Dr. Arvind Pattamatta

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Research Interests

Microscale energy transport, Phase change heat transfer (spray cooling, flow boiling, heat pipes, vapor chambers), Multiphase flows, Electronics and Battery thermal management, Computational Fluid Dynamics and Heat Transfer, Machine Learning for multiphase flows.

Multiscale Thermal Transport Research Laboratory (MT^2RL) website: https://www.mt2rl.in/

Education

Degree	Year	Institution	Department
Ph.D.	2009	State University of New York at Buffalo, NY, USA	Aerospace Engineering
M.Tech.	2003	Indian Institute of Science, Bangalore, India	Aerospace Engineering
B.E.	2001	University of Madras, Chennai, India	Aeronautical Engineering

Professional Experience

Secretary, Indian Society for Heat and Mass Transfer (ISHMT)	2022 – Present
Professor, Dept. of Mechanical Engineering, IIT Madras	2021 – Present
Treasurer, Indian Society for Heat and Mass Transfer (ISHMT)	2018 – 2021
Visiting Professor, SUNY Binghamton, NY	May – Jul 2018
JSPS Invitational Visiting Faculty, I^2CNER, Kyushu University	May – Jul 2017
Associate Professor, Dept. of Mechanical Engineering, IIT Madras	2015 – 2021
Humboldt Visiting Scientist / Postdoctoral Fellow, TTD, TU Darmstadt	2013 – 2014
Assistant Professor, Dept. of Mechanical Engineering, IIT Madras	2010 – 2015
Principal Scientist, Heat & Mass Transfer CoE, Thermax Ltd., Pune	2009 – 2010
Graduate Research Assistant, Dept. of Mech. & Aerospace Eng., SUNY Buffalo	2005 – 2009
Design Engineer, Advanced Combustion Engineering, GE Transportation, Bangalore	2003 – 2005

Honors and Awards

- Invitational Fellowship, **Alexander von Humboldt Stiftung** to conduct research at TTD, TU Darmstadt, May–July 2024.
- Invitational Fellowship, **Japan Society for Promotion of Science (JSPS)** to visit Kyushu University, May–July 2017.
- Visiting Professorship, **German Academic Exchange Service (DAAD)** to visit TU Darmstadt, June–August 2016.
- **Young Engineer Award (YEA)**, Indian National Academy of Engineering (INAE), 2015.
- **Humboldt Postdoctoral Fellowship**, Alexander von Humboldt Stiftung to conduct research at TTD, TU Darmstadt, 2013–2014.
- Visiting Professorship, **German Academic Exchange Service (DAAD)** to visit TU Darmstadt, June–August 2011.
- Certification on 'Teaching and Learning', organized by CCE, IIT Madras in collaboration with Texas A&M University, 2010.
- Certificate in High Performance Computing, SUNY Buffalo, 2009.
- Certification from Teaching Proficiency Workshop, SUNY Buffalo, 2008.
- Certification from Future Faculty Training Workshop, SUNY Buffalo, 2008.
- Six Sigma Green Belt, Certified from GE India, 2004.
- Received 'Project of the Month' Award, GE India, 2004.

Courses Taught

Undergraduate Courses

- Thermodynamics
- Heat Transfer
- Thermal Power Engineering
- Mechanical Engineering Lab

Graduate Courses

- Advanced Heat and Mass Transfer
- Convective Heat Transfer
  NPTEL Webcourse: http://nptel.ac.in/courses/112106170/
- Micro and Nanoscale Energy Transport
  NPTEL Webcourse: http://nptel.ac.in/courses/112106222/
- Thermal Engineering Lab

