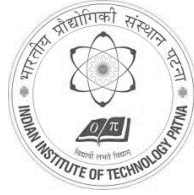


Rishi Raj, Ph.D.

Associate Professor,
Department of Mechanical Engineering
and
Principle Investigator,
Thermal and Fluid Transport Laboratory (TFTL)
Indian Institute of Technology Patna



Address: Room 113, Block III
IIT Patna, Bihar 801103, India
www.iitp.ac.in/~rraj/ (TFTL)
rraj@iitp.ac.in, rraj.iitp@gmail.com
☑ +91-611-5233166 (office), +91-829-2339322 (mob)

1. Major scientific fields of interest

Energy, Boiling, Condensation, Colloids and Interface Science, Microgravity Science, Machine Learning

2. Education

Degree	University / Institution	Year	Specialization
B.Tech.	Indian Institute of Technology Guwahati	2006	Mechanical
M.S.	University of Maryland, College Park, MD, USA	2009	Mechanical, Thermal
Ph.D.*	University of Maryland, College Park, MD, USA	2010	Mechanical, Thermal

*Doctoral Dissertation Title: [Development of a Boiling Regime Map and Gravity Scaling Parameter for Pool Boiling Heat Transfer](#) (Best Dissertation Award)

3. Experience

Duration	Institution	Position
December 2019 – present	Indian Institute of Technology Patna	Associate Professor, Department of Mechanical Engineering
July 2021 – July 2022	Indian Institute of Technology Patna	Associate Dean, Resources
August 2013 – December 2019	Indian Institute of Technology Patna	Assistant Professor, Department of Mechanical Engineering
August 2011 – July 2013	Massachusetts Institute of Technology (MIT), Cambridge, MA, USA	Post-doctoral Associate, Department of Mechanical Engineering
May 2010 – July 2011	University of Maryland, College Park, MD, USA	Post-doctoral Research Associate, Department of Mechanical Engineering
January 2009 – May 2010	University of Maryland, College Park, MD, USA	Future Faculty Fellow
August 2006- May 2010	University of Maryland, College Park, MD, USA	Research Assistant

4. Fellowship/Editorship/Associateship/Membership

- i. [Editor](#), International Communications in Heat and Mass Transfer, Elsevier (2022 – till date)
- ii. [Member, Editorial Board](#), Interfacial Phenomena and Heat Transfer (2023 – till date)
- iii. Swarnajayanti Fellowship 2021, Department of Science and Technology, GoI
- iv. Member, Publication Committee, Indian National Academy of Engineering (INAE)
- v. Young Associate, Indian National Science Academy (INSA)
- vi. Young Associate, Indian National Academy of Engineering (INAE)
- vii. Associate, Indian Academy of Sciences (IASc)
- viii. Member, Executive Committee, Indian Society of Heat and Mass Transfer
- ix. Life Member, Indian Society of Heat and Mass Transfer

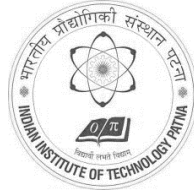


5. Awards and Recognition

Fellowship	Details	Year	Type
Swarnajayanti Fellowship Award	Awarded by <i>Department of Science and Technology, Government of India</i>	2021	National
Awards from Academies/Societies	Details	Year	Type
Prof. K. N. Seetharamu Medal and Prize	Awarded by the <i>India Society for Heat and Mass Transfer (ISHMT)</i> to Researchers in Heat and Mass Transfer	2021	National
Medal for Young Scientists	Awarded by the <i>Indian National Science Academy (INSA)</i>	2019	National
Young Engineer Award	Awarded by the <i>Indian National Academy of Engineering (INAE)</i>	2018	National
Associateship	Awarded by the <i>Indian Academy of Science (IASc)</i>	2018	National
Keynote Lectures	Details	Year	Type
Keynote Speaker	Delivered a Keynote Address during the <i>1st International Conference in Fluid, Thermal, and Energy Systems</i> organized by NIT Calicut on June 9, 2022.	2022	International
Keynote Speaker	Delivered a Keynote Address during the <i>48th National Conference on Fluid Mechanics and Fluid Power (FMFP 2021)</i> organized by Birla Institute of Science and Technology Pilani, Rajasthan, India 28 th December, 2021.	2021	National
Keynote Speaker	Delivered a Keynote Address during the <i>One-Day Online International Symposium on Fluid and Thermal Engineering (FLUTE 2021)</i> organized by Amity University on 22 nd July, 2021.	2021	International
Keynote Speaker	Delivered a Keynote Address during the <i>25th National and 3rd International ISHMT-ASTFE Heat and Mass Transfer Conference (IHMTTC)</i> organized at IIT Roorkee between 28-31 December 2019.	2019	International
Keynote Speaker	Delivered a Keynote Address during the <i>ASME 2017 International Conference on Nanochannels, Microchannels and Minichannels</i> , Hyatt Regency, Cambridge, MA, August 27-30, 2017.	2017	International
Best Paper/Poster	Details	Year	Type
Best Poster Award	For the paper titled “Constant Mean Curvature Based Framework for Modeling Droplet Evaporation on Lubricant-Infused Surfaces,” <i>10th International Colloids Conference, Mallorca, Spain</i> (Conducted Online), December 6-9, 2020.”	2020	International

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Best Paper/Poster	Details	Year	Type
Prof. P. K. Sarma Best Paper Award	For the paper titled “Acoustic feedback-controlled pool boiling of aqueous surfactant solutions” during the 25th National and 3^d International ISHMT-ASTFE Heat and Mass Transfer Conference (IHMTTC) organized at IIT Roorkee between 28-31 December, 2019.	2019	International
Best Poster Award	For the paper titled “Pool boiling with aqueous ionic liquid solutions” during the 10th International Conference on Boiling and Condensation Heat Transfer , 12-15 March 2018, Nagasaki, Japan	2018	International
Best Paper Award	For the paper titled “Experimental characterization and modeling of capillary-pumped thin-film evaporation from micropillar wicks” during the ASME THE/FE/ICNMM Conference , Washington DC, July 10-14, 2016.	2016	International
Best Poster Award	For the paper titled “Hotspot Thermal Management via Thin-Film Evaporation” during The Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems (iTherm) , Las Vegas, May 31 – June 3, 2016.	2016	International
Best Paper/Poster Awards	Details	Year	Type
Best Paper Award	For the paper titled “Nanoporous evaporative device for advanced electronics thermal management” during The Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems (iTherm) , Lake Buena Vista, Orlando, FL, USA, May 27-30, 2014.	2014	International
Best Poster Award	For the paper titled “Characterization of Pool Boiling over a Range of Gravity Levels and Heater Sizes” during the 5th International Topical Team Workshop on Two-Phase Systems for Ground and Space Applications , Kyoto, Japan, Sept. 26-29, 2010.	2010	International
Best Poster Award	For the paper titled “Gravity Scaling Parameter for Pool Boiling Heat Transfer,” during the ASME International Mechanical Engineering Congress and Exposition (IMECE) , Lake Buena Vista, Orlando, Florida, November 13-19, 2009.	2009	International
Teaching	Details	Year	Type
Best Teacher Award	Awarded by the Indian Institute of Technology Patna	2018	Institutional

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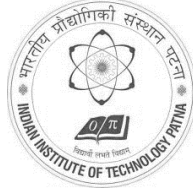


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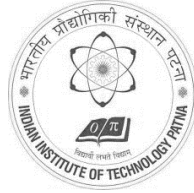
Other Fellowships	Details	Year	Type
Postdoctoral Fellowship	Recipient of the 2011/12 Battelle/MIT Postdoctoral Fellowship by the Department of Mechanical Engineering, Massachusetts Institute of Technology	2011	International
Future Faculty Fellowship	Awarded by A. James Clark School of Engineering, University of Maryland, College Park, MD, USA	2009	International
Others	Details	Year	Type
Member, International Scientific Committee	Member of International Scientific Committee of the International Conference on Boiling and Condensation Heat Transfer	2018	International
Travel Award	Department of Science and Technology Travel Award for attending the 15th International Heat Transfer Conference, August 10-15th 2014, Kyoto, Japan.	2014	National
Best Doctoral Dissertation Award	Best Doctoral Dissertation Award 2010 by the Department of Mechanical Engineering University of Maryland, College Park, USA	2010	International
Best Presentation Award	Graduate Research Interaction Day (GRID) 2010, University of Maryland, College Park, USA	2010	Institutional

6. Sponsored/Consultancy Projects

Title	Agency/Amount	Type	Status/Duration
Investigation of low global warming potential alternative chemicals to substances controlled under the Montreal Protocol <i>(with co-PI Dr. A. D. Thakur, IIT Patna)</i>	Project Management Unit, Ozone Cell, Ministry of Environment, Forest and Climate Change Amount: 50 Lakhs	Sponsored	2023-2028 Ongoing
Decoding the science of boiling via bubble acoustics: Towards preemptive control of vapor explosion in industrial applications	Swarnajayanti Fellowship Scheme, SERB and DST Amount: 334 Lakhs	Sponsored	2022-2027 Ongoing
Assessment of the Use of Modern Robotic and Machine Learning Tools for Addressing Operational Challenges at 3×660 MW Capacity Coal Fired Supercritical Power Plant <i>(as Co-PI with Dr. Atul Thakur, IIT Patna, as the PI)</i>	Prayagraj Power Generation Company Ltd. Amount: 10 Lakhs	Sponsored	2022-2023 Ongoing
Permanent Dropwise Condensation via Amphiphilic Additives in Vapor Phase <i>(with co-PI Dr. S. Daschakraborty, IIT Patna)</i>	Indo-Korea, DST Amount: 30 Lakhs	Sponsored	2021-2024 Ongoing



Title	Agency/Amount	Type	Status/Duration
Psychrometry Driven Design and Fabrication of An All-Season Optimal Atmospheric Water Harvester <i>(with co-PI Dr. A. D. Thakur, IIT Patna)</i>	<i>Water Technology Initiative, DST</i> Amount: 32 Lakhs	Sponsored	2020-2023 Ongoing
Passive Two-Phase Heat Spreader for Hotspot Mitigation in Microgravity of Space	<i>Human Spaceflight Centre (HSFC) ISRO</i> Amount: 30 Lakhs	Sponsored	2020-2023 Ongoing
Development of an Ionic Liquid-based Ultra-High Heat Dissipation Module for Energy Efficient Boiling Systems	<i>Core Research Grant, SERB</i> Amount: 47 Lakhs	Sponsored	2020-2023 Ongoing
Strengthening Interfacial Characterization Facilities: Funds for Improvement of S&T Infrastructure (one among six co-PIs with HoD as the PI)	<i>DST FIST</i> Amount: 290 Lakhs	Sponsored	2019-2024 Ongoing
Development of an agricultural waste based off-the-grid climate control unit for storage and processing of agricultural produce <i>(with co-PI Dr. A. D. Thakur, IIT Patna)</i> <i>Industry Partner: New Leaf Dynamics</i>	<i>SERB under IMRPINT-2 scheme</i> Amount: 108 Lakhs	Sponsored	March 2019 – January 2023 (Completed)
Surface Active Additives for Enhanced Flow Boiling in Microchannels	<i>DST-RFBR Joint Call</i> Amount: 16 Lakhs	Sponsored	December 2019 – December 2021 (Completed)
Acoustic Detection of Leidenfrost Dynamics on Scalable Micro-/Nanostructured Surfaces	<i>DST Nanomission</i> Amount: 27 Lakhs	Sponsored	July 2016 – July 2019 (Completed)
Design and Development of an Agricultural Waste Based Gasifier Heating System for GreenCHILL™ <i>(with co-PI Dr. A. D. Thakur, IIT Patna)</i> <i>Industry Partner: New Leaf Dynamics</i>	<i>MHRD and DST under UAY</i> Amount: 95 Lakhs	Sponsored	August 2016 – August 2018 (Completed)
Enhancement of Boiling Heat Transfer via the Suppression of Coalescence in Microgravity	<i>RESPOND ISRO</i> Amount: 27 Lakhs	Sponsored	April 2015 – April 2018 (Completed)
Flow Boiling Heat Transfer in Scalable Nanostructured Microchannels for High Heat Flux Applications <i>(with co-PI Dr. S. K. Saha, IIT Bombay)</i>	<i>DST SERB</i> Amount: 50 Lakhs	Sponsored	August 2014 – August 2018 (Completed)
CFD Simulation in a Co-Current Pressure Nozzle-Spray Dryer	<i>Haryana Leathers Chemical Ltd.</i>	Consultancy	December 2016 – February 2017 (Completed)
Performance Analysis and Improvement of a Tonne, 7 kW Ammonia based Adsorption Refrigerator <i>(with co-PI Dr. A. D. Thakur, IIT Patna)</i>	<i>New Leaf Dynamic Technologies (P) Ltd.</i>	Consultancy	December 2014 – February 2015 (Completed)



7. Patents/Scholarly Publications

Patents Granted

- [1] Sunil, [Raj, R.](#), Thakur, A. D., Rajan, B. K., Chaitanya, B., Sinha, R., Agarwal, A., and Agarwal, A., "System and Method for Heat Recovery in Gasification Process," *Indian Patent Number 390902, Issue Date: 01/03/2022*, Application no. 201831011600, Priority Date 28/03/2018.
- [2] Raza, M. Q., and [Raj, R.](#), "Surfactant Based Boiling System for Zero Gravity," *Indian Patent Number 314531, Issue Date 24/06/2019*, Application Number 208/KOL/2015, Priority Date 26/02/2015.
- [3] Xiao, R., [Raj, R.](#), Narayanan, S., Wang, E. N., Enright, R., and Maroo, S. C., "Enhanced Evaporative Heat Transfer Device Using Porous Membranes," *U.S. Patent No. 9,835,363, Issue Date. December 5, 2017*.

