80 Lakh	3 Years	SERB, DST	<b>Ongoing</b>  Start Date: 25.03.2021  End Date: 24.09.2024
20.	Design and Analysis of Long range version of 81 mm Advanced Mortar System [Project No. <b>SSP235612</b> ] <b>Role: Leader, CFD</b>	44.84 Lakh	2 Years	GSF, Cossipore	<b>Successfully Completed</b>  Start Date: 04.05.2021  End Date: 03.05.2023
21.	Analysis of the hot blast system after integration of 4th stove with the existing hot blast main pipeline for BF4 at Durgapur Steel Plant (SAIL) [Project No. <b>TSP1416</b> ] <b>Role: Principal Investigator</b>	12.5 Lakh	2 Months	CET, Ranchi	<b>Successfully Completed</b>  Start Date: 16/06/2022  End Date: 15/08/2022
22.	Expert support and guidance for the user in designing the platform and associated sub-systems of an Extra-Large Unmanned Undersea Vehicle (XLUUV) intended for autonomously collecting ocean data with very high endurance of 30-45 days. [Project No. <b>CNP1004</b> ] <b>Role: Co-Project Leader</b>	62.5 Lakh	10 Months	Indian Navy	<b>Successfully Completed</b>  Start Date: 19/07/2022  End Date: 18/05/2023
23.	Design, development and demonstration of proof of concept on underwater homing and docking system [Project No. <b>GAP240412</b> ] <b>Role: Team Member</b>	399.60 Lakh	3 Years	MoES-NIOT, Chennai under Deep Ocean Mission (DOM)	<b>Ongoing</b>  Start Date: 06/02/2023 End Date: <b>05/02/2026</b>