Invited Lectures

- Invited Keynote Speaker at the **13th Australasian Heat and Mass Transfer Conference**, Curtin University, 26–27 June 2025.
- Invited Keynote Speaker, International Workshop on 'Multiscale Multiphysics Systems', IIT Madras, January 6–7, 2025.
- Invited Keynote Speaker, Workshop on 'Multiphase Flows and Applications to Heat Transfer', IIT Madras, 23–24 February 2025.
- Invited Keynote Speaker, Workshop on Interfacial Engineering at Multiple Spatio-temporal Scales, IISc Bangalore, 29–31 January 2024.
- Invited Keynote Speaker, Two-Day Workshop on 'Thermal Management Techniques: Innovations and Insights', IIT Madras, 10–11 January 2024.
- Invited Keynote Speaker, **27th National and 5th International ISHMT-ASTFE Heat and Mass Transfer Conference**, IIT Patna, 14–17 December 2023.
- Invited Speaker, Short course on Measurement Techniques for Interfacial Phenomena, IIT Madras, 6–8 March 2023.
- Invited Speaker, One week Short term course (online, TEQIP-III) on Computational Fluid Dynamics For Solving Engineering Problems, MNIT Jaipur, 7–11 August 2020.
- Invited Speaker, Pre-conference workshop on "Nanofluids" during Indian Conference on Applied Mechanics (INCAM), IISc Bangalore, July 2, 2019.
- Invited Speaker, Short term course on 'Radiation Heat Transfer', JNTUK Kakinada, May 9–14, 2019.
- **Keynote Speaker**, National Conference on "Critical Heat Flux and Multiphase Flow", IIT(BHU) Varanasi, 22–23 December 2018.
- Invited Lecture, "Insights into the Thermo-hydrodynamics of a Unit cell Model of a Pulsating Heat Pipe (PHP) through Experiments and CFD", TEQIP Workshop, NITK Surathkal, September 6, 2018.
- Invited Speaker on "Thermocapillarity in Microfluidics", Short term course on 'Microfluidics based healthcare diagnostics and interfacial phenomena', IIT Madras, Nov 6–11, 2017.
- Invited Lecture, "Insights into the Thermo-hydrodynamics of a Unit cell Model of a PHP", 106th Institute Interest Seminar Series, I^2CNER, Kyushu University, June 8, 2017.
- Invited Lecture, "Numerical Investigation on the Thermo-Hydrodynamics of liquid-gas-solid interfaces: Selected Case Studies", IIT Ropar, May 5, 2017.
- Guest Lecture on "Heat Transfer Characteristics of nano particulate suspensions", School of Mechanical Engineering, VIT University, Vellore, February 1, 2017.
- Invited Lecture, Faculty Development Training Programme on "Thermal Engineering", University College of Engineering Villupuram, December 13, 2016.
- Invited Lecture, "Insights into the Thermo-hydrodynamics of a Unit cell Model of a PHP", Indo-French Workshop on Phase-Change Thermal Systems, Khajuraho, November 29 – December 1, 2016.
- Invited Lecture on "Modeling Tools for Simulation of heat transfer in Nanofluids and flow boiling

in micro-channels", Workshop on Micro Nano Fluidics and Engg., IIT Madras, September 3, 2016.

- Invited Talk, TEQIP-II Sponsored FDP on "Computational Fluid Dynamics", College of Engineering Adoor, January 11–15, 2016.
- Guest Lecture on "Lattice Boltzmann Methods for the Simulation of fluid and heat transport Phenomena", AICTE sponsored National conference, Sri Venkateswara College of Engineering, Sriperumbudur, 24–26 June 2015.
- Invited Talk on "Pulsating Heat Pipes: An Alternative Passive Reactor Containment Cooling System", Division of Arms Control, Disarmament and International Security (ACDIS), University of Illinois at Urbana-Champaign, April 15–17, 2013.
- Invited Lecture on "Heat Exchanger Design", organized for BHEL, IIT Madras, February 23, 2013.
- Invited Lecture on Micro/Nano scale heat transfer, Short Term Course on "Recent Advancements in Microfluidics", IIT Madras, January 17, 2013.
- "Lattice Boltzmann Methods", A Three day workshop at the Centre for Converging Technologies, University of Rajasthan, December 2011.
- "Modeling energy transport in nanostructures", CTFD Division, National Aerospace Lab, Bangalore, May 13, 2009.
- "Modeling thermal energy transport in nanostructures", IBM Semiconductor R&D Center, Vermont, December 23, 2008.
- "Nanoscale Heat Transfer in Thermoelectric Materials", Dept. of Mechanical and Aerospace Engineering, SUNY Buffalo, February 7, 2008.