Patents Applications Published

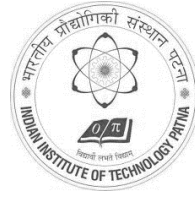
- [4] Shukla, A., Sunil, [Raj, R.](#), and Thakur, A. D., "System and Method for Extracting Atmospheric Moisture," Application filed with the Indian Patent Office, *Serial Number 202331035489, Date 22/05/2023*.
- [5] Sunil, Sinha, R., [Raj, R.](#), Thakur, A. D., Shukla, A., and Agarwal, A., "An Apparatus and Method for Off-The-Grid Climate Control," Application filed with the Indian Patent Office, *Serial Number 202231026031, Date 04/05/2022*.
- [6] Sharma, D., Kumar, A., Ghosh, D. P., [Raj, R.](#), and Saha, S. K., "An Improved Heat Sink System for Suppressing Two-Phase Thermal and Flow Instabilities and a Method Thereof," Application filed with the Indian Patent Office, *Serial Number 201931001796, Application no. TEMP/E-5/1861/2019-KOL, Date 15/01/2019*.
- [7] [Raj, R.](#), Thakur, A., Banerjee, S., and Pandey, U., "A System and Method for Controlling the Buoyancy of an Underwater Submersible," Application filed with the Indian Patent Office, *Serial Number 201831028588, Application no. E-12/31190/2018-KOL, Date 30/07/2018*.

Book Chapters

- [8] Chaitanya, B., Thakur, A. D., and [Raj, R.](#), 2020, "Biomass Gasifier-Powered Adsorption Chiller for Atmospheric Water Harvesting: Prospects in Developing World," *Advances in Energy Research, Vol. 1*, Springer, pp. 451-460. ISBN 978-981-15-2666-4.
- [9] Ghosh, D. P., [Raj, R.](#), Mohanty, D., Saha, S. K., 2016, "Onset of Nucleate Boiling, Void Fraction, and Liquid Film Thickness," *Microchannel Phase Change Transport Phenomena*, Elsevier, pp. 5–90. ISBN 978-0128-04-356-1.
- [10] Chattopadhyay, A., Thakur, A., and [Raj, R.](#), 2016, "Spline Based Modeling of Two-Dimensional Droplets on Rough and Heterogeneous Surfaces," *Fluid Mechanics and Fluid Power - Contemporary Research*, Springer, ISBN 978-81-322-2741-0.

Archival Technical Reports

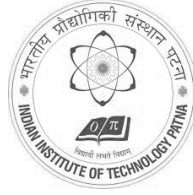
- [11] Jakhar, K., Chattopadhyay, A., Thakur, A., and [Raj, R.](#), 2019, "Spline-based Interface Modeling and Optimization (SIMO) for Surface Tension and Contact Angle Measurements," *arXiv*, 1909.05943.
- [12] Kim, J., [Raj, R.](#), McQuillen, J., 2014, "Gravity and Heater Size Effects on Pool Boiling Heat Transfer," *NASA Contractor Report # NASA/CR-2014-216672, E-18879, GRC-E-DAA-TN13259*.



Peer-reviewed Journal Articles

SN	Name of all Authors	Paper Title	Name of Journal	Impact Factor+ (IF), H5 Index++	Year, Vol. No. Page	DOI of the paper
1.	Upadhyay, A., Kumar, B., Kumar, N., and <u>Raj, R.</u>	Simultaneous Enhancement of Critical Heat Flux and Heat Transfer Coefficient via In-Situ Deposition of Ionic Liquids during Pool Boiling	<i>International Journal of Heat and Mass Transfer</i>	Impact Factor: 5.431 H5 Index: 115	2023, 208, pp. 124066: 1-11.	https://doi.org/10.1016/j.ijheatmasstransfer.2023.124066
2.	Hedau, G., Qadeer, Md., Gulhane, N. P., <u>Raj, R.</u> , and Saha, S. K.	On the Importance of Fluidic Manifold Design and Orientation on Flow Boiling Instability in Microchannel Heat Sinks	<i>International Journal of Heat and Mass Transfer</i>	Impact Factor: 5.431 H5 Index: 115	2023, 209, pp. 124120: 1-19.	https://doi.org/10.1016/j.ijheatmasstransfer.2023.124120
3.	Chaitanya, B., Gunjan, M. R., Sanargi, R. N., <u>Raj, R.</u> , and Thakur, A. D.	Per-fluorinated Chemical Free Robust Superhydrophobic Copper Surface Using a Scalable Technique	<i>Materials Chemistry and Physics</i>	Impact Factor: 4.778 H5 Index: 67	2022, 278, pp. 125667: 1-10.	https://doi.org/10.1016/j.matchemphys.2021.125667
4.	Hedau, G., <u>Raj, R.</u> , and Saha, S. K.	Complete Suppression of Flow Boiling Instability in Microchannel Heat Sinks using a Combination of Inlet Restrictor and Flexible Dampener	<i>International Journal of Heat and Mass Transfer</i>	Impact Factor: 5.431 H5 Index: 115	2022, 182, pp. 121937: 1-18.	https://doi.org/10.1016/j.ijheatmasstransfer.2021.121937
5.	Sinha, K. N. R., Kumar, V., Kumar, N., Thakur, A., and <u>Raj, R.</u>	Deep Learning the Sound of Boiling for Advance Prediction of Boiling Crisis	<i>Cell Reports Physical Science</i>	Impact Factor: 7.832 H5 Index: 31	2021, 2, pp. 100382: 1-14.	https://doi.org/10.1016/j.ccrp.2021.100382
6.	Gunjan, M. R., Kumar, A., and <u>Raj, R.</u>	Cloaked Droplets on Lubricant-Infused Surfaces: Union of Constant Mean Curvature Interfaces Dictated by Thin-Film Tension	<i>Langmuir</i>	Impact Factor: 4.331 H5 Index: 76	2021, 37 (22), pp. 6601-6612.	https://doi.org/10.1021/acs.langmuir.0c03560
7.	Verma, A., Kumar, N., and <u>Raj, R.</u>	Direct prediction of foamability of aqueous surfactant solutions using property values	<i>Journal of Molecular Liquids</i>	Impact Factor: 6.633 H5 Index: 120	2021, 323, pp. 114635: 1-10.	https://doi.org/10.1016/j.molliq.2020.114635
8.	Hedau, G., <u>Raj, R.</u> , and Saha, S. K.	Effect of Outlet Plenum Design on Flow Boiling Heat Transfer in Microchannel Heat Sinks	<i>Thermal Science and Engineering Progress</i>	Impact Factor: 4.560 H5 Index: 48	2021, 23, pp. 100868: 1-19.	https://doi.org/10.1016/j.tsep.2021.100868
9.	Kumar, A., Gunjan, M. R., and <u>Raj, R.</u>	On the Validity of Force Balance Models for Predicting Gravity-Induced Detachment of Pendant Drops and Bubbles	<i>Physics of Fluids</i>	Impact Factor: 4.980 H5 Index: 64	2020, 32(10), pp. 101703: 1-5.	https://doi.org/10.1063/5.0025488

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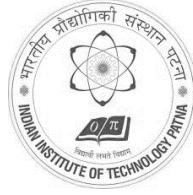


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SN	Name of all Authors	Paper Title	Name of Journal	Impact Factor+ (IF), H5 Index++	Year, Vol. No. Page	DOI of the paper
10.	Kumar, V., Sinha, K. N. R., and Raj, R.	Leidenfrost Phenomenon during Quenching in Aqueous Solutions: Effect of Evaporation-Induced Concentration Gradients	<i>Soft Matter</i>	Impact Factor: 4.046 H5 Index: 65	2020, 16, pp. 6145-6154.	https://doi.org/10.1039/D0SM00622J
11.	Gunjan, M. R., Kumar, A., and Raj, R.	Droplets on Lubricant-Infused Surfaces: Combination of Constant Mean Curvature Interfaces with Neumann Triangle Boundary Conditions	<i>Langmuir</i>	Impact Factor: 4.331 H5 Index: 76	2020, 31 (11), pp. 2974-2983.	https://doi.org/10.1021/acs.langmuir.9b03927
12.	Sarode, A., Raj, R. , and Bhargav, A.	On the Role of Confinement Plate Wettability on Pool Boiling Heat Transfer	<i>International Journal of Heat and Mass Transfer</i>	Impact Factor: 5.431 H5 Index: 115	2020, 156, pp. 119723: 1-12.	https://doi.org/10.1016/j.ijheatmasstransfer.2020.119723
13.	Kumar, N., Sinha, K. N. R., Raza, M. Q., Verma, A., Seth, D., Jasvanth, V. S., and Raj, R.	Design, Fabrication, and Performance Evaluation of a Novel Orientation Independent and Wickless Heat Spreader	<i>International Journal of Heat and Mass Transfer</i>	Impact Factor: 5.431 H5 Index: 115	2020, 153, pp. 119572: 1-12.	https://doi.org/10.1016/j.ijheatmasstransfer.2020.119572
14.	Hedau, G., Dey, P., Raj, R. , and Saha, S. K.	Experimental and Numerical Investigation of the Effect of Number of Parallel Microchannels on Flow Boiling Heat Transfer	<i>International Journal of Heat and Mass Transfer</i>	Impact Factor: 5.431 H5 Index: 115	2020, 158, pp. 119973: 1-18.	https://doi.org/10.1016/j.ijheatmasstransfer.2020.119973
15.	Ghosh, D. P., Sharma, D., Kumar, A., Saha, S. K., and Raj, R.	An Ingenious Fluidic Capacitor for Complete Suppression of Thermal Fluctuations in Two-Phase Microchannel Heat Sinks	<i>International Communications in Heat and Mass Transfer</i>	Impact Factor: 6.782 H5 Index: 63	2020, 110, pp. 104347: 1-8.	https://doi.org/10.1016/j.icheatmasstransfer.2019.104347
16.	Kumar, A., Gunjan, M. R., Jakhar, K., Thakur, A., and Raj, R.	Unified Framework for Mapping Shape and Stability of Pendant Drops Including the Effect of Contact Angle Hysteresis	<i>Colloids and Surfaces A: Physicochemical and Engineering Aspects</i>	Impact Factor: 5.518 H5 Index: 68	2020, 597, pp. 119973: 1-10.	https://doi.org/10.1016/j.colsurfa.2020.124619
17.	Sinha, K. N. R., Ranjan, D., Kumar, N., Raza, M. Q., and Raj, R.	Simultaneous Audio-Visual-Thermal Characterization of Transition Boiling Regime	<i>Experimental Thermal and Fluid Science</i>	Impact Factor: 3.370 H5 Index: 53	2020, 118, pp. 110162: 1-12.	https://doi.org/10.1016/j.expthermflusci.2020.110162