Conferences & Workshops Organised

- Organized a GIAN course on "Multiphase Heat Transfer: from Fundamentals to Applications" with Prof. Marco Marengo, University of Pavia, Italy, January 2025.
- Organized a two-day Workshop on 'Multiphase Flows and Applications to Heat Transfer', IIT Madras, 6–7 January 2025.
- Co-organized a two-day Workshop on 'Thermal Management Techniques: Innovations and Insights' with Prof. Marco Marengo, University of Pavia, 10–11 January 2024.
- Co-chaired **Professor Arcot Ramachandran Centenary Symposium on Heat Transfer and Energy Systems** with Prof. C. Balaji, IIT Madras, 11 December 2023.
- Co-organized a short course on "Measurement Techniques for Interfacial Phenomena" with Prof. Cameron Tropea, TU Darmstadt, Germany, March 6–8, 2023.
- Organized a GIAN course on "Special Topics in Micro Scale Flow and Heat Transport" with Prof. Peter Stephan, TU Darmstadt, Germany, June 2023.
- **Organizing Secretary**, ISHMT-ASTFE Heat and Mass Transfer Conference (IHMTC-2021), IIT Madras.
- Co-organized a two-day workshop on "Nanoengineered interfaces for energy and health care", Dept. of Mechanical Engineering, IIT Madras, 16–17 March 2020.
- Co-organized a three-day workshop on "Next Generation Electronic Systems: Heterogeneous Integration, Thermal and Power Management, Related Machine Learning", co-hosted by Binghamton

University, IIT Madras and IIT Ropar, October 6–8, 2020.

- Resource Person for the One day workshop on "Research Proposal Writing" conducted by the German Academic Exchange Service (DAAD), August 2019, Colombo, Sri Lanka.
- Coordinated the pre-conference workshop on "Fluid flow and heat transfer at Micro/Nanoscales" organized during the Indian Conference on Applied Mechanics (INCAM), IISc Bangalore, July 2, 2019.
- Co-organized a joint workshop between IIT Madras and SUNY Binghamton titled 'Energy Optimization in Data Centers', February 5, 2019.
- Served as a member of Organizing Committee for "Fourth Engineers Conclave-2016 (EC-2016)" held jointly with IIT Madras and INAE, September 1–3, 2016.
- Organized an Indo-German workshop titled "Modeling and Measurement Techniques for Micro-Scale Flows" at IIT Madras, February 23–25, 2015.

Academic and Administrative Responsibilities

- Co-ordinator of the **ISRO-IITM S Ramakrishnan Centre of Excellence for Research in Fluid and Thermal Sciences** since 2025.
- Served as chairman of the undergraduate Mechanical Engineering Department course committee for the academic year 2020–2021.
- Guest Editor for a special issue of Indian Conference on Applied Mechanics (INCAM-2019) Conference on fluid mechanics in the *International Journal of Advances in Engineering Sciences and Applied Mathematics*.
- Organized Massive Open Online Course (MOOC) on Micro and Nanoscale Energy Transport on NPTEL platform in 2017.
- Member of the technical committee for Asian Symposium on Computational Heat Transfer (ASCHT-2017). Also served as Guest Editor for a special issue on computational heat transfer and fluid dynamics in the *Int. J. Advances in Engineering Sciences and Applied Mathematics*.
- Guest Editor for a special issue of ISHMT-ASTFE Heat and Mass Transfer Conference-2017 in the *Journal of Enhanced Heat Transfer*.
- Head of the **Heat Transfer and Thermal Power Laboratory**, IIT Madras, 2016–2019.
- Served in the Doctoral and Master's Research Committees for several PhD and M.S. students at IIT Madras.
- External examiner for evaluating PhD thesis at various universities across India.
- Committee member for evaluating Master's and Bachelor's students final year projects in the Department of Mechanical Engineering.
- Served in the Mechanical Engineering Department Examination Invigilation Committee.

Research Collaborators

- Prof. Peter Stephan, TU Darmstadt, Germany
- Dr. Axel Sielaff, TU Darmstadt, Germany
- Prof. Martin Geier, TU Braunschweig, Germany
- Prof. Cameron Tropea, TU Darmstadt, Germany
- Dr. Harish Sivasankaran, University of Tokyo
- Prof. Chandraveer Singh, University of Toronto
- Prof. Bahgat Sammakia, SUNY Binghamton, NY
- Prof. Yasuyuki Takata, Kyushu University, Japan
- Prof. Ramesh Narayanaswamy, Curtin University, Australia
- Prof. Marco Marengo, University of Pavia, Italy
- Prof. Manish Tiwari, University College London, UK
- Dr. Daniel Orejon, University of Edinburgh, Scotland
- Dr. Alexandros Askounis, University of East Anglia, UK
- Prof. Sarit K. Das, IIT Madras
- Prof. C. Balaji, IIT Madras
- Dr. Pallab Sinha Mahapatra, IIT Madras

Research Guidance

Postdoctoral Fellows

1. Dr. Satyanand Abraham (2017–2020).
2. Dr. Laxman Malla (2021–2023).
3. Dr. Gopal Chandra Pal (2025–Present) – Vapor chamber design for electronics cooling.

Ph.D. Completed

S.No.	Name	Title of Thesis	Year
1	Savithiri	Investigation into the role of slip mechanism during convective heat transfer in nanofluids using lattice Boltzmann method	2014
2	Purbarun Dhar	Augmented thermophysical and electro magnetic transport properties of graphene nanosuspensions	2015
3	Chinige Sampath Kumar	Experimental and numerical investigations on convective heat transfer enhancement of impinging jets in conjunction with porous media	2018
4	Sangamesh Godi	Experimental and numerical investigations on fluid flow and heat transfer characteristics of turbulent wall jets	2019
5	Ganesh Guggilla	Coalescence and evaporation dynamics of multiple droplet impingement over a heated surface	2020

S.No.	Name	Title of Thesis	Year
6	Akash A.R.	Evaluation of the thermohydraulic performance of nanofluid coolants for application in automotive radiator	2021
7	K Srinivasa Sagar	Thermocapillary migration dynamics of droplets in different configurations: fluid column, capillary tube and on a solid surface	2021
8	Tejaswi Josyula	Investigation into the contact line dynamics, thermal patterns, and internal flow in evaporating sessile water drops	2021
9	Ritesh Gaur	Thermal management of turbine vane trailing edge using innovative surface roughness element	2023
10	R Ananda Prasanna	Experimental and numerical investigations on the three dimensional slot film cooling of an annular combustor	2023
11	Praveen Dhanalakota	Thermal Performance Investigation of Enhanced Flat Thermosyphon Heat Sinks	2024

M.S. Completed

S.No.	Name	Title of Thesis	Year
1	Manoj Siva	Investigation of flow and temperature maldistribution in parallel microchannel systems	2013
2	Deepchand Negi	Investigation of heat transfer augmentation over dimpled surfaces using impinging jet flows with application to electronics cooling	2014
3	Ankur Chattopadhyay	Numerical investigation of energy transport in nanostructures using Lattice Boltzmann Method	2014
4	Sivasai Vadri	Numerical heat transfer characteristics of Al_2O_3–water nanofluid through porous media in free and forced convection regimes	2015
5	Pranit Joshi	Experimental and numerical investigation on buoyancy induced convective heat transfer for various types of nanosuspensions	2017
6	Anand Takawale	Experimental investigation on flow regimes and thermal performance of flat plate and capillary tube pulsating heat pipes	2018
7	Desh Deepak Dixit	Influence of external magnetic field on natural convection heat transfer in nanoparticle suspensions	2019