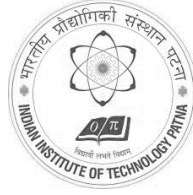


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SN	Name of all Authors	Paper Title	Name of Journal	Impact Factor+ (IF), H5 Index++	Year, Vol. No. Page	DOI of the paper
18.	Rahman, O.S.A., Mukherjee, B., Priyadershini, S., Gunjan, M. R., <u>Raj, R.</u> , Aruna, S. T., and Kehsri, A. K.	Investigating the Wetting Phenomena and Fabrication of Sticky, Para-hydrophobic Cerium Oxide Coating	<i>Journal of the European Ceramic Society</i>	Impact Factor: 6.634 H5 Index: 71	2020, 40, pp. 5749-5757.	https://doi.org/10.1016/j.jeurceramsoc.2020.06.028
19.	Hedau, G., Dey, P., <u>Raj, R.</u> , <u>R.</u> , and Saha, S.K.	Combined Effect of Inlet Restrictor and Nanostructure on Two-Phase Flow Performance of Parallel Microchannel Heat Sinks	<i>International Journal of Thermal Sciences</i>	Impact Factor: 4.779 H5 Index: 56	2020, 153, pp. 106339: 1-16.	https://doi.org/10.1016/j.ijthermalsci.2020.106339
20.	Sarode, A., <u>Raj, R.</u> , and Bhargav, A.	Scalable Macroscale Wettability Patterns for Pool Boiling Heat Transfer Enhancement	<i>Heat and Mass Transfer</i>	Impact Factor: 2.325 H5 Index: 36	2020, 56, pp. 989- 1000.	https://link.springer.com/article/10.1007/s00231-019-02783-y
21.	Sachi, S., Zaitsev, D. V., and <u>Raj, R.</u>	Effect of Ionic Liquid Additives on Temperature and Pressure Fluctuations during Water Flow Boiling in Microchannels	<i>Journal of Physics: Conf. Ser.</i>	Impact Factor: 0.547 H5 Index: 39	2020, 1677, pp. 012093.	https://doi.org/10.1088/1742-6596/1677/1/012093
22.	Sarode, A., <u>Raj, R.</u> , and Bhargav, A.	Effect of Confinement and Heater Surface Inclination on Pool Boiling Performance of Patterned Wettability Surfaces	<i>Journal of Enhanced Heat Transfer</i>	Impact Factor: 2.449 H5 Index: 15	2020, 27 (8), pp. 711-727.	https://doi.org/10.1615/JEnhHeatTransf.2020033852
23.	Kumar, N., Raza, M. Q., Sinha, K. N. R., Seth, D., and <u>Raj, R.</u>	Amphiphilic Additives to Enhance Pool Boiling Heat Transfer in Confined Spaces	<i>Journal of Enhanced Heat Transfer</i>	Impact Factor: 2.449 H5 Index: 15	2020, 27 (6), pp. 545-560.	https://doi.org/10.1615/JEnhHeatTransf.2020034432
24.	Sunil, Sinha, R., Chaitanya, B., Rajan, B. K., Agarwal, A., Thakur, A. D., and <u>Raj, R.</u>	Design, Fabrication, and Performance Evaluation of a Novel Biomass-Gasification- Based Hot Water Generation System	<i>Energy</i>	Impact Factor: 8.857 H5 Index: 135	2019, 185, pp. 148-157.	https://doi.org/10.1016/j.energy.2018.09.183
25.	Raza, M. Q., Kumar, N., and <u>Raj, R.</u>	Effect of Foamability on Pool Boiling Critical Heat Flux with Nanofluids	<i>Soft Matter</i>	Impact Factor: 4.046 H5 Index: 65	2019, 15, pp. 5308-5318.	https://doi.org/10.1039/C8SM02565G

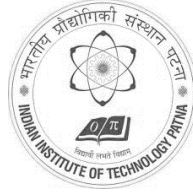


Associate Professor,
Department of Mechanical Engineering
and
Principle Investigator,
Thermal and Fluid Transport Laboratory (TFTL)
Indian Institute of Technology Patna

Address: Room 113, Block III
IIT Patna, Bihar 801103, India
www.iitp.ac.in/~rraj/ (TFTL)

rraj@iitp.ac.in, rraj.iitp@gmail.com
+91-611-5233166 (office), +91-829-2339322 (mob)

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26.	Sinha, K. N. R., Ranjan, D., Raza, M. Q., Kumar, N., Kaner, S., Thakur, A., and Raj, R.	In-situ acoustic detection of critical heat flux for controlling thermal runaway in boiling systems	<i>International Journal of Heat and Mass Transfer</i>	Impact Factor: 5.431 H5 Index: 115	2019, 138, pp. 135-143.	https://doi.org/10.1016/j.ijheatmasstransfer.2019.04.029
27.	Sharma, D. Ghosh, D. P., Saha, S. K., and <u>Raj, R.</u>	Thermohydraulic Characterization of Flow Boiling in Nanostructured Microchannel Heat Sink with Vapor Venting Manifold	<i>International Journal of Heat and Mass Transfer</i>	Impact Factor: 5.431 H5 Index: 115	2019, 130, pp. 1249-1259.	https://doi.org/10.1016/j.ijheatmasstransfer.2018.11.005
28.	Kumar, N., Raza, M. Q., Seth, D., and <u>Raj, R.</u>	Surface-Active Ionic Liquids as Potential Additive for Pool Boiling Based Energy Systems	<i>Journal of Molecular Liquids</i>	Impact Factor: 6.633 H5 Index: 120	2019, 287, pp. 110953: 1-12.	https://doi.org/10.1016/j.molliq.2019.110953
29.	Raza, M. Q., Kumar, N., and <u>Raj, R.</u>	Experimental Characterization and Modeling of Critical Heat Flux with Subcooled Foaming Solution	<i>International Journal of Thermal Sciences</i>	Impact Factor: 3.744 H5 Index: 56	2019, 141, pp. 199-210.	https://doi.org/10.1016/j.ijthermalsci.2019.03.007
30.	Ghosh, D. P., Sharma, D., Mohanty, D., Saha, S. K., and <u>Raj, R.</u>	Facile Fabrication of Nanostructured Microchannels for Flow Boiling Heat Transfer Enhancement	<i>Heat Transfer Engineering</i>	Impact Factor: 2.431 H5 Index: 29	2019, 40 (7), pp. 537-548.	https://doi.org/10.1080/01457632.2018.1436399
31.	Chaitanya, B. Bahadur, V., Thakur, A. D., <u>Raj, R.</u>	Biomass-gasification-based atmospheric water harvesting in India	<i>Energy</i>	Impact Factor: 8.857 H5 Index: 135	2018, 165, pp. 610-621.	https://doi.org/10.1016/j.energy.2018.09.183
32.	Raza, M. Q., Kumar, N., and <u>Raj, R.</u>	Wettability-Independent Critical heat Flux during Boiling Crisis in Foaming Solutions	<i>International Journal of Heat and Mass Transfer</i>	Impact Factor: 5.431 H5 Index: 115	2018, 126(A), pp. 567-579.	https://doi.org/10.1016/j.ijheatmasstransfer.2018.05.062
33.	Kumar, N., Raza, Md. Q., <u>Raj, R.</u>	Aqueous Ionic Liquid Solutions for Boiling Heat Transfer Enhancement in the Absence of Buoyancy Induced Bubble Departure	<i>International Journal of Heat and Mass Transfer</i>	Impact Factor: 5.431 H5 Index: 115	2018, 122, pp. 354-363.	https://doi.org/10.1016/j.ijheatmasstransfer.2018.01.101
34.	Kumar, N., Raza, Md. Q., <u>Raj, R.</u>	Surfactant Aided Bubble Departure during Pool Boiling	<i>International Journal of Thermal Sciences</i>	Impact Factor: 4.779 H5 Index: 56	2018, 131, pp. 105-113.	https://doi.org/10.1016/j.ijthermalsci.2018.05.025

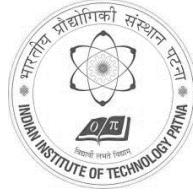


Associate Professor,
Department of Mechanical Engineering
and
Principle Investigator,
Thermal and Fluid Transport Laboratory (TFTL)
Indian Institute of Technology Patna

Address: Room 113, Block III
IIT Patna, Bihar 801103, India
www.iitp.ac.in/~rraj/ (TFTL)

rraj@iitp.ac.in, rraj.iitp@gmail.com
+91-611-5233166 (office), +91-829-2339322 (mob)

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35.	Adera, S., Antao, D. S., <u>Raj, R.</u> , and Wang, E. N.,	Hotspot Thermal Management via Thin-Film Evaporation - Part II: Modeling,	<i>IEEE Transactions on Components, Packaging and Manufacturing Technology</i>	Impact Factor: 1.922 H5 Index: 36	2018, 8 (1), pp. 99- 112.	https://doi.org/10.1109/ TCPMT.2017.2757461
36.	Adera, S., Antao, D. S., <u>Raj, R.</u> , and Wang, E. N.,	Hotspot Thermal Management via Thin-Film Evaporation - Part I: Experimental Characterization,	<i>IEEE Transactions on Components, Packaging and Manufacturing Technology</i>	Impact Factor: 1.922 H5 Index: 36	2018, 8 (1), pp. 88- 98.	https://doi.org/10.1109/ TCPMT.2017.2757463
37.	Gunjan, M. R., and <u>Raj, R.</u> ,	Dynamic Roughness Ratio Based Framework for Modeling Mixed Mode of Droplet Evaporation	<i>Langmuir</i>	Impact Factor: 4.331 H5 Index: 76	2017, 33 (28), pp. 7191-7201.	https://doi.org/10.1021/ acs.langmuir.7b01653
38.	Jakhar, K., Chattopadhyay, A., Thakur, A., and <u>Raj, R.</u> ,	Spline Based Shape Prediction and Analysis of Uniformly Rotating Sessile and Pendant Droplets	<i>Langmuir</i>	Impact Factor: 4.331 H5 Index: 76	2017, 33 (22), pp. 5603-5612.	https://doi.org/10.1021/ acs.langmuir.7b00811
39.	Kumar, A., and <u>Raj, R.</u> ,	Droplets on Microdecorated Surfaces: Evolution of the Polygonal Contact Line	<i>Langmuir</i>	Impact Factor: 4.331 H5 Index: 76	2017, 33 (19), pp 4854–4862.	https://doi.org/10.1021/ acs.langmuir.7b00559
40.	Raza, M. Q., Kumar, N., and Raj, R.	Surfactants for Bubble Removal against Buoyancy	<i>Scientific Reports</i>	Impact Factor: 4.996 H5 Index: 206	2016, 6, 19113	doi:10.1038/srep19113
41.	Adera, S., Antao, D. S., Raj, R., and Wang, E. N.,	Design of micropillar wicks for thin-film evaporation	<i>International Journal of Heat and Mass Transfer</i>	Impact Factor: 5.431 H5 Index: 115	2016. 101, pp. 280–294	https://doi.org/10.1016/j .ijheatmasstransfer.2016.0 4.107
42.	Antao, D. S., Adera, S., Zhu, Y., Farias, E., <u>Raj, R.</u> , and Wang, E. N.	Dynamic Evolution of the Evaporating Liquid-Vapor Interface in Micropillar Arrays	<i>Langmuir</i>	Impact Factor: 4.331 H5 Index: 76	2016, 32 (2), pp. 519-526.	http://pubs.acs.org/doi/a bs/10.1021/acs.langmuir. 5b03916
43.	Antao, D. S., Adera, S., Zhu, Y., Farias, E., <u>Raj, R.</u> , and Wang, E. N.	Visualization of Evaporating Liquid-Vapor Interface in Micropillar Arrays	<i>Journal of Heat Transfer – Transactions of ASME</i>	Impact Factor: 1.855 H5 Index: 31	2016, 138 (2), pp. 020910.	https://heattransfer.asme digitalcollection.asme.org/ article.aspx?articleid=2484 592