S.No.	Name	Title of Thesis	Year
8	Ujas Patel	Droplet evaporation and combustion: Effect of air turbulence, fuel composition and nanoparticle addition	2019
9	Adapa Buchi Raju	An improvised hybrid slot-effusion configuration for cooling enhancement in an annular combustor liner	2022
10	Gokul Radhakrishnan	Study of Distributed Machine Learning Methods for Two-phase Flows	2024
11	Monu Kumar	Spray and Thermal Behavior of Atomized Nozzles for Electronic Cooling Applications	2025
12	Mohd Zahid	Experimental study of condensation and frosting on wettability engineered metallic surfaces	2025

Ph.D. Ongoing

1. Hemanth D. – Battery thermal management (Co-guide: Prof. P.S. Mahapatra)
2. Md Moitur Rahman – Flow boiling in microchannels, PMRF (Co-guide: Prof. S.K. Das)
3. Viraj Dusane – Spray cooling for electronics (Co-guide: Prof. R. Narayanaswamy, Curtin Univ.)
4. Shuchi Chaurasia – Multiphase CFD solver development, JDP with TU Darmstadt (Co-guide: Prof. P. Stephan)
5. Midhun Abraham – Vapor chambers (Co-guide: Prof. P.S. Mahapatra)
6. Ambreena Abass – Vapor chamber fin design (Guide: Prof. P.S. Mahapatra; Co-guide: Prof. A. Pattamatta)
7. Sujatha S. – Battery thermal management (Guide: Prof. S.K. Das; Co-guide: Prof. A. Pattamatta)
8. Sathyasree – Immersion cooling for lithium-ion batteries

Memberships

- American Society of Mechanical Engineers (ASME)
- Indian Society for Heat and Mass Transfer (ISHMT)
- Indian Society for Applied Mechanics (ISAM)

Editorship

- Editorial Board of Begell House journal *Interfacial Phenomena and Heat Transfer*
- Editorial Board of Begell House journal *Computational Thermal Sciences*
- Guest Editor of Begell House Journal *International Journal of Fluid Mechanics Research*

- Guest Editor of Begell House Journal *Journal of Enhanced Heat Transfer*
- Guest Editor of Springer Journal *International Journal of Advances in Engineering Sciences and Applied Mathematics*

Patents

1. L.K. Malla, D.T. Vempeny, D. Praveen, H. Dileep, P.S. Mahapatra, A. Pattamatta, "A super wettable flat pulsating heat pipe based cooling device", **Indian Patent No. 511897**, 2023.
2. D. Praveen, H. Dileep, L.K. Malla, P.S. Mahapatra, A. Pattamatta, "A kind of integrated two-phase heat spreader heat sink", **Indian Patent No. 468268**, 2023.
3. Purbarun Dhar, Ajay Katiyar, A. Pattamatta and Sarit K. Das, "Graphene Nanoflakes Based Polymeric Pastes/Gels for Mega-Electroviscous Utilities", **Indian Patent No. 352112**, 2015.
4. A. Pattamatta and Ghanshyam Singh, "A heat exchanger tube", IPC: F28F13/12, 2012.

Books Published

1. *Essential Convective Heat Transfer – Theory & Applications*, Ane Books Pvt. Ltd., 2025.
2. *Fundamentals of Nano- and Microscale Heat Transport*, Springer, 2025.
3. *Modelling Energy Transport in Nanostructures*, LAP Lambert Academic Publishing, 2013.

Research Projects

Project Title (Sponsor)	Funding (INR)	Duration
Development of Integrated Vapor Chamber Heat Sinks for Enhanced Electronics Cooling for Futuristic Technology (DRDO)	3,12,66,120	2025–2028
Experimental and Numerical Studies for the Design of Active Systems for Effective Spacecraft Thermal Management (ISRO)	1,33,57,000	2025–2028
Effective Spacecraft Thermal Management through Passive Phase-Change-Based Devices (ISRO)	85,91,000	2025–2028
Advanced Laser Material Processing and Surface Engineering – Co-PI (IoE CoE)	2,00,48,000	2023–2026
Design of a parallel microchannel evaporator based on flow and temperature maldistribution studies during flow boiling for spacecraft thermal control (ISRO)	38,08,000	2023–2025
Surface Engineering Vertical – Centre for Materials and Manufacturing for Futuristic Mobility (IoE CoE)	6,50,00,000	2021–2023
Experimental Studies on the Performance Enhancement of Pulsating Heat Pipe for Microprocessor Cooling (DRDO)	1,00,00,000	2021–2024