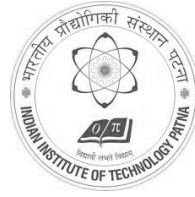


Associate Professor,
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and
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IIT Patna, Bihar 801103, India
www.iitp.ac.in/~rraj/ (TFTL)

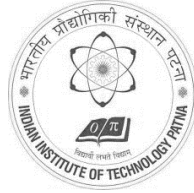
rraj@iitp.ac.in, rraj.iitp@gmail.com
+91-611-5233166 (office), +91-829-2339322 (mob)

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44.	Raj, R. , Adera, S., Enright, R., and Wang, E. N.,	High Resolution Liquid Patterns via Three-Dimensional Droplet Shape Control	<i>Nature Communications</i>	Impact Factor: 17.694 H5 Index: 307	2014, 5, 4975	doi:10.1038/ncomms5975
45.	Humplik, T., Raj, R. , Maroo, S. C., Laoui, T., and Wang, E. N.	Effect of Hydrophilic Defects on Water Transport in MFI Zeolites	<i>Langmuir</i>	Impact Factor: 4.331 H5 Index: 76	2014, 30(22), pp. 6446-6453.	DOI: 10.1021/la500939t
46.	Humplik, T., Raj, R. , Maroo, S. C., Laoui, T., and Wang, E. N.	Framework Water Capacity and Infiltration Pressure of MFI Zeolites	<i>Microporous and Mesoporous Materials</i>	Impact Factor: 5.876 H5 Index: 67	2014, 190, pp. 84-91.	http://dx.doi.org/10.1016/j.micromeso.2014.01.026
47.	Raj, R. , Adera, S., Enright, R., and Wang, E. N.	Polygonal Droplets on Microdecorated Surfaces	<i>Journal of Heat Transfer – Transactions of ASME</i>	Impact Factor: 1.855 H5 Index: 31	2014, 136 (8), pp. 080906.	http://dx.doi.org/10.1115/1.4027521
48.	Adera, S., Raj, R. , Enright, R., and Wang, E. N.,	Non-wetting Droplets on Hot Superhydrophilic Surface	<i>Nature Communications</i>	Impact Factor: 17.694 H5 Index: 307	2013, 4, 2518.	doi:10.1038/ncomms3518
49.	Raj, R. , Maroo, S. C., and Wang, E. N.,	Wettability of Graphene	<i>Nano Letters</i>	Impact Factor: 12.262 H5Index: 164	2013, 13 (4), pp. 1509-1515	DOI: 10.1021/nl304647t
50.	Raj, R. , Enright, R., Zhu, Y., Adera, S., and Wang, E. N.	Unified Model for Contact Angle Hysteresis on Heterogenous and Superhydrophobic Surfaces	<i>Langmuir</i>	Impact Factor: 4.331 H5 Index: 76	2012, 28 (45), pp. 15777-15788	DOI: 10.1021/la303070s
51.	Raj, R. , Kim, J., and McQuillen, J.,	Pool Boiling Heat Transfer on the International Space Station: Experimental Results and Model Verification	<i>Journal of Heat Transfer – Transactions of ASME</i>	Impact Factor: 1.855 H5 Index: 31	2012, 134(10), 101504-1 – 101504-14	doi:10.1115/1.4006846
52.	Kim, J., Raj, R. , and McQuillen, J.,	Gravity Scaling of Pool Boiling Heat Transfer	<i>Journal of the Japan Society of Microgravity Application</i>	ISSN: 0915 3616; 2188 9783	2012, 29 (2), pp. 92-98.	http://www.jasma.info/journal/wp-content/uploads/past/assets/images/jornal/29-2/2012_p092.pdf
53.	Raj, R. , Kunkelmann, C., Stephan, P., Plawsky, P., and Kim, J.,	Contact Line Behavior for Highly Wetting Fluid under Superheated Conditions	<i>International Journal of Heat and Mass Transfer</i>	Impact Factor: 5.431 H5 Index: 115	2012, 55 (9-10), pp. 2664-2675	https://doi.org/10.1016/j.ijheatmasstransfer.2011.12.026

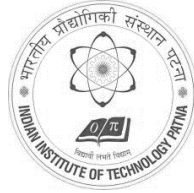


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54.	<u>Raj, R.</u> , Kim, J., and McQuillen, J.,	On the Scaling of Pool Boiling Heat Flux with Gravity and Heater Size	<i>Journal of Heat Transfer – Transactions of ASME</i>	Impact Factor: 1.855 H5 Index: 31	2012, 134 (1), pp. 011502-1 – 011502-13	doi:10.1115/1.4004370
55.	Di Marco, P., <u>Raj, R.</u> , and Kim, J.,	Boiling in Variable Gravity under the Action of Electric Field: Results of Parabolic Flight Experiments	<i>Journal of Physics: Conf. Ser.</i>	Impact Factor: 0.547 H5 Index: 39	2011, 327, 012039.	https://doi.org/10.1088/1742-6596/327/1/012039
56.	<u>Raj, R.</u> , Kim, J., and McQuillen, J.	Gravity Scaling Parameter for Pool Boiling Heat Transfer	<i>Journal of Heat Transfer – Transactions of ASME</i>	Impact Factor: 1.855 H5 Index: 31	2010, 132(9), pp. 091502-1 -091502-9.	doi:10.1115/1.4001632
57.	<u>Raj, R.</u> , and Kim, J.	Heater Size and Gravity Based Pool Boiling Regime Map: Transition Criteria between Buoyancy and Surface Tension Dominated Boiling	<i>Journal of Heat Transfer – Transactions of ASME,</i>	Impact Factor: 1.855 H5 Index: 31	2010, 132(9), pp. 091503-1 - 091503-10.	doi:10.1115/1.4001635
58.	<u>Raj, R.</u> , Kim, J., and McQuillen, J.	Subcooled Pool Boiling in Variable Gravity Environments	<i>Journal of Heat Transfer – Transactions of ASME,</i>	Impact Factor: 1.855 H5 Index: 31	2009. 131, pp. 091502-1 - 091502-10.	doi:10.1115/1.3122782
59.	<u>Raj, R.</u> , and Kim, J.,	Thermocapillary Convection during Subcooled Boiling in Reduced Gravity Environments	<i>Annals of the New York Academy of Sciences</i>	Impact Factor: 6.499 H5 Index: 77	2008, 1161, pp. 173-181.	DOI: 10.1111/j.1749-6632.2008.04327x
60.	Parida, P. R., <u>Raj, R.</u> , Prasad, A., and Mishra, S. C.,	Solidification of a Semitransparent Planar Layer subjected to radiative and convective cooling	<i>Journal of Quantitative Spectroscopy & Radiative Transfer</i>	Impact Factor: 2.342 H5 Index: 45	2007, 107, pp. 226-235.	https://doi.org/10.1016/j.jqsrt.2007.02.004
61.	<u>Raj, R.</u> , Prasad, A., Parida, P. R., and Mishra, S. C.,	Analysis of solidification of a semitransparent planar layer using the lattice Boltzmann method and the discrete transfer method	<i>Numerical Heat Transfer Part A</i>	Impact Factor: 2.569 H5 Index: 28	2006. 49, pp. 1-21.	https://doi.org/10.1080/10407780500359828

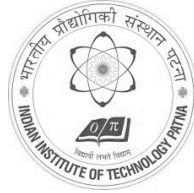
+ As per JCR accessed on June 30, 2022 ++ As per Google Scholar accessed on June 30, 2022

**Peer Reviewed Conference Proceedings**

- [1] Sharma, T., Erimban S., Azad, R., Nam, Y., Daschakraborty, S., and **Raj, R.**, “Decoding the vapor phase adsorption of aroma compounds on the vapor-liquid interface by molecular dynamic simulations,” *9th International and 49th National Conference on Fluid Mechanics and Fluid Power (FMFP)*, IIT Roorkee, Uttarakhand, India, December 14 – 16, 2022.
- [2] Sinha, R., Sunil, Thakur, A. D., and **Raj, R.**, “Development of an All Season Off the Grid Climate Control Unit for Agricultural Produce,” *Proceedings of the 26th National and 4th International ISHMT-ASTFE Heat and Mass Transfer Conference*, IIT Madras, Chennai, India, December 17-20, 2021.
- [3] Prakash, C. G. J., Gunjan, M. R., and **Raj, R.**, “Bio Inspired Honeycomb Pores as Lubricant Reservoir for Scalable and Durable Slippery Surfaces,” *Proceedings of the 26th National and 4th International ISHMT-ASTFE Heat and Mass Transfer Conference*, IIT Madras, Chennai, India, December 17-20, 2021.
- [4] Sharma, T., Kumar, V., Sinha, K. N. R., and **Raj, R.**, “Deep Learning Time Frequency Representations of Boiling Acoustics for Accurate Prediction of Transition between Heat Transfer Regimes,” *Proceedings of the 26th National and 4th International ISHMT-ASTFE Heat and Mass Transfer Conference*, IIT Madras, Chennai, India, December 17-20, 2021.
- [5] Sharma, T., Kumar, V., Sinha, K. N. R., and **Raj, R.**, “Physics Informed Deep Learning for Acoustic Detection of Departure from Nucleate Boiling,” *Proceedings of the 26th National and 4th International ISHMT-ASTFE Heat and Mass Transfer Conference*, IIT Madras, Chennai, India, December 17-20, 2021.
- [6] Kumar, V., Sinha, K. N. R., Sharma, T., and **Raj, R.**, “Acoustic Detection of Departure from Nucleate Boiling as a Precursor to the Critical Heat Flux,” *Proceedings of the 26th National and 4th International ISHMT-ASTFE Heat and Mass Transfer Conference*, IIT Madras, Chennai, India, December 17-20, 2021.
- [7] Upadhyay, A., Kumar, N., Pathak, M., and **Raj, R.**, “Numerical Simulation of Bubble Behavior during Pool Boiling with Foaming Solutions,” *Proceedings of the 26th National and 4th International ISHMT-ASTFE Heat and Mass Transfer Conference*, IIT Madras, Chennai, India, December 17-20, 2021.
- [8] Hedau, G., **Raj, R.**, and Saha, S.K., “Effect of Outlet Plenum Volume During Flow Boiling Inside Plain Parallel Microchannel,” *Proceedings of the 5th World Congress on Momentum, Heat and Mass Transfer (MHMT'20)*, Lisbon, Portugal Virtual Congress – October 2020.
- [9] Kumar, N., Sinha, K. N. R., Raza, M. Q., Seth, D., **Raj, R.**, “Aqueous ionic liquid solution based two-phase thermal management for adverse gravity applications,” *21st Electronics Packaging Technology Conference (EPTC)*, IEEE RS/EP/EDS Singapore Chapter, Singapore, December 4-6, 2019.
- [10] Kumar, N., Raza, M. Q., Sinha, K. N. R., Seth, D., and **Raj, R.**, “Heat Transfer Enhancement using Surface-Active Additive during Pool Boiling in a Confined Chamber,” *Proceedings of the 25th National and 3rd International ISHMT-ASTFE Heat and Mass Transfer Conference*, IIT Roorkee, Roorkee, India, December 23-31, 2019.
- [11] Sarode, A., **Raj, R.**, and Bhargav, A., “A Simple, Scalable and Cost-effective Technique for Pool Boiling Heat Transfer Enhancement,” *Proceedings of the 25th National and 3rd International ISHMT-ASTFE Heat and Mass Transfer Conference*, IIT Roorkee, Roorkee, India, December 23-31, 2019.
- [12] Sinha, K. N. R., Ranjan, D., Kumar, N., and **Raj, R.**, “Acoustic Detection of Microbubble Emission Boiling (MEB),” *Proceedings of the 25th National and 3rd International ISHMT-ASTFE Heat and Mass Transfer Conference*, IIT Roorkee, Roorkee, India, December 23-31, 2019.
- [13] Ranjan, D., Sinha, K. N. R., Raza, M. Q., Kumar, N., and **Raj, R.**, “Acoustic Feedback Controlled Pool Boiling of Aqueous Surfactant Solutions,” *Proceedings of the 25th National and 3rd International ISHMT-ASTFE Heat and Mass Transfer Conference*, IIT Roorkee, Roorkee, India, December 23-31, 2019. [Prof. P. K. Sarma Best Paper Award](#)
- [14] Raza, M. Q., Kumar, N., and **Raj, R.**, “Critical Heat Flux Enhancement during Subcooled Pool Boiling with Foaming Solution,” *CHEMCON 2018: 71st Annual Session of Indian Institute of Chemical Engineers*, NIT Jalandhar, December 27-30, 2018.
- [15] Kumar, N., Raza, M. Q., Seth, D., and **Raj, R.**, “Bubble Dynamics during Boiling with Foaming Ionic Liquid Solution,” *CHEMCON 2018: 71st Annual Session of Indian Institute of Chemical Engineers*, NIT Jalandhar, December 27-30, 2018.