Project Title (Sponsor)	Funding (INR)	Duration
Enhancement of Boiling and Condensation in Minichannels through Durable Wettability-patterned Surfaces (SERB)	55,00,000	2020–2023
Precision Nanoengineered, Wettability Patterned Surfaces with Potential Applications in Energy and Healthcare – Co-PI (SPARC)	47,00,000	2019–2021
Passive Transit Food Storage Device – IIGP 2.0 – University Challenge Competition 2018 – Co-PI (Indo-US S&T Forum)	11,00,000	2018–2019
Experimental and Numerical Studies on Impressed Combustor Lines Cooling Methodology (COPT, DRDO)	96,30,380	2017–2021
Impingement Heat Transfer Measurements Using Thermo Chromic Liquid Crystal Paint Technique (GE India, Bangalore)	16,29,220	2014–2015
Experiments and Modeling of the Size and Concentration Effect on the Enhancement of Various Modes of Heat Transfer in Nanofluids and its Application in Automotive Engine – Co-PI (DMSRDE, DRDO)	75,00,000	2013–2017
Investigation of Heat Transfer Augmentation on Dimpled Surfaces using Wall Jet and Impinging Jet Flows (DST)	22,00,000	2012–2015
Numerical and Experimental Studies of Thermal Boundary Resistance across Nanostructured Interfaces (ICSR, IIT Madras)	10,00,000	2010–2013

Journal Papers

1. Dileep, H., Mahapatra, P.S., Pattamatta, A. (2026). Lightweight thermal management strategy for Li-ion pouch cells using localised cold plate and graphite sheet. *Thermal Science and Engineering Progress*, 104570.
2. Rahaman, M.M., Harshavardhan, R., Muhamed, H., Dhanalakota, P., Anand, A.R., Das, S.K., Pattamatta, A. (2026). Turbulent Flow in a Rectangular Microchannel: Development and Validation of Correlations for Nusselt Number and Friction Factor. *ASME Journal of Heat and Mass Transfer*, 041801.
3. Dileep, H., Acharjee, S., Mahapatra, P.S., Pattamatta, A. (2026). Immersion cooling of lithium-ion pouch cells: Comparative heat-transfer performance of dielectric fluids with machine learning based temperature field reconstruction. *Journal of Energy Storage*, 120739.
4. Kumar, M., Dusane, V., Marengo, M., Pattamatta, A. (2026). Spray cooling at low–moderate heat fluxes: Droplet-scale diagnostics and infrared mapping with a low-GWP dielectric fluid. *International Journal of Thermal Sciences*, 110497.
5. Rahaman, M.M., Sathriyan, M., Malla, L.K., Anand, A.R., Das, S.K., Pattamatta, A. (2025). Pixel-resolved thermography for simultaneous temperature and heat-flux mapping in single and parallel microchannel heat sinks. *Experimental Heat Transfer*, 1–27.
6. Sharma, R., Chaurasia, S., Geppert, A.K., Kind, J., Stephan, P., Marengo, M., Pattamatta, A. (2025). VOF Simulation of Symmetry Breaking Lamella Dynamics during Single Droplet Impact on a Cubic Pillar. *Atomization and Sprays*, 1–26.

7. Dileep, H., Patil, I.M., Mahapatra, P.S., Pattamatta, A. (2025). Integrated graphite–insulation sheet with cold plate for effective thermal management in pouch-type lithium-ion modules. *Applied Thermal Engineering*, 128592.
8. Malla, L.K., Dileep, H., Vempeny, D.T., Mahapatra, P.S., Pattamatta, A. (2025). Effect of Ambient Temperature and Proximity on Flat Plate Pulsating Heat Pipes. *Heat Transfer Engineering*, 1–10.
9. Zahid, M., Raipilli, A.K., Pattamatta, A., Sinha Mahapatra, P. (2025). Sustainable Humid Air Condensation: Insights into Nanoengineered Surfaces. *ACS Applied Materials & Interfaces*, 17(10), 16111–16121.
10. Dhanalakota, P., Rahaman, M.M., Mahapatra, P.S., Anand, A.R., Das, S.K., Pattamatta, A. (2025). Insights Into Pool Boiling Heat Transfer on Minichannel Surfaces Through Point and Field Measurements. *ASME Journal of Heat and Mass Transfer*, 147(2).
11. Dileep, H., Dhanalakota, P., Mahapatra, P.S., Pattamatta, A. (2025). Performance assessment of a novel localized cooling system for battery thermal management at high ambient conditions. *Applied Thermal Engineering*, 125756.
12. Vempany, D.T., Malla, L.K., Dileep, H., Mahapatra, P.S., Srivastava, P., Pattamatta, A. (2025). A novel antiparallel flat plate pulsating heat pipe for thermal management of electronics. *Experimental Heat Transfer*, 1–17.
13. Dileep, H., Jha, K.K., Mahapatra, P.S., Pattamatta, A. (2024). Thermal characterization of pouch cell using infrared thermography and electrochemical modelling for the Design of Effective Battery Thermal Management System. *Applied Energy*, 376, 124301.
14. Radhakrishnan, G., Pattamatta, A., Srinivasan, B. (2024). Distributed Physics-Informed machine learning strategies for two-phase flows. *International Journal of Multiphase Flow*, 177, 104861.
15. Josyula, T., Malla, L.K., Thomas, T.M., Kalichetty, S.S., Sinha Mahapatra, P., Pattamatta, A. (2024). Fundamentals and Applications of Surface Wetting. *Langmuir*, 40(16), 8293–8326.
16. Malla, L.K., Dhanalakota, P., Dileep, H., Mahapatra, P.S., Pattamatta, A. (2024). Surface Wettability Modifications and Applications in Wickless Heat Pipes. *Surfaces and Interfaces*, 103837.
17. Revulagadda, A.P., Rana, R., Suresh, B., Balaji, C., Pattamatta, A. (2024). A multiobjective optimization of 3D-slot jet configuration for enhancement of film cooling in an annular combustor liner. *International Journal of Heat and Mass Transfer*, 218, 124745.
18. Revulagadda, A.P., Adapa, B.R., Balaji, C., Pattamatta, A. (2023). Performance assessment and optimization of three-dimensional hybrid slot-effusion jet cooling configuration of an annular combustor liner. *Applied Thermal Engineering*, 122198.
19. Dhanalakota, P., Dileep, H., Malla, L.K., Mahapatra, P.S., Pattamatta, A. (2023). A novel integrated flat thermosyphon heat sink for energy-efficient chip-level thermal management in data centers. *Applied Thermal Engineering*, 121667.
20. Revulagadda, A.P., Adapa, B.R., Balaji, C., Pattamatta, A. (2023). Fluid flow and heat transfer characteristics of three-dimensional slot film cooling in an annular combustor. *International Journal of Heat and Mass Transfer*, 211, 124211.
21. Kalichetty, S.S., Sundararajan, T., Pattamatta, A. (2023). Numerical study of thermocapillary migration of a droplet on an oleophilic track. *International Journal of Heat and Mass Transfer*, 214, 124448.
22. Malla, L.K., Vempeny, D.T., Dileep, H., Dhanalakota, P., Mahapatra, P.S., Srivastava, P., Pattamatta, A. (2023). Thermal Performance Comparison of Flat Plate Pulsating Heat Pipes of Different

Material Thermal Conductivity using Ethanol-Water Mixtures. *Applied Thermal Engineering*, 121475.