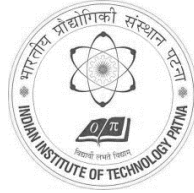


- [16] Gunjan, M. R., Kumar, A., and Raj, R., “Wettability of Lubricant-Infused Surfaces (LIS),” *7th International and 45th National Conference on Fluid Mechanics and Fluid Power*, IIT Bombay, Mumbai, India, December 10-12, 2018.
- [17] Kumar, A., Gunjan, M. R., Jakhar, K., and Raj, R., “Interface Shape Evolution during Buoyancy Induced Droplet Detachment,” *7th International and 45th National Conference on Fluid Mechanics and Fluid Power*, IIT Bombay, Mumbai, India, December 10-12, 2018.
- [18] Behera, D., Mohanty, D., Ghosh, D. P., Saha, S.K., and Raj, R., “Experimental Investigation of Single-Phase Heat Transfer on Scalable Nanostructured Microchannels,” *4th World Congress on Mechanical, Chemical, and Material Engineering*, Madrid, Spain, August 16-18, 2018.
- [19] Kumar, N., Raza, M. Q., Seth, D., and Raj, R., “Pool Boiling with Aqueous Ionic Liquid Solution,” *10th International Conference on Boiling and Condensation Heat Transfer*, Nagasaki, Japan, 12th – 15th March 2018. [Best Poster Award](#)
- [20] Raza, M. Q., Kumar, N., and Raj, R., “Critical Heat Flux Mechanisms during Pool Boiling with Nanofluids,” *10th International Conference on Boiling and Condensation Heat Transfer*, Nagasaki, Japan, 12th – 15th March 2018.
- [21] Kumar, N., Raza, M. Q., Seth, D., and Raj, R., “Pool Boiling with Aqueous Ionic Liquid Solutions for Zero Gravity Applications,” *24th National and 2nd International ISHMT-ASTFE Heat and Mass Transfer Conference*, Hyderabad, India, December 27-30, 2017.
- [22] Raza, M. Q., Kumar, N., and Raj, R., “Critical Heat Flux Mechanism during Pool Boiling with Surfactants,” *24th National and 2nd International ISHMT-ASTFE Heat and Mass Transfer Conference*, Hyderabad, India, December 27-30, 2017.
- [23] Sinha, N. R., and Raj, R., “Acoustic Detection of Leidenfrost Dynamics on Plain and Nanostructured Surfaces,” *24th National and 2nd International ISHMT-ASTFE Heat and Mass Transfer Conference*, Hyderabad, India, December 27-30, 2017.
- [24] Ghosh, D. P., Sharma, D., Saha, S.K., Raj, R., “Flow Boiling Enhancement using Scalable Nanostructures Inside Rectangular Microchannels,” *24th National and 2nd International ISHMT-ASTFE Heat and Mass Transfer Conference*, Hyderabad, India, December 27-30, 2017.
- [25] Sharma, D., Ghosh, D. P., Saha, S.K., Raj, R., “Optimization of Inlet and Outlet Manifolds for Flow Boiling Heat Transfer Enhancement in Microchannels,” *24th National and 2nd International ISHMT-ASTFE Heat and Mass Transfer Conference*, Hyderabad, India, December 27-30, 2017.
- [26] Hedau, G., Ghosh, D. P., Sharma, D., Vaeghese, A., Raj, R., Saha, S.K., “Effect of Nanostructure Microchannels on Flow Boiling Instability,” *24th National and 2nd International ISHMT-ASTFE Heat and Mass Transfer Conference*, Hyderabad, India, December 27-30, 2017.
- [27] Jakhar, K., and Raj, R., “Spline-based Interface Modeling and Optimization (SIMO) for Tensiometry and Goniometry Applications,” *44th National Conference on Fluid Mechanics and Fluid Power*, Amrita University, Amritapuri Campus, Kollam, Kerala, India, December 14-16, 2016.
- [28] Gunjan, M. R., and Raj, R., “Modelling of Inner Coffee Ring Deposits during Evaporation of Nanoparticle-laden Droplets,” *44th National Conference on Fluid Mechanics and Fluid Power*, Amrita University, Amritapuri Campus, Kollam, Kerala, India, December 14-16, 2017.
- [29] Kumar, A., Gunjan, M. R., Jakhar, K., and Raj, R., “Buoyancy Induced Detachment of Pendant Droplets from Surfaces with Contact Angle Hysteresis,” *44th National Conference on Fluid Mechanics and Fluid Power*, Amrita University, Amritapuri Campus, Kollam, Kerala, India, December 14-16, 2017.
- [30] Chaitanya, B., Thakur, A. D., Raj, R., “Biomass Gasifier Powered Adsorption Chiller for Atmospheric Water Harvesting: Prospects in Developing World,” *6th International Conference on Advances in Energy Research*, Indian Institute of Technology Bombay, India, December 12-14, 2017.
- [31] Adera, S., Antao, D. S., Raj, R., and Wang, E. N., “Thin-film evaporation from micropillar wicks in ambient environment”, *The Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems (ITHERM)*, Orlando, FL USA, May 30 – June 2, 2017.
- [32] Ghosh, D. P., Sharma, D., Raj, R., and Saha, S. K., “Enhancement of Flow Boiling Heat Transfer via Suppression of Pressure Drop Fluctuations in Nanostructured Microchannels,” *6th International and 43rd*

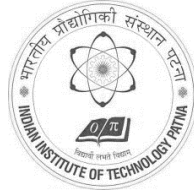


National Conference on Fluid Mechanics and Fluid Power, MNNITA, Allahabad, U.P., India, December 15-17, 2016.

- [33] Sharma, D., Ghosh, D. P., Raj, R., and Saha, S. K., "Flow Boiling in Microchannels: Experimental Study of Heat Transfer and Pressure Drop Fluctuations," *6th International and 43rd National Conference on Fluid Mechanics and Fluid Power*, MNNITA, Allahabad, U.P., India, December 15-17, 2016.
- [34] Gunjan, M. R., and Raj, R., "Modelling and Characterization of Mixed Mode of Droplet Evaporation," *6th International and 43rd National Conference on Fluid Mechanics and Fluid Power*, MNNITA, Allahabad, U.P., India, December 15-17, 2016.
- [35] Kumar, A., and Raj, R., "Evolution of Droplets with Polygonal Contact Line on Microstructured Surfaces," *6th International and 43rd National Conference on Fluid Mechanics and Fluid Power*, MNNITA, Allahabad, U.P., India, December 15-17, 2016.
- [36] Kumar, N., Raza, M. Q., and Raj, R., "Effect of Orientation on Pool Boiling Heat Transfer with Aqueous Surfactant Solution," *6th International and 43rd National Conference on Fluid Mechanics and Fluid Power*, MNNITA, Allahabad, U.P., India, December 15-17, 2016.
- [37] Raza, M. Q., Kumar, N., and Raj, R., "Surfactant Enhanced Pool Boiling Heat Transfer in Confined Spaces," *6th International and 43rd National Conference on Fluid Mechanics and Fluid Power*, MNNITA, Allahabad, U.P., India, December 15-17, 2016.
- [38] Shukla, V., Raza, M. Q., Kumar, N., and Raj, R., "Effect of Sidewall Containment on Pool Boiling with Aqueous Surfactant Solution on an Inverted Heater," *6th International and 43rd National Conference on Fluid Mechanics and Fluid Power*, MNNITA, Allahabad, U.P., India, December 15-17, 2016.
- [39] Raj, R., and Thakur, A., "Buoyancy Induced Detachment of Pendant Droplets," *6th International and 43rd National Conference on Fluid Mechanics and Fluid Power*, MNNITA, Allahabad, U.P., India, December 15-17, 2016.
- [40] Adera, S., Antao, D. S., Raj, R., and Wang, E. N., "Experimental Characterization and Modeling of Capillary-Pumped Evaporation from Micropillar Wicks," *Heat Transfer, Fluids Engineering, & Nanochannels, Microchannels, and Minichannels Conferences*, Washington DC, USA, July 10-14, 2016. **Best Paper Award**
- [41] Adera, S., Antao, D. S., Raj, R., and Wang, E. N., "Extreme Hotspot Heat Flux Thermal Management via Thin-Film Evaporation from Microstructured Surfaces," *Hilton Head 2016 Workshop, A Solid-State Sensors, Actuators and Microsystems Workshop*, Sonesta Resort, SC 29928, USA, June 5-9, 2016.
- [42] Adera, S., Antao, D. S., Raj, R., and Wang, E. N., "Hotspot Thermal Management via Thin-Film Evaporation," *The Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems*, Cosmopolitan Hotel, Las Vegas, NV, USA, May 31 - June 3, 2016. **Best Poster Award**
- [43] Kumar, N., Raza, M. Q., and Raj, R., "Comparison of Bubble Behavior and Heat Transfer during Pool Boiling with Aqueous Surfactant Solution on Upward and Downward Facing Heater," *CHEMCON 2015, 68th Annual Session of Indian Institute of Chemical Engineers*, Guwahati, India. December 27-30, 2015.
- [44] Ghosh, D. P., Mohanty, D., Saha, S. K., and Raj, R., "Fabrication of Nanostructured Microchannels for Enhancement of Single and Multiphase Heat Transfer," *23rd National Heat and 1st International ISHMT-ASTFE Heat and Mass Transfer Conference*, Thiruvananthapuram, India, December 17-20, 2015.
- [45] Raza, M. Q., and Raj, R., "Pool Boiling Critical Heat Flux Enhancement for Reduced Gravity Application," *23rd National Heat and 1st International ISHMT-ASTFE Heat and Mass Transfer Conference*, Thiruvananthapuram, India, December 17-20, 2015.
- [46] Chattopadhyay, A., Thakur, A., and Raj, R., "Spline Based Modeling of Static and Sliding Droplets with Contact Angle Hysteresis", *42nd National Conference on Fluid Mechanics and Fluid Power*, National Institute of Technology, Surathkal, India, December 14-16, 2015.
- [47] Wei, M., Somasundaram, S., He, B., Liang, Q., Raj, R., Tan, C. S., and Wang, E. N., "Optimization of Biporous Micropillar Array for Enhanced Heat Transfer Performance", *ASME International Mechanical Engineering Congress and Exposition*, Houston, Texas, USA, November 13-19, 2015.
- [48] Raza, M. Q., and Raj, R., "Surfactant-Enhanced Pool Boiling Heat Transfer During Surface Tension Dominated Boiling Regime", *9th International Conference on Boiling and Condensation Heat Transfer*, Boulder, Colorado, USA, April 26-30, 2015.

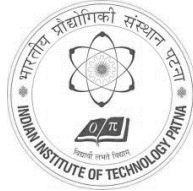


- [49] Chattopadhyay, A., Thakur, A., and Raj, R., "Spline Based Two-Dimensional Modeling of Droplets on Rough and Heterogeneous Surfaces", *5th International and 41st National Conference on Fluid Mechanics and Fluid Power*, Kanpur, India, December 12-14, 2014.
- [50] Raza, M. Q., and Raj, R., "Pool Boiling Heat Transfer with Aqueous Surfactant Solutions: Importance of Time Scales", *IUTAM Symposium on Multiphase Flows with Phase Change: Challenges and Opportunities*, Hyderabad, India, December 08-11, 2014.
- [51] Raj, R. and Wang, E. N., "Influence of Dynamic Wettability on Evaporation Kinetics of Microscopic Sessile Droplets," *The 15th International Heat Transfer Conference*, Kyoto, Japan August 10-15, 2014.
- [52] Lu, Z., Narayanan, S., Hanks, D. F., Raj, R., Xiao, R., Antao, D. S., and Wang, E. N., "Modeling of Nanoporous Membranes for High Flux Thin Film Evaporation," *The 15th International Heat Transfer Conference*, Kyoto, Japan August 10-15, 2014.
- [53] Hanks, D. F., Lu, Z., Bagnall, K. R., Narayanan, S., Raj, R., Xiao, R., and Wang, E. N., "Nanoporous Evaporative Device for Advanced Electronics Thermal Management", *The Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems (ITHERM)*, Orlando, FL USA, May 27-30, 2014. [Best Paper Award](#)
- [54] Humplik, T., Raj, R., Maroo, S. C., Laoui, T., and Wang, E. N., 2014, "Selective Water Transport Across Uniform Sub-Nanometer Pores in Microfabricated Membranes," *Hilton Head 2014 Workshop, A Solid-State Sensors, Actuators and Microsystems Workshop*, Sonesta Resort, SC 29928, USA, June 8 - 12, 2014.
- [55] Liang, Q., Raj, R., Adera, S., Somasundaram, S., Tan, C. S., and Wang, E. N., "Experiment and Modeling of Microstructured Capillary Wicks for Thermal Management of Electronics," *15th Electronic Packaging Technology Conference*, Singapore, December 11-13, 2013.
- [56] Adera, S., Raj, R. and Wang, E. N., "Capillary Limited Thin-Film Evaporation on Microstructured Surfaces," *ASME 2013 4th Micro/Nanoscale Heat and Mass Transfer International Conference*, Hong Kong, China, December 11-14, 2013.
- [57] Adera, S., Raj, R., Enright, R., and Wang, E. N., "Evaporation-Induced Cassie Droplets on Superhydrophilic Microstructured Surfaces," *ASME 2012 10th International Conference on Nanochannels, Microchannels and Minichannels*, Puerto Rico, July 8-12, 2012.
- [58] Raj, R., Kim, J., and McQuillen, J., "On the Scaling of Pool Boiling Heat Flux with Gravity and Heater Size," *ASME/JSME 8th Thermal Engineering Joint Conference*, Honolulu, Hawaii, March 13-17, 2011.
- [59] Raj, R., Kim, J., and McQuillen, J., Sheredy, W., Booth, W., Charpie, J., Eggers, J., Funk, G., Funk, J., and Valentine, R., "Heater Size and Orientation Effect on Pool Boiling of FC-72," *ASME International Heat Transfer Conference IHTC-14*, Washington D.C., August 8-13, 2010.
- [60] Raj, R., Kim, J., McQuillen, J., "Gravity Scaling Parameter for Pool Boiling Heat Transfer," *ASME International Mechanical Engineering Congress and Exposition*, Lake Buena Vista, Florida, November 13-19, 2009. [Best Poster Award](#)
- [61] Raj, R. and Kim, J., "Heater Size Effect on Subcooled Boiling of FC-72", *7th ECI Conference on Boiling*, Florianopolis-SC, Brazil, May 3-7, 2009.
- [62] Raj, R. and Kim, J., "Thermocapillary Convection During Subcooled Boiling in Reduced Gravity Environments," *Interdisciplinary Transport Phenomena V: Fluid, Thermal, Biological, Material and Space Sciences*, Banskó, Bulgaria, October 14-19, 2007.
- [63] Raj, R., Prasad, A., Parida, P. R., and Mishra, S. C., "Analysis of Phase Change of a Semitransparent Media using the Lattice Boltzmann Method and the Discrete Transfer Method," *18th National and 7th International ISHMT-ASME Heat and Mass Transfer Conference*, Indian Institute of Technology Guwahati, India, January 4-6, 2006.
- [64] Mishra, S. C., Parida, P. R., Raj, R. and Prasad, A., "Application of the Lattice Boltzmann Method and the Discrete Ordinate Method for the Analysis of Solidification of a Semitransparent Planar Layer Subjected to Radiative and Convective Cooling," *International Conference on Advanced Material Design and Development*, Goa, India, December 14-16, 2005.

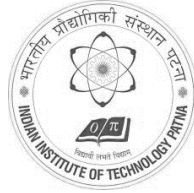


Peer Reviewed Conference Presentations

- [65] Alam, Md. Q., Upadhyay, A., Sinha, K. N. R., Kumar, V., Assam, A., Thakur, T., and Raj, R.*, “Acoustic characterization of bubbles for in-situ prediction and control of boiling heat transfer regimes,” *11th International Conference on Boiling and Condensation Heat Transfer, ICHCCT-2023*, University of Edinburgh, May 15-17, 2023.
- [66] Upadhyay, A.*, Kumar, B., and Raj, R., “Simultaneous Enhancement in Pool Boiling CHF and HTC with the Aqueous Solutions of Mixture of SDS and [C2mim][Cl],” *Indian Chemical Engineering Congress & 75th Annual Session of Indian Institute of Chemical Engineers CHEMCON - 2022*, Harcourt Butler Technical University Kanpur, December 27 – 30, 2022.
- [67] Kumar, B.*, Upadhyay, A., and Raj, R., “Synergistic Effect of Ionic Liquid on the Foamability of Aqueous Surfactant Solutions,” *Indian Chemical Engineering Congress & 75th Annual Session of Indian Institute of Chemical Engineers CHEMCON - 2022*, Harcourt Butler Technical University Kanpur, December 27 – 30, 2022.
- [68] Alam, M. Q.*, Upadhyay, A., Assam, A., and Raj, R., “Numerical Investigation of Passive Acoustic Emissions during Bubble Departure from an Underwater Nozzle,” *Indian Chemical Engineering Congress & 75th Annual Session of Indian Institute of Chemical Engineers CHEMCON - 2022*, Harcourt Butler Technical University Kanpur, December 27 – 30, 2022.
- [69] Azad, R.*, Sharma, T., Nam, Y., Daschakraborty, S., and Raj, R., “On-demand rupture of condensate film via interfacial adsorption of aroma compounds,” *Indian Chemical Engineering Congress & 75th Annual Session of Indian Institute of Chemical Engineers CHEMCON-2022*, Harcourt Butler Technical University, Kanpur, India, December 27 – 30, 2022.
- [70] Sunil*, Sinha R., Agarwal, A., Thakur, A. D., and Raj, R., “Biomass Gasification-based Low Temperature Drying of Farm Perishables,” *International Virtual Conference on H2 and CO2 2022 (ICH2CO2'22)*, Indian Institute of Science Education and Research Pune, India, November 17 – 19, 2022.
- [71] Upadhyay, A.*, Kumar, B., and Raj, R., “Understanding the Role of Counterions of Imidazolium-based Ionic Liquids on Boiling Heat Transfer,” *International Chemical Engineering Conference 2022*, Indian Institute of Technology Patna, November 12 – 13, 2022. [*Best Presentation Award](#)
- [72] Sharma, T., Erimban, S., Azad, R., Nam, Y., Daschakraborty, S., and Raj, R., “Molecular dynamic simulations of aroma compounds adsorbed on vapor-liquid interface,” *International Chemical Engineering Conference 2022*, Indian Institute of Technology Patna, November 12 – 13, 2022.
- [73] Sunil, Agarwal, A., Thakur, A. D., and Raj, R., “Comparison of High Cycle Performance of Calcium Chloride Composites,” *International Chemical Engineering Conference 2022*, Indian Institute of Technology Patna, November 12 – 13, 2022.
- [74] Sinha, K. N. R., Kumar, V., Thakur, A., and Raj, R., “Decoding the Sound of Boiling for Advance Prediction of Boiling Crisis,” *1st International Conference in Fluid, Thermal, and Energy Systems (ICFTE22)*, NIT Calicut, June 9, 2022, [Keynote Address](#).
- [75] Raza, M. Q., Kumar, N., Verma, A., and Raj, R., “Boiling Based Thermal Management Strategies for Earth and Reduced Gravity Applications,” *Online International Symposium on Fluid and Thermal Engineering (FLUTE 2021)*, Amity University, 22nd July, 2021. [Keynote Address](#)
- [76] Gunjan, M. R., Kumar, A., and Raj, R., “Constant Mean Curvature Based Framework for Modeling Droplet Evaporation on Lubricant-Infused Surfaces,” *10th International Colloids Conference, Mallorca, Spain (Conducted Online)*, December 6-9, 2020. [Best Poster Award](#)
- [77] Kumar, A., Gunjan, M. R., and Raj, R., “Unified Tool for Mapping the Evolution of Sessile Drop Under the Influence of Gravity,” *10th International Colloids Conference, Mallorca, Spain (Conducted Online)*, December 6-9, 2020.
- [78] Chaitanya, B., Gunjan, M. R., Thakur, A. D., and Raj, R., “Fabrication of Robust and PFC Free Superhydrophobic Copper Surfaces,” *10th International Colloids Conference, Mallorca, Spain (Conducted Online)*, December 6-9, 2020.
- [79] Kumar, N., Raza, M. Q., and Raj, R., “Boiling with Foaming Solutions for Earth and Microgravity Applications”, *25th National and 3rd International ISHMT-ASTFE Heat and Mass Transfer Conference (IHMTc)*, IIT Roorkee, India, 28-31 December 2019. [Keynote Address](#)
- [80] Raza, M. Q., Kumar, N., and Raj, R., “Critical Heat Flux Mechanism during Pool Boiling with Foaming Solutions,” *2019 Micro and Nanoscale Phase Change Heat Transfer, GRC, Renaissance Tuscany II Ciocco in Lucca (Barga) Italy, February 3-8, 2019.*