23. Dhanalakota, P., Malla, L.K., Dileep, H., Mahapatra, P.S., Pattamatta, A. (2022). Effective thermal management of heat sources in sustainable energy devices using a compact flat thermosyphon. *Energy Conversion and Management*, 268, 116041.

24. Malla, L.K., Dhanalakota, P., Mahapatra, P.S., Pattamatta, A. (2022). Thermal and flow characteristics in a flat plate pulsating heat pipe with ethanol-water mixtures: From slug-plug to droplet oscillations. *International Journal of Heat and Mass Transfer*, 194, 123066.

25. Dhanalakota, P., Abraham, S., Mahapatra, P.S., Sammakia, B., Pattamatta, A. (2022). Thermal performance of a two-phase flat thermosyphon with surface wettability modifications. *Applied Thermal Engineering*, 204, 117862.

26. Josyula, T., Mahapatra, P.S., Pattamatta, A. (2022). Internal flow in evaporating water drops: dominance of Marangoni flow. *Experiments in Fluids*, 63(2), 49.

27. Josyula, T., Esther Blesso Vidhya, Y., Vasa, N.J., Mahapatra, P.S., Pattamatta, A. (2022). Non-axisymmetry and flow transition in evaporating water drops. *Applied Physics Letters*, 120(1), 011602.

28. Adapa, B.R., Revulagadda, A.P., Pattamatta, A., Balaji, C. (2022). Film cooling Studies on Combined three-dimensional Slot and Effusion jet Configuration of an annular Combustor liner. *International Journal of Fluid Mechanics Research*, 49.

29. Guggilla, G., Narayanaswamy, R., Stephan, P., Pattamatta, A. (2021). Influence of flow rate and surface thickness on heat transfer characteristics of two consecutively impinging droplets on a heated surface. *International Journal of Heat and Mass Transfer*, 165, 120688.

30. Guggilla, G., Narayanaswamy, R., Stephan, P., Pattamatta, A. (2021). Heat Transfer Characteristics of a Train of Droplets Impinging Over a Hot Surface: From Film Evaporation to Leidenfrost Point. *Journal of Heat Transfer*, 143, 061602.

31. Josyula, T., Mahapatra, P.S., Pattamatta, A. (2021). Insights into the evolution of the thermal field in evaporating sessile pure water drops. *Colloids and Surfaces A: Physicochemical and Engineering Aspects*, 611, 125855.

32. Kalichetty, S.S., Sundararajan, T., Pattamatta, A. (2021). Effect of wall proximity on the lateral thermocapillary migration of droplet rising in a quiescent liquid. *Physics of Fluids*, 33, 022107.

33. Abraham, S., Takawale, A., Stephan, P., Pattamatta, A. (2021). Thermal Characteristics of a Three-Dimensional Coil Type Pulsating Heat Pipe at Different Heating Modes. *Journal of Thermal Science and Engineering Applications*, 13, 041011.

34. Ramakrishnan, B., Hoang, C.H., Khalili, S., Hadad, Y., Rangarajan, S., Pattamatta, A., Sammakia, B. (2021). Experimental Characterization of Two-Phase Cold Plates Intended for High-Density Data Center Servers Using a Dielectric Fluid. *Journal of Electronic Packaging*, 143, 020904.

35. Thomas, T.M., Chowdhury, I.U., Dhivyaraja, K., Mahapatra, P.S., Pattamatta, A., Tiwari, M.K. (2021). Droplet Dynamics on a Wettability Patterned Surface during Spray Impact. *Processes*, 9, 555.

36. Vidhya, Y.E.B., Pattamatta, A., Manivannan, A., Vasa, N.J. (2021). Influence of fluence, beam overlap and aging on the wettability of pulsed Nd^{3+}:YAG nanosecond laser-textured Cu and Al sheets. *Applied Surface Science*, 548, 149259.

37. Chowdhury, I.U., Mahapatra, P.S., Sen, A.K., Pattamatta, A., Tiwari, M.K. (2021). Autonomous

transport and splitting of a droplet on an open surface. *Physical Review Fluids*, 6(9), 094003.

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Conference Papers

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