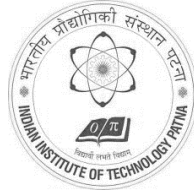
- [81] Sinha, K. N. R., Ranjan, D., and Raj, R., "Acoustic Detection of CHF during Pool Boiling", *Proceedings of the National Conference on Critical Heat Flux and Multiphase Flow*, Indian Institute of Technology, BHU, December 22-23, 2018.
- [82] Kumar, N., Raza, M. Q., and Raj, R., "Pool Boiling Critical Heat Flux Enhancement in the Absence of Buoyancy Induced Bubble Departure", *Proceedings of the National Conference on Critical Heat Flux and Multiphase Flow*, Indian Institute of Technology, BHU, December 22-23, 2018.
- [83] Raza, M. Q., Kumar, N., and Raj, R., "Critical Heat Flux with Foaming Solutions: Mechanism and Modeling", *Proceedings of the National Conference on Critical Heat Flux and Multiphase Flow*, Indian Institute of Technology, BHU, December 22-23, 2018.
- [84] Raza, M. Q., Kumar, N., and Raj, R., "Vapor Crowding-based Limit to Pool Boiling Critical Heat Flux," *ASME 2017 International Conference on Nanochannels, Microchannels and Minichannels*, Hyatt Regency, Cambridge, MA, August 27-30, 2017. [Keynote Address](#)
- [85] Adera, S., Antao, D. S., Raj, R., and Wang, E. N., "Hotspot Cooling via Thin-Film Evaporation," *MARC 2016*, Bretton Woods, NH, January, 2016.
- [86] Hanks, D. F., Lu, Z., Sircar, J., Raj, R., Antao, D. S., Narayanan, S., Barabadi, B., Enright, R., Salamon, T., Simon, E., Wang, E. N., "Microfabricated Nanoporous Membrane-Based Evaporation for High Heat Flux Thermal Management," *GOMACTech*, St. Louis, MO, May 23-26, 2015.
- [87] Raj, R., Adera, S., Enright, R., and Wang, E. N., "Wettability on Micro and Nanoscale Surfaces for Improved Understanding of Phase Change Heat Transfer," *Gordon Research Conference on Micro and Nanoscale Phase Change Heat Transfer*, Galveston, TX, January 10-16, 2015.
- [88] Antao, D. S., Adera, S., Raj, R., and Wang, E. N., "Probing the Liquid-Vapor Interface during Phase Change Heat Transfer," *Gordon Research Conference on Micro and Nanoscale Phase Change Heat Transfer*, Galveston, TX, January 10-16, 2015.
- [89] Adera, S., Antao, D. S., Raj, R., and Wang, E. N., "Experimental Study of Thin-Film Evaporation from Microstructured Surfaces," *MARC 2015*, Bretton Woods, NH, January, 2015.
- [90] Humplik, T., Raj, R., Maroo, S. C., Laoui, T., and Wang, E. N., "Optimized Zeolite-based Membranes for Water Desalination," *MARC 2014*, Bretton Woods, NH, January 2014.
- [91] Raj, R., Adera, S., Enright, R., and Wang, E. N., "Polygonal Droplets on Microstructured Surfaces," Visualization of Heat Transfer, *ASME 2013 Summer Heat Transfer Conference, Minneapolis, MN*, July 14-19, 2013.
- [92] Raj, R., Enright, R., Zhu, Y., Adera, S., Wang, E. N., "Thermodynamic Model for Contact Angle Hysteresis on Heterogeneous and Superhydrophobic Surfaces," *ASME 2013 Summer Heat Transfer Conference, Minneapolis, MN*, July 14-19, 2013.
- [93] Raj, R., Xiao, R., and Wang, E. N., "Experiments, Modeling, and Optimization of Thin Film Evaporation in Microstructured Capillary Wicks," *ASME 2013 Summer Heat Transfer Conference, Minneapolis, MN*, July 14-19, 2013.
- [94] Raj, R., Maroo, S. C., and Wang, E. N., "Substrate Effect on the Wettability of Graphene," *2013 Material Research Society Spring Exhibit and Meeting*, San Francisco, California, April 1-5, 2013.
- [95] Humplik, T., Raj, R., Laoui, T., Wang, E. N., "Determining the Optimal Zeolite Properties for Increasing Water Permeability," *2013 Material Research Society Spring Exhibit and Meeting, San Francisco, CA*, April 1-5, 2013.
- [96] Raj, R., Enright, R., Adera, S., and Wang, E. N., "Thermodynamic Model for Contact Angle Hysteresis on Rough Surfaces," *Bulletin of the American Physical Society, APS March Meeting*, 58(1), 2013.
- [97] Adera, S., Raj, R., Enright, R., and Wang, E. N., "Evaporation-Induced Cassie Droplets on Superhydrophilic Microstructured Surfaces," *ASME International Mechanical Engineering Congress and Exposition*, Houston, Texas, November 9-15, 2012.
- [98] Di Marco, P., Raj, R., and Kim, J., "Boiling in Variable Gravity under the Action of Electric Field: Preliminary Results of Two Parabolic Flight Experiments," *Seventh International Topical Team Workshop on Two-Phase Systems for Ground and Space Applications*, Beijing, China, September 17-21, 2010.
- [99] Kim, J., Raj, R., and McQuillen, J., Pool Boiling Heat Transfer in Microgravity: Results from the Microheater Array Boiling Experiment (BXF-MABE) on the ISS, *1st Annual ISS research and Development Conference*, Colorado, Denver, USA, June 26-27, 2012.



- [100] [Raj, R.](#), and Kim, J., “Characterization of Pool Boiling over a Range of Gravity Levels and Heater Sizes,” *Fifth International Topical Team Workshop on Two-Phase Systems for Ground and Space Applications*, Kyoto, Japan, September 26-29, 2010. [Best Poster Award](#)
- [101] [Raj, R.](#), Kim, J., and John McQuillen, “Gravity Scaling Parameter for Pool Boiling Heat Transfer,” *Fifth International Topical Team Workshop on Two-Phase Systems for Ground and Space Applications*, Kyoto, Japan, September 26-29, 2010.
- [102] Di Marco, P., [Raj, R.](#), and Kim, J., “Boiling in Variable Gravity under the Action of Electric Field: Preliminary Results from the Parabolic Flight Experiments,” *Fifth International Topical Team Workshop on Two-Phase Systems for Ground and Space Applications*, Kyoto, Japan, September 26-29, 2010.
- [103] [Raj, R.](#), Kim, J., and McQuillen, J., “Subcooled Pool Boiling in Variable Gravity Environments,” *Third International Topical Team Workshop on Two-Phase Systems for Ground and Space Applications*, Brussels, Belgium, September 10-12, 2008.

8. Invited Talks

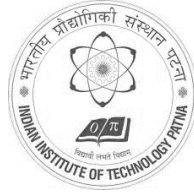
- i. Acoustic Characterization of Bubbles for In-situ Prediction and Control of Boiling Heat Transfer Regimes, *Department of Mechanical Engineering, IIT Gandhinagar, January 6, 2023.*
- ii. Decoding the Sound of Boiling for Advance Prediction of Boiling Crisis, *1st International Conference in Fluid, Thermal, and Energy Systems (ICFTE22), NIT Calicut, June 9, 2022, [Keynote Address](#).*
- iii. Acoustic Prediction and Control of Boiling Heat Transfer Regimes, *Thermal Transport Café, May 19, 2022.*
- iv. Decoding the Sound of Boiling for Advance Prediction of Boiling Crisis, *Department of Mechanical Engineering, IIT Ropar, February 3, 2022.*
- v. Droplet on Lubricant Infused Surfaces: Union of Constant Mean Curvature Surfaces, *48th National Conference on Fluid Mechanics and Fluid Power (FMFP 2021), Birla Institute of Science and Technology Pilani, Rajasthan, India, 27-29 December, 2021, [Keynote Address](#).*
- vi. Boiling Based Thermal Management Strategies for Earth and Reduced Gravity Applications, *FLUTE – 2021, International Symposium on Fluids and Thermal Engineering, Amity University, 22nd July, 2021, [Keynote Address](#).*
- vii. Boiling Heat Transfer with Foaming Solutions for Terrestrial and Microgravity Applications, *Faculty Development Programme (FDP) on "Advanced Engineered Surfaces for Phase Change Heat Transfer Application", Department of Chemical Engineering, NIT Calicut, India, July 13, 2021.*
- viii. Bubble Dynamics during Boiling with Foaming Solutions: Implications on Earth and Microgravity Heat Transfer, *Department of Mechanical and Materials Engineering, University of Cincinnati (online), USA, January 22, 2021.*
- ix. Enhancement of Boiling Heat Transfer via the Suppression of Coalescence in Microgravity, *ISRO Academia Day 2021, January 7, 2021.*
- x. Novel Insights on Fluidic Interfaces in Thermal Applications, Bubble Dynamics during Boiling with Foaming Solutions, *ScienceConnect: Langmuir, The ACS Journal of Fundamental Interface Science, 10-12 October, 2020.*
- xi. Boiling Heat Transfer in Earth and Space, *TEQIP-3 Webinar, Bhagalpur College of Engineering, Gaya, Bihar, India, September 25, 2020.*
- xii. Boiling Heat Transfer in Earth and Space, *TEQIP-3 Webinar, Gaya College of Engineering, Gaya, Bihar, India, August 4, 2020.*
- xiii. Bubble Dynamics during Boiling with Foaming Solutions, *Two Day International Workshop on Interfacial Flow and Heat Transfer in Droplets and Liquid Films for Advanced Thermal Management, Indian Institute of Technology, Bombay, India, March 6-7, 2020*
- xiv. Boiling with Foaming Solutions for Earth and Microgravity Applications, *25th National and 3rd International ISHMT-ASTFE Heat and Mass Transfer Conference, IIT Roorkee, India, December 28-31, 2019, [Keynote Address](#).*
- xv. Passive Heat Spreader for Hotspot Mitigation, *Structured Training Programme (STP) on 'GenNext Spacecraft Systems & Technologies', URSC, ISRO, December 16-20, 2019.*



- xvi. Workshop on Research Projects and Publications, Keynote Address, *Amity University, Ranchi, Jharkhand*, July 2019.
- xvii. Energizing the Waste: Biomass Based Gasifier Heating System for Energy and Environment Applications, TEQIP-III Sponsored Faculty Development Programme, *Bhagalpur College of Engineering, Bihar*, May 2019.
- xviii. Development of Two-Phase heat Sinks for Earth and Microgravity Thermal Management Applications, *Department of Mechanical Engineering, Indian Institute of Science, Bangalore*, April 5, 2019.
- xix. Agricultural Waste Based Gasifier Heating System for Various Energy and Environment Applications, *TEQIP III, National Institute of Technology Patna*, December 19, 2018.
- xx. Two-Phase Heat Spreader for Hotspot Mitigation in Reduced Gravity Applications, *INAE Annual Convention, RCI Hyderabad*, December 13-15, 2018.
- xxi. Pool Boiling Critical Heat Flux Enhancement Strategies on Earth and in reduced Gravity of Space, *Indian Institute of Technology Gandhinagar*, September 8, 2017.
- xxii. Vapor Crowding-based Limit to Pool Boiling Critical Heat Flux, *ASME 2017 International Conference on Nanochannels, Microchannels and Minichannels*, Hyatt Regency, Cambridge, MA, August 27-30, 2017, [Keynote Address](#).
- xxiii. Vapor Crowding based Hydrodynamic Limit to Critical Heat Flux during Pool Boiling with Nanofluids and Aqueous Surfactant Solutions, *Department of Mechanical Engineering, University of Maryland, College Park, MD, USA*, August 25, 2017.
- xxiv. Critical Heat Flux Mechanism during Boiling with Surfactants, *6th International and 43rd National Conference on Fluid Mechanics and Fluid Power*, MNNITA, Allahabad, U.P., India, December 2016.
- xxv. Boiling Heat Transfer: Introduction to Applications, *Workshop on Boiling Heat Transfer*, BCE Bhagalpur, Bihar, December 2016.
- xxvi. Nanotechnology for Two Phase Flow and Heat Transfer Enhancement, *TEQIP-II Sponsored Two Day's National Workshop on Advances in Two-Phase Flow and Heat Transfer*, NIT Agartala, Tripura, March 2016.
- xxvii. Nanotechnology for Energy Efficient Thermal Management, TEQIP-II Sponsored Faculty Development Programme, *College of Engineering, Adoor, Kerala*, December 2015.
- xxviii. Surfactants for Bubble Removal against Buoyancy, *ISRO Satellite Centre*, Bangalore, December 2015.
- xxix. SEISMECH 2015, The Annual Technical Symposium, Department of Mechanical Engineering, IIT Guwahati, March 2015.
- xxx. Role of Wettability on Micro and Nano-structured Surfaces for Enhanced Phase Change Heat Transfer, *International Workshop on Thermal Design and Management in Electronics*, Bangalore, December 2013.
- xxxi. Microheater Array Boiling Experiment (MABE) on the International Space Station, *ISRO Satellite Centre*, Bangalore, December 2013.
- xxxii. Thermo-Fluidic Transport Processes Near the Three-Phase Contact Line, *Recent Advances in Micro/Nanoscale Heat Transfer and Applications in Clean Energy Technologies*, IIT Ropar, December, 2013
- xxxiii. Thermo-Fluidic Transport Processes near the Microscopic Contact Line, *International Symposium on Micro/Nanoscale Heat Transfer & its Applications*, PEEST Bangalore, December 2013.
- xxxiv. Surface Heterogeneity Effects on the Wettability of Graphene, *Department of Mechanical Engineering, Syracuse University*, March 2013.
- xxxv. Multiscale Transport Phenomena for Space and Energy Applications, *Department of Mechanical Engineering, Indian Institute of Technology, Bombay*, September 2012.

9. Popular Science Lectures

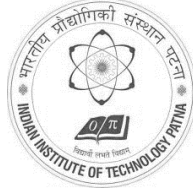
- i. Weight, Less Weight, and Weightlessness, *Moon Landing Day, Shrikrishna Science Centre, Patna*, July 20, 2022.
- ii. Finding your Thrill, TEDx Talk, *IIT Patna*, September 10, 2021.



10. Student Guidance

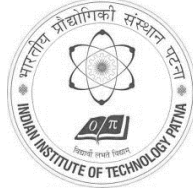
Doctor of Philosophy (Ph.D.): Awarded: 7, Ongoing: 8

Student Name	Theme/Thesis Title	Others Guides	Duration
Surendra Prasad Yadav	BOILING HEAT TRANSFER		2023 – till date
Rajnish Azad	CONDENSATION HEAT TRANSFER	Dr. Snehashis Daschakraborty (Chemistry)	2022 – till date
Md. Quamar Alam	BUBBLE ACOUSTICS	Dr. Ashwani Assam (Mechanical)	2022 – till date
Tonmoy Sharma Prime Minister's Research Fellowship	CONDENSATION HEAT TRANSFER	Dr. Snehashis Daschakraborty (Chemistry)	2021 – till date
Avinash Upadhyay	BOILING HEAT TRANSFER		2021 – till date
Abhash Shukla	ATMOSPHERIC WATER HARVESTING	Dr. Ajay D. Thakur (Physics)	2021 – till date
Rahul Sinha	RENEWABLE ENERGY	Dr. Ajay D. Thakur (Physics)	2019 – till date
Sunil	RENEWABLE ENERGY	Dr. Ajay D. Thakur (Physics)	2019 – till date
Kumar Nishant Ranjan Sinha	ACOUSTIC CHARACTERIZATION OF BUBBLE BEHAVIOR FOR IN-SITU PREDICTION AND CONTROL OF BOILING HEAT TRANSFER REGIMES		2016-2022 Awarded
Madhu Ranjan Gunjan	MODELING THE EFFECT OF CONTAMINANTS AND LUBRICANT FILM ON THE MODES OF DROPLET EVAPORATION		2016-2022 Awarded
Alok Kumar	MODELING AND SIMULATION OF FLUID-FLUID INTERFACE AND THREE-PHASE CONTACT LINE OF DROPS AND BUBBLES ON SOLID SURFACES		2015-2022 Awarded
Bathina Chaitanya	FABRICATING ECO-FRIENDLY SUPERHYDROPHOBIC COATING AND EXPLOITING BIOMASS ENERGY POTENTIAL FOR SUSTAINABLE ATMOSPHERIC WATER HARVESTING	Dr. Ajay D. Thakur (Physics)	2015-2022 Awarded
Nirbhay Kumar	DESIGN AND DEVELOPMENT OF AN ORIENTATION INDEPENDENT AND WICKLESS TWO-PHASE HEAT SPREADER		2016-2021 Awarded
Durga Prasad Ghosh	SUPPRESSION OF TWO-PHASE INSTABILITIES IN MICROCHANNEL HEAT SINKS VIA ADAPTIVE VAPOR VENTING		2015-2019 Awarded
Md. Qaisar Raza	POOL BOILING OF FOAMING SOLUTIONS FOR EARTH AND REDUCED GRAVITY HEAT TRANSFER APPLICATIONS		2014-2019 Awarded



Master of Technology (M.Tech.): Awarded: 15, Ongoing: 3

Student Name	Theme/Dissertation Title	Others Guides	Duration
Ravindra Kumar	MICROFLUIDICS	Dr. Abhishek Raj	2022-2024
Kundan Saha	SMART STETHOSCOPE	Dr. Atul Thakur	2022-2024
Brijesh Kumar	BOILING HEAT TRANSFER		2021-2023
Monisha Daimari	BUBBLE ACOUSTICS USING COMPUTATIONAL FLUID DYNAMICS SIMULATIONS	Dr. Ashwani Assam (Mechanical)	2020-2022
Ninad Pradeep Kuware	PROGNOSIS AND CONTROL OF BOILING CRISIS BY LEVERAGING ACOUSTIC EMISSIONS AND DEEP LEARNING	Dr. Atul Thakur (Mechanical)	2020-2022
Tonmoy Sharma	DEEP LEARNING TIME-FREQUENCY REPRESENTATIONS OF BOILING ACOUSTICS FOR ACCURATE PREDICTION OF TRANSITION BETWEEN HEAT TRANSFER REGIMES		2019-2021
Avinash Upadhyay Institute Silver Medal	NUMERICAL SIMULATION OF BUBBLE BEHAVIOR IN SURFACTANT AIDED POOL BOILING	Dr. Manabendra Pathak (Mechanical)	2019-2021
Vijay Kumar Institute Silver Medal	LEIDENFROST PHENOMENON DURING QUENCHING IN AQUEOUS SOLUTIONS		2018-2020
Ashwani Verma	DIRECT PREDICTION OF FOAMABILITY OF AQUEOUS SURFACTANT SOLUTION FROM THE PROPERTY VALUES		2018-2020
Sabya Sachi	FLOW BOILING IN MICROCHANNELS WITH AQUEOUS IONIC LIQUID SOLUTION		2018-2020
Rabindra Sarangi Best M.Tech. Project Award	ROBUST SUPER-HYDROPHOBIC SURFACE WITH SELF-CLEANING, WATER DROPLET BOUNCING, AND DROPWISE CONDENSATION PROPERTIES	Dr. Ajay D. Thakur (Physics)	2017-2019
Dugesh Ranjan	ACOUSTIC FEEDBACK CONTROL OF POOL BOILING WITH AQUEOUS SURFACTANT SOLUTIONS		2017-2019
Anurag Kumar Institute Silver Medal, and Best M.Tech. Project Award	FLUIDIC HIGH-PASS FILTER FOR SUPPRESSING TWO-PHASE INSTABILITIES IN MICROCHANNEL HEAT SINKS		2017-2019
Ajit Kumar Tanti	PERFORMANCE EVALUATION OF GASIFIER HOT WATER GENERATION SYSTEM WITH PINEWOOD PELLETS		2017-2019
Sumit Banerjee	DEVELOPMENT, CHARACTERIZATION AND CONTROL OF A BOILING-BASED VARIABLE BUOYANCY ROBOT	Dr. Atul Thakur (Mechanical)	2015-2017
Deepak Sharma Best M.Tech. Project Award	INVESTIGATION OF LIQUID SUPPLY MANIFOLD DESIGNS FOR FLOW BOILING HEAT TRANSFER ENHANCEMENT IN MICROCHANNEL HEAT SINKS		2015-2017
Nirbhay Kumar	SURFACTANT AIDED BUBBLE DEPARTURE DURING POOL BOILING ON UPWARD AND VERTICAL FACING HEATER ORIENTATIONS		2014-2016



Student Name	Theme/Dissertation Title	Others Guides	Duration
Guddi Kumari	DEVELOPMENT OF A DATA ACQUISITION UNIT FOR TEMPERATURE MONITOR AND CONTROL DURING POOL BOILING APPLICATION	Dr. Atul Thakur (Mechanical)	2013-2015

Bachelor of Technology (B.Tech.): Awarded: 13, Ongoing: 4

Student Name	Graduation Year	Student Name	Graduation Year
MANAV AGRAWAL	2024	ANSH SAXENA	2024
VEER BAHUR SINGH	2024	PRIYANKA KUMARI	2024
KRITADHI MAITY	2023	AYUSH GUPTA	2023
JNANDEEP TALUKDAR <i>Best B.Tech. Project Award</i>	2023	HARSH SHAH	2022
SHREYAS TAWARE	2021	A. M. K. SARMA	2019
BUSIREDDY V. D. REDDY	2019	HARSHIT AGRAWAL	2018
KARTIK AGRAWAL	2018	KARAN JAKHAR	2017
SAI RAVITEJA BHAMIDIPATI	2015	ASHESH CHATTOPADHYAY	2015
SAI KRISHNA THOGARU	2015	<i>Best B.Tech. Project Award</i>	

11. Editorial and Reviewer Activities

Editor: International Communications in Heat and Mass Transfer, Elsevier (2022 – till date)

Member, Editorial Board, Interfacial Phenomena and Heat Transfer (2023 – till date)

Reviewer for Journals in the area of Energy and Thermal Management: International Journal of Heat & Mass Transfer (*Certificate of Outstanding Contribution in Reviewing 2017*), Applied Thermal Engineering, International Communications in Heat & Mass Transfer, Applied Energy, International Journal of Therm. Sciences, International Journal of Multiphase Flow, Experimental Thermal and Fluid Sciences, Journal of Heat Transfer – Transactions of ASME, Journal of Electronic Packaging – Transactions of ASME, Journal of Thermal Science and Engineering Applications – Transactions of ASME, Thermal Science and Engineering Progress, Interfacial Phenomena and Heat Transfer, Heat Transfer Research, Heat Transfer Engineering, Microgravity Science and Technology, Transport in Porous Media, Journal of Enhanced Heat Transfer

Reviewer for Journals in the area of Colloids and Interface Science: Langmuir, Soft Matter, Journal of Colloids and Interface Science, Colloids and Surfaces A: Physicochemical and Engineering Aspect, The Journal of Physical Chemistry, Applied Surface Science, Current Opinion in Colloids and Interfaces, ACS Omega

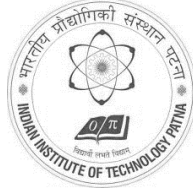
Reviewer for Multidisciplinary Journals: Advanced Materials Interfaces, Nature Materials, Nature Nanotechnology, Nature Microsystems and Nanoengineering, Scientific Reports, Nanoscale and Microscale Thermophysical Engineering

12. Other Professional Activities

- i. Organizing Secretary of the 27th National and 5th International ISHMT-ASTFE Heat and Mass Transfer Conference ([IHMTTC-2023](#)) to be hosted at IIT Patna.
- ii. International Scientific Committee Member at the 11th International Conference on Boiling and Condensation Heat Transfer, Edinburgh, Scotland, 2023.
- iii. Served as the National Advisor Committee member for the 1st International Conference in Fluid, Thermal, and Energy Systems (ICFTE22), NIT Calicut, June 9, 2022.
- iv. Served as the Session Chair and the Technical Program Committee (PC) Member for the 26th National and 4th International ISHMT-ASTFE Heat and Mass Transfer Conference (IHMTTC-2021).
- v. Served as the International Ambassador for *The Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems* (ITherm) for the years 2019-2020.

Rishi Raj, Ph.D.

Associate Professor,
Department of Mechanical Engineering
and
Principle Investigator,
Thermal and Fluid Transport Laboratory (TFTL)
Indian Institute of Technology Patna



Address: Room 113, Block III
IIT Patna, Bihar 801103, India
www.iitp.ac.in/~rraj/ (TFTL)
rraj@iitp.ac.in, rraj.iitp@gmail.com
☑ +91-611-5233166 (office), +91-829-2339322 (mob)

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- vi. Served as the Session Chair and the Technical Programme Committee (TPC) member for the 25th National and 3rd International ISHMT-ASTFE Heat and Mass Transfer Conference (IHMTTC-2019).
 - vii. Served as the International Scientific Committee Member at the 10th International Conference on Boiling and Condensation Heat Transfer, Nagasaki, Japan, 2018.
 - viii. Served as the session chair at the 24th National and 2nd International ISHMT-ASTFE Heat and Mass Transfer Conference (IHMTTC-2017).
 - ix. Served as the session chair at the 6th International & 43rd National Conference on Fluid Mechanics and Fluid Power (FMFP-2016).
 - x. Served as the Technical Program Committee Member for the 6th International & 43rd National Conference on Fluid Mechanics and Fluid Power (FMFP-2016).
 - xi. Served as the session chair at the 9th International Conference on Boiling and Condensation Heat Transfer, Boulder, Colorado, USA, 2015.
 - xii. Served as the topic chair at the ASME 2015 InterPACK/ICNMM Conference.